



The Mediating Role of Housing Acquisition Behavior and Public Housing Service Quality to Enhance Sustainable Housing Development

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ABSTRACT

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sustainability barriers, water-based housing, housing acquisition behavior, public housing service quality (PHSQ), sustainable housing development (SHD)

The main purpose of the study is to observe the effect of (1) economic barriers (EB), social barriers (SB), environmental barriers (EnB), institutional barriers (IB) on housing acquisition behaviour (HAB), public housing service quality (PHSQ), and sustainable housing development (SHD); (2) HAB and PHSQ on SHD; and (3) mediation of HAB and PHSQ on SHD. The examination of SHD employed a survey of 230 homeowners who are living in water-based housing (WBH) both in Jakarta and London. The investigation of the study employed Structural Equation Modelling (SEM) based on AMOS software. The study findings exhibited that both HAB and PHSQ mediate the relationship between sustainability barriers on SHD. Though it contributes significantly to the development of sustainable housing, this research has limitations. Primarily, further consideration is necessary because the research was conducted in both developed and developing countries. The study's findings indicate that the primary factor influencing the quality of public housing services is EB. The principal contribution of this research is to validate the mediation role of HAB and PHSQ on SHD in the housing industry. Nevertheless, no literature assesses the moderation effect of sustainability barriers SHD in the housing industry.

1. INTRODUCTION

In 2023, Indonesia recorded a significant backlog of 12.7 million homes, with 93% of those backed up being low-income or impoverished individuals [1]. Comparing this figure to the 11.4 million households in the housing backlog in 2015, there was an increase. President Joko Widodo launched the one million houses program as one of the initiatives on his priority agenda (Nawa Cita), which is detailed in the Medium-Term National Development Plan 2015-2019, in order to provide housing, particularly for low-income individuals. It went on with Economic Policy Package XIII, which made it easier for low-income individuals to get building permits for homes. Water-based housing (WBH) is one of the topics that can carry out community housing development.

Most nations still struggle to provide people with a decent place to live, especially those in emerging nations. The problems result in a shortage of housing stock, which is indicated by the housing shortage. This is the existing state of affairs and a developing issue in the majority of Asian nations [2]. Asia is home to about half of the world's slum residents, with South-East Asia accounting for 31% of them [3]. Indonesia is the largest and most populous country in Southeast Asia, home to roughly 270 million people. In 2020, just 56.51 percent of Indonesian households were housed appropriately, with roughly 56.7% of the country's population living in cities [4]. The percentage of households living in

subpar housing is 38.9% [5]. The housing backlog persisted despite the numerous housing policies, initiatives, and funding plans that have been implemented. Out of over 2.5 million homes in Jakarta, 1.77 million do not have a healthy and liveable place to live, according to the Central Statistics Agency of DKI Jakarta [6].

A claim of the right to the city and legal claims regarding tenure are necessary components of measures to ensure that everyone has access to suitable housing. Concerning rich and developing nations alike, the shortage of affordable housing in urban areas is highly concerning. Established cities are not exempt from the pervasive consequences of urban poverty; rather, it is primarily a problem in developing nations. According to [7], the cost of housing is rising sharply in London, which has resulted in a significant surge in homelessness [7]. One in fifty Londoners was living in temporary housing by the middle of the year [8]. London has 8.80 million people living there as of the 2021 Census [9]. In other words, 176,000 people in London were homeless. The study primarily examines how local governments carry out WBH policies. Overcoming certain obstacles is essential when addressing housing backlog concerns in a growing nation such as Indonesia, where different levels of government have different authorities. The provision of housing for low-income groups (LICs) in Indonesia has been the subject of numerous studies and legal evaluations [10]. Studies contrasting housing policies in industrialized and developing countries are scarce,

especially when it comes to WBH. Therefore, this research will contribute to the development of a valuable knowledge framework for policy review studies involving intergovernmental participation. The main recommendations for handling housing-related issues are thoroughly examined in this study, together with the viewpoints of the authorities actively engaged in implementing housing regulations.

The on-going decline in home affordability and the inherent unpredictability in the housing sector are the primary challenges facing this study. Thus, the study's objectives are to: 1) determine the impact of institutional, social, environmental, and economic barriers (EB) on public housing service quality (PHSQ), public housing acquisition behaviour (HAB), and sustainable housing development (SHD); 2) identify the role that PHSQ and HAB play as mediators in the creation of SHD; and 3) investigate the relationship between PHSQ and SHD. The sustainability hurdles theory will be applied empirically for the first time to the housing industry with this study. Put differently, there are ramifications for industry as well as for academia from this current study. From an academic standpoint, this study might be helpfully utilized to clarify the internal mechanisms of PHSQ and acquisition behaviour as a mediating function for SHD within the housing industry. Furthermore, the study's findings can be applied as measurement instruments to advance the sustainable housing sector.

2. THEORETICAL AND HYPOTHESIS

The creation of key success criteria (CSC) for assessing SHD is one of the UN's Sustainable Development Goals. Alibašić [11] asserts that the CSC serves as the framework for rendering decisions. These standards can be evaluated objectively or subjectively based on their qualitative or quantitative nature [12]. Reference [13] divided the CSC for sustainable housing into six groups according to the following fundamental criteria: "time of housing project completion," "cost performance of housing project," "quality performance of project," "safety performance (crime prevention) of housing facility," "environmentally friendly (eco-friendly)," "ease of maintenance or maintainability of housing facility," "energy efficient housing facility," "price affordability of housing facility," "rent affordability of housing facility," "transportation cost of household to the facility," and "technology transfer/innovation [13]." Most of these CSC have been approved by the UN as Sustainable Development Goals (SDGs) for the housing industry [14]. The second Sustainable Development Goal (SDG) states that "by 2030, ensure access for all to adequate, safe and affordable housing and basic services and upgrade slums." Therefore, whether discussing CSC or SDGs in connection to housing, the term "SHD," or SHD, is utilized.

This study examines four key barriers: EB, social barriers (SB), environmental barriers (EnB), and institutional barriers (IB). Although these barriers individually influence the determination of affordable housing, there exists a significant relationship between economic and SB [15]. The additional study also identified a direct relationship between social and EnB [16].

2.1 Economic barriers (EB)

The idea of EB, according to reference [17], might be

attained by lower commuting costs (location affordability cost) and more affordable housing, either in terms of price or rental rate. It might also be attained by paying less for utilities (maintenance and operation). In terms of environmental sustainability, lowering transportation costs by making transportation more accessible will lower greenhouse gas emissions from moving vehicles. In addition to lowering carbon dioxide emissions, maintaining energy and water efficiency in housing facilities' operation and maintenance will also cut down on the use of non-renewable resources. Housing that is environmentally sustainable may result from this. In terms of social sustainability, having a happy home and having high-quality housing are necessary requirements for suitable housing or shelter. Additionally, social cohesiveness between neighbors and residents could be attained by guaranteeing effective stakeholder management through the satisfaction of neighbors and stakeholders and a decrease in the frequency of disagreements. This will promote social sustainability and a stronger feeling of community.

According to reference [18], one of the most important challenges facing modern businesses is sustainability, and it is often known that long-term growth is essential. According to studies, the building industry has a significant impact on the environment as well as social and economic life, which is a growing concern [19]. Legislators, administrative authorities, politicians, construction experts, the scientific community, and consumers worldwide have all expressed interest in the data that has been made available about the environmental impact of buildings [18]. In industrialized economies, concerns regarding sustainability in the execution of construction projects have taken centre stage [20]. However, developing countries have placed a higher priority on economic growth than meeting environmental requirements. Environmental concerns have been overshadowed by the demand for construction projects created by emerging countries' pursuit of economic expansion [21]. Building and infrastructure planning, design, and construction, as well as their eventual deconstruction and waste management, are just a few of the ways that applying sustainable practices to construction project management might take [22].

