

**Social Sustainability in Residential Urban Environments:  
Single-Family House Neighbourhoods in Basra, Iraq**

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Thesis Submitted in Fulfilment of the Requirements for the Degree of Doctor of  
Philosophy

2021



## DECLARATION

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Signed: *Noor Almansor*

Date: 5<sup>th</sup> January 2021

## ACKNOWLEDGMENT

First and foremost, I am most grateful to Allah, the Most Gracious and Most Merciful for granting me the knowledge, ability, and strength to accomplish this study. Completing this thesis would certainly not have been possible without the contributions of many supportive and knowledgeable people.

To begin with, I am deeply indebted to the Iraqi Ministry of Higher Education and Scientific Research and to Basra University for granting me the scholarship to complete my PhD. I am extremely grateful to the University of Strathclyde for giving me the opportunity to undertake this research. I would like to express my deep appreciation to my supervisor Prof. Ashraf Salama for his valuable advice, support and guidance. His trust in me, and the freedom he gave me helped me to build the confidence I needed to explore, which kept me motivated through the research process. Productive discussions with my supervisor were invaluable sources of energy and inspiration.

I would also like to extend my sincere thanks to the staff members of the Architectural Department in the Engineering College of Basra University for supporting my study at the University of Strathclyde, especially Mrs. Alia Abdulsaheb and Dr. Riyam Rajab.

Also, I would like to extend my gratitude and genuine appreciation to the architects and staff in Basra Municipality for their cooperation in collecting data from case studies, especially Eng. Ghina Saadoon and Eng. Hassan Faleh. My fieldwork survey would not have been accomplished without the support and valuable assistance of Abdulameer Almansor, Mustafa Almansor, and Mohammad Khadim. Most importantly, I want to extend my heart-felt thanks to all participants (experts and residents) who took the time to participate in this study. Without their willingness to give their time so generously this work would not be possible.

I have been amazingly fortunate to have many supportive friends who were always there to give me motivation and advice, particularly Dr. Amira Elsemellawy, Dr. Amneh Alshawabka, and Dr. Maareb Abdullah.

Finally, this was not possible without love, patience, and prayers of my beloved family. I am deeply grateful to my father for his never-ending patience, encouragement, trust, and guidance during my study journey. I cannot begin to express how grateful I am to my mum for her love, support, and prayers, and to my sisters, brother, nephews and nieces for their permanent love and confidence in me, which has encouraged me to continue in my study throughout the past years.

## ABSTRACT

Over the last few decades, the emergence of various social problems within the urban neighbourhoods of cities has called for further research to consider the role of urban social sustainability. For example, the decline of face-to-face social interaction and social trust among residents, increased noise, limited mobility, and social conflicts of housing crisis. Social life in Iraq has been changed due to transformations in both political and economic milieus, and the introduction of technologies to people's lifestyles. These have affected social values and, in turn, contributed to significant changes in the social environment, leading to a continuous reduction in social interaction. Yet, social considerations at different levels are still neglected in Iraq in urban developments. Improving social sustainability requires comprehensive analysis to identify the factors that affect social interaction among residents. Using multiple case studies, this research investigates the influence of factors relevant to social sustainability indicators (SSI), physical characteristics of the built environment (PCBE), and demographic factors (DF) on social interaction. This includes social indices, including neighbouring, social networks, and social relationships among residents in communal spaces within single-family houses neighbourhoods (SFHNs). Additionally, this research identifies the communal spaces used for regular and formal social gatherings in SFHNs in Basra, Iraq.

To achieve this, primary data have been collected from three single-family housing neighbourhoods in Basra. A range of different qualitative and quantitative techniques is applied systematically. These include semi-structured interviews with experts, to determine the influential factors from a professional perspective and a residents' survey, involving users' daily life activities in communal spaces to identify the influential factors according to users. Also, socio-spatial practices, involving observation and behavioural mapping are used to understand users' behavioural patterns and to identify the most commonly used communal spaces, and a fieldwork site survey is applied to explain the current situation concerning communal spaces.

The findings demonstrate a number of factors, mostly concerning SSI (the sense of community, privacy, safety and security); PCBE (the provision and location of public utilities, open green spaces, communal spaces that are climate responsive designed, accessibility, maintenance), and DF (gender, education level, employment status and the presence of relatives living within the neighbourhood), have been found to affect social interaction and social indices within the selected case studies. The findings also demonstrate that unintentional communal spaces, such as the space in front of the main entrance of houses, accommodate most of the regular social interactions between residents, while worship facilities, such as mosques and hussainya, offer formal scheduled gatherings in the neighbourhoods. The design implications of these findings call for a full consideration of these factors in the design of future sustainable housing neighbourhoods in Basra, with attention given to the design of unintentional communal spaces as actual places of contact among neighbours.

This research contributes to international literature and knowledge and offers much-needed empirical evidence to inform the design of future sustainable SFHNs in Iraq. This is realised through the development of design recommendations based on empirical evidence, noting modifications to existing assumptions about the influential factors on social interaction among residents, and identifying the role of communal spaces in facilitating these interactions. It also contributes to future empirical research on social sustainability and social interaction about the effectiveness of a mixed-methods-approach and the refinement of existing indicators and measures.

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# Chapter 1 Introduction

## 1.1. Research Overview:

The notion of sustainable development has been used over an extended period of international discourse since the 1960s, and widely after the publication of the Brundtland report (World Commission on Environment and Development, 1987). This concept has gradually affected housing, planning, and urban development policy across the world over recent years. Following the publication of the Brundtland report, sustainable development has been understood to be a *“development that meets the needs of the present without compromising the ability of future generations to meet their own needs”* WCED (1987). As this definition is still broad and does not recognise the principles of development, scholars have proposed definitions for development. For Munro (1995, p. 28), development is *“a complex of activities . . . all enabling people to reach their full potential and enjoy a good life”*. Meeting human needs and aspirations by enhancing both current and future potential shows the sustainability of development (Chiu, 2002; Hediger, 2000; WCED, 1987). After the publication of the Brundtland report, the WCED (1987) confirmed that sustainable development encompasses three dimensions or pillars, namely economic, environmental, and social. However, until the late 1990s, the environmental and economic dimensions dominated the sustainable development policy context whilst less attention has been paid to social sustainability in the last two decades (Bramley & Power, 2009; Jabareen, 2005).

Social sustainability is defined as *“the continuing ability of a city to function as a long-term, viable setting for human interaction, communication, and cultural development”* (Yiftachel & Hedgcock, 1993, p.140). Colantonio (2007) reveals that social sustainability is a complicated and multifaceted concept that has often been examined through the lenses of separate disciplines and theoretical perspectives. Although it is considered nebulous, it is still one of the important dimensions of sustainable development. Colantonio (2007) showed that sustainable development is not only created from the collaboration between the 1960s environmental movement and 1970s basic needs, but its social aspects are also difficult to measure or quantify (Hemani et al., 2012). Also, Bramley & Power (2009) argued that sustainability incorporates economic and social aspects and not only the environmental dimension. Other scholars, such as Chiu (2003) and Karuppannan & Sivam (2011), highlighted the importance of social sustainability dimension by explaining that it is as essential as the other constituents of sustainability. Previously, this aspect has not acquired attention. Moreover, Bramley & Power (2009, p.31) indicated that the social aspect is a crucial factor in sustainable development



although it is a nebulous notion; “There is little agreement as to what this consists of”. As a result, the study will investigate the social sustainability dimension, which represents the third pillar of sustainable development on the residential neighbourhood scale.

The chapter presents a research overview that is followed by the knowledge gap and research problem related to social sustainability. Also, the chapter shows the research questions and related objectives, research methodology, the significance of the study, and the thesis structure after providing a summary of the research context.

## **1.2. Knowledge Gap:**

The researcher reviewed several databases, including SUPrimo, E-Theses Online Services (Ethos), ScienceDirect, EPSCO, and Google Scholar. The researcher extensively examined sources that discussed related subjects under urban social sustainability, including books, conference papers, projects papers, and articles that were published in trusted journals, such as Elsevier, Taylor and Francis Group, and Springer. Various social issues within the neighbourhoods of cities have emerged as a result of lifestyle changes, especially in developed countries; furthermore, until recently, the social aspects of sustainable development have been neglected (Farshidi & Deveci, 2014). Over the last decades, urban social sustainability has received less theoretical and empirical attention (Eizenberg & Jabareen, 2017), and thus still needs to be examined and assessed in various contexts (Bramley & Power, 2009; Jabareen, 2005; Karuppannan & Sivam, 2011). Instead, the environmental and economic dimensions dominated the context of sustainable development policy until the late 1990s. Consequently, several studies had been conducted to investigate social sustainability as an important and vital factor alongside the economic and environmental dimensions; thus, sustainable development can also address social issues.

After reviewing earlier literature that considered social sustainability, it was found that most research was conducted in developed rather than developing and Middle East countries. Some of these studies were conducted to measure their urban social sustainability in developed contexts, such as in the UK (Bramley et al., 2009), USA (Mak & Peacock, 2011), Germany (Hamiduddin, 2015), and Australia (Yiftachel & Hedgcock, 1993). Moreover, some of these studies were empirical research. Other studies were conducted in developing countries, such as India; for instance, Dave (2011) examined the impact of density on social sustainability, while Karuppannan & Sivam (2011) investigated the influence of the urban form on social sustainability.

Furthermore, a few studies were conducted in the context of the Middle East. For example, some studies examined the design of the residential environment on social sustainability; for example, Ahmed (2011, 2012) evaluated the level of social sustainability in local neighbourhoods by examining their designs in the UAE. Similarly, Sharifi & Murayama, (2013) conducted an investigation into the influence of traditional urban patterns in Iran on creating integrated urban environments that are more socially sustainable. Also, some studies considered concepts related to social sustainability, such as Rastegar et al. (2017) who investigated the impact of social capital on improving the quality of life and social justice in Mashhad, Iran. Moreover, investigations undertaken in Libya (Elgadi et al., 2016) and Iraq (Alanbari et al., 2014) discussed the notion of sustainable development by collecting indicators for its dimensions that were relevant to the cultures of Arabic and Islamic communities. This was achieved by extrapolating earlier research without implementing the indicators in a further empirical study. However, Al-Alwani (2014) developed an approach to local sustainability assessment that offered a methodological framework to facilitate the formulation, selection and prioritisation of key indicators to guide the assessment of city sustainability at a local level in Middle Eastern cities.

Moreover, Alahmed, Alaghbari, Ibrahim, & Salim (2014) considered urban social sustainability in the Iraqi context by examining the influence of the spatial design of low-rise residential buildings and ways to improve social interaction among residents. This study was based on Abbaszadeh's (2009) model which also focused on low-rise residential buildings in Basra. In contrast, Al-Hinkawi and Hassan (2014) evaluated the visual continuity of heritage features in the design of proposed schemes for a development region in Baghdad in an attempt to achieve social sustainability; however, this study used a qualitative method and was limited to proposed projects. As a result, there are few empirical studies that investigate urban social sustainability or relevant subjects in Middle East countries, especially in Iraq; this is the first gap that this research seeks to address.

From reviewing relevant earlier studies, it was found that some researchers theoretically examined the notion of social sustainability in order to clarify the nebulous concept. Such studies delivered definitions, explained what the notion included and discussed related concepts to social sustainability, such as social capital, social equity and their applications at the local level (see Bramley et al., 2009; Chiu, 2002, 2003; Godschalk, 2004; Jenks & Jones, 2009; Sachs, 1999; Vallance et al., 2011). Also, studies identified a set of indicators that manifest the dimensions of sustainable development (Al-Alwani, 2014; Alanbari et al., 2014; Elgadi et al., 2016), while others highlighted factors that improve the level of social sustainability (E. Chan

& Lee, 2008). However, other scholars sought to perform empirical studies in different contexts to determine the possible indicators and associated concepts that could be used to indicate or measure social sustainability. For example, considerable studies have investigated the degree to which social sustainability is influenced by some important indicators, such as the urban form (Bramley et al., 2009; N. Dempsey et al., 2011; Karuppannan & Sivam, 2011), density (Bramley & Power, 2009; Dave, 2011; Hemani & Rudlin, 2012) and resident satisfaction (Abu-Ghazzeh, 1999; Aydemir, 1990) to indicate whether the examined neighbourhoods are socially sustainable. Also, empirical studies were conducted into urban social sustainability to investigate the relationship between residents' social interaction and the design of the built environment, including the design of communal spaces in high-rise housing complexes (Abu-Ghazzeh, 1999; Farida, 2013; Farshidi, 2016; Huang, 2006; Mahdavinejad et al., 2012).

Moreover, some scholars investigated the impact of private and shared open spaces in high-rise buildings on users' behaviour (Kennedy & Buys, 2015). Others examined the relationship between the physical characteristics of communal open spaces in residential environments, types of outdoor appropriation, resident satisfaction with the visual appearance of buildings and outdoor spaces, their effects on community formation, the level of maintenance and the performance evaluation of housing schemes (Lay & Reis, 2003). Nevertheless, a lack of studies was found on the influence of Social Sustainability Indicators (SSI), Demographic Factors (DF), and the Physical Characteristics of the Built Environment (PCBE) of urban contexts on the level of social interaction amongst residents. Consequently, this research seeks to bridge this (second) gap.

In addition, most empirical studies were carried out in the residential areas of multi-rise buildings. In contrast, few studies considered the areas of mixed housing that included neighbourhoods of single-family houses, which are considered the general housing type in Iraq. One of these studies was conducted by Ahmed (2012) who discussed the social and cultural considerations of sustainability in the typical design models of the public houses adopted by The Sheikh Zayed Housing Program in the UAE. His study considered sustainability at the level of dwelling unit design. A study by Abu-Ghazzeh (1999) considered site design and its relationship with the social life of society as an essential concern for residential designers in Jordan. Abu-Ghazzeh investigated the social aspect by looking at the social interaction indicator at the level of community. The solutions adopted by the developers, consultants, and regulatory bodies could be unsuitable for other sites as appropriate specifications characterise each site and vary from one location to another (Karuppannan & Sivam, 2011). This could mainly owe to the lack of studies that investigate the notion of social sustainability and social interaction in

the context of single-family house neighbourhoods (SFHNs). Also, social sustainability differs from context to context due to the diversified culture and social values of each environment. Therefore, this research seeks to bridge this gap by considering the SFHNs in Iraq, which is the third gap addressed.

This research considers social interaction the essential determinant of social sustainability. Also, it aims to identify factors from the SSI, PCBE, and DF that affect the level of social interaction in the communal spaces within SFHNs. This goal will be achieved by first, collecting a list of factors that affect social interaction among residents in different residential environments by analysing existing literature. After that, the list will be filtered by conducting primary research, which will include semi-structured interviews with Iraqi experts, including architects, urban professionals, and decision-makers. Then, a questionnaire of the filtered list of factors will be used to investigate residents' perceptions and experiences in three selected case studies to empirically examine their influence. Observations and behavioural mapping will follow this step. Finally, after analysing the collected data, the research outcomes assimilate the findings and results of the three tools, and from this, recommendations will be noted.

### **1.3. Research Problem:**

It is widely argued that neighbourhoods designed during the 1970s and 1960s are unsustainable (Saville-Smith, 2008) because their designs typically focused on surveying, lot productive efficiency, and dwelling engineering design. According to the revised report by Gisborne/New Gisborne Outline Development Plan (2009) the current primary goal is to design a framework for a community that is sustainable environmentally, socially and economically. Sustainability is a wide, multi-focused agenda, whilst scholars have invented many terms and used them interchangeably to clarify its concepts (Ahmed, 2012; Lewis & Kitchens, 2006; McKenzie, 2004). Smith & Rees (1998) stated that sustainable development is one of the invented terms that points to a pattern of resources that can meet present human needs and those of generations to come while also preserving the environment. Elkington suggested a model for sustainable decision making in 1994 called the 'triple bottom line' (Elkington, 1997), and mentioned that this model aims to demonstrate the interconnected nature of the environmental, social, and economic partnership in order to achieve an outstanding 'triple bottom line' performance (Elkington, 1998). In the 1950s and 1960s, there was significant interest in the social life of urban neighbourhoods (e.g. Bell & Boat, 1957; Jacobs, 1961; Keller, 1968; Whyte, 1955). Although the neighbourhoods and lifestyles of residents in contemporary urban society adopt

increasingly diverse roles, more recently this has prompted the need for urban and community research into social relations to look beyond the neighborhood and into the wider community and city.

In Iraq, the notion of sustainable development, or ‘sustainable design’, has recently received attention. However, environmental and economic aspects are a greater focus than the social aspect although this attention is still at the discussion stage on Iraqi government and academic agendas. Nevertheless, the housing crisis is considered the most critical issue facing governments around the world (King, 2017), and especially those in developing countries (Dave, 2011) including Iraq. According to King (2017, p.1), “*a third of all urban dwellers worldwide – 1.2 billion people – lack access to safe and secure housing*”, and this crisis is worse in lower and middle-income countries. Although increasing economic growth has led to the growth of cities in Iraq in particular, and developing countries in general, the governments of these countries also face a lack of housing and infrastructure and urban poverty (Dave, 2011; ESCAP, 2005; UN-Habitat, 2006). Because of factors, such as human population growth, natural disasters and conflict, the current claim for housing has reached unprecedented levels worldwide (Bruen et al., 2013). This is evident in developing countries which have experienced excessive levels of demand due to their innate vulnerability (Bruen et al., 2013). Such crises could lead to different critical issues related to social, environmental and economic contexts. Therefore, adequate housing has a significant impact on these wider social, environmental and economic contexts. These impacts include a better quality of life and personal fulfillment for its inhabitants through the generation of employment, knowledge transfer, training, value and cultural continuity, improved health conditions, and the need to meet immediate basic human needs (Erguden, 2001).

As previously mentioned, several reasons have led to the housing crisis, and, in developing countries, one of these is rapid population growth such that governments cannot meet the demand for housing, services, and infrastructure to accommodate such growth (King, 2017). Iraq is one of the Middle Eastern countries that face a housing crisis where the government has worked hard to meet the rising demands for dwelling units in a short time. Therefore, most of the proposed and implemented solutions are weak, quick and do not consider the requirements for sustainable development. According to the report, this resulted from cooperation between the UN-HABITAT and the related Iraqi ministries. The annual plans of the State Commission of Housing include housing projects; however, they do not target specific categories of end-users. These housing projects are usually designed and constructed before determining the

ultimate beneficiaries without considering their needs or consulting them. Many of these communities are still vacant and uninhabited (Attour, 2017). Moreover, the most common type of housing in Iraq is for the single-family, which requires large areas to meet these demands. This results in the sub-division of existing properties into a greater number of dwellings to provide extra units, which impacts the character and amenity of adjoining residential areas.

The housing crisis negatively affects both the environment and services, and thus impacts social aspects, and continues to create confusion in urban planning. The government's inability to meet the housing demand has led to the emergence of many cases of abuse, such as the spread of slums, which are built without permission from the government, and the illegal take-over of land designed for public services and open public spaces. These slums usually lack all services and infrastructure and are characterised by extreme poverty, ill health and deprivation (Hemani et al., 2012). Such a crisis has caused many issues, such as leaving many people with limited incomes to convert agricultural areas to housing, which has resulted in the deterioration of agricultural conditions; the emergence of environmental issues as most of the city's green cover has been illegally taken over, and increased problems associated with rising and varying prices for rent and purchase in the residential sector. The consequences of such a situation create crowded, high-dense areas with limited-service levels. As a result, a number of problems appear within the residential neighbourhood and at the city level, such as a lack of infrastructure services and the emergence of conflict that leads to the appearance of social issues, such as the decline of social interaction among residents, increased noise, limited mobility (Alahmed et al., 2014), safety and security issues, and environmental and health issues (Basra Municipality; CSO, 2016). Furthermore, dropout amongst students in primary and secondary schools in Iraq in general, and in the Basra governorate has appeared, and an increase in the number of divorced couples has also become visible in recent years (see Tables B-4 to B-6 in Appendix B).

All previous causes have resulted in the neglect of development and the use available communal spaces within residential neighbourhoods. It is believed that the built environment of the residential sector and residents' social lives have been affected and these impact on social interaction among residents. A lack of social interaction among residents in Iraq, especially in Basra City (Alahmed et al., 2014) has been observed although this has not been widely discussed in theory. According to general discussions held with staff in Basra Municipality and some residents prior to the conduct of the main study, streets and their sidewalks are increasingly used for the conduct of social gatherings - mainly formal gatherings (such as weddings or mourning ceremonies) - within residential neighbourhoods. The children used to

play footballs in open areas and streets. A decline was observed in the conduct of social activities by residents within most shared gardens, which have become neglected places in many neighbourhoods. The situation within Iraqi neighbourhoods and the level of community-based cultural, religious and conceptual transformative debates have changed in the last 30 years and especially after the last war in 2003; these have reflected the political changes, fast, successful economic transformation, and changing lifestyles (Al-Thahab et al., 2014). Also, the social and cultural values of the Iraqi people and their behavioural and psychological features alongside the contemporary standards of home environments have similarly been influenced. These issues could lead to a deficiency of social interaction among residents. Hence, this research aims to address the decrease in the level of social interaction in Iraqi single-family house neighbourhoods.

#### **1.4. Research Context:**

The three case studies of this research are in Basra Governorate, which is the economic capital of Iraq. This southern governorate is near Kuwait and Iran, with an area of 19,070 sq. km (Al-Mas'audi & Al-Sa'adi, 2012; CSO, 2016). Basra is situated on the western bank of the Shatt Al-Arab (the waterway formed by the union of the Tigris and Euphrates rivers at its exit from Lake Al-Hammar, which is 110 km of water above Al-Fāw on the Arabic Gulf). Although Basra does not have deep-water access, it is the location of Iraq's main port, namely Umm Qasr. In 2018, Basra's estimated population was 2,908,491, which is Iraq's third-largest populous city after Baghdad. Basra has a desert climate, which has a wide thermal range of low rain to high humidity. At a rate of 80%, the most common type of housing in Iraqi residential areas in general, and Basra particularly, is low density buildings (single-family houses neighbourhoods - SFHNs); the other type of housing is a low-rise residential buildings (at a 20% rate) (SCH, 2010). As one of the solutions to address the housing crisis, the Iraqi government distributed plots to people who worked in the public sector and offered financial loans to assist the construction of houses. However, this solution has not been widely applied, therefore, the largest proportion of built residential dwellings have relied on personal financial sources.

As previously mentioned, Basra city has a high proportion of the Iraqi population due to increased migration from outside and inside the city. This is because the Basra's economic and security context more convenient than other Iraqi cities. This means the city faces greater housing demand and needs more public housing development. Since the war in 2003, the city has had a unique opportunity for development, especially following the expansion of its economic situation. There are proposals from foreign and local companies to develop the city's

masterplan in accordance with the urban form of the area, and the historical and architectural orientations of Basra. There is also a number of housing complexes under construction to address the housing crisis affecting Iraq and Basra alike, and as an attempt to move the city to the level of a modern city.

The modern designs implemented by the public and private sectors need to be updated so that the built environment meets social requirements and achieves sustainable development. According to Gehl (2011), contemporary cities and neighbourhoods have become lifeless. Thus, industrialisation, segregated functions, increased dependence on the car have all given the city an uninteresting identity. One such update is the development of communal spaces within neighbourhoods to improve the social lives of residents within their communities. Although the lack of variation and the vulnerability of communal spaces in residential complexes were not initially known, modern architects created such spaces for residents and families (Mahdavinejad et al., 2012). Architects and urban professionals need to critically consider the revision of communal spaces when the inefficiency of such spaces is acknowledged.

The vast differences in quality, maintenance, and use of communal spaces, and the reduction of social interactions amongst residents strongly motivated the researcher to investigate the underlying factors of such a phenomenon. It was also noted that such a phenomenon has become more widespread in contemporary residential neighbourhoods in Basra than in traditional areas, especially after the changes to, and development of, peoples' lifestyles following the war of 2003. It was also perceived that current communal spaces have lost their quality and efficiency and offer poor variety. Moreover, there is currently a lack of research into communal spaces in Iraq generally, and Basra particularly; thus, to the author's knowledge, there is no existing research into the factors affecting social interaction among residents in the communal spaces of SFHNs in Basra.

The researcher believes that the quality of communal spaces within SFHNs in Basra should be improved to ensure their appropriateness for its urban population, to effectively accommodate its users, and offer various activities and opportunities to relax. This, in return, will boost social interaction and the level of social sustainability within the city. It can be achieved by identifying the factors that affect social interaction among residents in these spaces. The researcher's initial observations and personal experience of communal spaces in Basra suggested that inhabitants have a healthy relationship with such spaces, especially those close to their dwelling units and to commercial activities. They spend their time outdoors engaging in their neighbourhood



spaces, especially when weather conditions are favourable. On spring and winter afternoons, and despite the present quality of shared neighbourhood gardens, some people can be seen interacting in these spaces (mainly young adults and children over 6 years of age). Therefore, this research focuses on the factors that affect the level of social interaction among residents in communal spaces within SFHNs, which represents the standard residential setting in Basra.

However, Basra's current developments and changes have mostly focused on one of the issues that face the government, namely meeting the demand for housing without considering the social aspect in designing communal spaces of the city's neighbourhoods. There is a lack of research into planning and urban design in general and communal spaces in SFHNs in Iraq in particular. In Basra, the local government has opened up opportunities for the private sector to build new residential complexes. However, the social ethos, a consideration of users' requirements, the image of the city, the adaptation of new designs and materials for new private residential complexes, and the provision of communal spaces are currently missing in existing SFHNs. Also, the communal spaces available in new residential complexes have not been examined to determine whether they are efficient for users. This needs to be addressed in order to develop successful communal spaces within SFHNs and social interactions among residents.

Due to the rapid transformation of Basra society (particularly since the 2003 war), there is a need to develop unique communal spaces that reflect users' requirements and lifestyles, which may not necessarily reflect traditional or Western concepts. Instead, these need to be exclusive responses to present needs and enable the regeneration of the image of the city and its neighbourhoods. The main challenge for urban professionals in Iraq is to consider innovative and supportive policies and reconsider and restructure their current planning system. This aims to provide successful communal spaces within SFHNs in a constructive manner that maintains the city's image and cultural values. It also aims to boost residents' social interactions and, in return, the city's social sustainability.

This study recognises that successful communal spaces are a crucial element in the structure of a city. Although a good deal of research already exists in this area, insufficient emphasis has been placed on Middle East cities and the communal spaces of SFHNs. Thus, there is an urgent need for research that identifies the factors affecting the development of these spaces in the region by determining their influence on social interaction among residents. This research bridges this gap by utilising three tools to identify the effective factors on social interaction among residents in communal spaces, especially amongst SFHNs in Basra.

## 1.5. Research Questions and Objectives:

### 1.5.1. The Research Questions:

The study has developed four research questions:

- **Research Question 1:** What are the key concepts, indicators and main determinants that drive the understanding of social sustainability as it relates to the built environment of residential neighbourhoods?
- **Research Question 2:** What are the possible aspects that affect local social interaction among residents in different types and contexts of residential environments?
- **Research Question 3:** How do the critical factors that affect social interaction manifest in the communal spaces of residential neighbourhoods comprising single-family houses in Iraq?
- **Research Question 4:** What improvements can be made to the planning and urban design systems in Basra to achieve successful communal spaces in single-family house neighbourhoods?

### 1.5.2. The Objectives:

The objectives have been mapped to the related research questions in Table 1-1. In order to achieve the previous research questions, the following objectives have been determined:

- To explore the key concepts, indicators and main determinants that guide the understanding of the notion of social sustainability as it relates to the built environment, in general, and to residential neighbourhoods.
- To explore the nature and type of aspects that affect local social interactions among residents in different residential environments and contexts.
- To identify the typologies of communal space used in the neighbourhoods of single-family houses in an Iraqi context, especially in Basra.
- To extract the most influential factors from social sustainability indicators, physical characteristics of the built environment, and demographic factors on social interactions among residents use of communal spaces within residential neighbourhoods comprising single-family houses.
- To investigate whether the current urban design of the built environment considers the socio-cultural values of a community with the changes in people's lifestyles and accommodates them in modern design trends in order to promote social sustainability, and thus, social life among residents.

- To develop a valid framework and lessons from Basra case studies, and recommend guiding principles for architects, urban professionals, and decision-makers by examining the views of decision-makers, residents, and spatial practices on improvements and enhancements to existing and future communal spaces within single-family house neighbourhoods.

## **1.6. Research Methodology:**

The methodology is based on multiple evidentiary sources; they respond to the identified research questions and related objectives of this research. This research considers social interaction as the main determinant of social sustainability, which, in return, improves the level of social sustainability in the city by enhancing the communal spaces within its neighbourhoods. The research aims to investigate the urban social sustainability of the Iraqi residential environment by examining the level of social interaction among residents in the communal spaces of SFHNs by identifying the influential factors. Therefore, the research strategy adopts a ‘multiple case studies’ approach to identify the SSI, PCBE, and DF that have an impact on social interaction among residents in the communal spaces of SFHNs in an Iraqi context. In order to achieve this, mixed qualitative and quantitative techniques are used for the data collection and analysis. By implementing a multiple case studies method, the research selects three single-family house neighbourhoods in Basra, which are known for their characteristic features (section 4.3 in chapter 4). They concern four elements, namely social sustainability indicators, the physical characteristics of the built environment, the demographic factors, and social interactions among residents. This multi-layered methodological approach utilises both qualitative and quantitative tools, which are systematically implemented. This involves:

1. An extensive and intensive literature review that responds to the first two research questions and partially responds to the third question. A review of earlier research is conducted alongside the collection of a list of potentially important indicators and factors that affect social interaction among residents in different residential environment. Moreover, the types of communal spaces within neighbourhoods are also identified.
2. Semi-structured interviews are conducted with Iraqi experts, including decision-makers, urban professionals, and architects. This tool aims to detect which of the investigated factors affect social interaction amongst residents in communal spaces within SFHNs in Iraq - in accordance with experts' points of view - and whether the collected indicators and factors are applicable in the Iraqi context.

3. A questionnaire involving users' reactions to communal spaces and their social lives aims to understand users' perceptions of the spaces and to interpret the variety of experiences that take place in such spaces.
4. Socio-spatial practices, involving observation and behavioural mapping techniques are employed to understand users' behavioural patterns and their engagement with the identified spaces. These techniques will help to determine the motivators and barriers that residents face when using specific communal spaces within their neighbourhoods. Also, it will highlight the influential factors that affect social activities within such areas from the researcher's point of view.
5. A fieldwork site survey will be conducted to obtain the schemes of the selected case studies. This includes the layouts of the housing and available communal spaces, which requires their comparison with official maps and schemes obtained from Basra Municipality and with the current situation of the areas, as acquired from Google Maps.

These techniques form a comprehensive investigation framework and enable an in-depth analysis of the selected case studies within their broader context. The selection of the case studies will help to develop a thorough understanding of the phenomenon that allows the findings to be generalised. As previously discussed, different types of method were selected to address the research questions and meet the related objectives. Data collection tools were designed from the literature review to identify the factors that affect social interaction among residents in communal spaces within SFHNs. The summary in Table 1-1 provides a brief overview of the research questions, their related objectives, the chosen tools, and the expected outcome of the findings from each method. Moreover, a detailed explanation of the methodology is provided in Chapter 4.

Table 1-1 A summary of the research questions, objectives, methods, and potential outcomes.

Questions	Objectives (Why)	Data Collection (Tool)	Methods (How)	Outcomes and Findings
<b>Q1: What are the key concepts, indicators and main determinants that drive the understanding of social sustainability as it relates to the built environment of residential neighbourhoods?</b>	Explore the key concepts, indicators and main determinants that guide the understanding of the notion of social sustainability as it relates to the built environment, in general, and to residential neighbourhoods.	Literature review and official documents (secondary data)	Critical analysis of the body of knowledge available on the key concepts that drive the understanding of the notion of urban social sustainability, its indicators, and its primary determinants in developed, developing, and Middle East contexts.	A general understanding of the key concepts of social sustainability as they relate to the built environment of residential neighbourhoods in different world contexts, and in the Middle East particularly. A particular focus on the critical indicators and the main determinant of social sustainability that will lead to learning in similar contexts.
<b>Q2: What are the possible aspects that affect local social interaction among residents in different types and contexts of residential environments?</b>	Explore the nature and type of aspects that affect local social interactions among residents in different residential environments and contexts.	Literature review and official documents (secondary data)	Categorising the key aspects extracted from the critical analysis of relevant articles, journals, and studies.	An understanding and determination of the factors/aspects that affect social interaction among residents in communal spaces in similar contexts to the research context.
<b>Q3: How do the critical factors that affect social interaction manifest in the communal spaces of residential neighbourhoods comprising single-family houses in Iraq?</b>	<ul style="list-style-type: none"> <li>Identify the typologies of communal space used in the neighbourhoods of single-family houses in an Iraqi context, especially in Basra.</li> </ul>	<ul style="list-style-type: none"> <li>Literature review, official documents, and Google Maps, observation and behavioural mapping (primary and secondary data)</li> <li>Users' urban and social sense questionnaire (primary data)</li> </ul>	<ul style="list-style-type: none"> <li>An analytical desk study of documents obtained from Basra Municipality: the analysis of maps and schemes of the research context, and site visits to observe users' behavioural patterns.</li> <li>Online/paper copy questionnaire.</li> </ul>	<ul style="list-style-type: none"> <li>Understanding behavioural patterns, determining types of used communal spaces in the neighbourhoods of single-family houses in Basra.</li> <li>Users' perceptions and suggestions concerning the case studies' communal spaces.</li> </ul>
	<ul style="list-style-type: none"> <li>Extract the most influential factors from social sustainability indicators, physical characteristics of the built environment, and demographic factors on social interactions among residents use of communal spaces within residential neighbourhoods comprising single-family houses.</li> </ul>	<ul style="list-style-type: none"> <li>Semi-structured interviews with 17 experts, including architects, urban professionals, and decision-makers (primary data)</li> <li>Users' urban and social sense questionnaire for Basra's residents (primary data)</li> </ul>	<ul style="list-style-type: none"> <li>Synthesis of the main findings of the three tools (Semi-structured interviews, Users' urban and social sense questionnaire, and Observation and behavioural mapping).</li> </ul>	<ul style="list-style-type: none"> <li>Collective views of architects, urban professionals, decision-makers, and residents, and their spatial practices to understand the effects of the three examined aspects on social interaction among residents in communal spaces of residential neighbourhoods comprising single-family houses.</li> </ul>
	<ul style="list-style-type: none"> <li>Investigate whether the current urban design of the built environment considers the socio-cultural values of a community with the changes in people's lifestyles and accommodates them in modern design trends in order to promote social sustainability, and thus, social life among residents.</li> </ul>	<ul style="list-style-type: none"> <li>Observation and behavioural mapping (primary data)</li> </ul>		<ul style="list-style-type: none"> <li>Recommendations to stakeholders to develop existing and future design systems for the communal spaces of single-family house neighbourhoods in Basra.</li> </ul>
<b>Q4: What improvements can be made to the planning and urban design systems in Basra to achieve successful communal spaces in single-family house neighbourhoods?</b>	Develop a valid framework and lessons from Basra case studies, and recommend guiding principles for architects, urban professionals, and decision-makers by examining the views of decision-makers, residents, and spatial practices on improvements and enhancements to existing and future communal spaces within single-family house neighbourhoods.	Synthesis of the main findings.		<ul style="list-style-type: none"> <li>Recommendations to urban professionals, architects, and decision-makers to enhance social interaction among residents, and thereby social sustainability, by improving the communal spaces within single-family house neighbourhoods.</li> <li>Lessons from the case studies and offering contributions to global knowledge.</li> </ul>

## 1.7. Research Significance:

In order to improve social life in communal spaces within SFHNs, it is necessary to consider the factors that affect the quality and quantity of social interaction amongst residents in these spaces. Significant research on the subject of communal spaces in SFHNs is first presented to explore the factors that affect social interaction among residents in such spaces from three different perspectives - users, experts and the researcher. This considers the specific communal spaces of three single-family housing neighbourhoods in Basra, as their housing layout and features share similar key qualities with most of Iraqi residential environments in other locations. The level of detail in the data collected is significant in comparison with previous studies due to the scale of such communal spaces within neighbourhoods and the factors that influence the quality and quantity of social interaction from experts' and users' perceptions. Identifying the factors that affect social interaction among residents in the communal spaces of SFHNs and providing the opportunity to improve the social lives of neighbourhoods by developing their communal spaces enhances the level of social sustainability within the city. The study's main contributions to existing knowledge can be exemplified in the following points:

1. Understanding the patterns of social interaction among users in communal spaces within SFHNs in Basra.
2. Testing existing assumptions regarding the impact of three types of factor on social interaction among residents in Basra, namely: the SSI, PCBE, and DF.
3. Uncovering the role of the physical characteristics of the built environment in neighbourhoods of single-family houses.

The research has also other contributions to existing knowledge include the following:

- Contributing to international literature and knowledge on the planning and urban design practice of communal spaces in residential neighbourhoods in Middle East cities.
- This research demonstrated the effectiveness of a multi-layer methodology (i.e., mixed-methods approach), which is a straightforward methodological structure for future researchers undertaking similar projects.
- Developing practical policy recommendations to influence future planning and urban design practices in Basra and other cities to enhance social lives and enable the establishment of a sustainable environment.
- Identifying the typologies of communal spaces in neighborhoods of single-family houses, especially in Basra.
- Developing new measures, indices and indicators.

## 1.8. The Thesis Structure:

This thesis is structured into the following nine chapters:

**Chapter One: Introduction.** This chapter provides an overview of the research topic and the knowledge gap by investigating the purposes for undertaking this study, identifying the research problem, and scoping the problem. The chapter outlines the research context, research questions and objectives, and methodology. The final section in this chapter outlines the structure of the thesis.

**Chapter Two: Social Interaction as the Main Determinant of Social Sustainability.** This chapter explores literature on urban social sustainability; it offers a summary of its indicators, while focusing on social interaction. The chapter addresses the first and second research questions: ‘What are the key concepts, indicators and main determinants that drive the understanding of social sustainability as it relates to the built environment of residential neighbourhoods?’ and ‘What are the possible aspects that affect local social interaction among residents in different types and contexts of residential environments?’ It reviews the notion of social sustainability in the Middle East, the effect of urban forms, and the social sustainability indicators examined in developed, developing and Middle East countries. The chapter also shows social interaction as the most efficient and frequent determinant of social sustainability. Moreover, it identifies the related theories and social ties, as well as the impact of role and type of communal space on the level of social interaction. The chapter discusses the nature and type of aspects that affect local social interactions among residents in different residential environments and contexts in order to develop the conceptual research framework, including the social sustainability indicators, physical characteristics of the built environment, and demographic factors.

**Chapter Three: The Research Context.** This chapter analyses government documents, secondary data and schemes obtained from Basra Municipality (BM) and some Iraqi ministries (Ministry of Planning and Housing - Central Statistical Organisation, Housing Directorate, Ministry of Construction and Housing- the State Commission of Housing), Google Maps, maps data from Esri and the rather fragmented literature on the history of Basra. The chapter meets part of the first objective of the third research question: ‘identify the typologies of communal space in SFHNs in the Iraqi context, especially in Basra’. The chapter offers a general overview of the research context, namely Iraq in general, and the Basra governorate in particular, including geographic location, climate conditions, and population. The urban form of Basra city throughout history, the housing policy in Iraq and standards of planning neighbourhoods, and

the types of communal spaces within single-family houses neighbourhoods have been discussed in this chapter. Besides, the chapter also presents an overview of Basra's existing social life and neighbouring alongside the cultural, economic, political and security aspects of the city.

***Chapter Four: Research Methodology.*** This chapter details the methodology to explain how the research questions were addressed. This chapter is divided into three parts; the first presents five criteria that inform the strategy for the case study selection and the neighbourhood portfolios. The second establishes the conceptual framework, research strategy, research design, and data collection approaches and methods. The third part of the chapter sets out the indices and measures, dependent and independent study variables, data analysis, and describes the testing of the method tools.

***Chapter Five: Decision-Makers' Perceptions of the Factors Affecting Social Interaction.*** This chapter demonstrates the analysis and discussion of the data collected from the semi-structured interviews - involving 17 Iraqi experts, including architects, urban planners and designers and decision-makers - to identify the factors that affect social interaction among residents in communal spaces of SFHNs. The chapter divides the analysis of the semi-structured interviews into six main sections relating to the aspects considered, including the SSI, PCBE, DF, the application of three aspects in the work processes, the sub-variables of social interaction, and the strength of the relationships between the three aspects. A reflective discussion is included after each section to discuss the findings that are later combined in the conclusion of this chapter. The results and findings of the analysis are used to build the residents' questionnaire and to compare the outcomes with the results of the questionnaire and observations.

***Chapter Six: The Perceptions of Residents.*** This chapter provides the analysis of the data from the questionnaire in order to identify the factors that affect social interaction amongst residents in the communal spaces of SFHNs according to residents' experiences. This chapter discusses the distribution of the questionnaire and the sample of respondents. A brief summary is presented on the DF of the surveyed sample, while a descriptive analysis is provided on the SSI, and PCBE. The chapter also explores the dependent variable - social interaction - in addition to the three social indices (Neighbouring Index, Social Networks Index, and Social Relationships Index) after discussing the normality test.



The main sections in this chapter demonstrate the factors affecting social interaction, neighbouring, social networks, and social relationships among residents in the communal spaces of SFHNs in the Iraqi context, and according to residents' perceptions. The chapter also demonstrates the communal spaces in SFHNs in Iraq according to respondents' experiences. This includes the interactional spaces for regular and formal meetings, the frequency of their use, the closest used spaces to dwelling units, the preferred time to use them, the type of activities occurring, and the preferred place for residents to spend their rest time within the neighbourhood. This section also discusses residents' suggestions regarding current and ideal communal spaces within the neighbourhoods. The results in this chapter will be combined with the findings of chapters five and seven to address the third research question and related objectives.

***Chapter Seven: The Socio-Spatial Practices of Residents.*** The chapter outlines the results and findings of the observation and behavioural mapping tool. The chapter explores users' behaviours in the communal spaces within the case studies. It describes the tools for use in the behavioural observations, and how and when they will be conducted. A comparison between the observations and behavioural mapping data of the three case studies is given after analysing the collected data from Case 1 - AlJunainah Neighbourhood; Case 2 - AlZahraa Neighbourhood, and Case 3 - AlKhalij Alarabi Neighbourhood. The chapter also highlights the potential motivations and barriers to the use of communal spaces from the researcher's point of view and discusses them under five points. The chapter includes an analysis of the most used communal spaces by residents within their neighbourhoods. The findings in this chapter will be combined with the outcomes of chapters five and six to meet the objectives of the third research question.

***Chapter Eight: Discussion.*** This chapter adopts a convergent parallel design to merge the results and findings of the previously discussed tools in Chapters Five, Six and Seven. It will compare the results and findings of the semi-structured interviews and questionnaire and align these with the observations. By collecting both quantitative, and qualitative data, the approach offsets the weaknesses of gathering a single type of data and enables a more complete understanding of the research problem/question. This, in turn, offers an explicit confirmation of the reliability of the final outcomes of this research. The chapter discusses the results for the factors affecting social interaction, neighbouring, social networks and social relationships amongst residents. Also, it identifies the typologies of communal spaces used in the neighbourhoods of single-family houses in an Iraqi context, especially in Basra, and the users'

perceptions and suggestions concerning the case studies' communal spaces. The chapter will address the third research question and the related objectives.

**Chapter Nine: Conclusion.** The chapter presents an overview of the achievements of the research questions (key findings) and research contributions. It also identifies the methodological limitations, recommendations at the level of both communal space and the city, recommended policies and guidelines, and areas for future research. The chapter will present the outcomes of the fourth research question and the related objectives

**Appendix A (Social Sustainability and its Influential Indicators)** includes more detail on urban social sustainability. It provides a general overview of sustainable development and presents relevant literature that examines the concepts and theories of urban social sustainability, and the overlapping concepts. The appendix also reveals the social sustainability indicators investigated in developed, developing, and Middle East countries and discusses the most critical indicators for this study.

**Appendix B (The Research Context Background)** includes extra detail regarding the geographic location, climate conditions, population, and public data of Iraq and Basra governorate.

**Appendix C** represents the ethics approval form, participants' information sheet, and the consent form.

**Appendix D (The Analysis Data of The Questionnaire)** shows the data analysis for the scale reliability, the validity of the questionnaire, and the analysis tables.

**Appendix E** includes the English and Arabic copies of the questionnaire's questions, while **Appendix F** includes the English and Arabic copies of the semi-structured interview questions.

## **Chapter 2 Social Interaction as the Main Determinant of Social Sustainability**

### **2.1. Introduction:**

This chapter reviews relevant literature in the area of urban social sustainability in order to address the first two research questions, which are: what are the key concepts, indicators and main determinants that drive the understanding of social sustainability as it relates to the built environment of residential neighbourhoods, and what are the possible aspects that affect social interaction among local residents in the different types and contexts of residential environments? This chapter aims to investigate the commonly used key concepts and indicators of social sustainability in the literature, which examine the notion in the housing context. Also, it analyses and identifies the main determinant of social sustainability and the most used indicator in earlier studies. Furthermore, the chapter reviews pertinent literature to identify the aspects that could affect social interaction among occupants in residential environments and thus build a theoretical research framework.

The chapter explores the emerging concept of urban social sustainability in Middle Eastern cities and research on urban form and social sustainability. The chapter reviews the essential indicators of urban social sustainability within developed, developing and, specifically Middle East contexts (more detail is available in Appendix A). Social interaction theories, social ties, the role of communal spaces and their typologies have been considered. Literature on the aspects that affect social interaction has been reviewed, which is followed by three sections which discuss the factors that could affect social interaction among occupants in residential environments, categorised into social sustainability indicators (SSI), physical characteristics of the built environment (PCBE), and demographic factors (DF).

### **2.2. Background:**

The notion of sustainable development has become a global goal in the agenda of many international contexts and has been widely used after the publication of the Brundtland Report in 1987. The concept comprises three main dimensions - environmental, economic and social - the latter of which is the main focus of the current research study. Through desk research methodology, the current chapter reviews relevant literature that examined the concept of social sustainability, where it is found that there is a growing body of literature that attempts to define this 'nebulous' concept. The study of Yiftachel and Hedgcock (1993, p. 140) is an example that

provided the first definition of urban social sustainability, which is defined as the “*continuing ability of a city to function as a long-term, viable setting for human interaction, communication and cultural development*”. Attaining urban social sustainability is a dynamic, complicated process. A significant gap was identified through the current urban-related literature on social sustainability as it is a dynamic concept and has changed with time. The current study considers two main dimensions - social equity and sustainability of the communities, which comprise social sustainability (Bramley et al., 2009; Bramley & Power, 2009; Dempsey et al., 2011). More details are discussed in Appendix A.

Reviewing the relevant literature shows that most of the studies are in the context of developed countries, indicating that there is a gap in relation to emerging issues in developing or less developed countries (Ghahramanpouri et al., 2013). Some studies were conducted at a neighbourhood scale in some developed and developing countries to examine the relationship between social sustainability and other social aspects, such as the urban form, density, a sense of community, residents’ satisfaction (Bramley et al., 2009; Bramley & Power, 2009; Dave, 2011; Hemani et al., 2012; Karuppannan & Sivam, 2011; Lindsay, 2010) or concepts (Forrest & Kearns, 2001; Rastegar et al., 2017). The literature review has specified a gap in addressing the concept of social sustainability in the Middle East region. Developed countries tend to address the concept of social sustainability more than developing countries. The transient nature of countries in the Middle East has yet to be fully addressed by academic researchers. The following section discusses urban social sustainability in the Middle East.

### **2.3. Urban Social Sustainability in the Middle East**

Cities in the Middle East have significantly experienced the impact of globalisation and migration. The concept of social sustainability is just emerging in countries, such as the UAE. Researchers have adopted different tools, intending to help decision-makers address social, environmental and economic sustainability. Subeh and Al-rawashdeh (2012) reported in their study on urban sustainability that cities in the Middle East have elapsed through many challenges and pressures caused by urbanisation over the past few decades. The concept of urban sustainability is most influential in cities, such as Dubai, Muscat, Beirut, Amman, and Cairo, where there is continuous development balanced with economic and social development; thus, urban areas are not independent units, but part of an international development milieu. Doha is the capital of Qatar and has seen urbanisation at a rapid pace, which occurred during a high influx of migrants after the discovery of oil. Wiedmann et al. (2014) have examined the

Doha's urban environment that combines urban governance, for efficient urban structures; spatial practice that is responsible for the diversification of structures, and inhabitant identification with their surroundings as the basis for social equity. Their research included surveys of ex-pats to understand the concept of liveability and geographical information system evaluations. Three challenges were focused on in their research, providing an efficient urban structure, developing diversity, and creating an identity. A lack of efficiency in the urban structure and transport systems were significant factors resulting in a lack of cohesion between urban areas. There was no dialogue between developers and end-users, and consequently no long-term commitment from developers. Wiedmann et al. (2014) suggested that, to create sustainable urbanism and central planning with an effective transport system, an interchange between developers and end-users would be useful. This would help Doha sustain cultural identity as a Gulf city, and migrants to create their own identity. In Figure 2-1, the triadic principles and sustainable urban model are set out. The key to enhance the ecological balance of cities is in the supply of an efficient urban structure through urban governance. The basis for constant economic growth is the urban diversity created by the interdependencies and interactions between investors, companies and inhabitants. Also, the basis for social equity is the urban identity resulting from the identification process between all social groups and the urban environment.

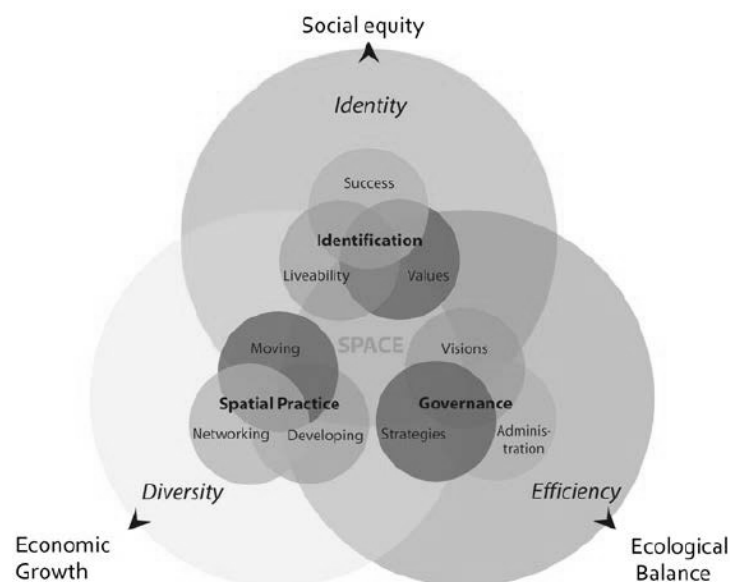


Figure 2-1 The interdependent production of sustainable urbanism and key sources of the three main urban qualities. (Source: Wiedmann, Salama and Mirincheva (2014)).

Sustainable urbanism is designing a sustainable urban system that creates physical and mental space to modify the urban form at any moment in time, to expect uncertain, unexpected and unprecedented alterations, and to develop stronger and become more resilient when uncertainty carries an influence (Roggema, 2016).

Various indicators evaluate urban social sustainability but vary depending on the regional and local context. In his research, Ahmed (2012) assessed urban social sustainability for neighbourhoods in Al Ain, UAE, and identified social sustainability indicators via qualitative methods, including face-to-face interviews with representatives of Emirati families living in public neighbourhoods, field observations and space syntactic analysis. The neighbourhoods selected were the main residences of Emiratis. The investigated indicators of social sustainability were: vitality and social interactions among residents; integrated public open spaces and neighbourhood links to the surroundings; pedestrianisation and cycling; a healthy environment, and a safe environment. From the previously mentioned indicators, the safe environment was significant, and a healthy environment partially achieved, while the other indicators were not meaningful (Ahmed, 2012). Ahmed (2012)'s study discussed the research gap around the requirement for socially sustainable neighbourhoods to consider regional, social and cultural characteristics. Residents' participation in the urban planning process has been negligible, yet a participatory approach can help remedy this. The Abu Dhabi Plan 2030 adapted traditional neighbourhood development planning with Fareej courtyard house design, which has been shown to enhance social interaction.

Chiu (2004), Dempsey et al. (2011) and McKenzie (2004) argued that community cohesion promotes social interaction and harmonious social relations among residents; indeed, it has been categorised by many scholars as a vital dimension for socially sustainable neighbourhoods. To encourage social interaction among residents, the guidelines propose that mosques, a symbol of socio-cultural life, should be located at a walkable distance, with facilities, such as a kindergarten, primary school, and cafes, in the proximity. An absence of public transport interconnectivity with urban space, and pedestrian and cycling facilities are all deficiencies in neighbourhood design. Houses should also provide privacy as well as a sense of the public realm. Other scholars have discussed the social life but with no direct link with sustainability. For instance, Abu-Ghazze (1993) considered privacy as the basis of architectural planning in the Islamic culture of Saudi Arabia. In this study, he used a literature review and fieldwork observations to examine how the culture of Saudi Arabia, affected by the Islamic religion article, influences the organisation of boundaries and architecture planning; this was achieved by studying the effects of two organising principles, gender and function.

In another study, Abu-Ghazze (1999) discussed the relationship between the social life of the community and the site design, including the housing layout, social interaction. The place of contact was studied in the context of multiple-family housing in the town of Abu-Nuseir in Amman. The researcher employed a house-to-house survey of households, using descriptive statistics to analyse data. Abu-Ghazze (1999) concluded that site design, including the layout of buildings in residential neighbourhoods, has intense effects upon people's behaviour and communication networks. Abu-Ghazze stated that designers should not view the site plan as simply a mechanistic tool for the laying-out of building structures. Based on the findings of his research, Abu-Ghazze (1999) believes that the designers of a residential environment have the power to facilitate social relationships through site plan manipulation. Also, it is not the amount of open space, but the arrangement of space that assists determine the use of the area.

In Iraq, the concept of urban social sustainability is discussed academically more than in the government agenda, although these discussions are negligible in comparison to studies that have examined environmental and economic sustainability. In their research, Al-hinkawi and Hassan (2014) argued that social sustainability could be achieved by using heritage features to express their sustainable social identity. The authors assessed two projects that were proposed by consulting offices to the Mayoralty of Baghdad (in 2009) for the development of the area surrounding the shrine of the two holy Imams Al-Kazimian in Baghdad via a list of observations and descriptive analysis. These projects were selected to provide the sample related to the research topic. As a holy city for Muslims (the traditional centre of Al-Kadhimiya), it manages to preserve its spiritual, social and cultural character and its renewed vitality and viability derived from the presence of the shrine of the Imams Al-Kazimian. The city is also able to preserve its local Islamic identity and indigenous residents. The literature review has produced a set of indicators to achieve social sustainability and sustainable architectural identity, including the consideration of cultural and social factors; the benefits of heritage in preserving socio-cultural identity; the use of local building materials and techniques, and the use of patterns and local architectural elements.

Since previous studies did not specify formulas for investing heritage elements in the formation of the contemporary urban scene, Al-hinkawi and Hassan's (2014) research assumes that the visual continuity of heritage elements is one form of achieving social sustainability. Although the study did not examine the current urban forms of the city, it offered important guidelines to achieve both a socially sustainable context as well as a sustainable architectural identity by promoting continuity. Al-hinkawi and Hassan (2014) suggest that the visual continuity of traditional elements is achieved at a higher level by the organisation of surfaces through their

visual properties and treatment of facades; furthermore, the continuity of formal relations is possible in terms of scale and proportion. As for the continuity of the local architectural style, it appears in the traditional formal elements. These heritage features depend on the constituents of each context, which be determined by historical, traditional, and architectural background factors.

There is an attempt by the Iraqi government to consider the concept of urban social sustainability in the annual governance agenda. Recently, the Iraqi Ministry of Planning has aimed to focus on the principles of sustainability, justice, and good governance by adopting a comprehensive framework for Iraq's development process that deals with the Sustainable Development Goals 2030. The Ministry presented a development vision and plans for Iraq's future with the assistance of professional and national expertise from inside and outside the Ministry and with support provided by international organisations. The vision identified five priorities with quantitative, measurable and implementable goals to overcome the challenges that face Iraq: building man, good governance, diversified economy, safe society, and a sustainable environment. The safe society goal includes steps that serve and promote the concept of urban social sustainability. Figure 2-2 represents five aims for the fourth goal of the vision of a safe society. Table 2-1 represents the literature that discussed social sustainability in the Middle East regions.



