

THE TOUCHSTONE OF AFFORDABLE HOUSING

Nadzirah Zainordin, Siti Atikah Ghazali, Ahmad Faris Omar

Center of Building & Resilient Development, Faculty of Engineering and the Built Environment, SEGi University, Kota Damansara, Selangor, Malaysia.

*For correspondence; Tel. + (60) 196292996, E-mail: nadzirahzainordin@segi.edu.my

ABSTRACT: Affordable housing is a program introduced by the government to improve housing affordability which ensures every income earner group could afford houses, especially for low-income households. The affordable sustainable housing project has no clear definition so far but the concept of needs, which seeks to ensure that the essential needs of the poor are adequately met; and the need for addressing every limitation arising from the use of technology and activities of social elements affecting the environment's ability to meet the present and future needs, may consider defining as a general idea. This paper its to identify the criteria of the affordable housing concept. By using the latest 10 years of publication for extensive literature review methodology perhaps may contribute in enhancing the existing knowledge.

Keywords: definition of affordable housing, affordable housing, criteria of affordable housing

I. INTRODUCTION

There are different types of housing offered in the market, but not all of them are affordable for everyone. Researchers had defined affordability in general as the relationship between household expenditure and income earned. However, there is an argument saying that affordability is not only influenced by that, but also by the levels and distribution of house process, structure of financing cost, housing availability, employment, maintenance of the existing affordable housing stock, and patterns of new construction [1, 2, 3, 4].

Affordable housing is a program introduced by the government to improve housing affordability, which ensures every income earner group could afford houses, especially for low-income households [5, 6, 7]. According to [1], houses that are having housing loans exceeding 30percent of monthly gross household income will not be counted as affordable housing as it will affect other basic needs of the owner. Other than the financial affordability, the location, quality, and build-up of a house should be sufficient to entitle affordable housing [8].

The Malaysian government had implemented several affordable housing program such as Program Bantuan Rumah (PBR) and Perumahan Rakyat 1Malaysia (PR1MA) for low- and middle- income households to cope with the problem of te mismatch between supply and demand of housing due to socioeconomic change, urbanization, and evolving population structures [9]. However, according to [8], Malaysia is still facing a shortage of affordable homes for the masses. Hence, it is essential to have more affordable housing constructed in Malaysia.

II. Affordable Housing

A house is a home, building, or structure that functions as a habitat for humans or other creatures. The term house includes many kinds of dwellings ranging from rudimentary huts of nomadic tribes to complex structures composed of many systems. Apart from affordable, the aspect of comfortable is also important. According to [10], the definition of affordable housing is generally involved in a household's ability to get the housing services, while specifically, it involves the correlation between household income and the price or payment. Mostly, Malaysia's accommodation procedure aims to realize all nations, mainly the low-income group (LIG), are definite admission satisfactory and unrestricted admission to a reasonable accommodation requirement. According to [10], it is hoped that they seek out the country for a feasible and sustainable

settlement that can be achieved throughout a suitable and well deliberate accommodation condition.

The Brundtland report defines SD as "development that meets the needs of the present without compromising the ability of future generations to meet their own needs" [11]. The two vital common concepts contained in the above two SD definitions are the concept of needs, which seeks to ensure that the essential needs of the poor are adequately met; and the need for addressing every limitation arising from the use of technology and activities of social elements affecting the environment's ability to meet the present and future needs.

Based on the two concepts as mentioned earlier, which are affordable and sustainable housing, it should adequately meet the housing needs of the vulnerable households continuously, and at the same time consider the environmental limitations while meeting such needs both in the present and future concerning the affordable techniques and sustainable components [12]. However, sustainability issues are bound to arise where the appropriate measures are not adequately linked together in affordable housing delivery. Therefore, clearance on defining affordable, sustainable housing projects indeed much appreciated making these two concepts well deliver to the public and the construction players, the parties who deliver these concepts.

By referring to Table 1, few authors state that houses will be considered affordable only when the financing of homeownership, which included utility fees, maintenance fee, taxes, and insurance, is less than 30% of the monthly gross household income. When the amount of house cost more than 30%, the house will not be considered as affordable housing as it will affect the other 70% of income, which initially allocated for the use of basic needs such as food, clothing, vehicles, medical financing, education, cultural needs, and even leisure time and entertainment [1, 13, 14, 15].

However, some author mentions that affordable housing is the relationship between housing and people. According to [16], a range between 15 to 30 years will be given for the client to obtain affordable houses. The affordability is depending on the ability and desire of the client to own or buy houses. For the particular client, all house is considered affordable for them; however, for a specific client, no housing is affordable unless it is free [17 18 19, 20, [21].

