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Improving Government Formal Housing Satisfaction: Key Considerations for Future Housing Plan

Meningkatkan Kepuasan Perumahan Formal Kerajaan: Pertimbangan Utama untuk Pelan Perumahan Masa Depan

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ABSTRACT

Everyone aspires to have a comfortable and welcoming home, which significantly impacts their quality of life and contributes to their overall satisfaction. Residential satisfaction is a vital component of life satisfaction. This study aims to evaluate the level of satisfaction with the current state government's formal housing model, which will serve as a reference for future government housing initiatives. The study is grounded in empirical data regarding residents' satisfaction with their living environments, with feedback from residents being the primary source of information. The study employs quantitative analysis by collecting data through a survey method, targeting 262 respondents residing in government-built formal housing in Seberang Kota, Kuala Kedah. The methodology includes calculating the Formal Housing Satisfaction Index (FHSI) and employing Multiple Hierarchical Regression Analysis using SPSS. The findings indicate that residents' satisfaction with formal housing is moderate overall. Notably, the variable concerning Safety and Security received the lowest satisfaction rating compared to other factors. Many residents reported limited access to security services, which has resulted in challenges in their daily lives and diminished well-being. In light of these results, it is recommended that the government enhance security services and address concerns to improve the satisfaction and well-being of the community. This study emphasizes the need for developers and policymakers to prioritize design, facilities, and social dynamics to improve living conditions. Targeted interventions can enhance well-being, leading to more sustainable and inclusive environments that boost overall quality of life.

Keywords: Formal housing; resident satisfaction; index regression, scatter plot

ABSTRAK

Setiap orang bercita-cita untuk memiliki rumah yang selesa dan mesra, yang memberi kesan ketara kepada kualiti hidup mereka dan menyumbang kepada kepuasan keseluruhan mereka. Kepuasan kediaman adalah komponen penting dalam kepuasan hidup. Kajian ini bertujuan untuk menilai tahap kepuasan terhadap model perumahan rasmi kerajaan negeri semasa, yang akan menjadi rujukan untuk inisiatif perumahan kerajaan pada masa hadapan. Kajian ini berasaskan data empirikal mengenai kepuasan penduduk terhadap persekitaran tempat tinggal mereka, dengan maklum balas daripada penduduk menjadi sumber maklumat utama. Kajian ini menggunakan analisis kuantitatif dengan mengumpul data melalui kaedah tinjauan, menyasarkan 262 responden yang tinggal di perumahan formal binaan kerajaan di Seberang Kota, Kuala Kedah. Metodologi termasuk pengiraan Indeks Kepuasan Perumahan Formal (FHSI) dan menggunakan Analisis Regresi Hierarki Berganda menggunakan SPSS. Dapatan kajian menunjukkan bahawa kepuasan penduduk terhadap perumahan formal adalah sederhana secara keseluruhan. Terutamanya, pembolehubah berkenaan Keselamatan dan Keselamatan menerima penarafan kepuasan terendah berbanding faktor lain. Ramai penduduk melaporkan akses terhad kepada perkhidmatan keselamatan, yang telah mengakibatkan cabaran dalam kehidupan seharian mereka dan kesejahteraan yang berkurangan. Berdasarkan keputusan ini, adalah disyorkan agar kerajaan meningkatkan perkhidmatan keselamatan dan menangani kebimbangan untuk meningkatkan kepuasan dan kesejahteraan masyarakat. Kajian ini menekankan keperluan bagi pemaju dan pembuat dasar supaya mengutamakan reka bentuk, kemudahan, dan dinamik sosial untuk memperbaiki keadaan hidup. Campur tangan kerajaan yang disasarkan boleh meningkatkan kesejahteraan, membawa kepada persekitaran yang lebih mampan dan inklusif yang meningkatkan kualiti hidup keseluruhan.

Kata kunci: Perumahan formal; regresi indeks kepuasan penduduk, plot serakan

INTRODUCTION

Housing can be defined as the space of building harmonious living. The housing must equip with the concepts of security, love, peace, and freedom. Comfortable housing conditions will contribute to improved living standards, health, safety, and well-being. Thus, the way of housing is provided will influence the development goals such as wealth distribution and poverty eradication. According to Mahdi, & Mazumder (2023), developing countries have three types of housing development systems namely formal, informal, and organic. The formal housing development is more planned and has a basic facility needed and provided for the low-income group (Kim, et. al 2022). The formal housing development is under government control and regulations. The informal housing development is illegal and consists of unauthorized squatter settlements. These types of developments occur mainly because of the inability or sometimes lack of legal housing in the housing market. Organic housing development emerges within a certain period whether legal or illegal (Agyabeng et.al, 2022; ,Mottelson, 2023). Organic housing is often referred to as informal housing depending on its extensive nature.

Development of formal housing occurs when the existence of informal housing is built by individuals or groups illegally on the government land. Even the development of informal housing has been recognized as one of the important urban or rural phenomena especially in developing countries triggered by the high rate of rural-urban migration resulting in housing shortage, especially for the poor (Mottelson, 2023; Garriga, 2023). One of the solutions that have been taken by the government is to reduce the construction of informal housing and provide formal housing to meet the needs of the growing population. Informal housing development occurs for a variety of reasons. One of the reasons is due to lack of land, low demand for formal houses due to high prices even the low-income households cannot afford to own a house. Therefore, informal housing development is an available and affordable alternative for the poor (Mottelson, 2023). Irregular, unplanned, illegal settlements and squatters are terms that refer to informal housing. According to UN-Habitat, there are two categories of informal settlements (UNDP, 2003) such as squatter settlements and illegal land development. Squatter settlements refer to land and/or buildings that have been occupied without the owner's permission while illegal development refers to settlements where initial occupation is legal but illegal land development has occurred such as the expansion of the building without following the legal procedure, not to follow to zoning plans, no consideration to the services and infrastructure. According to Agyabeng et.al, (2022), 'informal housing' are groups of housing units built on land where the occupants have no legal claim or are occupying illegally. In contrast, 'informal development' are areas of unplanned settlement where the housing does not comply with current planning and building regulations or illegal housing (Agyabeng et.al, 2022).

Everyone has a dream of owning a good and comfortable home as a basic human need. Homeownership is very much related to the quality of life and provides high satisfaction to the household. Satisfaction with the house is achieved when their wants and needs are met. A high level of housing satisfaction is achieved when the house becomes a good, efficient, and effective shelter. If the household is not satisfied with their house means that the house has not achieved a high level of satisfaction. In the future, the government should build formal housing based on a higher satisfaction index because they also have the right to live in a comfortable home. The purpose of the study is to identify the satisfaction of the existing model of formal housing as a guide on the future formal housing plan.

LITERATURE REVIEW

THE CONCEPT OF SUSTAINABLE HOUSING

Sustainability in development is referred to as the balance between social, economic, and environmental needs for the present and sustainable up to future generations (Adabre & Chan, 2021; Aigbavboa & Thwala, 2012). In the context of housing, a house is a unit forming a good quality of life and sustainable development. For example, home location can determine the quality of life of a community such as accessibility to infrastructures such as schools, financial institutions, utilities such as broadband facilities, electricity, and clean water, and traffic accessibility to connect residential areas with major growth centers. Infrastructure such as houses of worship, educational centers such as schools, religious classes and kindergartens, police stations, health, and dental clinics provide facilities and form a prosperous community. The existence of this infrastructure, enabling the community to enjoy educational facilities, health, leisure, and economic benefits, these aspects will form a prosperous community.

Apart from the infrastructure aspect, the physical aspect of the house also shapes the quality of life of the household. According to Winston & Eastaway (2008), the structural features of the home design that are closely related to the quality of life are such as lighting, soundproofing from the outside, and energy efficiency. Meanwhile, Akadiri (2015) stated low electricity generation, ecological housing is an important component of sustainable development. He also added that housing areas that are marginalized from sustainability, are not only affected by efficient energy sources but also local communities are vulnerable to disease outbreaks, drug or alcohol abuse, low levels of education, social isolation, and unemployment. In other words, the concept of sustainable housing will not separate these problems in designing homes and neighborhoods (Giorgi et al.,2021; Azman & Mohamed Harith, 2020).

