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Conceptual Study of Consumers' Intention to Purchase Sustainable Building in Malaysia

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Abstract--- *Adherence to the strict compliance set by authority regulations for sustainable building projects is deemed necessary among the building developer firms towards gaining a competitive advantage. This conceptual paper aimed to study on what determines consumers' intention to purchase sustainable building is minimal especially in a developing country. Thus, the goals of this study are fivefold: (i) to investigate the influence of attitude, subjective norm, perceived behavioral control, environmental concern, environmental knowledge, and government incentive on consumers' intentions to purchase sustainable building in Malaysia, (ii) to examine the influence of environmental concern on consumers' attitude towards purchasing sustainable building, (iii) to assess the influence of environmental concern on subjective norm towards purchasing sustainable building, (iv) to inspect the influence of environmental knowledge on subjective norm towards purchasing sustainable building, and (v) to test the influence of government incentive on perceived behavioral control towards purchasing sustainable building. This research applies the extended theory of planned behavior (TPB) as study guiding principle. The research finding said the building developer firms to examine the most significant predictor that consumers' intentions to purchase sustainable building in Malaysia. Besides, with this research offers important insight to the building developer firms towards meeting consumers' challenging needs and wants.*

Keywords--- *Study of Consumers, Purchase Sustainable, TPB.*

I. INTRODUCTION

The worldwide rapid economic growth was causing many challenges among society and environmental issues, therefore sustainable development is one of the priorities to promote balance between the needs for continue in business without destroying the natures and compromising of the environment and society's needs(Tang, Ng & Skitmore, 2019). Building construction industry is considering a part of the most important economy factor in every countries and Ofori(2015) describes building construction was playing a key role between social and economic issues, the high building demands during economic blooming and the large values cot of investment in building development and construction projects which having significant positive impact to the economy. The building construction projects having significant positive impact in economy growth but eventually the building construction industries will also negatively impact the nature and environment. The building construction works are consuming high usage of energy, water and material resources with creating a lot of construction waste debris and mitigating dust pollution (Wu, Zhang, & Wu, 2016), furthermore building development projects is to create and built building structure on a piece of nature land which means every new building projects were disturb and sacrifice the original natures and greenery on that piece of land and the construction works were polluting the surrounding natures and environment and created environmental problems.

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Malaysia was fast growing in economic as well as growth to be urban populations as Foreign Direct Investment (FDI) stated Malaysia has been recognized to be one of the most popular investment destinations in the region (Fadhil, &Almsafir, 2015), which the rapid growth were required a lot of new development and building construction projects to accommodate the growth. The Malaysia's economic was rejoiced and growth with the new development and construction projects but Ajayi, Oyedele, Jaiyeoba, Kadiri, and David (2016) described building construction industry created the pollution which poses a risk to the natures and environment with impacts on human health and created social problems. During the fast urbanization and industrial revolution where the environmental problems were alerted people's awareness of sustainable development with the need and important of environmental protection for our futures, with resulted the developed countries were started implementing Green Building concepts for all kind of products but still focusing on the building construction projects which aimed to reduce CO2 emissions and energy reliance on fossil fuels (Zhang, Chen, Wu, Zhang and Song 2018)furthermore Green Building strategy has been evolved and upgraded to be more complete strategy with Sustainable Building. The sustainability concept is to balance between three sustainable dimensions of social, environment and economy with enable for future generations to benefit from present developments, meets the present people requires and needs without undermining the ability of future generations' capacity to satisfy their needs (Zimmermann, Skjelmose, Jensen, Jensen and Birgisdottir, 2019).

There are not only the developed countries were concerning about their nature and environment, even the developing countries such as Malaysian were also highly concern about the nature and environmental problems with increased awareness the important of the environmental issues and sustainability, the Malaysian's government and some local authority such as Dewan Bandaraya Kuala Lumpur (DBKL) has implementing green building requirement with required all the new building development around Kuala Lumpur area to comply green building index (GBI) . The Construction Industry Development Board of Malaysia (CIDB) has stated focus on the sustainability concept and established sustainable building policies with the program of "Sustainable Construction Excellence Centre" (MAMPAN) to drive the sustainable construction in the country with innovative initiatives methods and focus conservation of the environment while critical development-related problems are included in a building construction project. CIDB has also developed instruments to help contractors in integrating construction works with sustainability. MyCREST is the tool and guideline to guide the construction industry players in various aspects of sustainability.

