

# Measuring the Residential Satisfaction as a Guide for Planning and Design Process in Housing Projects (Case Study of Riyadh in Saudi Arabia)

Abdulrazaq Thabet Mohammed, Mohamed Mahmoud H. Maatouk, and Mansour Rifaat Helmi

## ABSTRACT

This study sought to enhance the planning process of housing projects in Riyadh, Saudi Arabia by measuring residential satisfaction. To achieve this goal, the study conducted a survey of 3,568 household heads in four public housing projects and analyzed 342 responses using descriptive statistics. The survey consisted of forty-three indicators across six dimensions: residents' demographics, housing, social environment, physical environment, accessibility to services, and efficiency of services. The results of the survey revealed that while 49.6% of the residents were satisfied with their social relationships with neighbors, friends, and family, 59.4% of respondents were unsatisfied with the sense of safety and security within the projects, 78.7% were dissatisfied with housing project management, 68.8% with the physical environment, and 76.9% with access to public facilities such as mosques, schools, health and commercial centers, workplaces, relatives' homes, and the efficiency of housing project services was dissatisfied rated at 77.5%. Overall, the majority of respondents expressed dissatisfaction with the housing projects as a place to live. To address these findings, the study developed a conceptual framework and approach based on residents' satisfaction as a means of improving the planning and design of housing projects in Saudi Arabia. The study also reviewed best practices for planning housing projects worldwide to inform the conceptual framework and approach. These findings and suggestions can inform future efforts to improve the residential satisfaction of housing projects in the Kingdom of Saudi Arabia.

**Keywords:** Planning and design process, public housing projects, residential satisfaction, Riyadh.

**Published Online:** September 28, 2023

**ISSN:** 2796-1168

**DOI:** 10.24018/ejarch.2023.2.4.33

**A. T. Mohammed\***

Department of Urban and Regional Planning, Faculty of Architecture and Planning, King Abdulaziz University, Saudi Arabia.

(e-mail:

aabdulrazaqmohammed@stu.kau.edu.sa)

**M. M. H. Maatouk**

Department of Urban and Regional Planning, Faculty of Architecture and Planning, King Abdulaziz University, Saudi Arabia.

(e-mail: mmaatouk@kau.edu.sa)

**M. R. Helmi**

Department of Urban and Regional Planning, Faculty of Architecture and Planning, King Abdulaziz University, Saudi Arabia.

(e-mail: mhelmi@kau.edu.sa)

\*Corresponding Author

## I. INTRODUCTION

Adequate housing for various segments of society, particularly the low-income group, is a demand addressed by a system that incorporates economic, social, urban, design, and planning aspects. Saudi Arabia is worried about housing in order to increase the number of homeowners. Since 1970, the Five-Year Plans have regulated the number of grants necessary, as well as the number of plots of land and building materials permitted per five years. Until 2011, the government focused on social or public housing within the context of the developmental housing program by establishing the Housing Authority. Recently, the government has begun to relate these policies to Saudi Arabia's Vision 2030, as well as merging two ministries (the Ministry of Housing and the Ministry of Municipal and Rural Affairs) to become the Ministry of Municipal, Rural Affairs, and Housing. Despite numerous developmental achievements in terms of public housing distribution, implementation methods must be enhanced regarding the efficiency and speed of planned development efforts to maintain pace with the country's and society's goals (Al-Anzi, 2010). This vision is achievable as long as sufficient space is created for other stakeholders to collaborate within defined national, regional, and local frameworks to provide appropriate and affordable housing for the community's most vulnerable residents (Al-Mulhim *et al.*, 2022).

Few studies have focused on Saudi housing projects in terms of housing unit size, design, and construction materials in order to lower housing unit costs while attempting to ensure long-term sustainability (Bahammam, 2018; Haidar & Bahammam, 2020; Kabisch *et al.*, 2022). It was discovered that there is a gap between policies and practices in the provision of public housing projects (Al-Shihri, 2008), which manifests itself in the inability of many public housing projects to meet the expectations of the inhabitants in their living environment due to their lack of understanding of general housing indicators such as the physical and social environment, public services, and infrastructure availability, delivery plans and design for high-quality housing required for residents (Francescato *et al.*, 1989). These shortcomings emphasize the need to understand the factors influencing satisfaction with the residential environment.

Despite the role of housing satisfaction in quality of life (QoL), no statistical research has been conducted on residents' satisfaction with housing projects in Saudi Arabia. In developed countries, resident satisfaction has acquired consideration as a subjective indicator of housing quality (Morris & Winter, 1975), but not in developing countries.

The majority of studies used subjective and objective criteria to assess residential satisfaction by developing questionnaires to know the opinions of the residents. Subjective features include individual opinions on what is presented as objective aspects of the housing project, like the quality of houses, services, and public utilities. Furthermore, residential satisfaction heavily depends on the family's needs and housing situation. As a result, changes in residential satisfaction levels differ from changes in family desires and aspirations, which may be influenced by social situations or poor living conditions (Biswas *et al.*, 2021). The questionnaire indicates a description of the social situation, a guide to the status of the residential neighborhood's-built environment, and aspirations for a typical neighborhood that expresses the residents' vision and future ambitions (Kabisch *et al.*, 2022).

This research contributes to the worldwide literature by investigating residents' satisfaction with housing projects in Riyadh, Saudi Arabia, focusing on the criteria and indicators that determine the level of satisfaction to enhance the planning and design of housing projects.

## II. KINGDOM OF SAUDI ARABIA HOUSING PROJECTS SITUATION

One of the objectives of Vision 2030 is to provide more house ownership to Saudi residents, which is adequate to meeting their needs. However, recently, the decline in oil prices has had a substantial impact on the government budget which resulted in considerable declines in the house building financing. The government has also made many changes to encourage local and international developers to build 1.5 million houses in the country by 2025 (Ministry of Housing, 2018). As shown in Fig. 1, Vision 2030 for housing is planned in multiple phases, including encouraging healthy lifestyles and sports among residents, sustainable cities with improved infrastructure and services, decreasing pollution levels, and environmental protection (Al-Mulhim *et al.*, 2022). By realizing the rate of population growth in Riyadh city, many concerns were raised that the expanding housing might not be achieved with the Ministry of Municipal and Rural Affairs and Housing goals (PwC, 2014).



Fig. 1. Vision 2030 planned for housing. Source: Al-Mulhim *et al.* (2022).

Previously, the KSA's rapid urbanization resulted in the formation of unplanned neighborhoods devoid of safe areas, schools, hospitals, and infrastructure (Tolba & Saab, 2008). Even when people were able to locate housing, (Al Surf *et al.*, 2013) discovered that it was rarely sustainable or effective in meeting the occupants' cultural expectations. Short-term initiatives to develop a high number of affordable housing units are usually unsustainable and can result in a significant number of low-quality housing units (PwC, 2014).

According to a study from the Ministry of Municipal and Rural Affairs and Housing, the ownership percentage of eight housing initiatives has reached 60%. Among the initiatives are land subsidies from municipalities, real estate fund loans, villas and apartments, extra loans from commercial banks in collaboration with the Ministry, rent, and loans supplied by commercial banks and financial institutions. However, according to the survey done by (Banafea & Ibnrubbian, 2018), most housing programs were of average efficiency for individuals. The land grant program had a low level of program effectiveness of 30% because most municipal grants are always associated with areas not provided with public utilities such as electricity, water, and sewage. Also, there was no precise methodology or comprehensive strategy for identifying people's housing demands and preferences in residential projects. House sales by the Housing Ministry suffered from low percentages of 5.87%, such as maps selling compared to private developers' sales of 94.12% (General Authority for Statistics, 2019).