Furthermore, the notion of economic obstacles encompasses the concrete and intangible beliefs of homeowners regarding their housing buying behaviour [23]. According to reference [24] there appears to be a primary perception associated with the dwelling acquisition behaviour, which is economic restrictions that play a vital role in homeowner choice making [24]. According to earlier studies, significant economic constraints have the potential to improve the quality of public housing services [25]. When it comes to decision-making, customers' perceptions and experiences which reflect their general understanding of a service's quality tend to shape economic obstacles [26]. However, a study states that one of the most important factors in the development of sustainable housing is economic constraints [27]. This suggests that economic obstacles have a significant influence in determining the development of sustainable housing. Drawing from prior research, the current investigation regards financial obstacles as a significant determinant of both the purchasing behaviour of public housing and the calibre of its services.

Hypothesis 1. There is strong association of the EB and HAB to develop sustainable housing.

Hypothesis 2. There is strong association of the EB and PHSQ to develop sustainable housing.

Hypothesis 3. There is strong association of the EB and SHD.

2.2 Social barriers (SB)

SB is known as the result of homeowners' assessment, which shows that the social status can meet their expectations, and the homeowners are satisfied with their chosen house [28]. A previous study revealed that SB impacted homeowners' evaluation and experience toward a specific type of housing [29]. In addition, SB is considered the outcome of homeowners' expectations and perceptions after consumption [30]. Besides, little study have discussed the correlation between SB as well as HAB [31]. The existence of SB enhanced the improvement of HAB in the housing industry [32]. SB is the effect of the social customers who continue to purchase a house [33]. Other scholars also found that higher SB impacted the higher HAB [34].

According to a recent study, housing purchase behaviour was found to be reduced when SB increased [35]. Moreover, poorer house buying behaviour was influenced by stronger SB [36]. The other study likewise found a strong relationship between house acquisition behaviour and SB [37]. Subsequent research revealed a favourable correlation between social obstacles and the quality of public housing services [38]. It is also pertinent to past research on the quality of public housing services [39]. Furthermore, Yin et al.'s 2019 study discovered that societal obstacles have a major impact on the development of sustainable housing [40]. These results can be considered as a fundamental assessment for identifying sustainable home development. The following theories were proposed by the researchers based on previous empirical studies:

Hypothesis 4. There is strong association of the SB and HAB to develop sustainable housing.

Hypothesis 5. There is strong association of the SB and PHSQ to develop sustainable housing.

Hypothesis 6. There is strong association of the SB and SHD.

2.3 Environmental barriers (EnB)

Decades of research have been dedicated to the study of EnB, and numerous academics have established EnB in a variety of ways. In social psychology, environmental obstacles are typically thought of as an inherent aspect of meaningful social interaction that arises from interpersonal interactions. The cornerstone of EnB is the belief that people are motivated and driven by positive and encouraging intentions towards the welfare and interests of homeowners [41]. This belief gives rise to a sense of security. According to the results of the other study, EnB are thought to be the primary factor influencing people's decisions to purchase homes [5]. An earlier study discovered that the EnB, however, measures the degree of confidence that another party will perform as expected [42]. The rise of relationship-oriented marketing initiatives has made the study of EnB a popular subject in marketing studies [43]. According to reference [44], erecting EnB is a good way to reduce environmental uncertainty in the housing sector [44].

Environmental obstacles increased, which had a favourable effect on housing service quality and homeowners' confidence [45]. As a result, EnB are positively connected with value, difference, perceived quality, and satisfaction in addition to HAB [46]. According to reference [47] the second report, EnB were likewise indicative of high-quality housing services [47].

But environmental obstacles are also seen to be a major element affecting the development of sustainable housing [48]. As a result, the researchers proposed the following hypothesis:

Hypothesis 7. There is strong association of the EnB and HAB to develop sustainable housing.

Hypothesis 8. There is strong association of the EnB and PHSQ to develop sustainable housing.

Hypothesis 9. There is strong association of the EnB and SHD in the housing industry.

2.4 Institutional barriers (IB)

IB describes as a customer to government relationship that combines three psychological components, namely commitment, intimacy, and passion [49]. Therefore, earlier study found that IB have a significant impact toward HAB [50]. Currently, the IB is quantified using seven different construct to develop better relationship with homeowners [51]. IB measurement for this study was derived from seven separate scales [52]. The proposed instrument includes land policy, mortgage policy, skilled labour availability, and service provider capacity. In addition, earlier study also measuring significant relationship between IB and HAB [53]. Even though only limited study discussing IB, but there is a study which investigate the impact of IB toward service quality [54]. Moreover, IB also influencing the existence of SHD. This study explains that IB can be minimised by improving service quality and service innovation. Then, the below hypothesis was posited:

Hypothesis 10. There is strong association of the IB and HAB to develop sustainable housing.

Hypothesis 11. There is strong association of the IB and PHSQ to develop sustainable housing.

Hypothesis 12. There is strong association of the IB and SHD to develop sustainable housing.

2.5 Sustainable housing development (SHD)

It is possible to propose the idea of SHD as an appropriate theoretical framework for illustrating the homeowner-housing provider connection. It is possible to summarize the significance of home purchase behaviours for housing providers by pointing out that they are one of the main pillars of SHD [55]. Scholars generally agree that good homeowner behaviour is essential to building strong relationships between homeowners and housing providers [56]. In other words, the behaviour of those who purchase homes is thought to be a key component in determining SHD. Furthermore, the quality of housing provider is determined by the level of service quality. Higher levels of customer interaction influence sustainable service quality, as Dananjoyo et al. [57] indicate. According to reference [58] prior study, SHD is significantly impacted by high levels of housing service quality in the housing business. These analyses have encouraged the present researchers to put out this theory:

Hypothesis 13. There is strong association of the HAB and SHD.

Hypothesis 14. There is strong association of the PHSQ and SHD.

Hypothesis 15. There is intervening role of the HAB on the correlation between EB and SHD.

Hypothesis 16. There is intervening role of the HAB on the correlation between SB and SHD.

Hypothesis 17. There is intervening role of the HAB on the correlation between EnB and SHD.

Hypothesis 18. There is intervening role of the HAB on the correlation between IB and SHD.

Hypothesis 19. There is intervening role of the PHSQ on the correlation between EB and SHD.

Hypothesis 20. There is intervening role of the PHSQ on the correlation between SB and SHD.

Hypothesis 21. There is intervening role of the PHSQ on the correlation between EnB and SHD.

Hypothesis 22. There is intervening role of the PHSQ on the correlation between IB and SHD.

3. DATA AND METHODOLOGY

The purpose of the current study is to examine the relationship between institutional, social, economic, and EnB to SHD and housing barriers. The focus of the study was the housing sector, more especially WBH. The primary rationale for selecting WBH communities lies in the observation that those residing by the riverside are individuals who lack the means to purchase a landed house [24]. Individuals residing in this area are primarily regarded as part of a low-income community [37]. This represented the primary obstacle they faced in acquiring a landed house. Consequently, we conclude that WBH serves as a suitable object for this investigation.

