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Assessing the Challenges of Integration Affordable and Sustainable Housing from Economic Perspectives

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Abstract. The increasing worldwide demand for affordable housing and sustainable development leads to highly needed sustainable solutions in the housing sector. Households in the middle-income range struggle to secure the right sustainable home within their budget. In response to the Malaysian Eleventh National Plan (2016-2020), importance is given for every citizen to have affordable housing with sustainable elements, which leads to the trend of integrating affordability housing criteria in sustainable housing development. Thus, the aim of this study is to analyze the critical challenges of the integration of affordable and sustainable housing from the economic, environmental, and social perspectives of the middle-income group. However, this study focuses mainly on the challenges from economic perspectives. The semi-structured interview approach was employed involving several housing developers in the Klang Valley area as the sustainable concept is still early in Malaysia. Results revealed that the high cost of sustainable development, financial constraints of developers, lack of design, technology and expertise, financial constraints, lack of government enforcement and incentives, lack of commitment from stakeholders are the key challenges in developing affordable and sustainable housing. The outcomes of this study will hopefully serve to offer several guidelines for construction players to enhance the quality of life for sustainable communities via the Sustainable Affordable Housing Scheme.

1. Introduction

The worldwide population is estimated to increase as of 4.2 billion in 2018 to 6.3 billion in 2050 [1]. A house is a basic necessity for humans to live as it serves as a shelter and a place of safety and protection for people. The housing sector contributes significantly to the socio-economic development and the safety of communities [2]. Although providing sufficient housing is vital, it creates a significant challenge to most developed and developing countries during the urbanization process. Specifically, developing affordable housing is an area with critical issues that need to be overcome in improving the living conditions of low-income households [3].

According to National New-Type Urbanization Plan (2014-2020), environment protection is measured as one of the core philosophies during the urbanization process. Unfortunately, sustainability issues are often neglected due to the housing shortage, especially in developing countries [4]. This is because affordable sustainable housing comes with a high upfront cost caused by the demands of environmental sustainability. Thus, it prompts the rare integration of affordable and sustainable housing [5-6].

Skyrocketing housing prices and inadequate of affordable housing creates social complaints, threatening socio-economic and political stability [7]. Economic sustainability does not only focus on



improving housing affordability, but the houses built should fulfil the criteria of healthy living, value for money and within a good neighbourhood [8]. Even though implementing sustainability may lead to a very high initial cost, the life cycle cost and quality of building may be upgraded. As evidenced by Coimbra and Almeida [9], the cost only increases by 4.2% compared to the conventional method. A variety of life cycle benefits such as reduced maintenance costs and energy bills can also be forecasted. Therefore, it is vital to integrate sustainability criteria into housing planning and construction in affordable housing programs [6].

In Malaysia, 37,000 units of houses have demanded by low to medium-income populations [10]. The housing market prices were expanding year by year over the past fifteen years [11-12]. Thus, the approach of integrating affordable and sustainable practices in housing development is inevitable. Various housing programmes have been implemented by the government to provide affordable housing for both rural and urban communities, in line with inclusive development missions. However, the house prices are still high at all times, making it hard for them to buy a property. It poses critical barriers to the government in integrating and developing affordable sustainable housing.

The sustainability criteria have become a benchmark for the success of construction projects. The sustainable buildings necessitate the incorporation of innovative design, construction and post-construction to reach a minimum life cycle cost. The earlier completion of projects enables the clients to secure affordable housing [13]. Thus, there is a necessity to study affordable sustainable housing projects to recommend the solutions of incorporating multi ecosystem elements that consider environmental, social and economic advantages. However, this paper focuses on economic perspectives. Future research will focus on other multi ecosystem perspectives. The outcomes of the study will help to establish a framework of integrated affordable sustainable housing, as there is a lack of sustainability framework to integrate sustainability criteria with affordable housing in Malaysia.

2. Affordable housing and sustainable development

Malaysia has been executing housing transformation agenda in the housing industry over the last two decades [10]. The National House Buyers Association (HBA) claimed that there are differences between affordable housing and social housing. Social housing is targeted for lower-income groups, which refer to the household income of below RM 3,000 per month [14]. Meanwhile, affordable housing is classified as properties anticipated for the median population. In Malaysia, the household income of this middle-income group is between RM 3000 to RM 10,000 per month [15]. The lower-income group has been offered various housing schemes, whereas the middle-income group is left out to secure a home on their own [14]. The government defines affordable housing as those priced between RM 150,000 to RM 350,000. However, properties that fall within this price are quite limited among the new properties launched by developers. Most of the latest launches by developers have cost more than RM 500,000, and this is beyond the financial competency of the middle-income group [14]. They face difficulties to save for the down payment and to service the monthly housing loan based on their current income [11]. This is parallel with findings by Department of Statistics Malaysia [15], who claimed that the young generation has to minimize their social life, such as postponement their marriage and childbirth, minimize entertainment spend and daily expenditure to keep the money for the house down payment.

