

# The Barriers in Adopting Sustainable Affordable Housing (SAH) Development: An Article Review

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**Abstract:** *The insistence to have guidelines on Sustainable Affordable Housing (SAH) development has gained substantial courtesy in recent years due to the vast needs for affordable houses and increasing awareness of environmental concerns especially in most developing countries. The affordable housing development in Malaysia has been progressively improving since the Eleventh Malaysia Plan (11<sup>th</sup> Malaysia Plan) commencement, which focuses on increasing the affordability and accessibility of housing within low and middle-income groups, especially in urban areas. However, in order to achieve proper urban development, affordable housing must also be sustainable. Therefore, the aim of this paper is to analyse the barriers in adopting SAH from the perspectives of developers, householders, and Governments. The objective of this study also is to draft out the barrier indicators pertaining to SAH development. This extended literature review research applied the Content Analysis Method which analysed 12 articles on the challenges of integrating affordable houses into sustainable houses by various authors in different countries and with diverse legislative practices. The findings consist of six (6) main barriers and thirty-seven (37) challenges from the perspectives of the main participants (developers, householders, and the Governments) of SAH development. The result revealed that the financial, expertise and technology, education, knowledge and awareness, accessibility and land use planning, enforcement and initiatives, land assessment, and land cost are the main barriers in implementing SAH development. The findings of this research will provide a comprehensive understanding of the limitations that hinder the widespread adaptation of SAH development initiatives. The future research will underscore the verification and validation of SAH development indicators from the main participants to initiate strategic planning on SAH developments. Ultimately, addressing the barriers will contribute to the realisation and potential of sustainable affordable housing options for all.*

**Keywords:** Barriers, Limitations, Sustainability, Affordability, Sustainable Affordable Houses (SAH)

## 1. Introduction

Housing development is a necessity as humans need shelter in order to fulfill their basic needs according to Maslow's Hierarchy of Needs. Housing affordability has become major attention globally either in developing or developed countries. According to (Cheah Su Ling *et. al*, 2017)

the key drivers of affordable housing concerns are the growth of income and openness to better job opportunities, especially in urban areas. The requirements of affordable housing are to be appropriate in quality and location and “not so costly”. This is to ensure that the financial commitment to housing will not burden the house buyers, the quality of houses was satisfying, and having good access to necessary facilities and amenities. It was estimated that 330 Million urban households around the world were living in poor housing conditions and facing financial stress regarding housing mortgage and eligibility based on research carried out by the McKinsey Global Institute in 2014. This scenario also similarly happens in Malaysia. According to Bank Negara Malaysia (BNM) Report 2017, housing has become seriously unaffordable in Malaysia since 2016 due to certain circumstances. The rule of thumb for affordable housing is, the housing financial commitment is not more than 30% of the household income. Recently, Malaysia’s affordable housing development has been continuously improving, but affordability alone is still not sufficient to achieve sustainable development.

The increasing awareness of conservation and protection of the environment had led to the idea of sustainable housing development. This is due to building and residential is also the main contributor to greenhouse gas emissions. This is consistent with (UN-Habitat, 2016) that most of the cities in the world used more than 70% of their land for housing purposes which determines the layout and density of urbanisation. Therefore, this has led to the existence of a significant relationship between civilisation and the environment that is influenced by housing activities. UN-Habitat (2012) asserts that home construction and maintenance use a significant number of natural resources and lead to waste, air, and water pollution. This emphasises the requirement for appropriate rules and measures designed to increase the sustainability of building operations. While improving social, economic, and environmental conditions, a sustainable housing strategy may also increase people’ quality of life and provide a healthy environment.

Therefore, the idea of sustainable affordable housing is to meet the middle point between civilization and environment. Sustainable Affordable Housing (SAH) is one of the strategies as we are battling with urbanisation and climate change issues. Accessibility to affordable housing is not only fundamental to human rights but is also considered a vital element of a sustainable urban society. Thus, SAH aims to provide affordable housing options that are energy-intelligent, resource-conserving, and socially inclusive. However, despite its clear benefits, the adaptation of SAH faces certain obstacles that impede its progress.