For this investigation, a non-probability sampling strategy was used. Given that the participants in this study originated from two distinct backgrounds, we established analogues screen criteria. We are utilizing the lowest minimum wage in each location as the primary criterion. Homeowners who reside on riverbanks in Jakarta, Indonesia, and London, United Kingdom, provided the data. With 10.5 million residents, Jakarta is the most populous city in Indonesia [59]. Accordingly, 1.77 million of Jakarta's 2.5 million households do not now have a safe and liveable place to live [6]. The backlog in housing is currently the primary problem in many nations, even wealthy ones. The most populous city in Europe, London, is likewise dealing with a housing shortage. The median ratio of house prices to incomes depending on residence is currently 12.77, as can be observed [60]. Thus, the cost of property in London is equivalent to 12.77 times the income of a homeowner. This was the primary motivation of the study's conduct in London, UK, and Jakarta, Indonesia. A total of 300 questionnaires were delivered to the householders residing on the riverbank; of these, 230 were returned, signifying a response rate of 77%. The primary motivation for this study's investigation of WBH is the deteriorating affordability of housing in both developed and developing nations. A survey was created and distributed to the homeowners residing along the riverside. Table 1 displays the demographic characteristics of the respondents.

To gauge the effectiveness of the study's hypothesis testing, the researchers used the structural equation modelling (SEM) technique. Because SEM can evaluate the correlation between latent variables, it was used for the study [61]. According to reference [62], the primary advantages of SEM are its capacity to measure causal processes through a set of structural equations and its investigation of the structural links of conceptual theories [63]. As a result, descriptive statistics were performed in this study using Statistical Product and Service Solutions (SPSS), and the association between latent variables was examined using Analysis of Moment Structures (AMOS).

AMOS employs covariance-based SEM, emphasizing confirmatory factor analysis, hypothesis testing, and model validation, making it appropriate for established theories and larger sample sizes. Therefore, SmartPLS employs Partial Least Squares (PLS) path modelling, emphasizing variance-based SEM and prediction, which is particularly advantageous for exploratory research and intricate models. The aim of this study is to validate hypothesis testing, it means AMOS is more appropriate.

Table 1. Demographic factors

Characteristics	Amount	Percentage (%)
Gender		
Male	175	76.09
Female	55	23.91
Age		
< 25 years	5	2.17
26-35	54	23.48
36-45	85	36.96
46-55	46	20.00
> 55	40	17.39
Education		
High school	128	55.65
Diploma	68	29.56
Bachelor	34	14.79
Occupation		
Government	21	9.14
Entrepreneur	98	42.61
Medical	45	19.56
Lecturer/Teacher	36	15.65
Army/Police	19	8.26
Other	11	4.78

A seven-point Likert scale, ranging from 1 (strongly disagree) to 7 (strongly agree), was used to measure the research constructs. Economic obstacles are measured with eight variables, SB with five indicators, and EnB with three indicators. Additionally, there are seven indicators related to institutional impediments, whereas SHD uses eleven indicators [63]. Additionally, five indicators are utilized to gauge the behaviour of those who purchase homes [54]. In conclusion, the quality of public housing services was determined using four factors [38].

4. RESULT AND DISCUSSION

To ascertain the content validities, the primary analysis involved evaluating Cronbach's alpha values. For HAB, PHSQ, social hurdles, EnB, IB, and SHD, the predicted Cronbach's alpha values are 0.819, 0.825, 0.836, 0.784, 0.893, 0.782, and 0.883. According to reference [17], data validity is indicated by the Cronbach's alpha value being more than 0.7. As a result, for every indicator from every variable, the standard deviations and mean scores were estimated. Table 2 displays the findings of the mean and standard deviation scores.

High land costs were shown to have the highest mean score for economic obstacles based on the statistical data analysis. Next, among SB, loan credibility had the greatest mean score, while among EnB; waste management had the highest mean score. Furthermore, according to the statistical data, policies that are unstable are deemed to have the greatest mean score for institutional impediments. Furthermore, the dwelling location was shown to have the greatest mean score based on the outcomes of HAB. The service procedure was found to

have the highest mean score when it came to the quality of public housing services. The SHD with the highest mean score goes to the quality performance.

Table 2. Descriptive statistics

Constructs	Mean	Standard Deviation	Cronbach's Alpha, Item Deleted	Overall Cronbach's Alpha
EB				0.816
Insufficient funding (EB1)	3.796	0.826	0.864	
High land cost (EB2)	4.815	0.572	0.872	
High building material cost (EB3)	4.527	0.624	0.871	
Expensive approval cost (EB4)	4.208	0.813	0.863	
Insufficient incentives (EB5)	4.174	0.824	0.892	
Excessive interest rates (EB6)	3.825	0.942	0.883	
Excessive inflation rates (EB7)	4.362	0.722	0.854	
Complex credit procedure (EB8)	3.902	0.670	0.832	
SB				0.885
Income disparity (SB1)	4.278	0.747	0.839	
Social elimination (SB2)	4.192	0.912	0.817	
Insufficient maintenance (SB3)	3.875	0.908	0.822	
Loan credibility (SB4)	4.527	0.874	0.843	
Loan record (SB5)	3.926	0.873	0.885	
EnB				0.875
Insufficient waste management (EnB1)	4.627	0.803	0.836	
Inadequate housing facilities (EnB2)	3.935	0.879	0.810	
Limited low housing development (EnB3)	4.226	0.782	0.857	
IB				0.863
Complex process for land registration (IB1)	3.923	0.795	0.875	
Inadequate financial institution (IB2)	3.874	0.826	0.839	
Unstable policy (IB3)	4.481	0.864	0.844	
Lack of land control system (IB4)	4.125	0.827	0.893	
Insufficient public housing (IB5)	3.956	0.848	0.827	
Lack of skilled labour (IB6)	3.854	0.873	0.881	
Insufficient housing service provider (IB7)	4.227	0.819	0.876	
HAB				0.893
Housing features (HAB1)	3.653	0.827	0.864	
Housing quality (HAB2)	3.921	0.838	0.841	
Housing location (HAB3)	4.387	0.895	0.827	
PHSQ				0.879
Service Value (PHSQ1)	3.743	0.758	0.885	
Service Function (PHSQ2)	4.185	0.816	0.813	
Service Process (PHSQ3)	4.768	0.849	0.862	
SHD				0.816
Suitable project completion (SHD1)	3.289	0.726	0.832	
Appropriate cost performance (SHD2)	3.197	0.734	0.833	
Appropriate quality performance (SHD3)	4.276	0.841	0.854	
Sufficient safety performance (SHD4)	3.550	0.854	0.865	
Affordable environment (SHD5)	4.061	0.769	0.869	
Appropriate housing maintenance (SHD6)	3.725	0.785	0.874	
Efficient energy (SHD7)	3.893	0.812	0.860	
Sufficient facilities (SHD8)	3.916	0.796	0.849	
Affordable rental cost (SHD9)	4.109	0.710	0.801	
Sufficient community facilities (SHD10)	4.118	0.821	0.811	
Sufficient technology (SHD11)	4.129	0.874	0.826	

Table 3. Goodness-of-fit (GOF)

Index	Cut of Value	Results	Note
χ^2	> 0.05	878.98	Satisfactory
GFI	≥ 0.90	0.678	Moderate
AGFI	≥ 0.90	0.665	Moderate
NFI	≥ 0.90	0.676	Moderate
TLI	≥ 0.90	0.963	Satisfactory
CFI	≥ 0.90	0.985	Satisfactory
RMSEA	≤ 0.08	0.024	Satisfactory

The statistical measurement for the goodness of fit revealed acceptable fit with χ^2 of 878.98; GFI (0.678) and AGFI (0.665) indicated a moderate level, while RMSEA of 0.024 signified a

satisfactory fit. Table 3 displays incremental fit indices for this study at a satisfactory level, with TLI of 0.963 and CFI of 0.985, while NFI of 0.676 denoted a moderate level. As the goodness of fit at moderate and satisfactory levels, for all factor loads, they were significant. It signifies that the scales were one-dimensional, and the proposed model was accepted.