To achieve the concept of sustainability, the problems of affordability and availability to most buyers need to be considered in the housing market (Hashim, 2010). In the study of Flavin & Yamashita (2011), the continuity of house prices is correlated with the economic sustainability of a country where occupied houses are determined by house prices, population growth, and income. According to Liu (2014) and Adabre & Chan (2019), most housing cost issues only look at the economic sustainability aspect as opposed to the environmental and social sustainability aspect. Housing market pressures can be reduced through sustainable housing supply and act as a major contributor to sustainable housing (Adabre & Chan, 2019). An affordability model is an assessment tool that encompasses economic, environmental, and social Homeownership is an indicator of sustainable living through investment, consumption, and lifestyle chosen by present and future generations where an affordability model is an assessment tool that encompasses economic, environmental, and social (Addo, 2016).

SATISFACTION ON HOUSING

Housing satisfaction is one of the relevant and subjective criteria in the post-construction assessment of affordable housing facilities. There are three main indicators of housing satisfaction criteria namely end-user satisfaction with housing facilities and infrastructure, the function of housing facilities, and safety performance (Adabre & Chan, 2021). Housing satisfaction is defined as the disparity between household needs and goals and residential realities (Varady & Preiser, 1998). Whereas Mohit & Raja (2014) that housing satisfaction is the level of satisfaction experienced by an individual or family member taking into account the housing conditions

inhabited. Anqi and Söderberg's (2023) recent study highlights the complexity of residential pleasure in various living circumstances, including student housing, by emphasizing that various indicators and personal experiences shape it. Housing satisfaction is also associated with individuals 'perceptions of quality of life (Djebarni & Al-Abed, 2000), this is because the housing environment determines the quality of life of households (Ogu, 2002).

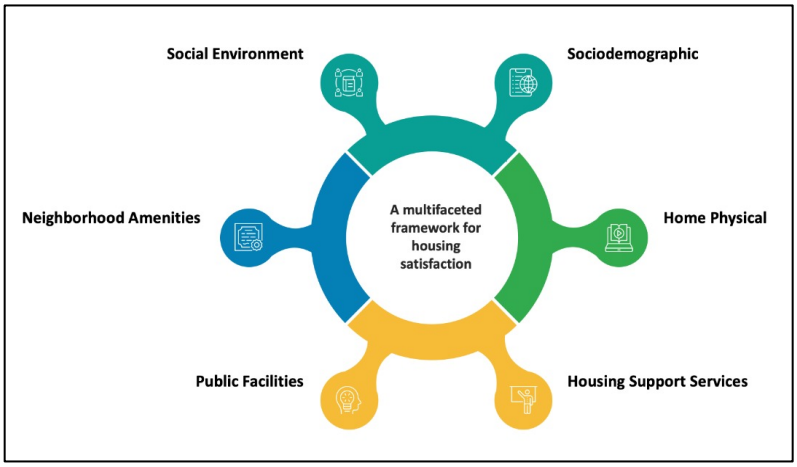

FIGURE 1. Framework for Various Aspects of Housing Satisfaction
Source: Mohit & Raja (2014)

There are several aspects associated with housing satisfaction, including building or house characteristics such as the number of bedrooms, size and location of kitchens, and quality of materials and infrastructure facilities such as schools, hospitals, shops, and recreational facilities (Salleh, 2008). According to Kowaltowski et al. (2006) quality of life can be associated with emotional safety, physical security, and protection from rain, wind, and light, and environmental comforts such as thermal space and space function. Housing satisfaction can be explained more easily when categorized according to components such as sociodemographic characteristics, physical characteristics of the house, housing support services, public facilities, neighborhood facilities, and social environment (Mohit & Raja, 2014). The conceptual framework for housing satisfaction levels developed by Mohit & Raja (2014) is as shown in Figure 1.

Jim & Chen (2009) presented the results of their study that there is a high level of dissatisfaction among public housing occupants in Hong Kong. The study also shows that the concerns that should be given priority are the maintenance and cleanliness of the housing unit and its surroundings, the structural integrity of the building, and ease of access using public transportation. A study by Soyinka & Siu (2018) showed that the factors influencing overall housing satisfaction were neighborhood compared to residential and community service unit's factors. The study of Potter et al. (2001) compared resident satisfaction in three buildings renovated for housing and the results showed that that safety, perception, and comfort are important for resident satisfaction in different environments. A study by Mohit & Raja (2014) showed that satisfaction with housing unit characteristics had a positive correlation with housing support services, public facilities, and social environment for all housing groups except the social environment component of cluster housing clusters. In addition, the living environment is also influenced by several factors that can determine qualities such as physical, mental, and social well-being of individuals and families if the housing conditions meet the highest comfortable living

standards and produce positive or negative feelings of residents in their homes and surroundings (Zuber, et al, 2023; Koçak & Terzi, 2024).

According to Rossi's 1955 Housing Requirements Theory, a person's requirements and goals alter during their life, which is why housing satisfaction is correlated with these changes. A discrepancy between present requirements and available living circumstances can result in unhappiness. This hypothesis posits that individuals modify their dwelling circumstances to meet their demands via migration or enhancement. When the home and environment fail to satisfy anticipated demands, individuals typically seek a resolution by relocating or altering their current housing to attain greater pleasure (Rossi, 1955; Francescato et al., 1987; Mohit & Raja, 2014; Hu et.al, 2022).

Several aspects, including the physical attributes of the residence, public amenities, and the social milieu, determine housing happiness. Research indicates that when domestic conditions diverge from societal norms or individual standards, it can lead to a housing deficit that impacts overall satisfaction (Lee, 2020). In this setting, emotional safety and environmental comfort are critical factors influencing the population's quality of life (Kowaltowski et al., 2006; Wouters-Soomers,et al, 2022). Consequently, comprehending the relationship between the residence's architectural design and its occupants' well-being is crucial for formulating a more effective and responsive housing policy that addresses the community's demands.

METHODOLOGY

STUDY AREA

This study was conducted in Kuala Kedah, Kedah State Malaysia. Kuala Kedah is a parliamentary constituency in the state of Kedah Darul Aman, in the north of Peninsular Malaysia. Kuala Kedah is located at the mouth of the Kedah River. The distance from Kuala Kedah to the city center, Alor Setar, is only 10 km. Kuala Kedah is a fishing village. Fishermen catch fish in the Straits of Malacca and the Andaman Sea, and until the 1960s, river and sea channels functioned as the principal thoroughfares for transportation. As a sea highway stop, Kuala Kedah is an important stop connecting Kuala Perlis, Kuala Sanglang, Kuala Jerlun, Tanjung Dawai, and Penang. Kuala Kedah is also a gateway to the interior through the Kedah River. In the sixty's era, Kuala Kuala was contacted by ferry boats and cargo boats. With the rapid development after independence, many roads were built so the sea routes are declining except for the fishing and tourism industries (Figure 1).

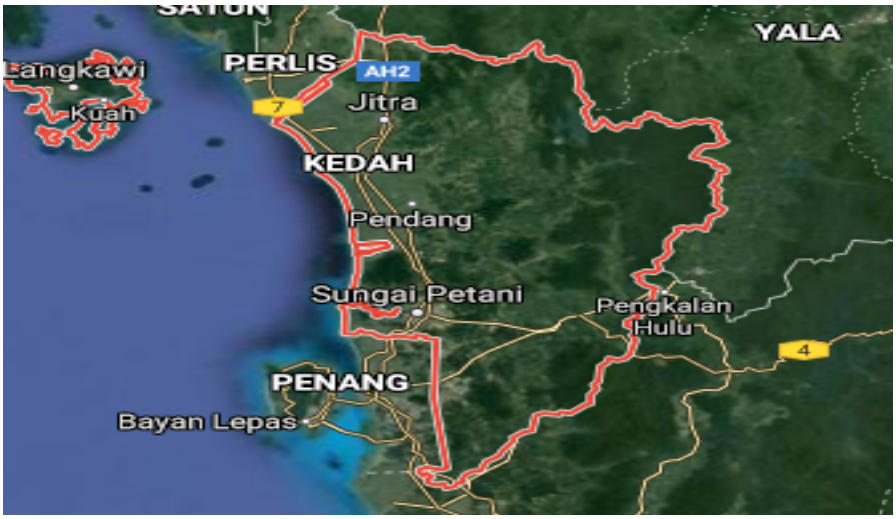

FIGURE 2. Map Of Kedah State
Sources: Google Map

With the development of Langkawi Island as a tax-free island during the reign of Tun Mahathir as Prime Minister, the importance of Kuala Kedah and Kuala Perlis increased again. From Kuala Kedah tourists can also go to Pulau Payar, a tourist island, and fisheries reserve. There is a modern jetty built by the central government to make it easier for tourists to visit the beautiful island of Langkawi. The jetty is located at the mouth of a muddy river and the main plant is the mangrove swamp. In front of the Kuala Kedah jetty, there is a historic site, the City of Kuala Kedah. Apart from that, a Kuala Kedah Marina has been built which has been completed but cannot be used because it is in a shallow area.