## **2. The Sustainable Affordable Housing Development, SAH**

The core fundamental of SAH development incorporates a harmonious mixture of economic viability and preservation of the environment without compromising the social equity. It is a perfect blend of sustainable and affordable offers to the urban dwellers. According to Fuhry; Well, (2013): Isalou et al., (2014), integrating **economics sustainability** and affordable housing requires consideration of initial upfront costs, future transportation costs, and energy consumption costs. The decreasing spending on transportation and energy will be leaving some space for the lower middle-income householders to spend more on non-housing spending due to their limited income as mentioned by (Golubchikov, 2012).

The **environmental sustainability** indicators in affordable housing encompass energy and water efficiency, effective resource utilisation, reliability and durability of housing, intelligent waste management, comfortable and healthy environment and reduction of carbon footprint

(Xiaolong Gan, 2017). Globally, the primary sources of greenhouse gas and carbon emission are 73.2 % from the energy emitted by electricity, heat, and land use of 18.4% in the year 2016 as reported by Oxford Martin School. The residential and building activities also contributed to carbon emissions which can affect the environment. Environmental sustainability also extended to optimal and efficient land use (Fuhry, 2013). According to (Charoenkit, 2014), the selection of the site also needs to avoid places that are at risk of flooding, natural disasters and other threats. The mixed-use of land also needs to be taken into account to minimise the transportation costs and maximise the accessibility of the location to the necessary amenities and facilities.

On the other hand, **social sustainability** is also one of the pillars in SAH development. The main concern on social sustainability is the fair and equitable treatment of those who are eligible for affordable housing (Chiu, 2003). Furthermore, the increasing interest in sustainable housing also must be supported by appropriate policies (Myerson, 2007). The housing quality and neighbourhood consideration is something really to ponder.

In Malaysia, sustainable affordable housing is less attended although there is much research that has been carried out for more than a decade. The implementation of SAH in Malaysia might be in different approaches and practices. This is due to certain barriers arising from a complex interplay between main participants in SAH development.

### **3. Research Methodology**

A content analysis methodology was adopted to explore the barriers in adopting SAH development from the previous study. The data in the literature review references were collected from both primary and secondary sources. They also provided insights from professionals and developers as their respondents. By adopting Parahoo (2006), systematic literature review methodology, there are 5 steps that need to be taken in commencing such a study. The steps are as follows:

#### **Step 1: Formulating the research question**

Research Question: What are the barriers in adopting SAH from the perspectives of developers, householders and the Governments?

#### **Step 2: Set the inclusion or exclusion criteria**

There are 16 articles that were related to the challenges/limitations/barriers of integrating sustainability into affordable housing. After certain exclusion, only 12 articles are really identical to the research objective.

#### **Step 3: Select and access the literature**

The selection of the literature reviews is from published journal articles, conference proceedings, and reliable resources.

#### **Step 4: Assess the quality of the literature and in the review**

Most of the articles are extracted from the Elsevier, Institute of Physics (IOP), and other high-ranking publishers as the authors are giving value-added knowledge to the readers as to explore new knowledge and gaps based on the previous research.

**Step 5: Analyse, synthesise and disseminate findings**

The data is then being arranged and tabled according to the six (6) themes of the main barriers to SAH development implementation. The findings disseminate thirty-seven (37) barriers that were classified according to various perspectives of developers, householders, and the Governments.

**4. Result and Discussion**

Table 1 indicates the findings on the barriers of Sustainable and Affordable Housing (SAH) development derived from the compilation of literature review of various authors and contexts. Based on the findings, six (6) main barriers to SAH were identified. The main barriers acknowledged as **financial, expertise and technology, education, knowledge and awareness, accessibility and land use planning, enforcement and incentives, and lastly land assessment and land cost.**