Figure 2-2 The aims underlying to achieve the fourth main goal of the vision, Safe Society. (Source: Iraq Vision for Sustainable Development 2030, Johan, Kazem, Mostafa, & AL-Mahdawe (2019)).



Table 2-1 The most important studies debate the notion of social sustainability in the Middle East regions.

Authors	General Focus	Underline Issues	Social Sustainability
Subeh and Al-rawashdeh (2012)	Exploring the implementation of expansion organization efforts in the Middle East Cities.	<ul style="list-style-type: none"> <li>Reviewing the nature and trends of urban development, and its consequences.</li> <li>Introducing concepts and strategies for promoting urban sustainability through compact urbanization.</li> <li>Discussing the implications of expansion organization strategies for the Middle East region.</li> </ul>	Moderate
Wiedmann et al. (2014)	Urban qualities for sustainable urban development in Qatar's capital Doha.	<ul style="list-style-type: none"> <li>Analysing and evaluations of GIS data</li> <li>Interviews with ten planning experts at the Ministry of Municipalities and Urban Planning.</li> <li>Questionnaires from 350 inhabitants.</li> <li>Analysing the three dimensions of sustainability concerning the urban qualities needed for producing them.</li> </ul>	Moderate
Ahmed (2012)	Examining the design of the public neighbourhoods in the city of Al Ain in the UAE in terms of social sustainability.	<p>Evaluating the dimensions of social sustainability:</p> <ul style="list-style-type: none"> <li>Face-to-face interviews with representatives of Emirati families living in public neighbourhoods.</li> <li>Analysing the design patterns of selected neighbourhoods.</li> <li>Field observations.</li> <li>Spatial syntactic analyses.</li> </ul>	Heavily
Abu-Ghazzeah (1993)	Investigating how the culture and socio-religious norms of Saudi Arabia affect the organization of boundaries and architecture planning, and the effects of gender and function.	<ul style="list-style-type: none"> <li>The author develops a theoretical interpretation of privacy in the cultural context of Saudi Arabia and its impact on the design and use of boundaries.</li> <li>Emphasising on residential buildings where the psychological implications of boundaries are fundamental.</li> <li>Based on a literature review and fieldwork observations, it is concluded that Saudi Arabians use physical partitions to nonverbally communicate their concern about privacy to outsiders; their territorial behaviour is based on strong adherence to the Islamic religion and on their sense of self identity.</li> </ul>	
Abu-Ghazzeah (1999)	Concerning the relationship between the site design and the social life of the community in the town of Abu-Nuseir, Amman for housing designers.	<ul style="list-style-type: none"> <li>A house-to-house survey of households concerning the areas near houses.</li> <li>The perceived adequacy of these places for social interaction and, as a result, the development of social relationships.</li> </ul>	
Al-hinkawi and Hassan (2014)	The human being within the social dimensions of sustainability, his belonging and awareness of identity through the employment of local heritage in the contemporary product.	<ul style="list-style-type: none"> <li>Adopting the heritage vocabulary and expressing sustainable social identity in the application of concluded theoretical framework in a contemporary urban project.</li> <li>The visual continuity of traditional vocabulary.</li> <li>The continuity of organising the surfaces regarding optical properties and elevations treatments.</li> <li>The continuity of formal relations regarding scale and proportion.</li> <li>The continuity of the local architectural style appears in the heritage formal elements.</li> </ul>	

## **2.4. Urban Forms and Social Sustainability**

A built environment creates spaces for people, and they become significant. Urban forms have been integral contributors to a sustainable built environment. According to Williams (2014), urban form is defined as the physical characteristics that form built-up areas, including shape, size, density and the configuration of settlements. Moreover, it can be analysed at different scales - regional, urban, neighbourhood, block and street. Some urban forms are more sustainable than others and afford efficient urban patterns, which can create a sense of community and resident satisfaction. Various variable characteristics include mixed land-use, street patterns, transport facilities, the arrangement of houses, and amenities; these have defined the components of urban form.

Urban planners can be inspired by traditional urban forms to create integrated urban environments which are more sustainable socially. Sharifi and Murayama (2013) described the main elements of traditional Iranian cities, their qualities, and the way they have contributed to the social sustainability of communities. Furthermore, the study clarified the current situations, and the way these elements have lost their function, and their integrity is disrupted. Sharifi and Murayama (2013) concluded that it is important for planners to take into consideration the evolution of the city over time by considering the lessons learned from the past at the time of the development or redevelopment. This will complement modern planning and design techniques by taking into account the inherent values of traditional urban forms, and will thus help in the creation of communities, which are more sustainable socially.

Bramley and Power (2009) discussed the social impact of urban forms of the neighbourhood in England. They identified density, house types, the height of buildings and the density of cars as elements of urban form. They concluded that, when considering socially rented housing, the socio-demographic composition is more important than the urban form. However, in terms of access to services in the neighbourhood, urban forms become more critical. Compact forms contribute better access to services but do not provide resident satisfaction; consequently, the two dimensions of social sustainability are social equity and sustaining communities. These dimensions work in opposite directions, meaning that the impact of urban forms on sustainability varies, based on where and how people live, and how communities are sustained.

In today's context of hyper-urbanisation, cities have emerged as pivotal in human development due to higher mobility and rural-urban migration. Keivani (2010) focused on sustainable development and environmental concerns, addressing social and economic domains mediated through physical spaces and built form. Urban form and spatial development have significant

consequences for sustainable development, including environmental, social and economic aspects. The concept of compact city development aims to optimise energy use, promote renewable energy sources, and provide integrated public transport networks and cycle routes. This changes the culture of energy and resource consumption, and increases social inclusion (Jenks and Jones, 2010, cited by Keivani, 2010). Challenges here revolve around the multi-faceted nature of the sustainability debate in towns and cities, where large concentrations of people and activities have created both a myriad of complex issues, and the potential to address them.

Karuppannan and Sivam (2011), who focused on neighbourhoods in Delhi, India emphasised the importance of urban form in creating a socially sustainable neighbourhood. In their study, three neighbourhoods are distinct in character: one is from the oldest city area, another was designed during British colonial times, and the third is from a contemporary period. Design parameters and social behaviour indicators were used to assess social sustainability. The study concluded that physical design, layout patterns, location and the design of open spaces result in opportunities to develop social relations and socially sustainable neighbourhoods; this has contributed to the policymaking framework.

The relationship between neighbourhood and social sustainability should be understood by stakeholders who develop neighbourhoods and invest in urban development. Greene (1992) reports that urban form is the physical arrangement of various activities and architectural forms to suit land-use regulations. Lynch (1960), Cullen (1961), Levy (1988), and Trancik (1986) all perceive the design of urban form in physical and environmental terms. In contrast, others argue that it represents a relationship between its psychological, sociological and philosophical aspects (Rapoport 1982, Mahy et al., 1987). Thus, the role of the built environment in creating spaces, where neighbours interact intentionally or accidentally has often been important. Urban sustainability has influenced policies and governance in many cities. Chiu (2012) examines the rapid urbanisation of Chinese cities - Beijing, Shanghai and Guangzhou – which have adopted sustainability principles in their urban form planning strategies. Compact urban forms and sustainability performances are investigated for their advantages and disadvantages. Improvements in liveability were not only dependent on urban form, but also on urban policies. However, the success of Shanghai and Guangzhou, in contrast with Beijing, is underscored by their efficient multi-nodal urban forms. Discussion forum respondents also suggest that urban design has a close relationship with sustainable development; the layouts of streets and open spaces, and the design of building and transportation networks are key elements in creating sustainable urban living spaces.

Hernbäck (2012) considered the significance of spaces and investigated the relationship between urban form and urban life. Space syntax analysis was used for a study of Pune, India, which investigated the influence of urban form on public space in planned and formally unplanned urban environments. Hernbäck cited Jacobs (1961), Gehl (1987), and Whyte (1980), who emphasised the influence of urban form on urban life, and Hanson and Hillier (1987), who explored how socio-spatial environments reflect the social nature of people. Hernbäck (2012) also cited Legeby (2010) and Al Ghatam (2012), who suggested that social integration issues can be addressed when planning meets social science. For example, due to the hierarchy of street patterns in unplanned areas, which restrict the mobility of women, urban forms clearly have social implications.

Urban form constantly evolves in response to social, environmental, economic and technological developments as well as planning, housing and urban, health, transport and economic policies. Various factors in an urban form contribute to sustainability. However, although urban forms are addressed at the macro and micro scale, human scale is equally important in designing something that can enhance social networks and a sense of belonging. This makes street orientation and the design of spaces to encourage social interactions amongst residents important.

Hillier and Hanson (1984) recognised space as an area that contains social behaviour, because it offers the opportunity to move around and meet others, and therefore, to generate social relationships. Spaces with high accessibility and connectivity to surrounding places are likely to be more appealing in terms of social interaction, while segregated and closed spaces are more likely to prevent an area's social life. Consequently, in order to understand how people move in spaces and how spaces are generated by social environments, Hillier produced a socio-spatial theory called 'Space Syntax'. The socio-spatial perspective in urban research addresses how the *built environment* and *society* interact. It assumes that social space operates as both a product and a producer of changes in the metropolitan environment (Gottdiener et al., 2018). In the socio-spatial perspective, the built environment is essentially meaningful; it has its particular 'semiotics' that inform policy, culture, society, economy, and security. Awareness of socio-spatial studies emerged around the 1960s after critics, such as Jane Jacobs, William H. Whyte, and Jan Gehl, began to emphasise the significance of creating space for people rather than focusing merely on aesthetic forms and technical solutions. Therefore, they, and many other scholars, began to develop tools and methods to study public life and strategies to maintain and encourage the vitality of life between buildings.

Emphasis on the importance of creating space for people emerged after successive trends in urban planning and design aroused awareness that city and landscapes began to lose their identity. This particularly occurred after the dominant ideology of the mid-20th Century, which was represented by waves of industrialization and modernism, rational modern buildings, straight lines, symmetrical cities, and large open green spaces. Life between buildings disappeared despite the manifesto for a healthier, more humane, and safer life. The vibrant streets which were full of people and activities, and once the fabric of ordinary life, were replaced with empty green lawns or car-dominant avenues. No one was charged with responsibility for life between the buildings, and traditional know-how about the interaction of urban life and space were lost during this rapid transition (Gehl & Svarre, 2013). The socio-spatial approach is appropriate for use in this research, because of the importance and effectiveness of this approach in providing comprehensive insights into the quality of communal spaces and residents' social patterns. As previously mentioned, this approach includes many tools and methods; this study will consider the observations and behavioural mapping.

## **2.5. Urban Social Sustainability Indicators Discussed in Different Contexts:**

Numerous indicators in earlier studies were deliberated to assess social sustainability in different contexts. The following three sections analyse relevant literature that discusses urban social sustainability, mentioning the used indicators, sub-variables, and factors, as well as the methods and results of each study. At the end of these sections, a list of indicators manifesting social sustainability has been demonstrated.

### **2.5.1. Indicators Discussed in the Developed Countries' Contexts:**

The following section demonstrates that some relevant empirical studies discussed the notion of social sustainability by examining the relationships between the notion and other social indicators or overlapping concepts. This was achieved by using indicators related to the two key dimensions of social sustainability in a developed context.

Dempsey et al. (2009) provided a review of the concept of social sustainability, and its associated concepts, at the neighbourhood scale. This was achieved by identifying the dimensions of social sustainability that are claimed to be affected in some way by the built environment at the neighbourhood scale. The research was performed by the City-Form: Sustainable Urban Form Consortium, which examined the relationship between urban form and

sustainability in UK neighbourhoods over four years. According to a review of relevant literature, the researchers demonstrated that two types of factors affect social sustainability, namely the predominantly physical factors, and the non-physical factors, as shown in Table 2-2. The study highlighted specific inter-related measurable aspects (the main indicators) of community sustainability, which are related to collective aspects of everyday life and are appropriate and meaningful concepts at the neighbourhood scale:

- 1- Social interaction/social networks in the community.
- 2- Participation in collective groups and networks in the community.
- 3- Community stability.
- 4- Pride/feeling of the place.
- 5- Safety and security are considered to be a fundamental part of social sustainability (Barton, 2000a).

*Table 2-2 Non-physical and physical factors (source: Dempsey et al. (2009)).*

Non-physical factors	Predominantly physical factors
<ul style="list-style-type: none"> <li>• Education and training.</li> <li>• Social justice: inter- and intra-generational.</li> <li>• Participation and local democracy.</li> <li>• Health, quality of life and well-being.</li> <li>• Social inclusion (and eradication of social exclusion).</li> <li>• Social capital.</li> <li>• Community.</li> <li>• Safety.</li> <li>• Mixed tenure.</li> <li>• Fair distribution of income.</li> <li>• Social order.</li> <li>• Social cohesion.</li> <li>• Community cohesion (i.e. cohesion between and among different groups).</li> <li>• Social networks.</li> <li>• Social interaction.</li> <li>• Sense of community and belonging.</li> <li>• Employment.</li> <li>• Residential stability (vs turnover).</li> <li>• Active community organisations.</li> <li>• Cultural traditions.</li> </ul>	<ul style="list-style-type: none"> <li>• Urbanity.</li> <li>• Attractive public realm.</li> <li>• Decent housing.</li> <li>• Local environmental quality and amenity.</li> <li>• Accessibility (e.g. to local services and facilities/employment/green space).</li> <li>• Sustainable urban design.</li> <li>• Neighbourhood.</li> <li>• Walkable neighbourhood: pedestrian-friendly.</li> </ul>

Numerous studies discussed the relationship of urban form and the density of context to examine social sustainability in developed and developing countries (Ahmed, 2011, 2012; Arundel & Ronald, 2017; Boyko & Cooper, 2011; Bramley et al., 2009, 2006; Bramley & Power, 2009; Dave, 2011; Dempsey et al., 2011; Hemani et al., 2012; Karuppannan & Sivam, 2011; Sharifi & Murayama, 2013). Bramley et al. (2009), Bramley and Power (2009), and Dempsey et al. (2009) provided a detailed exploration and definition of the concept of social sustainability within the urban context, by identifying two key dimensions of social

sustainability, and proving the impact of urban form and density on some aspects and dimensions of social sustainability. The three studies generally used similar indicators for social equity and sustainability of the community with some specific differences.

Using data from the Survey of English Housing, Bramley and Power (2009) analysed the relationship between key aspects of the urban form, housing types, density and the selected outcomes of social sustainability. The results pointed out the significant influence of urban form on a range of outcomes, although in opposite directions for the equity and community dimensions. This influence had been substantially modified after controlling the exogenous and intervening demographic and socioeconomic factors. Similarly, Bramley et al. (2009) investigated the relationship between aspects of social sustainability and the urban form, but in 15 case studies within five medium-sized British cities. In each city, three areas were chosen at three different distances from the city centre. The study proved that ‘compact cities’ are more socially sustainable in some social sustainability dimensions, and that urban form has different aspects with differing social effects. This study used household surveys linked to neighbourhood physical, map-based, and sociodemographic data. Table 2-3 below represents the ‘used aspects’ of the two studies.

*Table 2-3 Indicators and aspects considered in the research of Bramley & Power (2009) and Bramley et al. (2009). (Source: compiled by the researcher).*

The aspects	Indicators	
	Bramley & Power (2009)	Bramley et al. (2009)
<b>Social equity</b>	Accessibility to the following: <ul style="list-style-type: none"> <li>- Corner shops or supermarket.</li> <li>- A post office.</li> <li>- A doctor.</li> </ul>	<ul style="list-style-type: none"> <li>- Use of neighbourhood facilities/services.</li> <li>- The frequency of using public utilities.</li> <li>- The frequency of use of leisure services.</li> </ul>
<b>The sustainability of community</b>	<ul style="list-style-type: none"> <li>- Social interaction with other residents or social networks.</li> <li>- Participation in collective community activities.</li> <li>- Pride or sense of place.</li> <li>- Residential stability (versus turnover).</li> <li>- Security (lack of crime and disorder).</li> </ul>	<ul style="list-style-type: none"> <li>- Social interaction within the neighbourhood.</li> <li>- Participation in collective group/civic activities.</li> <li>- Pride/an attachment to the neighbourhood;</li> <li>- Satisfaction with the home.</li> <li>- Stability (vs residential turnover).</li> <li>- Safety/security (vs the risk of crime, antisocial behaviour).</li> <li>- Perceived quality of the local environment.</li> </ul>
<b>Urban form measures</b>	<ul style="list-style-type: none"> <li>- Density (gross residential), measured (preferably) in terms of dwellings ('spaces'), or habitable rooms, per hectare.</li> <li>- House type mix expressed as the proportion of flats, detached, semi-detached, or terraced houses.</li> <li>- Presence of high(er) residential buildings, proxied by households whose lowest floor of accommodation is above various floor levels.</li> <li>- The density of cars, relative to space, dwellings, or households, can also be measured.</li> </ul>	Considering: <ul style="list-style-type: none"> <li>- The location of the residential neighbourhood.</li> <li>- Density.</li> </ul>

In Arundel and Ronald's (2017) study in Amsterdam, they looked at how specific neighbourhood built form relates to key measures of sustainability of the community. Their study looked beyond the element of density itself to the specific variables that relate to dwelling and neighbourhood-level urban form. They determined which were best associated with *social capital* or *sense of community and resident satisfaction* and whether a 'well-designed' compact-city form could mitigate the purported negative liveability and community associations. The findings of Arundel and Ronald's (2017) study strongly indicate that higher densities have no statistically significant negative impact on local social capital, the sense of community or resident satisfaction. Relatively, other built-form measures, such as scale, the existence of local stores, the degree of automobile dominance and the construction period were of greater importance.

Dixon and Woodcraft (2013) developed a framework adapted from the Berkley Group with a set of metrics for new housing developments to assess their social sustainability. Figure 2-3 is taken from Dixon and Woodcraft (2013)'s study of the 'Kidbrooke Village' project that assessed social sustainability. The three dimensions laid out per this framework are:

- **'Amenities and infrastructure'**: a foundation for a thriving community, which provides facilities through a housing mix, the public realm, landscaping, transport connections, and community infrastructure.
- **'Social and cultural life'** is based on people's experiences, and contributes to their quality of life, perceptions of safety, feelings of belonging and interactions with neighbours.
- **'Voice and influence'** pertain to the potential and opportunities for the community to engage with each other.



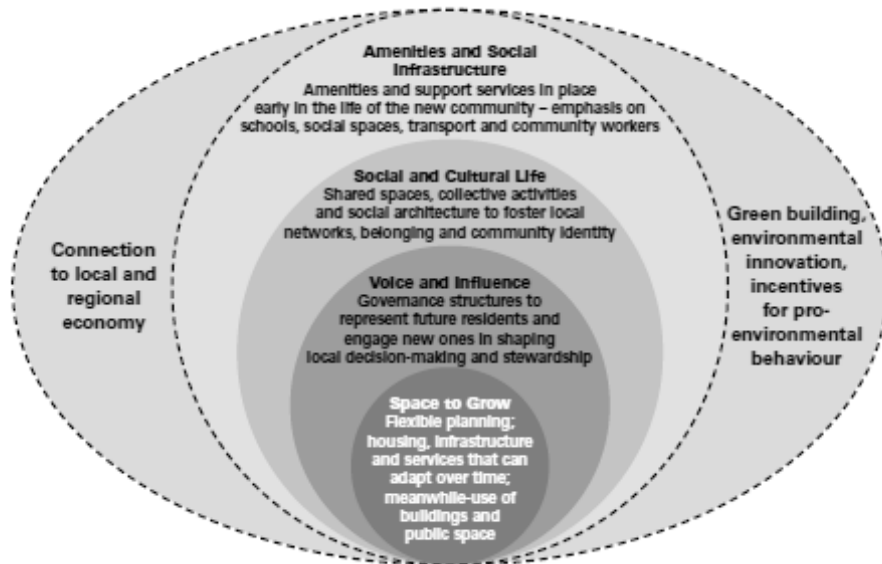


Figure 2-3 Future communities – a framework to create socially sustainable communities adapted from the Berkley Group.  
(Source: Dixon and Woodcraft (2013)).

Social sustainability emphasises the importance of place-making; hence, the physical environment is important. Most residents felt settled, secure, and a sense of belonging. Social interactions with neighbours were assessed based on the exchange of favours, advice seeking and by regularly talking with them. A low level of interaction was seen in those with a weak link with their neighbours. The level of interaction amongst respondents who had been living there for a year or less was low, although urban planning opportunities had sought open streets and spaces to encourage interaction.

In comparison with residents staying in private villas, those in affordable housing indicated a better level of social interaction. Figure 2-4 demonstrates the fourth dimension identified as important in a practical assessment of social sustainability: ‘change in the neighbourhood’, which captures the impact over time of a new community on the surrounding neighbourhood and wider area. The authors asserted that the social dimension is important for the long-term sustainability of new communities. Social sustainability is an issue of public value, well-being, quality of life and resident satisfaction. Consequently, today, social sustainability issues have become an integral component of the job of city planners.

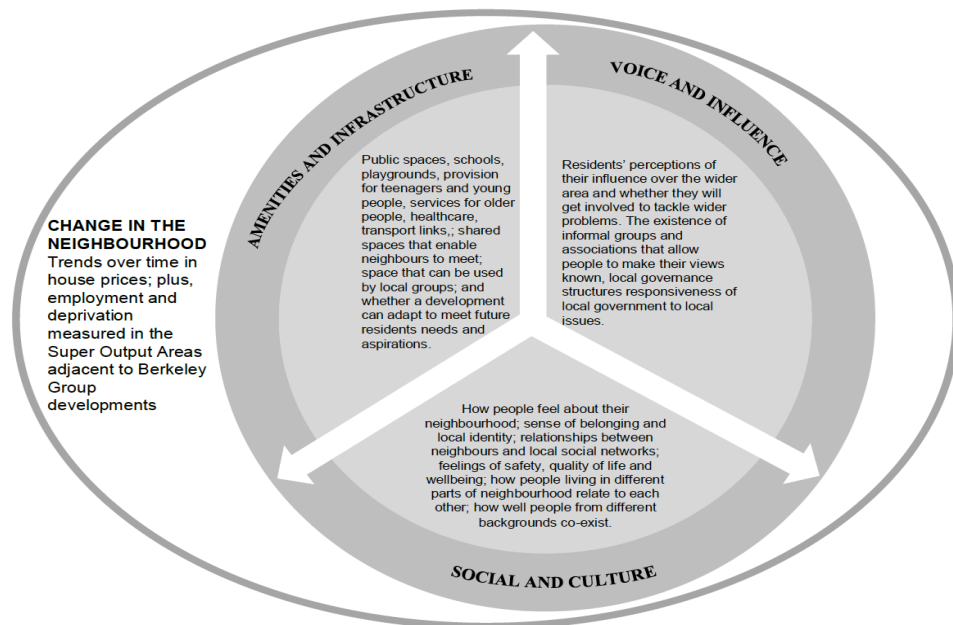


Figure 2-4 Four dimensions of social sustainability framework (Source: Dixon and Woodcraft (2013)).

Woodcraft et al. (2012) deliberated the framework developed by the Young Foundation and offers a structured procedure for every urban planner, designer and policymaker. Figure 2-5 illustrates the four important areas in the framework for social sustainability building blocks; amenities and social infrastructure, social and cultural life, space to grow, voice and culture.

- **Amenities and social infrastructure** include local services, such as schools, shops and public transport. These help people to feel at home and create opportunities to meet other residents, as well as for community and cultural activities. A sense of shared history enables residents to meet their neighbours. *“Whenever these opportunities were provided before the arrival of new communities, networks were easily formed, while when there was a lack of social infrastructure to support new residents, the community had long-term problems for well-being”* (Woodcraft et al., 2012, p.26). Creating strong social networks and breaking down barriers reduced tensions between diverse social groups.
- **Social and cultural life** is the result of formal and informal local activities within the neighbourhood. Residents often prefer to choose their communities based on the social and cultural background of the neighbourhood. Nevertheless, building social capital among diverse ethnic groups is a challenge. Therefore, creating spaces for residents to interact through community planning is the role of urban planners.
- **Voice and culture** refer to the involvement of community at the early stage of planning and development. A sense of belonging can occur when communities are established and form social networks.

- **Space to grow** is the physical space the community becomes acclimatised to with time. It is necessary to address flexibility and adaptability as community spaces are dynamic and change with social patterns. According to Woodcraft et al. (2012), creating spaces to grow can help residential stability, and communities can become more established.

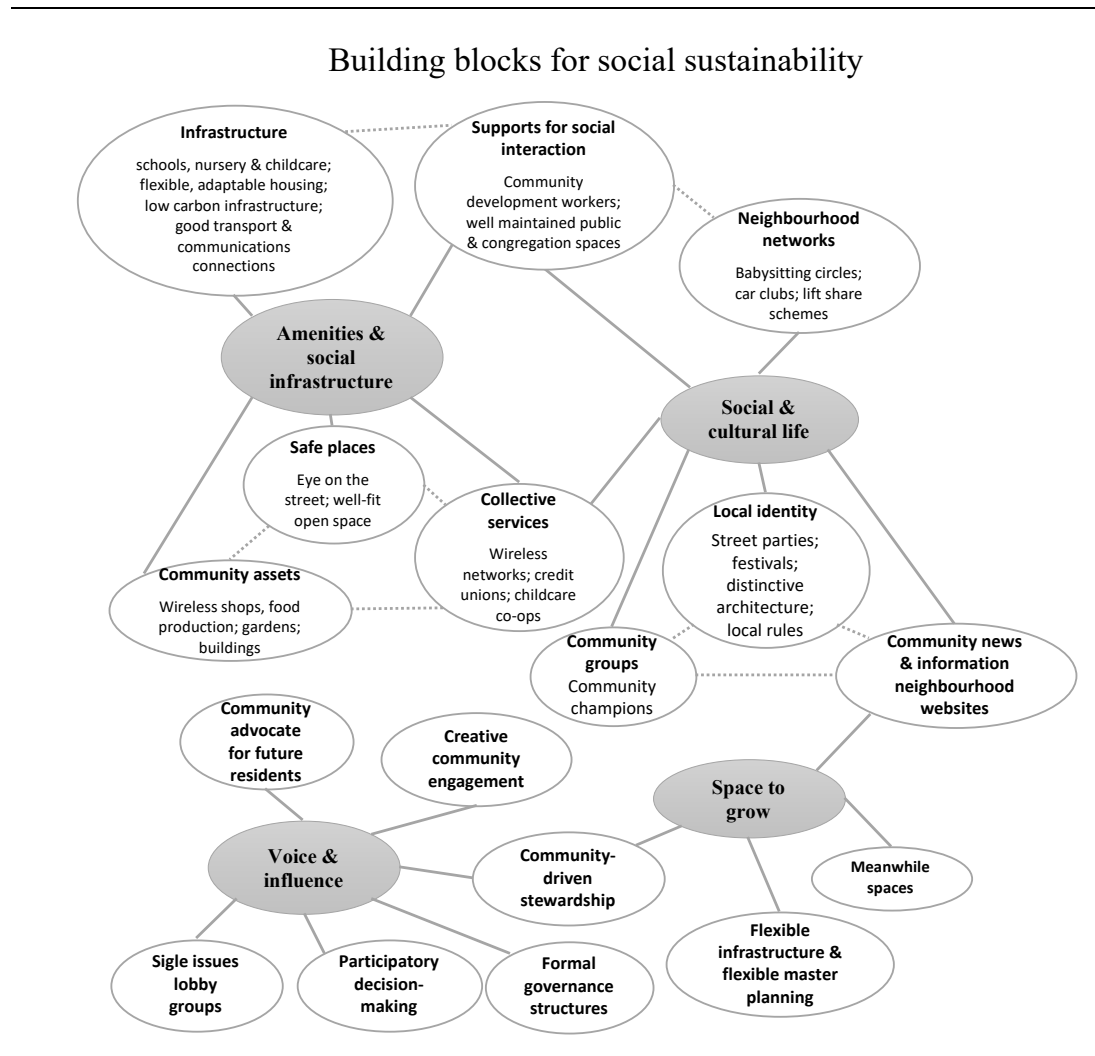


Figure 2-5 Social sustainability building blocks. (Source: Woodcraft et al. (2012)).

Hewitt and Pendlebury (2013) investigated the relationship between place and community in seeking to understand the importance of spatial and social identities. Their study examined the concept of people and place, the sense of community and social value. A participative approach helps develop the idea of locality and relates to the contemporary policy agenda.

### 2.5.2. Indicators discussed in the Context of Developing Countries:

Karuppannan and Sivam (2011) used a list of social indicators and design parameters, as represented in Table 2-4, to investigate the influence of three dissimilar urban forms of neighbourhoods in Delhi, India on social sustainability. They used mixed methods, which included: layout plan analysis; an observation survey; a structured interview (to gather

residents' opinions), and a comparison between the three neighbourhoods. The results of the study provided meaningful results in providing evidence of a strong relationship between social sustainability and urban form.

*Table 2-4 The social indicators and design parameters used by Karuppannan and Sivam (2011).*

The Social Indicators	The Design Parameters
<ul style="list-style-type: none"> <li>• Knowing their neighbours/ sense of community.</li> <li>• The frequency of meeting their neighbours.</li> <li>• Participating in community and social activities.</li> <li>• Opportunities for formal and informal social gathering.</li> <li>• Pride of place/place attachment.</li> <li>• How many neighbours they visit.</li> <li>• Safety and security concerns.</li> <li>• Feeling attached to this residence strongly and feeling at home.</li> <li>• Stop and chat with neighbours or say hello.</li> <li>• Making new friends.</li> </ul>	<ul style="list-style-type: none"> <li>• Provision and location of social infrastructure.</li> <li>• Provision and location of open spaces.</li> <li>• Aesthetic.</li> <li>• Accessibility.</li> <li>• Circulation pattern.</li> <li>• Safety.</li> </ul>

According to Dave (2011), six social aspects were used to provide empirical evidence for the influence of physical and perceived density on selected aspects of social sustainability in one of the developing contexts (Mumbai), (see Table 2-5). This evidence resulted from a comparison of 11 case studies of different urban forms and densities within the Mumbai Metropolitan Region, India, using multiple developed indicators to measure their levels of social sustainability. The primary data were collected using two methods; first, by documenting a built form, a physical site survey, density patterns, land use and a number of households; second, by conducting an in-depth interview using a questionnaire. The statistical programme for the social sciences (SPSS) and multiple centrality assessment were used to analyse the data. The author concluded that higher household and population densities have no adverse impacts on the social aspects of sustainability except for the undesirable effect of density perceptions. Nevertheless, such perceptions are the reason for most of the negative relationships of density; accordingly, it is found that the built form, layout, design and amount of mixed uses in addition to socio-demographic variables, such as family income and location, have an essential role in achieving social sustainability. Table 2-5 represents the aspects and the list of indicators used in the study.

Table 2-5 Aspects and indicators of social sustainability. (Source: Dave (2001)).

Aspects	List of indicators
Access to facilities & amenities	<ol style="list-style-type: none"> <li>1- Average distance to nearest daily use shops, primary school, health facilities, open spaces and parks, transport nodes, bank, post office.</li> <li>2- An average number of school, health facilities and open space and park per 1000 people.</li> </ol>
Amount of living space	<ol style="list-style-type: none"> <li>1- Floor area per person.</li> <li>2- Perceived level of satisfaction with the size of home.</li> <li>3- Self-reporting of any private outdoor spaces within the home.</li> </ol>
The health of the inhabitants	<ol style="list-style-type: none"> <li>1- The self-reported health of the residents regarding the number of family members having stress-related, pollution-related or no health problems.</li> </ol>
Community spirit and social interaction	<ol style="list-style-type: none"> <li>1- Perceived number of social contacts (knowing people) within the neighbourhood</li> <li>2- Perceived number of informal chats with neighbours.</li> <li>3- Self-reported involvement in various community activities at various levels in the last 12 months.</li> <li>4- Perceived friendliness of the neighbourhood.</li> </ol>
Sense of community	<ol style="list-style-type: none"> <li>1- Perceived safety within the neighbourhood during daytime.</li> <li>2- Perceived safety within the neighbourhood after dark.</li> <li>3- Perceived vandalism in the neighbourhood.</li> <li>4- The perceived reputation of the neighbourhood.</li> </ol>
Neighbourhood as a place to live in	<ol style="list-style-type: none"> <li>1- Perceived neighbourhood regarding attractiveness, architectural character, well-maintained buildings, infrastructure, outdoors, parking facilities, quality of the environment, cleanliness and general appearance.</li> <li>2- The measured intensity of noise within the area.</li> <li>3- The perceived problem of noise pollution within the neighbourhood.</li> <li>4- Perceived privacy within the neighbourhood.</li> <li>5- Residents' satisfaction with the neighbourhood as a place to live.</li> <li>6- Desire to move out of the present home.</li> </ol>

Another study examined the impact of urban form on social sustainability in the Iranian cities from a different perspective by Sharifi & Murayama (2013). They argued that planners could be inspired to create integrated urban environments, which are more socially sustainable by considering traditional urban patterns. The scholars concluded that it is important to take into consideration the evolution of the city over time and to consider the lessons learned from the past at the time of development or redevelopment. Complementation modern planning and design techniques can consider the inherent values of traditional urban forms in order to facilitate the creation of communities that are more socially sustainable.

The next section describes two studies conducted to collect social indicators to evaluate the level of social sustainability in the Developing and Middle East countries.

### 2.5.3. Indicators Discussed in the Context of Middle East Countries:

As mentioned previously in section 2.5, urban social sustainability was considered in the context of the UAE. Ahmed (2012) examined the design of public neighbourhoods in the city of Al-Ain in terms of social sustainability. The study adopted qualitative methods, which were face-to-face interviews, the analysis of the design patterns of some selected neighbourhoods,

site observations, and spatial syntactic analysis. The indicators of social sustainability that were investigated in this study included: vitality and social interactions among residents; integrated public open spaces and neighbourhood links to the surroundings; pedestrianisation and cycling; a healthy environment, and a safe environment. From the previously mentioned indicators, the safe environment was significant, a healthy environment partially achieved, while the other indicators were not meaningful. Table 2-6 represents the eight social aspects with their indicators and sub-variables.

The research limitations related to some cultural constraints that prevented the expansion of the number of face-to-face interviews conducted with native Emirati citizens, especially women. Another limitation for the researcher is that Ahmed (2012) depended on a qualitative method instead of conducting mixed methods for a greater confirmation of the findings.

*Table 2-6 Principles, indicators and sub-variables of social sustainability in neighbourhoods (source: Ahmed (2012)).*

Aspects	Indicators	Sub-variables
Vitality and social interaction among residents	1. Social activities infrastructure and local activity centres.	<ul style="list-style-type: none"> <li>• Presence of a Friday prayer mosque.</li> <li>• Presence of a kindergarten.</li> <li>• Presence of two primary schools (girls/boys).</li> <li>• Presence of daily needs shops.</li> <li>• Presence of a café shop.</li> </ul>
	2. Accessibility to the activity centres.	<ul style="list-style-type: none"> <li>• Appropriate amount and variety of medium-density housing within and around activity centres.</li> <li>• Local activity centres within walking distance of houses and/or existing or proposed public transport routes.</li> </ul>
	3. The proper design of public spaces to encourage social interaction.	<ul style="list-style-type: none"> <li>• Local activity centres structured as mixed-use centres.</li> <li>• Local activity centres detailed to provide a high-quality public space.</li> <li>• Local activity centres supportive of public transport, walking and cycling.</li> </ul>
	4. Social cohesion among the residents.	<ul style="list-style-type: none"> <li>• The relationship between neighbours.</li> </ul>
	5. The residents' identification with their neighbourhoods.	<ul style="list-style-type: none"> <li>• Duration of stay in the neighbourhood.</li> <li>• Preference to stay in the neighbourhood</li> </ul>
Integrated public open space and neighbourhood links to its surroundings	II. The connection to surrounding neighbourhoods and activity centres.	<ul style="list-style-type: none"> <li>• Maximum access to public transport services</li> <li>• Integrated public transport facilities into the street design.</li> <li>• Presence of bus stops.</li> </ul>
	III. Interconnected streets and pedestrian and cyclist networks.	<ul style="list-style-type: none"> <li>• Grid street design</li> <li>• Avoidance of disconnected streets</li> </ul>
	IV. Accessible public parks and public open spaces.	<ul style="list-style-type: none"> <li>• Integrated parks and open spaces into the urban structure within the appropriate catchment area</li> </ul>
	V. A proper quality and quantity of public open spaces.	<ul style="list-style-type: none"> <li>• Parks and open spaces prepared for recreation and social interaction.</li> </ul>

Aspects	Indicators	Sub-variables
Pedestrianisation and cycling	1. Pedestrian and cycling facilities.	<ul style="list-style-type: none"> <li>Well-connected pedestrian network.</li> <li>Off-road cycle paths. DA, FO</li> <li>On-road cycle lanes.</li> </ul>
	2. Appropriate movement of pedestrians and cyclists.	<ul style="list-style-type: none"> <li>Walkable access and cycling routes along with the street network, both within and between neighbourhoods.</li> <li>Presence of pedestrian paths through parks and green areas.</li> <li>Shaded walking pavement.</li> <li>Good quality pavement.</li> <li>Well-lit walking pavement and cycle lanes.</li> <li>Level of usage of pedestrian and bicycles lanes.</li> <li>Appropriate width of the footpaths and sidewalks.</li> <li>Obstacles-free pedestrian movement.</li> </ul>
Healthy environment	1. Sources of pollution.	<ul style="list-style-type: none"> <li>Sources of pollution.</li> <li>Appropriate locations for garbage containers.</li> <li>Periodical collection of garbage.</li> <li>Cleanness of the neighbourhood.</li> </ul>
	2. Solar access and natural ventilation of buildings.	<ul style="list-style-type: none"> <li>Buildings orientation for solar access.</li> <li>Buildings orientation for a prevailing breeze.</li> </ul>
	3. Green areas and public parks.	<ul style="list-style-type: none"> <li>Appropriate locations and areas of parks and green areas.</li> </ul>
	4. Children and youth physical activities.	<ul style="list-style-type: none"> <li>Well-equipped children's playgrounds.</li> <li>Well-equipped youth playgrounds.</li> </ul>
	5. The presence of medical care facilities.	<ul style="list-style-type: none"> <li>Presence of a clinic.</li> </ul>
Safe environment	<ul style="list-style-type: none"> <li>The safety measures in the neighbourhood.</li> </ul>	<ul style="list-style-type: none"> <li>Houses plots arranged to face front streets and parklands.</li> <li>Well-connected street network.</li> <li>Well-connected pedestrian and cyclist network.</li> <li>Well-lit streets, footpaths and cycling routes.</li> <li>Surveillance of public parkland and green areas through appropriate structuring and design of the parks.</li> <li>People encounter through integrated spatial design.</li> <li>Police Patrol.</li> </ul>
Privacy for residents	1. Hierarchy of spaces.	<ul style="list-style-type: none"> <li>Hierarchical street network and open spaces</li> </ul>
	2. The layout of the housing plots and the streetscape.	<ul style="list-style-type: none"> <li>Appropriate orientations for houses.</li> <li>Trees and fences.</li> </ul>
Housing layout quality and housing diversity	<ul style="list-style-type: none"> <li>Various plot sizes of houses with proper allocations in the site.</li> </ul>	<ul style="list-style-type: none"> <li>Different residential plot sizes.</li> <li>Good views through plots layout.</li> <li>Increased densities in and around the neighbourhood centre and public transport stops, and adjacent to higher amenity areas such as parks.</li> </ul>
Participatory decision-making process relevant to the neighbourhood.	1. Active participation in meetings.	<ul style="list-style-type: none"> <li>Number of meetings</li> </ul>
	2. Residents' intervention in raised problems.	<ul style="list-style-type: none"> <li>Residents' initiatives for solving neighbourhood relevant problems.</li> </ul>
	3. Involvement involuntarily works.	<ul style="list-style-type: none"> <li>Participation involuntarily works.</li> </ul>



Moreover, two studies were carried out in a context of Developing countries in order to collect indicators relating to the concept of sustainable development that emerged from earlier literature (Alanbari, Alisawy, Abdulqader, and Aladhami, 2014; Elgadi, Ismail, Al Bargi, and Suliman Ali, 2016). The methodology of these studies involved the extrapolation of urban sustainability indicators from earlier studies for residential neighbourhoods in different world contexts. Interviews were then conducted with local experts to filter the list collected.

To evaluate the sustainable performance of a residential neighbourhood in the Iraqi city, Alanbari et al. (2014) aimed to select a group of sustainability indicators in the economic, social, environmental aspects at the level of the residential neighbourhood. This selection depended on some specific criteria: easy to understand, scientific validity, data availability, relevance, forward-looking, equity, value orientation, congruence, practicality, and visibility. The authors performed interviews with a group of local planning multidisciplinary experts who were attending a conference in Iraq by making cycles of in-depth discussion. Alanbari et al. (2014) reviewed Data Poetry Indicators (Seward Neighbourhood), which were developed by Seward Neighbourhood Group in collaboration with Crossroads Resource Centre; DRAFT Data Poetry Indicators (Longfellow Community) which were developed by Longfellow Community Council in collaboration with Crossroads Resource Centre, and GIS-Based Urban Sustainability Assessment: The Case of Dammam City, Saudi Arabia. Thus, the authors offered a concluding 41 indicators, as shown in Table 2-7.

*Table 2-7 Social indicators confirmed by Alanbari et al. (2014) (Source: compiled by the researcher from Alanbari et al. (2014)).*

Social indicators	
1. Number of coop housing. 2. Number of houses not in good repair. 3. Number of houses at risk for condemnation. 4. Persons per hectare in a built-up residential area. 5. The ratio of the average house sale price to an 'affordable price'.	Housing Affordability
6. Number of Hospitals. 7. Number of Clinics. 8. Years of healthy life expectancy. 9. Percentage of babies born at adequate birth weight.	Health
10. Number of Recreation services, e.g., community centres. 11. Number of Cultural facilities, e.g., libraries. 12. Number of professional and personal services. 13. Percentage of historical and archaeological sites and buildings designated for preservation.	Social services
14. Crime rate (# criminal code, violent, property crimes). 15. Incidence of crimes committed by youth. 16. Number of hate crimes in the community. 17. Percentage of residents who feel safe in their neighbourhood. 18. Recorded crime per 1,000 population. 19. Percentage of block clubs with a scope of activity broader than crime prevention.	Safety: 1. Crime (police resource) 2. Perception of security – fear (a survey would need to be conducted).
20. Number of bicycles travelling on the main routes compared to the number of cars.	Transportation/ Pedestrian activities.



Social indicators	
21. The average time of travel to work by neighbourhood residents.	Poverty
22. Per cent of residents who walk to local stores to purchase most life essentials.	
23. Pct. of families living in poverty.	
24. Percentage of population living below the poverty line (earn less than US\$4 per day).	
25. Number of people working out of their homes.	Work
26. % resident who have one or no person outside of their family to call on in case of an emergency.	Participation in activities/Social Network/ Empowerment / taking charge Individual, collective
27. Pct. of parents volunteering at their children's schools.	
28. Number of residents active in community organisation.	
29. Pct. of children involved in organised community activities.	
30. Number or per cent of families engaged in out-of-house recreation.	
31. Family participation in organised leagues.	
32. Recreational opportunities that meet diverse income levels and interests.	
33. Percentage of total land dedicated to open space.	
34. A number of residents who share skills or barter services with each other.	
35. Hours of TV/videos/games during evening or weekends.	
36. Percentage of neighbourhood children attending schools in the neighbourhood.	Education status
37. Percentage of students from the neighbourhood who changed schools at least once during the school year.	
38. Literacy rate (completion of primary education by primary-school-age children).	
39. Access to basic education (percentage of population).	Accessibility
40. Access to open spaces (percentage of population).	
41. Access to health services (percentage of population).	

The aim of Alanbari's et al. (2014) research is similar to the study conducted by Elgadi et al. (2016), which aimed to evaluate sustainable development in Tripoli, Libya. They considered four major factors, which are: social, environmental, economic and institution. After collecting a list of indicators from earlier studies, the preliminary list was evaluated and filtered by experts in the industry, and the number of indicators became 50, which were deemed relevant to sustainable development in Tripoli, Libya. The 50 indicators were grouped into 30 main themes that reflected either sustainable economic, environmental, social, or institutional indicators. The list of aspects that measured social sustainability as indicators are shown in Table 2-8.

Table 2-8 Social themes and indicators (Source: Elgadi et al. (2016).

Social Themes	Indicators
Income poverty	<ul style="list-style-type: none"> <li>The proportion of the population living below the national poverty Line.</li> <li>Social benefits per capita.</li> </ul>
Gender Equality	<ul style="list-style-type: none"> <li>The amount of public funding provided to address gender inequality.</li> </ul>
Crime	<ul style="list-style-type: none"> <li>Number of intentional homicides per 100,000 population.</li> <li>Number of preventive processes against Terrorism.</li> <li>The proportion of city covered by monitoring cameras in the streets and using explosives detection devices.</li> </ul>
Sanitation	<ul style="list-style-type: none"> <li>The proportion of the population using an improved sanitation facility.</li> <li>The number of managed landfill sites.</li> </ul>
Health status and risks	<ul style="list-style-type: none"> <li>Morbidity of major diseases such as HIV/AIDS, malaria, tuberculosis.</li> </ul>
Mortality	<ul style="list-style-type: none"> <li>Healthy life expectancy at birth.</li> <li>Life expectancy at birth.</li> </ul>
Educational level	<ul style="list-style-type: none"> <li>Gross intake ratio to the last grade of primary education.</li> <li>Net enrolment rate in primary education.</li> <li>Adult secondary (tertiary) schooling attainment level.</li> </ul>
Literacy	<ul style="list-style-type: none"> <li>Percentage of sales of newspapers and other print media.</li> </ul>
Material consumption	<ul style="list-style-type: none"> <li>The intensity of Material Use.</li> </ul>
Population change	<ul style="list-style-type: none"> <li>Population growth rate.</li> <li>Net migration rate.</li> </ul>

After reviewing the relevant studies, it is found that numerous indicators measure urban social sustainability in different contexts around the world. The current research study uses the two key dimensions, social equity and the sustainability of communities to achieve the research questions, as social sustainability should be seen as comprising these two main dimensions (Bramley et al., 2009; Bramley & Power, 2009; Dempsey et al., 2011). Social equity is a concept rooted in social justice with notions of fairness in the distribution of resources, the avoidance of exclusion and the promotion of the full participation of residents in all aspects of society (Dempsey et al., 2012). In addition, in operational terms, it can relate to both the geographical distribution of amenities, opportunities and employment and to the provision of the means to access them, such as transportation or other forms of communication. The geographical or horizontal dimension of equity is important (Kay, 2005), with spatial imbalances manifested through deprivation with reduced access to facilities and a more impoverished living environment (Dempsey, 2009, p.292). Therefore, based on the previous studies, accessibility to the social services, facilities, and communal spaces, will be considered in this research for the social equity dimension.

Regarding the sustainability of the communities' dimension, notions of 'social capital' and 'social cohesion' have a strong association. According to Bramley and Power (2009), Dempsey et al. (2011), and Forrest and Kearns (2001), the notions of 'social capital' and 'social cohesion' are the product of trust and social relations, which are developed through interactions between residents, participation in community institutions, through the relative stability of a community and the positive connection with a place. Bramley et al. (2006, p.5) identify five key measurable aspects of social life that can be used as indicators of community sustainability: (i) social interaction and networks, (ii) participation in community groups and networks (sense of community), (iii) community stability, (iv) pride or sense of place, and (v) safety and security. The reviewed literature has also identified other indicators that could affect social sustainability: density, urban form, residents' satisfaction, and privacy and culture.

Therefore, the final list of social sustainability indicators has been collected from earlier studies and depend on the most used overlapping indicators in the Developed, Developing, and Middle East contexts. Figure 2-6 represents the overlapping concepts with the notion of social sustainability (represented by the green cells), indicators (represented by the yellow cells), and their variables (represented by the blue cells). The following represents the collected indicators that listed under the sustainability of communities' dimension:

1. Social interaction
2. Participation in community groups and networks/Sense of community
3. Community stability
4. Safety and security
5. Attachment to the place/Sense of pride
6. Residents' satisfaction
7. Privacy and culture
8. Urban form
9. Density

In total 191 studies discussing urban social sustainability have been analysed, including peer-reviewed journal articles, books, book sections, working papers, conference proceedings, and reports. These sources were obtained from three databases - Web of Science, Ethos, and Google Scholar. After intensive analysis, it was found that the term social interaction has been mentioned frequently under the umbrella of social sustainability. The results of the analysis that was conducted using Mendeley and NVivo software showed that around 30% of the analysed sources discussed the term of “social interaction” and related keywords, such as “social networks”, “social communication”, “social contact”, and “neighbouring”. Moreover, according to Bramley and Power (2009), the concept of social sustainability of urban development is connected with the achievement of social equity, social inclusion and social capital. Social sustainability implies that people need to work together and interact in order for a community to be socially sustainable. Social interactions were identified as a common thread between these concepts, where it was assumed that social interaction creates community (Karuppannan & Sivam, 2011). Accordingly, the current research study advocates that social interaction is the main determinant of social sustainability. Thus, the second research question has been answered completely. Table 2-9 represents the earlier analysed studies that considered social interaction and other related keywords. Table 2-10 shows the important studies that discussed social interaction in the research context.

Table 2-9 Earlier analysed studies regarding social interaction and related keywords.

Keywords	The authors
Social interaction	Abu-Ghazzeh (1999); Ramezani & Hamidi (2010); Farshidi (2016); Abbaszadeh (2009); Moulay et al. (2017); Alahmed et al. (2014); Lindsay (2010); Rasidi et al. (2012); Farida (2013); Williams (2005); Dempsey et al. (2012); Huang (2006); Thompson (2002); Ghahramanpouri & Sedaghatnia (2013); Skjaeveland & Garling (1997); Dempsey (2008); Lim et al. (2017); Reid (2015); Randhawa & Ahuja (2017); Montford (2013); Burgess et al. (1988); Boyko & Cooper (2011); Haqi (2016); Bramley et al. (2009); HACT (2015); Woodcraft (2012); Keivani (2010); Murphy (2012); Dixon & Woodcraft (2013); Bramley et al. (2006); Mahdavinejad et al. (2012); Hernbäck (2012); Sharifi & Murayama (2013); Davidson & Wilson (2009); Eben Saleh (1998); Hamiduddin (2015); Castro (2004); Bramley & Power (2009); Woodcraft et al. (2012); Smailes (1995); Al-Thahab et al. (2014); Hilgers & Goldsmiths (2013); Chiu (2012).
Social network	Bridge (2002); Raman (2010); Stafford et al. (2003); Bramley et al. (2006); Boyko & Cooper (2011); Haqi (2016); Bramley et al. (2009); HACT (2015); Woodcraft (2012); Mak & Peacock (2011); Dempsey et al. (2012); Murphy (2012); Hanson & Hillier (1987); Dixon & Woodcraft (2013); Murphy (2012); Hernbäck (2012); Sørholt et al. (2012); Davidson & Wilson (2009); Castro (2004); Bramley & Power (2009); Woodcraft et al. (2012); Hilgers & Goldsmiths (2013);
Neighbouring	Skjaeveland & Garling (1997); Buonfino & Hilder (2006); Boyko & Cooper (2011); Dempsey et al. (2012); Hanson & Hillier (1987); Alahmed et al. (2014); Castro (2004); Woodcraft et al. (2012); Smailes (1995); Yiftachel & Hedgcock (1993); Al-Thahab et al. (2014); Chiu (2012).
Social contact	Ramezani & Hamidi (2010); Mak & Peacock (2011); Dempsey et al. (2012); Bramley et al. (2006); Davidson, & Wilson (2009); Hamiduddin (2015); Smailes (1995).
Neighboring	Skjaeveland et al. (1996); Sharifi, A., & Murayama (2013); Eben Saleh (1998); Johan et al. (2019).
Social communication	Alahmed et al. (2014)

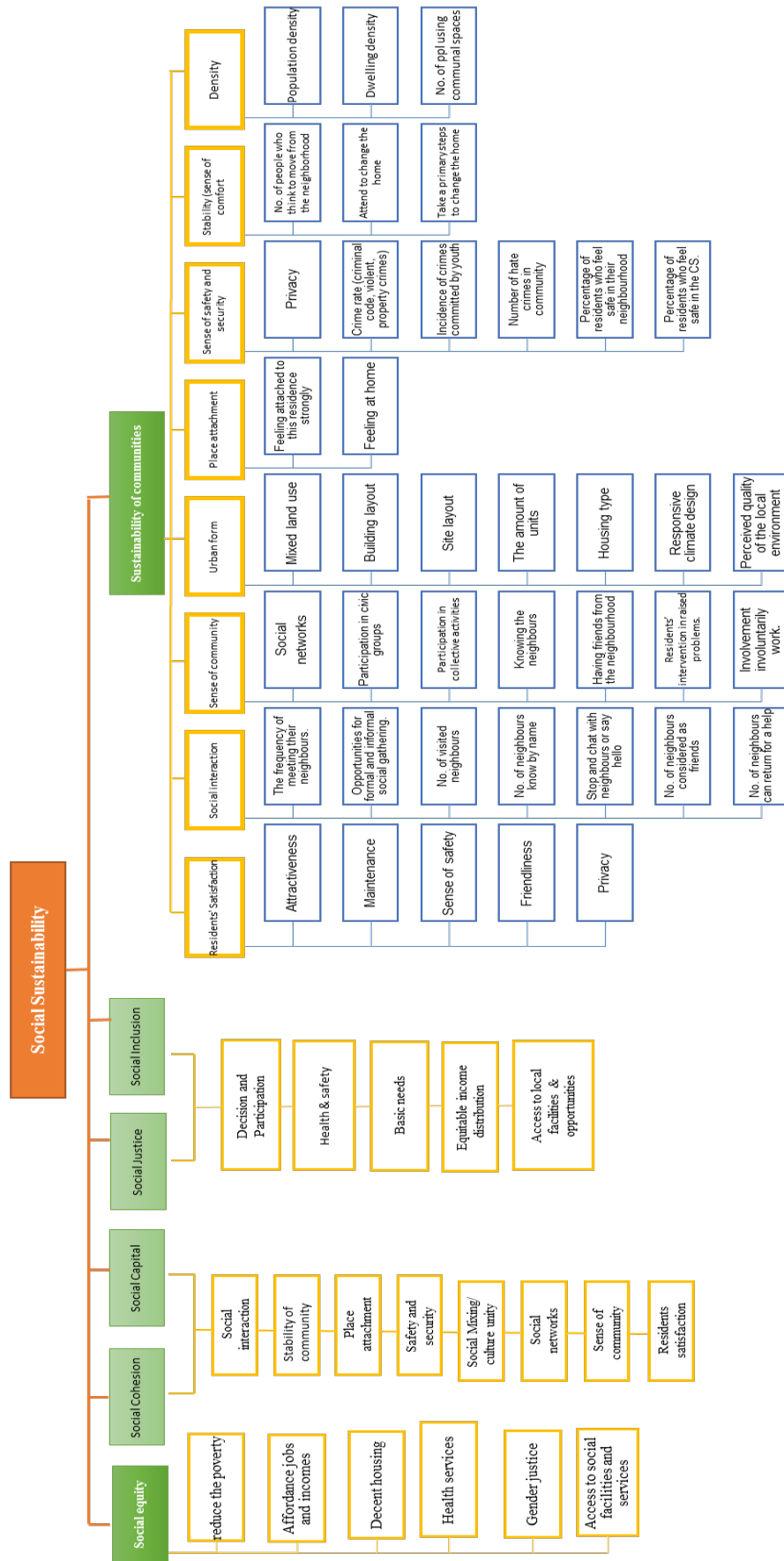


Figure 2-6 A summary of the overlapping concepts with the concept of social sustainability, the indicators, and the sub-variables for each indicator.  
(Sources: Ahmed, 2012; Bramley et al., 2009; Dave, 2011; Karuppannan & Sivam, 2011). Made by the researcher.