### A. Riyadh City, Case Study

Riyadh, the capital and largest city in Saudi Arabia. According to 2017 estimates (Sweden, 2019), it has a population of roughly 6.5 million people, and forecasts indicate that the city's population will grow between 10 and 15 million people by 2030. The Saudi capital is recognized as one of the world's fastest-growing cities, with the city's area rising from 1,800 km<sup>2</sup> to 3,115 km<sup>2</sup> in half a century. The major cause for internal migration to Riyadh is job opportunities; of the 75.4% migratory population, 64.2% are Saudi nationals, while 34.9% are non-Saudi citizens.

The housing units in Riyadh increased from 513,996 in 2004 to 1,217,996 units in 2016. The city now has 1,116,339 families, with 56% of them owning their own houses. Indeed, villas are preferred by the majority of families which provides more privacy. Thus, villas account for 52% of all housing units in Riyadh, apartments for 42%, and Arab homes with one-floor account for 2.5%. 70% of household heads migrated two or three times, and 10% five or more times (UN-Habitat, 2019).

As shown in Fig. 2, fifteen housing projects are located around Riyadh and are supervised by the Ministry of Housing in collaboration with the private sector to provide housing units with a variety of alternatives such as apartments, townhouses (attached houses), and villas. One of Riyadh's largest residential developments, the residential villa project in Bawabat Al Sharq includes 5,968 villas with a total area of 6,544,310 m<sup>2</sup>. The Mursiah Project, located in Joan Suburb, has a total area of 2.7 million m<sup>2</sup> and includes 5,590 apartments and townhouses. The Zamel Homes project provides 155 villas built on 41,776 m<sup>2</sup>. The Maali Anan housing project has 440 townhouses on 105,831 m<sup>2</sup>, ranging from 220 to 400 m<sup>2</sup>. The ministry has assigned ready-made apartments under two Sakani program choices, including the Parisiana Project, which provides about 686 units with an area of 133-179 m<sup>2</sup> on a total of 813 m<sup>2</sup>. Furthermore, the Sultan Project offers 77 apartments ranging in size from 124 to 280 m<sup>2</sup>, with a total area of 17,553 m<sup>2</sup>.

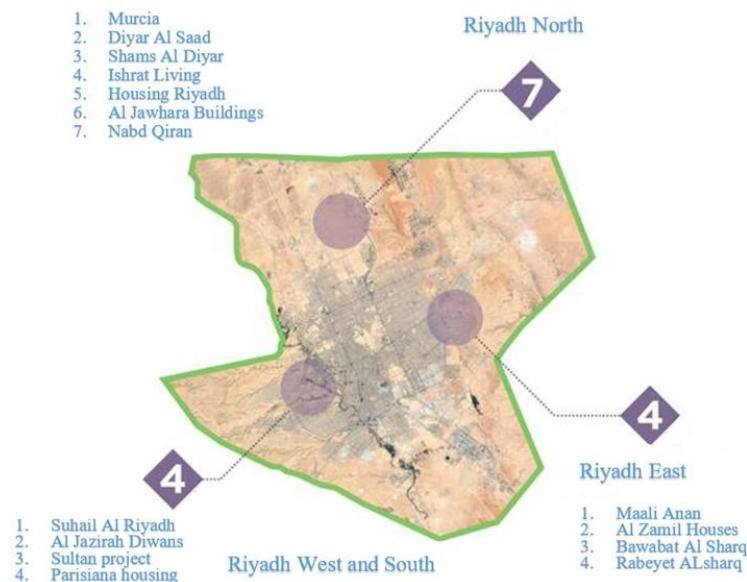


Fig. 2. Housing projects in Riyadh.  
Source: Adapted from Sakani Housing (2019).

## III. RESEARCH PROBLEM, QUESTIONS, AND OBJECTIVES

### A. Research Problem

The government intends to establish public housing projects at a rapid pace to bridge the gap between supply and demand caused by people's inability to provide suitable accommodation. Indeed, residential satisfaction and QoL have never been considered in the housing projects' planning and designing stage. Due to this, future research demands to evaluate and provide a review of suitable housing with high residential satisfaction and QoL.

### B. Research Questions

This study attempts to answer several questions related to the housing projects adopted by Saudi Arabia during the establishment of the Ministry of Housing,

- 1) What are the pros and cons of housing projects in Riyadh?
- 2) What are the best practices for planning and designing housing projects worldwide?
- 3) What is the residents' level of residential satisfaction in housing projects in the case study?
- 4) What are the suggestions for improving the planning and designing process of housing projects in Saudi Arabia?

### C. Research Objectives

To achieve the main research objective of developing the quality of planning and designing of housing projects based on residential satisfaction in Riyadh. The following specific objectives were investigated:

- 1) To review criteria and indicators of measuring residential satisfaction of housing projects.
- 2) To review the best practice of planning and designing housing projects worldwide.
- 3) To survey the level of residents' satisfaction with Riyadh housing projects.
- 4) To conclude with some suggestions for improving the planning and designing process of housing projects in Saudi Arabia.

## IV. RESEARCH METHODOLOGY

The research methodology was divided into several main sections:

- 1) Analyzing the international indicators and standards that affected residents' satisfaction and extracting the most important indicators and criteria that were influential in the level of resident satisfaction in many housing projects' experiences.
- 2) Formulating what was extracted from indicators and criteria in measuring the level of satisfaction through a questionnaire answered by residents of housing projects in Riyadh to identify the residents' satisfaction level and the most prominent indicators and criteria that contributed to changing the residents' satisfaction level.
- 3) Review the planning and design process of housing projects around the world in terms of how cities manage housing projects from the division of roles between national and local governments as well as decision-makers and real estate developers in order to become acquainted with the best practices globally to raise the level of planning and design process of housing projects in the Kingdom of Saudi Arabia.
- 4) The research concludes with a conceptual framework and methodology for enhancing the housing project planning and design process in the Kingdom of Saudi Arabia.

## V. REVIEW OF CRITERIA AND INDICATORS OF MEASURING RESIDENTIAL SATISFACTION OF HOUSING PROJECTS

The relations between residents and the built environment differ according to their ages, incomes, families, and what has been provided in housing projects. The general concept of residential satisfaction as a function of various categories of variables has been frequently discussed in the literature (Francescato *et al.*, 1989). They found through descriptive analysis when studying the social, economic, and physical environment criteria that some residents modify physical indicators such as the dwellings according to their needs and others move to a new home because they are unsatisfied. However, the physical interaction between housing and project components influenced individual and community satisfaction with the residential environment. For example, home infrastructure, safety, and privacy, neighbourhood deterioration, sports arenas, accessibility to neighbourhood facilities, green areas, and the developer's method of providing, distributing, and connecting them with the housing unit all affect resident satisfaction (Amérigo & Aragonés, 1997).

