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DEVELOPING A SUSTAINABLE FEATURES OF AFFORDABLE HOUSING MODEL BASED ON OCCUPANTS' PERCEIVED HOUSEHOLD COST BURDEN REDUCTION

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Abstract

Housing affordability has evolved beyond housing purchase prices to include long-term operating and maintenance costs. Although sustainable housing features are recognised for improving environmental performance, limited evidence exists on which features effectively reduce household cost burdens in stratified affordable housing. This study identifies the Sustainable Features of Affordable Housing that contribute to Perceived Household Cost Burden Reduction (PHCBR) among occupants of affordable housing schemes in the Klang Valley, Malaysia. A quantitative approach was adopted using a structured questionnaire administered to 385 respondents. Descriptive statistics and multiple regression analysis were employed to examine the influence of sustainable housing features on PHCBR. The findings indicate that 15 sustainable housing features significantly contribute to reducing occupants' perceived household cost burdens, with LED lighting in common areas, motion sensor lighting, and energy-efficient lifts emerging as the strongest predictors. The regression model explained 65.7% of the variance in PHCBR ($R^2 = 0.657$), indicating strong explanatory power. Based on these findings, the study proposes the Sustainable Features of Affordable Housing Model, comprising four sustainability pillars: Energy Efficiency, Water Efficiency, Materials and Resources, and Indoor Environmental Quality. The proposed model provides practical guidance for developers and policymakers in prioritising sustainable housing features that enhance long-term housing affordability and financial sustainability.

Keywords: Sustainable Features of Affordable Housing; Affordable housing; Perceived Household Cost Burden Reduction; Housing affordability; Malaysia.

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INTRODUCTION

Rapid urbanization, rising housing demand, and growing environmental concerns have intensified global efforts to promote sustainable housing development. The residential sector is recognized as a major consumer of energy, water, and construction materials, while simultaneously contributing significantly to greenhouse gas emissions and environmental degradation. Consequently, governments and international organizations are increasingly advocating for the adoption of sustainable housing features. Such as energy-efficient technologies, water conservation systems, eco-friendly building materials, and improved indoor environmental quality as essential components of sustainable urban development (United Nations, 2015; World Green Building Council, 2019). These sustainable features are expected not only to enhance environmental performance but also to reduce building operating costs and improve residents' quality of life.

Despite the growing emphasis on sustainable housing, integrating sustainability into affordable housing development remains a significant challenge. Gan et al. (2017) assert that affordable housing should strike a balance between economic affordability, environmental sustainability, and social well-being, rather than merely providing housing at a lower purchase price. Similarly, Chan and Adabre (2019) argue that sustainable affordable housing must go beyond construction costs to consider the building's lifecycle performance, operating expenses, housing management, and the long-term financial well-being of occupants. Previous studies have extensively examined aspects of sustainable housing, such as green feature adoption (Zulkepli & Rahman, 2025); the willingness to pay a price premium (Lee et al., 2025); environmental performance, green building certification, purchase intention, residential satisfaction, and consumers' willingness to pay a premium purchase price for green housing (Chan & Adabre, 2019a; Adabre et al., 2020; Tan et al., 2022) and far less attention has been invested to the role of sustainable housing features in alleviating the long-term financial burden associated with housing maintenance and household cost. Previous authors argued that investment in sustainable features in affordable housing is essential, considering the continuing operational management and positive externalities, such as neighborhood benefits (MacAskill *et al.*, 2021). In Malaysia, affordable housing programs primarily focus on increasing access to homeownership through various government initiatives on housing prices (Saleh et al. 2025a). However, growing evidence suggests that housing affordability cannot be assessed solely based on the initial purchase price. Homeownership entails ongoing financial commitments throughout the housing lifecycle, including mortgage repayments, utility bills, maintenance fees, sinking fund contributions, and repair costs (Chan & Adabre, 2019b)

Therefore, this study examines the relationship and impacts between sustainable housing features and the perceived reduction in housing cost burden among stratified affordable occupants in Klang Valley. Specifically, the study aims to identify sustainable housing features that contribute to reducing utility expenses, common area maintenance costs, and maintenance fee burdens, ultimately developing a Sustainable Affordable Housing Features Model to guide future stratified affordable housing developments. The findings are expected to provide valuable guidance for developers, property managers and policymakers in balancing sustainability objectives with long-term housing affordability while ensuring the financial sustainability of affordable housing management.

