Challenges of Integrating Affordable and Sustainable Housing in Malaysia

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Abstract. Developing countries including Malaysia have begun to comprehend the needs for affordable and sustainable housing development. The majority of the population is still aspiring for a comfortable, safe and reasonably priced house. Households in the low-middle income range face difficulties to find housing that can satisfy their needs and budget. Unfortunately, most of the housing development programs are considering affordability rather than sustainable aspects. Furthermore, developers are more interested in profit and neglect sustainability issues. Thus, the aim of this paper is to review the challenges in integrating affordable housing and sustainable practices in Malaysia. This paper is produced based on an extensive literature review as a basis to develop strategies of integrated affordable and sustainable housing in Malaysia. The challenges are divided into four sections, namely market challenges, professional challenges, societal challenges and technological challenges. The outcomes of this paper will assist in the decision making involving housing development and in enhancing quality of life for sustainable communities.

1. Background

Good and comfortable housing is necessary for all citizens. It is also as a main indicator of sustainable development in a community [1]. In general, sustainable development is categorised into three sectors: social, economic and environmental. From the social perspective, housing does not only provide shelter but also offers a sense of protection to a community [2]. Owning a house is also considered as the ultimate plan in a family’s lifetime. From an economic perspective, the development of housing generates significant contribution to the construction industry sector and leads to increase the GDP year by year [3]. From the environmental perspective, housing should be liable to reduce a green house gas emission, optimize usage of energy and material and control waste [4].

The demand of houses for the low - medium income population in Malaysia has exceeded 37,000 units nationwide [5]. The housing market price underwent significant price expansion over the past fifteen years and it continues to grow year by year [6]. It has become difficult for low - middle income households to buy property when the house prices are high all the time. Houses should be built and equipped with all of the elements of healthy living, cost-effective and constructed within a well-connected neighbourhood to enhance the quality of life. Thus, incorporating sustainability aspects in
housing development is essential from the economic, socio- psychological and environmental perspectives.

In response to Malaysia’s government’s effort to provide an equal access to affordable housing with sustainable approaches for every Malaysian, as manifested in the Eleventh National Plan (2016-2020), the needs of integrating affordable and sustainable practices in housing development seems vital. This poses a critical challenge to effective governance in making housing affordable and sustainable in order to enhance their quality of life. However, there is an argument between the approach of affordable housing and sustainable development [7]. Many developed and developing countries view sustainable housing development as unaffordable for low -middle income households. Therefore, integrating sustainable aspects in providing affordable housing are quite questionable and challenging. Failure to improve housing affordability will affect long- term economic development, urban development fatality rate and intergenerational equity [8].

In light of these problems, it is crucial to develop some strategies to achieve integrated affordable and sustainable housing. However, only a fraction of research is geared at studying challenges of integrated affordable and sustainable housing development [9,7]. Thus, the aim of this paper is to highlight the challenges faced in integrating affordable and sustainable housing via extensive literature review.

2. Affordable Housing and Sustainable Development

The concept of affordable housing is diverse and complex but can be generally described in economic terms [9]. There are numerous discussions on definitions related to affordable housing. According to [7] defined affordable housing as small housing units that use low cost materials and built on cheap land at the edge of the city. Affordable housing also can be defined as a house that a family group can acquire within a given period, which generally ranges from 15 to 30 years [10]. A common practice in measuring affordable housing include considering housing cost at a value less than 30% of the household income of the occupants [11]. However, the measurement of affordability is different between states and regionally but the most accepted measurement is the ratio between a household’s’ income and the housing cost [12]. Thus, the term ‘affordability’ used in this paper agrees with Disney [11] namely the affordable housing cost is not more than 30% of the households income.

Sustainable housing is also part of sustainable development. Sustainable development means “meeting the needs of the present without compromising with the ability of future generations to meet their own need” [9; 13]. Applying the concept of sustainable development is vital to achieve a balance between human activities and nature without jeopardising social and economic systems for future generations [14; 15]. Sustainability should be the main principle in designing house in which one of the important dimensions to be considered is housing quality. Therefore, sustainable housing should be socially acceptable, economically viable, environmentally friendly and technically feasible [16].