According to [8], other than financial affordability, affordable housing is sufficient in quality and location. Affordable housing is also a concept which use to explain socioeconomic and development environments. It aimed to make sure that

every income-earner cluster could afford the houses provided [18].

TABLE I. DEFINITION OF AFFORDABLE HOUSING

Definition	Author, Year
Affordable housing is sufficient in quality and location and is not so costly that it prevents its occupants from satisfying other essential living needs.	[8]
Affordable housing can be defined as "it is a relationship between housing and people. For some people, all housing is affordable, no matter how expensive it is; for others, no housing is affordable unless it is free".	[17][19][21]
Affordable housing also meant that homeownership financing does not exceed 30 percent of monthly gross household income.	[1]
Affordable housing is a concept used to explain socioeconomic and development environments, aiming to confirm if housing provided for families afford by each income-earner cluster: low, middle, or high income-earner cluster.	[18]
Affordable housing is a feature of housing facilities related to customer ability and the desire to own or buy houses.	[18][20]
The housing costs that consume less than 30% of a household's budget is an affordable house.	[13][22]
Affordable housing is a house that a family group can acquire within a given period, ranging from 15 to 30 years.	[16]

III. Criteria of Affordable Housing

There are no specific criteria for affordable, sustainable housing yet. Hence this research covers the criteria of sustainable housing and the criteria for affordable housing. Table 2.3 shows the criteria for sustainable and affordable housing from a different author. There are twenty (20) criteria cover the sector of social, economic, and environment. Based on Table 2, resource-efficient and energy efficiency are criteria discussed by most of the researchers that six (6) authors mention when they talk about affordable housing and sustainable housing. Follow by water efficiency, which discuss by five (5) authors. Other than that, four (4) authors mention the criteria of safe, secure and healthy, and facilities and services. Three (3) authors had discussed affordability, sustainable site planning and management, and material efficiency. Two (2) authors had mentioned available and flexible, architecturally acceptable, indoor air quality, and quality management when discussing the criteria of affordable housing and sustainable housing. Socially and ecologically sustainable, long-lasting, renewable energy, innovation, loans, accommodation, grow home, appropriate

technology, and effective policy and legal frameworks are the criteria discussed by either one of the authors.

A. Resource Efficient

Resources such as infrastructure, land, and energy need to utilize efficiently. The house design should consider the site topography as it will manage negative wind impacts and maximize the advantages of sunlight, daylight, and solar paybacks. Utilizing the resources helps to promote and minimize future maintenance and expansion costs [12, 23]— Besides, the raw material used to build any form of the building. However, too much consumption will bring a negative effect on the environment and cause global warming. In sustainable development, resources one of the essential elements and alternative resources to substitute the primary resources [24, 25, 26].

B. Energy Efficient

In the construction industry, energy efficiency could help to reduce the development cost. By referring to the theory of green building, it includes high energy efficiency and low burden from building to the environment [24, 27, 28]). Energy efficiency is successfully achieved by installing renewable energy such as solar panels, solar roof shingles, and energy-efficient appliances like LED lights and air conditioning systems [24][29].

C. Water Efficient

Malaysia is a country that has a high average rainfall per year. However, the supply of water could no longer be perpetual due to water scarcity. Water scarcity will limit both population and economic growth, endanger wildlife, and reduce the domestic gardening for homegrown food. Therefore, water efficiency and sustainable usage are essential. Usage of water should be in several ways, such as installing low-flow water fixtures or water-efficient sanitary appliances and tap fittings, rainwater harvesting system for irrigating plants, and water management system which use greywater for irrigation [25, 30, 28, [31].

D. Safe, Secure and Healthy

Safety is always one of the main concerns for house buyers when it comes to the house's location. The living area must be safe and secure [24, 25]. It should also be easy for cyclists and pedestrians to travel within and across the locality. The vehicle, including service vehicles, should enter and exit the housing area easily [23]. Thus, to ensure the housing area's safety, crime prevention procedures such as natural surveillance should be practiced. Natural surveillance is a member of the public look out over the public spaces in the course of their day-to-day lives. The configuration of physical features, activities, and people, in ways that maximize the opportunities for surveillance, can act to discourage crime [28, 30].