FIGURE 3. Map of Kampung Seberang Kota

The scenery in the jetty area is quite interesting as many colorful fishing boats can be seen back from the sea. Fishermen are tired of transporting their catch. Fishermen's houses are scattered along the seafront and rivers in Kuala Kedah. In 2004 a Seberang Kota Fishermen Resettlement program was implemented by the state government. The Kedah state government has built 700 village-style two-story houses in the village of Seberang Kota (Figure 2). The more provided the more structured and formal. About 700 fishermen living in a fishing village have been relocated to new areas. The resettlement program is part of the government's efforts to create structured and orderly settlements for fishermen and is also known as formal housing.

DATA COLLECTION

The paper uses a quantitative methodology to examine a formal housing model that can direct the development of new settlements. It used a descriptive design to survey 262 households chosen by purposive sampling in Kuala Kedah, Malaysia. A systematic questionnaire with two sections—respondent profiles and household satisfaction with housing—was used to gather data. The survey employed a Likert scale to gauge respondents' satisfaction levels, with responses ranging from "strongly dissatisfied" to "strongly satisfied." Using SPSS, descriptive statistics were used to calculate frequency and mean, and multiple hierarchical regression was used to examine correlations between variables. While secondary data were obtained from various publications and papers about the development of the research region, primary data were obtained through questionnaires and interviews with local leaders. This comprehensive approach aims to shed light on housing satisfaction and guide the development of housing laws in the future. In this study, survey forms have been broken down into several parts namely:

i. Part A: Respondent Demographic Information

In this section, there is some information on the background of the respondents which includes gender, age, number of family members, status, marital status, academic status, and so on. The questions in Section A were modified based on matters closely related to the respondents 'information. This section is one of the important questions in the implementation of the study because it symbolizes the status or background of an individual.

ii. Part B: Information about the Home Structure

The information required in this section are:

(a) A number of bedrooms
(b) A number of toilets
(c) A number of bathrooms
(d) Kitchen size
(e) Living room size
(f) availability home space

iii. Part C: Information on Formal Housing Variables

The information required in this section are:

(a) Home environment
(b) Community and neighborhood
(c) Facilities and infrastructure
(d) Security and safety

DATA ANALYSIS

This study has used two types of analysis, namely descriptive data analysis and statistical analysis. Descriptive analysis refers to the way to organize and collect information numerically with a research variable one by one and usually, this level uses tables. In addition, this study also uses the method of analyzing data by using statistical levels to produce a conclusion of a situation that occurs in a population by using the sample obtained. Therefore, a descriptive statistical method is used to examine the demographic distribution of respondents of Kuala Kedah. This analysis can help in describing the profile of respondents such as age, gender, education, and so on.

SELECTION OF FORMAL HOUSING SATISFACTION VARIABLES

The selection of variables for this study was guided by past studies on housing satisfaction (Abidin et al., 2019), the purpose of the research, and the availability of data. The dependent variables for this study are Home structure and four items of independent variables (Figure 4):

1. Home Environment,
2. Community and neighborhood,
3. Facilities and Infrastructure and
4. Security and safety

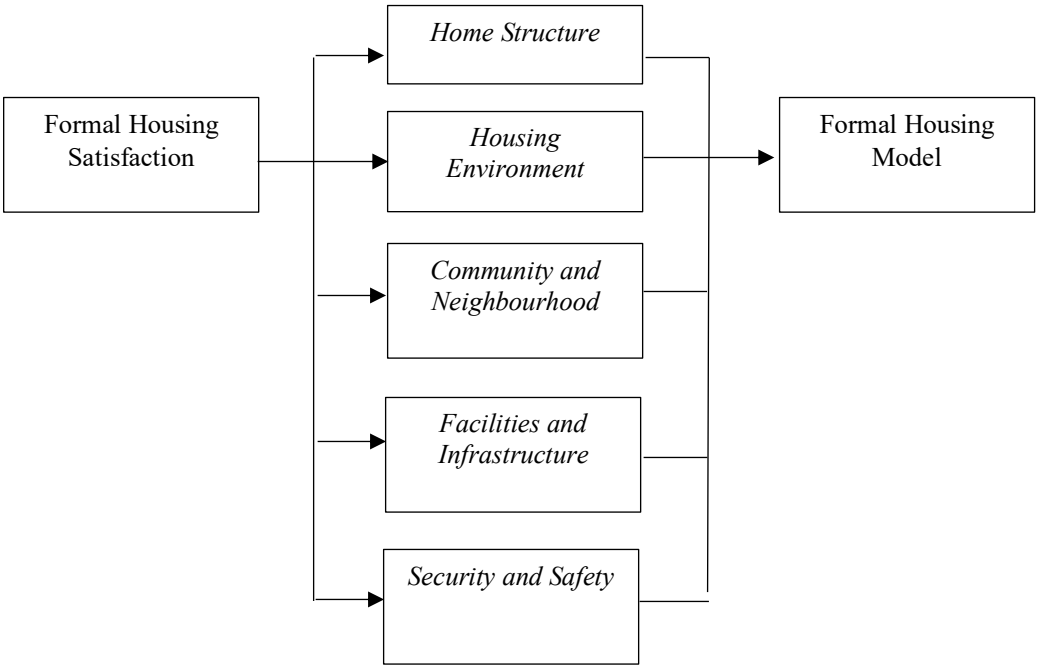

FIGURE 4. Housing Satisfaction Framework

RELATIONSHIP BETWEEN HOME STRUCTURE AND HOUSEHOLDS WELLBEING BY SCATTER PLOT

A scatter plot will use in this study. A scatter plot is a mathematical plot or diagram using Cartesian coordinates to show values for two variables in the data set. Scatter plot is like line graphs that use horizontal and vertical axes to plot data points. However, this distribution plot has used for a particular purpose: to show the relationship of two variables that influence each other on the X and Y axes. The purpose of using the scatter plot is to identify the relationship between Home Structure and Households Satisfaction in the scatter plot.

The scatter plot shows the respondents' feedback on Home Structure and Residents Wellbeing Score. The scatter plot has divided into nine quadrants. Every quadrant has its level and regressions line as shown in Figure 5:

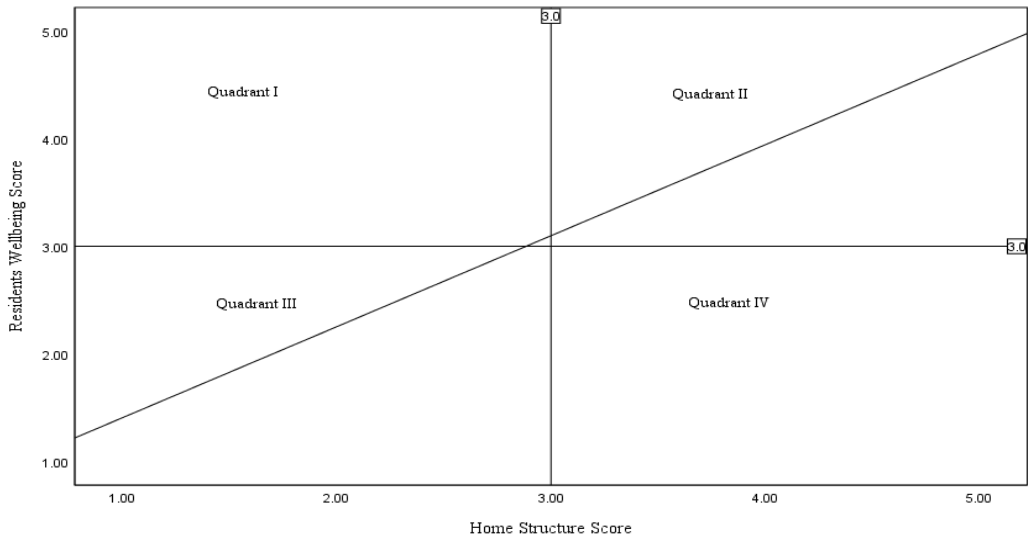

FIGURE 5. Schematic of Relationship between Home Structure and Residents Wellbeing