Table 2-10 Social interaction indicator is the most frequently used in the literature. (Table compiled by the researcher from Ahmed (2012); Alanbari et al. (2014); Bramley & Power (2009); Dave (2011); Dempsey et al. (2011); Karuppannan & Sivam (2011)).

Dempsey et al. (2009)	Dave (2011)	Ahmed (2012)	Bramley & Power (2009)	Bramley et al. (2009)	Karuppannan & Sivam (2011)	Alanbari et al. (2014)
Social interaction/social networks in the community.	Community spirit and social interaction	Vitality and social interaction among residents	Social interaction with other residents or social networks.	Social interaction	Knowing their neighbours/ sense of community.	Participation in collective groups and activities/ social interaction
Participation in collective groups and networks in the community.	Amount of living space	Integrated public open space and neighbourhood links to its surroundings	Participation in collective community activities.	The frequency of use of utility services.	The frequency of meeting their neighbours.	Housing Affordability
Community stability.	The health of the inhabitants	Participatory decision-making process relevant to the neighbourhood	Pride or sense of place.	The frequency of use of leisure services.	Opportunities for formal and informal social gathering.	Health
Pride/ feeling of the place.	Access to facilities & amenities	Housing layout quality and housing diversity	Residential stability (versus turnover).	Stable versus mobile (stability).	How many neighbours they visit	provision of Social services
Safety and security	Sense of community	Pedestrianisation and cycling	Security (lack of crime and disorder).	Participation in groups.	Stop and chat with neighbours or say hello	Safety and security
	Neighbourhood as a place to live in	Healthy environment	Presence of high(er) residential buildings	Pride and attached	Participating in community and social activities.	Education status
		Safe environment	Density	Use of neighbourhood facilities/services	Feeling attached to this residence strongly and feeling at home.	Accessibility
		Privacy for residents	House type mix	Safety	Safety and security concerns.	Transportation/ Pedestrian activities
			Accessibility	Environmental quality,	Pride of place/place attachment	Poverty
			The density of cars.	Satisfaction with the home.	Making new friends	Work

## 2.6. Social Interaction:

Social interactions are an integral part of any society where people of various cultures, and social and cultural backgrounds meet. According to Unger and Wandersman (1985), “*social interaction refers to the social activities that neighbours engage in, such as borrowing or lending tools, informal visiting, and asking for help in an emergency, and to the social networks which residents develop in their neighbourhood*”. This is what the literature has commonly referred to as ‘neighbouring’ (Keller, 1968; Olson, 1982). Local social interactions play a critical role in the social sustainability of urban communities by enhancing the sense of community and safety among residents of urban neighbourhoods (Dave, 2011). Doda (2005) states that social interactions are an action or event in which two or more people are involved in saying, doing or behaving in any manner. Similarly, sociologists see social interaction as behaviour between two or more people which is given meaning (Andersen et al., 2013). Through social interaction, people react and change, depending on the actions and reactions of others. Abbaszadeh (2009) defined the social interaction that continues informal communication between at least two residents and eventually leads to a resident’s accessibility to social and economic source and supports. Wirth (1964, p.17) describes social interaction as “*the basic process in the formation both of human nature and of the social order*”, whilst a cohesive society is said to hang together, in part, through social interaction (Hirschfield & Bowers, 1997).

Social interaction, also referred to as ‘social networks’, is one of the most agreed components, which can impact the social sustainability of communities both directly and indirectly (Aldridge et al., 2002; Bramley et al., 2009; N. Dempsey et al., 2011; Unger & Wandersman, 1985; Woodcraft et al., 2011). Without social interaction, people living in a given area can only be described as a group of individuals living separate lives, with little sense of community or sense of pride or place attachment (N. Dempsey, 2006). Dempsey, Bramley, Power, and Brown (2011), Kuo, Sullivan, Coley, and Brunson (1998) and Unger and Wandersman (1985) have argued that the presence of some level of ‘social interaction’ or ‘social ties’ transforms a group of individuals living in a given area into a community. Holland, Clark, Katz, and Peace (2007) argued that a sense of community develops with social interaction. Henning and Lieberg (1996) found in their study of a Swedish residential development that even very weak forms of social interaction, such as visual contact and greetings, can generate a ‘feeling of home’ and ‘security’ among residents.

According to Forrest and Kearns (2001), social interaction and social networks are consistently described as integral aspects of social capital. Social networks indicate to a person's overall connections to others regardless the supportive content of the ties. Social networks offer a way of expressing social relationships, linkages, or patterns of ties, and the flow of resources between individuals (Marin & Wellman, 2014; Unger & Wandersman, 1985). Bramley and Power (2009) stated that the concept of social sustainability in urban development is connected with the achievement of social equity, social inclusion and social capital. Social capital has been described as “*social networks and the associated norms of reciprocity*” (Putnam, 2000, p. 21); it also refers to features of the social organisation, including trust, the density and knowledge of relationships within networks and obligations and expectations (Pennington & Rydin, 2000). These features are said to facilitate reciprocal actions and spontaneous cooperation (Putnam et al., 1993). It is argued that local social networks, including both weak and strong ties, bring about the formation of social capital which affords residents with coping mechanisms for poverty, especially in deprived neighbourhoods (Flint & Kearns, 2006).

It is disputed that social networks are ‘social support systems’, demonstrating that the people we know and feel we can depend on can influence other aspects of life such as feelings of safety and a sense of well-being (Fischer, 1982; Pierson, 2002, as cited by Dempsey et al., 2011). Moreover, Fischer (1982) acknowledges that the supportiveness of networks can be exaggerated, as it is claimed that such social and mutual support is integral to people’s values and identities as well as to a civil society. Such social networks can range from weak, such as recognising someone by sight, to strong, including close friends and family. It is argued that, at the local scale, weak networks or ties can be as important as strong ties, particularly when considering the size and nature of a neighbourhood, as well as the provision of a variety of social opportunities (Skjæveland et al., 1996). While it is clear that both strong and weak ties can be expected at the same time within a community, not all relationships within, for example, a group, a family or a community are equally weighted, and nor should one expect them to be.

While extra-local social networks are “*increasing and becoming more dissociated from forms of local interaction*”, there is still a strong contingent in urban sociology literature that maintains that the neighbourhood is an important arena in which social activity occurs (Forrest & Kearns, 2001; Stafford et al., 2003). Neighbourhoods include local meeting places, such as a pub, café, community centre or leisure centre, which provide opportunities for social interaction. The physical settings, social settings and the environment improve social interactions, which illustrate various aspects of society, including social life and social ties between individuals and groups. Examples of the claimed relationships between the urban form and social interaction



and networks relate to density, layout and extent of mixed land use in a street or neighbourhood. For instance, high-density, mixed-use streets with overlooking residences are claimed to facilitate social interaction because of the increased range of people (and motivations for) using the street over wholly residential ones (Jacobs, 1961; Talen, 1999), although this was refuted elsewhere (Raman, unpublished PhD thesis). Empirical studies on the neighbourhood, social interactions, and social ties indicate that urban planners are partially responsible for the declining concept of the community. Reasons for the decline in social ties and interactions among neighbours range from land use, planning, density, and the availability of open space, to many other design factors. At the same time, many factors encourage social interactions and social ties among the community, such as the size and nature of the neighbourhood, its social opportunities, the relationship between urban form and social interactions, density, layout, and land use.

One of the domains of social capital is participation in organised activities within the community; furthermore, it is an essential factor in community stability (Forrest & Kearns, 2001). The level of participation depends on the accessibility of community facilities; if the commuting time to access these is long, participation levels are proportionately lower. Resident mobility is a reason for lower levels of attachment to the community; the higher the level of residential stability, the more active residents participate.

In order to manifest social interaction within the context of the current research study, indicators that measure the level of social interaction have been collected from previous studies (Ahmed, 2012; Alanbari et al., 2014; Bramley & Power, 2009; Dave, 2011; N. Dempsey, 2008; N. Dempsey et al., 2011; Farida, 2013; Karuppannan & Sivam, 2011; Skjaeveland & Garling, 1997; Skjaeveland et al., 1996). Table 2-11 illustrates studies that present social interaction in different contexts. The indicators that were collected that manifest social interaction are:

1. The number of neighbours knowing each other by name.
2. The number of neighbours visited every now and then.
3. The number of neighbours an individual says hello to.
4. The number of neighbours an individual usually stops to chat with.
5. The number of neighbours an individual considers as friends
6. The number of neighbours whom an individual can ask them for help.
7. The frequency of meeting neighbours.
8. Exchanging small things between neighbours.
9. Participating in opportunities for formal and informal social gatherings.
10. Pedestrians using local streets and alleys per day or during peak periods.

## 11. Visual interaction (passive communication).

*Table 2-11 The indicators of social interaction (Source: compiled by the researcher, from Ahmed (2012); Alanbari, Alisawy, Abdulqader, & Aladhami (2014); Bramley & Power (2009); Dave (2011); Dempsey, 2008; Dempsey et al. (2011); Farida (2013); Karuppannan & Sivam (2011); Skjaeveland & Garling (1997); Skjaeveland et al. (1996)).*

The Authors	Indicators
<b>Dempsey et al. (2009)</b>	<ul style="list-style-type: none"> <li>• Social interaction/social networks in the community.</li> <li>• Participation in collective groups and networks in the community.</li> </ul>
<b>Dempsey (2008)</b>	<ul style="list-style-type: none"> <li>• Interaction with neighbours.</li> <li>• Socialising with neighbours.</li> <li>• See friends/ friends in the neighbourhood.</li> <li>• Participation in activities in the neighbourhood.</li> </ul>
<b>Dave (2011)</b>	<ul style="list-style-type: none"> <li>• Perceived number of social contacts (knowing people) within the neighbourhood.</li> <li>• Perceived number of informal chats with neighbours</li> <li>• Self-reported involvement in various community activities at various levels in the last 12 months</li> <li>• Perceived friendliness of the neighbourhood.</li> </ul>
<b>Ahmed (2012)</b>	<ul style="list-style-type: none"> <li>• Presence of a Friday prayer mosque.</li> <li>• Presence of a kindergarten.</li> <li>• Presence of two primary schools (girls/boys).</li> <li>• Presence of daily needs shops.</li> <li>• Presence of a café shop.</li> </ul>
<b>Bramley &amp; Power (2009)</b>	<ul style="list-style-type: none"> <li>• Social interaction with other residents or social networks.</li> <li>• Participation in collective community activities.</li> </ul>
<b>Farida (2013)</b>	<ul style="list-style-type: none"> <li>• The number of persons you know by name in your building.</li> <li>• The number of persons you know by name in a different building within the same neighbourhood.</li> <li>• Do you have friends in the neighbourhood?</li> <li>• If you have a personal problem, do you have a neighbour you can talk to?</li> <li>• Frequency of visits to people living in your neighbourhood.</li> <li>• Nature of exchanges and favours asked/received.</li> </ul>
<b>Karuppannan &amp; Sivam (2011)</b>	<ul style="list-style-type: none"> <li>• Knowing their neighbours/ sense of community.</li> <li>• The frequency of meeting their neighbours.</li> <li>• Opportunities for formal and informal social gathering.</li> <li>• How many neighbours do they visit?</li> <li>• Stop and chat with neighbours or say hello.</li> <li>• Participating in community and social activities.</li> </ul>
<b>Alanbari et al. (2014)</b>	<ul style="list-style-type: none"> <li>• Participation in collective groups and activities/ social interaction.</li> <li>• Pedestrians using local streets and alleys per day or during peak periods.</li> </ul>
<b>Skjaeveland &amp; Garling (1997)</b>	<ul style="list-style-type: none"> <li>• If I need a little company, I can stop by a neighbour, I know.</li> <li>• If I have a personal crisis, I have a neighbour I can talk to.</li> <li>• I have made new friends by living here.</li> <li>• If I do not have something I need for my cooking, I can borrow it from a neighbour.</li> <li>• How many neighbours do you visit now and then?</li> <li>• How often do you help your neighbours with small things, or they help you?</li> <li>• How many of your closest neighbours do you typically stop and chat with when you run into them?</li> <li>• How many of your neighbours who live near you do you say hello to when you meet them?</li> </ul>

The quality of social interaction has different dimensions. One of the dimensions that has been studied before, is the neighbouring level. The term ‘Neighbouring’ refers to social relations between people living in close proximity (Buonfino & Hilder, 2006; Harris & Gale, 2004; Talen, 1999).

Skjæveland et al. (1996) developed a Multidimensional Measure of Neighbouring (MMN), employing a short and easily managed questionnaire that aimed to measure dimensions of social life within neighbourhoods. Principal Components Analysis (PCA) consistently extracted four factors, which were reproduced in three independent samples (N = 96 to 1060). The factors appeared as theoretically significant dimensions adopting the concepts of supportive acts of neighbouring, neighbour annoyance, neighbourhood attachment, and weak social ties. Residents' perceptions of neighbouring were also measured in Skjæveland and Garling (1997)'s study by applying the MMN, which considers supportive acts of neighbouring, neighbour annoyance, neighbourhood attachment, and weak social ties. They examined relationships between the physical features of neighbourhoods and social interaction among the residents. The data used in MMN were obtained from a questionnaire for residents regarding their perceived environment.

The study also depended on another independent data collection, namely the properties of the objective physical environment that were recorded by experts. The PCA considered eight selected neighbourhood physical dimensions for measurement: semiprivate space, visual appearance (surveillance), seating environment, dwelling density, spaciousness, street/entrance level, and size of private open space. The results of the study revealed that all objective and perceived physical dimensions, except for the size of the open private space, demonstrated variance in at least one of the neighbouring dimensions. Objective and, in particular, perceived spaciousness had the highest correlation with neighbouring. Visual appearance also explicated relatively large portions of neighbouring, but only on the annoyance dimension. Table 2-12 represents factor loadings for items in the Multidimensional Measure of Neighbouring in Skjæveland et al. (1996)'s study.

Table 2-12 Factor loadings for items in the Multidimensional Measure of Neighbouring after orthogonal varimax rotation\*†  
(source: Skjaeveland & Garling (1997)).

Item	Supportive acts of Neighbouring	Neighbour annoyance	Neighbourhood attachment	Weak social ties
1. If I need a little company, I can stop by a neighbour I know	0.87			
2. If I have a personal crisis, I have a neighbour I can talk to	0.80			
3. I have made new friends by living here	0.76			
4. If I don't have something I need for my cooking, I can borrow it from a neighbour	0.71			
5. How many neighbours do you visit now and then	0.69			
6. How often do you help your neighbours with small things, or they help you?	0.60			
7. Noise which my neighbours make can occasionally be a big problem		0.80		
8. How often are you irritated with some of your neighbours?		0.77		
9. In this house, I never feel quite safe		0.70		
10. I feel strongly attached to this residence			0.86	
11. I don't feel at home in this neighbourhood			0.83	
12. I would have better contacts with friends, family, etc, if I lived in another part of town		0.42	0.55	
13. How many of your closest neighbours do you typically stop and chat with when you run into them?				0.87
14. How many of your neighbours who live near you do you say hello to when you meet them?	0.39			0.73
Cumulative percentage of variance	32.3	48.3	56.7	64.3

\*Factor loadings with absolute values less than 0.35 are not displayed

†Response categories were of the following three types:

(1) Four categories; completely correct, partly correct, partly wrong, completely wrong (items 1–4, 7, 9–12)

(2) Four categories; several times a week, 1–6 times a month, more seldom, never (items 6 and 8).

(3) Six categories; 0, 1, 2, 3, 4–6, more than six neighbours (items 5, 13, and 14).

## 2.7. Social Interaction Theories

Ludvigsen (2005) investigated the theories of social interactions in public life in US middle-class society that were studied by the sociologist Goffman (1963). Goffman (1963)'s three central concepts are the occasion, the situation and the encounter. Figure 2-7 shows a conceptual framework of social space that connects the three levels with each other.

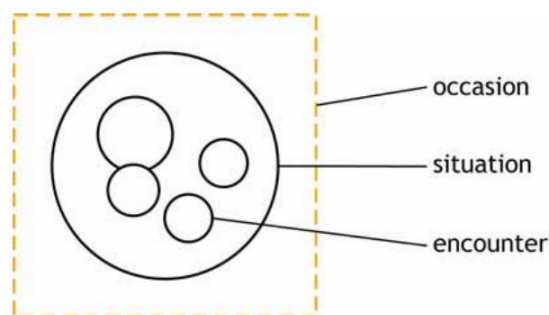


Figure 2-7 Layers of rules defining social interaction. (Source: Ludvigsen (2006)).

The occasion depends on the cultural and sub-cultural background, while the encounter or face-to-face engagement is more dynamic and represents the smallest unit of social interaction. The occasion defines a formal code, while encounters are more informal. A situation is 'an environment of communication possibilities' in which everyone enters and is accessible to other respondents. In a social situation, communication is both expressive and linguistic, and messages are conveyed through physical gestures, appearance, posture and the spoken word. Social interactions are enacted at various occasions in differing situations. The literature affirms that social interactions within the neighbourhood strengthen social ties and community cohesiveness.

In comparison, social isolation, which is the opposite of social interaction, is an emotional and physical state where there is a lack of contact with society. Social isolation can be harmful for the health of individuals, whereas social interactions boost psychological growth and enhance personality.

Both Western and Arab-Muslim literature have identified four theories of influence concerning the neighbourhood-built environment on residents' social interactions. Western theories are the theory of incivility and sense of community, while Arab-Muslim theories are social solidarity (Ummah) and the prevention of harm to public rights. The first social interaction is the theory of incivility that examines ways of designing a built environment that could avoid the disordered behaviour of individuals. The theory of incivilities defines several factors that significantly affect disorder and incivility in communities (Kelling & Wilson, 1982; Perkins & Taylor, 1996). These factors consist of: unpopular spatial configurations of territorial functions, residents perceived decreased safety levels and the weakening of informal social controls. However, Taylor (1987) proposed a solution to community disorder by using street blocks in a design-built environment with apparent patterns and boundaries. Moreover, he suggested approaches to increase communication and interactions among residents by designing a built environment within it, such as a garden, yard and crime prevention signs. Rapoport (1982) mentioned that positive communication attitudes and interactions among residents could become norms if providing personalised spaces in the built environment design, such as including yards with houses; however, a disordered behaviour setting could arise if residents ignored such territorial markers (Perkins & Taylor, 1996). The physical built environment and the incivilities of residents affect the crime percentage in a neighbourhood or in any built environment aspect.

Some scholars, such as Robinson, Lawton, Taylor, and Perkins (2003) and Taylor (2002), mentioned that incivilities theory had been greatly influenced by policy changes in the

community and in community crime prevention. In particular, Perkins and Taylor (1996) indicated the factors influencing a decreased percentage of crime and fear of crime. They studied 63 street blocks in Baltimore and found out that magnifying the elements of a built environment and social climate (such as residents' satisfaction and social interaction) would lead to the promotion of territorial functioning, which further reduced the level of crime. Moreover, Newman (1996) found that physical design could support informal meetings among residents and improve their social interactions.

The second social interaction theory is the sense of community. According to Duany and Plater-Zyberk (1992), losing a sense of community is identified as a modern social problem and can result from the sprawl of suburbia. Meanwhile, it is clear that the term 'sense of community' relates to many fields of research, such as psychology, urban planning, design and urban sociology. Each field of study has its own definition and assessment tools; thus, there are many studies in various fields that describe the role of the sense of community. In psychology, the sense of community attempts to analyse and determine the relationships between individuals and groups, and the psychological sense of community that a particular person shares with a group. McMillan and Chavis (1986) explain the meaning behind the psychological sense of community. It is a sense of belonging that the people have and share among each other, and a trustful sense between individuals and groups. Hill (1996), in his study, explained the findings of 30 research works that measured the sense of community. Four factors were found to influence the sense of community (Chavis & Pretty, 1999), which include: influence, integration and the satisfaction of demands, memberships, and feelings that are shared among the members.

Urban planning and design explain the sense of community as a sociological tradition in that the sense of community represents human satisfaction (Brower, 1996). This study has illustrated that the performance of the built environment performance represents a substantial factor that influences the social interaction among residents. Therefore, the study attempted to identify which built environment design and characteristics could improve residents' social interactions. Plas and Lewis (1996) reviewed a new neighbourhood by the seaside in Florida using a qualitative research methodology to study the built environment, the sense of community, and the relationships between them. Their study used four-element sense of community index (Chavis & Newbrough, 1986; McMillan & Chavis, 1986) as variables of sense of community, that included loyalty, integration and the satisfaction of demands, membership, and feelings that are shared among the members.

Islamic roles and literature have explained social interaction among residents, and which ways in which these could be enhanced. One of its social interaction theories is the prevention of harm to public rights. Caring and maintaining residents' rights and duties are principles that inform the theory of the prevention of harm to public rights. Many traditional religious scholars have discussed inhabitants' rights and duties according to Islamic values, for example, Ibn Taimiya who lived between 1263 and 1328. As stated by Mortada (2003), Ibn Taimiya explained the rights and duties of residents in traditional Muslim cities, such as all inhabitants should have opportunities to build many floors in their dwellings, but the height of dwellings should not affect their neighbours, (by, for example, influencing the air ventilation, light, privacy, etc). Furthermore, no one has the right to build industrial services in the neighbourhood (e.g., flour mill or leather-tanning factory), which means keeping the neighbourhood as convenient as possible for residents without any source of pollution or noise (Mortada, 2003).

Social solidarity (Ummah) theory is a fundamental principle of urban and planning design, as well as architectural design, and is as part of Islam roles. The spatial configuration of traditional Muslim cities, such as streets, open space and land use, has to support the social relationships between residents. Moreover, mixed land use predominated in traditional Muslim cities, which encouraged social relationships among their inhabitants. Such mixed-use patterns enhance the transportation of movement in the community that harmonised with the traffic system, and there was limited disturbance to the community (Mortada, 2003, p. 75). Moreover, by analysing the traditional Muslim marketplace, Perdo (1980) found the accessibility to market-placing (*sug*) was the same for all the dwelling units in neighbourhoods. Prophet Mohammed emphasised the location of marketplaces in several sayings, known as *hadiths*, which are used as Islamic context and roles. All residents have the same opportunities to share facilities in the city. Additionally, this approach involved the formulation of inhabitants in terms of ethnic issues, like tribes, and ignored any economic issues. Meanwhile, ethnic issues supported the sense of brotherhood and unity among inhabitants.

In conclusion, there was a positive influence on social solidarity by zoning inhabitants into tribes or groups within quarters, whereby low-income and wealthy families lived next to each other, and all differences were ignored. The strategy of the Prophet Mohammed in planning the city (*Medinah*) could be seen from the lands given to various tribes with homogeneous, ethnic backgrounds, regardless of their wealth and poverty. This gave them the freedom to subdivide the lands and use them according to their needs (Mortada, 2003). Thus, the spatial configuration of traditional Islamic cities was created by Prophet Mohammed's thoughts about 'Islamic roles and residents' requests and needs (Mortada, 2003).

## 2.8. Social Ties

Schiefloe (1990) mentions that utopian schemes for physical neighbourhood planning first appeared among architects and sociologists, due to the belief that the physical boundaries around local areas are as relevant as social boundaries. Henning and Lieberg (1996) realised that the social ties of residents were weak in the neighbourhood and strong outside of it. Moreover, they believed that social relations were important in everyday life and part of the social foundation of society. Social ties were evaluated based on the parameters of social networks, and combined practical help amongst neighbours, emotional help, childcare, and leisure contacts. The superficial relationships amongst neighbours point to weak social ties. Guest and Wierzbicki (1999), who studied trends in socialising with neighbours, analysed the concept of the 'declining community'. At the neighbourhood level, residents are becoming more selective of social groups, whilst their social ties outside the neighbourhood are stronger than those within. Families without children had fewer social ties and socialised outside the neighbourhood, whereas families with children developed strong social ties within it.

Yamamura (2011) deliberates social ties in the context of social capital as encountered by those who own their homes versus those who rent. Social capital was investigated against residential mobility, and found weak ties if families move to other residences, and no residential stability. According to Putnam (2000), social capital creates benefits for residents, and is based on investment in housing, whether to own or rent. Freeman (2001) investigated the impact of neighbourhood density on social ties. A sprawling neighbourhood with low-density urban forms is indicative of weak social ties. In these low-density planned areas, there is a lack of open public spaces, such as parks and gardens, because of privatisation. This results in a lesser degree of social interaction and a reduction in social capital.

There has also been an argument concerning high and low-density neighbourhoods and social ties. Nasar and Julian (1995, cited by Freeman, 2001) highlighted how high-density urban environments can weaken social ties, as difficulties can emerge amongst the relations with neighbours beyond their floors. Moreover, there is a theoretical link between sprawl and neighbourhood ties. Urban planners have a key role in creating an urban environment that is conducive to liveable communities. Urban planning can therefore enhance social ties within the neighbourhood. Kaźmierczak (2013) outlined that social ties are deteriorating due to mobility and changing modes of communication. Local parks, in comparison, which provide opportunities for social interactions, can strengthen social ties.

Considering the results and findings of relevant earlier studies, the next section describes the factors that could affect social interaction among residents.



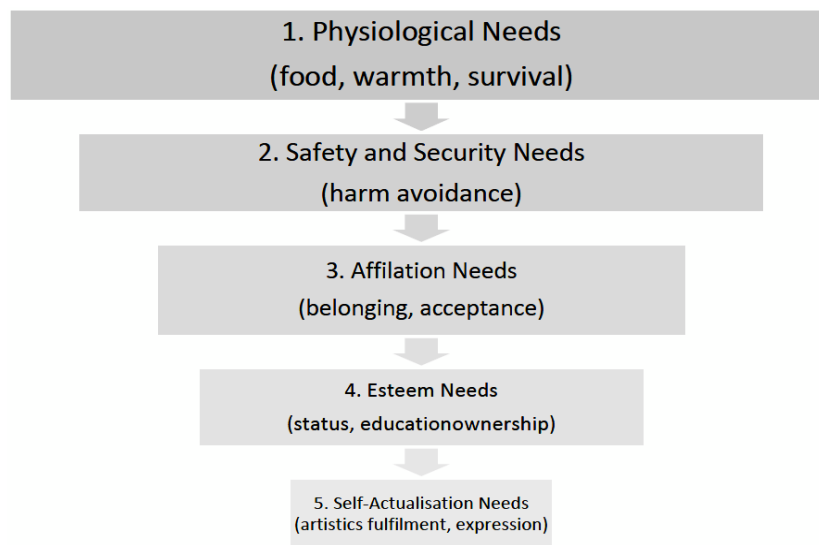
## **2.9. The Role of ‘Common Spaces’**

A strong focus in urban sociology literature maintains that the neighbourhood is an important arena in which social activity occurs, although extra-local social networks are increasing and becoming more dissociated from forms of local interaction (Forrest & Kearns, 2001; Stafford et al., 2003). Neighbourhoods in the contexts of developed countries include local meeting places, such as pubs, cafés, community or leisure centres. In contrast, neighbourhoods in developing countries include local meeting places and spaces, such as mosques, local shops, malls, cafes, in addition to open spaces and children’s playgrounds, which provide opportunities for social interactions. The physical surroundings, social contexts, and environment improve social interactions, which illustrate various aspects of society, including social life and social ties between individuals and groups.

Gehl (2011) discussed the concept of public spaces within the city. Social activities involve the presence of people and include all types of communication in city spaces. In this regard, many people perform passive activities, which include see and hear contacts, watching people, and observing what is happening. However, there are active relations that include exchanging greetings and talking to neighbours. Extensive contacts further grow from smaller contacts; children’s play or contacts between younger age groups who have meeting places are more extensive contacts. Hence, the principles of the right human scale must be a natural part of the urban fabric (More, 2017). According to Gehl (2011), the concept of the lively city is about lively public spaces that enable people to be in direct contact with the society around them and create a collaborative, enjoyable experience for social interaction. ‘People come where people are’ is an old proverb saying in Scandinavia and is commonly seen as the example of children seeing other children playing and wanting to join them. It is, therefore, essential to assemble people and events (Gehl, 2011).

In urban planning, these aspects (people and events) can be self-reinforcing elements for the spaces in the city. Spaces can be livelier by following either two approaches - either by quantitatively inviting more people to come or by qualitatively asking them to stay longer. Hence, working with time and quality rather than number and quantity improves spatial attributes. The concept of ‘Social Sustainability’ is important as communities become more urbanised; hence, they must be more ‘inclusive’ to ensure access and attraction to all groups in society and gain a comprehension of each other by sharing the same city space. To achieve the same, attempts should be made to reach beyond physical structures and social institutions.

As neighbourhood planning has a social dimension, urban planners and designers can shape the built environment to enhance patterns of social life. In this regard, Carmona et al. (2010) discussed the original work of Maslow (1986) that highlighted the hierarchy of human needs in the physical environment. They include: physiological for warmth and comfort; safety and security; affiliation, to belong to a community; esteem, to feel valued by others, and self-actualisation for artistic expression and fulfilment. Thus, a real society should meet all these needs; Figure 2-8.



*Figure 2-8 Pyramid of human needs, (source Carmona et al. (2010)).*

The role of the neighbourhood in bringing out the best in human nature was advanced by (Ford, 2000, p. 199). Holland et al. (2007) emphasised the importance of social spaces in creating a sense of community in the neighbourhood. The guidelines for successful social spaces hold that the success of a public space is not solely in the hands of the architect, urban designer or town planner, but also relies on people adopting, using and managing the space. People make places more than places make people. In their study, Eissa et al. (2015) examined sustainable urban development in the quality of public open spaces to evaluate the neighbourhood of Al-Najada, Doha. Their research suggested the revitalisation of Al-Najada to make it socially sustainable. The role of a public park is discussed, which is a place of encounters between different communities, yet it lacks facilities to boost social interactions. The study concluded a set of planning guidelines for Al-Najada for many other communities to visit the place and make it more inclusive. For example, this included the availability of public transport using multi-modal transportation, the promotion of activities for community involvement, and a secure environment.

The open spaces found in the neighbourhood can help to bring residents together, and this can build social interaction, as well as further develop and strengthen social ties in the community. Dubai's urban spaces are reflected in the study by Elsheshtawy (2004) with an emphasis on understanding issues about migration, the formation of identities within transnational spaces and the impact of planning/architecture on human behaviour. The transnational space is understood as locally based but connected globally to migrant home countries. Elsheshtawy adopts the tools of environment-behaviour research that includes behavioural mapping and videography to understand the dynamics of everyday life as experienced by migrants in the identified sites. This method described how the physical structure of the space influences behaviour to suggest how the built environment provides opportunities for interaction. Data from the observation was supplemented by interviews and conversations for a deeper understanding of the socio-cultural factors of users.

### **2.10. Typology of Communal Spaces:**

In this study, communal spaces can be classified according to three levels, which are the scale, service, and design. The first classification, the scale level, classifies communal spaces according to the area of those places and considers the number of people who would use them. In other words, the hierarchy in the size of the communal spaces and places. Starting from small communal spaces serving one or two people, such as a balcony moving to communal spaces and places of a medium or large size serving a group of users, such as the space in the front of the main doorstep, front/backyard garden, courtyard, streets, sidewalks, open spaces, children's playground, cafe, restaurant, or gym. This type of classification also focuses on the privacy level; from private, such as balcony; semi-private, such as the front garden or space in front of the main doorstep, adjacent street or a sidewalk, to public, such as a public garden, restaurant, or cafe. The second level for classifying communal spaces is the service level, which categorises communal spaces depending on their functions and the services they offer — for example, lifts, main doors, smoking rooms, roof terrace, shops, neighbourhood gardens, children's playground, bus stops, and parking.

Some scholars, such as Farshidi (2016), classified the design of communal spaces into two types: intentional and unintentional communal space within urban residential developments. The term intentional communal spaces refers only to those shared spaces that are initially designed for social interaction, such as gathering rooms, shared gyms and leisure facilities, roof terraces, courtyards (patios), front gardens, backyards that are sufficiently covered, balconies, and neighbourhood parks or open spaces (Gehl, 2011; Heckscher & Robinson, 1977; Kennedy

& Buys, 2015; Newman, 1996). In comparison, the term unintentional communal spaces relates to all communal spaces that are originally designed for service purposes, which also naturally adapt to different levels of social interaction. These spaces are not intentionally designed for social interaction so might be called ‘unintentional communal spaces’, such as stairs, lifts, parking areas, shared laundries, bus stops, main entrances, streets, sidewalks, and a corner shop at the neighbourhood scale. Also, communal spaces can be categorised into two types. First, open communal spaces are located within the neighbourhood, such as streets, sidewalks, open green spaces, along with the spaces in front of both the main entrance of houses, local shops, worship facilities, and schools. The second type is enclosed communal places available within the neighbourhood, such as cafes, restaurants, shops, and worship facilities, gyms, leisure facilities, and malls.

However, Gehl divided outdoor activities in city based public spaces into three categories, each of which places very different demands on the physical environment: necessary activities, optional activities, and social activities. Necessary activities “*include those that are more or less compulsory, such as going to work, shopping, waiting for a bus or a person, running errands*” (Gehl, 2011, p. 9). This group includes the vast majority of those related to walking, in addition to other activities. Because the activities in this group are necessary, their incidence is influenced only slightly by the physical framework. These activities occur throughout the year, under almost all circumstances, and are approximately independent of the exterior environment. Thus, participants have no choice.

Optional activities are “*those pursuits that are participated in if there is a wish to do so, and if place and time make it possible, are quite another matter*” (Gehl, 2011, p. 9). This category involves activities such as walking to enjoy fresh air, standing around enjoying life, or sitting and sunbathing. These activities happen only when exterior conditions are optimal, especially when the weather and place encourage them. Consequently, this relationship is particularly important for physical planning. In other words, these activities are mainly dependent on exterior physical conditions.

Social activities “*are all activities that depend on the presence of others in public spaces*” (Gehl, 2011, p. 12). Social activities involve greetings and conversations, children at play, communal activities of various kinds, and finally, as the most widespread social activity, passive contacts, which is, merely seeing and hearing other people. These activities could also be described as ‘resultant’ activities since social activities occur spontaneously as a direct outcome of people moving about and being in the same spaces. This means that social activities are indirectly

supported whenever necessary and optional activities are given better circumstances in public spaces.

According to Gehl (2011), social activity occurs every time two people are together in the same space. This could mean seeing and hearing one other and meeting, which is, in itself, a form of contact, a social interaction. The actual meeting, merely being present, is the seed for more comprehensive forms of social activity, and it is important for physical planning. Gehl (2011) also argues that architects and planners can impact the opportunities for meeting, seeing, and hearing people, although the physical framework does not have a direct impact on the quality, content, and intensity of social contacts. The current study will examine the influence of the physical characteristics of the built environment in more detail.

## **2.11. Urban form and Social Interaction:**

This section deals with earlier studies that investigate the relationship between different aspects and social interactions, which in return improve the level of social sustainability of the examined contexts. For this, a list of factors that could have an impact on social interaction has been collated. Some studies focus on the impact of the physical aspects of the built environment on social interaction among residents, including the design of either the neighbourhood or the shared open spaces (Alahmed et al., 2014; Farida, 2013; Farshidi, 2016; Henning & Lieberg, 1996b; Huang, 2006; Mahdavinejad et al., 2012; Raman, 2010; Skjaeveland & Garling, 1997; J. Williams, 2005). In comparison, others are concerned with the impact of other social aspects and indicators, such as ‘the sense of community’ on social interaction among residents (Al-Thahab et al., 2014; Francis et al., 2012; Randhawa & Ahuja, 2017; Talen, 1999), social sustainability and urban densities (Dave, 2011).

### **2.11.1. The Physical Characteristics of the Neighbourhoods:**

In terms of the influence of the built environment on social interaction, several studies have examined the relationship between the design or physical characteristics of the built environment and the social lives of residents. These studies were mostly conducted using mixed methods to capture meaningful results. Raman (2010) studied the relationship between design, layout and social interaction in six selected neighbourhoods of varying densities and layouts in the UK. Questionnaire surveys recorded community cohesion, while social networks were mapped. Observation surveys investigated social activities, pedestrian movements, the quality of the built environment, the layout of the neighbourhood and physical characteristics. Computer models analysed visual linkages, physical accessibility and connectivity. Space

syntax analysis was utilised to understand the visual linkages of neighbourhoods. It was found that physical characteristics, spatial layout, and building form affect the number of social contacts, quality of the social network, and frequency of social interaction in the neighbourhood. For instance, residents living in higher level tower blocks remain spatially segregated and encounter fewer social networks. A general physical layout that presents well-connected communal spaces promotes further social activities. The visual connections between houses have a significant influence on social networks, moreover the location of open spaces encourage social interaction and activities.

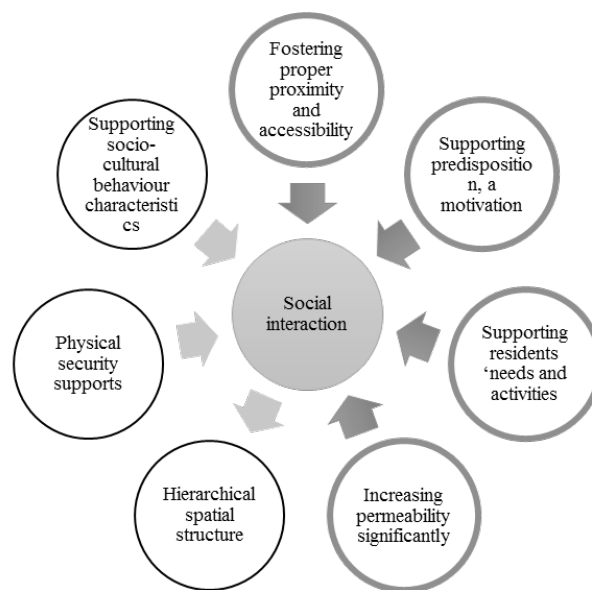
In contrast, Alahmed et al. (2014) investigated the impact of spatial design characteristics on social interaction in low-rise building neighbourhoods in Al-Basra City. This aimed to consider the social interactions exhibited amongst residents in low rise properties alongside those in single homes and traditional neighbourhoods. They used variables adopted from Abbaszadeh et al.'s (2009) research, who studied the lack of social interaction in high-rise residential neighbourhoods and found that the main reason for this was the built environment. The researchers used social interaction as the dependent variable and considered four types of space that typically develops social interaction in a neighbourhood. Thus, the independent variables in the regression model were *supportive*, *responsive*, *secured* and *collective spaces*. The regression results and co-linearity between the independent and dependent variables showed that seven variables influence social interaction; four of them were found to be the most significant variables in supporting residents 'needs and activities, increasing permeability, supporting predisposition, increasing motivation, fostering proper proximity and accessibility (see Table 2-13 and Figure 2-9).

The researchers gave recommendations for architects, especially urban designers, to enhance social interactions in low-rise residential building neighbourhoods in Basra city. They advised that architects should consider the design of low-rise residential neighbourhoods that consider the habits, practices and predispositions of residents. They advised on the provision of spaces for a range of residents including children, women and teenagers and the provision of facilities to enable play, discussion and other activities such as shopping and prayer. The formation of spaces should be carefully considered by architects when designing accessible spaces. They argued that attractive and accessible elements encourage the residents to visit and spend more time in open spaces and increase informal meetings and residents' social ties. Another important recommendation is the consideration of safety, because feeling secure is one of the potential factors that impact residents' social interactions. The last recommendation is creating opportunities for informal meetings that influence residents' social ties. This can be achieved

by considering the appropriate positioning of spaces at suitable distances, which impacts on the frequency of residents' visits to open spaces in the neighbourhood, such as gardens and children's play areas.

*Table 2-13 Tested and affecting variables on social interaction (Source: compiled by the researcher from Alahmed et al. (2014)).*

Independents variables	Tested Variables	Variables Affecting Social interactions
Secured spaces	<ul style="list-style-type: none"> <li>• Hierarchical spatial structure.</li> <li>• Physical security supports.</li> </ul>	<ul style="list-style-type: none"> <li>• Hierarchical spatial structure.</li> <li>• Physical security supports.</li> </ul>
Collective spaces	<ul style="list-style-type: none"> <li>• Fostering proper proximity and accessibility.</li> <li>• Meaning spaces for communal activity.</li> </ul>	<ul style="list-style-type: none"> <li>• Fostering proper proximity and accessibility.</li> </ul>
Supportive spaces	<ul style="list-style-type: none"> <li>• Supporting predisposition, and motivation.</li> <li>• Supporting socio-cultural behaviour characteristics.</li> <li>• Supporting residents' needs and activities.</li> </ul>	<ul style="list-style-type: none"> <li>• Supporting predisposition and motivation.</li> <li>• Supporting socio-cultural behaviour characteristics.</li> <li>• Supporting residents' needs and activities.</li> </ul>
Responsive spaces	<ul style="list-style-type: none"> <li>• Increasing permeability.</li> <li>• Increasing variety.</li> <li>• Increasing legibility.</li> </ul>	<ul style="list-style-type: none"> <li>• Increasing permeability.</li> </ul>



*Figure 2-9 The variables that influence the social interaction in low-rise residential buildings neighbourhoods. (Source: Compiled by the researcher from Alahmed et al. (2014)).*

An overabundance of studies has surfaced associating neighbourhood elements with social cohesion and integration and demonstrating the importance of quality neighbourhood design and facilities. From the macro planning of neighbourhoods to the local management of facilities and amenities, most researchers seem to agree that a good quality physical environment encourages social interaction. Lim et al. (2017) focused on the 'New Village' (NV), one of three types of urban village in Malaysia that have remained in a state of neglect despite awareness amongst the Malaysian government of the importance of national unity and social

integration. These urban villages are commonly associated with longstanding traditions and socio-cultural heritage, but have suffered from ineffective management, poor maintenance, and inadequate community facilities. The researchers developed a model for predicting social trust among villagers using the structural equation modelling technique, and based on a perception survey involving 334 respondents. The results supported findings amongst existing literature, which identified satisfaction towards neighbourhood facilities as a significant predictor of social trust. Therefore, there is a need to improve the perception and satisfaction with residence in neighbourhood facilities, with a particular focus on commercial and educational facilities in the examined context.

Moreover, studies have examined the physical aspect of the built environment when measuring the level of neighbouring. Skjaeveland and Garling (1997) conducted a study in central and rural parts of Bergen, Norway using a questionnaire to measure the residents' perceptions of neighbouring. The researchers used the Multidimensional Measure of Neighbouring (MMN), which includes supportive acts of neighbouring, neighbourhood attachment, neighbour annoyance, and weak social ties. They also analysed the properties of the objective physical environment, which were registered through structured expert ratings using the principal component analysis (PCA). These measures touched on eight neighbourhood physical dimensions, as shown in Table 2-14. The results revealed that all the objective and perceived physical dimensions, excepting the size of the open private space, clarified a variance with at least one of the neighbouring dimensions. Objective and, in particular, perceived spaciousness correlated highest with neighbouring, whilst visual appearance also explained the relatively high level of neighbouring, although only on the annoyance dimension.

*Table 2-14 PCA factors solution and the associated variables (Source: Skjaeveland & Garling (1997)).*

PCA factors solution (the analysed physical aspects)	Variables (no. 36)
1. Semi-private space	<ol style="list-style-type: none"> <li>1. Soft interfaces.</li> <li>2. Garden surrounding house.</li> <li>3. Garden gate.</li> <li>4. Buffer zone.</li> <li>5. Verandas.</li> <li>6. Screened social arena.</li> <li>7. Building age.</li> </ol>
2. Visual appearance	<ol style="list-style-type: none"> <li>1. Appearance, interior.</li> <li>2. Wear, interior.</li> <li>3. Wear, exterior building.</li> <li>4. Appearance, façade.</li> <li>5. Appearance, property.</li> <li>6. Inviting physical appearance.</li> <li>7. Appearance, adjacent building.</li> <li>8. Appearance, neighbourhood.</li> </ol>
3. Surveillance	<ol style="list-style-type: none"> <li>1. Windows provide visual contact.</li> <li>2. Interactional space along the front path.</li> </ol>



PCA factors solution (the analysed physical aspects)	Variables (no. 36)
	3. Social arena on the property. 4. See people on the front path.
4. Seating environment	1. Delimited by physical boundaries . 2. Greeneries. 3. Contains benches etc. 4. Possible to talk to neighbours.
5. Dwelling density	1. Dwellings per entrance door. 2. Number of floors. 3. Dwellings per building. 4. Dwellings per corridor. 5. Dwellings per 50 m street.
6. Spaciousness	1. Adjacent non-occupied land. 2. View more than 500 m. 3. Functional land between the houses.
7. The street/entrance level	1. Level of the target building. 2. Dominant building level in street.
8. Structured open space	1. Semi-private land subdivided. 2. Size of semiprivate open space. 3. Size of common open space. 4. Screened seating.

In comparison, other studies have illustrated empirical and theoretical approaches to understand the relationship between the characteristics of the physical environment and the social aspect of residents. Abu-Ghazzeh (1999) adopted a methodology for the empirical study of human use of outdoor spaces and social interaction in residential areas, and demonstrated how this approach worked in practice with a particular case study. As core focus for residential designers, the researcher examined the relationship between site design, including housing layout, social interaction and shared spaces in the context of multiple-family housing in the town of Abu-Nuseir in Jordan. The study was based on site visits and the use of questionnaire. Moreover, in a pilot study that involved behavioural observations and interviews, the researcher also reviewed the extent to which neighbourhood outdoor spaces in Abu-Nuseir fulfil a community role. These data represented socio-behavioural patterns that involved: any daytime recreational use (including the time of day); the personal characteristics of outdoor space users; social indicators, such as the type of activity, companionship, and patterns of community interaction. Abu-Ghazzeh (1999) carried out in-depth interviews to gain a basis for the questions in his questionnaire. Within the town, findings reveal differences in the ways people use and practice interaction, as noted through six patterns of housing layout and physical environmental forms. The findings suggested the need to distinguish the layout of residential buildings and the different aspects of any resulting open spaces between the structures. This study concluded that site design, including the layout of buildings in residential neighbourhoods, has profound effects upon people's behaviour and communication networks.

A critical study undertaken by Farshidi (2016) used similar aspects to those adopted by Abu-Ghazze (1999). Farshidi aimed to establish if and how the design of urban residential developments could enhance the quality and quantity of social interactions between residents in Scotland. Questionnaires, semi-structured interviews and a site survey, were employed in seven urban residential developments in order to collect data on three areas: social interaction patterns, the use of communal spaces, and the design qualities of the communal spaces within selected developments. To analyse the collected data, content analysis and GIS analytical maps were used. As the findings revealed, the unintentional communal spaces need as much design attention as the actual places of interaction among neighbours. It has also been found that social interaction and the space use patterns within selected case studies are affected by a number of physical attributes, but mostly include physical proximity, privacy, affordance and the visual attractiveness of communal spaces. Figure 2-10 and Table 2-15 represent the examined aspects in Farshidi’s study.

Table 2-15 Examined aspects in the study of Farshidi (Source: compiled by the researcher from Farshidi (2016)).

The Examined Aspects		
Design Qualities	Social Interaction	Use of Space
Physical Proximity.	Neighbourliness.	Intentional Communal Spaces (ICS).
Visual Connectivity.	Social Network.	Unintentional Communal Spaces (UCS).
Visual Attractiveness.	Social Ties.	
Privacy.		
Affordance.		

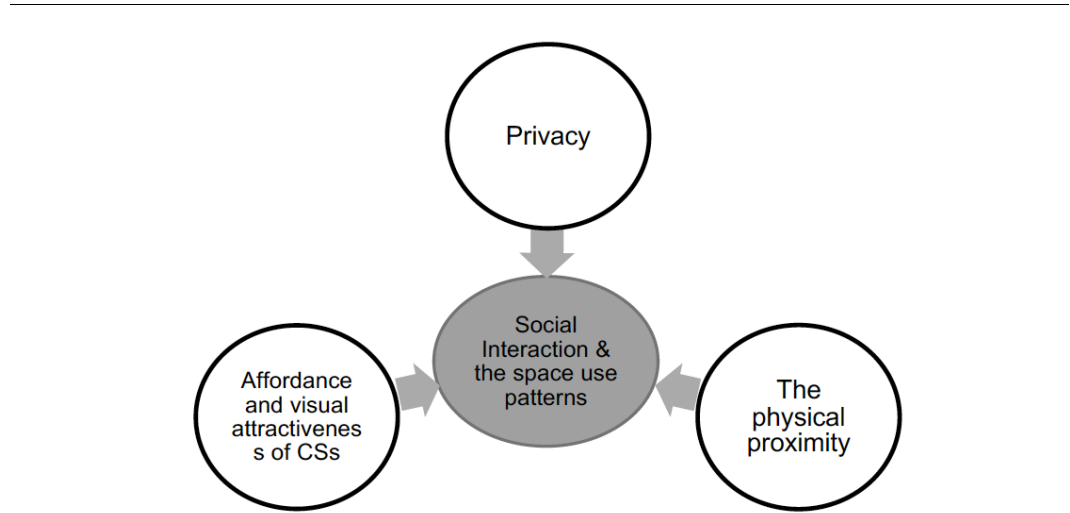


Figure 2-10 Physical attributes that affect social interaction and the spaces use patterns. (Source: compiled by the from Farshidi (2016)).

### 2.11.2. The Design of the Communal Spaces:

Some studies have considered the impact of the design of shared places that on social interaction among residents. It is argued that the most valued open urban spaces are not those that are significant or large and away from home, but instead are familiar and close (Burgess et al., 1988). Huang (2006) revealed that the phenomenon of social withdrawal among the residents, and both space types and design elements influence residents' social interactions. Using site-observation, he examined the influence of the courtyard design of high-rise housing complexes in Taipei, Taiwan on social interaction. The researcher identified five spatial categories based on their major environmental characters: 'seating space', 'scenic space', 'circulation space', 'activity space', and 'vague space'. Moreover, he recognised ten design elements: concave seating, convex seating, visual focuses, plants, nodes, routes, play areas, open areas, undefined areas and border areas. Thus, each pair were included in each one of the spatial categories above, respectively. Among the five space types, significantly more social interactions were found in circulation spaces, and significantly fewer social interactions were observed in seating and vague spaces.

In their study that was carried out in residential complexes, Mahdavinejad et al. (2012) examined the form of communal spaces and their impact on users' behaviour in Iranian cities from the anthropological and sociological perspective of urban architecture. Their study incorporated both qualitative and quantitative research. First, the quantity of the units was calculated, then, quantitative information in quality architectural and anthropological approaches was considered. To collect the quantitative data, a correlation technique and questionnaires were used, and four steps were followed to investigate the connection between residential complex features and their function: a) prepare a checklist for combined research of residential complexes; b) list the main features of the studied samples; c) list the differences and similarities of the samples; d) study the features mentioned on the solidarity model and users' culturalism model (Krosel & Klano Clark, 2009). Mahdavinejad et al. (2012) determined the relationship between four variables, which were: the number of building floors, the communal space share area, the capacity of the spaces, and the activity time. These four variables were compared and the solidarity between them calculated. Their study concluded a list of recommendations to increase the size of communal areas, were emerged from the researchers' inference that residential complexes with a high share of communal spaces, saw more residents use such areas.

The results of Mahdavinejad et al.'s (2012) study are similar to those of Kennedy and Buys's (2015). Kennedy and Buys (2015) investigated the contribution of private and shared open spaces to positive or negative perceptions of the liveability of multi-storey apartment buildings in a subtropical urban context in Brisbane, Australia. The research aimed to identify the exact, essential spatial and physical features, from residents' perceptions, for provision in open spaces, which are related to inhabitants' private residences and with shared open spaces. The results of the study showed that *spaciousness* for diverse activities, *privacy* and *climate responsive design* would enhance residents' satisfaction with the built environment and the contribution of collective open spaces to apartment liveability. Communal spaces and facilities are used infrequently by many residents who prefer interactions with others in the external environment. According to Lee, Je, & Byun (2011, cited by Kennedy & Buys, 2015) a dwelling space should meet personal social and cultural preferences in order to be liveable by its residents. This could be achieved by providing two types of indicators: a healthy physical living environment and a healthy psychological living environment, as shown in Table 2-16.

Table 2-16 Important indicators to enhance residents' satisfaction with the communal spaces. (Source compiled by the researcher from Kennedy & Buys (2015); Lee et al. (2011)).

Kennedy and Buys (2015) Spatial and physical features, in residents' perceptions	Lee, Je, & Byun (2011)	
	The healthy physical living environment	Healthy psychological living environment
<ul style="list-style-type: none"> <li>• Spaciousness for diverse activities.</li> <li>• Privacy.</li> <li>• Climate responsive design.</li> </ul>	<ul style="list-style-type: none"> <li>• Maintenance of shared spaces.</li> <li>• Indoor air quality and ventilation</li> <li>• Thermal comfort.</li> </ul>	<ul style="list-style-type: none"> <li>• Daylighting and view availability.</li> <li>• Silence's provision.</li> <li>• No feeling of overcrowding because of a sense of spaciousness.</li> <li>• The quality of shared areas that offer to control the intensity of communication among neighbours.</li> </ul>

In comparison, the results of Farida's (2013) study differed from those of Mahdavinejad et al. (2012) and Kennedy and Buys (2015), as she found that the openness of communal spaces negatively affected social interaction and the use of such spaces. She examined the influence of the characteristics of the shared outdoor spaces in housing estates on the social interaction of residents in Biskra, a city in southern Algeria. The investigation drew on two sources of information - observations of how residents use their neighbourhood spaces and a questionnaire with residents about the perceived competence of these spaces for social interaction. Four indicators were used in the questionnaire to determine the most in-depth form of social contact among residents: friends in the neighbourhood, the frequency of visits between neighbours, the nature of exchange between neighbours, and conversations with neighbours on personal problems (see Table 2-17). The results showed that poor quality communal outdoor spaces and

a high degree of project openness negatively affected all forms of spatial use, and as such, these spaces became merely transit areas. As a result, the use of shared outdoor spaces in residential neighbourhoods and the social interaction among residents are affected by the quality of these spaces and the layout of buildings. She also noted that how neighbours interact with others, and how they use the shared outdoor spaces are affected by the socio-demographic characteristics of a neighbourhood. Factors such as a respondent's stage in the life cycle (including age, marital status, and presence of children at home), their tenure type (owner/tenant), length of residence, educational status and annual income were relevant socio-demographic characteristics for social interaction (Haggerty, 1982).

*Table 2-17 Used and influential indicators on social interaction. (Source: compiled by the researcher from Farida (2013)).*

The indicators of the questionnaire	Factors affect social interaction and the use of shared outdoor spaces
<ul style="list-style-type: none"> <li>• Friends in the neighbourhood.</li> <li>• The frequency of visits between neighbours.</li> <li>• Nature of exchanges between neighbours.</li> <li>• Conversation with neighbours on personal problems.</li> </ul>	<ul style="list-style-type: none"> <li>• The quality of communal outdoor spaces.</li> <li>• The layout of buildings.</li> <li>• The degree of openness.</li> <li>• Socio-demographic characteristics of a neighbourhood (age, marital status, and presence of children at home, tenure type, length of residence, educational status and annual income).</li> </ul>

Privacy has been the focus of several studies, especially those conducted in the Middle East. Al-Thahab, Mushatat, & Abdelmonem (2014) investigated privacy and everyday life as physical characteristics of the built and urban fabric; they addressed their impact on traditional settlements and the architecture of the home in contemporary Iraq. They used mixed methods, including a questionnaire for inhabitants, observations of residents' behaviours and activities, and in-depth interviews. The researchers determined that the investigative tool would examine the perception of shared space in Iraqi houses and local communities by using the concept of the social sphere and by illustrating the association between the socio-cultural parts of public and private areas. The researchers showed that privacy has a crucial role in Islamic rules, principles, and culture despite the influence of factors expressed in the built environment. Also, the main problem regarding privacy and communal social communication emerges from paying no attention to traditional inherited values by increasing the openness of social spaces to the outside and making them universally accessible. The study highlighted the significance of the traditional city urban form, traditional values and the privacy that in turn affects social communication.