E. Facilities and Services

The component of facilities and services is essential in sustainability and affordability as it will help save energy and conserve the environment through efficient planning and design [28]. Sustainability advocates better travel choices by reducing the need for travel by car and shorten the length and duration of journeys. Besides, the house's location should be easy access to employment opportunities, shopping facilities, education centers such as school and early childhood care services, green space, public transport services, and health

services [12, 18]. The relationship between housing and location had been defined as a more meaningful measure of affordability by the Centre for Transit-Oriented Development and the Centre for Neighbourhood Technology. They

evaluate affordability through the cost of housing and transportation prices related to the place, known as location efficiency [18, [31].

TABLE II. CRITERIA FOR AFFORDABLE HOUSING

Criteria								
Authors	[23]	[8]	[29]	[27]	[5]	[18]	[12]	Total Referred
Affordability	✓					✓	✓	3
Socially and Ecologically Suitable	✓							1
Accessible and Flexible	✓						✓	2
Resource Efficient	✓	✓	✓	✓	✓		✓	6
Safe, Secure and Healthy	✓	✓		✓		✓		4
Long-Lasting	✓							1
Architecturally Proper	✓						✓	2
Sustainable Site Planning and Management		✓		✓	✓			3
Energy Efficiency		✓	✓	✓	✓	✓	✓	6
Water Efficiency		✓	✓	✓	✓		✓	5
Indoor Air Quality		✓			✓			2
Material Efficiency			✓	✓	✓			3
Generate Renewable Energy			✓					1
Innovation					✓			1
Loans and Accommodations						✓		1
Facilities and Services				✓	✓	✓	✓	4
Quality Management						✓	✓	2
Grow Home						✓		1
Appropriate Technology							✓	1
Effective Policy and Legal Frameworks							✓	1

IV. Methodology

Table 3 shows different years of source referred. 28 journals had been used as references while producing this paper.

TABLE III. JOURNAL REFERRED

Year of published journal	Total referred
2017	2
2016	5
2015	3
2014	2
2013	4

2012	3
2011	1
2010	0
2009	0
2008	2
2007	0
2006	0
2005	1
2004	1
2003	2

2002	0
2001	0
2000	0
1999	0
1998	0
1997	0
1996	1
1995	0
1994	1
Total	28

V. CONCLUSION

The criteria for affordable and sustainable housing are obtained through secondary data. However, an affordable, sustainable housing project is still new in Malaysia. Five main criteria were agreed by most previous researchers, which are resources efficient, energy-efficient, water-efficient, safe, secure, and healthy and facilities and services. When it comes to affordable, sustainable housing, the main focus definitely will be on affordability. The house loan of the house must meet the owner's ability, in which the monthly loan not more than 30% of the household's budget. Next, affordable, sustainable housing must be long-lasting. In other words, the houses should only have a minor defect, which would not affect the owner to live in the house and would not cost the owner an extra expense on fixing the house.

As mention, affordable, sustainable housing should focus on the economy and the environment, and society. Indoor air quality and facilities and services are another criterion that the respondents agree to consider while developing affordable, sustainable housing. The excellent indoor air quality will lead to a healthy body, enabling the owner to continue their job or rest at home.

On the other hand, affordable criteria can be said and parallel define with sustainable development criteria. Further study on emerging affordable and sustainable development to be in line with Sustainable Development goals can benefit society.