During the urbanization process, Malaysia has met difficulties in producing adequate affordable housing in a socially and ecologically manner. However, current housing projects need to implement sustainable practices due to the increasingly critical issues about climate change. Based on the Green Building Action Plan released by the National Development and Reform Commission in 2013, sustainable housing should consist of 70% of newly built affordable housing by 2020. Therefore, the relevant parties need to commit to pursuing housing development more sustainably. They should create an ultimately enhanced well-being and quality of life by addressing multi ecosystems, i.e. economic, environmental and social domains.

In Malaysia, the implementation of the sustainability concept in affordable housing development is still at an initial stage [16]. There are arguments among the necessity to deliver affordable housing and the need to achieve sustainable development in the construction development lines. It becomes imperative to ensure an equilibrium amongst environmental protection, economic development and

social development in the construction industry [17]. From a social perspective, Aman et.al [18] pointed out that housing is not only offered accommodation but also compromise safety to a public. From the environmental perspective, the house should be liable to reduce greenhouse gas emissions, optimize usage of energy and material and waste management [19]. From an economic perspective, the housing development sector creates a significant increment GDP year by year [20]. However, the increment of construction materials costs such as cement, steel and timber housing projects contributed to the increase in housing prices [21]. The limitations of sustainable materials in Malaysia further adds to the cost burden due to the high rate of import materials from other countries [16]. The project stakeholders have become discouraged from developing affordable sustainable houses on a tight budget. Therefore, the consideration of the economic sustainability of the developers is vital to ensure that these combinations can be executed continuously. Even though developers may implement the cost reduction strategies, providing financial incentives by the government is necessary for developers to secure economic viability. The financial security of project stakeholders has become a prerequisite compared to other factors in integrating affordable sustainable housing. Therefore, this paper focuses on the challenges of the integration of affordable and sustainable housing from economic perspectives.

3. Research methodology

A qualitative approach was adopted to represent the perspective of the Malaysian construction industry on the integration of affordable housing and sustainable practices. The preliminary study involved a survey on housing developers located in the Klang Valley area. The Klang Valley area was selected due to their strategic locations and business development opportunities. The list of the housing developers was acquired from the Real Estate and Housing Developers' Association (REHDA). The target respondents for this study comprised staff in the middle management position of property development firms such as quantity surveyors. The respondents should also have experience in handling sustainable housing. Only eight interviewees were carried out in this study as the sustainable concept is still new and scarcely implemented in Malaysia. The eight (8) developers have been in the industry for more than 15 years and currently responsible for sustainable housing projects. Data gathered from the semi-structured interviews were transcribed, classified and narrowed down for further analysis using a content analysis approach. Strategies for integration of affordable sustainable housing projects were established by using the findings from the data analysis and synthesis,

4. Results and discussion

Table 1 presents the findings on the challenges of the integration of affordable sustainable housing concept in Malaysia. Based on the findings, five (5) themes on the challenges of integrating affordable and sustainable housing were determined. They are the high cost of sustainable building, financial constraints by the developer, lack of government enforcement and incentives, lack of commitment and support from stakeholders and lack of design, technology and expertise.

4.1 High cost of sustainable housing

All respondents are in consensus that the high cost of sustainable housing poses the most barriers in integrating affordable and sustainable housing. The respondents stated that the high price for sustainable materials products causes it hard to be applied to low medium-cost housing projects. The green product offers in the Malaysia market does not cover all building materials. Difficulties in obtaining the suppliers for sustainable materials in Malaysia have also been stressed. Meanwhile, buyers are requested to use sustainable materials from foreign countries because it portrays higher quality. They believe that the growth of sustainable practice will be at the sluggish level if the construction companies use local green products. Developers have to import sustainable materials, even with the lack of rebates from the government. However, the respondents also argued that they have to request for custom made products to outfit the local climate. As a result, the cost may increase on top of the transportation cost.