**Table 1: The Barriers in Adopting Sustainable Affordable Houses (SAH) Development**  
Source: Authors (2023)

Identified Category of Main Barriers in Sustainable Affordable Housing (SAH)	Barriers in Adopting Sustainable Affordable Housing (SAH)	Authors	Context
<b>Financial</b>	<b>Developers</b>		
	<ul style="list-style-type: none"> <li>High costs of sustainable buildings (materials and products)</li> </ul>	(S Z H Syed Jamaludin <i>et al</i> , 2020), (Micheal Atafo Adabre, 2020), (Kai Chen Goh, 2013)	Malaysia, Nigeria
	<ul style="list-style-type: none"> <li>Eco-friendly construction’s materials are higher in price due to difficulties of obtaining the materials</li> </ul>	(S Z H Syed Jamaludin S. A., 2018)	Malysia
	<ul style="list-style-type: none"> <li>Unwillingness of the developers to bare “additional construction costs”</li> </ul>	(Ifeoluwa Benjamin Oluleye, 2021)	Nigeria
	<b>Householders</b>		
<ul style="list-style-type: none"> <li>Household income and household unaffordability to acquire sustainable houses which are high in price</li> </ul>	(Dian Ratri Cahyani, 2020)	Indonesia	
<ul style="list-style-type: none"> <li>Buyers have a limitation on buying sustainable houses due to higher prices</li> </ul>	(Kai Chen Goh, 2013)	Malaysia	
<b>Government</b>			
<ul style="list-style-type: none"> <li>Inadequate public funding for sustainable and affordable houses</li> </ul>	(Zhang, 2016), (Micheal Atafo Adabre, 2020),	Australia, Worldwide	
<b>Expertise and Technology</b>	<b>Developers</b>		
	<ul style="list-style-type: none"> <li>Lack of up-to-date knowledge of green technologies and materials</li> </ul>	(S Z H Syed Jamaludin S. H., 2020)	Malaysia
	<ul style="list-style-type: none"> <li>No/less expertise in sustainable design</li> </ul>	(Kai Chen Goh, 2013)	Malaysia
	<ul style="list-style-type: none"> <li>Uncertainty of technological changes in the future</li> </ul>	(Dania Sunday, 2021)	Indonesia
	<b>Householders</b>		
<ul style="list-style-type: none"> <li>Fear and risks with the adoption and adaptation of new technology</li> </ul>	(Ifeoluwa Benjamin Oluleye, 2021)	Nigeria	
<b>Government</b>			
<ul style="list-style-type: none"> <li>Green technology expertise and materials need to be imported from foreign countries</li> </ul>	(Kai Chen Goh, 2013), (Ifeoluwa Benjamin Oluleye, 2021)	Malaysia, Nigeria	

	<ul style="list-style-type: none"> <li>• Technology transfer</li> </ul>	(D.K. Ahadzie, 2008)	Developing countries
<b>Education, Knowledge, and Awareness</b>	<p><b>Developers</b></p> <ul style="list-style-type: none"> <li>• Miss-conception of sustainable affordable housing</li> <li>• Do not understand the core concept/foundation of sustainable housing development</li> </ul> <p><b>Householders</b></p> <ul style="list-style-type: none"> <li>• Lack of clients' interests and demand</li> <li>• Social acceptability</li> <li>• Lack of public awareness</li> </ul> <p><b>Government</b></p> <ul style="list-style-type: none"> <li>• Lack of exposure on sustainable development as a core subject in higher institutions that offers related courses</li> <li>• Lack of promotion on the sustainability education in the universities</li> </ul>	(J. Yang, 2015)  (Kai Chen Goh, 2013)  (Ifeoluwa Benjamin Oluleye, 2021), (X. Li, 2019)  (Dian Ratri Cahyani, 2020)  (Ezinnia, 2022)  (Kai Chen Goh, 2013)  (Ifeoluwa Benjamin Oluleye, 2021)	Australia  Malaysia  Nigeria, New Zealand  Indonesia  Nigeria  Malaysia  Nigeria
	<p><b>Developers</b></p> <ul style="list-style-type: none"> <li>• No mixed land use planning</li> <li>• Unfavourable location for such a scheme</li> </ul> <p><b>Householders</b></p> <ul style="list-style-type: none"> <li>• Less accessibility to public facilities and amenities</li> </ul> <p><b>Government</b></p> <ul style="list-style-type: none"> <li>• Lack of a comprehensive physical development plan</li> <li>• Bureaucracy</li> <li>• Inefficient land use planning</li> </ul>	(Dian Ratri Cahyani, 2020)  (Dania Sunday, 2021)  (Dian Ratri Cahyani, 2020), (H. Wallbaum, 2012),  (Dania Sunday, 2021)  (Ezinnia, 2022)  (Dania Sunday, 2021)  (Dania Sunday, 2021)	Indonesia  Nigeria  Indonesia, Switzerland  Nigeria
	<p><b>Developers</b></p> <ul style="list-style-type: none"> <li>• Sustainable housing schemes are not a mandatory development</li> <li>• Less provision of incentives for developers</li> </ul> <p><b>Householders</b></p> <ul style="list-style-type: none"> <li>• Lack of financing program or incentives to acquire such housing scheme</li> <li>• Loans eligibility for such a scheme</li> </ul> <p><b>Government</b></p> <ul style="list-style-type: none"> <li>• Lack of monitoring and enforcement</li> <li>• Unapproachable guidelines and methods for sustainable affordable housing delivery</li> </ul>	(S Z H Syed Jamaludin S. H., 2020)  (Trudeau, 2018)  (Ifeoluwa Benjamin Oluleye, 2021), (H. Wallbaum, 2012),  (Dania Sunday, 2021)  (S Z H Syed Jamaludin S. H., 2020), (Ifeoluwa Benjamin Oluleye, 2021)  (Kai Chen Goh, 2013), (Ifeoluwa Benjamin Oluleye, 2021),  (Ezinnia, 2022)	Malaysia  United States  Nigeria, Switzerland  Malaysia, Nigeria  Malaysia Nigeria
	<b>Land Assessment and Land Cost</b>	<p><b>Developers</b></p> <ul style="list-style-type: none"> <li>• High cost of land</li> </ul> <p><b>Householders</b></p>	