The building developer firms normally do not have a proper intention about green strategy and sustainability development to build green building and/or sustainable building, they are just complying with the minimum authority regulation for the purpose of cost saving and convenient to the building construction projects. Sustainable building is not only a compliance to meet authority regulation but it is a protection of environment and becoming an important approach for building developer firms to gain a competitive advantage (Ajayi, Oyedele, Jaiyeoba, Kadiri, and David, 2016). However, what determines consumers' intention to purchase SB are unclear, especially the developing countries in Malaysia. The goals of this study are fivefold: (i) to investigate the influence of attitude, subjective norm, perceived behavioral control, environmental concern, environmental knowledge, and government incentive on consumers' intentions to purchase sustainable building in Malaysia, (ii) to examine the influence of

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environmental concern on consumers' attitude towards purchasing sustainable building, (iii) to assess the influence of environmental concern on subjective norm towards purchasing sustainable building, (iv) to inspect the influence of environmental knowledge on subjective norm towards purchasing sustainable building, and (v) to test the influence of government incentive on perceived behavioral control towards purchasing sustainable building. This research applies the extended theory of planned behavior (TPB) as study guiding principle. Further this research findings aid the building developer firms to examine the most significant predictor that consumers' intentions to purchase sustainable building in Malaysia. Besides, with this research offers important insight to the building developer firms towards meeting consumers' challenging needs and wants.

II. BUILDING INDUSTRY

What is Building? The definition of building is a structure with a roof and walls, such as a house or factory which is a basic human need to safeguard human life and health, therefore everybody needs a building as protection shelter and some peoples even called a building as property and/or real estate. In the recent world after the basic needs of foods to fill up our stomach and body wears to protect our body the next important need for human is dreaming to own a building as a necessity to safeguard themselves, human need either residential building for own stay and/or commercial building such as factory or office for occupying business. Due to all human should need a building occupy as home or business, therefore the demand of building is keep increasing in the developed and developing country, therefore building construction industry become crucial and very important factor over social and economy not only in Malaysia but it is similarly important to all the countries worldwide (Ofori, 2015).

Building industry was having significant positive impact to the economy growth but eventually the construction of a building will also negatively impact the nature and environment, it is due to the building construction works are consuming high usage of energy, water and material resources with creating a lot of construction waste debris and mitigating dust pollution (Wu, Zhang, & Wu, 2016). Furthermore, building development projects is to create and built building on a piece of nature land which means every new building project is required to disturb and sacrifice the original natures and greenery on that piece of land and the construction works were badly polluting the surrounding natures and environment and created environmental problems.

2.1. Building Industry in Malaysia

Malaysia is one of the fastest growing country in the region to be urban populations as Foreign Direct Investment (FDI) also stated Malaysia has been recognized as one of the most popular destinations for investment in Southeast Asia (Fadhil, &Almsafir, 2015), as which the rapid growth of economy will required a lot of new development and building construction projects to accommodate the growth. The Malaysia's economic was rejoiced and growth with the new development and construction projects but building construction industry created environmental problems with pollution which poses a risk to the natures and environment with impacts on human health and created social problems (Ajayi, Oyedele, Jaiyeoba, Kadiri, and David,2016).

The Malaysia's economic was rejoiced according to Department of Statistics Malaysia(DOSM) the Malaysia's economy growth accelerates to 4.7% in Q4 2018 with GDP RM322.6 billion, partly contributed by the growth of building construction sector with 4.7% of overall GDP, according to the Valuation & Property Services Department

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Ministry of Finance Malaysia the Malaysian Property Market 2018 report stated the Malaysia property market in 2018 was gradually improved and recorded a marginal increase, the property sector has recorded 313,710 transactions with value of RM140.33 billion in 2018 which been increased by 0.6% in volume and 0.3% in value compared to the past year in 2017. The residential property was even continued to support the overall property sector with 62.9% market share, followed by agriculture property with 21.5% share.