According to research done in Nigeria by Ukoha and Beamish (1997), the proximity of public services to public housing positively affects residential satisfaction. Conversely, individuals were unsatisfied with residential unit indicators such as building content, condition, and structural type. Furthermore, a study of low-income housing projects in Malaysia (Salleh & Yusof, 2006) discovered that green spaces and children's playgrounds influenced residents' satisfaction with the residential environment criteria between dwelling unit indicators, neighborhood facilities, and the built environment in housing projects. Additionally, amenities such as vehicle parking, a lack of security for residents, and the availability of special needs services were indicators of dissatisfaction with housing projects.

A study in South Korea compares residents of socially affordable homes with non-social housing emphasized that the availability of facilities boosted satisfaction levels. In contrast, the project's lack of parks and open space was the prime cause of concern, and landscape architecture in the residential area demonstrated residents' dissatisfaction (Ha, 2008).

The influence of independent indicators on changes in dependent indicators was examined by Mohit *et al.* (2010). The study found a positive relationship among housing units on multiple floors, the social environment for people of one race, and the quality of facilities and support services. There was also a negative association between housing satisfaction and the occupant's age, length of stay, family size and workers from the same family, kind of career, and previous residence.

A study by Opoku and Abdul-Muhmin (2010) indicated that housing projects in Saudi Arabia are directed only toward providing affordable housing. The research showed that the housing's interior



indicators impacted women's preferences. On the other hand, local environment indicators and proximity to family were more critical to married couples than to single respondents. The descriptive analysis method in the research analyzed housing preferences and essential indicators for citizens. Simultaneously, exterior material quality, residential neighbourhood type, and site location for services were critical for men and women. Another study assessed developers' and housing seekers' preferences (Mulliner & Algrnas, 2018) to investigate the outcomes of each group. The researchers found significant differences between housing seekers and developers' opinions of what residential indicators are important, like buildings' extrinsic and intrinsic material quality, location accessibility, and neighbourhood environment indicators. In contrast, built environment criteria such as physical building indicators were the most vital predictors of respondents' overall satisfaction in the study by Etmnani-Ghasrodashti *et al.* (2017). The lack of local services was the second significant concern in residents' minds because of the residential site's position in an outer area of the city. Housing project social criteria have less of an impact on residential satisfaction.

In addition, Lee (2020) identified three criteria that affect residential environmental satisfaction on the quality of life and the moderating effect of housing type. The first criteria were independent criteria for the residential environment, divided into three criteria: amenities, safety, and neighborhood relationships. The second criterion was housing type for low-rise to high-rise preference. The third criteria were demographic criteria that affected QoL. The analysis tested the effects of safety, amenities, and neighbourhood relationships on satisfaction with housing types. The research found the facilities available to the neighbourhood had a more significant impact on QoL than the type of housing, which affected the relationship between safety and QoL.

The review criteria and selection dimensions will mainly assess the quality of the survey about resident satisfaction. However, many previous studies discussed criteria and indicators that appeared in most residential satisfaction studies all over the world since 1978. In previous work, we summarized the six dimensions extracted as follows: demographic, physical environment, social environment, housing, accessibility to services, and efficiency of services (Mohammed *et al.*, 2022). The 43 popular indicators of those dimensions were also defined by describing how the indicators are measured, as tabulated in Table I.

TABLE I: CRITERIA, INDICATORS, AND MEASUREMENTS OF RESIDENTIAL SATISFACTION

Criteria/ Dimensions	Indicators	Measurements
Demographic Attributes	Household's age	Age per year
	Gender	Male/Female
	Income	Family income per month
	Educational	The level of responds' education
	Length of Residency	Numbers of years stays in housing
	Employment status	Employed, unemployed, retired
	Employment sector	Government, Private
	Home ownership	Tenure, Renters
	Family size	Members live in the house
	Vehicle owned	Owned car, rent car
Physical Environment	Appearance of residential project	Satisfaction of the level of cleanliness
	Management	Satisfaction level of handling complaints
	Surrounding buildings	Satisfaction of the Quality of buildings area within the estate
	Street lighting	Satisfaction level of the quality of the street lighting
	Public transportation	The distance to the bus station, metro
	Street sidewalks	Satisfaction level of the street sidewalks design
Social Environment	Sense of security and safety	Satisfaction level of the safety and security system
	Belonging to the neighborhood	Satisfaction level of the housing project
	Relationship with neighbors	Satisfaction level of the community relationships
	Relationship with relatives and friends	Satisfaction level of the time spent with relatives and friends
	Relationship with the family	Satisfaction level of the time spent with family members
Housing Characteristics	Bedrooms numbers	Satisfaction of the level of the size, number of the bedrooms
	Housing size	The average size of dwellings in m <sup>2</sup>
	Housing type	Villa, apartment
The Accessibility to services	Health centers, schools, sports clubs and social centers, commercial services, mosques, public parks and green spaces, accessibility to relatives' houses, worksite	Satisfaction with local services' accessibility, closeness to services, relatives' places, work site
The efficiency of services	Health centers, schools, public parks and green spaces, water service, commercial services, sanitation service, mosques, sports clubs and social centers, public squares and pedestrian paths, mobile service and network coverage, internet service	Satisfaction with local services and infrastructure quality

## VI. REVIEW OF THE BEST PRACTICE FOR PLANNING AND DESIGNING OF HOUSING PROJECTS WORLDWIDE

Many countries all over the globe have collaborated with various organizations to make housing projects

effective in their implementation on the ground. Regulations have been created at different levels as planning policies and processes. These levels mostly proceeded from national to regional, then to city, and eventually to developer corporation. Several legislations and policies were incorporated into the planning process to protect the role of the resident as an end user by providing decent housing fit for current and future demands with a high QoL. One of the national planning techniques is the right of residents who cannot secure housing through the real estate market to obtain homes sponsored by local government bodies concerned with public housing, as is the case in both Canada and Australia.

Canada, for example, has enacted legislation that examines the real estate market and directs the relevant authorities to investigate the requirements of citizens who cannot afford housing and to include them in the housing project system that may provide for them (Porter, 2018). Australia has also identified and produced a socioeconomic database for people who are qualified for housing, as well as information on the present real estate market in terms of quality, accessibility, safety, availability, and ownership opportunities for all demographics. Certain factors that might influence the real estate market, such as policies, housing programs, finance, population growth, and existing family size, are considered and translated into planning and design to meet people's needs (Milligan *et al.*, 2007).

Affordable housing was related to the national planning policy framework in the British public housing experience. Several regulations have been put in place to compel local governments to provide low-income people with homes. Among these rules is a requirement that the minimum rent for such housing for low-income people be at least 20% cheaper than the local real estate market rentals, including service costs. Furthermore, clarification of the design code and its guide for each residential project in terms of the diversity of spaces for the residential units in the selected locations, the city's future growth patterns, and its accessibility by public transit are required (Austin *et al.*, 2013; Government of the United Kingdom, 2012). Furthermore, the housing system has been controlled, with the central government establishing housing standards and financing sources. Further, the local government has developed four housing improvement programs: needs monitoring, resource routing, standard enforcement, and licensing and regulation. Finally, local partners are in charge of gathering information such as socioeconomic situations of people's eligibility for housing, finance, and the acceptability of the services offered for the housing project's beneficiaries (Preece *et al.*, 2021).