According to earlier studies, 0.6 is the acceptable composite reliability (CR) number. As a result, the average variance (AVE) was used to verify that the convergent model was valid; all constructs should have an acceptable value of 0.5 or higher [64]. Additionally, Cronbach's Alpha, which has a minimum threshold of 0.7, verified the comparison's appropriate dependability. Table 4 displays the measurement of reliability and convergent validity. It shown that all latent constructs'

coefficients of AVE satisfied the requirements for acceptable validity. Additionally, AMOS software was employed in this work to statistically analyse the data. According to some, the best analytical technique for examining the relationships between the variables in multivariate structures is SEM. Next, using SEM, the research model and study hypotheses were validated. Figure 1 displays the structural model's outcomes. Thus, Table 4 displays the outcomes of the hypothesis test. It was discovered that every theory was accepted.

Table 4. Direct hypothesis test

Hypothesis	β	p-value	Results
H1: EB \rightarrow HAB	0.237	0.016	Reinforced
H2: EB \rightarrow PHSQ	0.179	0.009	Reinforced
H3: EB \rightarrow SHD	0.739	0.002	Reinforced
H4: SB \rightarrow HAB	0.364	0.016	Reinforced
H5: SB \rightarrow PHSQ	0.188	0.027	Reinforced
H6: SB \rightarrow SHD	0.263	0.036	Reinforced
H7: EnB \rightarrow HAB	0.529	0.014	Reinforced
H8: EnB \rightarrow PHSQ	0.614	0.006	Reinforced
H9: EnB \rightarrow SHD	0.573	0.001	Reinforced
H10: IB \rightarrow HAB	0.763	0.003	Reinforced
H11: IB \rightarrow PHSQ	0.804	0.014	Reinforced
H12: IB \rightarrow SHD	0.926	0.028	Reinforced
H13: HAB \rightarrow SHD	0.654	0.006	Reinforced
H14: PHSQ \rightarrow SHD	0.583	0.012	Reinforced

With a p-value of 0.016 and an α of 0.237, HAB were directly and significantly influenced by economic constraints by 23.7%. It indicates that H1 received backing. With a p-value of 0.009 and an α of 0.179, the subsequent findings showed that social obstacles had a significant and direct 17.9%

impact on housing purchase behaviours. One could say that H2 was accommodated. With a p-value of 0.002 and an α of 0.739, the ensuing research revealed that EnB had a substantial and direct influence on dwelling purchase behaviours by 73.9%. It seems that H3 was accommodated. HAB were shown to be significantly and directly influenced by institutional impediments by 36.4%, as indicated by a p-value of 0.016 and an α of 0.364. It demonstrates the support for H4.

Moreover, with a p-value of 0.014 and an α of 0.416, EB had a substantial and direct influence on the quality of public housing services by 41.6%. With a p-value of 0.024 and an α of 0.273, social obstacles also had a substantial and direct impact on PHSQ, affecting it by 27.3%. Conclusion: H5 and H6 were found to be supported. The quality of public housing services was thus directly and severely impacted by EnB by 31.5%, with a p-value of 0.036 and an α of 0.315. IB had a 49.6% direct and substantial impact on the quality of public housing services, with a p-value of 0.004 and an α of 0.496. That implies that H7 and H8 were both supported.

Furthermore, economic obstacles had a strong and direct 26.4% impact on the development of sustainable housing, with a p-value of 0.018 and an α of 0.264. SB had a 44.8% significant and direct impact on the development of sustainable housing, with a p-value of 0.024 and an α of 0.448. One may say that H9 and H10 were provided support. Then, with a p-value of 0.008 and an α of 0.158, environmental obstacles had a significant and direct 15.8% impact on the development of sustainable housing. With α of 0.326 and p-value of 0.024, the institutional constraints had a substantial and direct impact on the development of sustainable housing by 32.6%. It indicates that H11 and H12 were both provided.

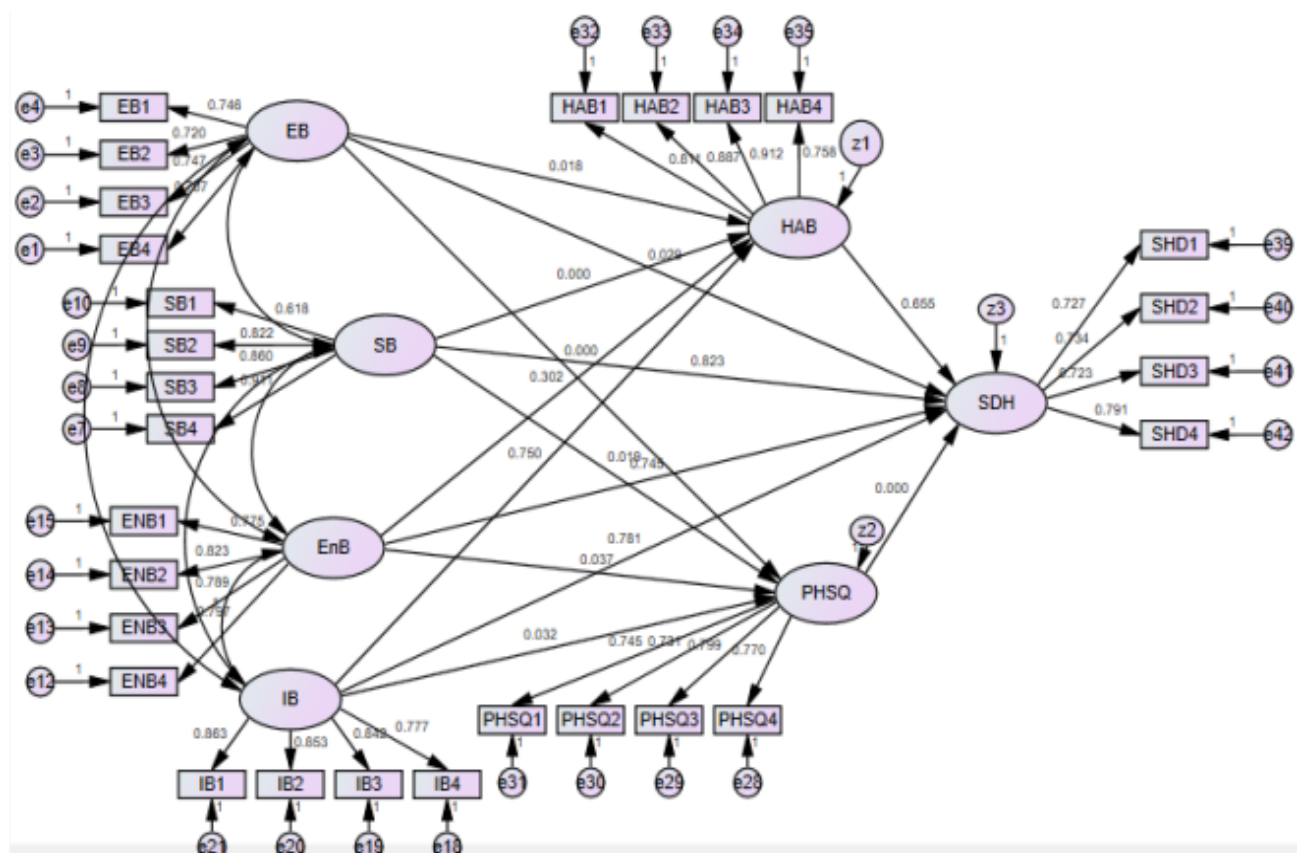


Figure 1. Structure model

Additionally, as a mediating variable, home acquisition behaviours might mediate between institutional, environmental, and economic impediments to the development of sustainable housing. This phenomenon is evident from Table 5's explanation of the t-value of the mediated model being bigger than that of the unmediated model. Because the mediated model's t-value was lower than that of the unmediated model ($14.269 > 11.092$), the study's findings indicate that HAB are unable to mediate social constraints and SHD. It signifies that SB can affect SHD independently of HAB. This finding is pertinent to the prior study undertaken by Mete and Xue [28], which compared the housing industries Milan and Oslo. It can also be asserted that housing feature, quality, and location do not influence the decisions of homeowner from various socioeconomic classes.