LITERATURE REVIEW

Sustainable Affordable Housing

Affordable housing is generally defined as housing that is financially accessible to low- and middle-income households without imposing excessive financial burdens that compromise their ability to meet other essential living needs. (Saleh et al., 2025a). Traditionally, housing affordability has been assessed based on the relationship between household income and housing costs, with particular emphasis on the purchase price or rental expenditure (Saleh et al., 2025b). However, this conventional definition has been increasingly criticised for overlooking the long-term financial commitments associated with homeownership, including utility bills, maintenance fees, repair costs, and other operational expenses incurred throughout the housing lifecycle. This issue is commonly observed in stratified residential developments governed by management bodies that are responsible for maintaining common property. Property owners are required to pay monthly maintenance and management fees to support the upkeep of these shared facilities. Such arrangements are typically found in high-rise or strata-titled residential government scheme; such as, PR1MA, Residensi Wilayah and Rumah Selangorku. Consequently, the concept of sustainable affordable housing has emerged, integrating the principles of environmental sustainability with long-term economic affordability and social well-being. Although, Jamaludin et al (2017) provides a detailed discussion on the challenges of integrating sustainability principles into affordable housing, this does not preclude the incorporation of sustainable housing features within government-subsidised affordable housing developments. Chan and Adabre (2019) defined sustainable affordable housing as housing that simultaneously satisfies affordability, environmental performance, and occupants' quality of life throughout its lifecycle. Similarly, Gan et al. (2017) argued that sustainable affordable housing should balance environmental, economic, social, institutional, and technological dimensions to ensure long-term housing sustainability.

In practice, this is achieved through the incorporation of sustainable housing features such as energy-efficient technologies, water conservation systems, durable construction materials, and improved indoor environmental quality, which not only minimise the housing prices but also reduce long-term operational and household costs. Despite these recognised benefits, the adoption of sustainable housing features within stratified affordable housing scheme remains limited, highlighting the need to identify those features that can effectively reduce long-term household operating costs while enhancing the financial sustainability of affordable homeownership.

Sustainable Features for Affordable Housing

The findings suggest that sustainable development features improve residential affordability by reducing long-term household expenditure and building operational costs. Rather than providing environmental benefits alone, the integration of Energy Efficiency (EE), Water Efficiency (WE), Materials and Resources (MR), and Indoor Environmental Quality (IEQ) contributes to lower electricity and water consumption, reduced maintenance requirements, and improved lifecycle performance of residential buildings. These outcomes are consistent with previous studies, which argue that sustainable housing should be evaluated based on its ability to minimise both initial and recurring housing costs, thereby improving long-term affordability (Chan & Adabre, 2019; Zulkepli & Rahman, 2025).

Energy Efficiency (EE) features, including solar photovoltaic (PV) systems, LED lighting, energy-efficient lift systems, EV charging infrastructure, motion sensors and energy star rating appliance, directly reduce electricity consumption in residential buildings. Lower energy demand decreases utility bills and common area operational expenditure, allowing management bodies to maintain more stable maintenance fees. This is particularly important in affordable high-rise housing, where recurring electricity costs form a significant proportion of monthly household expenditure (Santamouris, 2014; Ramli et al., 2024). Similarly, Water Efficiency (WE) measures, such as rainwater harvesting, water-efficient fixtures, dual-flush toilets, Water saving landscaping, and water sub-metering, reduce potable water demand while encouraging responsible water consumption. Besides lowering monthly water bills, these systems reduce water losses and maintenance costs associated with plumbing infrastructure, contributing to better long-term resource management (Al-Qawasmi et al., 2019; Mandell & Wilhelmsson, 2011).