In China, a structural framework for public housing provision has been implemented from several different sides. The National Committee for Reform and Development supervises the general planning of housing projects; the Ministry of Human Resources and Rural Development sets long-term and annual goals, develops initial guidelines, and monitors the success of public housing at the district level; the Ministry of Land Resources is responsible for allocating land resources to housing projects at the provincial level; The Ministry of Finance is in charge of designing and supervising the allocation of financing and capital to housing projects; finally, as developers of public housing projects, the Bank of China and the Central Bank of China are in charge of designing preferential policy and supervising the budget of capital market financing (Chen *et al.*, 2014).

In Malaysia, the housing provision structure is either directly through the federal government (which is responsible for setting policies, laws, and rules that regulate affordable housing projects through rent and sale) or indirectly through the concerned bodies as a system to locate affordable housing separate from the private real estate market (Shuid, 2016). In the United States, public housing projects were established as part of the city's master plan as a program that provides low-income residents with such housing at rates ranging from 20 to 30% of the overall urban development area. It also provided incentives to those who increased housing densities in order to enhance the number of units assigned to low-income individuals as alternative options for the national structural framework, given that each state in the United States has varied legislation and policies (Kalugina, 2016).

## VII. SURVEY METHODOLOGY

Data was collected through a survey targeting residents of housing projects in Riyadh. The residents' opinion is necessary to measure the satisfaction level with the housing projects that the Ministry of Housing worked on in cooperation with real estate developers in light of the participation of the private sector to increase the chances of obtaining affordable housing in the KSA. The questionnaire is an ideal way to collect data on the opinions and behavior of a large population using these projects. Furthermore, it assists the researcher in determining the frequency of residents' opinions on the various indicators that face a high rate of dissatisfaction or satisfaction with the current situation of housing projects, with the goal of improving housing planning in place to contribute to raising QoL.

The questionnaire consists of five main sections. The first section collected data on the participants' socioeconomic profiles of housing project residents such as: age, occupation, health status, gender, marital

status, monthly income, type of car ownership, and the number of family members. The second section analyzed housing indicators such as: the current housing type, numbers of bedrooms, housing size, housing project name and location in Riyadh, housing ownership, and the duration of residence in the project. The third section collected data on the accessibility and efficiency of services available to housing projects such as: mosques, health centers, schools, public parks and green spaces, social centers and sports clubs, and commercial services. This also includes accessibility to worksites and relatives' housing from the project, and services efficiencies like internet, water and sanitation, public squares and pedestrian paths, mobile and network coverage. The fourth section analyzed physical environment indicators such as the quality of the buildings surrounding the projects, the availability of public transportation, project maintenance management and response to residents' complaints, project cleanliness, street sidewalks, and lighting. The fifth section dealt with social environment standards such as: security and safety, the resident's relationship with family, friends, and relatives, relations between neighbors, and belonging to the neighborhood, and finally, the overall satisfaction with the housing project.

Questionnaires allow researchers to obtain information from a large group of respondents in a limited time frame. Google Forms was used to create an online survey interface, a preferred method for its fast, economical, and environmentally friendly data collection method. In this research, the survey questions were posted via the Telegram® Messenger App to four different housing projects. It was provided to the residents of the projects who formed groups under the names of residential projects in Riyadh; EastGate with 2,100 residents, BeyutAlzamel 155, MaealiAnan 285, Al-Jawan Suburb 1,028 residents, respectively. The frame of the study sample was 3568, 350 responses were obtained, 8 responses were excluded, and the sample size was 342. More than 57.3% of the respondents' houses are located in the Eastgate project, 28.1% on the Al-Jawan Suburb project's north side, and 13.2% on the east side of BeyutAlzamel and MaealiAnan projects, 1.5% are located west and south projects. The statistical analysis of the data collected from the targeted respondents was performed using the Statistical Package for Social Sciences (SPSS) program to investigate data. In the questionnaire, residents' level of satisfaction with housing projects was measured using a Likert-type scale ranging from 1 to 3 with the following scale: 1 = dissatisfied, 2 = neutral, 3 = satisfied. Among the different questions answered by the study sample were multiple-choice and open-ended questions.

#### A. Survey Results

The residents' socio-economic statuses from different criteria and indicators are expressed in detail in Table II. The survey results were provided by (86.3%) of men and (13.7%) of women. In education, (48.6%) of the respondents hold a bachelor's degree and (38.6%) hold a high school diploma. The majority age group ranged between 36-40 years, representing (30.7%) of the sample, followed by 31-35 years, representing (25.7%). The number of residents who enjoyed good health was (88.6%), and the most common families consisted of three to four members (42.7%), followed by five to six members (34.5%). The majority of those whose monthly income ranged between 6,000 and 10,000 Saudi Riyals is (37.7%), while (33.3%) earn between 11,000 and 15,000 Saudi Riyals. More than (69.3%) of the respondents were working in the government sector. Out of 342 respondents, 70.5% of residents own a car as a means of transportation in the city, while 27.2% use rent a car.

TABLE II: RESPONDENTS' SOCIO-ECONOMIC CRITERIA

Criteria	Indicators	Frequency (n = 342)	Percentage
Gender	Male	295	86.3
	Female	47	13.7
Age	Under 25	5	1.5
	26 – 30	29	8.5
	31 – 35	88	25.7
	36 – 40	105	30.7
	41 – 45	66	19.3
	46 – 50	36	10.5
	Over 51	13	3.8
Educational level	Intermediate education	5	1.5
	High school or diploma	132	38.6
	Bachelor's	167	48.8
	Postgraduate Studies (Masters - PhD)	38	11.1
Social status	Married	325	95.0
	Divorced	14	4.1
	Single	2	0.6
	Widower	1	0.3
Health status	Good	303	88.6
	Medium	37	10.8
	Poor	2	0.6
Family members	1 = (1–2)	32	9.4
	2 = (3–4)	146	42.7
	3 = (5–6)	118	34.5
	4 = (7–8)	35	10.2

Criteria	Indicators	Frequency (n = 342)	Percentage
	5 = (9-10)	11	3.2
Monthly Income (in Saudi Riyals)	1000 riyals - 5000 riyals	45	13.2
	6000 riyals - 10,000 riyals	129	37.7
	11,000 riyals - 15,000 riyals	114	33.3
	16,000 riyals - 20,000 riyals	29	8.5
	21,000 riyals - 25,000 riyals	6	1.8
	26,000 riyals or more	15	4.4
	No income	4	1.2
Job	Government sector	237	69.3
	Private sector	82	24.0
	Free business	7	2.0
	Retired	8	2.3
	Unemployed	8	2.3
Housing type	Apartment	172	50.3
	Villa	163	47.7
	Arabic house	7	2.0
Length of stay in the project	Less than one year	287	83.9
	One year	34	9.9
	More than one year	21	6.1
Car ownership	Owner	241	70.5
	Rented car	93	27.2
	None	8	2.3

Inquiries were made about a group of facilities such as mosques, schools, health centers, parks, social centers, sports clubs, and social services in terms of their accessibility for residents. As indicated in Fig. 3, the majority of residents were unsatisfied with the accessibility to all of these facilities; 84.2% were dissatisfied with the accessibility to health centers, 83.9% with the accessibility to schools, and 83% with the accessibility to public parks and green spaces. Residents were unsatisfied with the accessibility of sports clubs and social centers (81%), commercial services (80.4%), mosques (74.6%), worksites (65.5%), and relative housing (62.3%).