The indicators of quadrants are as below:

i. Quadrant I-Low Satisfaction of Home Structure but High in Residents Wellbeing.
ii. Quadrant II-High Satisfaction of Home Structure, and High in Residents Wellbeing.
iii. Quadrant III-Low Satisfaction of Home Structure and Low in Residents Wellbeing.
iv. Quadrant IV-High Satisfaction of Home Structure but High in Residents Wellbeing.

CALCULATION OF FORMAL HOUSING SATISFACTION INDEX (FHSI)

The Formal Housing Satisfaction Index (FHSI) is a versatile analysis to measure respondent satisfaction with the formal housing provided by the government. This index can help to identify the reasons for respondent satisfaction or dissatisfaction. Furthermore, it can measure the level of respondent satisfaction and as an essential factor in developing a new settlements plan. This data

can improve the quality of future formal housing and ensure respondents' well-being has achieved—a high level of satisfaction guarantees that standard housing is still needed, especially for the low-income group.

Satisfaction with housing has done by using the value of the housing satisfaction attribute weighed to determine the housing satisfaction index. Therefore, the Formal Housing Satisfaction Index (FHSI) for each element was determined. The level of satisfaction tested has selected by using a scale value of 4, which is satisfaction as the accepted value. This expressed as HSI = Housing Satisfaction Index mean for each housing satisfaction element is then obtained by summing the HSI of each attribute and dividing by the number of characteristics in the housing element.

The satisfaction index for a particular housing component has calculated with the following equation

$$\mathcal{SI} = \frac{\sum_{i=1}^{n} \mathfrak{s}i}{\sum_{i=1}^{n} \mathcal{S}i} * 100$$

where $\mathcal{SI}$ is the satisfaction index of a respondent of the formal housing, N is the number of variables being scaled, $\mathfrak{s}i$ is the actual score by a respondent on the ith variable, and $\mathcal{S}i$ is the maximum possible score that i could have on the scale used.

$$\mathcal{FHSI} = \frac{\sum_{i=1}^{n1} \mathcal{h}i + \sum_{i=1}^{n2} ei + \sum_{i=1}^{n3} ci + \sum_{i=1}^{n4} \mathcal{f}i + \sum_{i=1}^{n5} \mathcal{s}i}{\sum_{i=1}^{n1} \mathcal{H}i + \sum_{i=1}^{n2} \mathcal{E}i + \sum_{i=1}^{n3} \mathcal{C}i + \sum_{i=1}^{n4} Fi + \sum_{i=1}^{n5} Si} * 100$$

where $\mathcal{FHSI}$ is a respondent's satisfaction with the housing environment; n1, n2, n3, n4 and n5 are the number of variables selected for scaling under each component of housing environment; while $\mathcal{h}i$, ei, ci, $\mathcal{f}i$ and $\mathcal{s}i$ represent the actual score of a respondent on the ith variable in the five components. $\mathcal{H}i$, $\mathcal{E}i$, $\mathcal{C}i$, Fi and Si are the maximum possible scores for the ith variable in the Home Structure, Housing Environment, Community and Neighbourhood, Facilities and Infrastructure and Security and Safety, respectively, calculated for each category of variable.

TABLE 1. The Assessment Scale of Satisfaction

Scale	
0%-40%	Low
40%-60%	Moderate
60%-80%	High
80%-100%	Very High

MULTIPLE HIERARCHICAL REGRESSION ANALYSIS

Batikawai & Nawaqalevu (2020) applied a multiple linear regression analysis with variable regression capturing various housing components against the overall residential satisfaction score in their study. The aim was to ascertain which predictor variable gave the most significant influence on satisfaction levels. In this study, multiple regression analysis has used to detect the extent of the contribution of HE and FI to formal housing satisfaction. Multiple regression analysis aims to identify changes in two or more factors or independent variables contributing to changes in a dependent variable. In multiple regression, the independent variable has also known as the

predictor variable, and the dependent variable is called the criterion variable. Thus, multiple regression equations for the two predictor variables can be formed as follows:

$$\hat{Y} = a + B_1X_1 + B_2X_2+B_3X_3+B_4X_4+B_5X_5$$

Where

$\hat{Y}$ =
a = Regression constant
B1 = regression coefficient Variable 1
B2 = Regression coefficient Variable 2
B3 = Regression coefficient Variable 3
B4 = Regression coefficient Variable 4
B5 = Regression coefficient Variable 5
X1 = Score Variable 1
X2 = Score Variable 2
X3 = Score Variable 3
X4 = Score Variable 4
X5 = Score Variable 5

A multiple hierarchical regression tests allow the researcher to enter independent variables into multiple regression equations based on the level of importance of each independent variable to the dependent variable with the hypothesis of:
Hypothesis Null:
Formal Housing Variables (Home Environment, Community and neighborhood, Facilities, Security and safety) are not a factor to Formal Housing Satisfaction (DV).
Hypothesis Alternative:
Formal Housing Variables (Home Environment, Community and neighborhood, Facilities, Security and safety) are not a factor to Formal Housing Satisfaction (DV).

Stepwise multiple regression analysis were used to examine how particular characteristics affect housing satisfaction (Ismail et.al,2020). A stepwise regression analysis considered neighbourhood satisfaction a dependent variable and factor scores predictors (Türkoğlu et al., 2019).

RESULTS AND FINDINGS

BACKGROUND OF RESIDENTS

This study has conducted a descriptive analysis of the demographic profiles of formal housing respondents in Kuala Kedah. The demographics of the respondents have explained using the frequency (f) and percentage (%), which includes race, marital status, family status, Duration staying in the formal home, homeownership status, number of households, number of households in school and working and household income as shown in Table 4. The race information represented 261 (99.6%) respondents are Malay and only one (0.4%) Chinese. According to marital status, the information of respondents is categorized into three, namely married, single or unmarried, and widowed. Most of the respondents involved in this study are married, with 169

(64.5%) respondents. In addition, the status of the respondent in the family is either as a husband or as a wife. A study conducted in Kuala Kedah showed that 134 (51.1%) people from the total respondents are as wives, while the remaining 128 (48.9%) people are as husbands or heads of families.

TABLE 2. Background Information of Respondents (n = 262)

Item	Frequency	Percentage
Race		
Malay	261	99.6
Chinese	1	0.4
Marital Status		
Married	171	65.3
Bachelor	62	23.7
Widowed	29	11.1
Family Status		
Husband	128	48.9
Wife	134	51.1
Duration staying in formal home		
Less than 1 year	25	9.5
1-5 years	31	11.8
6-10 years	38	14.5
More than 10 years	168	64.1
Home Ownership		
Owner	186	71.0
Tenants	76	29.0
Number of family members		
1-3 persons	72	27.5
4-6 persons	146	55.7
7-9 persons	41	15.6
More than 9 persons	3	1.1
Number of Schooled		
None	79	30.2
1 person	58	22.1
2 persons	76	29.0
3 persons	38	14.5
More than 4 persons	11	4.2
Number of Working		
None	35	13.4
1 person	104	39.7
2 persons	108	41.2
More than 3 persons	15	5.7
Family Income		
RM500 and below	47	17.9
RM501-RM1000	118	45.0
RM1000-RM2000	11	4.2
RM1501-RM2000	60	22.9
RM2500 and above	26	9.9

Source: Surve

There was four information of the length of time respondents lived in the houses they occupied. Most respondents have lived in their homes for more than ten years, which is 167 (63.7%), a total of 25 (9.5%) of them lived in a house for less than a year, while 32 (12.2%) and 38 (14.5%) respondents had lived in their home for a period of between 1-5 years and 6-10 years respectively. Overall, according to the type of homeownership (Table 4.5), most respondents were homeowners living in both study areas. 182 (69.5%) respondents are owners, and another 75 (28.6%) are tenants. More than half of the respondents have a total of between four to six people

(55.7%), followed by 72 (27.5%) respondents with only one to three people living in the same house. 4.2 Measurement of formal housing satisfaction by mean score.