	<ul style="list-style-type: none"> <li>• Unaffordability among households to acquire such a scheme</li> </ul> <p><b>Government</b></p> <ul style="list-style-type: none"> <li>• Environmental and geological assessment funds/incentives</li> </ul>	(Dania Sunday, 2021)	Nigeria
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#### 4.1 Financial Barrier

Housing affordability is still a crucial issue in many countries. Basically, the house price is proportional to the building costs and land costs. If both of these variables increase, it will reflect the higher price of the houses especially to the end users (buyers). The idea of integrating sustainability into affordable houses may increase the construction and operational costs, thus the final housing price. This is due to sustainable features that need to be implemented in SAH development. Therefore, it will lead to financial constraints not only to the householders but also to the developers as well as the Governments.

**4.1.1 Developers** – According to S Z H Syed Jamaludin *et al* (2020), the high costs of sustainable materials will cause higher construction costs. This is due to most green materials being high in cost due to difficulties in obtaining them and some must be imported from foreign countries as they are not local-based products. This is not a favourable part of SAH development as most of the developers were unwilling to bear additional construction costs (Kai Chen Goh, 2013). It is learned that the cost of sustainable houses is 40% higher than conventional houses. Based on the interviews conducted by the previous researchers also find out that small-scale developers are also unafforded to commit to this kind of housing development. Due to this matter, implementing sustainability elements into the passive design of the housing construction may reduce certain costs for SAH development.

**4.1.2 Householders** – As the sustainable house price has to absorb the land costs and construction costs, the house price would be higher. According to Kai Chen Goh (2013), sustainable houses are high in price. This will limit the affordability of the householder to own a sustainable house as mentioned by (Dian Ratri Cahyani, 2020) in her research. The incapability to have sustainable houses affected housing affordability, especially among middle-income and low-income householders.

**4.1.3 Governments** – In many countries, the government has inadequate public funding for sustainable and affordable houses (Zhang, 2016), (Micheal Atafo Adabre, 2020). The government funds may focus on the development projects like infrastructural projects but there is less attention on funding the SAH development projects.

#### 4.2 Expertise and Technological Barrier

Sustainable housing practices and the technology beneath them are constantly developing. In some countries, sustainable housing concepts and practices are still in the infancy stage thus limiting the expertise among practitioners and sustainable (green) technology itself. The expertise and technological barrier also can be seen from the perspectives of the developers, householders, and the government.

**4.2.1 Developers** – A decade ago Kai Chen Goh, (2013) claimed that there was no or less expertise in sustainable design especially in Malaysia. According to S Z H Syed Jamaludin S. H., *et al*, (2020), the developers admitted that they are lacking up-to-date knowledge of green technologies and materials. Some developers also worry about the uncertainty of technological

changes in the future (Dania Sunday, 2021) as the technology evolves and the absence of expertise for new technology changes.