The Materials and Resources (MR) pillar contributes mainly through lifecycle cost reduction. The adoption of Industrialised Building Systems (IBS), durable construction materials, low-VOC products, universal design, and recycling facilities reduces repair frequency, replacement costs, and building

maintenance throughout the service life of the building. Previous studies indicate that sustainable housing should be assessed based on whole-life cost rather than initial construction cost alone (Iwuanyanwu et al., 2024; Olanrewaju & Tan, 2018). Indoor Environmental Quality (IEQ) features, including natural daylighting, natural ventilation, large windows, external views, and acoustic insulation, also contribute indirectly to housing affordability. Improved daylight and natural ventilation reduce dependence on artificial lighting and air-conditioning, while healthier indoor environments improve occupant comfort and satisfaction. Consequently, sustainable housing delivers both economic and social value by lowering energy consumption while enhancing residents' quality of life (Wang et al., 2025; Abdullah et al., 2025). Overall, the integration of EE, WE, MR, and IEQ improves resource efficiency, reduces utility bills and maintenance expenditure, and enhances housing affordability throughout the building lifecycle.

Perceived household cost burden reduction (PHCBR)

Perceived Household Cost Burden Reduction (PHCBR) refers to occupants' perception that sustainable housing features help reduce the overall financial burden of homeownership by lowering utility bills, common area maintenance costs, and recurring maintenance fees. In Malaysia, the problem is particularly severe in low-cost and affordable housing schemes, where approximately half of the residential units experience difficulties in making regular maintenance fee payments (Bernama, 2025). Meanwhile, Saleh et al. (2025b) and Adabre et al. (2020) noted that a major challenge in affordable housing lies in balancing sustainability objectives with financial affordability considerations. This concept extends housing affordability beyond the initial purchase price by recognising that homeowners or occupants continue to bear recurring housing-related expenses throughout the occupancy period.

RESEARCH METHODOLOGY

Data Collection and Sample Selection

A quantitative research approach was adopted, and a structured questionnaire was administered to 385 occupants of stratified affordable housing schemes in the Klang Valley. Respondents were selected from occupants residing in PR1MA, Residensi Wilayah and Rumah Selangorku developments, comprising both homeowners and tenants. Affordable Housing Scheme in Klang Valley was selected as the study area due to its high concentration of affordable housing developments and diverse housing schemes. The collected data were analysed using the Statistical Package for the Social Sciences (SPSS). Descriptive statistics were first employed to summarise mean score for dependent variables of PHCBR. Subsequently, regression analysis was performed to examine the influence of

sustainable housing features on occupants. The strength and significance of the relationships were assessed using the normality, correlation coefficient (r), coefficient of determination (R^2), standardized regression coefficient (β), significance level (p -value), and effect size (f^2), where appropriate. In the light of the following research, the hypothesis included;

- H^1 - Sustainable housing features have a significant influence on occupants' Perceived Household Cost Burden Reduction (PHCBR)

The proposed initial conceptual framework illustrating this relationship is presented in Figure 1.