The measurement made is through the mean score of population satisfaction.

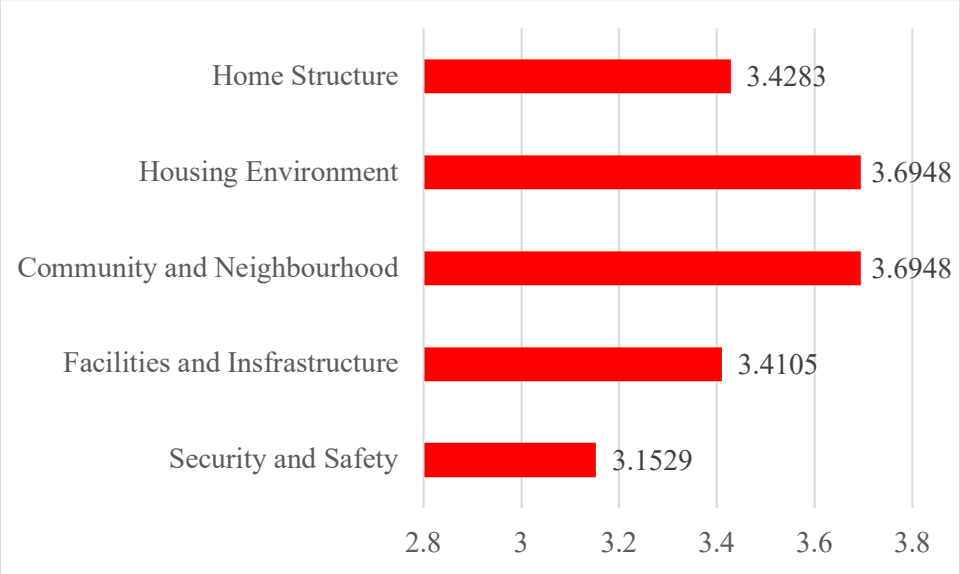

FIGURE 6. Satisfaction Formal Housing by respondents.

Figure 6 shows the level of satisfaction of respondents on the formal housing that they are living in. The highest mean scores came from the Home Environment and Community and Neighborhood variable with a score of 3.6948, respectively. At the same time, the third-highest mean score came from satisfaction of formal housing with a score of 3.4283. The fourth highest score is Facilities and Infrastructure, where the score value is 3.4105. The minor mean score came from Security and safety, where the value is 3.1529. Overall, the satisfaction of formal housing by respondents at a moderate level between 3,000 to 3,999.

SATISFACTION RELATIONSHIP BETWEEN FORMAL HOUSING MODEL AND RESIDENTIAL WELL-BEING

The relationship between formal housing styles and residential well-being is complex, encompassing various satisfaction levels. This study demonstrates that residential happiness is driven not only by physical comfort but also significantly by well-being characteristics, including home environment, neighborhood, security, and safety, which mediate the connection between comfort and overall contentment. This indicates that although the structural features of housing are significant, the psychological attachment inhabitants have to their dwellings is crucial for their general well-being. This scenario can be illustrated through the creation of a scatter plot.

The scatter plot shows the respondents' feedback on the survey and the relation Home Structure and Residents Well-being, as shown in Figure 7. From the scatter plot, about 6% of respondents feedback laid on Quadrant I, and it is shown that the Home Structure score over three and the Residents Wellbeing score less than 3. About 63.3% of respondents feedback laid on Quadrant II, and it is shown that the Home Structure score over three and the Residents Well-being score over 3. About 25.9% of respondents feedback laid on Quadrant III, and it demonstrated that

the Residents Wellbeing score is less than three and the Home Structure score is less than 3. About 4.5% of respondents feedback laid on Quadrant IV, and it is shown that the Residents Wellbeing score is less than three and the Home Structure score over 3.

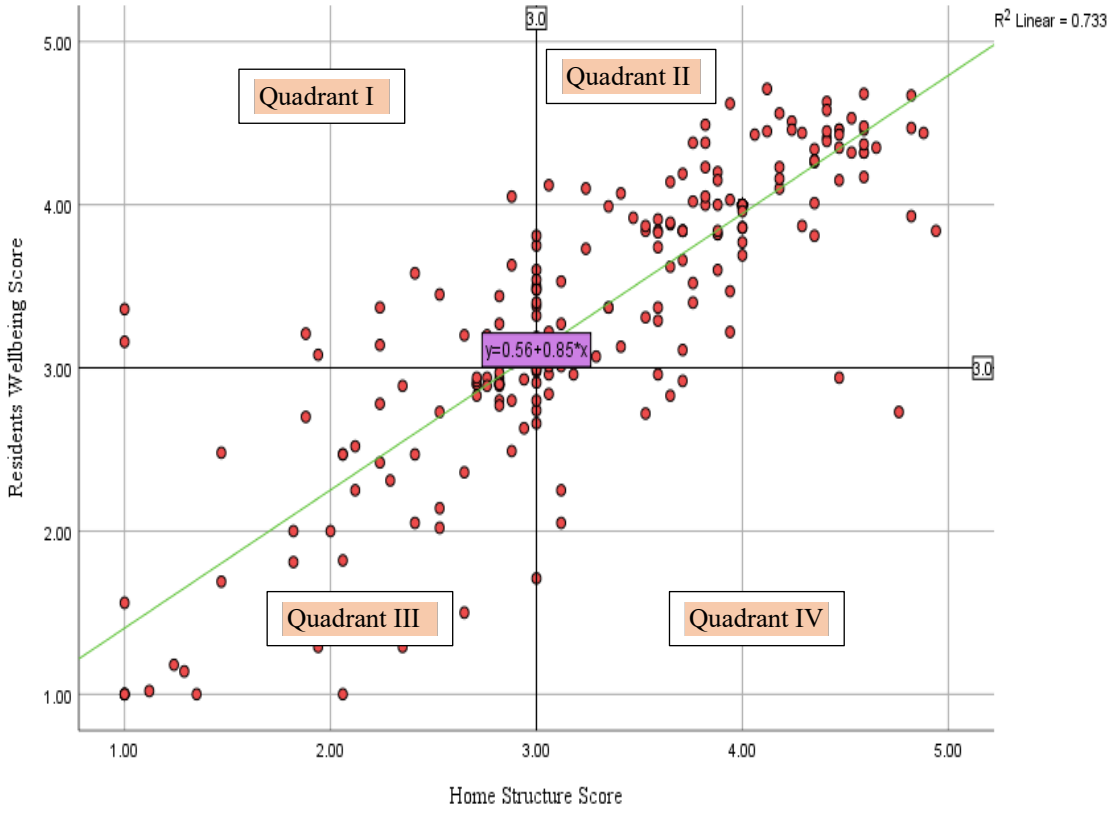

FIGURE 7. Relationship between Formal Housing Satisfaction Score and Determinant of Formal Housing

Based on the scatter plot output, data plot points form a straight-line pole from bottom left to top right. This indicates a linear and positive relationship between the House Structure variable (X) and the Wellness variable (Y). This positive relationship means that if there is an increase in House Structure (X), Well-being (Y) will increase because there is a linear relationship between the House Structure variable (X) and the Wellness variable (Y), so one of the assumptions for the regression model in this study has achieved.