Literature has noted that there are differences between green building and sustainable building [17]. Green building is the concept that is similar to the notion of “back to nature” in the design of houses. Meanwhile, sustainable housing should be available in sufficient supply, built of high quality in technical sense, affordable, energy saving, ecological and sustainable in waste management. In the context of Malaysian construction industry, six fundamental criteria are taken into account to assess the sustainability of buildings including energy efficiency, sustainable site planning and management, affordable, indoor environmental quality, water efficiency and innovation [18]. Thus, the term ‘sustainable housing’ used in this paper is understood as housing that is affordable, available in the market, optimizes the use of green materials and energy, high in quality, and has good accessibility to public amenities.

To conclude, integration of affordable and sustainable housing can be defined as the combination of housing that can be owned at minimal price, considers safety, allows for healthy living, and covers with sustainable aspects. The houses should be built and equipped with all of the elements of healthy living, learning, and working. In other words, the construction of houses and
building that enables low and middle income people to gain affordable homes requires the adoption of cost-effective, innovative and environmentally friendly housing technologies [19].

2.1 Effects on Economic and Societal Development

Many developed and developing countries that are experiencing rapid urbanisation have met challenges in producing sufficient housing in a socially and ecologically responsible manner. The developing world needs to cope with increased population simultaneously reduce the adverse consequences from the urbanization on the environment and living standard. As for Malaysia, it is characterized by rapid urbanization includes residential housing and industrial activities which believed gives impact on the environment [20]. It is a commitment to pursue development in a more sustainable manner apart from economical aspect to create ultimately better well-being and quality of life. Sustainable development focuses on increasing the efficiency of resource use such as energy, water, and materials while reducing building impact on human health and the environment during the building's lifecycle [20]. However, the cost of sustainable housing exceeds the financial capability of the low and middle income group. Failure to improve housing affordability and sustainability will affect long term economic development and urban development [11].

A number of researchers agreed that the high purchase rate of housing gives a negative impact towards economic performance and social sustainability [21; 22; 23]. The demand for houses keeps growing year by year due to life events such as marriage and childbirth [21; 22]. This is further established by [8], who found that many young people in China have to sacrifice their life events such as delaying their marriage and childbirth, reducing entertainment spending and being thrifty in daily expenditures in order to reserve money for house the down payment of their house. In Beijing, the migrants may become less motivated to migrate if house prices keeps growing, which in turn would cause unsustainable demographic and population growth [23]. Meanwhile, poor people may reduce the quality and quantity of their food, and have no choice except to rent a house or be homeless.

In Malaysia, low - middle income groups face similar difficulties to access the housing market due to the high purchase rate of sustainable housing [19; 6]. There are real tensions in the planning strategies between the desire to provide affordable housing and achieve sustainable development. According to [24] claimed that housing projects experience increasing price due to the increment of construction materials costs such as cement, steel and timber. The project stakeholders are not interested to build these houses on a tight budget [25]. The execution of sustainability concept in affordable housing development in Malaysia is still at an early stage [18]. Thus, there is an urge need to study on the affordability and sustainability housing development which believed to give positive impacts towards environmental and economic performance.

3. Research Methodology

An extensive literature review was conducted to explore the perspectives of Malaysian construction industry on affordable housing and sustainable practices. This paper specifically aims to highlight the challenges of integrating affordable housing and sustainable practices in many developed and developing countries. It involves discussions with construction practitioners and a study of various published sources such as journal articles, proceeding papers, and other related research materials. The study begins with a review of housing affordability in many developed and developing countries and considers why affordable housing should integrate sustainable aspects too. The list of challenges in implementing affordable housing and in applying sustainable practices is presented. It has been noted that there are several critical challenges in implementing affordable housing and that they closely align with the challenges in applying sustainability practices. However, some challenges that are quite the opposite of others.
4. Challenges of Integrating Affordability And Sustainability

Table 1 below shows a list of thirty – one challenges arising from integrating affordability and sustainability in housing development. Based on the findings, four (4) categories of challenges of integrating affordable and sustainable housing were identified. It consists of market challenges, professional challenges, societal challenges and technological challenges.