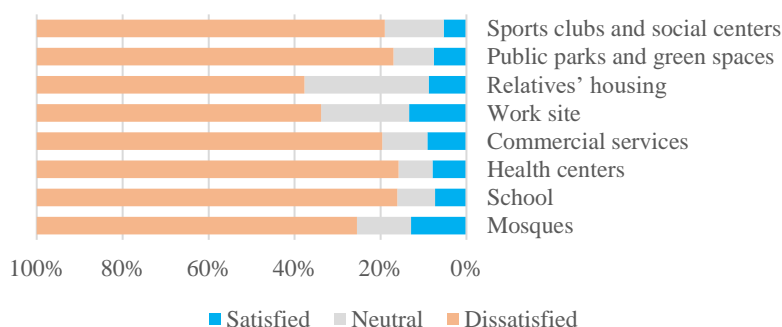


Fig. 3. Satisfaction level with the accessibility to services.

In terms of the effectiveness of the facilities shown in Fig. 4, the majority of respondents were found to be unsatisfied with the following: schools (83.6%), public parks and green spaces (82.7%), sewage services (79.2%), health centers (80.4%), sports clubs and social centers (79.8%), public squares and pedestrian paths (70.5%), commercial services (78.7%), internet service (74%), water service (72.5%), mosque efficiency (74%), and mobile network coverage (65.2%).

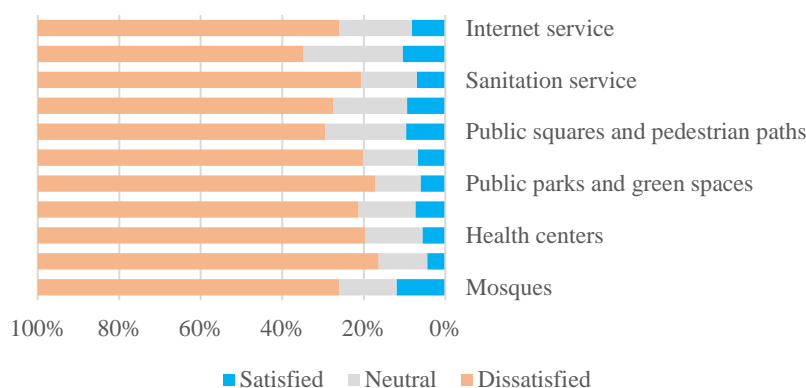


Fig. 4. Satisfaction level with the efficiency of services.

In terms of satisfaction with the physical environment, as shown in Fig. 5, responses revealed that 85.7%



were dissatisfied with public transit in both the bus and metro systems. Nevertheless, there was even more dissatisfaction with management in terms of periodic maintenance and reaction to residents' complaints (78.7%), housing project cleanliness (69.6%), building quality (64.3%), streetlights (61.7%), and street sidewalks (52.9%).

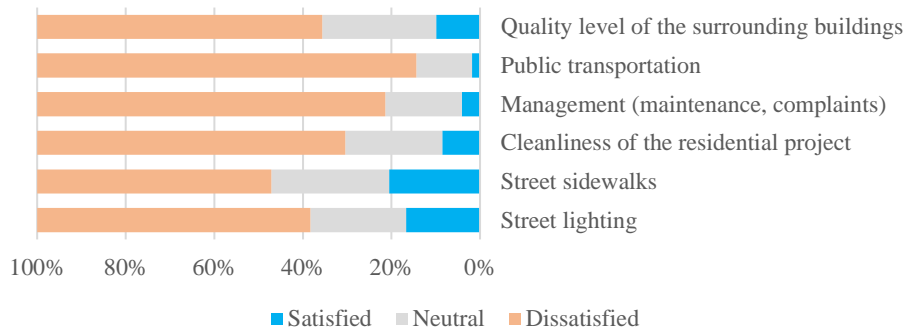


Fig. 5. Satisfaction level with the physical environment.

Fig. 6 illustrates the concerning level of satisfaction with the social environment. Overall, 59.4% of survey respondents reported that they were unsatisfied with the sense of safety and security within the projects. Yet, the questionnaires revealed that 45.3% of respondents were satisfied with social connections amongst neighbors. Similarly, 54.7 of locals were satisfied with their own families' relationships in terms of time and activities spent together. The number of inhabitants who were unsatisfied with their sense of belonging to the area was 38.3%, whereas the percentage of residents who were satisfied with their relationships with friends was 48.8%.

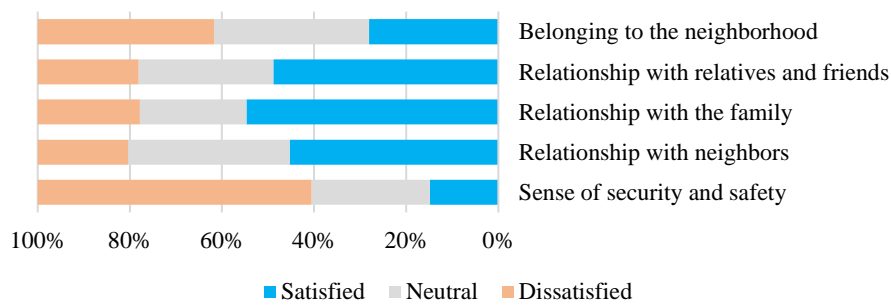


Fig. 6. Satisfaction level with the social environment.

In the questionnaire, forty-three indicators were addressing different aspects of the respondents about residential satisfaction. Fig. 7 shows the overall satisfaction with the housing projects as places to live. The results revealed that the majority of the residents (52%) were unsatisfied with public housing as places to live in Riyadh city. Whereas 15.8% reported they were satisfied and the remaining respondents (32.2%) were neutral.

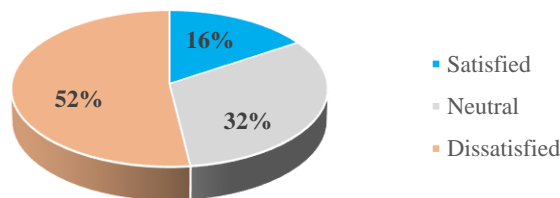


Fig. 7. Overall satisfaction with the housing projects.

Three-point Likert scale range was used to categorise overall satisfaction with the housing projects. Categories were: Dissatisfied = 1–1.66; Neutral = 1.67–2.33; Satisfied = 2.34–3. The research findings reported that the weighted mean score of satisfaction with the accessibility and efficiency of services and the physical environment was less than 1.66. The weighted mean of the satisfaction score with the social environment was between 1.56 and 2.31, putting it in the neutral group. Yet, the overall satisfaction mean

score is below 1.66, as detailed in Table III.