Table 1. Challenges of the integration of affordable and sustainable housing from economic perspectives

Challenges	Annotations
The high cost of sustainable building	“Eco materials are expensive” (RA, RB, RC, RD, RE, RF, RG, RH) “Limited suppliers of sustainable materials” (RB, RE) “Lack of rebates for importers of building materials” (RE) “Most of the green product materials factories located outside Malaysia” (RA, RC, RF, RG, RH) “High cost of land” (RB, RC, RD) “Low quality of green products in Malaysia” (RF, RG, RH) “High upfront cost” ((RA, RB, RC, RD, RE, RF, RG, RH)
Financial Constraints by Developer	“ High cost, yet the profit margin is not favourable” (RD, RF, RG, RH) “ The additional cost for developers to provide basic amenities to make the sustainable house” (RA, RB, RC, RD) “ Lack of incentives and tax exemptions” (RB, RC, RF, RG)
Lack of Government Enforcement and Incentives	“Governments policies keep changing” (RE, RF, RG, RH) “A sustainable practice is the sole responsibility of the government” (RA, RB, RC, RD) “Late building approvals such as building plan and master layout plan” (RB, RC, RD, RF) “ Lack of regulations and laws to implement sustainable housing concept” (RB, RC, RF, RG) “It is not mandatory for developers to provide such scheme” (RC)
Lack of Design, Technology and Expertise	“We don’t like to commit something new” (RB, RC, RD, RF, RG, RH). “Developers are comfortable with their business marketability” (RB, RC, RD, RF, RG, RH) “Green technology needs to import from other countries, and it is difficult to obtain in Malaysia” (R B, RC, RF, RG) “Higher cost of sustainable technology” (RC, RD, RF) “Companies are not willing to provide training/ workshop in sustainable skills” (RD, RF) “There is no expertise in sustainable design” (RD, RF, RG, RH) “People think twice to spend more money on sustainable design” (RD, RF, RG) “Depends on foreign skill workers” (RC & RG)
Lack of Commitment and Support from Stakeholders	“Many stakeholders difficult to understand sustainable housing concept” (RA, RB, RC, RD, RE, RF, RG, RH)

The high cost of land also poses other challenges to integrating affordable and sustainable housing. The respondents stated that the lack of subsidies for developers in purchasing the land will inhibit them from developing sustainable housing due to the lack of assurance that the houses will be sold. Otherwise, the high upfront cost should be prepared by developers in implementing sustainable housing concept. Albeit the life cycle cost for sustainable housing is low, the initial cost is high. For example, although using a solar panel system can minimize the life cycle cost for the house, the installation cost of this system is high. This finding is also consistent with Abidin [16], who found that high upfront cost is vital for implementing sustainable practices due to the need to assign environmental consultants, import foreign eco-materials and allocations for green rating assessment and environmental impact assessment (EIA). Thus, developers are dissuaded from implementing the

sustainable concept. It has been estimated that the cost of sustainable housing is 40% higher than the conventional house [22].

4.2 Financial constraint of the developers

The majority of developers in Malaysia are from medium and small-sized companies [16]. They perceive that the companies that have strong financial are more conscious of sustainable practices compared to SMEs because they believe sustainable practices may affect their profit margin. They feel reluctant to adopt the sustainable concept and are not willing to waste any money in it [3, 12]. However, the respondents pointed out that the company's financial would not affect the competency to integrate affordable housing and sustainable practices. They further confirmed that the SME's may implement sustainable practices without incurring an additional cost by integrating sustainable elements in the projects, focusing on the design and orientation of the building, emerging more green spaces and enhancing social requirements through upgraded facilities.

The majority of the respondents confirmed that their companies' profits produced by developing medium and low-cost houses, which still govern the Malaysian construction industry. Thus, they are reluctant to implement sustainable practices, which incur an additional cost. They would only apply a sustainable concept that would lead to instant cash in hand compared to the return in the long run. Even if sustainable housing achieved a minimum life cycle costs, developers do not get advantageous from it. They have to incur extra expense to fulfil basic amenities to create sustainable housing. Moreover, they stressed that most of the sustainable housing development plans create additional time to gain the approval of local councils. It causes the industry stakeholders to be unwilling to take a risk in implementing the sustainable concept in their housing development programs.

4.3 Lack of government enforcements and incentives

The government is the main client in the construction industry, and construction practitioners should emphasize their demand for integrating affordable and sustainable housing. In Malaysia, the Green Building Index (GBI) has been presented as a green rating tool for buildings to encourage sustainability practices. However, the lack of monitoring and enforcement by the government leads to the failure of implementing sustainability practices [23]. Half of the respondents agreed that the majority of the project stakeholders are unaware of this sustainable housing concept because government policies keep updating and this confuses them about the industry's real condition. They perceive that environmental protection is the sole responsibility of the government; also, developers don't need to provide sustainable practices scheme in Malaysia.