Commonly known the first priority for offer building product is to reduce the building cost without sacrificing the quality and meeting the potential property buyers' expectation, secondly marketers should influence the attitude of property consumers through advertising, word of mouth marketing and emphasize on how much benefit that owning a sustainable building (Chung, Yuong, Low &Ung,2018). Further more subjective norm with family members or friends to recommend and encourage purchasing more than one unit for the same type of property with extra rebates or discounts, lastly is to provide complete purchase information such as benefit of sustainable building, location, design features, amenities, purchase terms and conditions, property pricing, down payment, relevant fees and loans to the consumers to gain their perceived behavior control and increase their confidence level with better understand the ability to own a sustainable building.

III. CONCEPT OF SUSTAINABILITY

Concept of sustainability was increased rapidly is due to the globally environmental and society problems were getting serious in the recent years, therefore a global collective social goal was created the concept of sustainability which is to balance between three sustainable dimensions of social, environment and economy with enable for future generations to benefit from present developments, meets the present people requires and needs without undermining the ability of future generations' capacity to satisfy their needs. Furthermore, Chiotinis N. (2006) described the sustainability rules were developed as universal collective goal and become an attempt to sensitize citizens, thereafter attempt to institutionalize sensitization process. Sustainability have promotes companies to frame choices in terms of years or even decades rather than in the next quarter's revenue and it is to consider more factors than just the profit or loss involving the business. According to Kalu, Buang&Aliagha (2016) the more public awareness and education on the problems threat of social, environmental and economic, where contributing consideration developed the sustainability concept toward all industries with green products as well as building industry with GB and further increase afford developed into sustainable building, the aim of sustainable building is to minimize environmental impact and enhance building sustainability as well as social equity, cultural problems, traditional problems, human health, human safety, economical infrastructure, last but not least is the environmental protection (Berardi, 2013).

Zimmermann, Skjelmose, Jensen, Jensen and Birgisdottir (2019) described 1992 in Rio de Janeiro hosted the "United Nations Conference on Environment and Development" (UNCED) commonly known as 'The Rio Earth Summit' only has entered the global stage of Sustainability Development by the UN with178 nations representatives and non-governmental agencies (NGOs) to discuss the global environmental issues end-up as resulted it become a central policy. The conference namely "Earth Summit" was commonly known as presented the concept for shaping and saving the future of the 'blue planet'. Sustainability Development consist varieties of economic and social

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development that possible to safeguard and strengthen the existing natural environment, social equity and human excellently-being. Enable to achieve a true sustainability which needs to balance the three pillars of sustainability factors of economic, social and environmental in equally alignment. (1) ***Environmental Sustainability*** is able to live within the natural resources and true environmental ensure that consuming our natural resources, such as energy power, water, fuels, materials, land and etc. (2) ***Economic Sustainability*** is requiring for a business that using its resources effectively, accountably and responsibly so that the business can operate function in sustainable way to consistently continuously generate operating profit. (3) ***Social Sustainability*** is a critical element about the well-being and continuity of a community as it is the capacity of society to persistently attain healthy social well-being.