### 2.11.3. Social Aspects:

Scholars have also investigated other aspects and their indirect impacts on social interaction, such as Reid (2015), who investigated social interactions within multi-owned properties in four suburbs in Brisbane, Australia, and the influences they have on the sense of community. The researcher adopted a constructivist grounded theory research approach using a qualitative research methodology that consisted of 17 in-depth interviews. The findings showed that the concerns for *privacy*, *resident homogeneity*, *tenure type* and *the safety and security of the built environment* affect social interactions (see Figure 2-11). It was also found that, although there are more surface-level social interactions than deep social ties, respondents know others within their multi-owned properties. Improvements to the sense of community are also restrained by the strata and community title legislation that enables the existence of multi-owned properties. Excluding most multi-owned property residents from involvement in community participation is achieved by self-governance measures, through corporate and decision-making practices.

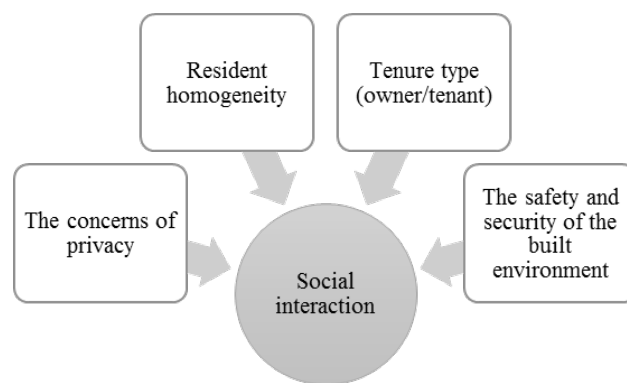


Figure 2-11 Influential factors on social interaction. (Source: compiled by the researcher from Reid (2015)).

On the other hand, Francis, Giles-Corti, Wood, & Knuiman (2012) investigated the relationship between four public spaces and the sense of community amongst residents of new housing developments in the Perth Metropolitan area, Western Australia. The selected public spaces were Public Open Space (POS), community centres, schools and shops. Data from this study were acquired from a cross-sectional survey, a POS audit, and Geographical Information Systems (GIS), and linear regression was used for the analysis. The findings showed that *improved wellbeing*, *increased feelings of safety and security*, *participation in community affairs* and *civic responsibility* had been affected by a strong sense of community. The feeling of community was associated considerably and positively to the perceived quality of POS in the neighbourhood, and this relationship seemed uninfluenced by the number of times people utilise these spaces. Enhancing the sense of community might be achieved by providing high-

quality public spaces as substantial settings. The variables used to obtain data for the research were:

1. Social, environmental variables, which included whether there was a high level of crime in the neighbourhood from the participants' perspectives.
2. The use of 'public space' variables, which included '*frequent use of public space*' (achieved by asking contributors how often they used these spaces, i.e., at least once a week equal 'frequent' use and less than once a week equal 'infrequent'); 'Mode of POS use' which was measured by asking contributors if they used POS to undertake activities (watch or play sport', 'attend an event', 'walk or jog', 'relax' and 'other activities).
3. Demographic variables, which involved gender, age, marital status, number of children under a specific age, education, work status, number of hours worked and area-level socioeconomic status.

Table 2-18 demonstrates the important indicators and factors that affect social interaction among residents, according to the literature review (Alahmed et al., 2014; Farida, 2013; Farshidi, 2016; Francis et al., 2012; Huang, 2006; Kennedy & Buys, 2015; Reid, 2015; Skjaeveland & Garling, 1997).

*Table 2-18 Important indicators and factors that affect social interaction in the CSs. (Source: compiled by the researcher from Alahmed et al. (2014); Farida (2013); Farshidi (2016); Francis et al. (2012); Huang (2006); Kennedy & Buys (2015); Reid, (2015); Skjaeveland & Garling (1997)).*

Authors	The factors that affect social interaction
Skjaeveland & Garling (1997)	<ul style="list-style-type: none"> <li>• Semi-private space.</li> <li>• Visual appearance.</li> <li>• Surveillance.</li> <li>• Seating environment.</li> <li>• Dwelling density.</li> <li>• Spaciousness.</li> <li>• The street/entrance level.</li> <li>• Structured open space.</li> </ul>
Alahmed et al. (2014)	<ul style="list-style-type: none"> <li>• Hierarchical spatial structure.</li> <li>• Supporting residents 'needs and activities.</li> <li>• Physical security supports.</li> <li>• Fostering proper proximity and accessibility.</li> <li>• Supporting predisposition and motivation.</li> <li>• Supporting socio-cultural behaviour characteristics.</li> <li>• Increasing permeability.</li> </ul>
Kennedy & Buys (2015)	<ul style="list-style-type: none"> <li>• Privacy.</li> <li>• Climate responsive design.</li> <li>• Spaciousness.</li> <li>• Local control in the private open spaces.</li> <li>• Residents' satisfaction with various activities.</li> <li>• Sense of community.</li> <li>• Maintenance of shared spaces.</li> </ul>
Huang (2006)	<ul style="list-style-type: none"> <li>• Space types.</li> <li>• Scenic.</li> <li>• Activity spaces.</li> <li>• Circulation spaces.</li> </ul>

Authors	The factors that affect social interaction
	<ul style="list-style-type: none"> <li>• Socio-demographic characteristics.</li> </ul>
Reid (2015)	<ul style="list-style-type: none"> <li>• Resident homogeneity.</li> <li>• Tenure Type (owner /tenant.</li> <li>• The safety and security of the built environment.</li> <li>• The concerns of privacy.</li> <li>• Sense of community.</li> </ul>
Farida ( 2013)	<ul style="list-style-type: none"> <li>• The quality of communal outdoor spaces.</li> <li>• The layout of buildings.</li> <li>• The degree of openness.</li> <li>• (age, marital status, presence of children at home, tenure type, length of residence, educational status and annual income).</li> </ul>
Francis et al. (2012)	<ul style="list-style-type: none"> <li>• Improved wellbeing.</li> <li>• Increased feelings of safety and security.</li> <li>• Participation in community affairs.</li> <li>• Civic responsibility.</li> </ul>
Farshidi (2016)	<ul style="list-style-type: none"> <li>• The physical proximity.</li> <li>• Privacy.</li> <li>• Affordance and visual attractiveness of CSs.</li> <li>• Demographic characteristics.</li> </ul>
Abu-Ghazze (1999)	<ul style="list-style-type: none"> <li>• Site design (the layout of buildings in residential neighbourhoods).</li> <li>• The diversity of settings in the layout of housing.</li> </ul>

## 2.12. The Factors that Could Affect Social Interaction Among Residents in Communal Spaces:

This section demonstrates the classification of factors that could affect social interactions, as gathered from earlier pertinent studies, including SSI, PCBE, and DF. These three categories are independent variables and will be investigated to identify which has an impact on social interaction among residents in communal spaces in SFHNs in Basra City, Iraq. These sets will be refined by interviewing Iraqi experts to gather their professional opinions on whether these sets influence residents' social interactions and are applicable to the Iraqi context.

### 2.12.1. Social Sustainability Indicators (SSI):

As revealed in relevant previous studies, a number of social indicators could have an impact on social interaction among residents, such as density (Bramley et al., 2009; Dave, 2011), urban form (Abu-Ghazze, 1999; Ahmed, 2011; Bramley & Power, 2009; Farida, 2013; Karuppannan & Sivam, 2011), a sense of community (Francis et al., 2012; Plas & Lewis, 1996; Reid, 2015), safety and security (Barton, 2000b; Francis et al., 2012; Reid, 2015), privacy (Al-Thahab et al., 2014; Farshidi, 2016; Kennedy & Buys, 2015; Mahdavinejad et al., 2012; Reid, 2015), and residents' satisfaction (Bramley et al., 2009; Dave, 2011; Iben & Amole, 2013; Karuppannan & Sivam, 2011; Kennedy & Buys, 2015; Lay & Reis, 2003; Lim et al., 2017). Furthermore, attachment to place was mentioned in most of the earlier studies as an important indicator to evaluate social sustainability within the built environment. Consequently, the social



sustainability indicators and sub-variables that have been examined for their impact on social interaction in this study are: safety and security, a sense of community, residents' satisfaction, attachment to the place/sense of pride, density, and privacy. Table 2-19 demonstrates the social sustainability indicators and their variables, as collected from earlier studies. Each indicator has been explained in detail in Appendix A.

*Table 2-19 Final list of social sustainability indicators and their variables (Source: compiled by the researcher).*

Name of SS indicator	Variables
Safety and Security	<ul style="list-style-type: none"> <li>- Crime rate (criminal code, violent, property crimes) or frequency of conflicts.</li> <li>- Incidence of crimes committed by youth.</li> <li>- The incidence of racism and hatred crimes in the community.</li> <li>- Percentage of residents who feel safe in their neighbourhood during daytime and night.</li> <li>- Percentage of residents who feel safe in the communal space during daytime and night.</li> </ul>
Sense of community	<ul style="list-style-type: none"> <li>- Participation in community affairs, social activities, and civic responsibility.</li> <li>- Knowing their neighbours/ sense of community.</li> <li>- Making new friends.</li> <li>- Participatory decision-making processes relevant to the neighbourhood.</li> </ul>
Attachment to the place/sense of Pride	<ul style="list-style-type: none"> <li>- Feeling attached to the neighbourhood strongly as being one of its members.</li> <li>- When I arrive in the neighbourhood, I feel if I have finally arrived at my home.</li> <li>- I feel proud of being living in this neighbourhood for good planning.</li> </ul>
Residents' Satisfaction	<ul style="list-style-type: none"> <li>- The satisfaction with the housing area.</li> <li>- The satisfaction with the aesthetic appearance of the built environment, providing attraction elements like water fountains and plants.</li> <li>- The satisfaction with planning and design of both the neighbourhood and communal spaces in the residential neighbourhood.</li> </ul>
Privacy	<ul style="list-style-type: none"> <li>- Hierarchy in spaces within the residential neighbourhood (open spaces and streets network).</li> <li>- Physical or visual boundaries (trees and fences).</li> <li>- Surveillance the communal spaces by the users of (e.g., parents and children).</li> <li>- Perceived privacy and comfort when using communal spaces within the residential neighbourhood.</li> </ul>
Density	<ul style="list-style-type: none"> <li>- Percentage of housing units to the total area of the residential area (comparing the current situation to the standard).</li> <li>- No. of people living in the neighbourhood to the total area of the residential neighbourhood.</li> <li>- No. of people per house.</li> <li>- A number of households per house.</li> <li>- No. of people using communal spaces.</li> </ul>

### **2.12.2. Physical Characteristics of the Built Environment (PCBE):**

The literature reveals that there are important items relating to the design parameters and physical characteristics of the built environment that have an impact on social interaction among residents. It has been found that the most discussed issues related to the built environment were the layout, design, level of neighbourhoods' maintenance and the availability of communal spaces. Additionally, it is necessary to afford an adequate variety of communal spaces, such as social and cultural amenities and open green spaces, and to consider their quality and distribution within the neighbourhood. Furthermore, it is important to consider whether the

design of the available shared places is responsive to the climate. It is argued that the essential theme in the built environment that improves social justice and social sustainability is the accessibility to facilities, services and jobs (Bramley & Power, 2009). Accessibility seems to be an essential theme in improving social sustainability. Citizens aspire to live, work and participate in leisure and cultural activities without travelling too far (Smith, 2000). Che Musa (2000) pinpointed that people would like to be housed in areas with employment opportunities and facilities for different family members. Regardless of their age and physical condition, everybody should thus have proper and convenient access to certain places in their daily lives. Freedom of movement from place to place is also recognized as a basic human right that should be preserved (E. H. Chan & Lee, 2009). This study collected the physical characteristics of the built environment, as related to the neighbourhood and its communal spaces, in contexts similar to the Middle East. This includes the provision and location of infrastructure (social, educational, etc.), the provision and location of open spaces, climate responsive designs, site designs (layout of neighbourhood, the inclusion of buildings and streets, and communal spaces), maintenance, and accessibility. Table 2-20 illustrates the physical characteristics of the built environment that this study will examine.

*Table 2-20 Physical characteristics of the built environment. (Source: compiled by the researcher from: Abu-Ghazze (1999); Alahmed, Alaghbari, Ibrahim, & Salim (2014); Farshidi (2016); Kennedy & Buys (2015); Reid (2015); Skjaeveland & Garling, (1997)).*

#	Physical Characteristics	Sub-variables
1	Accessibility	<ul style="list-style-type: none"> <li>- The accessibility to the communal spaces.</li> <li>- The accessibility to the communal spaces for both genders.</li> <li>- The proximity of the communal spaces to the users in the neighbourhood.</li> </ul>
2	Climate responsive design	<ul style="list-style-type: none"> <li>- No. of female access to communal spaces.</li> <li>- No. of male access to communal spaces.</li> <li>- No. of children accesses to communal spaces.</li> </ul>
3	Site design	<ul style="list-style-type: none"> <li>- Design proper the environmental climate of the region.</li> <li>- The selection of building materials that fit the place and the region.</li> <li>- The use of proper architectural treatments to the local environment.</li> </ul>
4	Maintenance	<ul style="list-style-type: none"> <li>- The dwelling area.</li> <li>- The area of communal spaces within the residential neighbourhood.</li> </ul>
5	Provision and location of infrastructures (social, educational, etc.)	<ul style="list-style-type: none"> <li>- The layout of the dwelling.</li> <li>- The layout of the communal spaces within the residential neighbourhood.</li> <li>- The layout of the residential neighbourhood.</li> </ul>
6	Provision and location of and open spaces.	<ul style="list-style-type: none"> <li>- The maintenance of the communal spaces.</li> <li>- The maintenance of the residential neighbourhood.</li> </ul>
		<ul style="list-style-type: none"> <li>- The provision of the infrastructures within the residential neighbourhood (social, educational, etc.)</li> <li>- The location of the infrastructures according to the need of the residential neighbourhood.</li> </ul>
		<ul style="list-style-type: none"> <li>- Number of green and open spaces within the residential neighbourhood.</li> <li>- Appropriate distribution of green and open spaces within the residential neighbourhood.</li> </ul>

### 2.12.3. Demographic Factors (DF):

Demographic factors are an integral part of any empirical study. According to the Abu-Ghazze (1999) and Farida (2013), socio-demographic characteristics of a neighbourhood affect both people's interaction with each other and their use of outdoor shared spaces. According to Haggerty (1982), there are relevant socio-demographic characteristics that are presumably linked with social interaction, such as a respondent's stage in the life cycle (including age, marital status, and presence of children at home), tenure type (owner/tenant), length of residence, educational status and annual income. Consequently, the main demographic characteristics from earlier studies that were conducted in contexts similar to that of the current research study are: age, gender, income level, the tenure type (owner/tenant), education status, employment or occupation status, number of working hours, the marital status, number of children, and length of stay. Table 2-21 shows the demographic factors that will be examined in the present study.

*Table 2-21 Demographic characteristics. (Source: compiled by the researcher from Abu-Ghazze (1999); Haggerty (1982); Huang (2006); Farida (2013); and Farshidi (2016)).*

#	Demographic Factors
1	Gender.
2	Age group.
3	Marital status.
4	Education status.
5	Employment status.
6	Number of working hours.
7	The length of stay.
8	The tenure types.
9	The level of income.
10	Number of children under a specific age.

### 2.13. Conclusion:

The chapter discusses studies undertaken by various researchers in the area of social sustainability and social interaction amongst residents. It discussed urban social sustainability in the Middle East, where it is an emerging concept. While it is widely applied in developed countries, many developing countries are yet to imply these theories, concepts and ideas. It has been inadequately discussed academically in Iraq, and in isolation of the urban form and people's participation. However, recently, the concept has been discussed as one of the goals of the notion of sustainable development in the Vision 2030 that was proposed by the Iraqi Ministry of Planning.

The chapter summarised the effect of urban form on social sustainability in developed and developing contexts by reviewing relevant earlier studies. The literature also summarised the role of planners and designers in creating physical elements which enhance social interactions among residents, where urban planners can be inspired by traditional urban forms to create integrated urban environments which are more sustainable socially (Sharifi & Murayama, 2013). The literature emphasised that physical designs, layout patterns, locations and the design of open spaces result in opportunities to develop social relations and socially sustainable neighbourhoods (Karuppannan & Sivam, 2011), where the built environment plays an essential role in creating spaces, and where neighbours interact intentionally or accidentally (Greene, 1992).

The chapter showed the collected indicators that determine social sustainability, where five key measurable aspects have been identified by Bramley et al. (2006) for use as indicators of community sustainability: social interaction and networks, participation in community groups and networks, community stability, pride or sense of place, and safety and security. The final collected list includes nine social sustainability indicators, including the previous five key measurable aspects of social life and density, urban form, residents' satisfaction, and privacy and cultural aspect.

The chapter discussed studies and definitions of social interaction. Social interaction is an integral part of any society where people of various cultures, social and cultural background meet. It plays a critical role in the social sustainability of urban communities by boosting the sense of community and safety among residents of urban neighbourhoods (Dave, 2011). In the literature, it is found that social interaction works alongside social networks and social ties. It is argued that the presence of some level of 'social interaction' or 'social ties' transforms a group of individuals living in a given area into a community (N. Dempsey et al., 2011; Kuo et al., 1998; Unger & Wandersman, 1985). The chapter highlighted theories that explained the influence of neighbourhood-built environments on residents' social interactions, from both Western and Muslim-Arab literature. Western theories include the theory of incivility and sense of community, while the Arab-Muslim theories are social solidarity (Ummah) and the prevention of harm to public rights.

Also, the chapter highlighted the important role of communal spaces in creating, enhancing, and developing social interactions among residents. Holland et al. (2007) emphasised the importance of social spaces in creating a sense of community in the neighbourhood. The guidelines for successful social spaces indicate that the success of a public space does not

merely lie in the hands of the architect, urban designer or town planner. It also relies on people adopting, using and managing the space, as “*people make places more than places make people*” (Worpole & Knox, 2007, p.2).

The chapter discussed pertinent studies that examine factors and aspects which influence social interactions among residents. For example, investigating the impact of the design of the built environment for each of the neighbourhood and communal spaces. Other studies investigated the impact of a sense of community, privacy, and the types of ownership on social interaction. Scholars also considered the influence of the urban form of traditional cities in inspiring planners to create integrated communities, which are more sustainable socially.

Most of the earlier studies highlighted the relationship between social interaction and the urban form of the built environment (including neighbourhood or shared communal spaces) and how to enhance social interaction. Additionally, it has been found that most of the studies were carried out in different contexts of developed and a few developing countries. At the same time, it was noted that there is a lack of empirical research to investigate urban social sustainability and social interaction in Middle East settings, especially in Iraqi residential environments. The shortage of studies that consider social sustainability can be attributed to the notion that social sustainability is still a newly emerging concept in the academic field and government agendas in these countries.

Furthermore, a large range of literature investigates social interaction among residents in high-rise residential building neighbourhoods. However, it was found that such investigations were not conducted adequately in residential areas of single-family houses in the Middle Eastern settings. Furthermore, no studies have been found to identify the factors that affect social interaction among residents in shared places within neighbourhoods. Therefore, the present research study aims to examine social interaction in the context of single-family houses neighbourhoods (SFHNs) in Iraq, to determine the factors that affect social interaction among residents in communal spaces. To achieve this, types of communal spaces have been categorised according to the activity and scale dimensions and are discussed in Chapter Four. The study focuses on three independent variables and will investigate their influence on social interaction. These independent variables were collected from the earlier relevant studies, and are categorised into demographic factors, social sustainability indicators, and physical characteristics of the built environment. These three aspects can directly or indirectly, subjectively or objectively affect social interaction.

## **Chapter 3 The Research Context**

### **3.1. Introduction:**

The chapter provides an overview of the research context. It also sheds light on how the urban form of Basra city developed throughout the history and discusses the effect of political, security, cultural and economic aspects. Moreover, it highlights the types of available communal spaces within residential neighbourhoods and the housing policy adopted in Iraq.

The information presented in this chapter is based on government documents, secondary data and schemes obtained from Basra Municipality (BM), Google Maps, maps from Esri (ArcGIS) and the rather fragmented literature on the history of Basra. These methods offer insights into the housing policy in Iraq, the changes that have affected social life and neighbouring, a general background to communal spaces, and the typologies within residential neighbourhoods. This analysis relies on a series of photographs and separate text, which are brought together as there is no coherent resource of historical diagrams and maps with text to work from.

The chapter begins by providing a brief contextual overview of Iraq with a focus on Basra city's topography, climate, population, and social structure. However, the central theme of this chapter is to outline the development of the residential urban fabric of Basra, and the evolution of its communal spaces. The housing policy in Iraq and the types of communal spaces within Iraqi residential neighbourhoods have also been considered. The chapter also describes the economic, political and security aspects of the Basra governorate after discussing the cultural aspect and social activities in Basra city.

### **3.2. General Overview of the Context:**

Iraq is a Middle East country located in south-west Asia and forming the north-eastern part of the Arab world. The capital is the Baghdad governorate, which is located at the centre of the country. Iraq's total area is 435,052 square kilometres (CSO, 2017), and it is divided into 18 governorates (Al-Mas'audi & Al-Sa'adi, 2012). The geographical location of Iraq is distinguished by its diversified terrain. In terms of the climate, Iraq's climate is subtropical with a rain-like system from the Mediterranean, as most rainfall occurs in winter, autumn and spring with zero rainfall in summer (CSO, 2017). Figure 3-1 shows the location of Iraq within the world and the Middle East.

Importantly, the Iraqi population is distinguished by its diversity of religions, such as Muslim, Christians, and Jewish, and its groups of ethnicities, such as Arab, Kurdish, Turkmen, Yezidi,



city of Basra is Iraq's third-largest urban centre, and Basra has the sixth largest total area (see Table B-2 in Appendix B).

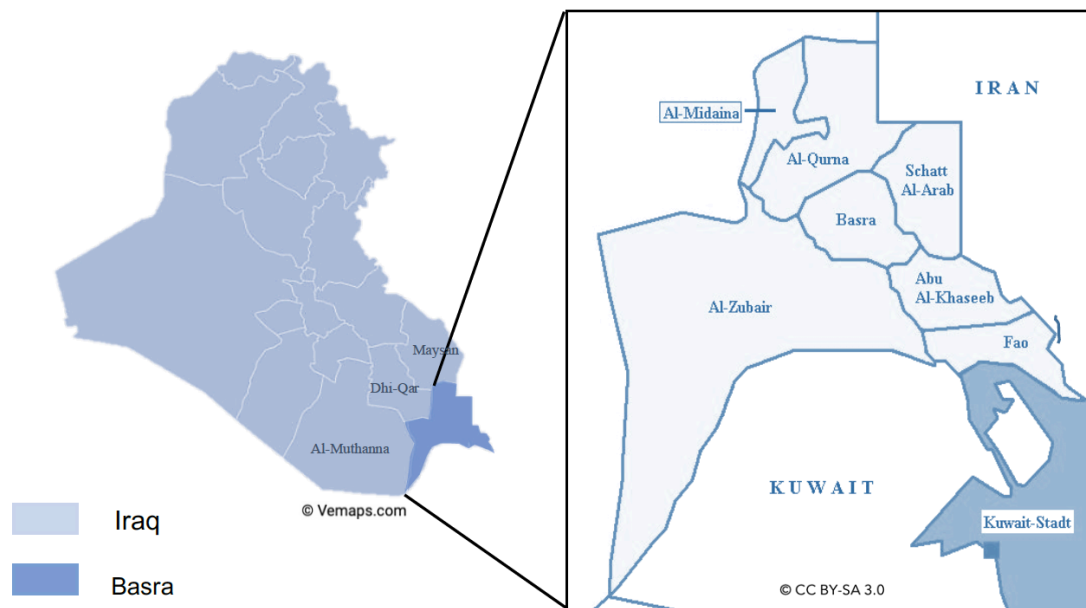


Figure 3-2 The location of Basra Governorate (map created, adapted by the researcher from Vemaps.com <https://vemaps.com/iraq/iq-04>, & <https://commons.wikimedia.org/wiki/File:Basra.JPG#/media/File:Basra.JPG>).

Moreover, the Basra governorate has a hot and arid climate, which has a wide thermal range, low rain, high humidity, and makes Basra consistently one of the hottest cities in Iraq. This explains the environmental treatments that were used, such as the inner courtyard houses and their designs, which tended to be closed from the outside and open from the inside. This design is the main orientation for most of the built environment in Basra.

Basra is most populous city after Baghdad and Ninevah, which in 2018 had an estimated population of 2,908,491 (CSO, 2017), see Table B-3. The governorate's population includes Shia and Sunni Arab, as well as small Chaldean and Assyrian Christian, Jewish, and Mandeans communities (NCCI, 2015). The society of the Basra governorate is religious and conservative.

### 3.3. Historical Overview of the Urban Form of Basra City:

The city of Basra was founded by Caliph Umar I during the early Arab conquests of the Seventh Century, in 638 c.e. It is the Bassorah of the *Arabian Nights* and Sinbad. In 1534, Basra was made part of the Ottoman Empire by Sultan Sulayman, who incorporated Iraq into his empire; along with Baghdad and Mosul, Basra was appointed one of the provinces of Ottoman Iraq. Although the Mamluks ruled Iraq for several centuries, the Ottomans re-established their



authority in 1831, ousting the Mamluks and forcefully subjugating the tribal areas. British companies meanwhile established a sphere of influence, strengthening ties with tribal shaykhs and controlling the import-export market. The strategic position of Basra as a link in the overland route to Asia or the Mediterranean created competition between the Ottomans, Germans, British, and Indians. The growth of the British and German presence in Basra during the Eighteenth Century awakened Ottomans to its importance. They attempted to re-establish their domination over Basra, Kuwait, and the surrounding region (Al-Khalaf, 2004). As a result, the urban form of Basra city evolved over three distinct historical stages, including the Ottoman period (before 1916), the British colony and Iraqi Kingdom period (1916-1958), and the Republic period (after 1958), (Marr & Al-Marashi, 2018). It can be concluded that the planning of Basra City depended on the economic, political, environmental, and security issues through the time.

The architecture of the city during the Ottoman colony could be split into two distinct stages. The period before 1900 is the fenced Basra city, while after 1900 is when the fenced city vanished (Al-Ali, 1973). The period 1900-1916 represented the second stage of the unplanned urban form of Basra city. This is shown as bold black dots in Figure 3-4, which is known today as the old Basra neighbourhoods. Although the contemporary city of Basra with civic amenities, governmental buildings, and European Consulates emerged, no official planning system was applied after the old fence decayed. The construction material is formed of brick, local plastering, mud, and timber, and the buildings were comprised of one or two floors. The facilities included houses, mosques, bazaars, and the governor building, which was called “Alsarai”. The urban structures were limited to the houses of the noble Ottoman families and their local allies plus the government buildings; all were mostly located on the banks of the Al-Ashaar River. These neighbourhoods mostly still exist; however, they are penetrated and bordered by arterial modern streets. The housing units in these neighbourhoods are courtyard houses and take organic shapes.

Although the housing units mostly still occupy the same plots, few traditional houses still exist. Moreover, the inner organisation of the neighbourhoods are mostly still the same since they were founded before 1916 (Al-Khattab, 1972; Longrigg, 1953; Wilson, 1930). However, after 1956, the courtyard housing mostly declined, whilst front yards, detached and semi-detached houses strongly emerged. Moreover, the urban tissue was obviously shifted from compacted to a sprawled urban form (Al-Khattab, 1972).

The period 1916-1958 is the British colonial period and the independent Iraqi Kingdom was 1922-1958. After 1916, modern buildings, paved arterial streets, and planning visions parallel to rivers were applied to the city by the British Army engineers who designed most of the civic buildings and planned the connecting streets (Longrigg, 1953). Before 1956, Max Lock was hired by the Iraqi government to make the first masterplan of Basra city. This masterplan involved automobile-oriented development, and the application of an orthogonal, grid-like or modern planning vision to the city. Commercial land use was completely separated from residential land use by establishing twelve commercial centres scattered across the city (Lock, 1956).

Figure 3-3 illustrates the masterplan for the municipality of Basra as made by Max Lock in 1956, which was his first intervention. The masterplan demonstrated the proposed land uses for Basra city from 1956 to 1976. A closer look shows the proposed land uses for one of the case studies of this research that existed at the time, namely Al-Zahraa neighbourhood, which is represented with a red ellipse, as it was proposed to be an industrial area. The other two case studies had not been planned in this masterplan; the red arrows show their locations from the masterplan.

However, after 1956, there was a smooth process of transition from the green cover of land into a built form that was not obligated to Lock's proposal. According to discussions with Basra Municipality members, Al-Zahraa and AlJunainah neighbourhoods were merely palm tree farms and the personal properties belonging to some wealthy families. Until the 1960s, the landowners decided to convert these farms to new developments on account of the green coverage, and at the request of the municipality of Basra after the government recognised that they needed land for expansion. Thus, the government bought areas that were assigned to utilities, such as streets and public services for the neighbourhoods. Unfortunately, there was no documentation to prove these deals because, during the first and second gulf wars, the governmental archive was burned several times.



Figure 3-3 The Masterplan of Basra City 1956-1976 by Max Lock 1956. (Scanned document).

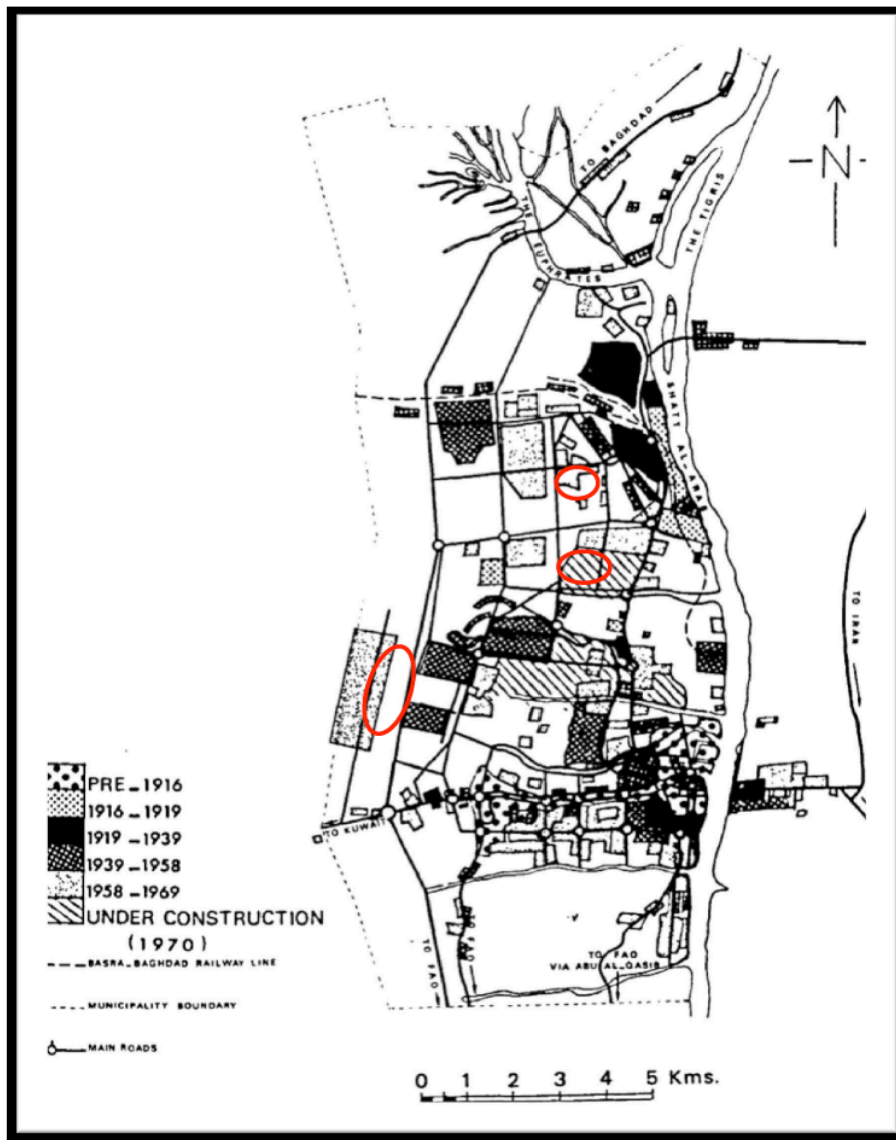


Figure 3-4 Master plan of Basra City 1900-1970, and the case studies' locations (source: adapted from Khattab (1972)).

In comparison, AlKhalij Alarabi neighbourhood was completely designed by the government for employees and formed one of the achievements of the five-year plan for Iraq in the 1970s. The three neighbourhoods are illustrated in the red ellipse in Figure 3-4. By the beginning of the 1970s, Al-Junainah, AlKhalij Alarabi, and AlZahraa had become residential neighbourhoods and were occupied by residents. The planning of these and most other neighbourhoods later involved automobile-oriented developments and an orthogonal, grid-like or modern plan for housing blocks and streets. Figure 3-5 shows the current schemes for the case studies; the source was adapted from secondary data that was obtained from the BM, and permission was granted to reuse it. In comparison, some parts of old Basra city still have old building patterns, represented in the winding arterial streets and housing units, which have old

wooden balconies called shanasheel (Figure 3-6). The engineers of BM established the bordering and penetrating streets in the neighbourhoods.

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(A)

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(B)

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(C)

*Figure 3-5 The current masterplan of (A) AlJunainah neighbourhood, (B) AlZahraa neighbourhood, (C) AlKhalij Alarabi neighbourhood, (source: adapted by the researcher from Basra Municipality secondary data after granting the permission to reuse it, 2018).*

The current masterplan of the Basra governorate has been kept updated on the growth in urban areas and population; new developments were established during the 2000s. Figure 3-7 illustrates the masterplan of the Basra governorate in 2003, which shows the expansion of residential areas around the old part of the city (bordered with a red line); the red dots represent the case studies. One of the important urban areas added to the Basra governorate masterplan was Basra Sports City, which was founded in 2012 as a newly built multi-use sports complex that planned to host the Arabian Gulf Cup. Also, a number of residential complexes (mixed housing units) have been built in recent years, such as Al-Amal City and Al-Andalus City; in addition, malls, such as Basra Times Square, and some public parks, such as Basra Land and Basra Family Park, have been added. Figure 3-8 represents the 2009 scheme of neighbourhood borders in Basra district; this does not detail new complexes that were built after 2010. Figure

3-9 shows the current masterplan of Basra city and demonstrates the extension and development in the form of Basra City and its land uses. The source of Figure 3-9 was obtained from BM and adapting by adding the map key to show general land uses. These two schemes were obtained from Basra Municipality.



Figure 3-6 A wood carved shanasheel in an old alley in Old Basra city, (source: Christian (2019)).



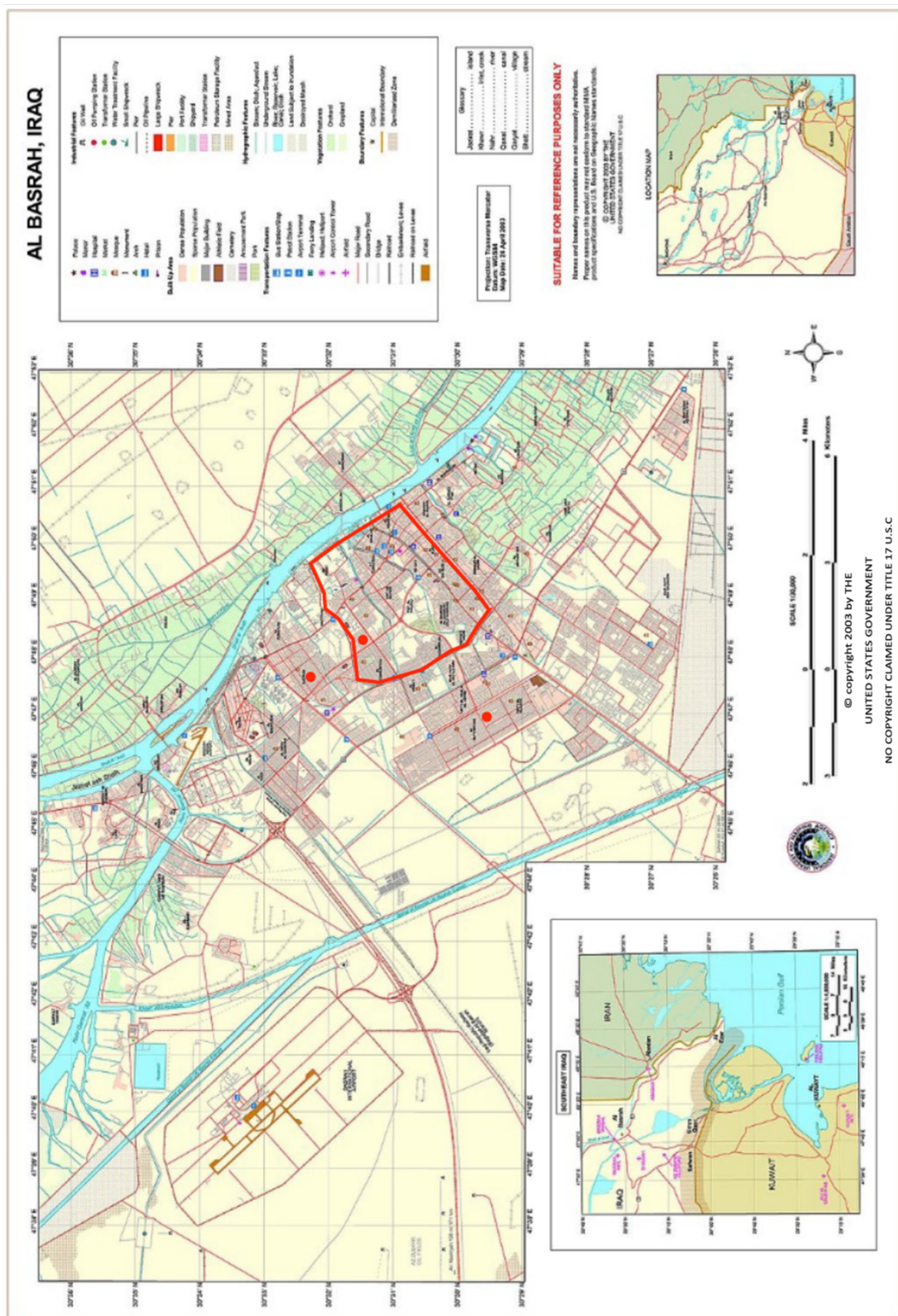
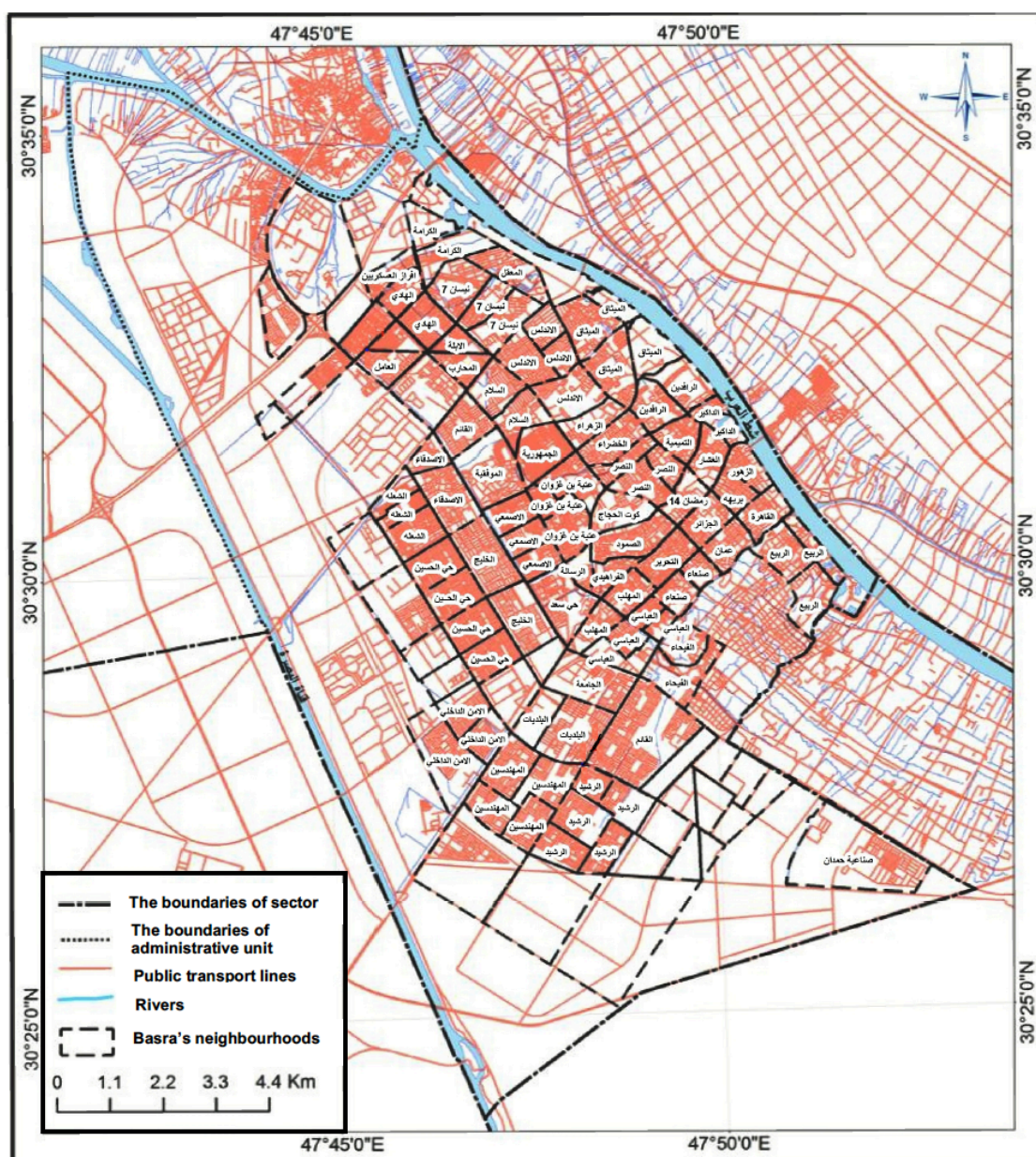


Figure 3-7 The masterplan of Basra governorate in 2003, source: adapted by the researcher from GlobalSecurity.org. <https://www.globalsecurity.org/military/world/iraq/maps-otherscities2.htm>.





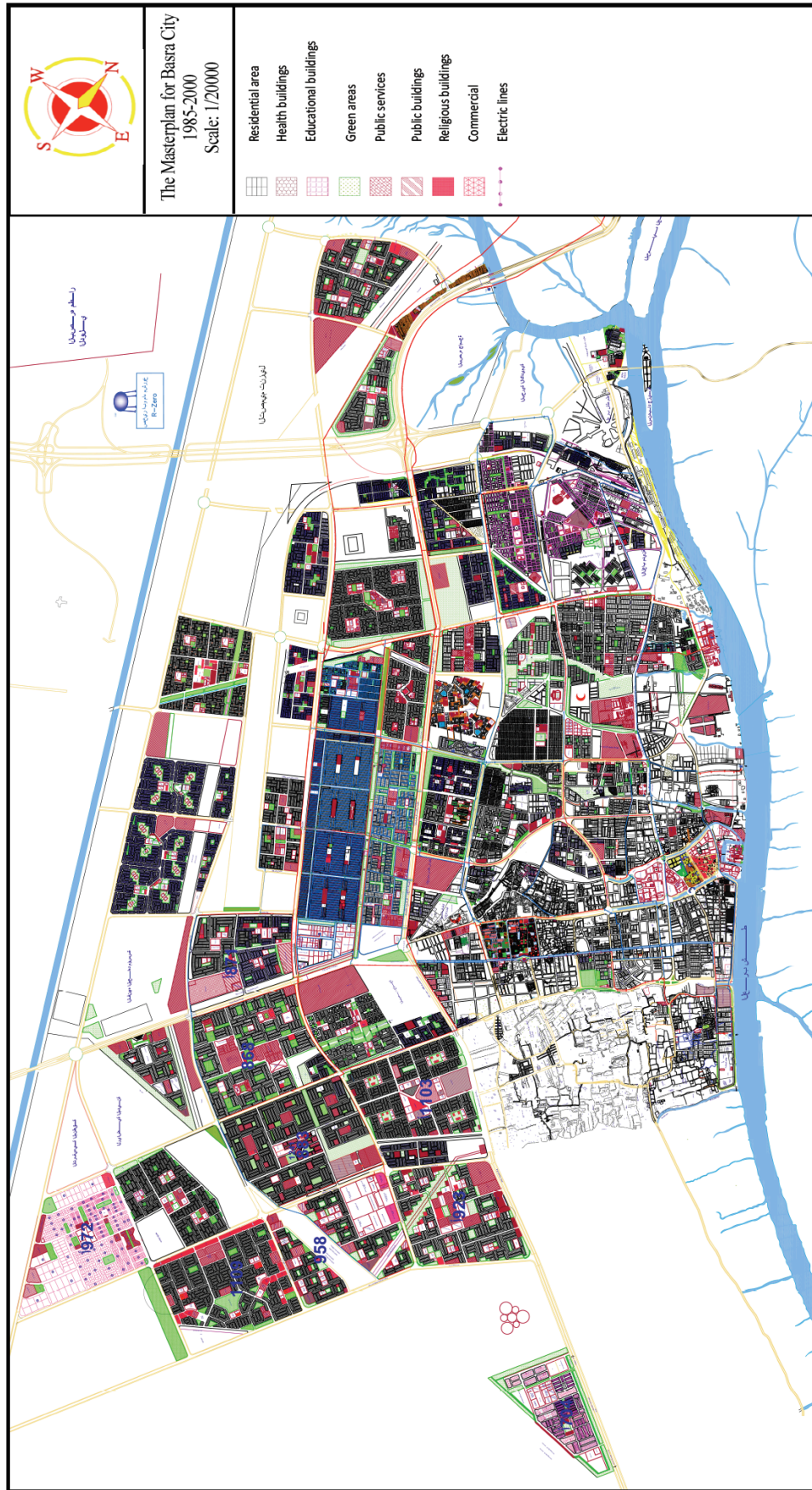


Figure 3-9 The current Masterplan of Basra city, (source: adapted from Basra Municipality secondary data, 2018).



### 3.4. The Housing Policy in Iraq:

According to the Iraqi Ministry of Construction and Housing-Directorate of Housing (MoCH-DoH), the total residential need is met by the government and private sectors; 85% of the total residential need is provided from the private sector while the government sector provides 15% of the total housing need. The government sector includes 42% from the Iraqi MoCH and Housing Fund, 40% from the General Federation of Cooperation, and 18% from other ministries. In order to understand housing neighbourhood design, it is important to recognise the standards used by the government authorities. According to Abbaszadeh (2009, p. 6), the term neighbourhood is defined as follows:

*It is a physical boundary, which is created based on several common factors such as common social and cultural background or common predisposition and motivation for residents towards supporting residents' socio-cultural behaviours and social interaction. The concept of neighbourhood community provides an opportunity for meeting resident's psychological needs based on their socio-cultural activities.*

There is no doubt about the magnitude of the housing crisis in Iraq, especially in larger cities centres. This crisis can be seen clearly in the overcrowding of dwellings, and subdivision (illegally) of existing housing units or plots lots, where it is noted that the number of families occupying one dwelling (formally sorted) is constantly increasing. Furthermore, the existing housing stock is out-dated, and there is resulting deterioration in both the construction and service levels in housing units. The housing shortage in Iraq is estimated to total approximately two to two and a half million housing units by 2020 (Al-Mas'audi & Al-Sa'adi, 2012); the calculation of this figure was based on statistical projections from the General Census conducted in Iraq in 1997. The shortage of housing units in the Basra governorate is estimated as 200,000 dwelling units (SCH, 2010; Basra province's five-year development strategy, 2011-2015).

Until recently, the prevailing directions of urban planning have adopted the neighbourhood concept with a service centre as its heart. Other trends have arisen, based on the distribution of services, which interferes with the grouping system dwelling and helps to keep the economic, social and cultural activities of the neighbourhood continuous and vital. According to the Iraqi housing standards that were formed from Paul Services Standards, the neighbourhood (Mahala) is the smallest form of housing and is called the residential precinct. The neighbourhood is based on three elements, namely the number of family members, the number of populations in the neighbourhood, and the number of dwellings. Figure 3-10 illustrates the formation of the city, starting from the smallest residential community, which is a neighbourhood (mahala). By

grouping four neighbourhoods, a housing sector is formed, while grouping four sectors is called a housing district. Furthermore, the city is formed by grouping four housing districts or more.

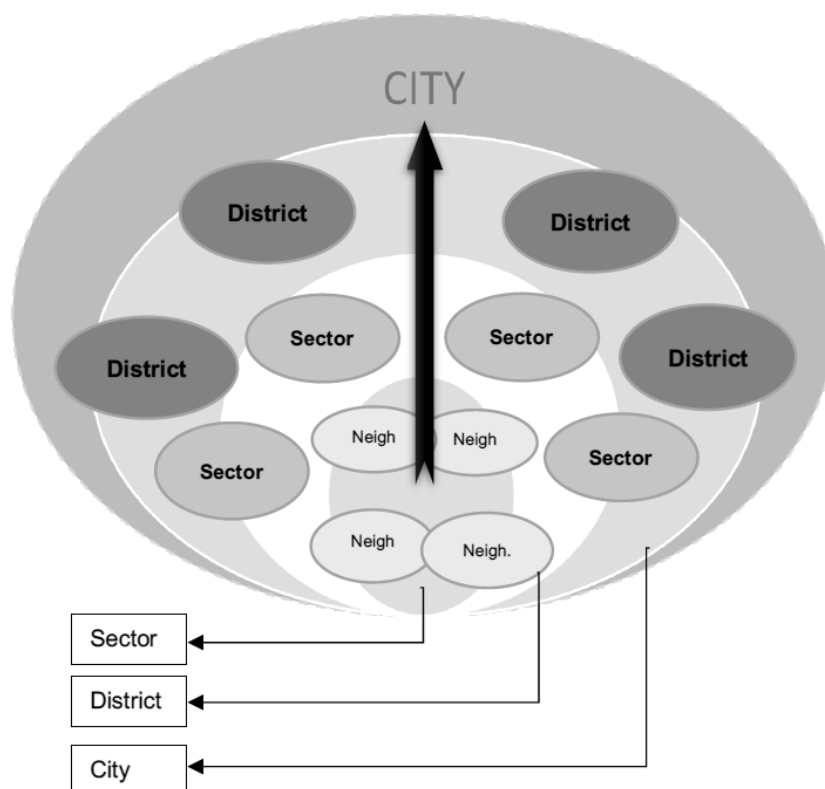


Figure 3-10 The formation of the city, (source: adapted by the researcher from CSO (2017)).

The planning of a neighbourhood in Iraq depends on the standards in Paul Service company, thus three elements are usually considered: the average family size (6 people), the average number of inhabitants (2,400-3,600 inhabitants), and the number of dwellings (400-600 dwellings). For the community social infrastructure, it is distributed in the city in a hierarchical way, starting from the neighbourhood to the district. At a neighbourhood level, the community social infrastructure includes one primary school with 18 classrooms, two intermediate/secondary school with 9-12 classrooms, local market, a mosque (church), healthcare centre, administration building, and nursery/kindergarten (with job opportunities for women). Figure 3-11 illustrates the community social infrastructure available at different levels - the neighbourhood, sector, and district. Open areas, parks and playing fields are provided according to age groups, and at all planning levels. Table 3-1 represents the following standards in the Iraqi housing policy while planning neighbourhoods. Table 3-2 shows the selected case studies' information.

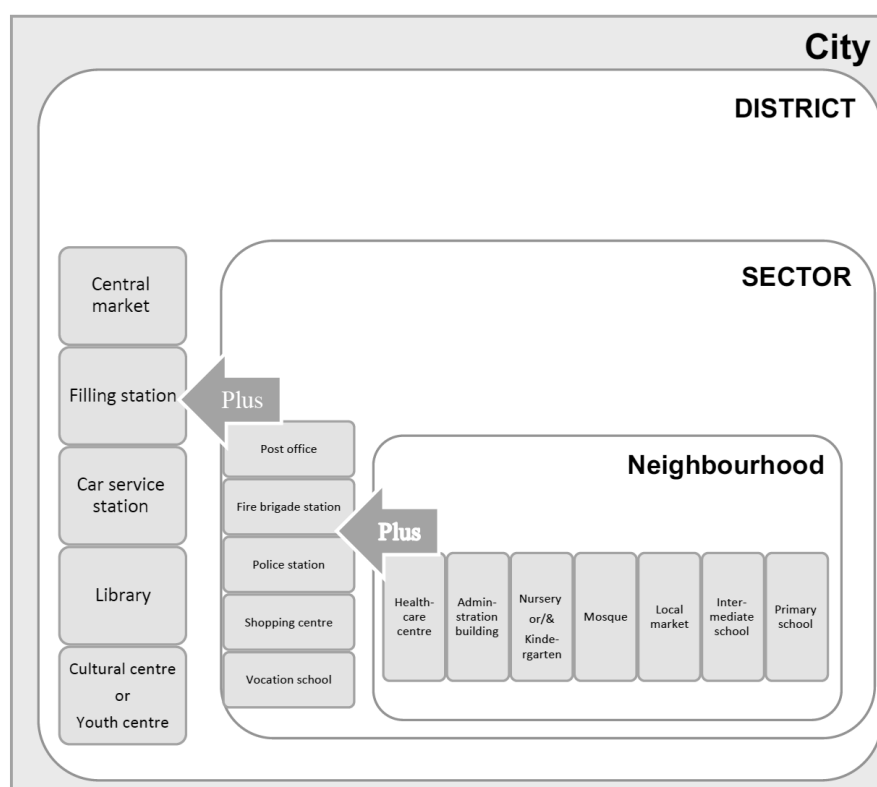


Figure 3-11 The hierarchical subdivision of the public services in the city, source: adapted by the researcher from CSO (2017).

The housing system in Basra governorate is medium density, although the crowded areas can be seen in most of the neighbourhoods in the city centre. The type of houses in most neighbourhoods of the Basra governorate comprise single-family. There are only three complexes of low-rise buildings in the governorate as apartments are not the preferred housing for many people in Iraq, in general, and Basra, in particular. Also, the soft nature of Basra's land is irresistible to the weight of high-rise buildings, which are costly to build (Al-Bakr, 2015).

Table 3-1 Residential Precinct Planning Indicators, (source: CSO (2017)).

	One-family houses:				Multi-family:	
	Detached	Semi-detached	Row houses	Courtyard /atrium houses	Low-rise	High-rise
Plot area\in sq. m\ obligatory	400-600 /1	300-400	200-350	150-300	-	-
The frontage of plot \in m.\	16-24	10-20	5-10	10-15	-	-
Recommended minimum Set-back of building A front line from right-of-way line in m.	4	4	2.5	2.5/ 2	-	-
Coverage ratio\maximum built-up area to total plot area\	0.30	0.45	0.60	0.75	-	-
The floor area ratio\total floor area to net residential area\	0.22-0.33	0.25-0.39	0.43-0.48	0.44-0.52	0.60-1.00	0.90-1.50
Accommodation density\dwelling/hectare\	13-21	18-27	24-42	28-48	40-80	60-120
Population net density Inhabitants /hectare	80-130	110-160	140-250	170-290	200-400	250-500

Table 3-2 The information of selected case studies in this research.

The Case Study	The total area of the neighbourhood (ha)	No. of houses (2009)	Plot area (m <sup>2</sup> )	No. of the population (2009)	Proximity to the city centre (km) by car	Age of the neighbourhood	Socio-economic classes	Housing types
Al-Junainah	79	2015	200-350	15710	5.6 – 6.2	1960s	Middle-high Class	Semi-detached
Al-Zahraa	63	500	300-400	3996	3.7 – 4.2	1960s	Upper Middle Class	Semi-detached
Al-Khaleej Al-Arabi	221	17811	400-600	14178	6.9 - 9	1970s	Middle-high Class	Detached

### 3.5. Housing Crisis:

Housing crisis is a widespread phenomenon in developing and some of the Middle East countries, especially Iraq, which continues to face a worsening housing crisis (Ernst & Young, 2012; MoCH & UN-HABITAT, 2010). Despite its rapid economic success after the war in 2003, according to interviewees from the Municipality of Basra (interviewed in 2018), Iraq particularly faces this issue in its main urban centres of which Basra province is one. According to the State Commission of Housing (SCH), (2010) and the Central Statistical Organisation Iraq (CSO), (2016), by the end of 2016 the estimated shortage of housing in Iraq (urban and rural areas) was approximately 2.2 million dwelling units. This number was calculated by statistical projections from the last census, which was conducted in Iraq in 1997. According to Basra province's five-year development strategy for the years 2011-2015, the shortage of housing in the Basra Governorate (the place of the case study) was estimated at 200,000 units (SCH, 2010). According to the Ministry of Construction and Housing, MoCH (2015), the causes of the housing crisis in Iraq, especially in its major city centres, are:

1. Long Wars in 1980 and 1990 during the last century and the war of 2003.
2. The widespread immigration between the governorates.
3. A decreasing housing construction ratio from 6.7% to 0.47%.
4. A decreasing GDP (Gross Domestic Products, **\$229.3 b**).
5. Increased construction materials prices and a lack of manufacturing.
6. Lack of land management laws, housing funds and investment.
7. No application for housing policy.
8. Population growth.
9. The social system of the Iraqi society.