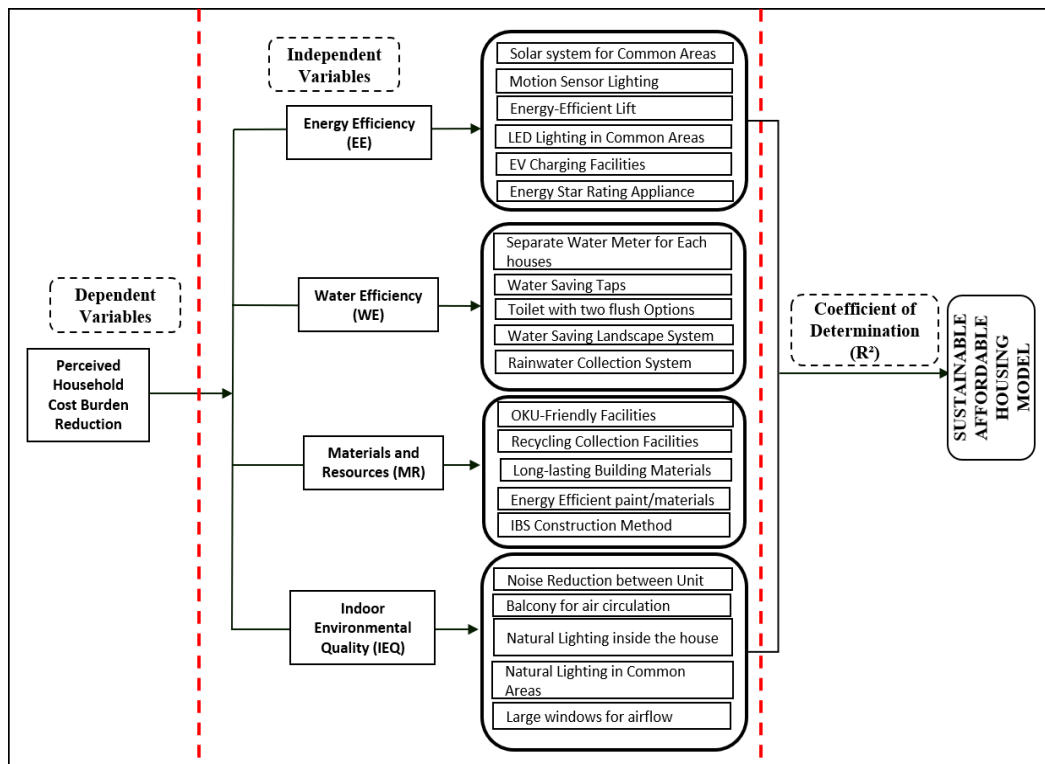


Figure 6: Conceptual and Research framework

The figure above presents the initial research framework, which was put together after considering previous studies that identified relevant attributes and integrated relationships between Sustainable Features of Affordable Housing as the independent variable and the Perceived Household Cost Burden Reduction

as the dependent variable. The selected initial attributes were classified into four categories, comprising a total of 21 attributes. The regression model formula for this research can be summarised as below;

$$Y = \beta_0 + \beta_1 X_1 + \beta_2 X_2 + \beta_3 X_3 + \dots + \beta_\gamma X_\gamma + \epsilon$$

Where;

Y = *Dependent variable; Mean of PHCBR*

$X = X_1, X_2, \dots, X_\gamma$ = *Independent variable; Sustainable Features of Affordable housing*

$\beta_0, \beta_1, \beta_2, \beta_3, \dots, \beta_\gamma$ = *Parameters of the variables* + ϵ = *Error estimation*

Therefore, the analysis commenced with the dependent variables by examining their composite mean scores to determine the overall level of respondents' perceptions.

RESULT AND DISCUSSION

Descriptive Statistics of Respondent Profiles

The basic distribution of respondents is presented in Table 1.

Table 1: Descriptive Statistics of Respondent Profiles

Variables	Category	Frequency (n)	Percentage (%)
Tenure	Owner	235	61.0
	Tenant	150	39.0
Housing Scheme	PR1MA	70	18.2
	Residensi Wilayah	150	42.9
	Rumah Selangorku	165	39.0
		385	100.0

Table1 shows that the sample comprised respondents from three affordable housing schemes, with the largest proportion from Residensi Wilayah (42.9%), followed by Rumah Selangorku (39.0%) and PR1MA (18.2%). In terms of tenure, homeowners constituted 61.0% of the sample, while tenants accounted for 39.0%. This distribution provides a contextual profile of the study sample, encompassing both ownership and rental occupancy within Klang Valley's affordable housing sector.

Descriptive Statistics of Perceived Household Cost Burden Reduction

Table 2: Mean Score

Variables		
Items	Mean	SD
Sustainable housing features reduce monthly utility costs (e.g., electricity and water bills).	4.188	0.742
Sustainable housing features reduce monthly maintenance costs for common areas.	4.113	0.754
Sustainable housing features reduce the overall financial burden of maintenance fees for homeowners.	4.061	0.701
Overall mean score: PHCBR	4.121	0.800

PHCBR was measured using three items related to perceived reductions in utility costs, common area maintenance costs, and maintenance fees payment. A composite mean score was calculated by averaging the responses to the three items. The overall mean score of 4.121 indicates a high level of perceived household cost burden reduction.