FORMAL HOUSING SATISFACTION INDEX (FHSI)

There is a strong relationship between Rossi's (1955) Housing Needs Theory and the Satisfaction Index, which measures an individual's level of satisfaction with various products and services, including housing. The Satisfaction Index is data and information on a person's level of satisfaction obtained from quantitative and qualitative measurements of their opinions while enjoying the goods and services provided, such as the housing Satisfaction Index. According to Amérigo & Aragones (1997), when an individual has assessed the objective attributes of the housing environment, it will be subjective to elicit a certain satisfaction as it is influenced by socio-demographic characteristics and personality of a person as well as quality patterns and natural and ideal housing environment.

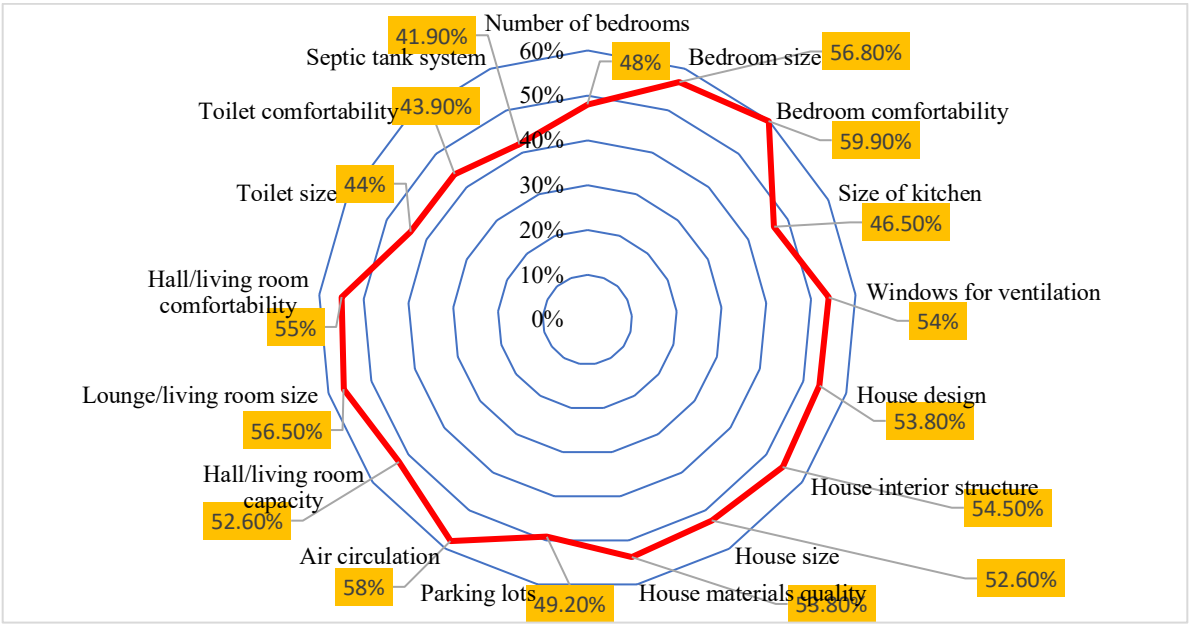

FIGURE 8. Home Structure Satisfaction Index

The result of the Formal Housing Satisfaction index has separated based on variables in the web spider. The variables are Home Structure, Home Environment, Community and Neighborhood, Facilities and Infrastructure and Security and Safety. Figure 8 shows the result of the satisfaction index on the Home Structure variable. The index on all items is moderate primarily (based on Table 4, 40% to 60%). The lowest index is an item of Septic tank system, about 41.9%.

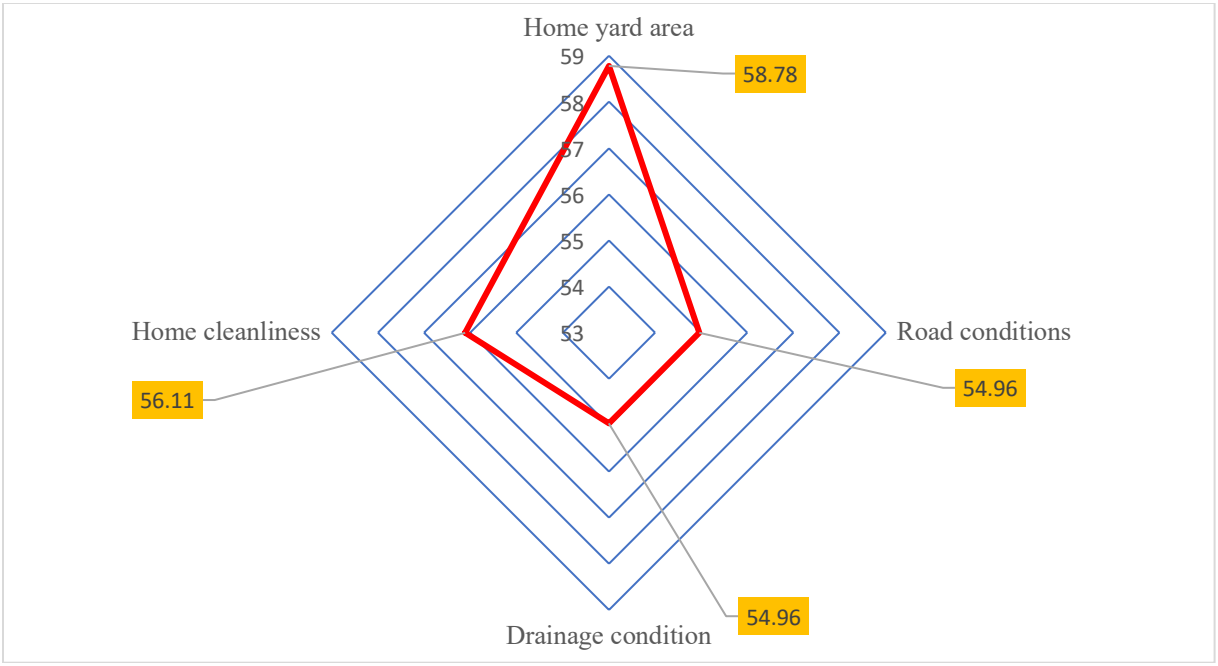

FIGURE 9. Home Environment Satisfaction Index

Figure 9 shows the result of the satisfaction index on the Home Environment variable. The index on all items is moderate primarily (based on Table 4: 40% to 60%).

FIGURE 10. Community and neighborhood Satisfaction Index

Figure 10 shows the result of the satisfaction index on the Community and Neighborhood variable. The index on all items is high primarily (based on Table 4: 60% to 80%). However, Noise around the residence is moderate, about 54.58%.

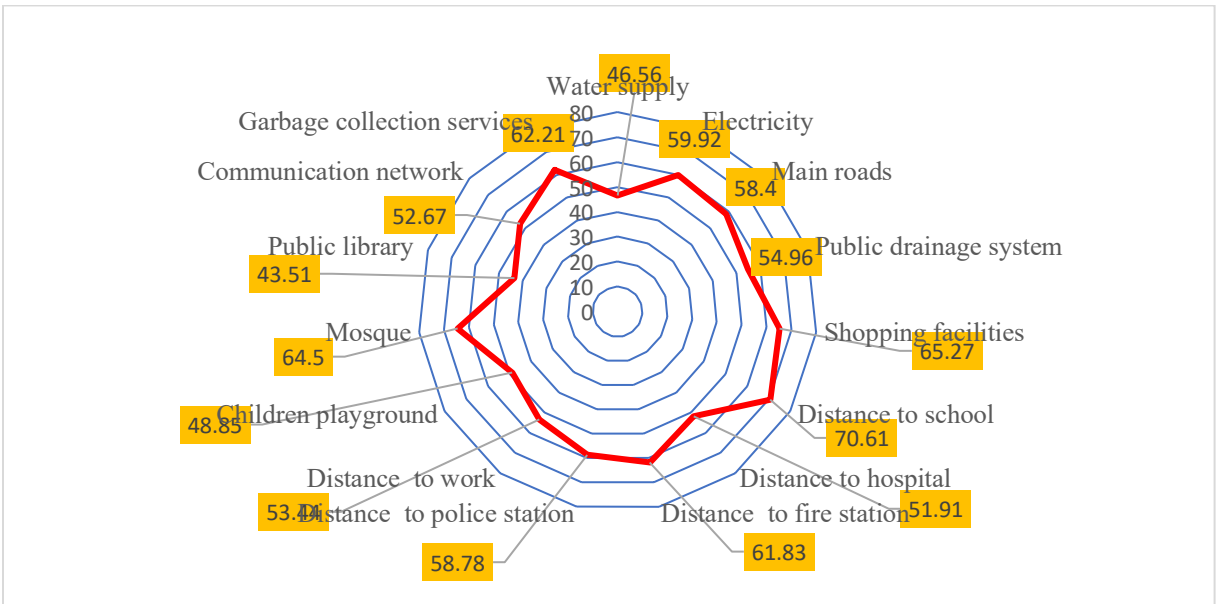

FIGURE 11. Facilities and Infrastructure Satisfaction Index

Figure 11 shows the result of the satisfaction index on the Facilities and Infrastructure variable. The index on all items is moderate primarily (based on Table 4: 40% to 60%). However, the items such as shopping facilities, distance to school, distance to the fire station, mosque facilities and garbage collection services have achieved high satisfaction index of more than 60%.