The lack of government involvement in providing incentives in improving policies and regulations is also the main limitation of the implication of sustainable concept in housing development. They stressed out that the government encourage the developer to do sustainable housing, but they do not offer incentives and tax exemption towards procuring sustainable materials. As a result, only developers with significant capital can implement sustainable practices due to the high cost of importing sustainable materials and technology.

4.4 Lack of design, technology and expertise

The rapid advancement of sustainable technologies and practices poses the main challenge to integrate affordable and sustainable housing. The majority of the respondents mainly agreed that the construction companies more prefer using the conventional concept compared to other methods for housing development. They feel reluctant to implement sustainable practices due to the cost increment of application, the striving of acquiring local sustainable technology and the limitation of local technical skills to operate it. They are not ready to use unfamiliar sustainable concepts and materials, and this leads the project to exceed the contract period. Besides, the majority of the respondents pointed out that employers are facing challenges in searching for a capable employee to carry out the tasks in sustainable housing projects. Sustainable technologies and practices keep updating, and it's different from earlier applications. It was proven by Saleh and Alalouch [24] as they claimed that previous skilled workers are no longer equipped to deal with the new sustainable knowledge and

application. As a result, developers are discouraged from implementing the sustainable concept due to the difficulty of hiring qualified personnel.

Furthermore, most respondents confirmed that the limitations of current knowledge on green technologies and materials among the developers could also be measured as a significant barrier to the industry. This scenario desires expertise from local construction practitioners, but the rapid development of sustainable technologies and practices lead the previous skills are inadequate to implement sustainable practices. They further complained that the limited number of expertise in Malaysia prevents the developers from integrating the affordable and sustainable concepts in their project development. Developers have to appoint foreign expertise to implement sustainable practices. This will inhibit the local expertise to develop their skills, and this again incurs an additional cost.

Besides, the respondent further claimed that sustainable housing requires architects and engineers who are familiar with sustainable design knowledge and applications. The majority of design teams lack the knowledge and expertise in this area. They have inadequate experience in offering recommendations and guidance for implementing sustainable housing design. Their understanding of the design of the sustainable house concept is inadequate and requires additional time to learn and apply. Therefore, it prohibits the company from incorporating this idea into their project development.

4.5 Lack of commitment and support from stakeholders

The respondents mainly agreed that the commitment and support from stakeholders is one of the key success factors in integrating affordable and sustainable housing. They have to pave the way towards establishing efforts in integrating affordability and sustainability in housing projects. Unfortunately, the majority of project stakeholders lack new knowledge on the integration of affordable and sustainable housing. This finding is consistent with Abidin [16], who claimed that academicians do not emphasize environmental issues in education for many decades. As a result, most of the project stakeholders are reluctant to apply this concept in their projects.

The rapid advancement of sustainable and green technologies leads to an understanding of the limitations of the technical specifications and procedures of these technologies by employees. The respondents mainly agreed that inadequate training in sustainable technology makes it tough for those employees who are concerned in this sustainable technology to acquire the necessary skills. Moreover, it is quite difficult to implement sustainable practices in housing development due to the lack of green technology.

Finally, the respondents also argued that the uncertainty among project stakeholders in the performance of sustainable materials and technologies is the main challenge in integrating affordable and sustainable housing. They feel reluctant to spend money to commit something new. Thus, this scenario leads to a delay in applying sustainable practices in housing development projects. In a nutshell, it can be said that the lack of implementation of sustainable housing development in Malaysia is caused by the stakeholders' reluctance to consider sustainability as their priority in decision making.

5. Conclusion

The housing development sector can be more economical, environmental and society-friendly if sustainability goals are given due consideration. However, this study concludes that the integration of affordable and sustainable housing development in Malaysia is at a sluggish level. The barrier of financial constraints faced by the developers could be solved by having in place adequate funding and sponsorship from the government. This may decrease the financial burden for the developers and may enhance their awareness in applying the sustainable concept. At the same time, this will also advocate construction practitioners to discover the latest technology, knowledge and systems related to a sustainable concept such as the use of Building Information Modelling (BIM) and Industrialised Building System (IBS). The lack of government enforcement and incentives can be addressed by ensuring faster processing of building plans approved by the local authority, effective housing policy, reduced house prices and more government subsidies. The professional bodies such as the Construction Industry Development Board (CIDB) can also be provided with Sustainable technology training to increase knowledge and skills on sustainability practices. Meanwhile, efficient management is needed in order to resolve the lack of commitment from the stakeholders. In terms of lack of design

and technical capabilities, the critical success factors indicate that efficient economic planning, economical design and lowest specification are essential. By successfully adopting all the elements, the project can be reduced, and this will simultaneously increase the affordability of sustainable housing.

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