Regression Analysis

Normality test

Normality was assessed using skewness and kurtosis values. Following Hair et al. (2022), all four sustainability categories met the recommended thresholds of ± 2.0 for skewness and ± 7.0 for kurtosis, as shown in Table 2;

Table 3: Normality Result

Variables	Normal distribution		Status
Categories	Mean	SD	Skewness Kurtosis
Energy Efficiency (EE)	3.938	0.742	-0.503 0.049
Water Efficiency (WE)	3.832	0.754	-0.660 1.161
Indoor Environmental Quality (IEQ)	4.027	0.701	-0.972 2.215
Materials and Resources (MR)	3.983	0.800	-0.849 0.883

As presented in Table 3, skewness values ranged from -0.503 to -0.972, Meanwhile, the kurtosis values ranged from 0.049 to 2.215, indicating that the distributions were slightly more peaked than a normal distribution but remained well within the acceptable threshold. Since all skewness and kurtosis values met the recommended criteria proposed by Hair et al. (2022), the data were considered

approximately normally distributed. Meanwhile, multicollinearity was assessed based on tolerance and VIF values. The results showed acceptable values for all predictors, indicating no significant multicollinearity concern in the model.

Correlation analysis with dependent variables

Table 4 show the correlation between total of composite mean score for perceived household cost burden reduction and categories in Sustainable Features of Affordable housing;

Table 4: Correlation analysis

Variables	Pearson Correlation (r)	Sig.2- Tailed	Relationship
DV: Perceived Household Cost Burden Reduction			
Energy Efficiency (EE)	0.573	<0.001	Moderate and Positive
Water Efficiency (WE)	0.664		Strong and Positive
Materials and Resources (MR)	0.586		Moderate and Positive
Indoor Environmental Quality (IEQ)	0.483		Moderate and Positive

The Pearson correlation analysis revealed that all four sustainable development categories were positively and significantly associated with PHCBR ($p < 0.001$). Among the four predictors, Water Efficiency (WE) demonstrated the strongest positive relationship with perceived household cost burden reduction ($r = 0.664$), indicating that respondents perceived water-efficient features as having the greatest contribution to reducing household living costs. Next, Materials and Resources (MR) exhibited a moderate positive correlation ($r = 0.586$), followed closely by Energy Efficiency (EE) ($r = 0.573$). These findings suggest that respondents recognised the role of durable construction materials, resource-efficient building practices, and energy-saving technologies in lowering long-term maintenance expenses and utility costs. Meanwhile, Indoor Environmental Quality (IEQ) recorded the lowest, yet still statistically significant, positive correlation with perceived household cost burden reduction ($r = 0.483$). Although IEQ features primarily enhance occupants' comfort and well-being, respondents also acknowledged their indirect contribution to reducing household expenditure through improved natural lighting and ventilation, which may reduce reliance on artificial lighting and mechanical cooling. Overall, the statistically significant positive correlations support the proposition that greater implementation of sustainable housing features is associated with stronger perceptions of reduced household financial burden. Subsequently, Table 5 summarises the results of the path coefficients (B), t-values (T), and ranked of the 21 attributes.

Table 5: Coefficient result of Sustainable Features of Affordable Housing with PHCBR

Regression Analysis DV: PHCBR		Beta	t	Sig. A	Ranks
Materials and Resources (MR)	OKU-friendly facilities (MR1)	-.032	-0.492	.632	Not Sig
	Recycling collection facilities (MR2)	.178	2.725	.004	12
	High-quality and long-lasting building materials (MR3)	.174	2.601	.004	13
	Energy Efficient paint/materials (MR4)	.185	2.912	.004	11
	IBS construction method (MR5)	.281	4.332	.002	7
Indoor Environmental Quality (IEQ)	Noise reduction between units (IQ1)	-.029	-0.482	.338	Not Sig
	Balcony for better air circulation (IQ2)	.249	3.814	.002	8
	Natural lighting inside the house (IQ3)	.224	3.448	.003	9
	Natural Lighting in Common Areas (IQ4)	.163	2.542	.004	14
	Large windows for better airflow (IQ5)	.198	3.052	.003	10
Energy Efficiency (EE)	Solar system for common areas (EE1)	-.375	-4.72	.003	5
	Motion sensor lighting (EE2)	.401	5.031	.000	2
	Energy-efficient lifts (EE3)	.389	4.922	.000	3
	LED lighting in common areas (EE4)	.408	5.130	.000	1
	EV charging facilities (EE5)	-.045	-.574	.553	Not Sig
	Energy Star Rating Appliance (EE6)	.381	4.845	.000	4
Water Efficiency (WE)	Separate water meter for each house (WE1)	.031	0.493	.634	Not Sig
	Water-saving taps (WE2)	-.054	-0.501	.671	Not Sig
	Toilets with two flush options (WE3)	.324	4.52	.001	6
	Water-saving landscape system (WE4)	.151	2.312	.004	15
	Rainwater collection system (WE5)	.129	2.082	.004	16