TABLE III: SATISFACTION WITH HOUSING PROJECT INDICATORS

Satisfaction with (n = 342)	Satisfied		Neutral		Dissatisfied		Weighted Mean
	n	%	n	%	n	%	
Accessibility to services							
Mosques	44	12.9	43	12.6	255	74.6	1.38
School	25	7.3	30	8.8	287	83.9	1.23
Health centers	27	7.9	27	7.9	288	84.2	1.24
Commercial services	31	9.1	36	10.5	275	80.4	1.29
Work site	45	13.2	73	20.3	224	65.5	1.48
Relatives' housing	30	8.8	99	28.9	213	62.3	1.46
Public parks and green spaces	26	7.6	32	9.4	284	83	1.25
Sports clubs and social centers	18	5.3	47	13.7	277	81	1.24
The efficiency of services							
Mosques	41	12	48	14	253	74	1.38
School	15	4.4	41	12	286	83.6	1.21
Health centers	19	5.6	48	14	275	80.4	1.25
Commercial services	25	7.3	48	14	269	78.7	1.29
Public parks and green spaces	21	6.1	38	11.1	283	82.7	1.23
Sports clubs and social centers	23	6.7	46	13.5	273	79.8	1.27
Public squares and pedestrian paths	33	9.6	68	19.9	241	70.5	1.39
Water service	32	9.4	62	18.1	248	72.5	1.37
Sanitation service	24	7	47	13.7	271	79.2	1.28
Mobile service and network coverage	36	10.5	83	24.3	223	65.2	1.45
Internet service	28	8.2	61	17.8	253	74	1.34
The physical environment							
Street lighting	57	16.7	74	21.6	211	61.7	1.55
Street sidewalks	70	20.5	91	26.6	181	52.9	1.68
Cleanliness of the residential project	29	8.5	75	21.9	238	69.6	1.39
Management (maintenance, complaints)	14	4.1	59	17.3	269	78.7	1.25
Public transportation	6	1.8	43	12.6	293	85.7	1.16
Quality level of the surrounding buildings	34	9.9	88	25.7	220	64.3	1.46
The social environment							
Relationship with neighbors	155	45.3	120	35.1	67	19.6	2.26
Relationship with the family	187	54.7	79	23.1	76	22.2	2.32
Relationship with relatives and friends	167	48.8	100	29.2	75	21.9	2.27
Belonging to the neighborhood	96	28.1	115	33.6	131	38.3	1.90
Sense of security and safety	51	14.9	88	25.7	203	59.4	1.56
Overall satisfaction	54	15.8	110	32.2	178	52	1.64

### B. Survey Discussion

The results of the questionnaire revealed that the dissatisfaction was primarily due to a lack of necessary services in the housing projects or their inefficiency; it also revealed that the accessibility of services adjacent to the housing projects was not sufficient. It was discovered that health centers, schools, parks and green areas, sports clubs, social and commercial centers, and mosques were not easily accessible. These findings corroborated the findings of Etmnani-Ghasrodashti *et al.* (2017) and Salleh and Yusof (2006), the accessibility to public parks and green spaces, as well as their effectiveness in housing projects, were considered external environmental indicators that affected the findings of dissatisfaction. As a result, their research advised that existing communities be merged with new housing projects so that residents may benefit from and have easy access to current services.

Lee's study (2020) result is in agreement with the study's findings in terms of the low efficiency of services provided to the residential project, and where the study suggested that attracting developers to investment places allocated to the residential project may be one of the factors that may raise service efficiency and thus QoL. The efficiency of sewage services, the internet, and mobile networks in the projects all contribute to inhabitants' satisfaction with their living conditions. The questionnaire results demonstrated the inefficiency of these services for residential projects, which was consistent with the findings of Ha (2008) and Ukoha and Beamish (1997).

The accessibility of public transportation with the residential projects was a significant source of dissatisfaction. It demonstrated the importance of increasing facilities such as bus stations around those projects (Etmnani-Ghasrodashti *et al.*, 2017; Ukoha & Beamish, 1997). The three most minor indicators of project dissatisfaction were the closeness to relatives and work sites. As a result of the high percentage of private car ownership, the overall number of residents who own cars may be viewed as insufficient to meet the population's demands for public transit.

Contrary to prior studies (Etmnani-Ghasrodashti *et al.*, 2017; Lee, 2020), relationships between residents, friends, relatives, and other family members did not significantly affect the general satisfaction of the residents (Mohit *et al.*, 2010). Among the reasons for dissatisfaction with internet services and mobile network coverage were poor site selection for housing projects and a lack of coordination among authorities, which resulted in unsuitable placements (Opoku & Abdul-Muhmin, 2010).

Residents' dissatisfaction with the housing projects was highlighted by the findings of measuring security and safety indicators, which is similar to the research of (Amérigo & Aragonés, 1997; Lee, 2020; Salleh & Yusof, 2006). The causes for unhappiness varied in the research since the projects may be separated from the city or lack street lights and pedestrian paths. Also, the difference between the studies of Etmnani-Ghasrodashti *et al.* (2017), Opoku and Abdul-Muhmin (2010), and Ukoha and Beamish (1997) on maintenance, cleanliness, and the developers' management of residents' complaints agreed with the outcomes of this study on those same factors. This study stands in agreement with Mulliner and Algrnas (2018) and with Ukoha and Beamish (1997), who found dissatisfaction with the quality of the buildings surrounding housing projects.

VIII. SUGGESTIONS

The level of satisfaction with housing projects is an essential part of QoL, therefore incorporating the six criteria specified in the housing satisfaction studies for housing project planning from the outset allows us to incorporate residents in collecting their opinions and aspirations. Furthermore, in order to combine these indicators to achieve the highest quality levels in housing projects, the concerned stakeholder must adopt a clear and simple methodology that is applicable to ensure access to housing that achieves residential satisfaction and make it a tool for planning and design. The stakeholder can then analyze their initiatives in terms of implementation and performance in order to adopt successful housing policies, as indicated in Fig. 8.

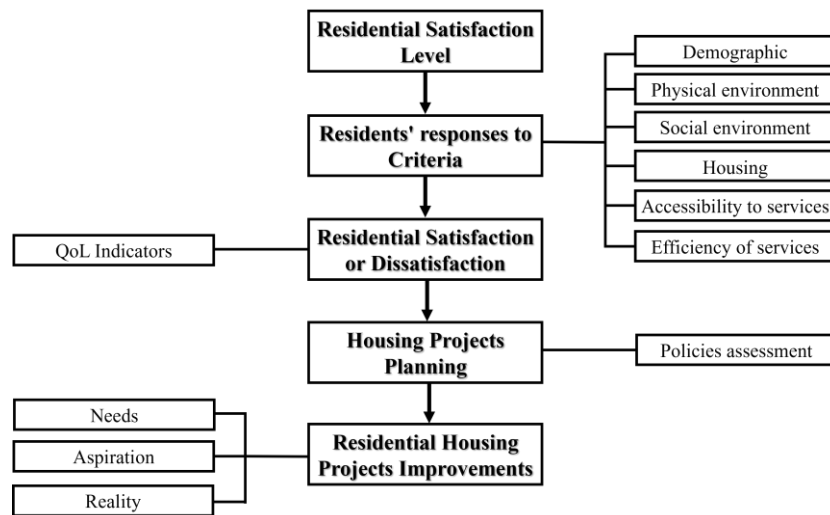


Fig. 8. The conceptual framework for raising housing projects planning process in Saudi Arabia.

The challenge in completing the project is establishing how to manage housing projects while ensuring resident satisfaction and quality of life. As a result, defining a clear route or strategy for each timeframe, cost, nature of indicators, roles assigned to stakeholders, and plan follow-up is one of the foundations upon which project design is built. As a consequence, the lack of clarity or availability leads many initiatives to fail or be delayed due to poor planning and a lack of engagement on the part of those involved in these projects. Furthermore, suppose the procedures and implementation methods are not compared with the local and global indicators included in the planning process, along with the main and secondary indicators, to improve the QoL in its internal and external environment. In that case, no housing project will be able to achieve the desired goals once designed and implemented.