VI. REFERENCES

- [1] Akadiri, P. O., Chinyio, E. A., & Olomolaiye, P. O. (2012). Design of a sustainable building: A conceptual framework for implementing sustainability in the building sector. *Buildings*, 2, 126-152.
- [2] Wilcox, S., (2003). *Can work, Can't buy*. York: Joseph Rowntree Foundation.
- [3] Nor Kalsum Mohd Isa, Zulkiflee Abdul Samad and Anuar Alias (2014). A Review on Sustainability Principles of Building: Formulation of a Theoretical Framework, *Journal of Surveying, Construction and Property (JSCP) Volume 5, Issue 1 (2014)*
- [4] Bramley, G. (1994). An Affordability Crisis in British Housing: Dimension, Cause and Policy Impact. *Housing Studies*, 9(1), 103-124
- [5] Mohd Wira Mohd Shafiei, Milad Samari, Nariman Ghodrati (2013). Strategic Approach to Green Home Development in Malaysia- the Perspective of Potential Green Home Buyers, *Life Science Journal 2013; 10 (1)*
- [6] M. Keiner, (2005). LinkHistory, definition(s) and models of sustainable development [Elektronische Daten] ETH e-Collection.
- [7] Salem Ang, AbdulLateef Olanrewaju, Fah Choy Chia, and Yeow Seong Tan (2016). Awareness on Sustainable Affordable Housing Among Homebuyers in Malaysia, *MATEC Web of Conferences 103, 03014 (2017)*
- [8] Cheah. S. L, Almeida. S.J & Ho S.W (2017). Affordable housing: Challenges and the way forward. *Quarterly Bulletin*, 19 – 26
- [9] Nor Baizura Jamaluddin, Yusfida. A.A, & Hazlina. H (2016). Ecapsulating the delivery of affordable housing: An overview of Malaysian practice. *MATEC Web of Conferences 66, 00047 (2016)*
- [10] Hamidah Ramlan and Eleeza Eleena Zahari (2016), Review the Issue Of Housing among Urban Dwellers in Malaysia with Special Reference towards Affordability to Home Ownership, *Procedia Economics and Finance 35 (2016) 216 – 223*
- [11] Sahib, N, H (2015). The types of affordable housing based on income in the Klang Valley: case study. *81 IPBJ Vol.7 (1), 81 – 95*
- [12] Akanbi Olusayo Oyebanji, Champika Liyanage, Akintola Akintoye (2017), Critical Success Factors (CSFs) for achieving sustainable social housing (SSH), *International Journal of Sustainable Built Environment (2017) 6, 216–227*
- [13] B Bakhtyar, A Zaharim, K Sopian, O Saadatian, J Abdulateef (2013), Affordable Quality Housing for Urban Low Income Earners in Malaysia. *Advances in Environmental Science and Sustainability, 60 -73*
- [14] Barclay, E. and Batker, D. (2004). Smart growth development: An analysis of 10 common myths about development. *Asia pacific environmental exchange, September*.
- [15] Anderson, M.L., Charles, St. J., and Fulliov, T.M. (2003). Providing affordable family housing and reducing residential segregation by income: A systematic review. *American Journal of Preventive Medicine, 24(3), 27-67*
- [16] H. Wallbaum, Y. Ostermeyer, C. Salzer, E. Zea Escamilla (2011). Indicator based sustainability assessment tool for affordable housing construction technologies, *Ecological Indicators 18 (2012) 353 – 364*
- [17] Adel El Menshawy, Sherine Shafik, Fadwa khedr (2016). Affordable Housing as a Method for Informal Settlements Sustainable Upgrading, *Procedia – Social and Behavioral Sciences 223 (2016) 126 – 133*
- [18] A.M.J.Esruq-Labin, A.I. Che-Ani, N.M. Tawil, M.N.M Nawi, M.A.Othuman Mydin (2014). Criteria for Affordable Housing Performance Measurement: A Review. *E3S Web of Conferences 3, 01003 (2014)*
- [19] Abed, A. (2012). The impact of sustainable neighborhood development on housing affordability: a systematic analysis of affordable leed and towards

- framing architectural and planning guidelines for affordable sustainable neighborhoods. *Texas: proquest llc 2013*
- [20] Yang, Z., and Shen, Y. (2008). The affordability of owner occupied housing in Beijing. *Journal of Housing and the Built Environment*, 23 (4), 317-335.
- [21] UN-Habitat, (2012). United Nations Human Settlements Programme. "Sustainable Housing for Sustainable Cities ." a policy framework for developing countries. (2012)
- [22] HUD, U.S. Department of Housing and Urban Development (2008). Affordable Housing: who needs? Retrieved from <http://www.hud.gov/offices/cpd/affordablehousing/>
- [23] Somayeh roshanfekr, N.M.Tawil and N.A.Goh (2016). Investigation of Sustainable Housing Criteria. *MATEC Web of Conferences* 66, 00096 (2016)
- [24] Chau Sim Yee, Mohd Hilmi Izwan Abd Rahim, Sulzakimin Hj Mohamed (2015). An Insight of sustainable housing in Malaysia.
- [25] Zeithaml, V. A., Berry, L. L. and Parasuraman, A. (1996b). The behavioral consequences of service quality. *Journal of marketing*, 60(2).
- [26] Zhang, Y. (2015). The Impact of Brand Image on Consumer Behavior: A Literature Review. *Open Journal of Business and Management*, 3(01), 58.
- [27] Radzi Ismail, Mohd Wira Mohd Shafiei, Ilias Said and Fazdliel Aswad Ibrahim (2013). Green Homes Development Practices and House Buyers' Requirements: A Review, *Australian Journal of Basic and Applied Sciences*, 7(13) November 2013, Pages: 7-15
- [29] Tan, T. H. (2013), "Assessing Green Home Performance: Case Study of Iskandar, Malaysia", Proceeding for Asia Pacific Network for Housing Research (APNHR) Conference 2013, Global Housing Dilemmas: The Ways Forward, Jointly organized by University of Malaya and University of Hong Kong.