Coefficient analysis was conducted to examine the influence of sustainable housing features on perceived household cost burden reduction (PHCBR). The results indicate that 16 out of the 21 sustainable housing features significantly influenced occupants' perceptions of household cost burden reduction, while the remaining five attributes, namely EV charging facilities, separate water meters, water-saving taps, OKU-friendly facilities, and noise reduction between housing units, were not statistically significant.

A closer look, Among the significant predictors, LED lighting in common areas emerged as the most influential factor ($\beta = 0.408$, $t = 5.130$, $p < 0.001$), followed by motion sensor lighting ($\beta = 0.401$, $t = 5.031$, $p < 0.001$),

energy-efficient lifts ($\beta = 0.389$, $t = 4.922$, $p < 0.001$), Energy Star-rated appliances ($\beta = 0.381$, $t = 4.845$, $p < 0.001$), and dual-flush toilet systems ($\beta = 0.324$, $t = 4.520$, $p = 0.001$). These features directly contribute to reductions in electricity and water consumption, enabling households to experience immediate savings in monthly utility expenses. This finding is consistent with Gan et al. (2017) and Chan and Adabre (2019), who emphasised that sustainable affordable housing should prioritise technologies capable of lowering lifecycle operating costs while improving long-term housing affordability. Other sustainable housing features, including IBS construction methods, balconies for natural ventilation, natural lighting, large windows for better airflow, energy-efficient paint/materials, high-quality durable building materials, and recycling collection facilities, also demonstrated significant positive relationships with PHCBR. These findings suggest that occupants recognise the long-term economic benefits of passive design strategies and durable construction materials, which are associated with lower maintenance requirements and reduced household energy consumption.

Interestingly, solar systems for common areas demonstrated a significant negative relationship with PHCBR ($\beta = -0.375$, $t = -4.720$, $p = 0.003$). Although solar energy systems are generally recognised for reducing electricity consumption, occupants may perceive that the installation, operation, and long-term maintenance of solar systems for common facilities increase overall building management costs. Since the electricity savings generated from common-area solar systems are not always directly reflected in individual household utility bills, occupants may perceive that the financial benefits do not immediately outweigh the additional maintenance or replacement costs associated with the technology. Furthermore, EV charging facilities ($\beta = -0.045$, $p = 0.553$) were found to have a negative but insignificant relationship with PHCBR. This finding suggests that occupants do not currently associate EV charging infrastructure with reductions in household expenditure. Instead, respondents may perceive EV charging infrastructure as an additional facility requiring higher installation, operational, and maintenance costs, which could ultimately increase maintenance charges rather than reduce household financial burdens. Similar observations were highlighted by Adabre et al. (2020), who noted that sustainable technologies should be prioritised based on their practical relevance and economic value to target users rather than solely on their environmental benefits.

Overall, the findings demonstrate that affordable housing occupants place greater emphasis on sustainable housing features that produce immediate and measurable reductions in utility bills and maintenance costs. From table below, the potential regression model was identified;

Table 6: Regression Model Fit for Perceived Household Cost Burden Reduction

Regression Analysis between PHCBR and Sustainable Features of Affordable Housing				
PHCBR	EE2,EE3,EE4,EE6; WE3, WE4, WE5; MR2,MR3,MR4,MR5; IQ2,IQ3,IQ4,IQ5	<i>R</i>	<i>Std. Error</i>	<i>Sig.</i>
		0.810	0.623	0.000
	<i>R</i> ²	.657		
	<i>F</i>	35.082		