The study's findings thus demonstrate the ability of PHSQ to mediate institutional, social, and EB to the construction of sustainable housing, as demonstrated by Table 5's explanation of how the mediated model's t-value was higher than the unmediated model. The association between environmental behaviours and SHD, however, cannot be mediated by PHSQ because the mediated model's t-value is smaller than the unmediated model's ($13.113 > 12.573$). It shows that homeowners who were concerned about environmental issues could not be influenced by the service's value, function, or method [12]. It indicates that a homeowner who cares about the environment will not change their mind about housing purchase decision. The main reason is homeowner already has their preferences related to the environmental issues. So, service quality provided by housing developer is not enough to distract homeowners' perspectives.

Table 5. Indirect hypothesis test

Hypothesis	t-Test	Results
H15: EB \rightarrow HAB \rightarrow SHD	15.376<16.128	Mediated
H16: SB \rightarrow HAB \rightarrow SHD	14.269>11.092	Unmediated
H17: EnB \rightarrow HAB \rightarrow SHD	14.837<15.253	Mediated
H18: IB \rightarrow HAB \rightarrow SHD	13.278<13.605	Mediated
H19: EB \rightarrow PHSQ \rightarrow SHD	12.693<13.882	Mediated
H20: SB \rightarrow PHSQ \rightarrow SHD	14.260<14.731	Mediated
H21: EnB \rightarrow PHSQ \rightarrow SHD	13.113>12.573	Unmediated
H22: IB \rightarrow PHSQ \rightarrow SHD	14.502<15.168	Mediated

The study's findings demonstrated that the factor most significantly influencing people's decisions to purchase homes is environmental constraints. This indicates that the majority of homeowners are concerned about environmental obstacles when they buy a home. These findings are pertinent to earlier research that indicated environmental obstacles are a significant factor in house acquisition behaviours in the setting of the housing business [65]. Homeowners' understanding of environmental issues is what sets environmental obstacles up to impact housing purchasing behaviours [57]. One study found that the primary element influencing HAB among homeowners was their capacity to remember or identify a certain alternative [66]. It suggests that homeowners who are aware of and comfortable with a certain housing option will be satisfied with it. In this sense, homeowner satisfaction determines how comfortable they are using a certain environmental concern in the housing industry. In order to improve homeowners' contentment with the housing sector, practitioners should come up with a variety of environmental issues based on the significance of the research findings.

IB are the main characteristics that support the connections

between the quality of public housing services and sustainable housing [67]. According to this study, homeowners' perceptions of institutional impediments had a 61.4% positive impact on the quality of public housing services. It implies that the findings of this study corroborate those of the earlier investigation, which found that institutional impediments had a major impact on the quality of public housing services [68]. When an IB starts to affect a homeowner's choice, it will reveal what the homeowner expects. An earlier study found that brand satisfaction was impacted by the organization's perceived quality of offerings [67].

SHD primarily prioritize the ability of homeowners to obtain their desired quality of life [69]. Then, in the context of SHD, financial restrictions emerge as the primary challenge facing homeowners. In other words, economic constraints reflect the ability of homeowners to purchase their home [70]. Since the intention of homeowners to buy is correlated with economic obstacles, a lower barrier can improve the likelihood that homeowners will be able to acquire a property [71]. These results are pertinent to the study's claim that the housing industry's homeowners had a direct impact on the development of sustainable housing.

Furthermore, housing barriers were mostly seen as the primary roadblocks to the development of sustainable housing. The study's findings demonstrate that home acquisition behaviours are unable to mitigate the link between SB and the creation of sustainable housing. It was in line with the earlier research that examined the connection between societal barriers and the development of sustainable housing [71]. In the meanwhile, behaviours related to home purchase that can act as a mediator between social, economic, and environmental constraints in favour of the development of sustainable housing. It was pertinent to the earlier research that showed home acquisition behaviours as a mediating variable for SHD [72]. The results of this study also suggest that the relationship between institutional, social, and EB to the development of sustainable housing might be moderated by the quality of public housing services. This indicates that the research validates the findings of the earlier study, which found that the quality of public housing services was a mediating factor for the development of sustainable housing [73].

Numerous studies have examined the role of service quality in sustainable development across various sectors, such as the retail sector [74], the construction sector [73], the telecommunication sector [75], and the hospitality sector [76]. Sustainable housing growth will result from housing services that meet or exceed homeowners' expectations. According to some studies, the result of housing purchasing behaviours is to support the development of sustainable housing [76]. The high degree of sustainable housing construction was then discovered to be influenced by the high quality of services [77]. The results of this study acknowledged that a higher level of SHD was sparked by homeowners' strong perceptions of service quality. The findings of this study may be related to the earlier assessment of sustainable home development. Thus, homeowner loyalty is another result of high-quality public housing services [78]. Recently, the other researcher discovered that high levels of sustainability were correlated with high levels of service quality [79]. These conclusions also apply to the current study's findings, which demonstrated that the highest possible standard of sustainable housing development was achieved by providing good public housing services.

5. CONCLUSION

This study set out to quantify housing barriers and SHD as they were influenced by PHSQ and acquisition behaviours. The study's findings confirm earlier research by demonstrating the positive influence of economic obstacles on HAB. Thus, as was previously noted, economic obstacles have a considerable impact on the quality of public housing services. Furthermore, this study confirmed a previous investigation that found EnB have a favourable impact on the quality of public housing services [80]. Furthermore, societal barriers had an impact on the house acquisition behaviours, according to this study. These results are consistent with earlier research [81]. Furthermore, the study's findings show a favourable correlation between environmental obstacles and the standard of public housing services. It was in line with previous research [82]. Furthermore, there is a considerable mediation effect between sustainable housing construction and the quality of public housing services. Finally, this study starts to investigate how housing impediments and SHD interact with HAB. It provided support for earlier research [83].

By recommending and verifying a model that assessed the relationship between housing barriers and SHD, as mediated by HAB and PHSQ, this report contributes to the body of current literature. This essay primarily provides three important contributions. First, the study confirmed that the presence of HAB and the quality of public housing services were directly caused by the antecedents of housing obstacles. This study found that, in the context of the housing business, economic constraints played a crucial influence in determining the quality of public housing services. Research on the housing business typically concentrated on procurement, logistics effectiveness, sustainable design, and other related topics. The results of this study support the growth of the housing industry because it concentrated on the quality of public housing services provided by the housing sector. This indicates that the study has benefited the industry.

Second, the analysis confirms that the development of sustainable housing was indirectly caused by the precursors of housing barriers. The prior study did not conduct an empirical investigation or confirmation of the housing impediments and SHD. The knowledge of sustainable housing in relation to acquisition behaviours and service quality is expanded by these findings. Third, the present study validates the relationship between the quality of public housing services and the establishment of housing purchase behaviours. The function of service quality, such as homeowners' satisfaction in influencing homeowners' loyalty, is supported by this article's hypothesis. The results of this analysis then motivate the businesses to develop a workable strategy for producing sustainable business.

This research has limits, despite the fact that it makes a substantial contribution to the development of sustainable housing. First and foremost, further thought is required because the study was done in both industrialized and developing nations, making it impossible to generalize the findings. Future research should employ mixed-method approaches to contextualize quantitative findings. Second, this conceptual framework should be tested in future research using more industry-related factors. Lastly, it will be difficult to expand the article's contribution to academia and industry by enhancing the conceptual framework with business performance metrics like market share, return on investment, and profit loss ratio.