IV. SUSTAINABLE BUILDING

The sustainability concept was increased rapidly and greatly accepted worldwide in the recent years it is due to the environmental and society problems were getting serious, but not only a single definition of sustainable building but there were several definitions have shown in previous study, it was due to the unclear definition of SB and incomplete justification (Berardi, 2013). The sustainable building aims to promote and support the concept of construction sustainability and improving environmental protection as it has a very strong correlation with the environmental conjecture based on resource consumption and pollution(Razali and Mohd Adnan,2015;Ajayi, Oyedele, Jaiyeoba, Kadiri, and David,2016)and Abu-Elsamen, Akroush, Asfour& Al Jabali (2019)described environmental awareness with energy-efficient household products significantly contributed to marketing strategies and impact consumer behavior. In fact, Berardi[11] has better justification of sustainable building as it was developed from the concept of sustainability development from 1970s, the aim of sustainable building is not only minimizing environmental impact and enhance building sustainability but it should improve social equity, cultural problems, traditional problems, public health, human safety, social infrastructure, and last but not less is the environmental protection. A true sustainable building has to begin from building design include the tools and system of design, construction system, methods and even materials used to the actual construction process and the operation and maintenance are equally important to be a sustainable building. As summary the sustainability concept is to balance between the three dimensions of sustainable development such as society, environmental and economy with allowing future generations to derive from current innovations development, fulfill the current needs without sacrificing the capacity of people in the future to satisfy their future needs (Zimmermann, Skjelmose, Jensen, Jensen and Birgisdottir, 2019).

During 1990's and 2000's concept of sustainability has deeply effect on the property and building construction industry, recent years GBI and GreenRe were both also enhanced with the name either GB or SB certification(Razali and Mohd Adnan, 2015). The Malaysia government has launched SB rating certification by the "Construction Industry Development Board of Malaysia (CIDB)" established "Sustainable Construction Excellence Centre (MAMPAN)" to drive Malaysian contractor to adopt in sustainable construction with innovative initiatives methods and focus on conservation of the environment while critical development-related problems are included in a building construction project. CIDB has also developed instruments to help contractors in integrating and viability with sustainable construction technique. MyCREST is the tool and guideline to guide the construction industry players in

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various aspects of sustainability. MYCREST has three basic tools as rating system such begin from design stage, after that will be construction stage and lastly is the sustainable operation and maintenance stage use for assess a sustainable building certification by MYCREST. The star rating either can certified in different phases or award on overall star rating of the project. There are many factor and approach to achieve a true sustainability and different phases begin from building design include the tools and system of design, construction system, methods and even materials used to the actual construction process and the operation and maintenance are equally important to be a sustainable building(De Paula, Arditi&Melhado, 2017).Hoxha & Shala (2019) found a huge gap between the purchasers' willingness to pay a premium price for buying sustainable building but government incentives have significant consequences. However, in this study is to investigate what factors that determines consumers' intention to purchase sustainable building in Malaysia.

4.1. Phases of Sustainable Building

i. Sustainable Design

Sustainable design is referred to the building design stage that assist to decrease adverse effects on the environment, public health and convenience of property occupants ultimately improve property performance effectively (Tazilan, 2012). The concept of sustainability development of design stage can be expanded to include the predictive validity of architectural aspects such as thermal insulation, acoustics and ventilation that can be split into material sustainability and visual sustainability. Sustainable design should inclusive sustainable townships planning with monitored closely with the cultural and social variations of the relevant township or neighborhood as a sustainable design should fulfill the current need without sacrificing the capacity of current human behaviors and activities linked to good and health sustainable urban living.

ii. Sustainable Design Tools

According to Oduyemio O. &Okoroh M. (2016) Building Information Modeling (BIM) is multi-disciplinary and collaborative information system that coordinating all building services within one design model with creating a chance to perform design analyzes correctly and effectively compared to traditional methods coordination separately or manually. BIM is a modeling system that delivers extensive improvements in the design coordination and assessment of buildings ' environmental costs and become a new leading technology for building design stage, the process of conversion procedures are relevance to all design consultants and designers working in collaboration. Most usefulness of BIM that offers greater important records data and information for projects design and it inclusive significant features for performance analysis, prior previous projects information and recording, designers can predict and anticipate probable design mistakes and consequently modify designs early to lower the failure possibility of project during design stage.

iii. Sustainable Construction

Construction works were always convicted with generating pollution and environmental issues from excess consumption of natural resources, normally begin from construction works to building operation and facilities maintenance to emissions of the surrounding area and the GB and SB design should continuing to use environmental

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friendly materials to reduce negative impact to the nature and environment. There are various sustainable construction methods and process that involve lesser environment problems to the planet, a proper waste management system for sustainable construction that can prevent or reduce of waste, enhanced recycling building materials which resulted more valuable to humanity and environment as well as more profitable (Akadiri, and Fadiya, 2013).