The performance system should be compatible with the country's vision established with the initial design and implementation via the distribution of works and duties among the developers who have been selected based on the highest relevant standards in the planning of housing projects, as shown in Fig. 9. Begin by developing the indicators specified in the design, the best means for implementing them, and the delivery time for each phase of the project. Using specialized control methods for gathering and evaluating information and drawing conclusions and indicators within the framework of time, spatial, and objective restrictions as the project's features were specified in the first two stages and then produced on a consistent schedule. Finally, reports are prepared and presented to the appropriate higher government bodies to ensure the quality of the deliverables.

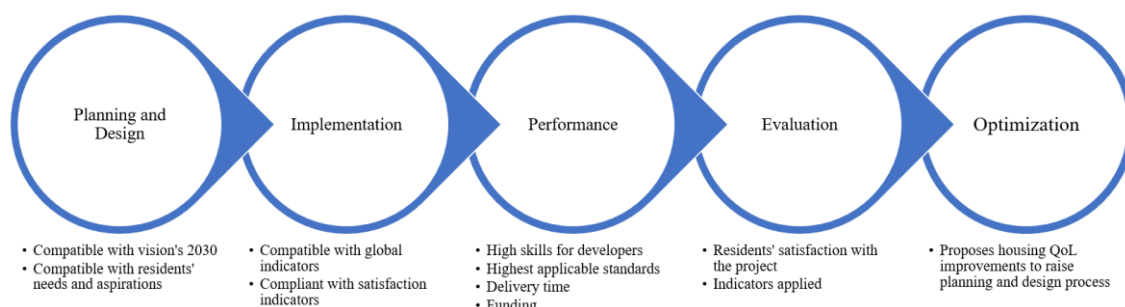


Fig. 9. An approach to raising housing projects planning in Saudi Arabia based on residents' satisfaction.

## IX. CONCLUSIONS

This study was performed to evaluate the residents' satisfaction of public housing in Riyadh city as a guide for the planning and designing process in the housing projects. The study examined various satisfaction aspects, including demographic, physical environment, social environment, housing, accessibility to services and efficiency of services. The analysis summarized in this paper indicates that cities have attempted to solve housing issues and rising demand by establishing public or social housing projects for residents. The results showed that, in general, the provision of as many residences aids this planning as feasible on government lands to decrease the overall cost of housing. Nevertheless, simply giving shelter is insufficient to improve people's QoL. More specifically, overall satisfaction with housing projects in Riyadh, Saudi Arabia was unsatisfied by (52%) and only (15.8%) were satisfied as places to live.

The Ministry of Municipal and Rural Affairs and Housing should make efforts to enhance the residential satisfaction level. A solution is required to determine the QoL in the housing project environment by assessing residents' satisfaction levels for those indicators. Based on an examination of the indicators presented in this paper, the practice of housing projects on planning and design, on the one hand, and residential satisfaction, on the other, revealed flaws in locating urban areas for people capable of establishing an integrated environment. Otherwise, housing projects will be deserted due to the exodus of residents to neighborhoods that suit their aspirations. Incorporating housing satisfaction criteria in housing projects is capable of meeting the ambitions of inhabitants and improving the reality of those projects. Nevertheless, it needs strong cooperation and constant commitment with stakeholders to engage in the ongoing planning process of high- QoL housing projects.

Further, the stages of development in the KSA are not lacking in decisions governing and enabling residential development for qualified inhabitants. Meanwhile, attaining management of housing projects and enhancing the consumer's living environment of the residents' satisfaction of public housing requires cooperation among the relevant government agencies. This study should be considered as an initial attempt to explore residential satisfaction and adjust their expectations accordingly. More future study is required to discover the effective management approach for housing projects involving several levels of government, developers, and residents. It can be concluded that establishing a comprehensive systematic framework for the Kingdom of Saudi Arabia's public housing industry will coordinate all stakeholders to increase resident satisfaction and achieve the desired quality of life in keeping with the higher goals of the Saudi Arabia Ministry of Municipal and Rural Affairs and Housing.

## ACKNOWLEDGMENT

The authors would like to thank for the accomplishment of the research supported by many things, that he/she cannot mention one by one. In particular, the corresponding author would like to present gratitude for Prof. Mohamed Mahmoud H. Maatouk as a supervisor, Dr. Mansour Rifaat Helmi as a supervisor assistant, my family and all friends for their efforts in obtaining the information for this study at the Ministry of Municipal, Rural Affairs, and Housing, Department of Urban and Regional, Faculty of Architecture and Planning, King Abdulaziz University, Jeddah, Saudi Arabia.

## CONFLICT OF INTEREST

The authors declare that they do not have any conflict of interest.