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REFERENCES

- [1] Brilian, A.P. (2024). Backlog rumah: Pengertian, jumlah dan persoalannya. <https://www.detik.com/properti/tips-dan-panduan/d-7378912/backlog-rumah-pengertian-jumlah-dan-persoalannya>.
- [2] Helble, M., Ok Lee, K., Gia Arbo, M.A. (2021). How (Un) affordable is housing in developing Asia? *International Journal of Urban Sciences*, 25(sup1): 80-110. <https://doi.org/10.1080/12265934.2020.1810104>
- [3] Kaibarta, S., Mandal, S., Mandal, P., Bhattacharya, S., Paul, S. (2022). Multidimensional poverty in slums: An empirical study from urban India. *GeoJournal*, 87(Suppl 4): 527-549. <https://doi.org/10.1007/s10708-021-10571-7>
- [4] Rizaty, M.A. (2021). Sebanyak 56, 7% Penduduk Indonesia Tinggal di Perkotaan pada 2020. *Katadata. Co. Id.* [https://databoks.katadata.co.id/demografi/statistik/fba342e3ebf6716/sebanyak-567-penduduk-indonesia-tinggal-di-perkotaan-pada-2020#:~:text=Badan%20Pusat%20Statistik%20\(BPS\)%20memperkirakan,tinggal%20di%20perkotaan%20pada%202045](https://databoks.katadata.co.id/demografi/statistik/fba342e3ebf6716/sebanyak-567-penduduk-indonesia-tinggal-di-perkotaan-pada-2020#:~:text=Badan%20Pusat%20Statistik%20(BPS)%20memperkirakan,tinggal%20di%20perkotaan%20pada%202045).
- [5] Blaisi, N.I. (2019). Construction and demolition waste management in Saudi Arabia: Current practice and roadmap for sustainable management. *Journal of Cleaner Production*, 221: 167-175. <https://doi.org/10.1016/j.jclepro.2019.02.264>
- [6] Simanungkalit, P. (2023). Addressing 12.7 Million Housing 'Backlog'. *Kompas.id.* <https://www.kompas.id/baca/english/2023/08/24/en-mengatasi-127-juta-backlog-perumahan>.
- [7] Jaszczak, A., Pochodyła-Ducka, E., Pranskuniene, R. (2024). Assessing the success of the development strategy of the Cittaslow Movement: An analysis of revitalisation programs and experts insights on the model for small towns' sustainable development. *Sustainability*, 16(11): 4459. <https://doi.org/10.3390/su16114459>
- [8] Watt, P., Minton, A. (2016). London's housing crisis and its activism: Introduction. *City*, 20(2): 204-221. <https://doi.org/10.1080/13604813.2016.1151707>
- [9] Stansbury, A., Turner, D., Balls, E. (2023). Tackling the UK's regional economic inequality: Binding constraints and avenues for policy intervention. *Contemporary Social Science*, 18(3-4): 318-356. <https://doi.org/10.1080/21582041.2023.2250745>

- [10] Muhtah, E.A., Rusli, B. (2020). Housing and settlement development in Indonesia. *International Journal of Engineering Research & Technology*, 13(12): 5400-5407.
- [11] Alibašić, H. (2022). Envisaging the future of strategic resilience and sustainability planning. In *Strategic Resilience and Sustainability Planning: Management Strategies for Sustainable and Climate-Resilient Communities and Organizations*, Springer, Cham, pp. 131-139. https://doi.org/10.1007/978-3-030-91159-1_8
- [12] Bekun, F.V., Alola, A.A., Sarkodie, S.A. (2019). Toward a sustainable environment: Nexus between CO₂ emissions, resource rent, renewable and nonrenewable energy in 16-EU countries. *Science of the Total Environment*, 657: 1023-1029. <https://doi.org/10.1016/j.scitotenv.2018.12.104>
- [13] Chan, A.P., Adabre, M.A. (2019). Bridging the gap between sustainable housing and affordable housing: The required critical success criteria (CSC). *Building and Environment*, 151: 112-125. <https://doi.org/10.1016/j.buildenv.2019.01.029>
- [14] Mukhtar, M.M., Amirudin, R.B., Sofield, T., Mohamad, I.B. (2017). Critical success factors for public housing projects in developing countries: A case study of Nigeria. *Environment, Development and Sustainability*, 19: 2039-2067. <https://doi.org/10.1007/s10668-016-9843-2>
- [15] Adabre, M.A., Chan, A.P. (2020). Towards a sustainability assessment model for affordable housing projects: The perspective of professionals in Ghana. *Engineering, Construction and Architectural Management*, 27(9): 2523-2551. <https://doi.org/10.1108/ECAM-08-2019-0432>
- [16] Silvius, G. (2017). Sustainability as a new school of thought in project management. *Journal of Cleaner Production*, 166: 1479-1493. <https://doi.org/10.1016/j.jclepro.2017.08.121>
- [17] Redclift, M. (2005). Sustainable development (1987–2005): An oxymoron comes of age. *Sustainable Development*, 13(4): 212-227. <https://doi.org/10.1002/sd.281>
- [18] Kylili, A., Fokaides, P.A. (2017). Policy trends for the sustainability assessment of construction materials: A review. *Sustainable Cities and Society*, 35: 280-288. <https://doi.org/10.1016/j.scs.2017.08.013>
- [19] Sfakianaki, E. (2019). Critical success factors for sustainable construction: A literature review. *Management of Environmental Quality: An International Journal*, 30(1): 176-196. <https://doi.org/10.1108/MEQ-02-2018-0043>
- [20] Fathalizadeh, A., Ghoddousi, P., Shirzadi Javid, A.A., Hosseini, M.R., Ghosh, A. (2019). Integrating sustainability into construction project management: Barriers in developing countries. In *13th International Conference Modern Building Materials, Structures and Techniques*, Vilnius, Lithuania, pp. 559-563. <https://doi.org/10.3846/mbmst.2019.122>
- [21] Banihashemi, S., Hosseini, M.R., Golizadeh, H., Sankaran, S. (2017). Critical success factors (CSFs) for integration of sustainability into construction project management practices in developing countries. *International Journal of Project Management*, 35(6): 1103-1119. <https://doi.org/10.1016/j.ijproman.2017.01.014>
- [22] Warner, K.J., Jones, G.A. (2017). A population-induced renewable energy timeline in nine world regions. *Energy Policy*, 101: 65-76. <https://doi.org/10.1016/j.enpol.2016.11.031>
- [23] Nazir, F., Edwards, D.J., Shelbourn, M., Martek, I., Thwala, W.D.D., El-Gohary, H. (2021). Comparison of modular and traditional UK housing construction: A bibliometric analysis. *Journal of Engineering, Design and Technology*, 19(1): 164-186. <https://doi.org/10.1108/JEDT-05-2020-0193>
- [24] Ghazali, I., Abdul-Rashid, S.H., Md Dawal, S.Z., Huda, N., Shariff, A.H.M., Herawan, S.G., Sakundarini, N. (2021). Guidelines for designing green products considering customers' cultural preferences. *Sustainability*, 13(2): 673. <https://doi.org/10.3390/su13020673>
- [25] Agha, A., Shibani, A., Hassan, D., Zalans, B. (2021). Modular construction in the United Kingdom housing sector: Barriers and implications. *Journal of Architectural Engineering Technology*, 10(2): 236. <https://doi.org/10.4172/2168-9717.1000236>
- [26] Kineber, A.F., Othman, I., Oke, A.E., Chileshe, N., Buniya, M.K. (2020). Identifying and assessing sustainable value management implementation activities in developing countries: The case of Egypt. *Sustainability*, 12(21): 9143. <https://doi.org/10.3390/su12219143>
- [27] Ibrahim, I.A. (2020). Sustainable housing development: Role and significance of satisfaction aspect. *City, Territory and Architecture*, 7(1): 21. <https://doi.org/10.1186/s40410-020-00130-x>
- [28] Mete, S., Xue, J. (2021). Integrating environmental sustainability and social justice in housing development: Two contrasting scenarios. *Progress in Planning*, 151: 100504. <https://doi.org/10.1016/j.progress.2020.100504>
- [29] Dananjoyo, R., Udin, U. (2025). The mediating role of brand experience in the relationship between social media marketing activities and customer based brand equity. *Multidisciplinary Reviews*, 8(6): e2025187. <https://doi.org/10.31893/multirev.2025187>
- [30] Cucca, R., Friesenecker, M. (2022). Potential and limitations of innovative housing solutions in planning for degrowth: The case of Vienna. *Local Environment*, 27(4): 502-516. <https://doi.org/10.1080/13549839.2021.1872513>
- [31] Eduful, A.K., Hooper, M. (2019). Urban migration and housing during resource booms: The case of Sekondi-Takoradi, Ghana. *Habitat International*, 93: 102029. <https://doi.org/10.1016/j.habitatint.2019.102029>
- [32] Yankson, P.W., Gough, K.V., Esson, J., Amankwaa, E.F. (2017). Spatial and social transformations in a secondary city: The role of mobility in Sekondi-Takoradi, Ghana. *Geografisk Tidsskrift-Danish Journal of Geography*, 117(2): 82-92. <https://doi.org/10.1080/00167223.2017.1343672>
- [33] Udelsmann Rodrigues, C. (2022). Hesitant migration to emergent cities: Angola's intentional urbanism of the 'centralidades'. *City*, 26(5-6): 848-869. <https://doi.org/10.1080/13604813.2022.2126172>
- [34] Gambino, E., Reboredo, R. (2024). Infrastructure, time and labour: Movement and suspension along the Abidjan-Lagos corridor. *Territory, Politics, Governance*, pp. 1-21. <https://doi.org/10.1080/21622671.2024.2357574>
- [35] Roque, S., Mucavele, M., Noronha, N. (2016). Subúrbios and cityness: Exploring imbrications and urbanity in