Multiple regression analysis was subsequently conducted to examine the relationship between sustainable housing features and PHCBR and to develop the proposed model. The final regression model identified 15 significant sustainable housing features, comprising four attributes from Energy Efficiency (EE) (EE2, EE3, EE4, and EE6), three from Water Efficiency (WE) (WE3, WE4, and WE5), four from Materials and Resources (MR) (MR2, MR3, MR4, and MR5), and four from Indoor Environmental Quality (IEQ) (IQ2, IQ3, IQ4, and IQ5). To further identify the relative contribution of these features to PHCBR, the standardized regression coefficients (β) were examined and used to rank the retained predictors. Based on the standardized regression coefficients, LED lighting in common areas ($\beta = 0.408$), motion sensor lighting ($\beta = 0.401$), energy-efficient lifts ($\beta = 0.389$), Energy Star-rated appliances ($\beta = 0.381$), and dual-flush toilets ($\beta = 0.324$) were the highest-ranked predictors of PHCBR. This pattern indicates that occupants placed greater perceived importance on features with a relatively direct connection to energy and water consumption. The remaining predictors demonstrated comparatively smaller but statistically significant contributions, extending across Materials and Resources, Water Efficiency, and Indoor Environmental Quality. The model demonstrated a strong relationship with PHCBR ($R = 0.810$) and explained 65.7% of the variance in occupants' perceived household cost burden reduction ($R^2 = 0.657$), suggesting that the selected sustainable housing features provide strong explanatory capability. Furthermore, the regression model was statistically significant ($F = 35.082$, $p < 0.001$). According to Cohen (2013), this exceeds the threshold for a large effect size ($f^2 \geq 0.35$), indicating that the selected sustainable housing features are significant predictors of household cost burden reduction. Although solar systems for common areas (EE1) demonstrated a statistically significant relationship, the negative regression coefficient indicates that occupants did not perceive this feature as contributing to household cost reduction. This may be because the financial benefits of common-area solar systems are not directly reflected in individual household utility bills, while installation and maintenance costs are perceived to increase overall building management expenses. Therefore, the proposed sustainable housing features framework focuses on features that are perceived to provide direct or indirect reductions in household costs, consistent

with the primary objective of this study and the argument of Chan and Adabre (2019) that the adoption of sustainable housing features is strongly influenced by occupants' perceived economic value.

CONCLUSION

This study demonstrates that sustainable housing features play a significant role in reducing occupants' Perceived Household Cost Burden Reduction (PHCBR) within affordable housing developments scheme in Klang Valley. The model identified 15 sustainable housing features across the four sustainable categories including Energy Efficiency, Water Efficiency, Materials and Resources, and Indoor Environmental Quality as significant predictors of perceived household cost reduction. Among these, energy-efficient technologies, including LED lighting, motion sensor lighting, energy-efficient lifts, and Energy Star-rated appliances, exhibited the strongest influence, indicating that occupants place greater value on features that generate immediate and measurable reductions in household utility costs. These findings support the argument of Chan and Adabre (2019) and Gan et al. (2017) that sustainable affordable housing should prioritise features that improve lifecycle affordability rather than focusing solely on environmental performance.

The findings further reveal that not all sustainable housing features are perceived equally by affordable housing occupants. Features such as EV charging facilities and common-area solar systems were not perceived as directly contributing to household cost reduction, suggesting that occupants evaluate sustainable technologies based on their immediate economic benefits rather than their environmental advantages alone. This observation is consistent with Adabre et al. (2020), who emphasised that the successful adoption of sustainable housing features depends on their perceived affordability, practicality, and economic value to end users. Overall, this study extends the sustainable affordable housing literature by demonstrating that occupants prioritise sustainable housing features capable of reducing long-term household expenditure. These findings support previous research that sustainable housing and affordable housing are complementary concepts, where lower operational costs and improved building performance ultimately reduce the financial burden on residents (Chan & Adabre, 2019; Zulkepli and Rahman, 2025). The findings provide an evidence-based foundation for developers, management bodies and policymakers to prioritise cost-effective sustainable housing features in future affordable housing developments, thereby enhancing long-term housing affordability, financial sustainability, and residents' quality of life.

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