**4.2.2 Householders** – As stated by Ifeoluwa Benjamin Oluleye (2021), there are certain fears and risks with the adoption and adaptation of new technology among householders. On top of that, the worries also extended to repairs and maintenance works, replacement, and restoration as not many householders are familiar with that kind of expertise.

**4.2.3 Governments** – Most of green technology expertise and materials need to be imported from foreign countries as lacking of local experts and materials as stated by (Kai Chen Goh, 2013) and then seconded by (Ifeoluwa Benjamin Oluleye, 2021). There are also deficiencies in technology transfer within governments in many countries as stated by (D.K. Ahadzie, 2008).

### **4.3 Education, Knowledge and Awareness Barrier**

Sustainable housing practices and technologies are constantly evolving. Many developers, architects, and contractors may have limited knowledge and awareness of the latest sustainable building techniques. This lack of awareness can hinder the widespread adoption of sustainable practices in affordable housing projects.

**4.3.1 Developers** - According to J. Yang (2015), there are certain miss-conceptions of sustainable affordable housing among developers and contractors. There is also a lack of skilled and professional labour in the latest green construction technologies. The study conducted by (Kai Chen Goh, 2013) in Malaysia stated that the contractors do not understand and have unclear insights of sustainable housing development fundamentals.

**4.3.2 Householders** - SAH development is still at infancy stage in certain countries. The level of awareness among the public is still at a poor rate. According to Ifeoluwa Benjamin Oluleye (2021): X. Li (2019) demonstrated that there is still a lack of clients' interest and demand for sustainable houses. The social acceptability among the public is also at a distressed rate. Dian Ratri Cahyani, 2020 stated that this kind of development in Indonesia is often located in remote areas which are further away from the necessary amenities. The mixed-land used which has comprehensive and sustainable planning cannot be achievable.

**4.3.3 Governments** – The knowledge of SAH development among higher education institutions is still limited due to deficiency exposure to sustainable development as a core subject that offers related courses. In addition, (Ifeoluwa Benjamin Oluleye, 2021) also stated that there is a lack of promotions on sustainability education in the universities. There should be a curriculum review on related courses offered by the University to ensure the “sustainability” of related built environment courses.

### **4.4 Accessibility and Land Use Planning Barrier**

Affordable housing developments were often located in remote areas that are disconnected from the city centre, accessibility to commercial areas and further away from public transportation means. However, there are fewer issues on accessibility and land use planning barriers in Malaysia.

**4.4.1 Developers** - According to Dian Ratri Cahyani (2020), developers tend to develop such schemes in exclusive land use rather than mixed land use. The research also proved that the SAH development was always located in an unfavourable location. The selected site for SAH

development is located far from the city centre which limits the accessibility of the occupants to basic facilities.

**4.4.2 Householders** - For householders, they are less motivated to buy the sustainable affordable house as the site selection has less accessibility to public facilities and amenities (Dian Ratri Cahyani, 2020); (H. Wallbaum, 2012). This situation will burden the householders as they have to spend more on transportation costs due to the cost-distance relationship.

**4.4.3 Governments** - As for the government, there is a lack of comprehensive physical development in regards to SAH development and inefficient land use planning as mentioned by Dania Sunday (2021). The problem of red tape and bureaucracy also can impede the progress of SAH developments.

#### **4.5 Enforcement and Incentives Barrier**

Policy and regulatory frameworks also play a critical role in determining the success of SAH initiatives. Inconsistency of laws or outdated regulations, inadequate zoning commandments, and a lack of supportive policies can obstruct the integration of sustainable practices into affordable housing projects.

**4.5.1 Developers** – According to (S Z H Syed Jamaludin S. H., 2020), the developers claimed that the SAH development is not a mandatory development. So, they are not obliged to this kind of development. On the other hand, Trudeau (2018) stated that there are fewer provisions of incentives and encouragement to the developers causing them not to carry out the SAH development.

**4.5.2 Householders** – For the householders, there is an unavailability of financing program offered by the financing institution to finance sustainable affordable houses as stated by (H. Wallbaum, 2012), and seconded by Ifeoluwa Benjamin Oluleye (2021). This will limit the eligibility of the end users or the householders to apply for loans for such development (Dania Sunday, 2021).