- Maputo, Mozambique. *Journal of Southern African Studies*, 42(4): 643-658. <https://doi.org/10.1080/03057070.2016.1189273>
- [36] McCabe, A., Pojani, D., van Groenou, A.B. (2018). The application of renewable energy to social housing: A systematic review. *Energy Policy*, 114: 549-557. <https://doi.org/10.1016/j.enpol.2017.12.031>
- [37] Moore, T., Nicholls, L., Strengers, Y., Maller, C., Horne, R. (2017). Benefits and challenges of energy efficient social housing. *Energy Procedia*, 121: 300-307. <https://doi.org/10.1016/j.egypro.2017.08.031>
- [38] Wei, C.R., Wang, Y. (2021). Research on the evaluation and influence mechanism of public housing service quality: A case study of Shanghai. *Sustainability*, 13(2): 672. <https://doi.org/10.3390/su13020672>
- [39] Zhou, D., Xu, J., Wang, L., Lin, Z. (2015). Assessing urbanization quality using structure and function analyses: A case study of the urban agglomeration around Hangzhou Bay (UAHB), China. *Habitat International*, 49: 165-176. <https://doi.org/10.1016/j.habitatint.2015.05.020>
- [40] Yin, Y., He, Y., Zhang, L., Zhao, D. (2019). Impact of building environment on residential satisfaction: A case study of Ningbo. *Sustainability*, 11(4): 1197. <https://doi.org/10.3390/su11041197>
- [41] Negash, Y.T., Hassan, A.M., Tseng, M.L., Wu, K.J., Ali, M.H. (2021). Sustainable construction and demolition waste management in Somaliland: Regulatory barriers lead to technical and environmental barriers. *Journal of Cleaner Production*, 297: 126717. <https://doi.org/10.1016/j.jclepro.2021.126717>
- [42] Islam, R., Nazifa, T.H., Yuniarto, A., Uddin, A.S., Salmiati, S., Shahid, S. (2019). An empirical study of construction and demolition waste generation and implication of recycling. *Waste Management*, 95: 10-21. <https://doi.org/10.1016/j.wasman.2019.05.049>
- [43] Jain, S., Singhal, S., Jain, N.K. (2021). Construction and demolition waste (C&DW) in India: generation rate and implications of C&DW recycling. *International Journal of Construction Management*, 21(3): 261-270. <https://doi.org/10.1080/15623599.2018.1523300>
- [44] Datta, S.D., Rana, M.J., Assafi, M.N., Mim, N.J., Ahmed, S. (2023). Investigation on the generation of construction wastes in Bangladesh. *International Journal of Construction Management*, 23(13): 2260-2269. <https://doi.org/10.1080/15623599.2022.2050977>
- [45] Lasarudin, A., Alvianna, S., Sugheha, A.Z., Hidayatullah, S., Estikowati, E. (2022). Mediation effect of visitor satisfaction from cleanliness, health, safety, and environment sustainable (CHSE) relationships on visitor loyalty at Kaliwatu rafting tourist destinations Batu City. *International Journal of Research in Engineering, Science and Management*, 6(1): 1-7.
- [46] Zulvianti, N., Aimon, H., Abror, A. (2022). The influence of environmental and non-environmental factors on tourist satisfaction in halal tourism destinations in West Sumatra, Indonesia. *Sustainability*, 14(15): 9185. <https://doi.org/10.3390/su14159185>
- [47] Suhartanto, D., Gan, C., Andrianto, T., Ismail, T.A.T., Wibisono, N. (2021). Holistic tourist experience in halal tourism evidence from Indonesian domestic tourists. *Tourism Management Perspectives*, 40: 100884. <https://doi.org/10.1016/j.tmp.2021.100884>
- [48] Makinde, O.O. (2015). Influences of socio-cultural experiences on residents' satisfaction in Ikorodu low-cost housing estate, Lagos state. *Environment, Development and Sustainability*, 17: 173-198. <https://doi.org/10.1007/s10668-014-9545-6>
- [49] Pearman, O., Cravens, A.E. (2022). Institutional barriers to actionable science: Perspectives from decision support tool creators. *Environmental Science & Policy*, 128: 317-325. <https://doi.org/10.1016/j.envsci.2021.12.004>
- [50] Van Enst, W.I., Driessen, P.P., Runhaar, H.A. (2014). Towards productive science-policy interfaces: A research agenda. *Journal of Environmental Assessment Policy and Management*, 16(1): 1450007. <https://doi.org/10.1142/S1464333214500070>
- [51] Gerlak, A.K., Guido, Z., Owen, G., McGoffin, M.S.R., Louder, E., Davies, J., Joshi, N. (2023). Stakeholder engagement in the co-production of knowledge for environmental decision-making. *World Development*, 170: 106336. <https://doi.org/10.1016/j.worlddev.2023.106336>
- [52] Zhu, S., Li, D., Jiang, Y. (2020). The impacts of relationships between critical barriers on sustainable old residential neighborhood renewal in China. *Habitat International*, 103: 102232. <https://doi.org/10.1016/j.habitatint.2020.102232>
- [53] Pan, W., Du, J. (2021). Towards sustainable urban transition: A critical review of strategies and policies of urban village renewal in Shenzhen, China. *Land Use Policy*, 111: 105744. <https://doi.org/10.1016/j.landusepol.2021.105744>
- [54] Akhter, H., Abdul Rahman, A.A., Jafrin, N., Mohammad Saif, A.N., Esha, B.H., Mostafa, R. (2022). Investigating the barriers that intensify undergraduates' unwillingness to online learning during COVID-19: A study on public universities in a developing country. *Cogent Education*, 9(1): 2028342. <https://doi.org/10.1080/2331186X.2022.2028342>
- [55] Yang, S., Guariglia, A., Horwood, N. (2021). To what extent is the Chinese housing boom driven by competition in the marriage market? *Journal of Housing and the Built Environment*, 36(1): 47-67. <https://doi.org/10.1007/s10901-020-09749-1>
- [56] B. Aalbers, M., Hochstenbach, C., Bosma, J., Fernandez, R. (2021). The death and life of private landlordism: How financialized homeownership gave birth to the buy-to-let market. *Housing, Theory and Society*, 38(5): 541-563. <https://doi.org/10.1080/14036096.2020.1846610>
- [57] Dananjoyo, R., Udin, U., Idris, A. (2024). Mediating roles of customer engagement and satisfaction in the connection between e-retail customer experience and loyalty. *International Journal of Sustainable Development & Planning*, 19(2): 751-759. <https://doi.org/10.18280/ijstdp.190232>
- [58] Cheah, C.W., Low, B., Lee, C.K.C. (2021). Sustainable housing development: The legitimacy-seeking perspective. *Journal of Business & Industrial Marketing*, 36(6): 1027-1041. <https://doi.org/10.1108/JBIM-07-2020-0318>
- [59] Oyetunji, A.K., Oluleye, B.I., Olukolajo, M.A., Chan, D.W. (2022). Is green good: Unveiling the latent benefits of sustainable housing delivery. *Cities*, 129: 103809. <https://doi.org/10.1016/j.cities.2022.103809>
- [60] Li, X., Liu, Y., Wilkinson, S., Liu, T. (2019). Driving forces influencing the uptake of sustainable housing in New Zealand. *Engineering, Construction and*