iv. Sustainable Construction System

Nawi, Lee, & Nor (2011) described the Industrialized Building System (IBS) is one of the sustainable construction system which is not a new construction technology in Malaysia but it have been launched more than 40 years ago by the Malaysian government that introduce this construction system for affordable housing projects in the early 1960's.IBS is a construction method with industrialized technology as a mass manufacturing of building elements either fabricate on site or produce in a plant or factory in alignment with the specified requirements with standard building form or shape with required sizes and transferred the element to the construction site to be rearranged in accordance with a certain standard in order to correctly construct the building with better workmanship and reduce work at site. Beside IBS system can be produce in a plant or factory which also can improve the construction process to reduce construction waste and avoid accidents and injury at site as construction commonly known as one of the highest risk industry.

v. Sustainable Building Material

There are several definitions of sustainable materials commonly people understanding that is similarly to green eco-material having lesser negative environmental impact throughout the life cycle of the material. Hoxha V, Haugen T. &Bjorberg S. (2017) has described sustainable building material is products that consume less energy during manufacturing production and even during logistic transportation until material use at construction site. Sustainable building materials are those materials that preserve energy and natural resources in most cost effective, secure and healthy to the environment and customers. On the other hand, others researchers also defined sustainable construction materials as high recyclable materials and small-emitting pollutants and Hoxha V, Haugen T. &Bjorberg S. (2017) found that sustainability use of energy such as energy saving, energy effectiveness, longevity, reliability and less energy consumption are the key important elements that measuring the sustainable building materials.

vi. Sustainable Building Operation / Facilities Management

Building operation is also name as facilities management (FM), which is representing the day-to-day building operation and maintenance services. Meng (2014) identified sustainable FM is relatively new compared to building design and building construction, as sustainable FM should design with integrated Building Management System (BMS) as sustainable operation system for heating, cooling and ventilation (Collins, Haugen, Lindkvist&Aamodt, 2019). But sustainable practice should begin from design and construction of buildings than carry on to sustainable operation and maintenance, as sustainable FM only can continue carryout sustainable operate and maintenance when the building was been design and constructed with sustainable functionality. Thereafter FM can operate the building with more ecologically, better efficiency, maintenance effectively, eco friendly and society accountable at the same

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time. In addition, improve energy performance has been recognized as having an important impact on reducing carbon footprint. Comfy, healthy, safe and secure place is a great sign for the well-being of the owner with a success sustainable FM.Collins, Haugen, Lindkvist&Aamodt(2019)found that was bridged the gap between SB and Sustainable FM mainly related to the influence of the operation level, another study Støre-Valen[24] found that SMEs were struggling to handle and manage sustainable facilities management mainly due to the unclear economical and financial advantages.

V. THEORETICAL FRAMEWORK FOR EXAMINE CONSUMERS' INTENTION TO PURCHASE SUSTAINABLE BUILDING

5.1. Theory of Planned Behavior (TPB) Model

The theory of planned behavior (TPB) have been commonly used as it is one of the most easy understanding social-psychological models for researchers to predict, and interpreting human behavior, since 1985 Ajzen I. has proposed the model through an article "From intentions to actions: A theory of planned behavior. "to study relationships between assumptions of attitudes, intentions and behavior which can be used in many different fields. Arifani&Haryanto (2018) described TPB can examine and prediction of consumers' decision on purchase attitude, subjective norm, and perceived behavioral. The basic TPB's core concepts and measurable dimensions are commonly known as behavioral intent, behavioral attitude and subjective norm (Ajzen I., 2015). Another study Emekci (2019) used TPB examined the variables affecting green purchase behavior and discovered perceived customer effectiveness and PBC had the greatest impact.