The population in Iraq has grown rapidly due to natural increases; indeed, the growth rate is 2.5%, and in 2016 the population reached more than 37 million (CSO, 2016). Furthermore, there has been increased migration from rural areas to the city with migrants searching for better lives and jobs. Moreover, urban migration has occurred within the cities centres due to political and security issues, especially after the war in 2003. The CSO (2016) estimated that, by the end of 2016, a 70% increase will have occurred in the urban population and the rural population reduced to 30%. Such urban growth means the government faces a difficulties in meeting residential needs. Therefore, the government has attempted to solve this situation by offering contributions from the authorities concerned with the implementation of residential units in Iraq.

According to the Iraqi Ministry of Construction and Housing-Directorate of Housing (MoCH-DoH), 85% of residential need is met by the private sector. The other 15% of the total housing need is met by the government sector, which includes 42% from the Iraqi MoCH and Housing Fund, 40% by the General Federation of Cooperation, and 18% by other ministries. These contributions play a strong role in meeting the need for housing among lower-income households. However, these contributions have reduced because the government has funding issues, and there are insufficient lands to meet the need for housing in urban and peri-urban centres. Hence, the second reason for the housing crisis could be the collapse of the Iraqi state and the gap in government that occurred immediately after the 2003 war, which led to the neglect of the construction sector (Ernst & Young, 2012).

Another factor that could aggravate this crisis is the social system of Iraqi society, where several families live in one single-family house. This system has continued for hundreds of years; it stems from social, cultural and traditional values and is evident in the southern Iraqi governorates. It is important to mention that the social and cultural values and the associated psychological and behavioural aspects adhere to the contemporary principles of the home environment and have been affected by political changes and the rapid success of the economy in Iraq over the last thirty years, especially after 2003 (Al-Thahab et al., 2014). Moreover, Iraq's entry into a new transitional stage of social, cultural, and intellectual transformative conflict affects social behaviour in the region (Al-Thahab et al., 2014).

The increased need for housing combined with the government's weak response to this demand have resulted in illegal action by people with no alternatives for shelter. For instance, according to some interviewees in Basra Municipality in 2018, the sub-division of existing properties into a greater number of dwellings impacts on the character and amenity of adjoining residential

areas. Moreover, in the absence of law, lands designed for public services and public open spaces, which are vital for encouraging and enhancing social integration among residents (Gehl, 2011; Heckscher & Robinson, 1977; Marcus & Francis, 1997) have been illegally taken over and exploited by the construction of houses. Other attempts to solve housing crisis have included the illegal building of houses on uninhabitable land, or agricultural areas, which are prevented by the government from conversion into housing. The reasons for this stem from the lack of infrastructure and basic services to meet human need; furthermore, these areas might be designed for different functions according to the master plan of the city (Ernst & Young, 2012). Moreover, to ensure the environmental benefits it is generally preferable to keep agricultural space as farmland. According to an interview with one of the municipality staff in 2018, this is particularly important for areas located in the main urban centres.

Converting agricultural areas to housing has resulted in the deterioration of agricultural conditions, a reliance on the import of agricultural products, the current housing crisis, and increased problems associated with rising and varying prices for rent and purchase in the residential sector. This situation has led many people with limited incomes to resort to illegal solutions. The transformation of farmland into housing has increased in recent years due either to the absence of determinants and legal controls, or their slow implementation. Also, the low price of 200 square meter plots (resulting from the division of agricultural areas) alongside the high price of owned house lands has led people to opt for this solution. Thus, relevant governmental departments have attempted to resolve this issue through a draft study to pass a law authorising the conversion of some agricultural land to residence (under particular conditions). This could lead to environmental issues as most of the green cover of the city has been illegally taken over. As a result, and according to the interviews held in 2018 with staff from Basra Municipality and the Housing Directorate, the solutions from decision-makers and those responsible are usually quick and designed to face the difficulties that may result from the aggravation of the crises. These focus on economic aspects and neglect environmental and social aspects.

However, until a real solution is implemented, the aforementioned circumstances will continue to negatively affect both the environment and services, and continue to create confusion in urban planning. Moreover, deterioration in the construction of homes and services as a result of 30 years of neglect and conflict due to wars has caused significant changes in the urban environment design. This situation could lead to the appearance of social issues in residential neighbourhoods, such as the decline of social interaction among residents, increased noise,



limited mobility (Alahmed et al., 2014), safety and security issues, and environmental and health issues (Basra Municipality; CSO, 2016). These affect resident satisfaction with the built environment and can mean a loss of community. Also, educational issues mean the number of dropout students in primary schools in the Basra governorate reached 9039, 9901, 8066, and 7981 in 2012, 2013, 2014, and 2015, respectively (CSO, 2016). Furthermore, an increase in the number of divorced couples has also become visible in recent years (see Tables B-4 to B-6 in Appendix B). It is believed that the built environment of the residential sector and social lives have been affected and that impacts on social interaction among residents. A lack of social interaction among residents in Iraq, especially in Basra City (Alahmed et al., 2014) has been observed although this has not been widely discussed in theory. The situation of Iraqi neighbourhoods and the level of community-based cultural, religious and conceptual transformative debates have changed in the last 30 years and especially after the last war in 2003; these have reflected the political changes, fast successful economic transformation and changing lifestyles (Al-Thahab et al., 2014). Also, the social and cultural values of the Iraqi people and their behavioural and psychological features alongside the contemporary standards of home environments have similarly been influenced. Moreover, it can be said that the housing crisis is considered a significant cause for social decline in Basra in particular, as well as the environmental issues.

### **3.6. The Communal Spaces:**

In this research, the limited, fragmented literature on communal spaces in similar contexts to Iraq has been analysed. In addition, a desk study includes the analysis and study of documents, maps, and schemes obtained from Basra Municipality and ministries' websites. The communal spaces within Iraq, especially in Basra, are similar to those in other residential contexts, except for those regarding the cultural background. For example, it is common to use the space in front of the main entrance of the house for gathering with a friend or a neighbour (Figure 3-12). In this research, the classification of design-based communal spaces was adopted (intentional and unintentional). As mentioned in Chapter Two, intentional communal spaces are those shared spaces that are initially designed for social interaction, such as gathering rooms, shared gyms and leisure facilities, playgrounds, and gardens. Unintentional communal spaces are those shared spaces that are not intentionally designed for social interaction, such as stairs, lifts, parking areas, bus stops, main entrances, streets, and sidewalks. The list of communal spaces has been considered in this study as a criterion for selecting case studies. Table 3-3 represents the communal spaces that will be considered in this study by categorising intentional and

unintentional communal spaces. Figure 3-12, to Figure 3-15 demonstrate a side of communal spaces used in residential neighbourhoods in Iraq.

Table 3-3 The communal spaces considered when selecting the case studies.

Intentional Communal Spaces	Unintentional Communal Spaces
1. Children's playground.	1. The space in front of the main entrance of the house.
2. Neighbourhood's gardens/open spaces.	2. Streets.
3. Restaurants.	3. Sidewalks.
4. Cafes.	4. Worship facilities (masjid, hussainya, or church).
5. Malls	5. Local shops (the space in front of the shop).
	6. Gyms.



Figure 3-12 The use of the space in front of the main entrance of the house for sitting and observing pedestrians, or for standing and chatting with friends (source: photos took by the researcher).





Figure 3-13 The outdoor activities - playing football and sitting and chatting - that take place in the shared garden within the neighbourhood in AlJuninah neighbourhood (source: took by the researcher).



Figure 3-14 The use of streets and sidewalks by residents (mainly by children) (source took by the researcher).



Figure 3-15 The use of the space in front of the restaurant and local shops for social activities by residents (photo (a) was taken by the researcher, photo (b) was adopted from Google Earth taken by Qaisa 1200 [https://lh5.googleusercontent.com/p/AF1QipPPUcj0l5OgwyEdZxWCuNT01LesCraaekanSHI\\_=h1440](https://lh5.googleusercontent.com/p/AF1QipPPUcj0l5OgwyEdZxWCuNT01LesCraaekanSHI_=h1440)).

### 3.7. Cultural and Social Aspects of Basra Governorate:

The social life in Basra city is similar to most of the conservative Middle East cities, which are characterised by a tendency to privacy in most daily activities. This is due to the rules of the city-built form and the cultural and tradition customs, which are similar in the Middle East cities. According to historians, most traditional Islamic cities, of which Basra city is one, were planned with central public services represented with the mosque, souq, and a few administrative buildings. The housing units were distributed around the public central services. Figure 3-16 shows an example of one of the Islamic cities that was built in the Islamic era. The city of Baghdad was built on a circular plan by the Abbasid caliph Al-Mansour, in which the traffic separation between pedestrians and animals, soldiers' roads and service roads were taken into account (Al-Masry, n.d.). In the ancient Islamic cities, which were built over ancient cities and civilisations, there was a hierarchy in the road network, which began with the main street, called the Kasbah, from which smaller secondary streets branched off. When entering residential areas, there are lanes, then alleys and then blocked lanes (Figure 3-17). The street network in this pedestrian city is narrow and winding (Al-Masry, n.d.).



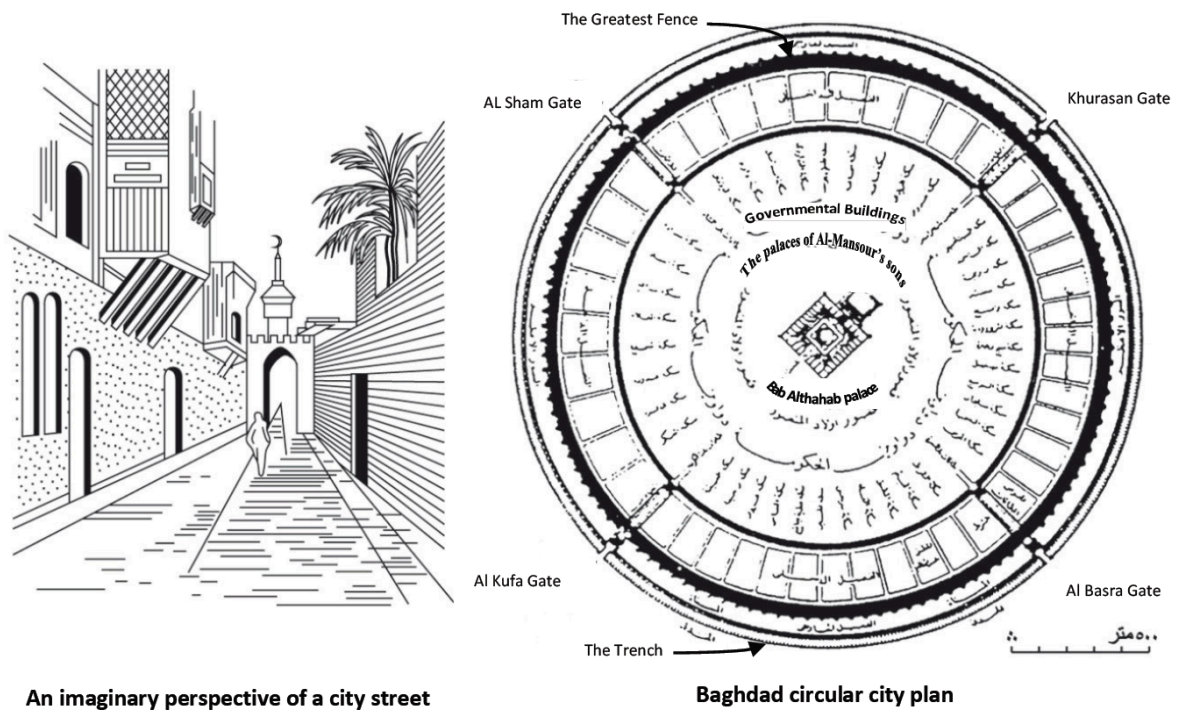


Figure 3-16 The city of Baghdad circular city plan that arose in the Islamic era. (Source: adapted from Al-Masry, n.d.)

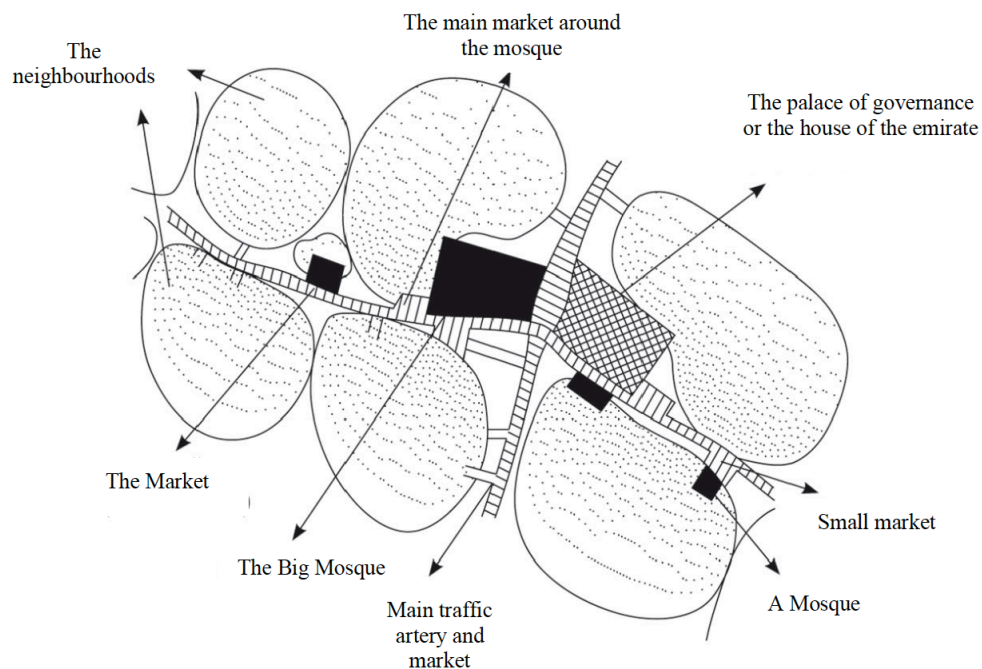


Figure 3-17 The hierarchy in the importance of the streets in Arab and Islamic cities and their widths, (source: adapted from Al-Masry, n.d.).

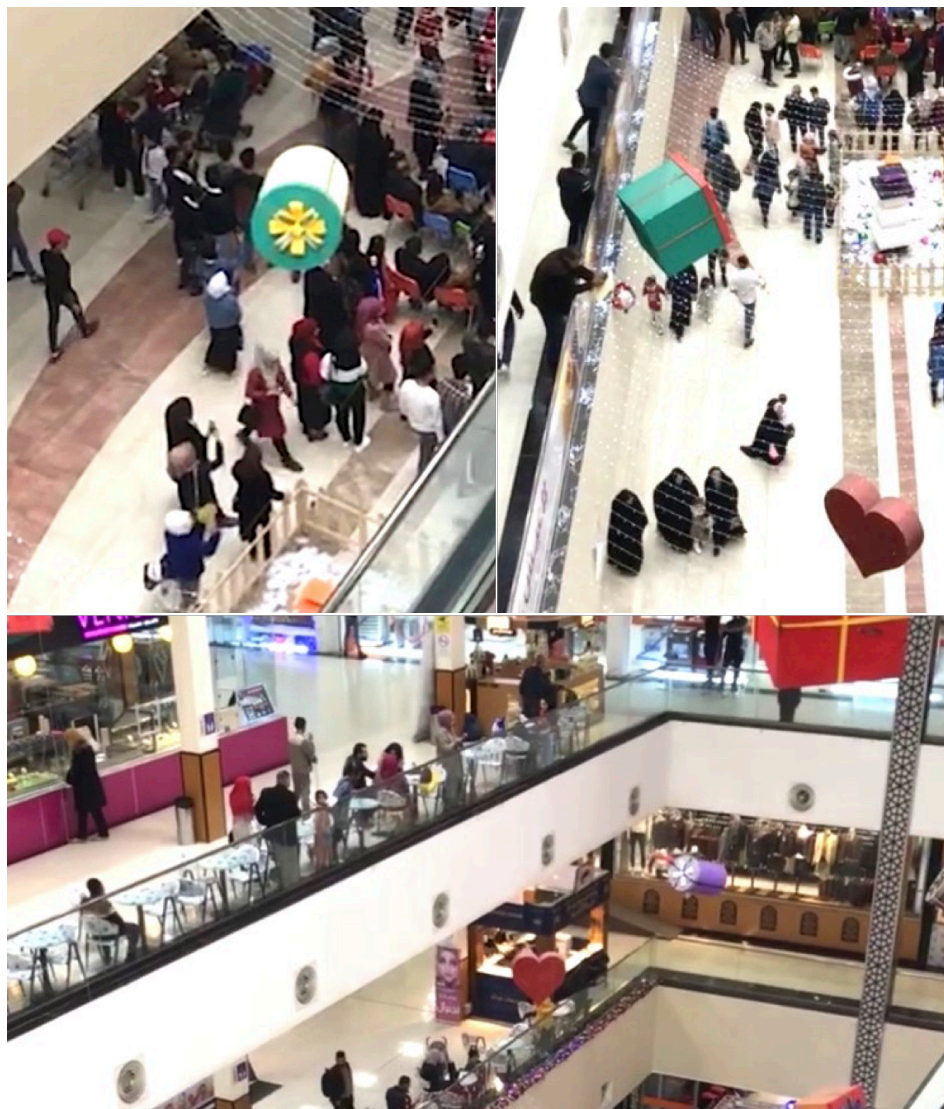
Past cultural and social activities were represented in daily acts, such as going to work (men), shopping, going to the mosque to pray almost five times every day (especially on Friday), and going to cafes, see Figure 3-18. A large portion of women were housewives and responsible for household chores, such as cleaning, cooking, and laundry. Social communication between women often occurred either by visiting each other in their homes or by standing in winding alleys (cul-de-sac) and conversing with neighbours (women) about daily and personal issues while watching their children play in the street near their houses. These social acts occurred on a daily basis in the traditional areas. Another cultural rule in the city is that women are not welcome outside alone without the presence of a male family member, such as a husband, son, or father.



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Figure 3-18 A: Umm Al-Sibaa café in Basra, with Kuwaiti visitors in the 1920s, (source: Al-Rifai (2015);  
B: A well-known café in Baghdad in 1916 called Azzawi café, source: Nuri (2016).

Nowadays, the situation has shifted due to many economic, political, and intellectual changes. Throughout the last ten years, a dramatical change has been noted in women activities within the community of Basra, such as increased social activities and participation in society. Although these changes are limited, they are considered significant in themselves. Moreover, the phenomenon of a few small groups of young women gathering in a particular public place, such as a mall, a restaurant, or a park, has recently been observed, usually with a middle-aged woman (see Figure 3-19), which is significant as such an event was not welcomed in the recent past. The presence of a middle-aged woman with a group of young females when attending a particular gathering place is most likely to be a means of protection from potential harassments. Usually, most women leave the house with a man from their family, like a husband, brother, or husband.



*Figure 3-19 Small groups of a few women in Basra Times Square during the Christmas celebration of 2019. Source: photos took by the researcher.*



Furthermore, occasions, such as weddings and some other ceremonies, have been held in places that ensure separation between males and females, to follow cultural expectations. In old Basra city, these occasions mostly took place in the street, which suggested the event was exclusive to men. Instead, women could look from the roof of the house or from a second-floor wooden balcony called 'shanshūl'. Shanshūl are also known as mashrabiya or rūshān and are an architectural element characteristic of Arabic residences. It is a type of projecting oriel window (see Figure 3-20, Halicki (2014)) enclosed with carved wood latticework located on the second storey of a building or higher, and often lined with stained glass, Figure 3-21. The shanshūl is an element of traditional Arabic architecture used since the Middle Ages through to the mid-20th Century. It is most commonly used on the street side of the building; however, it may also be used internally on the courtyard (sahn) side (Mohamed, 2015). The style is informally known as a "harem window" in English. This architectural element was widely used in most of the Middle East countries, such as Tunisia, Jeddah, Egypt, and Iraq, and it is still used today by a few architects designing houses in Iraq.



Figure 3-20 Oriel windows in Kłodzko, Poland. (Source: Jacek Halicki [Photographer]. (2014). Wikipedia. [https://commons.wikimedia.org/wiki/File:2014\\_K%C5%82odzko,\\_pl.\\_Chrobrego\\_13\\_03.JPG#/media/File:2014\\_Kłodzko,\\_pl.\\_Chrobrego\\_13\\_03.JPG](https://commons.wikimedia.org/wiki/File:2014_K%C5%82odzko,_pl._Chrobrego_13_03.JPG#/media/File:2014_Kłodzko,_pl._Chrobrego_13_03.JPG)).





*Figure 3-21 Photos of current old buildings with shanasheel in Old Basra city. (Source: Rady (2016)).*

Moreover, Muslims, particularly in Iraq, usually celebrate several official holidays every year, such as Eid Al-Fitr and Eid Al-Adha. Both Eids occur on dates in the lunar Islamic calendar, which is different from the solar-based Gregorian calendar. There are cultural actions in these celebrations in Iraq, in general, and in Basra, in particular. Eid Al-Fitr is celebrated at the end of Ramadan (a month of fasting during daylight hours) and lasts for three days. People during Ramadan also gather in mosques to pray and afterwards either have Iftar (breaking the fast) or Suhur (another meal before the dawn), see photo B in Figure 3-22; (permission was granted from the photo owner, who lives in Basra, Manawi Lijam, to use the photo). Eid Al-Adha is celebrated on the tenth day of Dhu al-Hijjah when the Hajj pilgrimage takes place, and it lasts for four days. Both Eid celebrations begin with prayers in the morning at the nearest mosque, where most people in all districts of Basra city (mostly males) gather for Eid prayers. After that, the worshipers congratulate each other which is followed by breakfast, and often other celebratory meals throughout the day. See photos A and C in Figure 3-22 that are captured from videos on YouTube that showing people greet each other after the prayer of Eid Al-Fitr (Alzuber, 2016 & Al-Mirbad, 2017, respectively). These two official holidays that occur every year are considered important social activities that can be seen in residential neighbourhoods.



*Figure 3-22 sides of residents' activities during Ramadan and Eid Al-Fitr. Source: photos are captured from videos on YouTube. Photos A (Alzuber, 2016) & C (Al-Mirbad, 2017): Residents greeting each other after the prayer of Eid Al-Fitr in Al-Zubair. Photo B: Residents have tea after iftar in Ramadan inside a mosque within one of Basra city's neighbourhoods (Manawi Lijam). Permission was granted from a resident live there to use the photo.*

From discussions and television broadcasts with elderly who have lived in traditional neighbourhoods, after Eid prayers, the men of one area used to have breakfast all together in one open space, such as the street, or inside the open area of a mosque (Sahn), or in one of the big houses in the neighbourhood, (Figure 3-23). Each house participated by offering a dish or any kind of food and exchanging it with others. At that time, the streets were often used for such gatherings as they were the closest available communal spaces. For women, they gathered in one of the courtyards or atria of houses for privacy. Following that, they (males and females) visited each other in their houses to congratulate everyone, starting with visiting the big family house, their relatives, and their neighbours and friends. Children usually played in the streets or went to a place, called Eid playgrounds, which was similar to a festival and located in an open area. The prayer gathering activity still happens these days in all Basra governorate. However, after the war of 2003, the breakfast gathering for men and women was limited to a few districts of the governorate, such as AL-Zubair. This is the basis for the emergence of the city of Basra.





Figure 3-23 Residents have breakfast of Eid after the prayer of Eid Al-Fitr in Al-Zubair. The photos (A & B) are captured from videos on YouTube (Alzuber (2016) and Al-Mirbad (2017), respectively).

Moreover, there is another important major official holiday, namely Yawm Ashura, which is the tenth day of Muharram, and the first month in the Islamic calendar. Ashura is foremost a holiday and an occasion for pilgrimage in Shia Islam. Ashura marks the climax of the Remembrance of Muharram, the annual commemoration of the death of Hussain and his family and supporters at the Battle of Karbala on 10 Muharram in the year 61 AH (10 October 680 CE). In Afghanistan, Iran, Iraq, Lebanon, Bahrain, and Pakistan, Ashura has become a national holiday, and many ethnic and religious communities participate in it, such as Christians in Iraq. On this occasion, public mourning rituals for the incident usually take place every year, represented by mourning and lamentations (Majalis Aza), which includes mourning congregations, lamentations, matam and all such actions which express the emotions of grief. The mourning is performed at a mosque or hussainya, which is a religious building for prayer, and mourning assemblies (Majalis Aza) for Shia, and widespread in Iraq, where mourners congregate at these places for sorrowful, poetic recitations that are known by different names, such as “marsiya” or “latmiya”, which are performed in memory of the martyrdom of Hussain.

In Basra, such official mourning assemblies (Majalis Aza) take place from the 1<sup>st</sup> to the 13<sup>th</sup> of Muharram and again on the 20<sup>th</sup> of Safar AH for both men and women separately. In between these dates, some people tend to perform mourning assemblies in their houses, usually women, while men typically gather in a hussainya or a mosque. However, when Majalis Aza is held on specific dates, and is attended by a large number of mourners, men congregate in the street, while women usually perform majlis Aza for the commemoration of Imam Hussain, in the houses and sometimes in a hussainya, and seldomly, in the street. Figure 3-24 shows some of majlis Aza that held in Basra for men and in Baghdad for women. Majalis Aza in Ashura is considered a common social and cultural activity amongst residents in Basra City because it is a conservative and religious society.



Figure 3-24 Majlis Aza for men held in Al-Maqal in Basra Governorate 2019. (Source: the office of religious reference Mr Hakim, 2019) and for women in at the Holy Qur'an Women's Institute in Baghdad, (source: The Feminist Institute of The Holy Quran, 2018).

### **3.7.1. Social Activities and Neighbouring in Basra and the Effects of Urban Development:**

The previous section discussed past cultural and social activities, which were represented in daily acts, including going to work, shopping, going to the mosque to pray almost five times every day (especially on Friday), and going to cafes. The social activities between women often occurred either by visiting one another in their homes or by standing in winding alleys (cul-de-sac) and conversing with neighbours (women) about daily and personal issues while watching children play in the street near their houses.

After 1956, Basra city witnessed an urban expansion, which was represented by the emergence of new land uses after Max Lock was commissioned to make the first masterplan for the city for the period of 1956 to 1976. As previously mentioned, Basra has two ports; one is the Port of Basra, also known as Al-Maqal Port. It was the first port in Iraq and was established by Britain in 1916 beginning operations in 1919. It had been constructed under the aegis of the British Army, who occupied Mesopotamia during the First World War. As Iraq's first modern port, it was intended by the British to serve as a significant commercial and mercantile hub, servicing Basra itself but also acting as a valuable economic bridge between Europe and Asia.

This large vital facility had a large number of workers who were from all parts of Iraq. Due to the workforce's capacity and the increased number of workers in this vital facility, it became necessary to provide adequate housing for employees. Consequently, because of the scarcity of areas and overpopulation near the Al-Maqal port, the government decided to allocate residential lands to citizens. This was a long-used method to provide housing by alternating governments in Iraq. Therefore, new neighbourhoods were planned after converting some farms that were belonged to families to residential neighbourhoods. This process was achieved in agreement and coordination with BM. This was when implementing AlJunainah and Al-Zahra neighbourhoods at the end of the 1960s.

The 1970s was considered an important qualitative shift in the urban scene of Basra's city, in which Iraq witnessed the first five-year budget plan. The plan included implementing an integrated infrastructure for the city in addition to residential neighbourhoods, such as Jama'yat or AlKhalij Alarabi. Also, land plots were distributed to employees in different directorates, such as health, financial, and education. A portion of these lands was sold to people by the municipality. Furthermore, the design included distinct streets, squares, gardens, service areas, and streets and sidewalks' extent. After this period, social activities were also affected by the city's urban plan and the changes to peoples' lifestyles.

During that period, social relations among residents were strong, and this was due to several reasons. First, most of those living in some neighbourhoods were from the same job environment, and therefore, they had strong social ties through the working climate and kinship between families living in the same residential neighbourhood. Since the services were, at the time, good and the government was interested in providing them, Basra's city maintained its cleanliness. Also, the nature of life in Iraq was semi-closed until 2003, which meant that most people were unable to travel. Moreover, there were limited entertainment facilities and communication with the outside world due to the lack of satellite channels or current social media programs; consequently, social relations were more potent than today. Most individuals used doorsteps to sit and observe pedestrians or discuss daily life issues. Also, people tended to sit in gardens at times that suit their business. As a result of the many wars that Iraq, especially Basra, went through, many cities were neglected, and service delivery fell to its lowest level. This meant damage to the streets, wasted accumulation, and worsening social problems due to the siege. This led to the need to raise the income level by finding additional work to meet citizens' needs and cover their expenses.

After the 2003 war, economic, social and political changes have occurred in public life in Iraq, in general, and in Basra, in particular. The Iraqi citizen showed an openness to the world through their ability to rapidly adapt to the development that took place in various areas of life in Iraq. These changes resulted in the emergence of new social activities within the Basra community. As a result, daily life and social activities changed in Iraq in general and Basra in particular. These changes included the emergence of the internet, social media, television channels, the provision of new public places, such as air-conditioned modern malls, stores, and cafes, by owners of capital, which became available to all and were new to the community of Basra. Also, the number of owned private cars increased in the Basra Governorate. According to an interview with the director of the Traffic Directorate in the Basra governorate, Brigadier General Abdul Hassan Shihab, that was held by Alsumaria News, the number of cars registered in 2016 reached 350,000 (Alsumaria News, 2016), although the percentage of those who owned cars did not exceed 20%. This led to a change in the daily distance travelled by residents to their destinations, and thus the tendency of the majority was to move outside the neighbourhood for social gatherings. The high level of income also led to the opportunity for many citizens to travel outside Iraq.

Moreover, as aforementioned, although the changes in women social activities are limited in the last ten years, they become noticeable in terms of the number of social activities and participating women, which is considered a difference in itself. Moreover, it has been observed

the emerge of the phenomenon of few small groups of young women gathering in a particular public place, such as a mall, a restaurant, or a park, usually with a middle-aged woman, see Figure 3-19. Usually, most women come out with a man from their family, like a husband, brother, or husband.

Furthermore, the long summer in Iraq starts from April and finishes in October and it experiences high temperatures, especially in Basra, as they reach more than 50 degrees Celsius. All the aforementioned reasons led people to search for places to gather away from their residence, where most of the gatherings and meetings took place outside the neighbourhoods, within enclosed places, such as malls, cafes and restaurants, as they are privatized places and have modern amenities. Therefore, most people have tended to not use the space in front of their house to meet their neighbours and friends or to entertain themselves as they used to before. The reason is that these areas are no longer environmentally or socially appropriate, especially when public services are incomplete in most residential neighbourhoods. The use of communal spaces within the neighbourhood seems to be restricted to mostly children at specific times; this may be due to the lack of service requirements, such as planting, lighting, seating or protective boundaries.

### **3.8. The Economic Aspects of Basra Governorate:**

As previously mentioned, Basra's location at the Shatt Al-Arab, and its vast oil reserves make it one of the most economically important governorates of the country. The city of Basra hosts an international airport, a state university and two private universities. The port of Basra and the port of Um Qasr, Iraq's only deep-water port, are both located in the governorate, which makes the governorate a centre for trade, transportation and storage. Several manufacturing companies also operate in the governorate. Off the coast of Basra, the strategically important Al-Basra Oil Terminal is the main oil outlet of Iraq. The massive oilfields of Basra produce two-thirds of Iraq's oil output. This explains the increasing number of migrants after the war of 2003 to the Basra governorate who followed the increased job opportunities.

Basra's economic prosperity, however, is impeded by the governorate's poor infrastructure and ageing oil installations. These downturns are attributed to a series of reasons. Firstly, Basra was a battleground in both the Iran-Iraq war and the two Gulf Wars. The results of these wars have meant damage to the economic infrastructure and have left a host of mines and unexploded ordnance littered throughout the governorate. This has hampered economic development, particular for the agricultural sector, which is hindered by the leftover explosives.



Secondly, the UN sanctions imposed after the Iraqi invasion of Kuwait in 1990 and only lifted after the occupation of Iraq in 2003 crippled the Iraqi economy and public infrastructure, in general, and the oil industry, in particular. The ageing oil installations deteriorated due to imposition of import restrictions (due to sanctions) on spare parts and modern equipment. This has led to limited production capacities and an increased risk of accidents. Furthermore, the diversion of resources to the military during the Iran-Iraq war (1980-1988), insecurity, and lack of investment after 2003 also contributed to the decay of the oil infrastructure.

Finally, agriculture in the governorate has been hampered because of the receding level of the Tigris and Euphrates. This has increased salinization and resulted in insufficient wastewater treatment capacity. Furthermore, corruption, crime and years of militant violence and sabotage following the 2003 American invasion also had a negative influence on the governorate's economic development.

Nowadays, Basra city has a unique opportunity for growth, as a number of proposed solutions and projects have been offered to develop some of the poor infrastructures reviewed by the government. However, there is a need to introduce suggestions to reestablish the city in a consistent way with its historical, urban, and architectural form in recognition of the city's outstanding historical significance. Also, there is a need to rebuild the city anew in line with the level of other similar cities in terms of public income return.

Therefore, it is important to consider sustainable development, especially the social dimension, which has not been given attention in a way that keeps in mind the original image of the city. According to Gehl (2011), contemporary cities and neighbourhoods have become lifeless. They have accompanied industrialisation, segregated functions and depend on the car; however, these give the city an uninteresting identity (Gehl, 2011). The adopted solutions by the developer, consultants, and regulatory bodies could be unsuitable for other sites as appropriate specifications that characterise each site vary from one location to another. Therefore, this urban context will be a new platform to investigate and enhance its level of social sustainability.



### **3.9. Political and Security Aspects of Basra Governorate:**

Throughout the centuries, the city and its surroundings maintained their strategic and economical importance. During the last decades, Basra was a battleground having seen the Iran-Iraq war 1980, the two Gulf Wars, the Shiite uprisings against Saddam Hussain and the post-2003 insurgency all of which took their toll on the governorate. The working paper by NCCI (2015) described both the political and security situations in the Basra governorate.

The main thrust of Iraq's initial attack against Iran commenced across the Shatt Al-Arab near Basra. The city of Basra was targeted by major Iranian ground offensives. The war destroyed oil facilities and agricultural land around the Shatt Al-Arab, and killed civilians, forcing thousands to flee the governorate, destroying both houses and economic infrastructure.

Again, the Basra governorate, its inhabitants and its infrastructure were devastated by the US-led international coalition war after the launch pad of the Iraqi invasion of Kuwait in 1990. The US-led international coalition launched a massive air campaign targeting Iraqi forces and several key installations, like power plants and port facilities.

The next crisis that the Basra governorate suffered after the Iraqi defeat at the hands of the International Coalition was mass uprisings, which broke out in Iraqi Kurdistan and the Shiite southern governorates in March 1991; these aimed to take down Saddam Hussein and were encouraged by former President George H. Bush. As the NCCI (2015) report stated, the governorate of Basra suffered extensive damage to its infrastructure. This is because the Iraqi army quickly crushed the uncoordinated rebels. The response was massive, and the outcomes totalled thousands, including civilians who perished when the Iraqi army indiscriminately targeted rebel-held areas using heavy weaponry and helicopters.

Another Shiite uprising broke out in Basra in 1999. The assassination of the popular Shiite cleric Grand Ayatollah Muhammad Sadiq al-Sadr, a staunch critic of the Ba'ath regime, triggered a wave of civil unrest and violence among Iraq's Shiite population. In Basra, the police stations and offices of the Ba'ath party were attacked. The security forces reacted forcefully to control the situation, and the outcome was hundreds of victims.

In the war of 2003, the governorate of Basra was the entry point of the American-led coalition to invade Iraq. The coalition forces took the city of Basra after a two-week-long siege and heavy fighting. After the fall of Saddam's regime and the invasion, the governorate became a flashpoint of militia conflicts and the focus of resistance against the Multinational Force and new Iraqi government. Also, the British forces assigned to the governorate lacked the workforce, equipment and strategic planning to maintain order and security in Basra;

consequently, between 2004 and 2008 the governorate slipped out of control of the Iraqi government.

The governorate's economic, political and security institutions were the competition points between political groups (e.g., Sadrist Trend and the Islamic Supreme Council of Iraq (ISCI)) to control the governorate. External interference played a significant role in the rise of these groups and their armed wings. The security situation rapidly declined as militias fought each other and the British forces, who finally withdrew to their base at Basra Airport. Additionally, sectarian violence, which targeted Sunnis and Christians, was practised in the governorate. The militias embraced most of the actions that unsettled the Basrawi community and changed its demographic, where they forcefully Islamised Basrawi society, by barring secular or moderate Shiites from public life and intimidating women who did not adhere to a strict Islamic dress code. The Basra governorate was brought back under the Iraqi government's control in 2008 after a truce was reached with the Sadrist group (Jaish Al-Mahdi) following a large-scale clearing operation by Iraqi security forces, backed by coalition troops.

Ever since the 2008 clearing operation, the Basra governorate has remained relatively peaceful. Calls for regional autonomy were heard in Basra, just like in the other southern Shia dominated governorates, but they never reached a critical momentum. Moreover, the Basra governorate was also spared from the crisis brought by ISIS onslaught in 2014.

### **3.10. Conclusion:**

This chapter discussed the research context - Iraq in general, and the Basra governorate in particular - in terms of the geographic location, total area, climate conditions, and population. The chapter also reviewed Basra City's urban form's historical background, which is represented in three main periods: before 1900 as the Ottoman Empire, from 1916 to 1964, and after 1965.

Moreover, the housing policy in Iraq and the housing crisis were described. According to the Iraqi Ministry of Construction and Housing-Directorate of Housing, the government and private sector meet the overall residential need. Thus, 85% of this need is provided by the private sector, while the government sector provides 15% of the total housing need. This can explain the housing crisis that faces the Iraqi government and the lack of sufficient dwelling units for the increased population in Iraq, and Basra particularly. The housing system in the Basra governorate comprises medium-density dwellings, and the majority of residential

neighbourhoods include single-family houses. The housing crisis is seen as a critical influence on the emergence of social and environmental issues in Iraq and can lead to the neglect of the social life of communal spaces.

This chapter also discussed communal spaces within the neighbourhood, including the intentional and unintentional communal spaces at different levels, their scale, service, and design. The list of communal spaces available in current residential neighbourhoods in Basra city were also detailed. This was achieved by conducting a desk study that included the analysis of documents, maps, schemes obtained from the Basra Municipality, and the analysis of limited, fragmented literature in this regard.

Furthermore, the chapter discussed cultural, economic, political and security aspects in relation to their influential roles in forming and developing Basra city and its society. Cultural and social life, and neighbouring in Basra city were explained according to the changes that have occurred in the city's urban plan throughout the years and the changes in people's lifestyles, such as the impact of the internet and social media, the increase in income levels and the growth of car ownership. The discussions included descriptions of official Islamic holidays in Basra community that are considered a motivation for social interaction, such as Eid Al-Fitr, Eid Al-Adha, Ramadan, and Ashura. It has been noted that these activities take place in different places for men and women. The most used places for men are the mosque, hussainya, and street, while women usually congregate in the house for most social activities and sometimes in the hussainya within the neighbourhood. This is because of the cultural restrictions and traditions of the community; these have been noted for their impact on social patterns and the use of communal spaces. Furthermore, it is noted that, in recent years, the socio-cultural values of the community have not been paid much attention to the development of residential areas. This can explicate the neglect of social sustainability in the maintenance, management, and development processes of these residential neighbourhoods.

The economic aspect of the Basra governorate is characterised by the substantial impact of important facilities, such as two important ports, and the massive oilfields of Basra that produce two-thirds of Iraq's oil output, and which explains the growing number of migrants after the war of 2003 who came for the increased job opportunities. However, Basra's economic prosperity is impeded in a number of ways. These can be summarised as past wars, UN sanctions imposed after the Iraqi invasion of Kuwait in 1990 and only lifted after the occupation of Iraq in 2003, and the disruption of agriculture due to the receding levels of the Tigris and Euphrates. These economic effects have influenced all the components of the city's urban form

and, in return, affected the social patterns for individuals in Basra city. It is noted that the economic issues that resulted from past wars and the UN sanctions have affected the ability to provide sufficient schemes that fulfilled citizens' demands. The focus of the government is on the importance of solving the housing crisis without considering the social dimension in their priorities.

Finally, the chapter reviewed the impact of both politics and security, which has informed society's use of public spaces, and their quality. The governorate has suffered for a while from an unstable situation due to Basra's political and security circumstances. This has particularly been affected by the 2003 war, after which the governorate's economic, political and security institutions became the competitive points between political groups. All the past political issues of Basra are considered to represent a critical period in people's lives. These conflicts were the reason for the spread of extremist political and religious ideology, especially after the war of 2003. It is believed that the spread of such extreme ideas among individuals could cause a sense of insecurity, such as mistrust, prejudice, and fear of each other, which, in turn, may lead to a decline in social interaction. Nevertheless, ever since the 2008 clearing operation, the Basra governorate has remained relatively peaceful.

## **Chapter 4 Research Methodology and Process**

### **4.1. Introduction:**

This chapter presents the development and application of a research methodology based on multiple case studies that enable the development of a measuring model to identify factors and indicators affecting social interaction among residents in Single-Family Housing Neighbourhoods (SFHNs) in Iraq. Four research questions are proposed. The research questions provide a full understanding of urban social sustainability, its indicators and its main determinant. The research questions also investigate how factors that affect social interaction among inhabitants manifest in communal spaces of SFHNs in Iraq. In particular, these questions explore types of communal spaces, and the impact of the urban design quality of residential neighbourhoods on the quality and quantity of social interaction among residents in SFHNs.

This chapter discusses the criteria for selecting the case studies and the portfolio of three selected neighbourhoods. The chapter also explains the research framework, the research strategy of inquiry, and research design. The data collection approaches, the development of the indicators and variables used to measure the dependent and independent variables are explained before discussing the data analysis. Finally, the process of testing the methods and the procedures for conducting the research are outlined.

### **4.2. Strategies of Neighbourhoods' Selection:**

Previous studies have shown that patterns of social interaction and the use of different spaces are greatly affected by the cultural and geographical context (R. Rapoport et al., 1975). Therefore, this study is conducted in a relatively small geographic area, i.e., in Basra City. The case studies in this research were selected from the residential neighbourhoods of single-family houses, where the communal spaces within these neighbourhoods form the main focus of the study. A list of legal and regular residential neighbourhoods of single-family houses of medium density in Basra, which were built and first occupied between 10 to 30 years ago, has been prepared to create a pool of choices to select the three case studies.

The list of case study selection criteria applied to this study was presented to experts from Basra Municipality (BM). In addition to considering the selection criteria, experts provided the researcher with their professional opinions and advice regarding selecting appropriate neighbourhoods for the study. They highlighted the neighbourhoods that are easily accessible and reachable by car, and their design patterns are standard and common. Moreover, they

emphasised safety and security when choosing the case studies because some neighbourhoods are challenging to be accessed by a female researcher to conduct an investigation without harassments. Some neighbourhoods are crowded and occupied by populations from rural regions who migrated to the city after 2003. Finally, the experts suggested taking into account the restrictions in traditional neighbourhoods when selecting the case studies, as these restrictions could limit the findings. Therefore, the current study excludes the old traditional part of the city.

In the final step, the study has chosen three residential neighbourhoods in order to conduct the main research. The following conditions have been considered criteria for the sample selection in order to maximise the variety of samples while ensuring comparability.

- **Age**

The first selection criterion is the age of the case study. This involved residential neighbourhoods completed and occupied between 10 to 30 years because social interactions between residents usually take some time to form once residents have moved into a new development. Since characters and identities can become solid and significant after a certain length of time, the developments have to be under a certain age to increase the validity of the comparisons between case studies.

- **Socio-Economic Background:**

Because traditional cities are examined widely in earlier studies where the level of social interaction among residents is already evident, the focus of this research is on residents who are from a middle-high socioeconomic background. This criterion was selected for the case studies.

- **Density**

The samples have been limited to medium density urban residential developments in order to make valid comparisons. According to the Basra Municipality, the selected samples are considered from a medium population density, where there is no accurate information regarding the population and dwelling density (dwellings per hectare); instead, only estimations are available, which were calculated from the statistical projections of the General Census conducted in Iraq in 1997 and has not since been updated. However, it is possible to estimate the dwelling density from a manual of housing standards published by SCH (2010). This is because the house types in the selected samples are semi-detached, the dwelling density is 18-27 dwellings per hectare, and the population net density is potentially 110-160 people per hectare. The plot area of each house ranges from 200 to 400 sq. meters.

- **Location:**

In terms of the proximity to the city centre Basra governorate (within the city), the choice of samples has been limited to three neighbourhoods located at three different distances from the city centre, ranging from 3.9 to 8.5 km by car. This selection was made to examine whether the proximity of social and commercial services within the city centre has an impact on social interaction among residents in communal spaces within the three case studies.

- **Types of Communal Spaces:**

As the focus of this research is to identify factors that affect social interaction among residents in communal spaces within SFHNs, each sample area has been chosen according to a list of intentional and unintentional communal spaces that are usually available in single-family neighbourhoods in Iraq. This list was collected from earlier studies, including a desk study of documents from BM, the analysis of maps and schemes, and the conduct of a fieldwork site survey. The case studies have been selected to cover different varieties of communal space. The following types of communal spaces represent the list of criteria on which each sample area was selected:

1. The space in front of the main entrance of the house: The front door of the house with the layout of the access route relative to the dwelling's position.
2. Streets and sidewalks: the internal streets between the opposite houses and their sidewalks relative to the position of the dwelling.
3. Neighbourhood's gardens: The shared common garden located between numbers of houses, which is the position of intentional communal spaces relative to the neighbourhood area.
4. Local shops: The position of the local shops relative to the neighbourhood area.
5. Children's Playgrounds: The position of the playgrounds relative to the neighbourhood area.
6. Places of worship: The position of the places of worship, such as a masjid, hussainia, or church, that are relative to the neighbourhood area.
7. Gyms: The position of the provided and available gyms that are relative to the neighbourhood area.
8. Restaurants: The position of the provided and existing restaurants that are relative to the neighbourhood area.
9. Cafes: The position of the provided and existing cafes that are relative to the neighbourhood area.

### **4.3. Neighbourhoods Portfolio:**

This section presents introductory information regarding each sample in order to understand the morphological characteristics of each selected case. Measures of the physical attributes of intentional and unintentional communal spaces are presented for each neighbourhood. To identify intentional communal spaces within selected urban residential neighbourhoods, secondary data from the BM were analysed, including documents, reports, and schemes of the selected samples, in addition to Google Maps and maps from Esri (ArcGIS). Also, the architects, who work in the Department of Cities' Organising /Masterplan Division in BM, were asked if there were any communal spaces within the neighbourhoods that were designed to facilitate social interaction among residents.

The final selected case studies are similar in terms of the physical characteristics of the built environment, which represent the common design patterns of residential neighbourhoods in the Basra Governorate; therefore, they describe the general case for most of the city. However, the selected neighbourhoods differ in some critical points. First, the neighbourhoods are located at different distances from the centre of Basra City, where most of the commercial and entertaining activities occur. Also, these areas could differ in terms of their total population, occupational status, and the number of available communal spaces, social and commercial services provided in each neighbourhood. The differences in the physical characteristics of the case studies might generate different results based on the quality of these characteristics. These case studies were selected as various examples that demonstrate social sustainability and its manifestation through social interaction.

#### **Case 1: AlJunainah Neighbourhood:**

AlJunainah neighbourhood was planned in 1965 and completed and occupied soon after that. It is located in the north-western part of Basra city with a total area of 0.79 km<sup>2</sup>; it is about an hour's walk from the city centre (Al-Ashar) and around 15 minutes by car, according to Google Maps. This neighbourhood, with another three areas, comprises Al-Rabat Alawal. Figure 4-1 shows the location of the neighbourhood from the city centre. Figure 4-2 shows an aerial photograph for the neighbourhood. The report obtained from the BM reveals that this area belonged to the heirs of "Jayba Ji" family, one of the most famous families in Basra city at that time. The family decided to give the whole grove to the government with the expectation that it would be planned as a residential neighbourhood. In 1965, the area was sorted into 1164 plots according to the provision of the second and third urban plan area. This was undertaken according to the Municipal Administration Law No. 165 of 1964, in which the provisions state



that the total area of the plots in this neighbourhood range between 200m<sup>2</sup> to 300m<sup>2</sup> with two and a half meters the recommended building setback from the front right-of-way line. Moreover, 65% of the neighbourhood area is constructed, while the rest is open space. In 1975, the land lots were distributed in two ways; firstly, parts of the land were assigned to employees, and secondly, parts were sold to the public by the municipality. There is no accurate data on the number of dwelling units, and the total people living in the neighbourhoods are estimated because all the numbers provided are based on the last census of 1997. According to paper documents from the 2009 census (the latest) obtained from BM, the total number of dwelling units in the neighbourhood is 2015, and the estimated number of inhabitants is 15710.

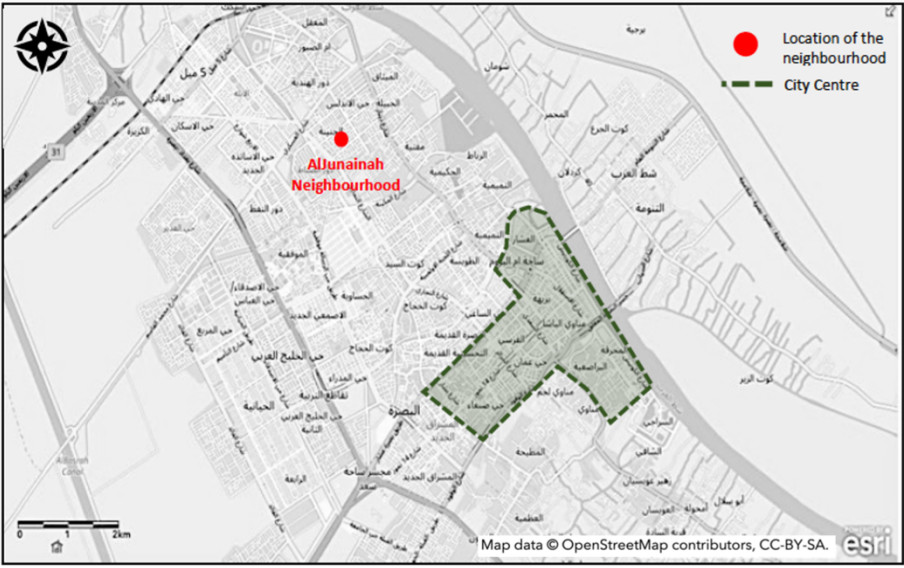


Figure-4-1 AlJunainah neighbourhood- location. (Source: map adapted by the researcher from Esri, accessed 2019).

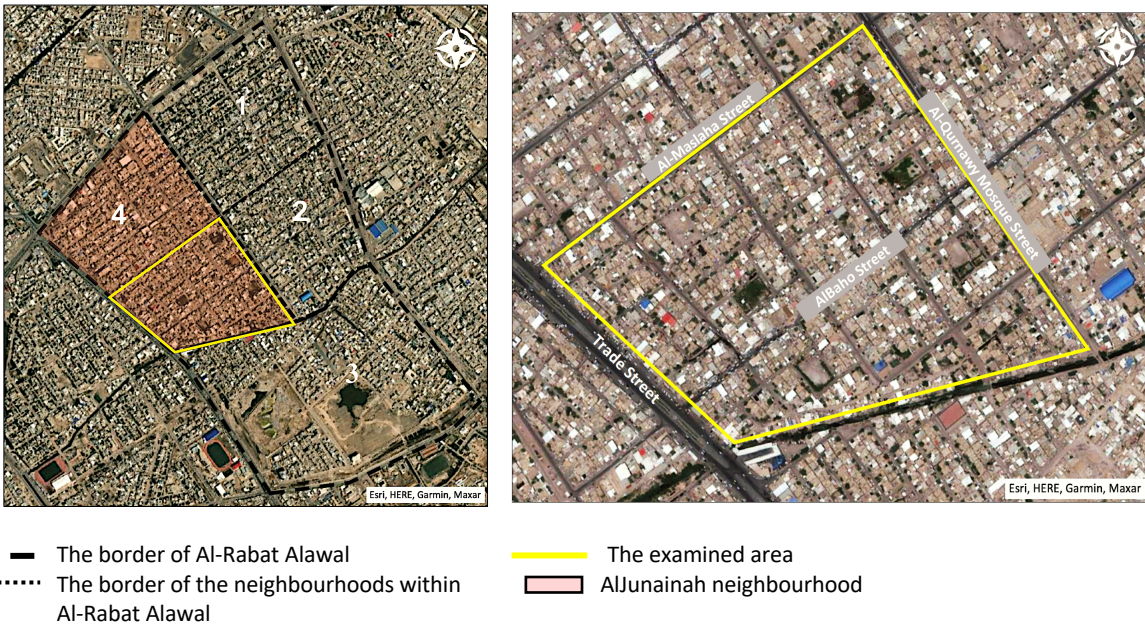


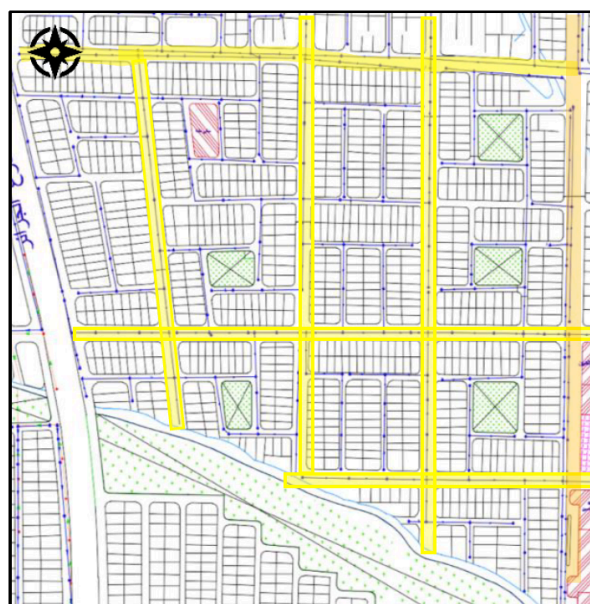
Figure 4-2 AlJunainah neighbourhood (4) with the other three areas comprising Al-Rabat Alawal, (source: maps adapted by the researcher from Esri, accessed 2021).

Figure 4-3 shows an AutoCAD scheme of the neighbourhood file (obtained from BM), showing that there are eight streets of 20 meters width that penetrate the neighbourhood; three of these are horizontal, and the other three are vertical, as highlighted in yellow, while the width of the internal streets between the houses is ten meters. The width of the streets includes the sidewalks. The source of the figure 4-3 has been adapted from an AutoCAD file obtained from BM in 2018. Permission was granted to reuse the source by highlighting the streets, the distances of streets surrounding the neighbourhood, and adding a map key to illustrate the land uses of the selected area. Generally, a grid system, using vertical and horizontal lines, has been used when designing the neighbourhood's streets. Using such a system gives the streets a direct connection with the main roads and a permeability from all directions. The housing units are semi-detached, mostly two-storey, with a front yard, and the construction condition ranges between average to very good. The homes in this neighbourhood vary between single and multi-ownership houses.