Table 1: Challenges of implementing affordability housing and sustainability practices

| Identified Challenges of Affordability | Identified Challenges of Sustainability | Authors                                                                 |
|----------------------------------------|-----------------------------------------|-------------------------------------------------------------------------|
| Escalating high cost of building materials due to dependency on imported building materials | High cost of construction materials | McMurray et al., (2014), Ayedun & Oluwatobi (2011), Maliene & Malys (2009), Goh et al., (2015), Chukwujeukwu (2006) |
| Scarcity of local green products | Difficulty of obtaining local green products | Abidin et al., (2013), Wallbaum et al., (2012), Goh et al., (2015), Alias et al., (2010), Chukwujeukwu (2006) |
| Lack of rebate for importers on building materials | | Ayedun & Oluwatobi (2011), Wang et al., (2011) |
| Non acceptance of local building materials | | Ayedun & Oluwatobi (2011), Wang et al., (2011) |
| Inadequate labour availability | | Ayedun & Oluwatobi (2011), Wang et al., (2011) |
| Professional Challenges | | |
| Lack of commitment and organisation | Lack of commitment and organisation | Abidin et al., (2013), Manly (2004) |
| Lack of knowledge and awareness among clients | Lack of knowledge and awareness among stakeholders | McMurray et al., (2014), Saleh and Alalouch (2015), Goh et al., (2015), Williams and Dair (2007), Chukwujeukwu (2006) |
| Financial capability of developer | Financial capability of developer | Abidin et al., (2013), Goh et al., (2015), McMurray et al., (2014) |
| Lack of local technical skills | Lack of local technical skills | Williams & Dair (2007), Goh et al., (2015) |
| Lack of demand from stakeholders | Lack of training and education | Abidin et al., (2013), Williams & Dair (2007) |
| Corruption and overpricing of contract sums of housing projects | Lack of coordination and monitoring | Ayedun & Oluwatobi (2011), |
| Societal Challenges | | |
| Lack of government incentives and rebates | Lack of government incentives and rebates | Ayedun & Oluwatobi (2011), Chukwujeukwu (2006) |
| Inaccessibility to low and cheap housing financing | Inaccessibility to low and cheap housing financing | Ayedun & Oluwatobi (2011), Chukwujeukwu (2006) |
| Ineffective mortgage system | | Ayedun & Oluwatobi (2013), Chan, Goh et al., (2015), Alias et al., (2010) |
| Poor remuneration and low minimum wage of citizens resulting in low purchasing power | | McMurray et al., (2014), Ayedun & Oluwatobi (2013), Chukwujeukwu (2006) |
| Lack of political commitim | | Ayedun & Oluwatobi (2013) |
| Technological Challenges | | |
| Lack of adequate local green technology and equipment | Lack of adequate local green technology and equipments | Goh et al., (2015), Saleh & Alalouch (2011) |
| Misunderstanding of sustainable technological operation | | Goh et al., (2015), Saleh & Alalouch (2011) |
| Uncertainty in sustainability technologies’ performance | | Goh et al., (2015), Saleh & Alalouch (2011) |
| Green technologies keep changing | | Goh et al., (2015) |
4.1 Market Challenges
Sustainable housing requires ecological building materials, energy saving and aesthetic design [3]. Eco-friendly products are quite expensive which makes it difficult to be applied to low - medium cost projects. Developers faced difficulties in obtaining green products in the local market due to the non-acceptance of local building materials by the buyers [26]. They are demanding green materials from foreign countries because it portrays a higher quality. However, the lack of rebate for importers of building materials may lead the incurrence of additional cost to import the materials [27]. The higher cost incurred for importing green materials and technology is a challenge to the shift towards sustainability.