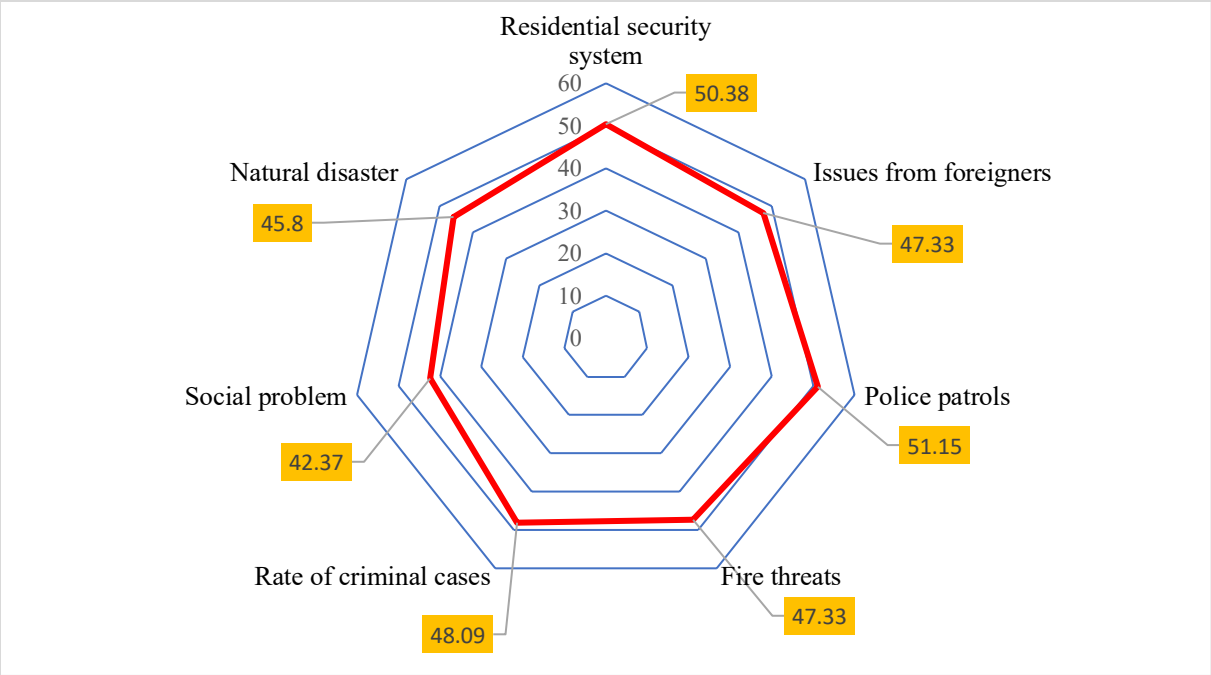

FIGURE 12. Security and safety Satisfaction Index

Figure 12 shows the result of the satisfaction index on the Security and safety variable. The index on all items is moderate primarily (based on Table 4: 40% to 60%).

MULTIPLE HIERARCHICAL REGRESSION ANALYSIS

All four independent variables were included in the regression model, $p < 0.05$. However, two independent variables are factors for the level of formal housing satisfaction. The value of $R2 = 0.771$ indicates that 77.1% ($r = 0.878$) of the change in the dependent variable (formal housing satisfaction) is due to the change in the independent variable, Home Environment. This means that Home Environment is a significant factor in contributing to FSH. The value of $R2 = 0.824$ (model 2) indicates that 82.4% ($r = 0.908$) of the change in the dependent variable (formal housing satisfaction) is due to the change in the combination of the two independent variables, namely Home Environment and Facilities and Infrastructure.

TABLE 3. Stepwise multiple regression analysis of predictor variables contributing to formal housing satisfaction

	B	SE	β	t	Sig	R2	Contribution
Constant	0.279	0.093		3.012	0.003		
Home Environment	0.55	0.041	0.579	13.493	0	0.771	77.10%
Facilities and Infrastructure	0.353	0.04	0.377	8.789	0	0.824	5.30%

Based on Table 3, the multiple stepwise regression analysis applied in this study showed that the combination of the two independent variables, namely Home Environment and Facilities and Infrastructure was a significant independent variable that accounted for 82.4% of the variance change in formal housing satisfaction {F (2,255) = 598.70, p = .000} as shown in Table 4.

TABLE 4. Analysis of variance of formal housing satisfaction regression model

Model		Sum of Squares	df	Mean Square	F	Sig.
1	Regression	145.855	1	145.855	863.18	.000[b]
	Residual	43.257	256	0.169		
	Total	189.112	257			
2	Regression	155.912	2	77.956	598.767	.000[c]
	Residual	33.2	255	0.13		
	Total	189.112	257			

a. Dependent Variable: Formal Housing Satisfaction
b. Predictors: (Constant), Home Environmet
c. Predictors: (Constant), Home Environmet, Facilities and Infrastructure

The Facilities and Infrastructure variable was found to be the least contributing predictor factor at only 5.3% in the formal housing satisfaction, while Home Environment was the most contributing factor in the formal housing satisfaction, at 77.10%. The findings of this study emphasize an essential point, which is to provide the formal housing in the future must emphasize the housing environment.

Thus, multiple regression equations for the two predictor variables can be formed as follows:

$$\hat{Y} = 0.279 + 0.55X1 + 0.353X2$$

Where

$\hat{Y}$ = Formal housing satisfaction score is predicted
a = Regression constant
B1 = regression coefficient of various Home Environment
B2 = Regression coefficient of various Facilities and Infrastructure
X1 = Score Home Environment
X2 = Score Facilities and Infrastructure

However, in addition to obtaining multiple regression equations, this article aims to find out more to what extent the contribution of each independent variable (Home Environment and Facilities and Infrastructure) to formal housing satisfaction, it is essential to know the value of β in line with Pallant (2001) who states 'in comparing the contribution of each independent variable; therefore we use the beta values". The findings of the analysis also clearly showed that, significantly, Home Environment was the most important predictor variable in formal housing satisfaction (β = 0.579, p <.05) and contributed 77.1 percent. This situation means that when Home Environment increases by one unit, the formal housing satisfaction will increase by 0.579 units with other variables are constant.

These findings show that Home Environment is the main contributing factor, 77.1% in the formal housing satisfaction. The second most crucial predictor variable that contributed 5.30% to the formal housing satisfaction was FI (β = 0.377, p <.05). This situation also means that when the Facilities and Infrastructure increase by one unit, it will also increase the formal housing satisfaction of 0.377 units, with other variables being constant. Thus, it can be stated that Facilities

and Infrastructure is also a factor that cannot be ignored in formal housing satisfaction. Therefore, it can be concluded H0 stating that there is no significant contribution between Home Environment and Facilities and Infrastructure on the formal housing satisfaction is rejected. The findings of the study also show Home Environment is the most contributing predictor factor, followed by Facilities and Infrastructure. The new results of this study provide a model for local governments to build formal housing for the affected and eligible population. The Satisfaction Index and Future Housing Plans closely relate to residents' satisfaction. Using data from the Satisfaction Index, policymakers can make decisions linking housing construction to residents' choices, thus improving their quality of life

CONCLUSION

According to research, stable, affordable housing with support decreases stress and improves health. Data analysis, including scatter plots, reveals a favourable association between house structure and residents' wellbeing, demonstrating that housing changes can boost life satisfaction. These findings affect urban planning and policymaking. Housing as a social predictor of health is also stressed in the studies. Poor home conditions can cause respiratory and mental health difficulties. Community interventions can reduce health inequities and improve disadvantaged populations' outcomes by improving infrastructure and access to critical services. This holistic strategy benefits residents and enhances community relationships and social cohesion. This research could inform comprehensive housing plans that prioritize physical and mental wellbeing. By understanding how housing circumstances affect inhabitants' quality of life, stakeholders may create policies that improve living conditions in numerous ways. Understanding these processes is essential for building sustainable communities that benefit everyone as urbanization rises worldwide. This study proposes rethinking housing as vital to community health and happiness rather than just architecture.