## REFERENCES

- Al-Anzi, A. (2010). Economy and Planning: Development plans lack implementation and we are not concerned with holding the defaulters accountable. September 22. [https://www.aleqt.com/2010/09/22/article\\_445338.html](https://www.aleqt.com/2010/09/22/article_445338.html).
- Al-Mulhim, K. A. M., Swapan, M. S. H., & Khan, S. (2022). Critical junctures in sustainable social housing policy development in Saudi Arabia: A review. *Sustainability*, 14(5), 2979.
- Al-Shihri, F. (2008). Urban development policies and its role in housing affordability in Saudi Arabia. *JES. Journal of Engineering Sciences*, 36(6), 1573-1593.
- Al Surf, M., Trigunaryyah, B., & Susilawati, C. (2013). Saudi Arabia's sustainable housing limitations: the experts' views. *Smart and Sustainable Built Environment*, 2(3), 251-271.
- Amérgio, M., & Aragónés, J. (1997). A theoretical and methodological approach to the study of residential satisfaction. *Journal of Environmental Psychology*, 17, 47-57.
- Austin, P. M., Gurran, N., & Whitehead, C. M. (2013). Planning and affordable housing in Australia, New Zealand and England: Common culture; different mechanisms. *Journal of Housing and the Built Environment*, 29(3), 455-472.
- Bahammam, A. (2018). An approach to provide adequate housing in Saudi Arabia. *J. Archit. Plan*, 30, 55-78.
- Banafea, W. A., & Ibnrubbian, A. K. (2018). The effectiveness of housing programs in Saudi Arabia. *University of Sharjah Journal of Humanities and Social Sciences*, 15(2), 1-37.
- Biswas, B., Ahsan, M. N., & Mallick, B. (2021). Analysis of residential satisfaction: An empirical evidence from neighbouring communities of Rohingya camps in Cox's Bazar, Bangladesh. *PLoS one*, 16(4), e0250838.
- Chen, J., Yang, Z., & Wang, Y. P. (2014). The new Chinese model of public housing: A step forward or backward? *Housing Studies*, 29(4), 534-550.
- Etmnani-Ghasrodashti, R., Majedi, H., & Paydar, M. (2017). Assessment of residential satisfaction in mehr housing scheme: A Case study of Sadra New Town, Iran. *Housing, Theory and Society*, 34(3), 323-342.
- Francescato, G., Wiedemann, S., & Anderson, J. R. (1989). Evaluating the built environment from the users' point of view: An attitudinal model of residential satisfaction. In W. F. E., Preiser (Ed.), *Building evaluation* (pp. 181-198). Plenum.
- General Authority for Statistics. (2019). Housing Statistics Bulletin. Riyadh: General Authority for Statistics. [https://www.stats.gov.sa/sites/default/files/nshr\\_hst\\_lmkn\\_lmntsf\\_m\\_2019.pdf](https://www.stats.gov.sa/sites/default/files/nshr_hst_lmkn_lmntsf_m_2019.pdf).
- Government of the United Kingdom. (2012, March 27). *National planning policy framework. Annex 2: Glossary*. <https://www.gov.uk/guidance/national-planning-policy-framework/annex-2-glossary>.
- Ha, S. K. (2008). Social housing estates and sustainable community development in South Korea. *Habitat International*, 32(3), 349-363.
- Haidar, E., & Bahammam, A. (2020). Compatibility of housing programs and initiatives with the Kingdom's vision (2030). *The 2nd International Engineering Conference and Exhibition. Riyadh: Saudi Council of Engineers*, 1-10.
- Kabisch, S., Poessneck, J., Soeding, M., & Schlink, U. (2022). Measuring residential satisfaction over time: results from a unique long-term study of a large housing estate. *Housing Studies*, 37(10), 1858-1876.
- Kalugina, A. (2016). Affordable housing policies: An overview. *Cornell Real Estate Review*, 14(1), 76-83.
- 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.
- Milligan, V., Phibbs, P., Gurran, N., & Fagan, K. (2007). *Approaches to evaluation of affordable housing initiatives in Australia* (Research Paper No. 7). Australian Housing and Urban Research Institute. [http://www.ahuri.edu.au/publications/download/nrv3\\_research\\_paper\\_7](http://www.ahuri.edu.au/publications/download/nrv3_research_paper_7).
- Ministry of Housing. (2018). *Saudi Vision 2030. The Housing Program Delivery Plan (2021-2025)*. [https://www.vision2030.gov.sa/media/ek5al1pw/housing\\_eng.pdf](https://www.vision2030.gov.sa/media/ek5al1pw/housing_eng.pdf).
- Mohammed, A., Maatouk, M., & Helmi, M. (2022). Conceptual framework of residential satisfaction indicators to direct housing policy: A review. *7th Arab Housing Conference*, 1-15.
- Mohit, M. A., Ibrahim, M., & Rashid, Y. R. (2010). Assessment of residential satisfaction in newly designed public low-cost housing in Kuala Lumpur, Malaysia. *Habitat International*, 34(1), 18-27.
- Morris, E. W., & Winter, M. (1975). A theory of family housing adjustment. *Journal of Marriage and Family*, 37(1), 79-88.
- Mulliner, E., & Algrmas, M. (2018). Preferences for housing attributes in Saudi Arabia: A comparison between consumers' and property practitioners' views. *Cities*, 83, 152-164.
- Opoku, R. A., & Abdul-Muhmin, A. G. (2010). Housing preferences and attribute importance among low-income consumers in Saudi Arabia. *Habitat International*, 34(2), 219-227.
- Preece, J., Robinson, D., Gibb, K., & Young, G. (2021). *Housing policy and poor-quality homes* (Report). Centre for Ageing Better. <https://ageing-better.org.uk/sites/default/files/2022-03/CaCHE-Past-Present-and-Future-Housing-Policy.pdf>.
- Porter, B. (2018). *Enhancing the rights-based framework for Canada's national housing strategy* (Report). Social Rights Advocacy Centre, 14. <https://assets.cmhc-schl.gc.ca/sites/place-to-call-home/pdfs/enhancing-the-rights-based-framework-bruce-porter-en.pdf>.
- PwC. (2014). *Anticipating problems, finding solutions. Global annual review 2014* (Report). PricewaterhouseCoopers. <https://www.pwc.com/gx/en/global-annual-review/assets/pwc-global-annual-review-2014.pdf>.
- Salleh, A. G., & Yusof, N. (2006). *Residential satisfaction in low-cost Housing in Malaysia* (Report). [https://www.academia.edu/27367908/Residential\\_Satisfaction\\_In\\_Low\\_Cost\\_Housing\\_In\\_Malaysia](https://www.academia.edu/27367908/Residential_Satisfaction_In_Low_Cost_Housing_In_Malaysia).
- Sakani Housing. (2019). *Sakani: 15 housing projects in Riyadh are currently being implemented to meet the wishes of the beneficiaries*. Sakani. <https://sakani.housing.sa/news/542153>.
- Shuid, S. (2016). The housing provision system in Malaysia. *Habitat International*, 54(3), 210-223.
- Sweden, F. (2019). *Riyadh is the capital of culture and civilization*. Al-Jazirah.Com. <https://www.al-jazirah.com/2019/20190331/rj1.htm>.
- Tolba, M. K., & Saab, N. W. (2008). *Arab environment: Future challenges. 2008 Report of the Arab Forum for environment and development* (Report). United Nations Environment Programme. [https://wedocs.unep.org/bitstream/handle/20.500.11822/9639/-Arab\\_Environment\\_1\\_Future\\_Challenges-2008ArabEnvironment\\_FutureChallenges\\_2008.pdf.pdf](https://wedocs.unep.org/bitstream/handle/20.500.11822/9639/-Arab_Environment_1_Future_Challenges-2008ArabEnvironment_FutureChallenges_2008.pdf.pdf).
- Ukoha, O. M., & Beamish, J. O. (1997). Assessment of residents' satisfaction with public housing in Abuja, Nigeria. *Habitat International*, 21, 445-460.
- UN-Habitat. (2019). *Future Saudi Cities Programme* (Report). Ministry of Municipal and Rural Affairs. <https://unhabitat.org/sites/default/files/2020/03/riyadh.pdf>.





**Abdulrazaq Mohammed** was born on 26 Nov1982 in Riyadh, Saudi Arabia. In 2006, He joined the Department of Regional and Urban Planning, at King Saud University, Riyadh, KSA. In 2005, he received his bachelor's degree in Architecture and Planning. In 2015, he earned his MSc degree in Advanced Geographic Information Systems at Arizona State University, United States. In 2019 He started his Ph.D. at the Department of Urban and Regional Planning, King Abdulaziz University, Saudi Arabia. His research interests include Urban Regional Policy and Planning, Housing, Services, and Neighborhoods, GIS.



**Mohamed Mahmoud H. Maatoukis** a Professor of Urban Planning at Faculty of Architecture and Planning, King Abdulaziz University (KAU), Saudi Arabia. His teaching experience goes back to 1987: Research Assistant (1987-1993), Lecturer (1993-1999), Assistant Professor (1999-2007), Associate Professor (2007-2019) and Professor since 19/10/2019. He is a specialist in Quantitative Methods and GIS in Urban Planning. He has many research papers that have sound results in architecture and urban planning. He has distinguished himself in the fields of architecture and urban planning. He has implemented many practical projects and executed many successful ones in Egypt, and Saudi Arabia.



**Mansour Rifaat Helmi** assistant professor in Land Use Planning, College of Architecture and Planning, King Abdulaziz University. Obtained a PhD in 2015 from the University of Newcastle, UK, and general supervisor of bachelor's graduation projects in the Department of Urban Planning, from 2016 to date. In 2005, he obtained a master's degree in urban and regional planning (land use planning) from the College of Environmental Design, King Abdulaziz University - Jeddah. In 1999 he obtained a bachelor's degree in urban and regional planning from the College of Environmental Designs, King Abdulaziz University – Jeddah, KSA.