In contrary, there is a belief that each sustainable housing project has been planned and designed in detail to comply with its target buyers’ financial status, interest, and expectations. [15] found that their target buyers are mostly high income earners and foreigners. They can easily own sustainable houses, as these reflect their lifestyle. However, many local developers have to deal with local buyers ranging from low, medium-low and medium-high income earners [26]. Thus, the challenge lies in determining ways to make sustainable housing affordable. Recommendations point out that the houses should be designed correctly by maximising natural resources instead of using expensive products.

4.2 Professional Challenges
The project stakeholders’ interest for sustainable practices is the main factor that influences their team members [28]. They have the responsibility to show their leadership for integrating affordability and sustainability in housing projects [29]. The lack of new knowledge on green technologies and materials among developers could also be considered as a significant challenge to the industry [30]. There is a significant gap of in the level of sustainability knowledge between well - established companies and small companies [18]. The young generations face difficulties in dispersing theoretical understanding of sustainability knowledge into practice due to the lack of environmental awareness in its education up until a decade ago. Thus, developers tend to reject the young generations’ ideas and opinions [31].

The lack of urgency to provide affordable and sustainable housing by the government and developers further adds to the challenges. Profits are generated by targeting low medium cost houses which still dominate the industry. Developers are comfortable with their business marketability and are reluctant to commit to something new [15]. Many developers are interested to pursue sustainability practices but it will lead to additional project cost. As a result, the number of housing units built is not enough to ensure that every unit built has the potential to be sold.

Big developers have greater financial capacity, better experience and, higher commitment from the top management as well as the required expertise to pursue sustainable practices [32]. These developers are more aware of sustainability practices by executing proper planning, design and allocation of budget. However, the majority of developers in Malaysia are from medium and small sized companies. The companies are aware of sustainability issues, but they believe sustainable practices may affect their profit margin [26]. This contradicts with [13] claim that company size would not affect the capability to integrate affordable housing and sustainable practices. They are able to implement sustainable practices by incorporating sustainable elements in their small or medium projects by focusing on the design and orientation of the building, providing more green spaces and improving social needs through upgraded facilities. Many developers are reluctant to devise their own methods and accept a latest technology which may incur more additional cost. In fact, developers may accept sustainability practices if consultants can provide a good design within the project budget [33]. At the same time, if buyers demand affordable and sustainable housing, more developers will join the green team.
4.3 Societal Challenges
The government is one of the main institutions that have a major influence over the development of any industry [30]. The government’s demand in providing affordable and sustainable housing will put pressure on construction practitioners. Government should play a vital role in integrating affordable and sustainable housing by strongly enforcing legislations, devising new policies or giving incentives to developers who want to pursue sustainability in their projects [30; 34]. These will encourage construction practitioners to explore the latest technology, knowledge and systems such as the use of Industrialised Building System (IBS).

In Malaysia, Green Building Index (GBI) has been introduced as a green rating tool for buildings to promote sustainability practices. However, developers do not emphasise sustainability issues due to the lack of monitoring and enforcement by the government [35]. They often perceive that environmental protection is the sole responsibility of the government. According to [30], government policies keep changing as developers are not keen to implement the sustainable housing concept. Most sustainable housing development plans take a long period and involve a complicated process to gain the approval of local councils [26]. This inhibits project stakeholders from implementing the sustainable housing development.

4.4 Technological Challenges
Rapid advancement of sustainable technologies and practices causes the previous skills to be no longer adequate to implement sustainable practices. [18] stressed knowledge and local expertise in green technology in Malaysia are still low and lacking. The integration of affordable and sustainable housing requires expertise from construction practitioners. The limited numbers of experts prevent developers from integrating the affordability and sustainability concept in their project development [26]. Developers have to appoint foreign expertise in order to implement sustainable practices. Unfortunately, this will pose a hindrance to the local expertise to develop their skills, increase the dependence to foreign experts and incur additional cost.

The difficulties of obtaining green technology and materials from the local market lead the developers to import green products, which bring about the increase of product costs. Moreover, the majority of buyers believe that if construction employs local green products, the progress of sustainable practice will be slow [30]. In fact, imported green products are produced based on their origin countries’ climate which is mostly different from Malaysia. Developers have to request custom-made products to suit the local climate [18]. This may add to the cost, on top of the delivery expenses.