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REFERENCES

Addo, I. A. 2016. Assessing residential satisfaction among low income households in multi-habited dwellings in selected low income communities in Accra. *Urban Studies* 53(4): 631–650.

Agyabeng, A. N., Peprah, A. A., Mensah, J. K. & Mensah, E. A. 2022. Informal settlement and urban development discourse in the Global South: Evidence from Ghana. *Norsk Geografisk Tidsskrift-Norwegian Journal of Geography* 76(4): 242-253.

Aigbavboa, C. O. & Thwala, W. D. 2012. An appraisal of housing satisfaction in South Africa low income housing scheme. *International Journal of Construction Management* 12(1): 1–21.

Akadiri, P. O. 2015. Understanding barriers affecting the selection of sustainable materials in

building projects. *Journal of Building Engineering* 4: 86–93. doi:10.1016/j.jobe.2015.08.006

Amérigo, M. & Aragones, J. I. 1997. A theoretical and methodological approach to the study of residential satisfaction. *Journal of Environmental Psychology* 17(1): 47–57.

Anqi, L. & Söderberg, M. 2023. Residential satisfaction in student housing: A study of diverse indicators and personal experiences. *Journal of Housing and the Built Environment* 38(1): 123-145.

Azman, A. A. & Mohamed Harith, N. H. 2020. Determinants of residential satisfaction towards people housing programme at PPR Melana Indah (Fasa 1), Johor Bahru. *Journal of Administrative Science* 17(2): 92-108.

Batikawai, E. & Nawaqalevu, A. 2020. A residential satisfaction assessment of public rental board housing in the greater Suva urban area, Fiji Islands. *The Journal of Pacific Studies* 40(1): 6–33.

Djebarni, R. & Al-Abed, A. 2000. Satisfaction level with neighbourhoods in low-income public housing in Yemen. *Property Management* 18(4): 230–239.

Flavin, M. & Yamashita, T. 2011. Owner-occupied housing: life-cycle implications for the household portfolio. *American Economic Review* 101(3): 609–614.

Francescato, G. 1979. Residents' satisfaction in HUD-assisted housing: Design and management factors: Prepared for the Office of Policy Development and Research, US Department of Housing and Urban Development. *The Office*.

Garriga, C., Hedlund, A., Tang, Y. & Wang, P. 2023. Rural-urban migration, structural transformation, and housing markets in China. *American Economic Journal: Macroeconomics* 15(2): 413-440.

Giorgi, E., Lucía, M. L., Ruben, G. M., Aleksandra, K., Carlos, C. & Miguel, A. M. 2021. Co-Housing response to social isolation of COVID-19 outbreak, with a focus on gender implications. *Sustainability* 13: 7203. https://doi.org/10.3390/su13137203

Hashim, Z. A. 2010. House price and affordability in housing in Malaysia. *Akademika* 78(1): 37–46.

Hu, M., Su, Y. & Yu, X. 2022. Housing difficulties, health status and life satisfaction. *Frontiers in Psychology* 13: 1024875.

Ismail, N., Baniyamin, N. & Mohd Ali, A. 2020. The influences of socio-cultural characteristics on public low-cost residents' satisfaction: A case study on PPR Seri Aman Kuala Lumpur, Malaysia. *Voice of Academia* 16(2): 110-121.

Jim, C. Y. & Chen, W. Y. 2009. Value of scenic views: Hedonic assessment of private housing in Hong Kong. *Landscape and Urban Planning* 91(4): 226–234.

Kim, S., Hwang, J. & Lee, M. H. 2022. Effect of housing support programs on residential satisfaction and the housing cost burden: Analysis of the effect of housing support programs in Korea based on household attributes. *Land* 11(9): 1392.

Koçak Güngör, M. & Terzi, F. 2024. Residential satisfaction and quality of urban life: Examining diverse housing environments. *Archnet-IJAR: International Journal of Architectural Research* 18(1): 58-80.

Kowaltowski, D. C. C. K., da Silva, V. G., Pina, S. A. M. G., Labaki, L. C., Ruschel, R. C. & de Carvalho Moreira, D. 2006. Quality of life and sustainability issues as seen by the population of low-income housing in the region of Campinas, Brazil. *Habitat International* 30(4): 1100–1114.

Lee, K. Y. 2020. The effect of residential environmental satisfaction on quality of life and the

moderating effect of housing type: The case of Gyeonggi, Korea. *Asian Journal for Public Opinion Research* 8(1): 3-21.

Liu, G. 2014. Development of a general sustainability indicator for renewable energy systems: A review. *Renewable and Sustainable Energy Reviews* 31: 611–621.

Mahdi, Z. & Mazumder, T. N. 2023. Re-examining the informal housing problem in Delhi: A wicked problem perspective. *Cities* 140: 104419.

Mohit, M. A. & Raja, A. M. M. A.-K. 2014. Residential satisfaction-concept, theories and empirical studies. *Planning Malaysia Journal* 12(3).

Mottelson, J. 2023. On informal housing supply restrictions and livelihood in informal settlements: Implications for sustainable development. *Sustainable Development* 31(5): 3566-3578.

Ogu, V. I. 2002. Urban residential satisfaction and the planning implications in a developing world context: The example of Benin City, Nigeria. *International Planning Studies* 7(1): 37–53. https://doi.org/http://dx.doi.org/10.1080/13563470220112599

Pallant, J. 2001. *SPSS: Survival Manual*. Buckingham: Open University Press.

Potter, J. J., Chicoine, J. L. & Speicher, K. E. 2001. Predicting residential satisfaction: A comparative case study. *Architecture Program: Faculty Scholarly and Creative Activity* 5.

Rossi, A. S. 1955. *Why families move: A study in the social psychology of urban residential mobility*. Glencoe, IL: Free Press.

Salleh, A. G. 2008. Neighbourhood factors in private low-cost housing in Malaysia. *Habitat International* 32(4): 485–493.

Soyinka, O. & Siu, K. W. M. 2018. Urban informality, housing insecurity, and social exclusion: Concept and case study assessment for sustainable urban development. *City, Culture and Society* 15: 23–36.

Türkoğlu, H., Terzi, F., Salihoğlu, T., Bölen, F. & Okumuş, G. 2019. Residential satisfaction in formal and informal neighborhoods: The case of Istanbul, Turkey. *Archnet-IJAR: International Journal of Architectural Research* 13(1): 112–132.

UNDP. 2003. *The challenge of slums: Global report on human settlements 2003*. London: Earthscan & UN Habitat.

Varady, D. P. & Preiser, W. F. E. 1998. Scattered-site public housing and housing satisfaction: Implications for the new public housing program. *Journal of the American Planning Association* 64(2): 189–207.

Wouters-Soomers, L., Van Ruysseveldt, J., Bos, A. E. & Jacobs, N. 2022. An individual perspective on psychological safety: The role of basic need satisfaction and self-compassion. *Frontiers in Psychology* 13: 920908.

Winston, N. & Eastaway, M. P. 2008. Sustainable housing in the urban context: International sustainable development indicator sets and housing. *Social Indicators Research* 87(2): 211–221.

Zuber, M., Khosla, C. & Javed, N. B. 2023. Housing conditions and their impact on health of residents. *Engineering Proceedings* 56(1): 46.

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