- Architectural Management, 26(1): 46-65. <https://doi.org/10.1108/ECAM-07-2017-0111>
- [61] Thakkar, J.J. (2020). Structural equation modelling. Application for Research and Practice. <https://doi.org/10.1007/978-981-15-3793-6>
- [62] Leguina, A. (2015). A primer on partial least squares structural equation modeling (PLS-SEM). *International Journal of Research & Method in Education*, 38(2): 220-221. <https://doi.org/10.1080/1743727X.2015.1005806>
- [63] Byrne, B.M. (2013). *Structural Equation Modeling with Mplus: Basic Concepts, Applications, and Programming*. Routledge. <https://doi.org/10.4324/9780203807644>
- [64] Anderson, J.C., Gerbing, D.W. (1988). Structural equation modeling in practice: A review and recommended two-step approach. *Psychological Bulletin*, 103(3): 411-423. <https://doi.org/10.1037/0033-2909.103.3.411>
- [65] Andersson, N., Slaug, B., Nilsson, M.H., Iwarsson, S. (2023). Environmental barriers and housing accessibility problems for people with Parkinson's disease: A three-year perspective. *Scandinavian Journal of Occupational Therapy*, 30(5): 661-672. <https://doi.org/10.1080/11038128.2021.2007998>
- [66] Adabre, M.A., Chan, A.P., Edwards, D.J., Mensah, S. (2022). Evaluation of symmetries and asymmetries on barriers to sustainable housing in developing countries. *Journal of Building Engineering*, 50: 104174. <https://doi.org/10.1016/j.jobbe.2022.104174>
- [67] Mao, W., Wang, W., Sun, H. (2020). Optimization path for overcoming barriers in China's environmental protection institutional system. *Journal of Cleaner Production*, 251: 119712. <https://doi.org/10.1016/j.jclepro.2019.119712>
- [68] Koskela-Huotari, K., Vink, J., Edvardsson, B. (2020). The institutional turn in service research: Taking stock and moving ahead. *Journal of Services Marketing*, 34(3): 373-387. <https://doi.org/10.1108/JSM-02-2019-0101>
- [69] Kelkar, G., Nathan, D. (2021). Cultural and economic barriers in switching to clean cooking energy: Does women's agency make a difference? *Energies*, 14(21): 7242. <https://doi.org/10.3390/en14217242>
- [70] Williams, J. (2005). Sun, surf and sustainable housing—cohousing, the Californian experience. *International Planning Studies*, 10(2): 145-177. <https://doi.org/10.1080/13563470500258824>
- [71] Dalirazar, S., Sabzi, Z. (2023). Strategic analysis of barriers and solutions to development of sustainable buildings using PESTLE technique. *International Journal of Construction Management*, 23(1): 167-181. <https://doi.org/10.1080/15623599.2020.1854931>
- [72] Djokoto, S.D., Dadzie, J., Ohemeng-Ababio, E. (2014). Barriers to sustainable construction in the Ghanaian construction industry: consultants perspectives. *Journal of Sustainable Development*, 7(1): 134-143. <https://doi.org/10.5539/jsd.v7n1p134>
- [73] Ametepey, O., Aigbavboa, C., Ansah, K. (2015). Barriers to successful implementation of sustainable construction in the Ghanaian construction industry. *Procedia Manufacturing*, 3: 1682-1689. <https://doi.org/10.1016/j.promfg.2015.07.988>
- [74] Dananjoyo, R., Udin, U. (2023). The effect of sustainable brand equity on customer satisfaction and customer loyalty using customer trust as mediation variable. *International Journal of Sustainable Development & Planning*, 18(7): 2281-2291. <https://doi.org/10.18280/ijstdp.180733>
- [75] Pinto, O., Brandão, A. (2021). Antecedents and consequences of brand hate: Empirical evidence from the telecommunication industry. *European Journal of Management and Business Economics*, 30(1): 18-35. <https://doi.org/10.1108/EJMBE-04-2020-0084>
- [76] Rosete, A., Soares, B., Salvadorinho, J., Reis, J., Amorim, M. (2020). Service robots in the hospitality industry: An exploratory literature review. In *Exploring Service Science: 10th International Conference, IESS 2020, Porto, Portugal*, pp. 174-186. https://doi.org/10.1007/978-3-030-38724-2_13
- [77] Wirtz, J., Patterson, P.G., Kunz, W.H., Gruber, T., Lu, V.N., Paluch, S., Martins, A. (2018). Brave new world: Service robots in the frontline. *Journal of Service Management*, 29(5): 907-931. <https://doi.org/10.1108/JOSM-04-2018-0119>
- [78] Lu, V.N., Wirtz, J., Kunz, W.H., Paluch, S., Gruber, T., Martins, A., Patterson, P.G. (2020). Service robots, customers and service employees: What can we learn from the academic literature and where are the gaps? *Journal of Service Theory and Practice*, 30(3): 361-391. <https://doi.org/10.1108/JSTP-04-2019-0088>
- [79] De Keyser, A., Kunz, W.H. (2022). Living and working with service robots: A TCCM analysis and considerations for future research. *Journal of Service Management*, 33(2): 165-196. <https://doi.org/10.1108/JOSM-12-2021-0488>
- [80] Dananjoyo, R., Udin, U., Wibowo, A.A. (2024). The role of customer relationship management to strengthen customer satisfaction using product innovation and customer value as intervening variable. *E3S Web of Conferences* 570: 04001. <https://doi.org/10.18196/ictced.v2i1.141>
- [81] Liu, F., Chen, K., Zhang, T., Zhang, Y., Song, Y. (2022). Will good service quality promote real estate value? Evidence from Beijing, China. *Land*, 11(2): 166. <https://doi.org/10.3390/land11020166>
- [82] He, J., Wu, J. (2016). Doing well by doing good? The case of housing construction quality in China. *Regional Science and Urban Economics*, 57: 46-53. <https://doi.org/10.1016/j.regsciurbeco.2016.01.003>
- [83] Liu, X., Xue, C.Q. (2016). Exploring the challenges to housing design quality in China: An empirical study. *Habitat International*, 57: 242-249. <https://doi.org/10.1016/j.habitatint.2016.08.006>