In contrary, [30] in a study done in Oman claimed that the main challenge is the uncertainty among project stakeholders of the performance of green products and technologies. These challenges make construction practitioners delay the implementation of sustainable practices in housing development. In Malaysia, the implementation of sustainable technologies is still at an early stage where specifications and other contract documents have not been documented properly [26]. The government as the main principal institutions should encourage construction practitioners, educational institutions as well as, research and development bodies to enable more qualified local production of green building materials and technology at a lower cost. Sustainable technology trainings can also be provided to increase and deliver knowledge on sustainability through bodies like Construction Industry Development Board (CIDB).

5. Conclusion
As the concern relating to economics and the environment increases, the need for integration of affordable housing and sustainable practice becomes more imperative. To date, this study found that the implementation of affordable and sustainable housing development in Malaysia is still at a very low level. The challenges of integration of affordable and sustainable housing in Malaysia need to be
addressed. It requires the commitment to pursue development in a more sustainable manner apart from economical aspect to ultimately create a better well being and quality of life among the population. Moreover, awareness and knowledge should be enhanced and delivered to project stakeholders, namely concerning the long term benefits of the integration of affordable and sustainable housing. Relevant public authorities should provide sufficient incentives, rebates and training to encourage more efforts in applying sustainability concepts. Measures can also taken by the government in ensuring the implementation of the integration of affordable and sustainable practices by enforcing strict rules and regulations. In this sense, the integration of affordable and sustainable housing is not a practice of a single party, but requires the involvement of all relevant parties to increase the quality of life among sustainable communities. Thus, development of strategies of integrated affordable and sustainable housing is crucial in Malaysian Construction Industry.

6. References

[1] Dumreicher H and Kolb, B 2008. Place as a social space: Fields of encounter relating to the local sustainability process. *J of Env Manage*, 87(2), 317-328.
[2] Arman M, Zuo J, Wilson L, Zillante, G and Pullen, S 2009. Challenges of responding to sustainability with implications for affordable housing. *Ecological Economics* 68, 3034 – 3041.
[3] Maliene V and Malys N 2009. High quality housing - A key issue in delivering sustainable communities. *Bldg and Env* 44 (2009), 426 - 430.
[4] Hoornweg D Sugar L and Trejosg C L 2011. Cities and greenhouse gas emissions: moving forward. *Env & Urban.* Int Institute for Env and Dev (IIED). Vol 23(1): 207–227.
[5] Hashim, Z.A. 2010 House Price and Affordability in Housing in Malaysia, Akademika 78 (Jan – April 2010), 37 – 46.
[6] Mat Ali S A 2012. Cost Comparison For Construction Of House Using Conventional and IBS Method.
[7] Sivam A and Karuppannan S 2008. The sustainability of affordable housing. Retrieved from https://tasa.org.au/wp-content/uploads/2008/12/Sivam-A lpana_-Karuppannan - Sadasivam.pdf .
[8] Ouyang H 2011. Living condition investigation of young people in large and medium-sized cities in China'. Xiaokang Index Qiushi J of Cons Eco, 176 – 182.
[9] Sharifzai M S, Kitagawa K., Habib A J, Halimee M K and Sakaguchi, D 2016. Investigation of sustainable and affordable housing policy principles and formulation adoptable in Kabul City, Afghanistan. *J of Sus Dev* 9, (2).
[10] Wallbaum H, Ostermeyer Y. Salzer C and Escamilla E Z 2012. Indicator based sustainability assessment tool for affordable housing construction technologies. *Eco Ind* 18 (2012), 353 –364.
[11] Disney J 2007. Affordable housing in Australia, some key problems and priorities for action, National Forum on Affordable Housing, Australian Housing and Urban Research Institute, Melbourne.
[12] Whitehead P G, Wilby R L, Battarbee R W, Kernan, M and Wade A J.2009. A review of the potential impacts of climate change on surface water quality. *Hydro Sc J*, 54(1), 101-123.
[13] Brundtland G H 1987. Our common future—Call for action. *Env Conservation, 14*(4), 291-294.
[14] Muhammad Z, Johar F and Sabri, S. 2015. A Review of Housing Provision and the Challenges of Sustainable Housing Delivery in the Federal Capital Territory Abuja, Nigeria, UTM, 77 : 14 (2015) 23 - 31.
[15] Abidin N Z, Yusof, N A and Othman A A 2013 Enablers and challenges of a sustainable housing industry in Malaysia. *Construction Innovation, 13*(1), 10-25.
[16] Choguill C L 2007. The search for policies to support sustainable housing. *Hab Int*, 31(1), 143-149.