According to Figure 4-3, the neighbourhood's plots are designed in blocks arranged on grid lines. Some of these blocks are arranged in squares called Islamic Mafruka (Islamic rubbed square), where six open spaces are located in the central part. The number of houses in each block range from 12 to 16 units. This shape is considered an Islamic decoration that was commonly used during the Umayyad, Abbasid, and the Ottoman Empire eras, and it was considered an artistic style characterised by the convergence of different currents. From analysing the site survey data, the maps obtained from Google Maps, and the scheme of the area obtained from BM, some important buildings were noted within and surrounding the AlJunainah neighbourhood.



A



B

- Al-Qarnawy Mosque Street
- Streets with 20 meters width.
- Green open area
- Housing
- Schools and kindergartens
- Public services (e.g., administrative buildings, electricity, offices)

Figure 4-3 A: The scheme of AlJunainah neighbourhood.

B: A closer look at the examined area.

(Source: Adapted AutoCAD Basra Masterplan - Basra Municipality, 2018).



For example, Al-Qarnawy Mosque was founded in 1964, and its adjacent street was named Al-Qarnawy Street. Al-Junainah Market is one of Basra's famous markets; an important old school called Almuharbyn school was founded in 1951, and Basra Times Square, one of the largest shopping and entertainment complexes in Iraq and Basra, and is located near the neighbourhood. In addition to the housing, there is variety in the land use of the area. This includes open spaces - gardens located between houses; commercial areas, including shops, local fast-food shops, restaurants, cafes, bakeries, hairdressing salons, and butchery stores; educational areas, including schools and kindergartens; health areas, including some pharmacies and clinics; administrative and worship facilities (see Figure 4-4). Most of these land uses are distributed along the busiest streets within the neighbourhood - AlBaho and AlMaslaha Streets - that penetrate the selected area. Therefore, the area is characterised by diverse land uses.



Figure 4-4 Facilities located within the area of AlJunainah neighbourhood (source: map data adapted by the researcher from Google: Google Maps and matched with secondary data obtained from Basra Municipality, 2018).

In terms of this case study's social characteristics, people from the middle to high class, working in the private and public sectors, and have different educational backgrounds (although most have a university degree) occupy the AlJunainah neighbourhood. The residential plots in the AlJunainah neighbourhood were distributed in two ways: BM directly selling part of the plots and assigning the other part to employees in the public sector. It is recognised that the majority of the neighbourhood's population is from the young age groups to the fifties.

In AlJunainah neighbourhood, the study found that one family, with an average of two to seven persons, inhabits dwelling units, while more than one family occupies some houses. This is due to Iraqi society's social customs where married sons reside in the same main house of the family. In some cases, the total number of households can reach ten persons or more. This depends on the total number of families living in the same house. Notably, this neighbourhood is characterised by extended families living in the same area. Accordingly, a high proportion of the residential properties in AlJunainah are owned, a lower proportion is multi-owned, whilst a low percentage of residential buildings are rented properties. Additionally, the neighbourhood is inhabited by a high proportion of people whose residence length ranges between five to more than 20 years.

AlJunainah neighbourhood is known for its diverse population from different religions. The Armenian community formed the majority to inhabit the area until the 2003 war. Among the most famous Iraqi figures to inhabit AlJunainah is the Armenian artist, Sita Hakobyan. This neighbourhood is lively as it is close to important landmarks in the area, such as public parks, markets, and malls. These increase an individual's movement around the neighbourhood.

### **Case 2: AlKhalij Alarabi Neighbourhood:**

AlKhalij Alarabi neighbourhood was planned in 1966 and built and inhabited by 1976. According to Google Maps, it is located in the southwestern part of Basra city, where it is around an hour and 20 minutes' walk from the city centre (Al-Ashar) and around 15 minutes by car. AlKhalij Alarabi neighbourhood is also called "Aljmeyat"; it is one of the largest and most beautiful areas of the Basra Governorate at that time. According to BM, the neighbourhood is the first planned area in Basra and one of the products of Iraq's five-year plan at that time. The housing was intended for employees who worked in the service sectors, such as education, health, oil, and the municipalities. The area is divided into three sections - AlKhalij Alarabi Alawal (first), AlKhalij Alarabi Althani (second), and AlKhalij Alarabi Althalith (third) - covering a total area of 2.38 km<sup>2</sup>. The latter area is formed by multi-rise building complexes, which are excluded from the study; therefore, the two neighbourhoods' total area is 2.13 km<sup>2</sup> and the examined area is 0.8 km<sup>2</sup>. The neighbourhood is located on one of Baghdad Street's sides and is surrounded by both Al-Asma'i and Al-Hussein neighbourhoods. Figure 4-5 shows the examined area's location, while Figure 4-6 represents AlKhalij Alarabi Alawal, Althani and Althalith (the first, second, and third) neighbourhood boundaries and the examined area.

According to BM, the AlKhalij Alarabi area was initially sorted into 800 plots according to provision within the second, third, and fourth urban plan area of the Municipal Administration Law No. 165 of 1964. In the third urban plan, the provisions state that the plots' total area should be 300m<sup>2</sup> and the recommended setback of buildings from the front line of the right-of-way is two and a half metres. Moreover, 65% of the area in this part of the neighbourhood is constructed, while the rest is open space. In the fourth urban plan, the plots' total area should be 400m<sup>2</sup> with four meters as the recommended setback; 55% of this part of the neighbourhood is constructed, while the rest is open space.

As mentioned previously, there is no accurate data on the number of dwelling units and people living in AlKhalij Alarabi neighbourhood. According to data from the latest census in 2009 obtained from BM, 17,811 dwellings were noted in AlKhalij Alarabi Alawal and Althani (the first and second). The census also stated that the latest number recorded of inhabitants living in the first and second sections of AlKhalij Alarabi neighbourhood until 2009 was 14,178. The examined area has been chosen between the first and second sections of the AlKhalij Alarabi neighbourhood with a total area of 0.8 km<sup>2</sup>, depending on the location of three open spaces, as shown in Figure 4-6. This area comprises around 700 dwelling units and an estimated population of 4,834 inhabitants, depending on an average of six persons living in each house.

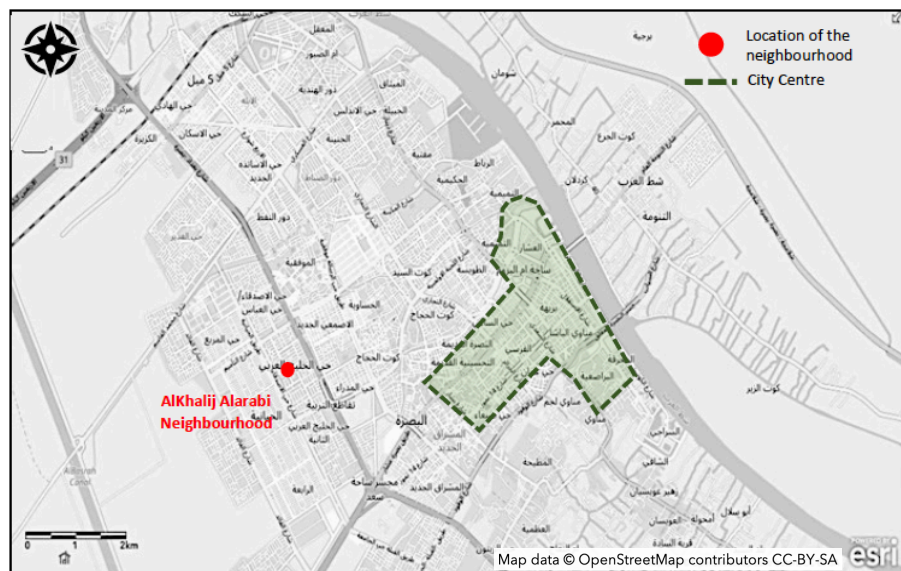


Figure 4-5 AlKhalij Alarabi neighbourhood- location (source: map adapted by the researcher from Esri, accessed 2019).



- The border of AlKhalij Alarabi part
- ..... The border of the neighbourhoods.
- The examined area
- AlKhalij Alarabi Alawal and AlKhalij Alarabi Althani neighbourhoods.

Figure 4-6 AlKhalij Alarabi neighbourhood, including AlKhalij Alarabi Alawal, Althani and Althalith (the first, second, and third). (Source: map adapted by the researcher from Esri, accessed 2021, and matched with secondary data obtained from Basra Municipality, 2018).

In terms of the streets, as shown in the neighbourhood scheme in Figure 4-7, the width of the internal streets between houses is ten meters. The source of Figure 4-7 has been also adapted from AutoCAD file obtained from BM in 2018. Permission was granted to reuse it by highlighting the streets, and adding a map key to illustrate the land uses of the selected area. Every block is surrounded by a street of 20 meters width, and the width of the streets includes the sidewalks. Most of the streets within the area are cul-de-sacs. Generally, the grid system, comprising vertical and horizontal lines, has been used when designing the neighbourhood's streets. Using such a system gives the streets a direct connection with main roads and a permeability from all directions. The housing units are detached and semi-detached; they are mostly two-storey with a front yard, and the construction condition ranges from average to very good. However, there are residential buildings of three floors. Homes in this neighbourhood vary between single and multi-ownership houses. According to Figure 4-7, the scheme of the area shows that the neighbourhood's plots are designed in blocks arranged in grid lines. As shown, some of these blocks are arranged adjacent to open spaces and public services, where the open spaces are mostly located at the edges of the blocks, dissimilar to the other two



neighbourhoods. The number of dwellings in each block range between eight to 24. Figure 4-7 represent the current masterplan of the area obtained from BM.



Figure 4-7 **A:** Scheme of the First AlKhalij Alarabi neighbourhood  
**B:** Scheme of the Second AlKhalij Alarabi neighbourhood. Source: AutoCAD Basra Masterplan - Basra Municipality, 2018.

According to the site survey, the scheme of the area obtained from BM, and Google Maps, there are some important buildings located within the neighbourhood, such as Ibn Al-Bitar Hospital, the South Oil Company building, and the Basra Education Directorate building. Also, there are two famous mosques: Imam Musa Al-Kazim Al-Kabeer Mosque and Al-Manasir Mosque, which is near Ibn Al-Bitar Hospital. One of the most prestigious streets in the neighbourhood is Old Education Street, due to the Basra Education Directorate Building location.

Figure 4-8 represents the facilities and land uses of the area; it shows that the area has diverse land uses, which can be categorised into housing, commercial, educational, health, administrative, worship facilities and parks. The land uses include houses, open spaces, parks, shops, restaurants, cafes, bakeries, supermarkets, hairdressing salons, butchery stores, schools, kindergartens, a police station, a hospital, clinics, pharmacies, and some administrative buildings. Like the first case study, AlKhalij Alarabi neighbourhood is inhabited by people from the middle to high class, and various educational backgrounds, although most have a university degree. The higher proportions of the population living in this neighbourhood are either students or employees who work in the public sector in the same employment sphere, such as education, health, oil, and the municipalities. The housing plots of this neighbourhood were assigned to employees in the public sector. In contrast, a low proportion of AlKhalij Alarabi's population work in the private sector.

Different age groups, mostly young people to the mid-fifties, represent the inhabitants living in this neighbourhood. They form the majority, comprising one-family households, with an average of five to eight persons for one family. Due to the Iraqi society's social traditions, houses consist of two or three families whom all inhabit the same house of the main family, and in some cases the total number of family members can be large. Importantly, this neighbourhood has the lowest kinship relationships rate than the other two case studies, where there is a lower rate of extended families living in the same area.

A large portion of the residential properties in AlKhalij Alarabi is owned, while a low percentage of properties are multi-owned, and a notable percentage of the residential buildings is rented. This is due to the large area of houses in AlKhalij Alarabi neighbourhood, which encouraged some residents to subdivide their properties into a larger number of dwellings in order to the elderly retiree benefit from rent. In terms of the neighbourhood's residency length, many people have lived in AlKhalij Alarabi between six to more than 20 years.



Figure 4-8 Facilities located within the area of AlKhalij Alarabi neighbourhood. Source: map adapted by the researcher from Google: Google Maps and matched with secondary data obtained from Basra Municipality, 2018.

### Case 3: AlZahraa Neighbourhood:

AlZahraa neighbourhood was planned and occupied after 1966. The area was sorted into 268 plots according to the provision of the third urban plan area, which means the total area of each lot is 300m<sup>2</sup> with a two-and-a-half-meter setback of buildings from the front line of the right-of-way line. Furthermore, 65% of the area is constructed, while the rest is open space, and ten of the sorted plots are for public services and utilities. The neighbourhood is located in the central part of Basra province (between AlJunainah and AlKhalij Alarabi neighbourhoods) with a total area of 0.63 km<sup>2</sup>. According to Google Maps, the neighbourhood is about 45 minutes' walk from the city centre (Al-Ashar) and around 10 to 13 minutes by car. According to the 2009 census, the total number of dwelling units in the neighbourhood was 500, and the estimated number of inhabitants was 3996. The location of the neighbourhood from the city centre is represented in Figure 4-9. Figure 4-10 shows an aerial photograph of the neighbourhood adapted from Google: Zoom Earth.



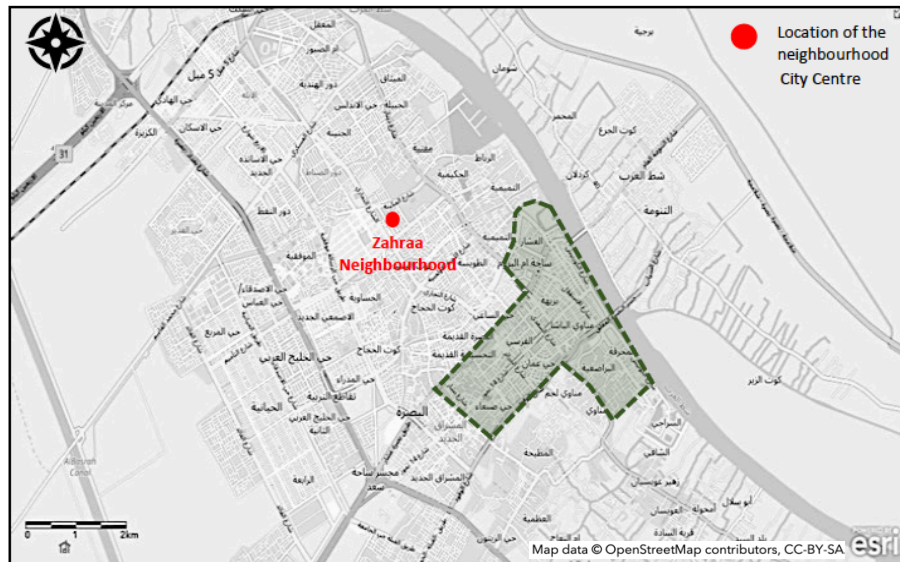


Figure 4-9 AlZahraa neighbourhood- location (source: map data adapted by the researcher from Esri, accessed 2019).



- The border of AlZahraa neighbourhood
- The examined area

Figure 4-10 Aerial photograph of AlZahraa neighbourhood, (source: map adapted by the researcher from Google: Zoom Earth, Microsoft, Bing Maps, accessed 2019).

As can be seen from the neighbourhood's scheme represented in Figure 4-11, there is a gradient on the width of the streets, which has not been seen in the other two neighbourhoods. The width of the internal streets between houses is ten meters. Two streets that penetrate the neighbourhood horizontally are 12 and 15 meters wide. Also, two streets are 20 meters wide, and these penetrate the neighbourhood vertically. The 25 meters wide street is separated at the right end of the neighbourhood from the National Oil Company area. The streets that surround the neighbourhood are 30 and 60 meters wide. Generally, the grid system, which includes vertical and horizontal lines, has been used to design the neighbourhood's streets. Using such

a system gives the streets a direct connection with the main roads and a permeability from all directions. The housing units in AlZahraa neighbourhood are semi-detached, mostly two-storey with a front yard, and the construction condition ranges from average to very good. The homes in this neighbourhood vary between single and multi-ownership. The design of the neighbourhood is similar to AlJunainah neighbourhood. According to the AutoCAD file obtained from BM, the neighbourhood's plots are designed in blocks arranged on grid lines. The blocks are arranged in squares (as shown in Figure 4-11), where four open spaces are located in four central parts. The number of housing units in each block ranges from 12 to 18.

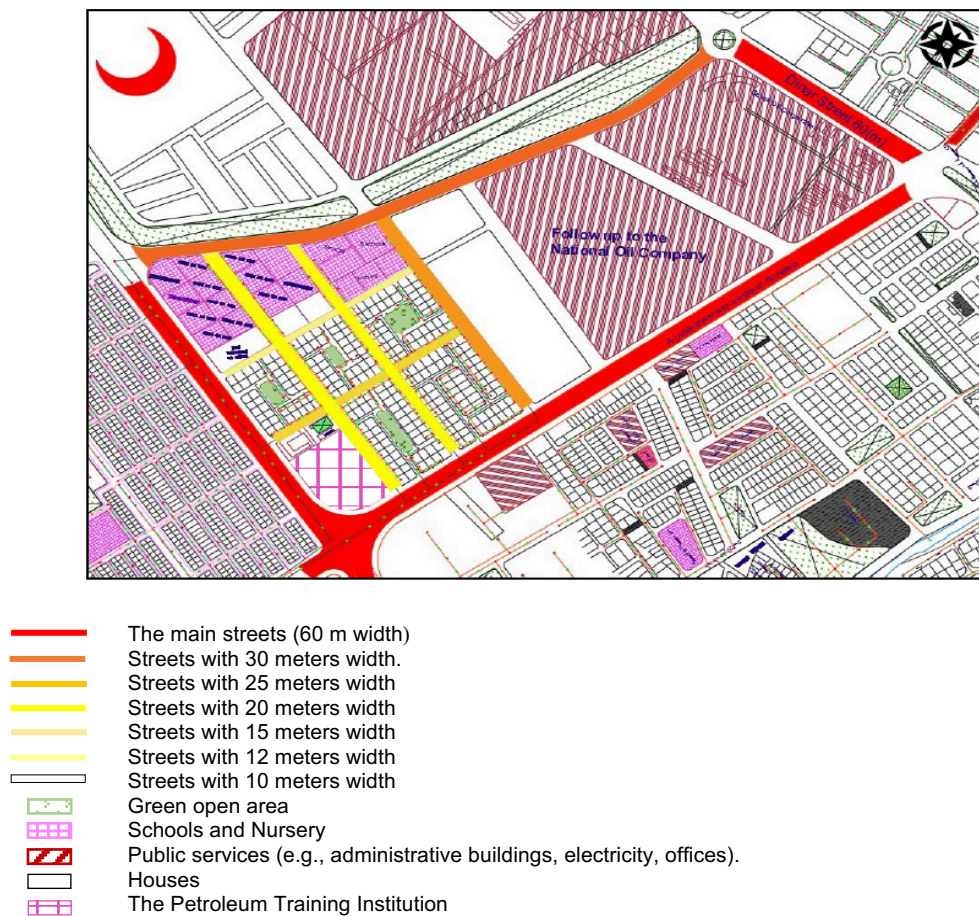


Figure 4-11 Scheme of AlZahraa neighbourhood. Source: AutoCAD Basra Masterplan - Basra Municipality, 2018. Permission was granted to reuse it by highlighting the streets and adding a map key to illustrate the land uses of the selected area.

The site survey shows some essential utilities located within the neighbourhood, such as Basra Oil Company Hospital, the South Oil Company, and the Petroleum Training Institution. Figure 4-11 and Figure 4-12 represent the area's land uses, which can be categorised into housing, commercial, educational, health, administrative, worship facilities, and open spaces. In other words, AlZahraa neighbourhood comprises houses, green open spaces, restaurants, cafes, bakeries, shopping centres, local shops, a butchery, schools, nurseries, a hospital, pharmacies, some administrative buildings, and some illegal buildings and dwellings.



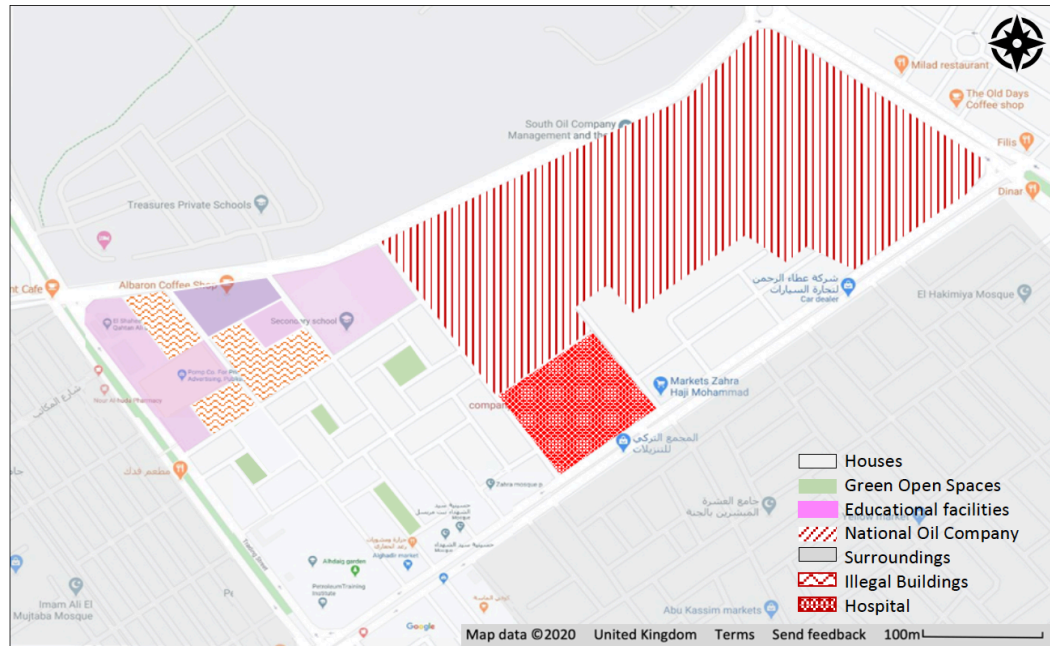


Figure 4-12 Facilities located within the area of AlZahraa neighbourhood. (Source: map adapted by the researcher from Google: Google Maps and matched with secondary data obtained from Basra Municipality, 2018).

The social characteristics of AlZahraa neighbourhood are similar to the other two case studies regarding social class and educational background. People from the upper-middle class with various educational statuses (although most have a university degree) occupy the neighbourhood. Most of the neighbourhood's population are employees working in the public sector, and a low proportion works in the private sector. This is because some of the housing plots were assigned to those working in the public sector after BM established a distribution plan for the plots. In contrast, the other part was directly sold by the municipality. This situation is similar to AlJunainah neighbourhood, as previously mentioned.

Different age groups, but mostly young to the mid-forties - like the other two case studies - represent the people living in this neighbourhood. They form a high portion of one-family households, with an average of three to five persons per family. Like the other two neighbourhoods, there are single-family houses that more than one family inhabits due to the Iraqi society's social customs. The total number of family members can be large in some cases. Importantly, this neighbourhood also has a number of extended families, which is similar to AlKhalij Alarabi neighbourhood.

A significant portion of residential properties in AlZahraa neighbourhood are owned, a lower proportion comprises multi-owned homes, whilst a few residential buildings are for rent. In terms of the residency length, many people have lived in AlZahraa neighbourhood for between six to more than 20 years.



#### **4.4. The Conceptual Framework:**

The research aims to contribute to empirical knowledge by identifying the factors that affect social interaction between residents in SFHNs in Iraq; it will achieve this by investigating residents interacting in communal spaces. Previous studies in the field of urban social sustainability have mostly focused on a neighbourhood scale, examining either: the effect of density on social sustainability (Ancell & Thompson-Fawcett, 2008; E. H. Chan & Lee, 2009; Dave, 2011; N. Dempsey et al., 2012); the relationship between the built environment and social interaction (Abu-Ghazzeh, 1999; Alahmed et al., 2014; Farida, 2013; Farshidi, 2016; Huang, 2006; Skjaeveland & Garling, 1997); or the influence of urban form on social sustainability (N. Dempsey et al., 2011; Hemani et al., 2012; Karuppannan & Sivam, 2011). Empirical evidence is also provided to bridge some of the gaps in knowledge. These studies have also resulted in general recommendations useful for policymakers, urban professionals and are appropriate for the examined contexts.

Although these studies have examined the social aspect in various contexts of the developed, developing, and a few Middle East countries, the general recommendations from these studies may not necessarily be useful in all contexts. This owes to society's nature and traditions, and differences between people's lifestyles from one area to another. This describes social sustainability differences from a context to context perspective that considers variations in social culture and values (Karuppannan & Sivam, 2011). In other words, recommendations resulting from any study that consider the social aspects mostly depend on the social culture of that examined context. Additionally, to date, there is a lack of research that consider the social aspect in the Iraqi context exploring social interaction among residents in communal spaces of neighbourhoods comprising single-family houses. Therefore, this research focuses on the communal spaces within these neighbourhoods to identify the factors that affect residents' social interaction. This to provide decision-makers, urban professionals, and architects with empirically evidenced insights and recommendations to develop these spaces.

The impact of design qualities on space use will eventually affect social interaction between residents by increasing the chance of social interaction; it will also influence SSI and DF. The effect of these three aspects will be examined on social interaction between residents in this study. After reviewing earlier studies in Chapters 2 and Appendix A, this research develops a conceptual framework based on four elements. The first three elements are independent variables: the SSI, PCBE, and DF. The fourth element is the dependent variable, the indicator of social interaction among residents at a neighbourhood level. Each element includes a list of indicators and sub-variables which were collected from earlier studies (such as Abu-Ghazzeh,

1999; Alahmed et al., 2014; Farida, 2013; Farshidi, 2016; Huang, 2006; Kennedy & Buys, 2015; Reid, 2015; Skjaeveland & Garling, 1997).

- **Research Question 1:** What are the key concepts, indicators and main determinants that drive the understanding of social sustainability as it relates to the built environment of residential neighbourhoods?
- **Research Question 2:** What are the possible aspects that affect local social interaction among residents in different types and contexts of residential environments?
- **Research Question 3:** How do the critical factors that affect social interaction manifest in the communal spaces of residential neighbourhoods comprising single-family houses in Iraq?
- **Research Question 4:** What improvements can be made to the planning and urban design systems in Basra to achieve successful communal spaces in single-family house neighbourhoods?

The first two research questions have been addressed by conducting an extensive literature review on urban social sustainability. Chapter 2 has discussed social sustainability, the most related key concepts and indicators related to residential neighbourhoods'-built environment in the Middle East. It also identifies the critical indicators discussed in the urban environment, and the most frequent indicator can be considered the main determinant for social sustainability, which is, in this study, social interaction. Moreover, the chapter has demonstrated an extensive review of the literature on the factors that influence social interaction in different environments and contexts to answer the second research question. These factors have been categorised into three aspects: SSI, PCBE, and DF. Also, the sub-variables of each of these aspects and social interaction among residents have been identified. The resulting lists have been used when starting the main study by building the semi-structured interviews' questions.

Regarding the third research question, mixed methods have been used. An extensive literature review and desk work analysis were conducted to identify the types of communal space (intentional and unintentional) in the SFHNs. The fieldwork site survey and the analysis of secondary data obtained from BM have been employed due to fragmented and limited literature. Chapter 3 has discussed and represented a list of the most commonly used communal space types by residents in SFHNs. The questionnaire results helped identify the most frequently used communal spaces in the Iraqi residential environment by residents. This is achieved by adapting two indices to quantify communal space types in SFHNs. These are the Interactional Spaces (IS) index and the Frequency of Use (FU) index, as discussed in Chapter 4 and 6. The socio-

spatial practices, including observations and behavioural mapping, confirmed the types of communal spaces used in the examined areas.

A side-by-side approach (Creswell, 2013) has been used to address the third research question and related objectives. This approach synthesises the findings of the interviews with those of the questionnaire. The researcher will use the residents' socio-spatial practices (including observations and behavioural mapping) to justify and confirm the outcomes. First, Iraqi experts, including decision-makers, urban professionals, and architects, have been interviewed. This enabled the consideration of their professional opinions and understanding to identify factors that affected social interaction among Iraqi residents in the communal spaces of SFHNs, and they are applicable in an Iraqi context. The semi-structured interviews have been analysed, reported and discussed in Chapter 5. Second, the questionnaire was used to explore residents' perceptions and experiences by examining users' reactions to communal spaces and their social lives in Basra. This was achieved by measuring the SSI, PCBE, and DF's significant influence on social interaction and social indexes. Three adopted and developed indexes were used to measure the quality and quantity of social interaction across the case studies: The Neighbouring Index, Social Relationships Index, and Social Network Index. Using tests in the SPSS, the significance between social interaction and social indexes and the factors of the three examined aspects were calculated. Data from the questionnaire are analysed, reported and discussed in Chapter 6. Table 4-1 represents the three aspects' factors that have been examined in terms of their impact on residents' social interaction.

*Table 4-1 Three independent elements that will be examined for their effect on social interaction among residents in communal spaces, (source: developed by the researcher from existing studies).*

DF	PCBE	SSI
<ul style="list-style-type: none"> <li>• Age group.</li> <li>• Gender.</li> <li>• No. of work hours.</li> <li>• Education status.</li> <li>• Marital status.</li> <li>• Employment status.</li> <li>• Tenure type.</li> <li>• No. of children/ teens under 18 years at home.</li> <li>• Years of residency in the neighbourhood.</li> <li>• The presence of relatives' relations in the same neighbourhood.</li> </ul>	<ul style="list-style-type: none"> <li>• Accessibility.</li> <li>• Climate responsive design</li> <li>• Site design.</li> <li>• Maintenance.</li> <li>• Provision and location of and open spaces.</li> <li>• Provision and location of infrastructures (social, educational, etc.)</li> </ul>	<ul style="list-style-type: none"> <li>• Sense of community.</li> <li>• Residents Satisfaction.</li> <li>• Safety and Security.</li> <li>• Privacy.</li> <li>• Density.</li> <li>• Attachment to the place/sense of Pride.</li> </ul>

The residents' socio-spatial practices, including site observation and behavioural mapping, helped in confirming the research outcomes, reported and discussed in Chapter 7. Sharing people's experiences and interactions, and their way of thinking, feeling and behaving on such

occasions can be useful in providing more reliable information (Al-Thahab et al., 2014). The synthesis of the research findings is discussed in Chapter 8.

The answer to the fourth research question is discussed in Chapter 9. It provides practical policy recommendations that offer new insights to decision-makers, urban professionals and architects about the urban form of current neighbourhoods and communal spaces. Furthermore, it emphasises the need to consider the social aspect, changes and developments in people's lifestyles when developing residential neighbourhoods to enhance residents' social lives and create new Iraqi society environments. Figure 4-13 shows the conceptual framework of this research. It includes the potential impacts of the three main parts on social interaction, which, in turn, impacts social behaviour at the neighbourhood scale and the city's overall social sustainability.

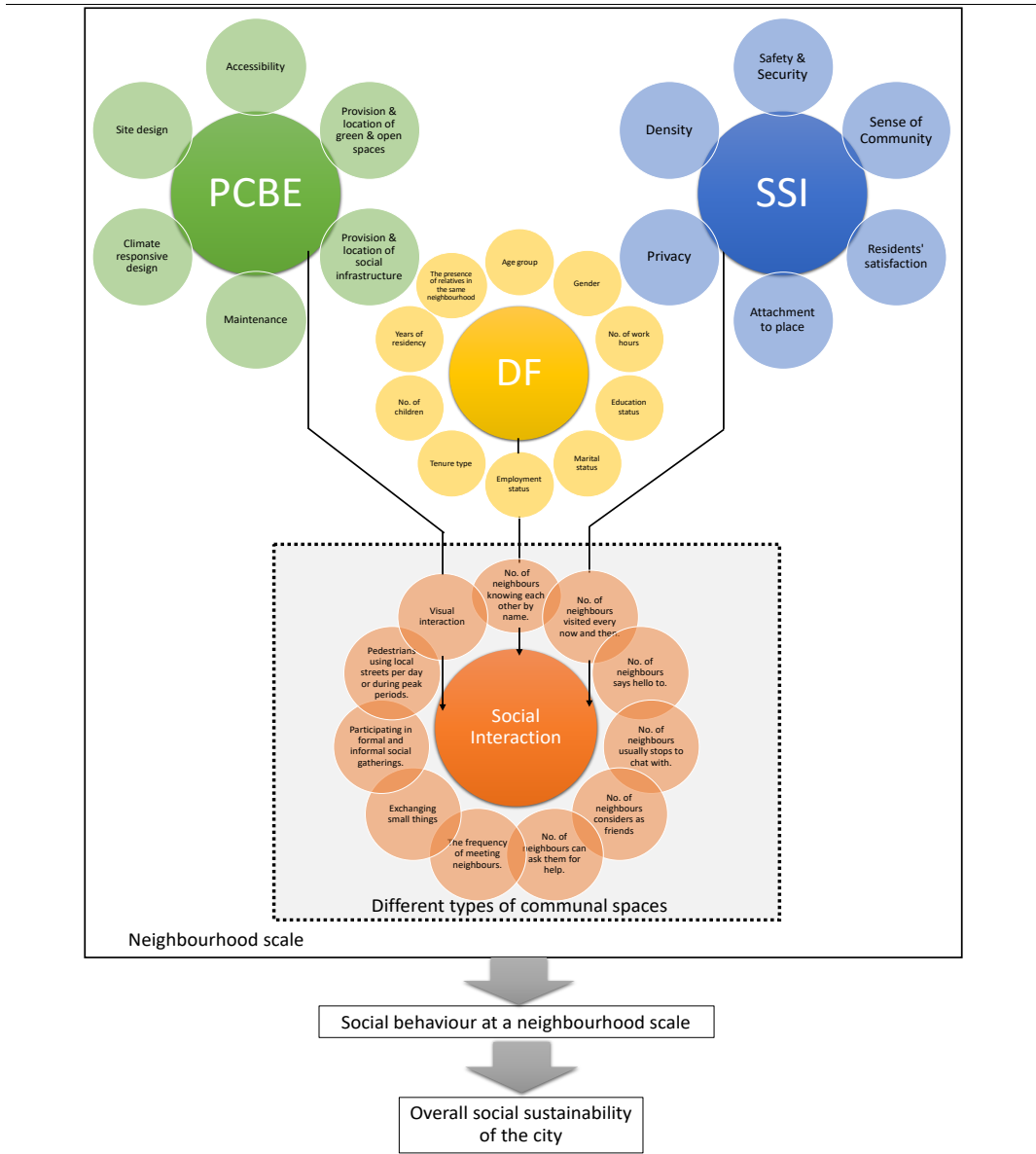


Figure 4-13 The Conceptual Research Framework.

#### 4.5. The Research Strategy of Inquiry:

Looking at the PCBE, SSI, and DF through the lens of social interaction among residents, taking a pragmatist position creates the opportunity to generate unique knowledge around the factors that can affect social interaction among residents in communal spaces of urban residential neighbourhoods of single-family houses. Although pragmatist researchers can use any method, technique, and procedure that helps them to build knowledge about a problem or situation (Cherryholmes, 1992; Morgan, 2007), this freedom of choice does not mean the random use of research methods. Instead, the choice of research method depends on the research questions and context. It also needs to establish a rationale for the reasons why such methods are chosen to generate relevant new knowledge (Creswell, 2013). To achieve this knowledge, an abductive logic has been adopted to answer the research questions, which is one of three logic approaches, namely inductive, deductive and abductive.

A multiple case studies strategy has been adopted for this research as the primary approach of investigation; this aims to capture reliable and accurate results regarding the factors that have an impact on social interaction among residents in communal spaces in an Iraqi residential context. This will include the collection and analysis of data from three SFHNs regarding four elements: SSI, PCBE, DF, and social interaction among residents.

The case study approach is defined by Groat & Wang (2013, p.418) as, “*an empirical inquiry that investigates a phenomenon or sittings within its real-life context, especially when the boundaries between phenomenon and context are not clearly evident*”. There are several reasons behind the adoption of a case study approach. Firstly, according to Johansson (2003), case studies usually examine one or multiple cases in their contexts by using a multiplicity of methods. This is significant as it has been evidenced that cultural settings, demographic patterns, and the climate can influence how people use specific spaces, and they do so by changing their lifestyles. In addition, the substance of a case study strategy is the focus on a phenomenon or setting embedded in its real-life context (Groat & Wang, 2013); indeed, the sensitivity of context is essential to this study. Multiple case studies were used, rather than a single case study because they enable a comparison that helps to identify the factors that have an impact on the social interaction of residents.

Another reason for adopting a case study strategy is their ability to capture the complexity of a phenomenon by using different data collection methods (Creswell, 2013; Farshidi, 2016). To achieve a comprehensive understanding of the way that people use specific communal spaces

and interact with their neighbours, and to determine what motivates their social interactions, it is necessary to look at the effective factors for both the quality and quantity of social interaction. This also provides an opportunity for data “triangulation”, which is one of the main characteristics of a case study approach.

Finally, Johansson (2003) has argued that case studies are especially valuable in design-oriented research areas, such as planning and architecture. In real-life practise, architects, urban professionals, and decision-makers can either use their own experience with previous projects or refer to established model cases. This study aims to provide architects, urban professionals, and decision-makers with context-specific reference points about designing and enhancing communal and service spaces in the urban residential neighbourhoods comprising single-family houses in Iraq by considering the factors that impact social interaction among residents and that improve the social lives and social sustainability of the city as a whole. In conclusion, although it is argued that multiple case studies create productive and reliable evidence, researchers should be careful to control the consumption of time and resources (Baxter & Jack, 2008).

#### **4.6. The Research Design:**

The research design is a type of inquiry within qualitative, quantitative, and mixed-methods approaches that affords a particular direction for the research procedures (Creswell, 2013). Ghauri and Grønhaug (2005) defined research design as a plan to link the theoretical research problem to the empirical work and to develop themes around the phenomenon. A research design comprises details on the data collection methods, the type of data sources to use and the associated constraints (Saunders & Lewis, 2012). Researchers such as Charmaz (2006), Creswell (2013), and Jonker & Pennink (2010) argue that several strategies are associated with each philosophy and approach. The three basic mixed method designs found in the social sciences are (i) Convergent, (ii) Explanatory sequential, (iii) Exploratory sequential.

Current research is based on convergent parallel mixed-methods that examine a social phenomenon that has not been researched before in developing countries, or specifically, in Iraq. According to Creswell (2013), a convergent mixed-methods approach is the most familiar of the basic and advanced mixed methods strategies. A researcher collects both quantitative and qualitative data (in any order), analyses them separately, and then compares the results to see if the findings confirm or contradict each other. The aim of this research is to identify the factors that affect social interaction among residents in communal spaces within SFHNs in Iraq, Basra. This will be achieved by assimilating findings from Iraqi experts’ perspectives, residents’



perceptions, and the researcher's opinion from observations and behavioural mapping to conclude the final outcomes.

The current research's procedures, shown in Figure 4-14, are divided into two phases, which include the collection of qualitative and quantitative data. The first phase represents the qualitative phase, which starts with the conduct of an extensive literature review on related main subjects in order to answer the four research questions. This was achieved by extensive detailed reading on urban social sustainability, the key concepts, indicators, and the main determinant to social sustainability, which is social interaction. At this stage, earlier studies that discussed urban social sustainability, in general, and social interaction, in particular, which were conducted in similar contexts to the current research were analysed to collect a list of factors that could affect social interaction among residents. From this, it was possible to classify them into three categories. One of the results of the first phase is the development of the research framework. At this point, the researcher addressed two research questions.

The first phase also reviewed the literature on communal space types in residential environments that residents usually frequent to interact with others. Moreover, part of the fieldwork site survey involved choosing case studies by considering specific selection criteria. This includes desk work involving the study and analysis of both the maps of residential neighbourhoods that obtained from Google Maps and Esri (ArcGIS) and the collected secondary documents, including schemes and reports of those neighbourhoods obtained from BM. At this point, part of the third research question was addressed, and the case studies and their communal spaces that the research will investigate were selected.

The list of factors collected from pertinent earlier studies was used to develop the semi-structured interviews (collecting qualitative data) with Iraqi experts, who included architects, urban professionals, and decision-makers. The interview questions comprised two steps before proceeding with the data collection. First of all, the questions' clarity and structure were assessed alongside the proposed method for conducting the interview. The clarity of the translated questions was then evaluated, and the time needed to conduct the interview. The interviews were conducted in December 2017. The interviews' results helped explore the factors that could influence social interaction from experts' perspectives and consider new factors that suit the research context. It also enabled the researcher to consider whether these factors are applicable and measurable in the Iraqi social and residential environment.

The findings of the qualitative and quantitative data (from the interviews) also helped to develop an instrument (Creswell, 2013). In other words, this informed the building of the residents'

questionnaire, which formed the start of the second phase of this research. This phase investigated whether the findings gained from experts' perspectives could be generalised to a larger population sample. The second phase represented the empirical work (multiple case studies) and involved a questionnaire, and socio-spatial practises, including observations and behavioural mapping. The process of building the questionnaire comprised three stages. Experts conducted the first two steps to assess the clarity of the questions and choices before and after translating the draft into Arabic and considering the proposed methods of delivery and collection. The last stage of testing the questionnaire was conducted by non-experts, namely Iraqi residents, to examine the questions' intelligibility and the time needed for completion. The researcher conducted the observations and behavioural mapping in the communal spaces of the case studies after testing and improving the techniques used for data collection. Both the observations and behavioural mapping and the questionnaire were conducted from December to March 2019.

The first and second phases answered the research questions by converging the findings and results of the three tools in order to follow a convergent mixed-methods design. This was achieved by synthesising the findings of the semi-structured interviews and questionnaires, respectively. The final outcomes were validated by the findings of the observation and behavioural mapping, where possible. This approach helped offer recommendations and new insights for architects, urban professionals, and decision-makers about ways to inform their practice. Also, it emphasised the need to consider the changes and developments in people's lifestyles when developing residential neighbourhoods in order to create new social environments within local communities and thus improve residents' social lives.

The next section describes and justifies the research methods and data collection.

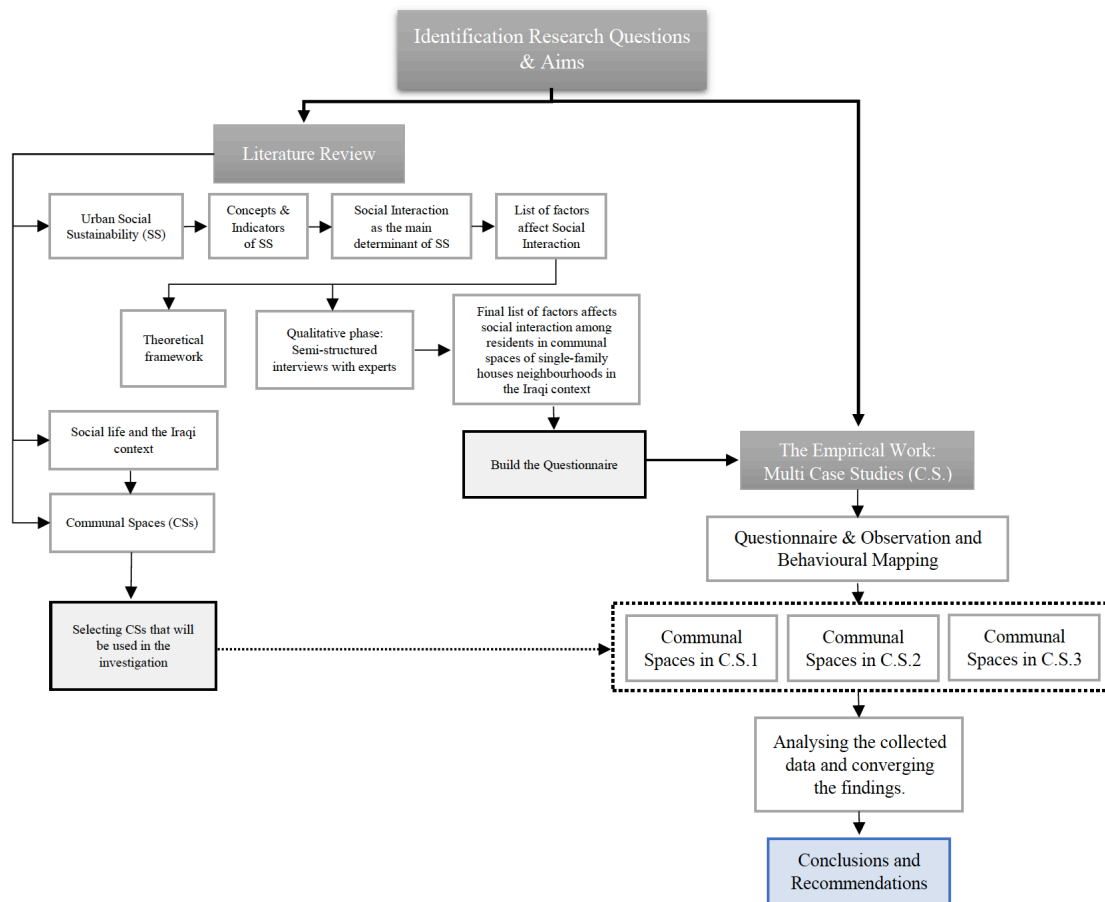


Figure 4-14 The Research Sequence Design.

#### 4.7. Data Collection Approaches and Methods:

As discussed previously, this study adopts mixed methods, defined by Creswell (2013, p.6) as “plans and the procedures for research that span the steps from broad assumptions to detailed methods of data collection, analysis, and interpretation.”. This includes a variety of techniques for the collection and analysis of both quantitative and qualitative data, the merging of two forms of data, and the use of different designs that may include theoretical frameworks and philosophical assumptions to create a full picture and provide the basis for essential analyses (Bryman, 2008, 2012).

It has been argued that the use of different methods of data collection adds weight to the data and maximises the validity of observations (Farshidi, 2016; Webb et al., 1966). This process is also called ‘triangulation’ (Johansson 2003). Furthermore, it is claimed that the combination of quantitative and qualitative methods generates an opportunity to offer new perceptions through attention to unexpected results and paradoxes (Amaratunga et al., 2002; Rossman & Wilson, 1994). For Creswell (2013), the advantages of adopting a mixed methods research approach, at

a general level, is its minimisation of the limitations of both qualitative and quantitative approaches and its strength in drawing on the advantages of both. At a practical level, if the researcher has access to both quantitative and qualitative data, mixed methods can be an ideal approach. At a procedural level, this approach is a useful strategy in demonstrating a more comprehensive understanding of research problems/questions (Creswell, 2013). Groat and Wang (2013) revealed that many scholars believe that combining methods (qualitative and quantitative) provides suitable tests against the weak points in each, while concurrently enabling the advantages to complement each other because each typical research strategy brings its specific strengths and weaknesses. In other words, the use of mixed methods gives the ability of justifying the findings. Therefore, this research adopts the multi-layered methodology of mixed methods.

As explained previously, mixed methods are adopted to answer the research questions (see Table 4-2). An extensive literature review has been conducted to answer the first two research questions that define the notion of social sustainability, identify its indicators in residential environments, its main determinant, and note the potential factors that could affect social interaction among residents. Creswell (2013) argues that, when research is concerned with exploring comprehensive experts' perception and experiences, which is the case in this research, qualitative methods are useful. Mixed methods have been used to meet the first objective of the third research question, regarding the types of communal spaces used in SFHNs in an Iraqi context. A literature review and a fieldwork site survey have been conducted to acquire a list of communal space types in the Iraqi residential context. The types identified are the focus area of investigation in the case studies. Behavioural observations, alongside the administration of a questionnaire that includes questions relating to the use of communal spaces, have helped to highlight the communal spaces mostly used by residents in SFHNs in Iraq.

The third research question aims to identify the factors affecting social interaction among residents in communal spaces in urban residential neighbourhoods of single-family houses in Iraq. To achieve this objective, qualitative and quantitative methods have been used. This includes semi-structured interviews, a questionnaire and justifying their findings with observation and behavioural mapping using a side-by-side approach. Table 4-2 represents the research questions, objectives, and proposed methods to address them.

Table 4-2 The research questions, objectives and methods used.

Questions	Objectives (Why)	Methods (How)
Q1: What are the key concepts, indicators and main determinants that drive the understanding of social sustainability as it relates to the built environment of residential neighbourhoods?	Explore the key concepts, indicators and main determinants that guide the understanding of the notion of social sustainability as it relates to the built environment, in general, and to residential neighbourhoods.	Critical analysis of the body of knowledge available on the key concepts that drive the understanding of the notion of urban social sustainability, its indicators, and its primary determinants in developed, developing, and Middle East contexts.
Q2: What are the possible aspects that affect local social interaction among residents in different types and contexts of residential environments?	Explore the nature and type of aspects that affect local social interactions among residents in different residential environments and contexts.	Categorising the key aspects extracted from the critical analysis of relevant articles, journals, and studies.
Q3: How do the critical factors that affect social interaction manifest in the communal spaces of residential neighbourhoods comprising single-family houses in Iraq?	<ul style="list-style-type: none"> <li>Identify the typologies of communal space used in the neighbourhoods of single-family houses in an Iraqi context, especially in Basra.</li> <li>Extract the most influential factors from social sustainability indicators, physical characteristics of the built environment, and demographic factors on social interactions among residents use of communal spaces within residential neighbourhoods comprising single-family houses.</li> <li>Investigate whether the current urban design of the built environment considers the socio-cultural values of a community with the changes in people's lifestyles and accommodates them in modern design trends in order to promote social sustainability, and thus, social life among residents.</li> </ul>	<ul style="list-style-type: none"> <li>An analytical desk study of documents obtained from Basra Municipality: the analysis of maps and schemes of the research context, and site visits to observe users' behavioural patterns.</li> <li>Online/paper copy questionnaire.</li> <li>Synthesis of the main findings of the three tools (Semi-structured interviews, Users' urban and social sense questionnaire, and Observation and behavioural mapping).</li> </ul>
Q4: What improvements can be made to the planning and urban design systems in Basra to achieve successful communal spaces in single-family house neighbourhoods?	Develop a valid framework and lessons from Basra case studies, and recommend guiding principles for architects, urban professionals, and decision-makers by examining the views of decision-makers, residents, and spatial practices on improvements and enhancements to existing and future communal spaces within single-family house neighbourhoods.	

#### 4.7.1. Data Collection:

The data were collected on three main areas: First, data about social sustainability indicators and the key concepts in urban residential environments. Second, factors that could affect social interaction among residents in communal spaces, including the DF, SSI, and PCBE. Third, the types of communal spaces in SFHNs and the design qualities of the neighbourhood and communal spaces. These three areas of data collection were established from the research questions. The first data set was gathered basically by conducting an extensive literature review on the area of urban social sustainability. The second data set was collected in two sequential steps: first, by conducting an extensive literature review; second, by using semi-structured interviews with experts, household questionnaires, and observation and behavioural mapping. The third data set was collected by reading extensively through the literature, and by conducting a historical study; also, through a site survey fieldwork checklist, an analysis of planning documents (e.g., schemes and photos), behavioural observations, and a questionnaire. Table 4-3 represents how the data were collected using the literature review, household questionnaires, fieldwork sites survey, semi-structured interviews, and behavioural observations.

Table 4-3 Research Questions and Research Methods of Data Sets.

Research Questions	Data Sets	Methods
<b>Q1:</b> What are the key concepts, indicators and main determinants that drive the understanding of social sustainability as it relates to the built environment of residential neighbourhoods?	<ul style="list-style-type: none"> <li>A general understanding of the key concepts of social sustainability related to the residential environment.</li> <li>The critical indicators and the main determinant of social sustainability.</li> </ul>	Literature review and official documents.
<b>Q2:</b> What are the possible aspects that affect local social interaction among residents in different types and contexts of residential environments?	An understanding and determination of the factors/aspects that affect social interaction among residents in communal spaces in similar contexts to the research context.	Literature review and official documents.
<b>Q3:</b> How do the critical factors that affect social interaction manifest in the communal spaces of residential neighbourhoods comprising single-family houses in Iraq?	<ul style="list-style-type: none"> <li>Factors affecting social interaction among residents in communal spaces of SFHNs.</li> <li>Types of communal spaces.</li> <li>Recommendations to stakeholders.</li> </ul>	<ul style="list-style-type: none"> <li>Literature Review.</li> <li>Semi-Structured Interviews with Experts.</li> <li>Users' urban and social sense questionnaire.</li> <li>Observation &amp; Behavioural Mapping.</li> </ul>
<b>Q4:</b> What improvements can be made to the planning and urban design systems in Basra to achieve successful communal spaces in single-family house neighbourhoods?	<p>Recommendations to urban professionals, architects, and decision-makers.</p> <p>Lessons from the case studies and offering contributions to global knowledge.</p>	Synthesis of the main findings.



#### *a. Literature Review:*

This tool was used to respond to the first two research questions. The researcher extensively read through relevant sources, such as books, journals, articles, websites, conference papers, and working projects. This, first, aimed to answer the first question regarding the key concepts, essential indicators, and the main determinants of the notion of social sustainability in residential environments. Secondly, it aimed to categorise aspects, which included factors and indicators that affect social interaction amongst residents in developed and developing countries. Furthermore, the limited, fragmented literature on the types of communal spaces in residential settings was reviewed, and a desk study was conducted that included the analysis of documents, maps and schemes obtained from Basra Municipality and ministries' websites.

#### *b. Semi-Structured Interviews:*

To obtain quantitative and qualitative data about the potential factors affecting social interaction in the Iraqi context from professional perspective, the researcher conducted semi-structured interviews with three categories of experts in Iraq: decision-makers, urban professionals, and architects. This method was used in relevant studies targeting different samples (such as Ahmed, 2012; Al-Thahab et al., 2014; Alanbari et al., 2014; Dave, 2011; Elgadi et al., 2016; Farshidi, 2016; Kennedy & Buys, 2015; Reid, 2015). Semi-structured, face-to-face interviews are a good source of qualitative data because they can provide further understanding (Green, 1999). It is claimed that semi-structured interviews preserve some degree of freedom to collect rich qualitative data regarding respondents' perceptions and ideas while saving time and resources (Barriball & While, 1994). Moreover, the qualitative research's strength is in its exploratory nature, and semi-structured interviews allow (Creswell, 2013). According to Bryman (2008), in semi-structured interviews, the interviewer has a series of questions in the general form of an interview schedule. However, he/she can vary the order, the wording of questions, and ask new questions in response to interviewees' replies. He points out that semi-structured interviews tend to be flexible, during which the research emphases might be adjusted according to significant issues that emerge during the interviews. Indeed, "*The interviewee may be interviewed on more than one and sometimes even several occasions*" (Bryman, 2008, p.437).

The purpose of these interviews is to capture more detailed information about the experts' opinions on a list of factors that could affect social interaction among residents. The interview questions were divided into four sections; the first three sections concerning the effect of SSI,

PCBE, and DF on residents' social interaction in residential settings. The last section considered the variables that could demonstrate social interaction in an Iraqi context.

The questions were tested in two stages before conducting the interviews. First, three experts were asked to assess the draft of the semi-structured interviews questions (the researcher's supervisor, one of the PhD students from the same discipline, and an MSc student for the English language). They commented on the clarity and structure of the questions, and the proposed methods to conduct the interviews. Next, the questions were translated into Arabic, which was the language of the interview participants. The second testing stage was conducted with three Iraqi interviewees in order to confirm the clarity and length of translated interviews questions. The questions were revised according to the comments of the interviewees, and they added two more questions to the list.

The interviews took place from December 2017 to January 2018. Each interview took around 90 to 120 minutes, depending on the work circumstance of the participants. The interview included three types of question: multi-choice (quantitative), open-ended (qualitative), and matrix. The answers were written by hand by the interviewees. Also, the interviews were audio-recorded after obtaining official consent from the interviewees. The researcher aimed to interview 21 Iraqi experts, including decision-makers, urban professionals, and architects who are work in the Basra and Baghdad. Because some of the participants were from Baghdad, the interviews were conducted online because it was difficult to travel to Baghdad for the time deficiency. A request interview was sent to 21 persons. Some expressed interest and accepted the invitation to participate, while others were unable to be part of the study because of their work circumstances; hence, they proposed some prominent names in their field of work instead. A total of 17 interviews were conducted with participants from all categories. The results of the interviews will be used to refine the collected lists of factors to build the questionnaire and carry out the quantitative phase of the research.