**4.5.3 Governments** – As for the government, lack of monitoring and enforcement has led to the adjournments of SAH development (S Z H Syed Jamaludin S. H., 2020); (Ifeoluwa Benjamin Oluleye, 2021). The unapproachable guidelines and methods for SAH delivery are also one of the barriers to its implementation (Kai Chen Goh, 2013). Therefore, the government and policymakers must address the urgency of the need for a comprehensive framework that encourages the adaptation of SAH developments.

#### **4.6 Land Assessment and Land Cost Barrier**

Unfortunately, the selection of SAH sites sometimes is disappointing. In fact, some sites are also located at vulnerable locations causing the population to be exposed to the danger of natural disasters such as floods, landslides, and others. Due to that course, land assessment must be conducted before any work is proceeded.

**4.6.1 Developers** – According to (Dania Sunday, 2021) the high cost of land restrains the developers to develop sustainable affordable housing. The high costs of land that are absorbed together with high construction costs may cause the final price of the house to rocket as much as possible. The profit margin for the developer may be tight causing them not to be interested in developing SAH.



**4.6.2 Householders** – Due to the high costs of land and lower entitlement for housing loans among householders had made them unafforded to own their SAH (Dania Sunday, 2021).

**4.6.3 Governments** – In order to encourage SAH development, the government should provide environmental and geological assessment funds or incentives (Dania Sunday, 2021) to speed up the development implementation. This is also a must to protect the occupants from unintended disasters.

In order to achieve the objectives of the research, barrier indicators were tabulated as in Table 2.

**Table 2: The barrier indicators in adopting Sustainable Affordable Housing Development**  
Source: Authors (2023)

Main Barriers	Perspectives	Barrier Indicators
<b>Financial</b>	Developer	1. Cost of construction 2. High cost of sustainable materials 3. The unwillingness of contractors to bare additional costs
	Householders	4. Unaffordability to buy sustainable affordable houses 5. Less purchasing power
	Government	6. Inadequate public funding for SAH development
<b>Expertise and Technology</b>	Developer	7. Lack of up-to-date knowledge of green technologies and sustainability 8. Less expertise in sustainable design 9. Uncertainty of technological changes in the future 10. Lack of skilled labour
	Householders	11. Fear and risks with the adoption and adaptation of new technology 12. Less skills in maintenance, repairs and replacement
	Government	13. Shortage of technological experts 14. Less commitment to technology transfer
<b>Education, Knowledge, and Awareness</b>	Developer	15. Miss-understanding of SAH development 16. Confounding of SAH practices
	Householders	17. Lack of interest 18. Less demanded 19. Deficiency in demand for SAH development
	Government	20. Less exposure to sustainable syllabus at higher education institutions 21. Less promotion of sustainable education
<b>Accessibility and Land Use Planning</b>	Developer	22. Overlooked mixed land-use planning 23. Selection of site to unfavourable location
	Householders	24. Less accessibility to public facilities and amenities
	Government	25. Lack of a comprehensive physical development plan 26. Bureaucracy 27. Inefficient land use planning
<b>Enforcement and Incentives</b>	Developer	28. SAH development is not a mandatory development to the developer 29. Less provision of incentives
	Householders	30. Lack of financing/ tenure to SAH development for the end users 31. Loan eligibility
	Government	32. Lack of monitoring and enforcement 33. Unapproachable guidelines and methods for SAH methods of housing delivery
<b>Land Assessment and Land Cost</b>	Developer	34. High cost of land 35. Land assessment costs that need to be absorbed on the sustainable affordable housing price
	Householders	36. Inability to bear the land cost
	Government	37. Inexistence of environmental and geological funds and incentives

## 5. Conclusion

Ultimately, there are still a lot of concerns in regard to SAH implementation in many countries. Addressing these barriers, the requirement of an inclusive approach concerning the strategic partnerships between developers, policymakers, financial institutions, and the communities now is an urgent call. As for further research, it is recommended to study on the challenges of SAH development and implementation in Malaysia in order to bring to the attention of the decision-makers to draw a policy for SAH development.

In order to develop SAH, it is envisaged that this study would contribute at least to a framework of SAH development guidelines for developers, households, and the government.

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