5.2. Proposed Theoretical Framework

TPB was widely used to predict consumer intention and behavior in a broad spectrum of areas and has also been considered an extremely strong model for demonstrating ecologically friendly green behavior or environmental sustainable products (Ajzen I., 2015). In fact, intention is still the best accessible prediction for human behavior as the previous researcher Maichum, Parichatnon &Peng (2016)have applied TPB towards green products among Thai consumers with added variables of environment concern and environmental knowledge as predecessor for the consumers' attitude of purchase green products. Furthermore Akroush, Zuriekat, Al Jabali. &Asfour (2019)found consumers attitudes are crucial and very important for the intention to purchase of energy-efficient products, another study Zhang, Chen, Wu, Zhang & Song (2018) have applied TPB to investigate the young consumers' intention to purchase green residential in China market with additional variables of subjective knowledge, government incentive and environment concern and found that other than standard TPB the both environmental and environmental concerns greatly facilitate the purchase of green products. Woo[30] classified functional value on buyer attitudes and promotion strategies were the greatest model to improve green behavior buying intentions for instance, higher green product quality, competitive prices, discounts, promotional incentives and easy accessibility could improve customer perception. Unlike others research Xu, Prybutok&Blankson (2019) studied found environmental attitudes does have a positive effect while perceived control has an adverse negative effect on purchasing intentions.

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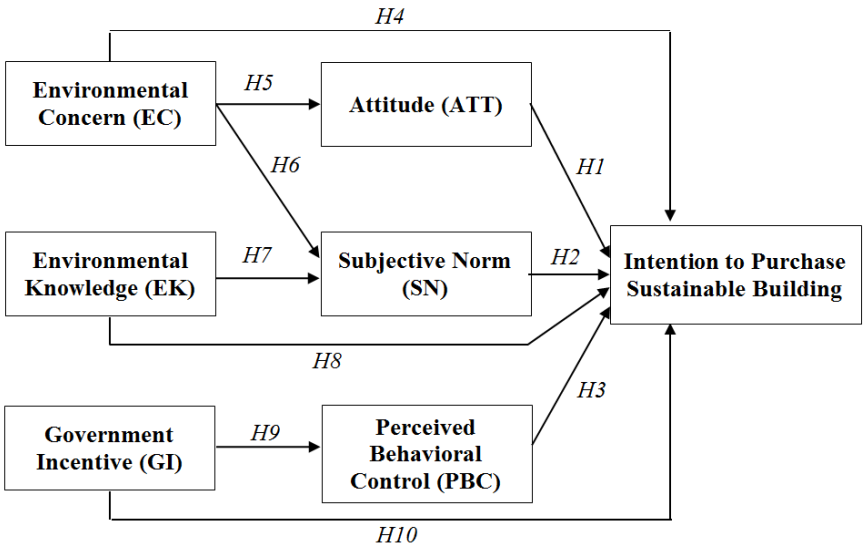

Figure 1: Proposed Research Framework

In Figure 1 shown the proposed research framework that developed for this study with extended theory of planned behavior (TPB) model serving the study foundation to investigate what factors determine consumers' intention to purchase sustainable building. This model will gives an idea of this study as a starting point to extent TPB as fresh conceptual framework, besides the proposed framework was created on the basis of the study objective and questionnaire. For instant the proposed research framework shown in Figure 1 have added constructs to extend the original TPB model such as environmental concern, environmental knowledge and governmental incentives, a total ten hypotheses drawn from the seven constructs, namely intention to purchase sustainable building (IPSB), attitude (ATT), subjective norm (SN), perceived behavioral control (PBC), environmental concern (EC), environmental knowledge (EK) and government incentive (GI).

VI. Discussion And Conclusions

In line with the rapid economic growth which was leading to adverse environmental and society problems globally. This research finding could allow Malaysian government as a reference guidance to promote sustainable building policy with encourages property developer firms to comply with MAMPAN and MyCREST from CIDB. Furthermore, building developer firms should need to understand their prospective consumers to purchase sustainable building in order to gain from the building property market, as understand consumers' purchase intentions would provide additional information related sustainable building and marketer as a source of distinctly different advantage for the future. The important factors need to be understood by property developer firms in order to accelerate the sustainable building market.

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