- *Interview survey preparation*

A shortlist of questions was prepared with the intention of guiding the interviewer through the conversation and ensuring that the critical areas were covered, thereby gathering expert perceptions on social sustainability indicators in the housing sector in general, design considerations, and users' needs to achieve social interaction among residents in communal spaces within neighbourhoods. All interview sessions were audio-recorded, which made it easy to capture and later transcribe. Also, the interviewer took notes and distributed the interview questions to the interviewees to answer the close-ended questions by hand. The responses to

the closed-ended questions were analysed using Qualtrics software. The data was imported as a CVS file using an Excel processor, and the final results were demonstrated in tables. The responses to open-ended questions were coded, and the results were grouped into a series of key themes about the research objectives and questions.

Semi-structured interviews were conducted with 17 experts from several departments involved in designing and managing public services and facilities for Iraq's housing sector. They were selected according to their positions and roles in these departments, representing the public and private sectors. They are representatives of the Department of Urban Design in Basra Municipality (public); Directorate of Urban Planning Al-Basra (public); Architectural Department at the University of Basra (public); Ministry of Construction, Housing, Municipalities, and Public Work – Baghdad Housing Directorate (public), and architects and urban planners from private construction and design companies in Basra. At the beginning of each interview, the researcher explained the rationale for the research then proceeded with the questions. The researcher collected information by encouraging the experts to discuss their experiences, understandings, and perceptions regarding the factors that affect residents' social interaction and their application in Iraqi residential developments.

- ***Background of Participants:***

The first semi-structured interview question asked about the positions of the interviewees. The question text was: *'Please, indicate your position. Please tick (✓) one box.'*

- An architect is working with the government/public authority, e.g. municipality, service sector.
- An architect is working in the private sector, e.g. a consultant in a consulting office, design office or company.
- An architect is working in academia, e.g. the university.
- An urban planner/designer is working in the government sector.
- An urban planner/designer is working in the private sector, e.g. a consultant in a consulting office, design office or company.
- An urban planner/designer is working in academia, e.g. the university.

The question asked experts who participated in face-to-face and online semi-structured interviews about their position. As shown in Table 4-4, five of the interviewees work in the academic sector, two of them are urban designers, and three are architects. Another two interviewees work in the private sector, one as an urban planner and one as an architect. Ten of the interviewees work in the government sector, seven of them work in the Basra governorate - five as architects and two as urban planners. Meanwhile, the last three interviewees work as architects in Baghdad, two as architects and one as an urban planner.

Table 4-4 The interviewed professionals with their positions and organisations.

Interviewee	Position	Sector	Nature of Organisation
IS	Architect (Manager).	Public Sector.	The Master Plan Section-the City Planning Department/ Basra Municipality (MPS-CPD/ BM).
EA	Architect (Engineer).	Public Sector.	Master Plan Division-Cities Planning Department/ Basra Municipality (MPS-CPD/ BM).
IH	Architect (Assistant Administrator).	Public Sector.	Building Permits Division- City Planning Department/ Basra Municipality (BPD-CPD/BM).
AK	Architect (Engineer).	Public Sector.	Master Plan Division-City Organisation Department/ BM.
SB	Architect (Engineer).	Public Sector.	Basra Municipality.
TY	Architect (Engineer).	Public Sector.	Directorate of Housing-Ministry of Construction and Housing and Municipalities, and Public Work / Baghdad (DoH-MoCH/B).
IR	Architect (Principal Engineer).	Public Sector.	Directorate of Housing- Ministry of Construction and Housing and Municipalities, and Public Work / Baghdad (DoH-MoCH/B).
AA	Urban planner.	Public Sector.	Directorate of Housing- Ministry of Construction, Housing, Municipalities, and Public Work /Baghdad (DoH-MoCH/B).
BA	Urban planner.	Public Sector.	Directorate of Urban Planning (DUP)/ Basra.
FA	Urban planner.	Public Sector.	Directorate of Urban Planning (DUP)/ Basra.
RR	Architect (Assistant Lecturer).	Public Sector Academic.	Architectural Department/ Basra University (AD-BU).
AG	Architect (Lecturer).	Public Sector Academic.	Architectural Department/ Basra University (AD-BU).
MF	Architect (Assistant Lecturer).	Public Sector Academic.	Architectural Department/ Basra University (AD-BU).
AF	Urban designer (Assistant Lecturer).	Public Sector Academic.	Architectural Department/ Basra University (AD-BU).
HS	Urban designer (Assistant Lecturer).	Public Sector Academic.	Architectural Department/ Basra University (AD-BU).
IT	Architect (Designer).	Private Sector.	Construction Company.
AS	Urban planner.	Private Sector.	Construction Company.
<b>Total</b>		<b>17</b>	<b>interviewees</b>

### c. Questionnaire:

The initial intention was to carry out semi-structured interviews with residents to obtain the information about the factors that affect social interaction among residents; however, due to difficulties with residents' privacy, and traditional and cultural issues, this was complicated. One of the potential difficulties in conducting such a method with residents was the cultural constraints and conservative nature of society (Ahmed, 2012), especially in Al-Basra city. Such restrictions affected the number of respondents, and as such, it became one of the limitations of the study. Another challenging in conducting interviews with residents is the difficulty in

gathering them at a specified time because of their obligations and working hours. The residents had different occupations, and their working time could vary significantly; therefore, it was challenging to conduct face-to-face interviews. Another difficulty in conducting interviews with residents involved the traditional and cultural restrictions of the Basra community where most householders' heads were male; thus, a female interviewer could be perceived as unsuitable and might be not taken seriously.

An alternative method for collecting data from a large sample population is a self-completion questionnaire, which is also efficient regarding cost, time and energy (Bryman, 2012). The purpose of using a questionnaire is to generalise from a sample to a population so that inferences can be made about some characteristics, attitudes, or behaviours (Creswell, 2013). Although it is broadly used in previous relevant studies (such as Abu-Ghazzeh, 1999; Farida, 2013; Farshidi & Deveci, 2014; Kennedy & Buys, 2015; Skjaeveland & Garling, 1997), this method has not been widely applied in studies within the Iraqi community until recently, such as Alahmed et al. (2014) and Al-Thahab et al. (2014). Recently, some international organisations, in collaboration with local government service departments, have started to use the survey method as a new process to develop city services, thus enabling residents' participation in decision-making. Another typical advantage of the questionnaire is that it ensures anonymity. People feel freer to express views that they think would arouse disapproval or get them into trouble; hence, anonymity can give greater confidence to answer freely and not be identified (Desai, n.d.). Thus, the questionnaire was used to raise questions about people's opinions on their living environment, their relationships with others, and collect other information relevant to daily social lives.

It is argued that what will be captured from a questionnaire is essentially very subjective and derived from self-report information, which can be considered a key limitation (Farshidi, 2016). However, this limitation was similar to that of interviews, which are eventually filtered through the interviewer and were therefore also subjective. The study attempted to minimise the limitation of this method by designing a comprehensive questionnaire, which provided the most reliable information on the four research areas. The questionnaire includes all the four parts, each covering different types of information, namely the DF, SSI, PCBE, and social interaction. Moreover, the questionnaire included closed-ended and open-ended questions, some of which were derived from other studies, such as Farshidi (2016), Farida (2013), Abu-Ghazzeh (1999), and Dave (2011).

The questionnaire was tested at three stages before the main study was conducted. First, experts from the university (the researcher's supervisor and three PhD students from the same discipline) were asked to assess the draft questionnaire and make comments about its clarity and the proposed delivery and collection methods. Second, after revising the draft, it was translated into Arabic because it the residents' language. After the first translation phase, four Iraqi experts from different backgrounds (e.g., architecture, project management, and administration) were asked to evaluate the draft and make comments about the clarity, question choices and language. After the second translation phase, the third stage involved non-experts, namely, Iraqi residents, who examined the questions' intelligibility and the time needed for its completion. According to the non-expert feedback, the draft was revised six times to ensure it was understood. Finally, the questionnaire and the process of delivery and collection were refined based on the comments.

The questionnaire was distributed at the end of January, February, and March 2019. It was conducted in two ways; firstly, online using social media, such as Facebook and WhatsApp groups. The researcher was keen to collaborate with an NGO that is known in the region. This helped to distribute the link of the questionnaire online among residents in the case studies. Secondly, paper copies of the questionnaire were delivered in person to each household with the help of three well-known persons who live in the selected case studies. The questionnaires were also distributed in mosques located within the selected neighbourhoods to reach as many people as possible. After one week, another visit was conducted to collect the completed questionnaires in order to maximise the response rate (Bryman, 2012). The process was repeated four times each month to collect as many completed questionnaires as possible. One hundred forty-five paper copies were distributed across the three case studies. Although the targeted sample was 275, 221 people completed the questionnaire; the questions' average response rate was 95%.

#### *d. Socio-Spatial Approach: The Observation and Behavioural Mapping*

The socio-spatial perspective in urban research addresses how the built environment and society interact. It helps to examine how people move in spaces and how spaces are generated by social environments. It also assumes that social space operates as both a product and a producer of changes in the metropolitan environment (Gottdiener et al., 2018). In the socio-spatial approach, the built environment is essentially meaningful as it has its particular 'semiotics' that inform policy, culture, society, economy, and security. Because of the importance and effectiveness of this approach in providing comprehensive insights into the quality of communal spaces and residents' social patterns, this study will consider using this approach. As mentioned by Chen



(2016), this approach includes many tools and methods; this study will consider observations and behavioural mapping.

According to Creswell (2013), behavioural observation is a qualitative method that is used to understand what people do in particular spatial settings (Alsumsam, 2017). According to Goličnik (2005), observation and behavioural mapping mean collecting evidence about ‘where, how, and what is going on’ within a place in a comprehensive way. Some scholars have provided definitions of behavioural mapping; for example, Alsumsam (2017) defines behavioural mapping as an objective observational method for measuring the actual use of space. Alsumsam also states that it is the study of the pattern of behaviours and physical activities in a given space, to improve the quality of relationships between people and the built environment.

Similarly, Cosco, Moore, and Islam (2010) define behavioural mapping as a valuable method to determine how people use a designed space by recording participants’ behaviours and/or tracking their movement within the observed space. In other words, it is the recording procedure that often supports an observation. For Bechtel, Marans, and Michelson (1987, p.23), behavioural mapping “*is to locate behaviour on the map itself, to identify kinds and frequencies of behaviour, and to demonstrate their association with a particular site*”. The method of observation has five dimensions: behaviour, environment, time, observer, and record of observation (Bechtel et al., 1987). It is possible to both ask questions and draw conclusions about behaviour and its relationship to a place by relating the behaviour with a specific environment (Bechtel et al., 1987, cited by Alsumsam, 2017, p. 89). Previous similar studies used behavioural observation that records residents’ activities (such as Al-Thahab et al., 2014; Farida, 2013; Huang, 2006) and site observations (such as Ahmed, 2012; Karuppannan & Sivam, 2011).

The critical factor in conducting behavioural mapping is that all targeted data should be observed simultaneously and coded at precisely the same site location (Cosco et al., 2010). Behavioural mapping is mostly applied in the literature to observe people in public open spaces, such as parks, urban plazas, urban squares, and streets (Gehl, 2011; Marcus & Francis, 1997). Behavioural observation was used to understand how people behave in communal spaces and the kind of activities they were carrying out (standing, sitting, transit, socialising with others or accompanying children, resting, walking, or practising a sport). Observation is also beneficial for the present research study in identifying the commonly used types of communal spaces that are located in SFHNs in Iraq.

This research aims to investigate factors affecting social interaction among residents in the communal spaces of SFHNs in Basra, Iraq, by using the semi-structured interviews and questionnaire techniques. Thus, to validate residents' perceptions (the residents' questionnaire), and experts' perspectives (the interviews), the observation and behavioural mapping were used in the three selected case studies. The observation survey is included because perception of people is subjective and will depend on people's awareness and might vary across the case studies, whereas the observation survey by researchers will have researchers' perspective for all three sites.

Bell, Montarzino, and Travlou (2006) emphasise the significance of fieldwork and observations to bridge the methodological gaps found in self-report techniques, such as questionnaires and interviews. This stance was one of the reasons for choosing site observation and behavioural mapping; however, a few limitations were found in using these techniques. Because of cultural and security considerations in Basra, taking photographs of people in communal spaces within residential neighbourhoods in Basra may not be welcome, especially when there are females or families present. Also, as a female researcher, it was difficult to obtain cooperation from the people in the context. Due to the restrictions on photographing individual groups, wide shots were taken to illustrate the issues. The data recording methods meant using a camera to record the site because of the difficulty for a female researcher to stand within a residential area for observing. Ciesielska et al. (2017) stated that written descriptions, video recordings, photographs and artefact documentation are some of many tools of an observation strategy.

- *Observation and Behavioural Mapping Records:*

As mentioned earlier, observation is a research method that aims to understand what people do in particular spatial settings. A behavioural map is an observational tool for recording people's behaviour. Bechtel et al. (1987) emphasise that a critical point in behavioural mapping is to decide on the categories of behaviour needed and to pre-test these in an actual environment. Therefore, in this study, the following attributes were recorded: who is using the place (male, female, families, singles, etc.); which age groups utilise the spaces; where do users tend to gravitate (sun, shade, a particular form of setting, or everywhere). Also, what type of activity is taking place; when do they use the space (time of week of occupancy, time of day of occupancy), and what are the weather conditions at the time of the activity (Goličnik, 2005; Marcus & Francis, 1997). Before the observation survey, some preparations were conducted to ensure the survey went smoothly.

According to Bechtel et al. (1987), some preparation for the recording technique was essential in order to ensure a correct, comprehensive and systematic execution, although the observation survey was known to be an uncomplicated and quickly learned technique. A list of predictable activities was prepared in a table in advance and space left open-ended for new activities to be added. Maps of the area were provided from Google Maps and Esri (ArcGIS) and modified according to maps from the Department of Cities' Organising in BM, in which all observed sites are shown with their immediate surroundings.

Before the final schedule for observations was prepared and accepted, a pilot study was conducted in December 2018 in the communal spaces of AlJunainah neighbourhood to check out the recording system and the researcher's ability to conduct the planned procedure in the selected places in Basra city. Relevant maps for visited places, tables and sets of symbols were prepared. The original plan is to observe one particular communal space in the neighbourhood three times a day and the other spaces only once on that same day. This meant observing a place three times a day, at least twice during the weekdays and once at the weekend. The pilot study resulted in some practical issues, such as a general daily routine, a time-consuming and exhausting process, the skills and concentration needed for every observation, and the planned schedule's impracticability. Hence, the observation technique was modified. It was found that the observation time can be twice a day as it is challenging to do it three times a day. It will be in the morning (between 9:00 am and 12:00 pm) and late afternoon (between 14:00 until 18:00 or 19:00). Also, a camera phone can be used to ease the recording data process. The observations were carried out during the weekdays and weekends and were scheduled so that all places were equally covered at different times of day as well as times of the week. Each spatial unit (communal space) in each zone was observed for around 10 minutes.

Because each case study has more than one open communal space, these spaces were named by giving them a symbol for each zone on the maps (Z1, Z2, Z3, etc.). This is to ease recording and distinguish the information of each communal space in every case study. The table set was refined and finalised based on the pilot case study. The table includes symbols to express the type of activities, gender, age group, time, date, weather condition, the name of the case study, zone number, and observation duration (see Table 4-5). Additionally, a camera phone was used to take photos and record videos during the behavioural mapping, when possible. Recording video was used for observations in some communal spaces within the case studies, such as streets, open spaces in front of mosques, and local shops, to facilitate the process for the researcher as culturally, it is difficult for a female to stand in the street to record information manually.

The surveys were undertaken in December 2018 and February 2019 (the end of winter and the beginning of spring, when the weather is considered the best time in Iraq's southern region). The survey was conducted twice a day on weekdays and at weekends: morning (9:00-12:00) and late afternoon (14:00-18:00). Each zone was observed for 15-30 minutes. The number of people using the spaces was counted during a 10-minute observation slot on weekdays and at weekends and the information was recorded in tables. The researcher used methods and tools for behavioural recording, including a camera and pre-prepared tables and modified Google maps. The observer used symbols on one modified Google map to denote people's location in the spaces; the observation also noted whether they were static or moving and what kind of activity they were engaged in. The observer also took some photos and videos of participants to capture more detail and confirm the information recorded in tables. People were categorised by their gender and age groups, and the researcher noted whether they were adults or children. Additionally, a people count was undertaken to establish the volume of people using the communal space.

*Table 4-5 Samples of the observation table.*

The name of the case study and zone no.				Date:		Time:		Duration of the observation				Symbols: Male (M) Female (F), Children (C)		
Z1, Z2, Z3, Z4, Z5, Z6, Z6				----/----/2018				-----mins						
				Sat. Sun. Mon. Tus. Wed. Thu. Fri.		(morning Afternoon /evening)		The weather:						
Types of place usage														
Symbol	Sitting & talking	Transit	Playing/ hanging out	Walking	Trash	Parking	Formal/ informal social gatherings	Others						
M														
F														
C														
No. of Children	No. of Male							No. of Female						
<18	18-24	25-34	35-44	45-54	55-64	65-74	75+	18-24	25-34	35-44	45-54	55-64	65-74	75+

#### *e. Fieldwork site survey and Desk Study:*

The researcher organised fieldwork, which included a checklist to collect information regarding the built environment's physical attributes. This includes obtaining the schemes and maps for each of the selected neighbourhoods, the block layouts for the housing buildings, and the communal spaces' layout, matching them with the official maps and schemes obtained from the BM and the current situation acquired from Google Maps and Esri (ArcGIS). Also, the researcher tended to take photographs of the communal neighbourhoods' spaces for the study. Moreover, identifying the physical characteristics of the communal spaces, such as whether

these spaces had physical or visual boundaries, noting any spatial hierarchy, and whether the communal space's design was climate responsive. The fieldwork site survey helped detect the provision of social services in the neighbourhoods, such as schools, local markets, shops, worship (church or mosque) parks, and open green spaces. This survey was undertaken twice; the first was during December 2017, and the second during February 2019.

#### **4.8. Indices and Measures:**

In order to quantify the factors that affect social interaction among residents, indicators and measures were adopted based on the literature review and the research questions of this study to manifest social interaction. It is claimed that, in order to quantify concepts that are not easy to directly measure, indicators are necessary (Bryman, 2012). In social science, indices have been widely used as composite measures to accumulate and summarise different aspects of one concept. To address the special needs of this study and provide an opportunity for data triangulation, some indices and indicators have been borrowed from the literature. These indicators were also developed and modified for this study. Two sets of measures and indicators have been defined. The first set was designed to measure the quantity and quality of social interaction among residents. The second set measured the frequency and likelihood of use of communal spaces.

##### **4.8.1. The Dependent Variable: Social Interaction:**

This section describes the dependent variable, which is social interaction. The level of social interaction across the surveyed case studies was calculated from adding the related questions in the questionnaire. Measuring social interaction between residents is complicated because of the qualitative nature of the data. Some previous studies have adopted or developed indices and measures to capture the quality and quantity of social interaction among a group of people (Farshidi, 2016; Lindsay, 2010; Raman, 2010; Skjæveland et al., 1996). This research adopted and developed previously tested indices from Skjæveland et al.'s study (1996) who used multidimensional measure of neighbouring and Farshidi's study (2016) who worked on the impact of design on social interaction within urban residential developments in Scotland, where she considered communal spaces in multi-rise residential buildings. The indices and measures have been adopted and developed to capture the following main features, which were representative of the quality and quantity of social interaction between residents.

- Neighbouring level among residents (Neighbouring index “N-Index”).
- The quantity of social interaction among residents (Index of social networks “SN-Index”).
- The quality of social interaction among residents (Index of Social Relationships “SR-Index”).

- **Neighbouring Index (N-Index):**

This index is a composite measure of the neighbouring level for each resident and the residents of each development overall. The index has been developed based on the proposed index in Farshidi's study (2016) *‘Impact of Design on Social Interaction within Urban Residential Developments in Scotland’*, which was based on the study of Skjæveland et al. (1996) *‘Multidimensional Measures of Neighbouring’*. Likert Scale measuring the likelihood of supportive acts of neighbouring were adopted from previous research in the field (Skjæveland et al., 1996). Going through a set of eight statements about the relationships with neighbours, residents report their perceptions of the neighbouring level at their residence. The respondents’ levels of agreement with statements and the integer response are added to achieve the final value of the index for each respondent. In each case study, the Overall Neighbouring Index is achieved by calculating the mean Neighbouring Index for all the respondents living in the neighbourhood. Number 63 (the highest value of the index) represented the highest level of neighbouring for residents and the overall level of neighbouring within a neighbourhood, while number 2 represented the lowest level of neighbouring. The following statements were included in the index:

1. The friendships and associations I have with other people in my residence mean a lot to me (strongly agree 4; agree 3; neither agree nor disagree 2; disagree 1; strongly disagree 0).
2. I have made new friends by living here (strongly agree 4; agree 3; neither agree nor disagree 2; disagree 1; strongly disagree 0).
3. If I need a little company, I can stop by a neighbour I know (strongly agree 4; agree 3; neither agree nor disagree 2; disagree 1; strongly disagree 0).
4. The possibility to use open communal spaces, e.g., street, sidewalks, the close shared garden to my house with my neighbours and friends. (Strongly agree 4; agree 3; neither agree nor disagree 2; disagree 1; strongly disagree 0).
5. The number of households in your neighbourhood that you can turn to in an emergency. (Integer).



6. How often do you help your neighbours with small things, or they help you? (Not at all 0; hardly ever 1; quite often 2; most of the time 3; constantly 4).
7. Have you ever participated in scheduled gatherings with neighbours? (yes 1; no 0)
8. If I have a personal crisis, I have a neighbour can talk to. (yes 1; no 0).
9. How often do you meet your neighbours? (Daily 4; weekly 3; monthly 2; once or twice a year 1; never 0).

- **Index of Social Networks (SN-Index):**

The index of social networks (SN-Index) is a composite measure demonstrating the quantity of residents' social networks. This index has been developed to include four questions instead of three, as in Farshidi's study (2016). The first three questions ask respondents to indicate the number of people they know by name, say hello to, or stop and chat with. The fourth question asks respondents to indicate whether their relatives live in the same neighbourhood. This question has been included because Iraqi communities have mostly been built and clustered on kinship relationships. This social phenomenon is common in most Middle East countries and could affect individuals' social networks. The respondents' answers (Yes or No) have been given a value of 1 and 0, respectively. The answers for the four questions are added and then divided by the number of dwellings to achieve the index of social networks for each resident. In each case study, the Overall Social Networks Index is achieved by calculating the mean Index of Social Networks for all respondents within the neighbourhood. The following questions have been included in the index:

1. How many of the people living in your residence do you know by name? (Integer)
2. How many of the people living in your residence do you say hello to when you meet? (Integer)
3. How many of the people living in your residence do you typically stop and chat with when you run into them? (Integer).
4. Do you have relatives live in the same neighbourhood where you live? (Yes 1; no 0).

- **Index of Social Relationship (SR-Index):**

The Index of Social Relationships (SR-Index) is a composite measure demonstrating the strength of residents' social ties. Respondents were asked to indicate the number of people they say hello to or stop and chat with (weak social relationships) as well as the number of people they consider friends or regularly visit (strong social relationships). The last part (strong social relationships) has been developed by adding a question on the number of households in the neighbourhood that individuals could turn to in an emergency. This behave indicates strong

trust among neighbours. The number of strong ties is divided by the total number of weak and strong social relationships to achieve the Index of Social Relationships for each resident. In each case study, the Overall Social Relationships Index is achieved by calculating the mean Index of Social Relationships for all respondents within the neighbourhood. A higher value index represents stronger social ties among residents within a neighbourhood.

The following questions have been included in the index:

1. How many of the people living in your neighbourhood do you say hello to when you meet? (Integer).
2. How many of the people living in your neighbourhood do you typically stop and chat with when you run into them? (Integer).
3. How many of the people living in your neighbourhood do you consider friends? (Integer)
4. How many of the people living in your neighbourhood do you visit every now and then? (Integer).
5. How many households in your neighbourhood can you turn to in an emergency? (Integer).

#### **4.8.2. Use of Space Measures:**

Before setting up any measure of how people use each communal space, it was necessary to define the boundaries of each communal space within the residential developments. The boundaries were either set where there was a significant physical boundary (e.g., walls, doors, fences and plants) between spaces or where there was a significant change in function (e.g., transition from a sidewalk and street to a shared garden) of spaces. Those spaces with the same functions and physical attributes (e.g., integration value, exposure to daylight, visibility, finishing materials, etc.) were considered one communal space for the data analysis.

How frequently residents use each communal space can affect the chance of meeting one of their neighbours in that particular space. Also, the number of social interaction incidents may encourage more residents to make use of the communal space and accordingly affect social interaction. Thus, two main measures were adopted from the earlier study of Farshidi (2016) in order to capture the frequency of use and density of social interaction incidents within each communal space.

- **Interactional space index (IS-Index)**

The *interactional space index (IS-Index)* is a composite measure representing the extent to which a communal space facilitates *regular* and *formal* contact between residents. The respondents were asked to report on those communal spaces where they regularly meet their neighbours, and they meet neighbours for formal gatherings. The number of respondents indicating a communal space as a regular contact place or formal contact place were added and then divided by the number of respondents (mean value) to achieve the final value of the index for each communal space, which is a number between 1 (marked by all residents as regular and formal contact) and 0 (never marked). *Actual places of contact* are those communal spaces with a higher *IS-Index*.

The following questions were included in the index:

1. Where do you usually meet your neighbours? (marked 1; unmarked 0)
2. Where do you usually meet your neighbours for scheduled gatherings? (marked 1; unmarked 0).

- **Frequency of Use Index (FU-Index):**

The Frequency of Use Index (FU-Index) is a composite measure demonstrating how frequently the residents use each communal space within the residential development. The respondents were asked to indicate whether they use each communal space daily, weekly, monthly, twice a year, or if they had never used it before. The respondents' frequency of use was all added and then divided by the number of respondents (mean value) to achieve the final value of the index for each communal space, which was a number between 4 (the most frequently used space by all residents) and 0 (never used before by any of the residents). The potential places of contact are communal spaces with a higher FU-Index.

The following question was included in each communal space:

1. How often do you use each space? (Daily 4; weekly 3; monthly 2; once or twice a year 1; never used before 0).

#### **4.9. The Independent Variables:**

This section describes the independent variables that this study investigates. As represented in Chapters 2, there are three categories of factor or aspects that could affect social interaction (the dependent variable) among residents in communal spaces of SFHNs. These three factors form the independent variables of this study, namely: DF, PCBE, and SSI. This study provided a list that included factors with the sub-variables within each category. In order to confirm the factors

and indicators listed under each of the three categories and to group their sub-variables by identifying the exact items under each factor investigated in this study, the Principal Component Analysis (PCA) test was conducted using IBM SPSS Statistics Version 25. The PCA was undertaken by testing the mean values of relevant questions related to each factor, inspecting the correlation matrix and the correlation coefficient, and calculating the loading of the variable on each factor, which should be above 0.4. Also, it meant checking whether the Kaiser-Meyer-Olkin (KMO) value exceeded 0.6, and how many factors the PCA revealed with an Eigenvalue > 1, using the Varimax rotation method. This type of test was used previously by Skjæveland et al. (1996) in their study that measured dimensions of social life within neighbourhoods. The following three sub-sections represent the items of each category.

#### 4.9.1. Demographic Factors (DF):

Table 4-6 shows ten factors that will be examined in the study. Gender, age groups, marital status, employment status, education level, the number of children under specific age live in the house, the number of working hours per day, relatives live in the same neighbourhood, the residency length, the type of ownership.

*Table 4-6 KMO and Bartlett's Test of the demographic factors.*

Demographic Factors	
1	Gender.
2	Age groups.
3	Marital status.
4	Employment status.
5	Education level.
6	The number of working hours per day.
7	The residency length.
8	The type of ownership.
9	The number of children under specific age live in the house.
10	The presence of relatives living in the same neighbourhood.

#### 4.9.2. The Physical Characteristics of the Built Environment (PCBE)

Table 4-7 represents the KMO value, which exceeded 0.6. The data in Table 4-8 shows six components under the PCBE group. The first component relates to the site design of the neighbourhood, including the shape and distribution of the dwelling blocks, the location of public utilities, and the design of streets and sidewalks. Meanwhile, the second component considers the site design of open communal spaces. This includes the diversity of communal spaces, their area, and the availability of visually attractive elements, like shaded seats, trees, and water figures.

Accessibility is the third component for the PCBE, which includes accessibility to the public services and communal spaces, the proximity of the public services and communal spaces to the house, and the accessibility to communal spaces within the neighbourhood for both genders. Maintenance is the fourth component, which considers the maintenance of neighbourhood services, such as garbage removal, the afforestation of common public gardens in the neighbourhood, the repair of broken seats, and maintaining street furniture like lighting columns. The fifth component is the total area of the occupied dwelling.

Table 4-7 The KMO and Bartlett's Test of the physical characteristics of the built environment.

KMO and Bartlett's Test		
Kaiser-Meyer-Olkin Measure of Sampling Adequacy.		.870
Bartlett's Test of Sphericity	Approx. Chi-Square	2875.815
	df	253
	Sig.	.000

Table 4-8 The rotated component matrix of the Physical Characteristics of the Built Environment.

	Component					
	1	2	3	4	5	6
Q27 Satisfaction with site design - The presence of sidewalks with a suitable width		<b>0.88</b>				
Q27 Satisfaction with site design - The width of the internal neighbourhood's streets.		<b>0.879</b>				
Q27 Satisfaction with site design - The design of the neighbourhood's internal streets		<b>0.862</b>				
Q27 Satisfaction with site design - The distribution of houses and public services		<b>0.651</b>	0.476			
Q27 Satisfaction with site design - The diversity of communal spaces			<b>0.787</b>			
Q27 Satisfaction with site design - The area of the open communal spaces		0.446	<b>0.764</b>			
Q27 Satisfaction with site design - The availability of visual attractions in the public garden		0.425	<b>0.703</b>			
Q26 Accessibility to public services and communal spaces				<b>0.81</b>		
Q26 Accessibility - The proximity of public services and communal spaces to the house				<b>0.795</b>		
Q26 Accessibility for both genders				<b>0.597</b>	-0.421	
Q29 Maintenance - Furnishing and maintaining the streets					<b>0.887</b>	
Q29 Maintenance of the neighbourhood's services.					<b>0.85</b>	
Q16 The total area of the house						<b>0.883</b>

Extraction Method: Principal Component Analysis.  
Rotation Method: Varimax with Kaiser Normalization.  
a Rotation converged in 6 iterations.

#### 4.9.3. The Social Sustainability Indicators (SSI):

Table 4-9 illustrates the KMO test of the SSI that exceeded 0.6. Table 4-10 shows that the PCA extracted five components under the SSI. The first component is resident satisfaction with the design of the built environment. This component includes “satisfaction with the presence of sidewalks with a suitable width”; “the width of the internal neighbourhood's streets”; “the shape of the neighbourhood's internal streets”; “the distribution of the blocks of houses”: and “the

location of public services within the neighbourhood”. This also considers “the satisfaction with the diversity of communal spaces in the neighbourhood”, “the area of open communal spaces within the neighbourhood”, and “the availability of visual attractions in the public garden between houses, e.g., shaded seats, trees, water figures”.

The second component considers the sense of community, which includes eight items (variables). They are: “the possibility of using the open communal spaces in the neighbourhood with the family and with friends and neighbours”; “the possibility of children using the provided communal spaces and opportunities to watch them easily”. It also includes: “if I need a little company”, “I can stop by a neighbour I know”; “I have made new friends while living here”; “the friendships and relationships I have with neighbours in the neighbourhood mean a lot to me”; “participating in decision-making processes relevant to the neighbourhood” and “attending most of the social gatherings organised in the neighbourhood”. However, this study will also consider the statements of question 22 to examine the level of privacy.

The third component was extracted to represent the safety and security of the neighbourhood and communal spaces. This includes “feeling safe when using the available enclosed and open communal spaces during the daytime and the evenings”, “whether the neighbourhood is safe to live in”, “feeling safe walking around the neighbourhood during the day”, and “if residents feel safe from car accidents when in the street in front of their houses”.

The fourth component considers the attachment to the place. This component includes four items: “feeling strongly attached to the neighbourhood as one of its members”; “feeling proud of living in this neighbourhood”; “feeling at home when arriving at the neighbourhood” and “planning to stay in the neighbourhood as long as possible”. The density is the last component under the SSI and includes two items: “the number of families that occupy the same house”, and “the total number of people living in the house”.

*Table 4-9 The KMO and Bartlett's Test of the SSI.*

KMO and Bartlett's Test		
Kaiser-Meyer-Olkin Measure of Sampling Adequacy.		.818
Bartlett's Test of Sphericity	Approx. Chi-Square	2177.300
	df	666
	Sig.	.000



Table 4-10 The rotated component matrix of the SSL.

	Component				
	1	2	3	4	5
Q24 Satisfaction with the presence of sidewalks with a suitable width of the neighbourhood's streets.	<b>0.854</b>				
Q24 Satisfaction with the width of internal neighbourhood streets.	<b>0.832</b>				
Q24 Satisfaction with the shape of the internal streets of the neighbourhood	<b>0.811</b>				
Q24 Satisfaction with the area of the open communal spaces within the neighbourhood	<b>0.756</b>				
Q24 Feeling satisfied with the distribution of both houses and the location of public services within the neighbourhood.	<b>0.755</b>				
Q24 Satisfaction with the availability of visual attractions in the public garden between houses e.g., shaded seats, trees, water figures.	<b>0.676</b>				
Q24 Satisfaction with the diversity of communal spaces in the neighbourhood.	<b>0.659</b>				
Q22 The possibility of using open communal spaces in the neighbourhood with friends and neighbours.		<b>0.768</b>			
Q22 The possibility of using open communal spaces in the neighbourhood with the family.		<b>0.763</b>			
Q21 If I need a little company, I can stop by a neighbour I know.		<b>0.688</b>			
Q21 I have made new friends while living here.		<b>0.681</b>		0.488	
Q21 The friendships and relationships I have with neighbours in the neighbourhood mean a lot to me.		<b>0.654</b>		0.515	
Q21 Participating in decision-making processes relevant to the neighbourhood		<b>0.621</b>			
Q22 The possibility of watching the kids easily when they are playing in the communal spaces provided near the house		<b>0.568</b>			
Q21 Attending most of the social gatherings organised in the neighbourhood		<b>0.564</b>		0.434	
Q19 Feeling safe when using available enclosed and open communal spaces during the evening			<b>0.843</b>		
Q19 Feeling safe when using available closed and open communal spaces during the daytime			<b>0.810</b>		
Q19 Feeling safe walking around the neighbourhood during the day.			<b>0.780</b>		
Q19 The neighbourhood is safe to live in.			<b>0.742</b>		
Q19 Feeling safe from car accidents when in the street in front of my house.			<b>0.661</b>		
Q20 Feeling attached to the neighbourhood strongly as one of its members				<b>0.755</b>	
Q20 Feeling proud of living in this neighbourhood				<b>0.721</b>	
Q20 Feeling at home when arriving at the neighbourhood.				<b>0.713</b>	
Q20 Planning to stay in the neighbourhood as long as possible.			0.436	<b>0.602</b>	
Q10 The number of families occupying the house.					<b>0.914</b>
Q10 The number of total people living in the house					<b>0.906</b>
Extraction Method: Principal Component Analysis. Rotation Method: Varimax with Kaiser Normalization. a Rotation converged in 10 iterations.					

#### 4.10. Data Analysis.

The data analysis was conducted in three parts. It included an analysis of the residential district scheme, Google Maps, and Esri (ArcGIS), the analysis of qualitative data, and the analysis of quantitative data. The first part aims to analyse the literature review in order to establish an explicit understanding of urban social sustainability, its indicators, its main determinant, and

the potential factors that could affect its main determinant, namely social interaction among residents in residential environments. This also endeavours to investigate the types of communal spaces available within the neighbourhoods of single-family houses.

The second part comprises an analysis of semi-structured interviews, which involves the content analysis of open-ended questions and the statistical analysis of close-ended questions. This explores experts' opinions on social sustainability and their agreement or disagreement with the list of factors collected from previous studies that could affect social interaction among residents in communal spaces of SFHNs of the Iraqi context.

Finally, the third part analyses the quantitative data using Statistical Package for the Social Sciences (SPSS) to determine the significance of factors on social interaction and to explore the patterns and correlations between the factors. However, these three parts are neither independent nor sequenced. As revealed by Baxter and Jack (2008), the data analysis started during the data collection process and continued until the end of the research. Case studies have been used for analytical generalisation rather than statistical generalisation and were achieved by using both quantitative and qualitative data (Johansson, 2003).

Overall, due to the complex nature of case studies and the variety of data, it is argued that analysing data is the most challenging task in case study research (Yin, 2017). This research combines various methods of qualitative and quantitative data analysis. The following sections discuss the two most essential methods, including content and statistical analysis.

#### **4.10.1. Content Analysis.**

This research adopted a content analysis method to analyse the qualitative data collected via open-ended questions from semi-structured interviews and questionnaire. It has been argued that content analysis is useful for creating theory from qualitative data (Creswell, 2013). In this study, the qualitative data collected from open-ended questions in the interviews were used to explore the following aspects:

- Applying the list of factors that the experts were asked about, namely the SSI, PCBE, and DF, in the design procedures when considering the social aspect.
- Highlighting the factors that the Iraqi experts typically use in the design procedure and clarifying their utilisation reasons.
- Capturing detailed information about experts' preferences and opinions on adding new factors that were not previously mentioned could affect social interaction among residents in communal spaces within SFHNs.

The findings of these aspects and the quantitative questions' results were used to quantify the factors affecting social interaction among the residents in communal spaces of SFHNs in Iraq from the experts' perspective.

Qualitative data from open-ended questions in the questionnaire have been used to explore the following aspects:

- Expectations of residents about communal spaces, and resident's perceptions about ideal communal spaces for social interaction.
- The motives and barriers to social interaction. These have been extracted from residents' suggestions on adding, changing or removing any of the available communal spaces in the neighbourhoods. These suggestions would help people involved in decision-making by capturing more information about their perceptions and by drawing directed recommendations.
- The types of communal space typically used by residents for formal and informal gatherings within their neighbourhoods.
- New shared places used for social gatherings instead of the communal spaces within the neighbourhood, and why these places are used.

First, for each of these aspects, related sentences and phrases were extracted from the text. The next step was to read each batch of data carefully and to assign the initial codes. According to Fereday and Muir-Cochrane (2006), this process is called initial coding or open coding. The initial coding was followed by a series of review and editing codes, which led to the developing of the final codes and categories (Elo & Kyngäs, 2008). At this stage, the categories and themes were formed by finding connections between the codes. Finally, the categories and codes were weighted on the number of repetitions.

#### **4.10.2. Statistical Analysis:**

This research adopted a statistical analysis method to analyse the quantitative data collected from close-ended questions in the interviews and the questionnaire; it used two software packages - IBM Statistical Package for the Social Sciences (SPSS) and Microsoft Excel.

IBM SPSS Version 25 was used to analyse the questionnaire's quantitative data. Several steps were taken before analysing the questionnaire. The reliability and validity tests for the scale (questionnaire), which are explained in detail in Appendix D, were carried out after conducting the Principal Component Analysis (PCA) to identify the exact items that go under each of the investigated factors, i.e., the PCBE, SSI, DF, and social interaction. Then, after categorising the

dependent variable (social interaction) into three indices, these indices were defined, and the researcher explained how they were obtained and what they measured. The Kolmogorov–Smirnov test was used to test the normality distribution of the dependent variable’s data. Then, a descriptive analysis was used on the respondents’ demographic factors gathered from the survey. This step described the targeted sample’s responses, using frequencies, a crosstab, and case study commands. The last step conducted a Generalised Linear Model test (GLM) to measure the impacts of the independent factors (PCBE, SSI, and DF) on social interaction among residents. It used the General Linear Model, the univariate test and the correlation test to confirm which items significantly influence social interaction.

Quantitative data from the semi-structured interviews were analysed using Microsoft Excel. The semi-structured interviews consisted of 17 questions, and the first asked about the background of the interviewees. Six of the questions from the semi-structured interviews were close-ended and used a five-point of Likert Scale that included strongly agree (SA), somewhat agree (SWA), neither agree nor disagree (NAND) and strongly disagree (SD). These five points were converted to numeric ratings from 5 (strongly agree) to 1 (strongly disagree). The analysis of the numerical ratings was based on a calculation of the average scores for each answer. Also, the agreement percentage was calculated by adding the values for SA and SWA to consider the total rate of agreement. The same action was undertaken with the SWD and SD values as the total rate of disagreement. As the NAND responses meant the choices were not considered, the items were not significant, and thus the values for NAND were added to the total disagreement rate. Also, the researcher analysed the responses from the experts who offered reasons for choosing their answers; this was addressed using a content and discourse analysis approach. The other seven questions from the semi-structured interviews were open-ended, and the content analysis was employed to analyse these questions, as explained in the previous section.

The last three interview questions formed a matrix table, asking interviewees to indicate potential strong relationships between the indicators and factors, using numbers from 1 (the weakest) to 6 (the strongest), and using 0 if there was no relationship. The researcher analysed the data in two ways, where one was a confirmation of the other. Firstly, the numerical ratings were analysed by calculating the average scores of each relationship, and strong relationships were those that received an average of above 5.0. Second, every three degrees were added together to analyse the differences between the answers and to summarise the points into three scales, weak (1, 2, and 3), strong (4, 5, and 6), and no change (0); from this, it was then possible to calculate the mean. A strong relationship would be that which received a mean score of 3.0.

#### **4.11. Testing the Data Collection Tools:**

This section describes the testing of research methods and the procedures that were followed in conducting this research. Testing the method tools is a suitable way to refine them before starting the main study and collecting data from the targeted population. The researcher can avoid critical mistakes and manage risk and time by finding issues and challenges associated with the methods and procedures. This was achieved by testing them on a small sample group. Therefore, the semi-structured interview forms, the residents' questionnaire, and the observation checklist in this research were tested in a real-life situation before proceeding to the primary data collection stage. Both processes were conducted in two separated periods depending on the time taken for each method.

The semi-structured interview questions were tested twice in December 2017 before conducting the first main part of the study. The first test was conducted with three professional experts before translating the form when interviewees were asked to assess the draft of the questions and make comments about their clarity and structure and the proposed method of conducting the interview. The tool was tested for the second time after translating the form into Arabic to examine the translated questions' clarity and the time needed to conduct the interview. This time the testing was carried out with three Iraqi professional experts (interviewees). Overall, the new version of the questionnaire was made shorter and more explicit (nine pages instead of ten pages), while the interviews were extended to ensure the richness of the data collected.

The residents' questionnaire was tested in three stages in December 2018 before the main study was started. The first stage was conducted with professional experts, asking them to assess the draft of the questionnaire and make comments about the clarity of the questions and the proposed delivery and collection methods. The second stage was conducted after the first survey translation phase when four Iraqi experts were asked to evaluate the draft by making comments about the clarity and choice of questions, and the language. The third stage was conducted with non-experts amongst Iraqi residents in AlJunainah neighbourhood (one of the selected case studies) and examined the questions' intelligibility and the time needed for completion. According to feedback from the three stages, the questionnaire draft was refined to ensure that it was understandable, while the piloting phase helped with the delivery and collection processes. Table 4-11 represents a summary of the lessons learnt and the related rearrangements.

Table 4-11 Summaries of testing the method's tools.

Tools	Lessons learnt	Re-arrangements
<b>Site survey</b>	Due to time considerations during the site visit, rather than filling in the checklist for each space on the field, photos of spaces were taken, and the information was extracted later from photos.	The checklist was revised to a single page for use as a guide for photography.
<b>Interviews</b>	The section in the interview regarding the factors and their sub-variables was found to be inaccurate and confusing to the experts while testing the questions.	Two new questions were added to the interview question list.
	To obtain rich information from the experts regarding the listed factors used in the interviews, new questions were added.	Three new questions were added to the interview's questions list.
	While testing the questions with the experts, the section in the interviews on investigating the presence of relationships between factors was found to use questions that cannot be answered in the right way.	The format of the questions was changed to a matrix.
<b>Questionnaire</b>	For clarity in the questionnaire amongst the surveyed residents, the language of the questions and the options were modified.	Using some words that aligned with the residents' understandings of the samples to explain the questions clearly.
	To capture more information from the residents, the experts suggested asking about the favoured place for spending rest and free time within the neighbourhood.	One new question was added to the questionnaire.
	Due to the confusion caused by the length of the list of problems that could affect residents' social interactions, the choices were categorised in a logical way to minimise the number of options.	Some of the options were merged, and residents were asked to indicate the three most prevalent problems.
	Due to the difficulty in indicating the exact number of workdays per week for some residents who do not work for the whole month, the work period range was changed in the question.	The question was changed to 'how many days do you work per month?'
<b>Observation checklist</b>	Due to the risk of forgetting information during the observation, a table was used to include the information needed from each case study.	The checklist was revised to a single page checklist to use as a guide for the observation.

## 4.12. Conclusion:

The chapter discussed the research methodology proposed for this study. It discusses five main factors that were introduced as case selection criteria, which are: the age of the area, the density, location, socio-economic background, and typology of the communal spaces. The morphological characteristics of the three samples have been discussed. The chapter also highlighted the knowledge gaps that this research aims to bridge. Firstly, although earlier studies have examined the social aspect in various contexts of the developed, developing, and Middle East countries, the general recommendations resulting from these studies may not be necessarily useful in all contexts. Secondly, to date, there is a lack of research examining the social aspects of the Iraqi context that explore the factors that affect residents' social interaction in communal spaces of SFHNs. Consequently, the current research focused on the communal spaces within urban residential developments of single-family houses, aiming to provide



decision-makers, urban professionals, and architects with empirically evidenced insights and recommendations into what influences residents' interactions within the shared spaces of urban residential developments. Therefore, four questions have been developed. Additionally, this research developed a conceptual framework based on three independent variables: the DF, SSI, PCBE, and one dependent variable, which involved social interaction among residents of urban residential neighbourhoods.

This research adopts a pragmatic philosophy to answer the research questions, and chooses convergent parallel mixed methods designs. A multiple case studies strategy was selected, and the multi-layered methodology of mixed methods was adopted, including semi-structured interviews, self-completion questionnaires, observation and behavioural mapping, and a site survey. The qualitative and quantitative methods used for this study create a comprehensive picture of the factors that affect social interaction among residents in the communal spaces of SFHNs in Iraq. As discussed earlier in this chapter, the researcher will conduct a qualitative data collection in order to obtain an in-depth understanding of the factors that apply in planning urban residential environments and that affect social interaction among residents in an Iraqi context. After acquiring a list of factors from experts' perspectives that could affect social interaction among residents, it is essential to examine these findings on a larger sample population to confirm whether they influence people's perceptions, and to check these against the researcher's observations

The methods used in this research were mostly employed by researchers who conducted studies in the field of urban social sustainability at a neighbourhood scale. For example, in-depth interviews were used by Ahmed (2012), Al-Thahab, Mushatat, & Abdelmonem (2014), Dave (2011), Farshidi (2016), Kennedy & Buys (2015), and Reid (2015). A questionnaire was used by Abu-Ghazzeh (1999), Al-Thahab et al. (2014), Farida (2013), Farshidi, (2016), Kennedy & Buys (2015), and Skjaeveland & Garling (1997). Behavioural observation and an examination of resident activities were used by Al-Thahab et al. (2014), Farida (2013), and Huang (2006). Finally, site observations were used by the researcher Ahmed (2012) and Karuppannan & Sivam (2011).

Measures and indices were adopted and modified based on existing ones that measure the quality and quantity of social interaction among residents and the use of space patterns among the residents of the three selected neighbourhoods. These measures include the Neighbouring Index (N-Index), Index of Social Networks (SN-Index) and Index of Social Relationships (SR\_Index). Also, two measures were proposed by Farshidi (2016) to measure how frequently

people use communal spaces, namely the Interactional Space Index (IS-Index) and the Frequency of Use Index (FU-Index). Semi-structured interviews, self-completion questionnaires, socio-spatial practices, and a site survey were used to collect data on the three factors categories and quantify which affect social interaction among residents in the communal spaces of SFHNs in Iraq.

The chapter discussed the collected data analysis. Content analysis and Microsoft Excel have been used to analyse the qualitative and quantitative data of semi-structured interviews to obtain experts' professional opinions on the factors that could affect social interaction among residents in Iraq and identify new factors not previously mentioned. Qualitative data from the questionnaire have also been analysed using a content analysis method. This enabled the collection of residents' perceptions about current communal spaces and their expectations of the ideal spaces, including the motives and barriers to social interaction; reasons for any dissatisfaction with the current built environment; their use of shared gardens in the community, and suggestions for new places that they would prefer to use as communal spaces. The SPSS version 25 and Microsoft Excel were used to analyse the questionnaire's quantitative data in order to identify the factors that affect social interaction among residents within shared spaces and the most used communal spaces.

The testing methods and procedures for conducting the research have been discussed in this chapter. All the data collection methods and processes were tested before the main data collection phase.

## Chapter 5 Decision-Makers' Perceptions of the Factors Affecting Social Interaction.

### 5.1. Introduction

The semi-structured interviews are analysed and discussed in this chapter. Firstly, a description was offered on the way the questions were analysed. Each question is categorised and analysed according to its corresponding aspect, namely social sustainability indicators (SSI), physical characteristics of the built environment (PCBE), and demographic factors (DF). Questions relating to the first two aspects are analysed on the degree of acceptance of each indicator, then the acceptance of the sub-variables was discussed, followed by the identification of any additional factors. Finally, a mini discussion section is provided for each sub-section. In comparison, for the third aspect - the demographic factors – does not consider the acceptance of the sub-variables. The questions that represent the acceptance of the social interaction sub-variables are analysed after considering the application of examined factors in work routines. The potential relationships among SSI, PCBE and DF are discussed before a conclusion is provided that summarises the final lists of sub-variables and corresponding aspects.

### 5.2. Analysing the Semi-Structured Interviews:

As mentioned in Chapter 4, the semi-structured interviews consisted of 17 questions with 17 interviewees (see Appendix F). One of the questions asked about the interviewees' background, as described in Chapter 4, section 4.7.1-b, and Table 5-1 represents the responses for each interviewee.

*Table 5-1 Interviewed professionals with their positions and organisations.*

Interviewee	Position	Sector	Nature of Organisation
IS	Architect (Manager).	Public Sector.	The Master Plan Section-the City Planning Department/ Basra Municipality (MPS-CPD/ BM).
EA	Architect (Engineer).	Public Sector.	Master Plan Division-Cities Planning Department/Basra Municipality (MPS-CPD/ BM).
IH	Architect (Assistant Administrator).	Public Sector.	Building Permits Division - City Planning Department/Basra Municipality (BPD-CPD/BM).
AK	Architect (Engineer).	Public Sector.	Master Plan Division-City Organisation Department/BM.
SB	Architect (Engineer).	Public Sector.	Basra Municipality.
TY	Architect (Engineer).	Public Sector.	Directorate of Housing-Ministry of Construction and Housing and

Interviewee	Position	Sector	Nature of Organisation
			Municipalities, and Public Work/ Baghdad (DoH-MoCH/B).
IR	Architect (Principal Engineer).	Public Sector.	Directorate of Housing- Ministry of Construction and Housing and Municipalities, and Public Work / Baghdad (DoH-MoCH/B).
AA	Urban planner.	Public Sector.	Directorate of Housing - Ministry of Construction, Housing, Municipalities, and Public Work /Baghdad (DoH-MoCH/B).
BA	Urban planner.	Public Sector.	Directorate of Urban Planning (DUP)/ Basra.
FA	Urban planner.	Public Sector.	Directorate of Urban Planning (DUP)/ Basra.
RR	Architect (Assistant Lecturer).	Public Sector Academic.	Architectural Department/ Basra University (AD-BU).
AG	Architect (Lecturer).	Public Sector Academic.	Architectural Department/ Basra University (AD-BU).
MF	Architect (Assistant Lecturer).	Public Sector Academic.	Architectural Department/ Basra University (AD-BU).
AF	Urban designer (Assistant Lecturer).	Public Sector Academic.	Architectural Department/ Basra University (AD-BU).
HS	Urban designer (Assistant Lecturer).	Public Sector Academic.	Architectural Department/ Basra University (AD-BU).
IT	Architect (Designer).	Private Sector.	Construction Company.
AS	Urban planner.	Private Sector.	Construction Company.
<b>Total</b>		<b>17 interviewees</b>	

Six questions were close-ended and used five-point Likert Scales, which included: Strongly-Agree (SA), Some What Agree (SWA), Neither-Agree Nor-Disagree (NAND) and Strongly-Disagree (SD). These scales were converted to numeric ratings, from 5 (strongly agree) to 1 (strongly disagree). The numeric ratings were analysed by calculating the average scores for each answer. Also, adding the SA and SWA points of the Likert Scale, which represented the total agreement rate, identified the agreement percentages. Furthermore, the NAND, SWD and SD points of the Likert Scale were added to represent the total disagreement rate. The values of the NAND points of the Likert Scale were omitted from the analysis, as the responses suggested that these indicators are neutral. Also, using content and discourse analyses, the researcher analysed the answers given by the experts on their reasons for choosing their answers.

Furthermore, three of the seven open-ended questions asked interviewees whether they considered indicators and factors in their current work processes. Moreover, answers to the remaining four open-ended questions (which also applied content analysis) offered the

opportunity to add new indicators and factors. Finally, the interviews' last three questions comprised a matrix table to indicate to which degree the strength of the relationship between the examined factors by using numbers from 0 (no change or no relationship) to 6 (the strongest). The researcher used two ways to analyse these three questions; each helped to corroborate the other. The first way was analysing the numerical ratings by calculating each relationship's average scores; the strong relationships were those that received an average score above 5.0. The researcher minimised the scale of strength degrees from seven to three scale points in the second approach. This was done by summing every three strength degrees together, i.e., strong (1, 2, and 3), weak (4, 5, and 6), and no change (0); from which it was possible to calculate the mean. The strong relationships were those that received a mean score of 3.0.

### **5.3. Social Sustainability Indicators (SSI):**

In the semi-structured interviews, three questions focused on examining whether the SSI and their sub-variables could have an impact on social interaction. The first two questions used five-point Likert scales that included: “Strongly agree”, “Somewhat agree”, “Neither agree nor disagree”, “Somewhat disagree”, and “Strongly disagree”. The list was collected from earlier studies, (Bramley et al. (2009); Bramley & Power (2009); Karuppannan & Sivam (2011)) and aimed to examine the influences on social interaction among residents in communal spaces within residential neighbourhoods. The following sections (5.3.1, 5.3.2, and 5.3.3) will discuss the analysis of these three questions.

#### **5.3.1. The Acceptance of the Social Sustainability Indicators (SSI):**

After the demographic information, this formed the second question of the semi-structured interviews and included six indicators of social sustainability. The question text was: *“Please indicate your degree of agreement or disagreement with the following list of social sustainability indicators that can affect the social interaction among residents in residential neighbourhoods and can be applied in the Iraqi urban context. Please tick (✓) one box in front of each indicator”*. The question used the aforementioned five-point Likert Scale to determine the degree of agreement or disagreement. It also included other questions that asked about the reasons for each answer.

The experts were asked to indicate their degree of agreement or disagreement on the influence of these indicators on social interaction among residents in residential neighbourhoods and whether these could be applied to Iraqi residential developments, according to their experiences

and perceptions of social sustainability in their field. The answers to this question are shown in Table 5-2.

*Table 5-2 Counts and rates of the answers to the second interview question on the social sustainability indicators.*

Indicators	SA	SWA	Sum SA & SWA	NAND	SWD	SD	Sum NAND, SWD & SD	The average of scores (scores/17)
Safety & security	11	5	16	0	1	0	1	4.5
Sense of community	11	5	16	1	0	0	1	4.6
Attachment to place/Sense of Pride	7	6	13	1	3	0	4	4.1
Privacy	5	8	13	3	1	0	4	4.0
Residents' satisfaction	5	7	12	2	3	0	5	4.0
Density	7	4	11	4	2	0	6	3.9

Table 5-2 illustrates the counts of respondents, according to their degree of agreement or disagreement with the second question of the semi-structured interviews. These are presented under the five categories of the aforementioned Likert Scale. Three additional columns are also included: one represents the sum of SA and SWA, the second is the sum of NAND, SWD, and SD, and the last is the average of the scores (scores/17).