[17] Ahn Y H, Jung C W, Suh M and Jeon M H 2016. *Int Const Process for Green Building. Procedia Engineering*, 145, 670 – 676.

[18] Abidin N Z 2010 Investigating the awareness and application of sustainable construction concept by Malaysian developers. *Hab Int*, 34(4), 421 –426

[19] Tam V W Y 2011. Cost effectiveness of using low cost housing technologies in construction. *Procedia Eng*, 14, 156 -160.

[20] Metibogum L and Mat Raschid 2013 Green Building Technology In The Context Of Sustainable Housing Affordability In Malaysia: An Overview. *Int J of Eng Res and Dev (Ijerd)*

[21] Li S M and Li L 2006 Life Course and Housing Tenure Change in Urban China: A Study of Guangzhou. *Housing Studies*, 21, 653-670.

[22] Song J 2010 ’Moving Purchase and Sitting Purchase: Housing Reform and Transition to Homeownership in Beijing’. *Hous Studies*, 25, 903-919

[23] Wang Z, Han J H and Lim, B 2012 The impacts of housing affordability on social and economic sustainability in Beijing’, *Aust J of Const Eco and Bldg, Conf Series*, 12 (1) 47 -55.

[24] Sampson A 2014 Interlocking Blocks Construction for Sustainable Affordable Housing in Ghana – A Case Study Of Sunyani Municipality.Department of Design and Technology. University Of Education, Winneba (Doctoral Dissertation).

[25] Kutty N K 2005 A new measure of housing affordability: Estimates and analytical results. *Housing policy debate*, 16(1), 113-142.

[26] Goh K C Seow T W and Goh H H, 2015 Challenges of implementing Sustainability in Malaysian Housing Industry.

[27] Ayedun, C A and Oluwatobi A O 2011 Issues and challenges militating against the sustainability of affordable housing provision in Nigeria. *Bus Mgmt Dynamics* 1(4), 1-8.

[28] Cole R J 2000 Cost and Value in Building Green, *Bldg Res and Info*, 28 (5/6), pp 304–309.

[29] Manly G 2004 Creating a Step Change for Sustainable Construction, CIBSE National Conference on Delivering Sustainable Construction, 29–30 Sept, London.

[30] Saleh M S and Alalouch, C 2015 Towards sustainable construction in Oman: Challenges & opportunities. *Procedia Engineering*, 118, 177-184.

[31] Chan S A 2009 ‘Green Malaysia’, Paper presented in the Preview of Malaysian Green Building.

[32] McMurray, A J Islam, M M Siwar and Fien J 2014. Sustainable procurement in Malaysian organizations : Practices, barriers and opportunities. *J of Purch & Supply Mgmnt* 20, 195 – 207.

[33] William K. and Dair C 2007. What is stopping sustainable building in England? Barriers experienced by stakeholders in delivering sustainable development. *Sus Dev*, 15, 135-147.

[34] Chukwujeckwu I E 2006 Facilitating Low Cost Housing Scheme: Which Way Forward? *The J of the Ass of Hous Corp of Nigeria*, Vol. 1 No. 10

[35] Alias A, Sin T K and Aziz W 2010 “The green home concept-acceptability and development problems”, *J of Bldg Performance*, 1(1): 130-139.