An inspection of the data in Table 5-2 reveals that the sum of agreement (SA and SWA) is higher than the sum of disagreement (NAND, SWD, and SD), as shown in the fourth and eighth columns. This suggests that most experts confirmed the importance of considering the majority of indicators, although they also revealed they usually do not pay much attention to them at the design and implementation stages. The indicators in Table 5-2 are sorted from the largest to the smallest value in the “Sum SA & SWA” column. As shown in Table 5-2, 16 interviewees agreed with the indicators for the sense of community, and safety and security, which were represented by the average scores 4.5 and 4.6, respectively. Furthermore, 13 interviewees agreed with the indicators for attachment to place/sense of pride and privacy, which were represented by the following (respective) average scores: 4.1, and 4.0. Next, 12 of the 17 interviewees agreed with the residents’ satisfaction indicator, which received a score of 4.0. Finally, 11 interviewees agreed with the last indicator, namely density, which received an average score of 3.9.

From these results, it can be seen that the interviewed experts generally agreed with the impact of the six examined indicators of social sustainability on social interaction among Iraqi residents and revealed that these indicators could be applied and measured in the Iraqi urban context. Figure 5-1 shows the response counts of the total agreement and disagreement to the second interview question. The following sections will illustrate the interviewees’ responses to each social sustainability indicator.



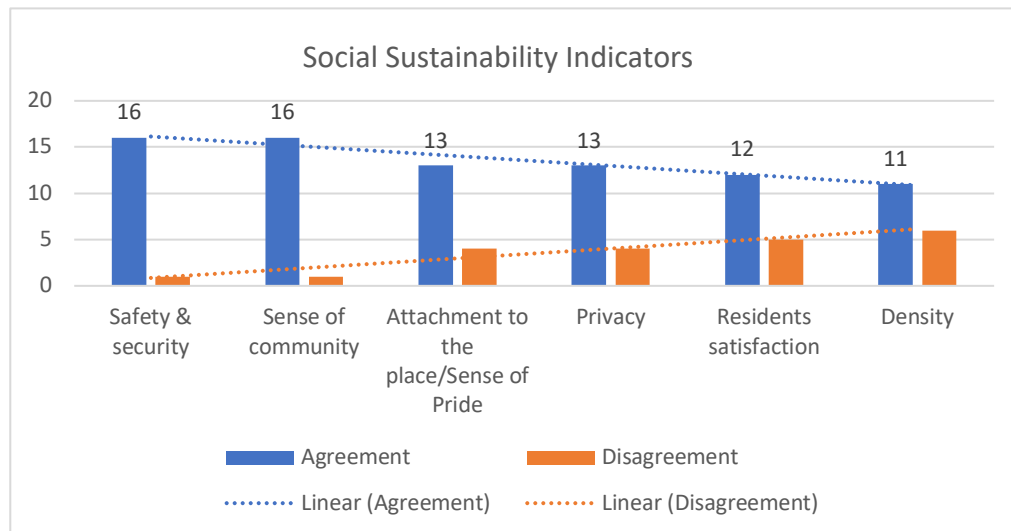


Figure 5-1 Response counts concerning the total agreement and disagreement on social sustainability indicators according to the second interview question.

- **Safety and Security:**

As shown in Table 5-2, the indicator with the highest agreement score is Safety and Security, as it received an average of 4.5, which corresponds with “strongly agree”. Also, 16 out of the 17 interviewees selected this, as shown in Table 5-2 and Figure 5-1. The interviewees agreed with the influence of this indicator on social interaction among residents in an Iraqi context as 11 selected “strongly agree”. Only one out of 17 interviewees selected “somewhat disagree” in response to the safety and security indicator. The results suggest the importance of this indicator, which potentially affects the stability of residents in the neighbourhood. Furthermore, it is one of the most important considerations for people when considering a house purchase or rental, which was noted by most interviewees. Three interviewees TY and AA, (urban planners) and IR (architect) agreed that the safety and security indicator represented “*an important factor for social interaction*”. Although this indicator is important as an essential factor for social interaction, it is not taken into account most of the time. For example, IS stated that:

*“Although this indicator (safety and security) is paramount, the schemes of the neighbourhoods are almost devoid of safety and security and in considering the indicator's effect on people's communication with each other”.*

The architects and urban designers (specifically AG and AF) interviewed who worked in the Architectural Department in Basra University (AD-BU) demonstrated their agreement and highlighted the importance of safety and security, confirming that it is one of the essential priorities in selecting a place to live. “*The unstable situation in the neighbourhood I lived in led me to move from it because of increased burglary problems*” (AG). Furthermore, the architect, EA, who works at Basra Municipality, also confirmed this.

One of the interviewees (SB) mentioned the reason for the importance of safety and security for social interaction:

*“A person's sense of safety and security is an important factor and is essential to his sense of belonging to a community and attachment to place. Therefore, we find individuals comply with the system of the neighbourhood and sanctify the internal environment of housing”.*

Another architect (AK who works in BM) stated that this indicator is considered a catalyst for other actions, *“because it [safety and security indicator] acts as a catalyst for the influx because it creates a sense of security and reassurance”*. One of the urban planners (BA) who works in the Directorate of Urban Planning in Basra confirmed that safety and security indicator is important as *“this indicator keeps people cooperating with each other to preserve it”*.

Moreover, after indicating the significant role of safety and security in social interaction among residents, other interviewees, such as RR (an architect) and HS (an urban designer) in AD-BU, highlighted the need to consider issues relating to residential neighbourhood design that could cause safety and security problems. However, one of the urban planners (FA) disagreed somewhat with the impact of safety and security on social interaction: *“This indicator is considered a security function”*, which means that it is considered by security authorities rather than by architects, urban designers and planners.

- **The Sense of Community Indicator:**

The second indicator from the semi-structured interviews with high agreement scores is *the Sense of Community*, to which 16 out of 17 interviewees agreed with the influence on social interaction among residents in Iraqi residential contexts (see Table 5-2). Eleven of the interviewees selected “strongly agree”, and the other five interviewees chose “somewhat agree”, while only one interviewee indicated “neither agree nor disagree”. According to the average response scores, this indicator received an average of 4.6, which matches the “strongly agree” scale.

Some assumptions were made about the significance of the sense of community. Most of the interviewees confirmed that this indicator influenced social interaction among residents and offered several arguments. Firstly, they suggested that it is one of the factors that form a human personality and the sense of the place, and that encourages the rapprochement and socialisation with others. The urban planner, FA, confirmed such perceptions; he considered the sense of community a significant influence on social interaction *“because it is a basic element in the nature of the Iraqi individual”*. Moreover, AK (who is an architect in BM) stated that *“this*

*indicator generates a sense of stability among people and therefore creates a sense of a tendency to go out to gather and interact with others outside the house”.*

Similarly, the BA (who is an urban planner) has the same opinion on this indicator, as it “*gives a kind of rapprochement between populations*”. Moreover, TY (an urban planner) suggested that its importance is reflected in the formation of the Arabic city on the human character. He stated that “*the sense of community is one of the most important elements of human personality formation, and this is evident in the planning of the Arab city*”. On the other hand, this indicator is considered a motivator to create social interaction among residents who live in the same community, as confirmed by SB (who is an architect in the Basra Municipality).

*“The sense of community is important to social interaction because the members of the same society usually suffer from the same problems and [experience] common living events so that they can carry out important and useful activities for each other, and well...that is what leads to social communication among them”.*

Although they confirmed that a sense of community exists in Iraqi society, AG (an architect who is also a lecturer) states that it is now at a different level from before:

*“A sense of community is a significant indicator affecting social interaction. However, recently, I think its level became lower than before because there are alternatives. Most of these alternatives are to be in a social space where there is no need for personal disclosure and no need to know the other”.*

Also, one of the alternative issues could be social media, which can isolate individuals from their local community. Moreover, increasing the number of large malls, coffee shops, and cinemas outside of the range of most residential neighbourhoods can have a similar impact. Thus, AG highlighted the importance of providing a well-designed open space within the residential neighbourhood boundaries in order to increase social interaction among residents. He assumed that:

*“The existence of space designed in a way [to] meet the needs of the users within a residential neighbourhood can encourage and catalyse the residents within that neighbourhood to communicate and increase the social interaction rate among them. In other words, the presence of [an] open space produces a shared social life and shared times among residents, which enhance the sense of community, and this will help to improve the attachment to place” (AG)*

One of the interviewees, EA (who is an architect) chose neutral (NAND) regarding the possible influence of the sense of community on social interaction. EA stated that this depends more on the nature of humans in Iraqi society.

*“Recently, most people have this orientation - me first. When the sense of community comes, for example, from making new friends and meeting neighbours, it depends on*

*the personality of residents and their nature. We can find people like to have friendly relations with neighbours whereas there are people who do not like visiting neighbours or establishing any link to contact them. Such a tendency is new, and it has been increasing in the last 20 years. So, I think it is not a proper indicator to be used to measure its effect on the social interaction among residents because it is a variable [that] depends on people's desire".*

- **Attachment to Place/Sense of Pride**

This indicator was ranked second amongst the total agreement rates, after safety and security and the sense of community. As shown in Table 5-2, 13 out of 17 interviewees agreed that the attachment to the place/sense of the place has an impact on social interaction among residents, as seven of the interviewees selected "strongly agree" and the other six "somewhat agree". However, three out of 17 interviewees disagreed with this influence, two of them chose "somewhat disagree", and one selected "neither agree nor disagree". According to the average response scores, this indicator received an average of 4.1, which is classed as "strongly agree" on the scale.

The reasons given by interviewees differed; some suggested that this indicator was used as a reflection of social interaction and social behaviour among residents in the built environment. The interviewee, TY, emphasised its impact on social interaction "... *individuals (Arabs) feel pride in their homeland and their city*" while the lecturer, AG, suggested that "*the attachment to place depends on the social tendency that individuals have*". On the other hand, SB stated that the attachment to place/sense of pride is linked to the nature of daily life and the individual's social relationships:

*"The Iraqi people are social in nature, and social life is essential for them and the establishment of gatherings and their development to cities [are] only a proof of it. The sense of place is strongly combined with daily human living, and therefore, social relations".*

According to HS, the attachment to place can be a tool for measuring the physical characteristics of a built environment or offer an assessment tool to the built environment. As the manager IS of MPS-CPD/ BM stated, "*although Iraqi people have more social affiliation than affiliation to place, this indicator is a significant factor to be considered, and I strongly agree with it being included in evaluating the built environment*". However, MF (who is an assistant lecturer) revealed that the sense of belonging to a place is a distinguishing characteristic in the personality of the Iraqi people whatever the condition of the built environment. "*Most ... Iraqi people are attached to the place and have a sense of pride even though the place (the built environment) could be a poor or ineffectual built environment*".

Other interviewees linked the influence of attachment to place on residents' social interaction to the presence of architectural symbols or landmarks in the built environment. This is because symbols and landmarks contribute a sense of importance and value in the place to residents and encourage them to use it in their social activities. Thus, RR, who is an assistant lecturer, highlighted the importance of symbols in reflecting the identity and belonging of a resident to a neighbourhood. Furthermore, EA confirms these by stating that:

*"For me, I feel I belong to my neighbourhood where I live when I see the Port building in Al-Maqal neighbourhood. Measuring and knowing this indicator can help in understanding people's perceptions of the built environment, and then, in evaluating their engagement with others within this environment".*

AS, an urban planner works in the private sector, believed that the attachment to place/sense of pride is mainly affected by age groups, as he stated that *"I believe that only elderly people who live in a place for longer than 20 years have an attachment to place, a pride to live in it"*.

Alternatively, two of the interviewees suggested that the attachment to place/sense of pride do not affect social interaction among Iraqi residents, but in fact, were *"a secondary issue"* (FA). Furthermore, IH stated that it could be measured in the Iraqi context due to *"what the current situation of the built environment has passed through during the last war of political, social, economic, schematic, and environmental changes"*.

- **Privacy**

This indicator was ranked second highest in terms of agreement amongst interviewees (as seen in the column "sum SA & SWA" in Table 5-2) regarding its impact on social interaction among residents. Thus, 13 out of 17 interviewees agreed with the indicator 'privacy', and five selected "strongly agree". However, four out of 17 interviewees disagreed with this influence, with one selecting "somewhat disagree", and three others choosing "neither agree nor disagree" in terms of this indicator's influence. According to the average response scores, this indicator received an average score of 4.0, which matches the "somewhat agree" scale.

Some of the interviewees considered spatial privacy as a motivator for residents to use the communal spaces, and that this increased social interaction among residents. AK stated that this indicator impacts social interaction in Iraq because *"it is appropriate to customs and traditions, especially as it is a conservative society, and it becomes a more appropriate place for the influx of users"*. Other interviewees perceive it as an insulating factor that may cause social exclusion. BA, an urban planner who somewhat disagrees with the privacy indicator, stated that *"this indicator is driving the population to isolation"*. Similarly, HS, a lecturer at BU, said that *"providing privacy within a public place makes it easier to use the place by users of different*

*age groups, although sometimes privacy may be insulation from social interaction*". Furthermore, AF, an assistant lecturer in BU, perceived that spatial privacy is not the main condition of social interaction.

*"The existence of the privacy of place is important, but it is not a condition to creating social interaction because the nature of the Iraqi people is adaptable to the reality of the situation; he uses the environment around him according to his need"*.

Regardless of whether spatial privacy exists or not, AS considered that interaction was a personal tendency; thus, he neither agreed nor disagreed with the influence of privacy on social interaction among residents. For example, *"if the privacy of the space exists, this does not necessarily mean it would ... increment social interaction among residents. It is a personal matter; some people just do not like to communicate with others socially"*.

Others perceive that spatial privacy is an essential factor when designing the city because it is one of the norms of the old Arabic town and the housing unit. The urban planner, FA, strongly agrees with the influence of privacy on social interaction. He perceives that spatial privacy is an essential factor in designing the city because it is one of the norms of the old Arabic town and the housing unit *"it is an essential requirement, even in the design of the housing unit"*. Similarly, SB stated that:

*"It can be influential on the interaction or uninfluential according to the nature of individuals living in the neighbourhood, the nature of the architectural environment, and the resultant special social characteristics of the population from that architectural environment. Privacy is one of the urban features of the original Arab city, which has a heritage that connects the Arab individual to his culture; its existence is an important call to preserve urban heritage"*.

AG, a lecturer in BU, considers that privacy is an organising factor on the physical characteristics of the built environment, including on buildings and organising spaces. Moreover, IS (a manager at BM) also claimed that *"the norm of spatial privacy is considered in specific regions"* whilst EA (an architect at BM) discussed some reasons for the absence of privacy in current residential neighbourhoods:

*"The design, or new orientations to design new residential neighbourhoods, is mostly typical. In fact, most designers are not architects or urban designers or urban planners, but most are surveyors. Most of the decisions to authorise schemes are governmental decisions. For example, imposing the proportion of residential units is more significant than the permissible rate per hectare; hence, this action affects the residential and population density without giving any consideration to the area of public services and the open spaces of the neighbourhood"*.

MF, an assistant lecturer at BU, discussed the privatisation of spaces within the neighbourhood and its use by specific age groups; for instance, the transformation of most open spaces in



neighbourhoods to football fields, which has started to become widespread in most communities. Such transformations mean that areas become specifically designed for some age groups and genders and do not consider the rights of other users.

*“Before, open spaces were used by more than one age group; however, these days, these spaces have become specific to particular youth age groups. Most of the popular traditional areas consist of open spaces used by different age groups such as using it as a football field for teenagers or a children’s playground. The matter is now taking what it is for public use and converting it for use by specific age groups, which is taking over the rights of others” (MF).*

- **Residents’ Satisfaction**

This indicator is ranked third in terms of its impact on social interaction among residents in the Iraqi context, as indicated in the column “sum SA & SWA”. As shown in Table 5-2, 12 out of 17 interviewees agreed with the indicator ‘Resident Satisfaction’, where five “strongly agreed” with its impact on social interaction among residents. However, five out of 17 interviewees disagreed with this influence, three selected “somewhat disagree”, and one chose “neither agree nor disagree”. This indicator received an average response score of 4.0, which matches the scale “somewhat agree”.

All interviewees noted the significance of this indicator when measuring social sustainability and the impact of the built environment on social interaction among residents. However, they confirm that residents’ satisfaction has not been given attention when designing, implementing and developing schemes. Therefore, all 13 interviewees highlighted the importance of considering this indicator, although stated that it would not be tangible. According to most of the interviewees, there is dissatisfaction on the current situation in the built environment. Also, EA claimed that *“people’s responses to this indicator will be negative due to some reasons”*.

As stated by the assistant lecturer, MF, most households and individuals are dissatisfied with their house area due to limited incomes or availability in a favoured area. Moreover, like much of Iraqi society, the individual tends to live in the main family house. Due to traditional values and economic reasons, when any male family member gets married, he will stay with his new family in the main family house. However, such social phenomena have started to disappear because of improving economic incomes and changes to some traditional values. Thus, a male getting married can now move out of the main family house into a new house with his family if he can offer that. This social phenomenon reflects in a negative way on the planning of the city where the areas of houses in some places are insufficient for occupation by more than one family; furthermore, some areas lack some infrastructure services.



*“Iraqi society’s nature tends to get all needs, especially after the last war and the openness in the modern world and travelling abroad. Where society finds an absence of many things, here, residents will not be satisfied with the current situation because he will compare what found from his travels to places within his current built environment” (MF).*

The architects SB and AK stated that residents’ satisfaction has an influence on their social interaction because they consider it a catalyst for the use the communal spaces. Indeed, *“it encourages gathering, meeting and increases the users of those places” (AK).*

*“The residents’ satisfaction on the planning and designing of the neighbourhood, as well as the attractions within it, increases the interaction between residents because people have links to the social fabric on the one hand and the physical form of the neighbourhood on the other. The characteristics of planning the housing and the residential environment play an essential role in influencing the social and psychological lives of individuals; and thus, this would strengthen or weaken the bonds of social relations between them” (SB).*

IS, the manager of MPS-CPD/BM, indicated that *“unfortunately, this indicator is not taken into account ... in work priorities because pleasing people is an unattainable goal”*. However, he encouraged the use of this indicator in order to understand people’s perceptions about the built environment, which represents the first attempt to measure the influence of this indicator on Iraqi social life. He stated that,

*“Every individual has different needs, standards and opinions about the built environment (houses, communal spaces within the neighbourhood, and the neighbourhood itself). People in Iraq are dissatisfied with the area of their houses and the communal spaces, and I believe this dissatisfaction belongs to, firstly, the existence of overrides. Secondly, the government has not afforded the services that residents seek ...”*

Also, IS added that the level of resident satisfaction is a shared responsibility between the government and the people.

*“The schemes usually include the basic services and social infrastructure being designed according to global standards; however, at the implementation stage, the situation differs. For example, if there is a space selected as a children playground, some objections may come from the municipal council to convert this space to a football field. So, away from the possibility of design problems, it is obvious that the problem may not be only in the planning stage, but also, could be because of people interfering ... to impose inappropriate needs. Mostly, such unstudied decisions are applied, causing dissatisfaction with the planning and the locating of functional services” (IS).*

EA’s perception of residents’ satisfaction is similar to that of IS. He argued that *“municipal regulations and laws should be put in place to make people aware of building procedures and acceptable design systems; otherwise, listening to people’s opinions is pointless because their*

*opinions are often outside the standards”* (EA). He also added other reasons for the occurrence of the overrides in the Basra governorate:

*“The reason for the override is the lack of censorship by the municipality for multiple sectors, as the municipality of Basra is composed of several sectors, each serving a specific area. Each of these sectors has different orientations, and these sectors are unrelated to the main centre (Basra Municipality), which makes it difficult for the municipality to control the work of these sectors”* (EA).

For the interviewees who disagreed with resident satisfaction, AF (assistant lecturer) stated that *“in Iraq, the residents’ satisfaction indicator is not activated and does not exist in a clear, tangible way. People will communicate socially anyway, even if the built environment is dissatisfying”*. BA and FA, who are both urban planners in DUP in Basra, disagreed with the impact of this indicator on social interaction among residents because they believe that *“satisfaction is a relative issue, it varies from person to person”* (FA).

Overall, all interviewees have a subjective judgment on resident satisfaction indicator. However, this indicator is based on people’s perceptions and opinions, especially those related to the built environment; therefore, to measure their satisfaction with the built environment, we have to consider people’s opinions and perceptions which are intangible. To address this issue, the question should consider the provision of basic needs that are linked to communal spaces and social services. Otherwise, this indicator needs greater focus than integration with other indicators.

- **Density**

This is the last in the list of SSIs considered in the semi-structured interviews. According to the column “sum SA & SWA”, 11 out of 17 interviewees agreed that ‘density’ impacted on social interaction among residents, and this could be measured in an Iraqi residential context, as seven selected “strongly agree”. However, six disagreed, four neither agreed nor disagreed, and the remaining two chose “somewhat disagree”. According to the response scores, this indicator received an average of 3.9, which corresponds to the scale “neither agree nor disagree”.

According to AK, an architect, and AF, an assistant lecturer, density influences social interaction among residents; therefore, it is an important indicator for inclusion when measuring social sustainability. EA, an architect, confirmed the influence of density on social interaction; consequently, he recommended multi-rise residential buildings to address the increasing populations in the city center as long as they do not affect negatively on the social aspect. Moreover, BA, an urban planner, explained the significance of density for social interaction as *“it is leading to population affinity”*. These two interviewees concluded that social interaction

increases in high-density areas, which is similar to arguments in the literature that indicate higher densities may make access to services and facilities both easier and more economically viable (Burton, 2000b; Collie, 1990; Haughton et al., 2003; ODPM, 2003), although this may vary between services and with other issues (e.g. job access) (Burton, 2000a, 2000b). Higher densities may also mean that people are more likely to meet each other on the street than in lower-density areas (Talen, 1999).

There are, however, alternative arguments that, in higher density societies, people may withdraw from social contact and experience stress (Bridge, 2002; Freeman, 2001; Simmel, 1995; Wirth, 1938). This is similar to statements by some of the interviewees, such as RR (assistant lecturer) who argued that following the required standard regarding density is important when designing the neighbourhood. *"In my opinion, the high-dense neighbourhoods could cause social withdrawal, and the low-dense districts give a sense of alienation, which may affect social interaction among residents"* (RR). Similarly, IS stated that density is an essential factor in designing a residential sector. Thus, greater density means less social interaction, as it can cause social withdrawal.

*"Social interaction exists in high-density neighbourhoods, but mostly, it is a negative interaction due to increased negativity and emerging problems. In low-dense neighbourhoods, the rate of interaction is concise [based] on known ... neighbours, which is unlike what is practised in densely populated areas, and sometimes this interaction becomes less".*

MF, an assistant lecturer, considered the density indicator from another perspective. He clarified that *"the density phenomenon in residential areas is a social nature of Iraqi society because the Iraqi individual tends to settle in the main family house"*. Also, he argued that the growth of high-density neighbourhoods in Iraq, and particularly in Basra, was due to public policies developed by the government.

*"The public policies have not met the increasing demand for housing units due to the increasing population growth. In other words, the default in solving the over-density issue in some neighbourhoods of Basra city with high residential and population densities, such as providing new neighbourhoods for groups of workers, and professionals to mitigate over-density in the city centre and its surroundings. The emergence of overrides in the city is because of the housing crisis, and incremental population growth in addition to the limited income amongst some people which force them to divide an original dwelling amongst ... more than one family.*

Furthermore, SB neither agreed nor disagreed with the impact of the density indicator on social interaction among residents, in general, because she does not believe that increasing the density of population enhances social communication.

*“It is expected that relations will increase and become entangled in the wake of the growing population. However, the proportion of the social relationships among residents does not increase in number but depends on the increase in the proportion of gatherings. For example, the residents who live in high-rise buildings with multiple storey may find it difficult to establish relations with neighbours, which may be superficial. Such relationships grow between the residents of the building when they are meeting at the entrance, elevator or in the parking lot. This could lead to a shortage of relations between residents, unlike the nature of relations in popular or traditional neighbourhoods of the city where density does not play a large role in social interaction” (SB).*

Similarly, TY and AA, who are urban planners, argued that the density of a population does not affect the quality and quantity of social communication among residents and the evidence on this is clear amongst contemporary neighbourhoods. *“In some contemporary residential neighbourhoods, there is strong social cohesion despite the low population density compared to the traditional Mahalla where social relations are adopted through clubs, stadiums and cafés” (TY).* This suggests that, nowadays, the privatisation of closed public spaces somehow enhances social relations among residents. Also, FA, an urban planner, disagrees with the effect of density on social interaction *“it is not influential because the Iraqi community is socially adapted in different densities”*; this is similar to the views of AG, a lecturer in BU.

- **Reflective Discussion:**

To conclude, the results of the second question of the semi-structured interviews confirm that all interviewees agreed on the need to consider the indicators of social sustainability in their working processes. This is not only because of their impact on social interaction but also due to their influence on each other and their role in improving the quality of life and social sustainability of residential environments. According to experts' perceptions, these indicators are applicable and measurable in the Iraqi urban context. However, the interviewees declared that not all these examined indicators are considered in their work despite confirming their importance for design, planning, development and decision-making. This is probably because social sustainability is a new complex concept that has been granted slight attention in the Middle East, in general, and the Iraqi context in particular. Also, there is a lack of adequate knowledge on the notion of social sustainability amongst Iraqi architects, urban planners, designers and decision-makers who seem to have a simple comprehension of the concept. In addition, the lack of attention could be attributed to inadequate support for social sustainability's required procedures (indicators) when designing and implementing them in the residential sector. *“There is a lack of awareness on the importance of social sustainability and its indicators” (EA).* Another reason was offered by AS (an urban planner who works in the private sector) who stated that:

*“Currently, these indicators are not taken into account in the reality of designing the schemes, their implementation, and developing the neighbourhoods. This is because the planning of the city is unregulated and uncontrolled. Also, the demarcation of residential neighbourhoods is compulsory at present”.*

Also, the housing crisis has meant the neglect of social sustainability and its indicators when considering developments, as stated by the architect IS:

*“The growing housing crisis in Iraq made the demand to increase housing units is a high priority, and the implementation of residential designs at maximum speed is a must. This leads to the quick creation of designs by architects and urban designers without any importance given to the indicators mentioned above in those designs”.*

IS continued *“some of these indicators exist among people subconsciously. Also, applying these indicators depends on the ownership type of the property. So, if it is private property, some of these indicators will be applied for sure”.*

To sum up, as shown in Figure 5-1, it was found that the first five indicators were mentioned and used frequently in earlier studies that considered the notion of social sustainability in general, and the indicator social interaction in particular. For instance, Ahmed (2012), Bramley & Power (2009), Farshidi (2016), Francis, Giles-Corti, Wood, & Knuiman (2012), Kennedy & Buys, (2015) and Reid (2015) examined these indicators in their studies. However, the last indicator in the list, density, received fewer total agreement counts, and thus had an average score of 3.9. Nevertheless, the density indicator was mentioned in earlier studies as one of the indicators that influence social sustainability and social interaction among residents (Bramley & Power, 2009; Dave, 2011; Karuppannan & Sivam, 2011).

### **5.3.2. Interviewees Acceptance of the Sub-Variables of the Social Sustainability Indicators:**

This was the third question of the semi-structured interviews. The text of the question was: *‘Please indicate your degree of agreement or disagreement with the following list of sub-variables shown in the table for each of the indicators of social sustainability mentioned in the previous question. Please tick (✓) one box in front of each index in the table below’.* The question was close-ended and used a five-point Likert Scale that offered the following choices: “Strongly agree”, “Somewhat agree”, “Neither agree nor disagree”, “Somewhat disagree”, and “Strongly disagree”. Also, it asked other questions relating to the reasons for each answer. This question included a list of 25 sub-variables concerning the sixth social indicator of social sustainability, as mentioned in the second question of the semi-structured interviews. The experts, according to their perceptions and experiences, were asked about their degree of

agreement or disagreement with the sub-variables of each indicator, and whether they could be used to measure the SSI in an Iraqi context. Table 5-3 details the answers to this question.

*Table 5-3 Counts of the answers to the third question of the semi-structured interviews, concerning the sub-variables of the social sustainability indicators.*

Sub-variables		SA	SWA	Sum SA & SWA	NAND	SWD	SD	Sum NAND, SWD, SD	The average
Sense of community	Knowing the neighbours/sense of community	8	7	15	2	0	0	2	4.4
	Participation in community affairs, social activities and civic responsibilities.	7	8	15	2	0	0	2	4.3
	Participatory decision-making processes relevant to the neighbourhood	4	10	14	3	0	0	3	4.1
	Making new friends.	4	10	14	2	1	0	3	4.0
Safety and Security	The crime rate (criminal code, violent, property crimes) or frequency of conflict.	13	2	15	2	0	0	2	4.6
	Percentage of residents who feel safe in their neighbourhood during daytime and night.	9	6	15	2	0	0	2	4.5
	The incidence of crimes committed by youth.	9	5	14	3	0	0	3	4.4
	Percentage of residents who feel safe in the communal spaces within residential neighbourhoods during the daytime and night.	8	6	14	3	0	0	3	4.3
	The incidence of racism and hatred crime.	8	3	11	4	2	0	6	4.0
Attachment to the place/Sense of Pride	Feeling attached to the neighbourhood strongly as one of its members	6	11	17	0	0	0	0	4.4
	When I arrive in the neighbourhood, I feel as if I have finally arrived at my home	8	7	15	2	0	0	2	4.4
	I feel proud of living in this neighbourhood for its good design and planning.	6	7	14	4	0	0	4	4.1
Residents' satisfaction	Resident satisfaction with the planning and design of both the neighbourhood and communal spaces in the neighbourhood.	8	5	14	3	1	0	4	4.2
	Resident satisfaction with the housing area	5	6	11	4	2	0	6	3.8
	Satisfaction with the aesthetic appearance of the built environment, providing attractive elements like water fountains and plants.	6	4	10	4	2	1	7	3.7
	Aesthetics of the facades of buildings surrounding the communal spaces.	5	4	9	4	2	2	8	3.5
Privacy	Perceived privacy and comfort when using communal spaces within the residential neighbourhood.	6	9	15	1	1	0	2	4.2



Sub-variables		SA	SWA	Sum SA & SWA	NAND	SWD	SD	Sum NAND, SWD, SD	The average
	Hierarchy in spaces within the residential neighbourhood (open spaces and street network).	8	6	14	2	0	1	3	4.2
	Physical or visual boundaries (trees and fences).	8	6	14	2	0	1	3	4.2
	Surveillance for the users of the communal spaces (e.g. parents and children).	7	6	13	2	1	1	4	4.0
Density	The number of communal space users.	8	6	14	3	0	0	3	4.3
	The number of people per house.	8	6	14	2	0	1	3	4.2
	The number of households per house.	7	7	14	2	0	1	3	4.1
	The number of people living in the neighbourhood to the total area of the residential neighbourhood.	6	7	13	2	1	1	4	3.9
	Percentage of housing units to the total area of the residential area (comparing the current situation to the standard)	4	8	12	3	0	2	5	3.7

Table 5-3 illustrates the counts of interviewees who answered the third question of the semi-structured interviews. Their responses are divided into five categories: Strongly Agree (SA), Somewhat Agree (SWA), Neither Agree Nor Disagree (NAND) and Strongly Disagree (SD). In addition, three columns show firstly, the sum of the SA and SWA columns, secondly, the sum of the NAND, SWD, and SD columns, and thirdly, an average of the scores (scores/17). It is apparent from this table that most of the sub-variables for each indicator were agreed by the interviewees. As shown in the “Sum SA & SWA” and “Sum NAND, SWD & SD” columns, the agreement responses exceeded the disagreement responses. Each group of sub-variables for each indicator were sorted from the largest to the smallest value according to the “Sum SA & SWA” column.

As presented in the figures below and Table 5-3, variables within the indicators for the sense of community, safety and security, attachment to place, and privacy received high agreement scores from the interviewees. All the sub-variables received an average score equal to 4.0 and less than 5.0. From the results in Table 5-3, the sub-variable that had received agreement from all the interviewed experts was “feeling attached to the neighbourhood” which belonged to the indicator ‘attachment to place’, see Figure 5-4. For the ‘sense of community’ indicator, the sub-variable “knowing the neighbours” received an average score of 4.4, and 15 out of 17 interviewees agreed with its significance. Meanwhile, the sub-variable “making new friends” received an average score of 4.0, and 14 out of 17 interviewees agreed with its significance, see



Figure 5-2. In terms of the safety and security indicator, the sub-variable with the highest average score (at 4.6) was “the crime rate...” and the total of interviewees who agreed with this was 15. Moreover, “the incidence of racism and hatred crimes” received an average score of scores 4.0 and only 11 interviewees agreed with its importance, see Figure 5-3.

In considering the attachment to place, the first two sub-variables, “feeling strongly attached to the neighbourhood ...” and “when I arrive in the neighbourhood...”, both received average scores of 4.4. However, all 17 interviewees agreed with the first sub-variable whilst 15 out of 17 agreed with the second, see Figure 5-4. In terms of resident satisfaction, the results for the sub-variable, “resident satisfaction with the planning and design of both the neighbourhood and communal spaces in the residential neighbourhood” received a higher average score at 4.2, with 14 of the interviewees indicating their agreement.

Meanwhile, the remaining three sub-variables received an average of score lower than 4.0, and the lowest was “aesthetic of the facades of buildings surrounding the communal spaces” at 3.5 with only nine interviewees confirming their agreement (Figure 5-5). For the privacy indicator, the first three sub-variables received the same average of scores of 4.2, and the last received a score of 4.0. However, the total agreement counts are different where 15 interviewees agreed on “perceived privacy...”, while 14 interviewees agreed on “hierarchy in spaces...” and “physical or visual boundaries...” and 13 interviewees agreed on “surveillance for users” (Figure 5-6). For the density indicator, a comparison of the results reveals that 14 interviewees agreed with the sub-variable “the number of the communal spaces' users”, which received higher than average scores at 4.3. The sub-variable that received a lower than average score (at 3.7) with agreement from only 12 interviewees was the “percentage of housing units”, see Figure 5-7.

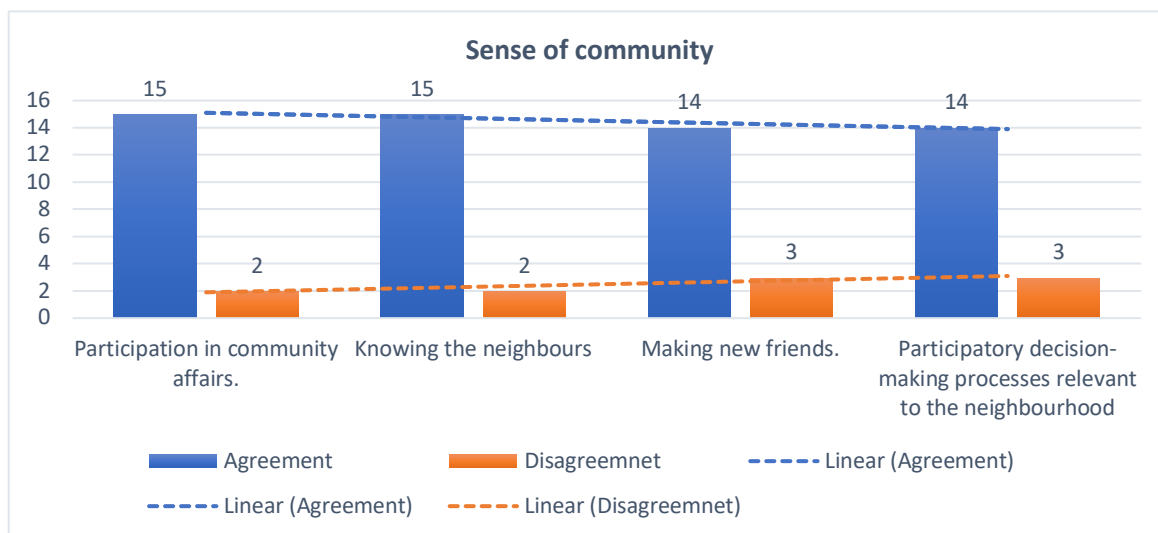


Figure 5-5-2 Response rate concerning the total agreement and disagreement on sense of community.

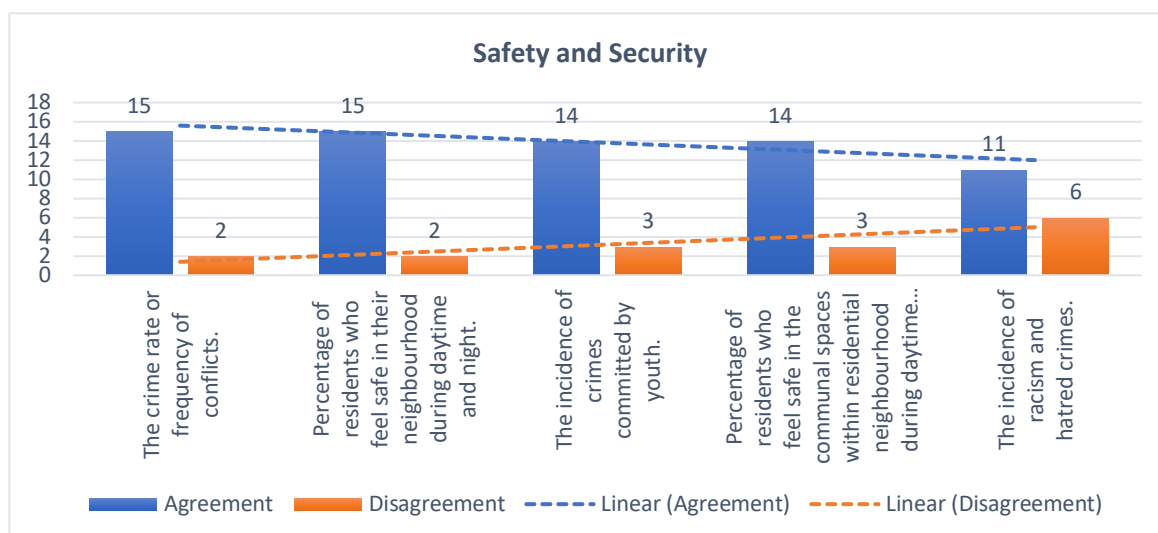


Figure 5-5-3 Response rate concerning the total agreement and disagreement on safety and security.

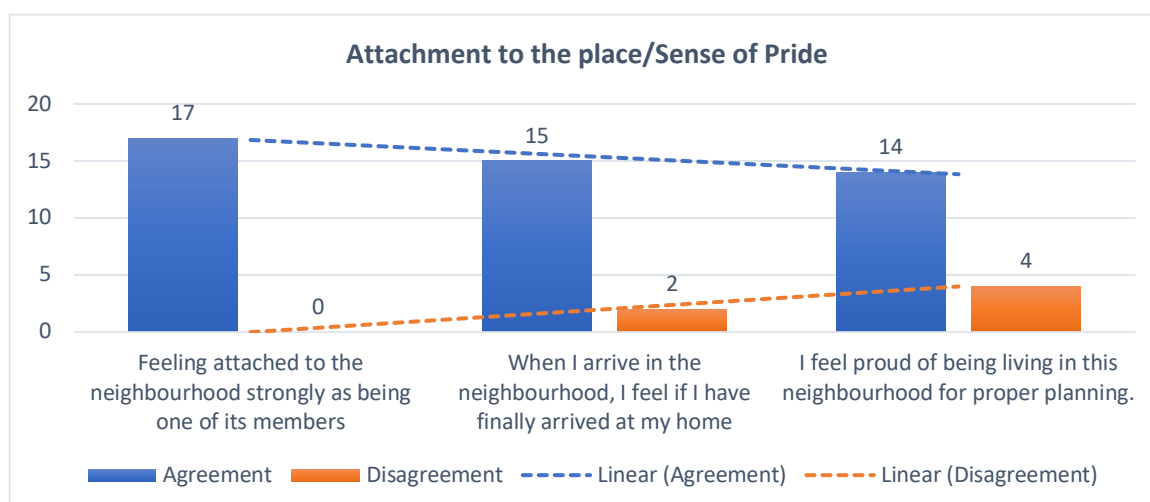


Figure 5-4 Response rate concerning the total agreement and disagreement on attachment to place/sense of pride.

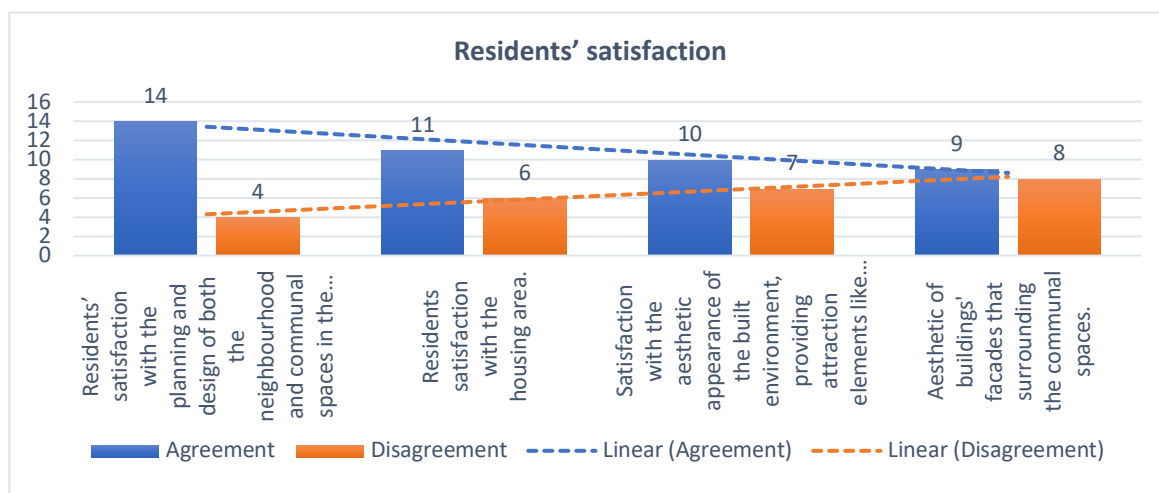


Figure 5-5 Response rate concerning the total agreement and disagreement on residents' satisfaction.

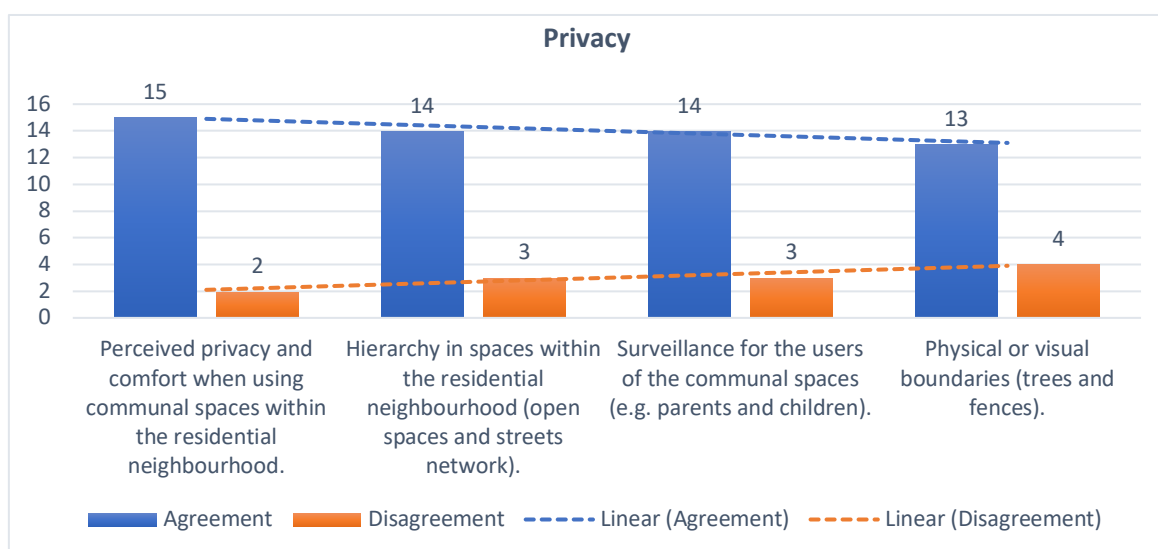


Figure 5-6 Response rate concerning the total agreement and disagreement on privacy.

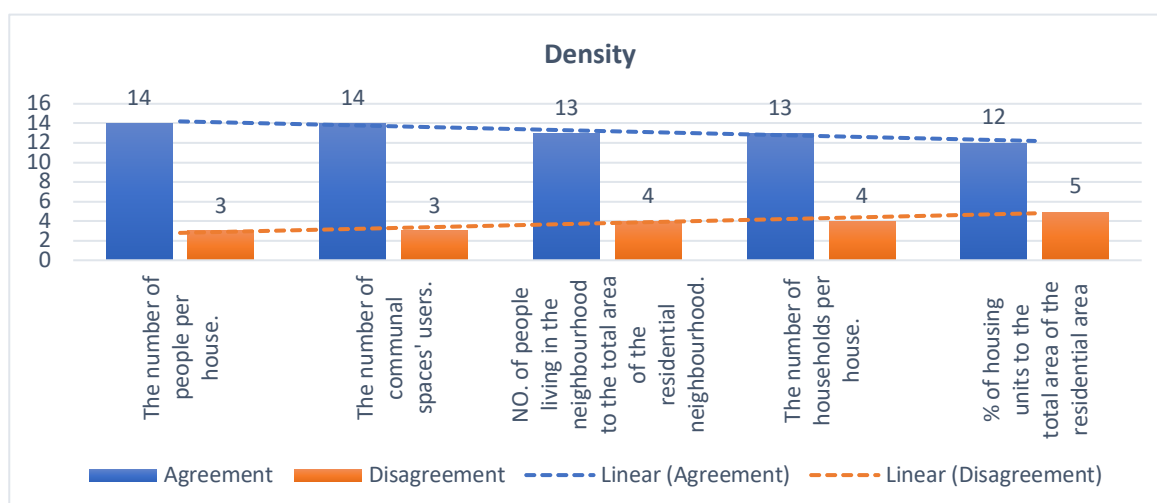


Figure 5-7 Response rate concerning the total agreement and disagreement on density.

- **Reflective Discussion:**

The sub-variables of the SSI listed in this question were collected from the literature review. They were gathered from different studies that considered the indicators of social sustainability separately, such as Bramley, Dempsey, Power, Brown, & Watkins (2009), Dave (2011), Farida (2013), Farshidi (2016) and Karuppannan & Sivam (2011). The interviewed Iraqi experts agreed on most of these sub-variables and considered them essential in measuring the SSI due to their effect on the social interaction among residents in the Iraqi urban context. However, they suggested adding some new sub-variables, which will be explained in the next section. The reason for approving these sub-variables is because they relate to architectural aspects and can be used to evaluate the physical characteristics of the built environment. Table 5-4 shows the sub-variables that received lower agreement counts.

*Table 5-4 The sub-variables from the social sustainability indicators that received lower agreement counts, according to the experts' opinions.*

Indicator	Sub-variables	The counts	The average score
Residents' satisfaction	Aesthetic of the façades of buildings surrounding public spaces	9	3.5
	Satisfaction with the aesthetic appearance of the built environment, providing attraction elements like water fountains and plants.	10	3.7
	Resident satisfaction with the housing area	11	3.8
Safety and Security	The incidence of racism and hatred crimes.	11	4.0
Density	The number of people living in the neighbourhood to the total area of the residential neighbourhood.	13	3.9
	Percentage of housing units to the total area of the residential area (comparing the current situation to the standard)	12	3.7

### 5.3.3. Additional Social Sustainability Indicators and/or Sub-Variables:

This is the fourth question of the semi-structured interviews; the text of the question was *'Please indicate if there are additional social sustainability indicators that you consider important and should be added to the second question. Kindly clarify why you think these additional indicators are important'*. This was an open-ended question, which was designed to capture detailed information about the opinions of experts on the addition of new SSI to the list detailed in the second question (section 5.3.1). This offered interviewees an opportunity to express their views and experiences.

Basically, the interviewees agreed with the original list of SSIs, and most did not add any new indicators or sub-variables. As previously mentioned in section 5.3.1, this was due to the lack of knowledge on social sustainability amongst those who work in professional fields involved

with the design, planning, implementation, and decision-making in the residential sector. Also, the indicators of this notion have not been practised in the design process. However, 35% of the interviewees suggested adding new sub-variables to some of the indicators, which can measure their social impact in a way that relates closer to the PCBE. Meanwhile, other interviewees offered some suggestions as an attempt to improve the current situation of the built environment. One of the interviewees offered suggestions related to general residential policies. MF, an assistant lecturer, discussed the need to address the housing crisis that resulted from population growth densities through:

*“... first, providing new housing units or residential plots in new neighbourhoods; adopting planning systems that take into account future expansion; set strict regulations on the overrides, and activate social awareness committees to identify the problems of the population as well as education towards a better environment”.*

The following sections will explain the additional sub-variables of each indicator.

- **Safety and Security Indicator:**

As mentioned in the second question under the safety and security indicator section, the interviewees highlighted the need to consider issues related to the design of residential neighbourhoods, which may affect safety and security. HS mentioned that some sub-variables of the safety and security indicator might be more influential on social interaction among residents than those mentioned in the third question. He said that:

*“To measure the indicator of safety and security from an architectural perspective, I will consider providing playground areas for children regarding quantity as well as locating these areas in a safe zone and separating the movement within the neighbourhood to prevent car accidents. Also, consider whether the type of houses (such as rows and semi-detached houses) and the provision of an open area next to houses may lead to safety and security issues” (HS).*

Moreover, he emphasised an examination of the design of the streets within the neighbourhood in terms of whether they are cul-de-sacs, narrow, or adopt a U-shape, also considering their width, and the provision of street lightening. *“I would prefer [that] my neighbourhood streets would be designed either as cul-de-sacs, narrow lanes, or in a U-shape to reduce the direct penetration of outside streets”.* He claimed that current overrides on the streets have come from resident dissatisfaction and a rejection of the design of street shapes. He claimed that that one of the signs of dissatisfaction with the built environment is using or putting artificial speed bumps in internal streets of the neighbourhood to address the high penetration rate experienced by wide straight streets in a neighbourhood.

One of the things that interviewees kept mentioning that seems to cause safety problems is the width of streets. Both the assistant lecturer RR and the lecturer AG suggested that street widths could lead to problems with safety and security. Also, IS, the manager of the MPS-CPD/BM, stated that:

*“The reason for the safety and security problems could also be due to a defect in the distribution of residential neighbourhood streets with a width of more than 10 meters, making them vulnerable to penetration from the outside and causing traffic accidents within the neighbourhoods” (IS).*

He continued, *“In the current situation, there are some neighbourhoods that have streets with a 20 or 15m width located between houses, while this width should be applied on the streets located between the housing and services areas”*. Also, he indicated another two points; first, examining the rate of car accidents within the neighbourhood, and second, to assess the effect of the built environment on the presence of violent behaviour in families when examining the safety and security indicator.

To sum up, the width and design of the streets are listed under the urban form and are mentioned in the literature (Ahmed, 2012; Mortada, 2003; Taylor, 2002). The current study will consider the width and design of the streets under the site design in the physical characteristics. This will be examined within the site survey of the case studies as well as by questioning people about their satisfaction with the streets' width and shape. Concerning family violence, the study will exclude this issue because it is outside the scope of this particular research; moreover, issues related to family are particularly difficult to measure in a conservative and traditional society like Iraq. In terms of the rate of car accidents within residential neighbourhoods, the research will ask people whether such a problem exists in their neighbourhood that prevents them from engaging in social interaction outside their houses.

- **Resident Satisfaction**

Under Resident Satisfaction, TY indicated that *“in my opinion, providing public services, such as educational, commercial, such as supermarkets, and health facilities will have an impact on people's satisfaction with the built environment of the neighbourhood”*. This means examining the level of satisfaction with the infrastructure service provision in the area as a catalyst for longer, stable residence. The study will conduct a site survey for the case studies to locate the case study from the city centre and identify the infrastructure services within the case study. This action will be added under the site design in the physical characteristics.



- **Privacy Indicator**

New sub-variables have been added to the list of privacy indicator sub-variables. HS indicated some points that should be taken into account to measure the privacy of the place, such as the total area and design of the house. However, this point is out of the scope of this research. The research focuses on the urban form of the residential neighbourhood and excludes the area and design of the housing unit. Three other points have been adding by HS:

*“To measure the sense of the privacy of the place, some points need to be considered, such as whether the place is used by a single person or a family; the type and location of the communal space, such as a park or playground area; the time of using the place, and the area and design of the house” (HS).*

Thus, these points were added:

- The type of communal space, such as a park or playground area;
- Whether the place is used by a single person or a family;
- The time of using the place.

The previous points will be considered in this study. Data on the first point will be collected from the secondary data obtained from analysing the case study maps and masterplans obtained from the BM and will be considered under the site design in the physical characteristics. Information on the last two points will be gathered from the questionnaire and behavioural observation.

- **The attachment to place/sense of pride:**

As mentioned in section 5.3.1 under the attachment to place/sense of pride, some interviewees linked the influence of the attachment to place on social interaction among residents to the presence of architectural symbols or landmarks in the built environment. This is because of the contribution of symbols and landmarks to the sense of importance and value in a place amongst residents that encourages them to engage with it in their social activities.

*“The existence of architectural symbols or landmarks in a neighbourhood reflects the identity and belonging of the resident to that neighbourhood; so, it is essential to consider this aspect in measuring and examining the indicator of the attachment to place/ sense of pride” (RR).*

The lecturer, AG, suggested another factor related to the DF that relate to the attachment to place, namely the presence of relatives in the same neighbourhood where a family live. This factor encourages current inhabitants to positively interact with the place and population.

To summarise, the views mentioned by RR are similar to those stated in the literature review. However, this is outside the scope of the current research, which does not consider the identity

of the place in the attachment to place/sense of pride; instead, it focuses on the relationship between the place and users. AG suggestion will be taken into account and added to the DF “*the presence of relatives in the same neighbourhood where the family lives*”.

- **Reflective Discussion:**

In this section, Table 5-5 illustrates the new suggested sub-variables for safety and security, resident satisfaction, privacy, and the attachment to a place considered in this study. All the added sub-variables have been highlighted in earlier studies, although some have not been closely studied.

*Table 5-5 Additional sub-variables for the social sustainability indicators according to the opinions of experts.*

The Added Sub-Variables	The Main Factor
The rate of car accidents occurring within the residential neighbourhood	Safety and security indicator
Satisfaction with infrastructure services in the area as a catalysing factor for long stable residency	
Whether the place is used by a single person or a family	Privacy indicator
Considering the time using the place	
The width of the streets	Site design (the neighbourhood & communal spaces)
The design of the street forms	
Locating the case study from the city center	
Locating the infrastructure services of the case.	
The type of communal space, such as a park or a playground area	
The presence of relatives in the same neighbourhood where the family live	Demographic factor

#### **5.4. Physical Characteristics of the Built Environment (PCBE):**

In the semi-structured interviews, three questions were asked about the list of PCBE and their sub-variables, in terms of their impact on social interaction. The list was collected from earlier studies, such as Bramley et al. (2009), Bramley & Power (2009) and Karuppannan & Sivam (2011), and this formed the second aspect of this study, namely to examine the influence of these factors on social interaction among residents in communal spaces within residential neighbourhoods. The following sections will analyse responses to the three questions relating to the PCBE.

##### **5.4.1. The Acceptance of the Physical Characteristics of the Built Environment:**

The PCBE were represented in the seventh question of the semi-structured interviews. The text of the question is, ‘*please indicate your degree of agreement or disagreement with the following list of physical characteristics of the built environment that can influence the social interaction among residents in residential neighbourhoods and can be applied in the Iraqi urban context.*

Please tick (✓) one box', see question seven in Appendix F. The question was close-ended and used a five-point Likert scale. It also included an open-ended question that asked interviewees to give reasons for each answer. The question included a list of PCBE. The interviewees were asked to indicate their degree of agreement or disagreement on whether the selected PCBE have an impact on residents' social interaction in the communal spaces of SFHNs in Iraq. They were also asked whether these PCBE can be measured in the Iraqi residential urban context. Table 5-6 and Figure 5-8 show the answers to this question.

Table 5-6 The counts and rates of the answers to the seventh interviews question about the physical characteristics of the built environment.

Physical Characteristics	SA	SWA	Sum SA & SWA	NAND	SWD	SD	Sum SD, SWD, NAND	The average of scores (scores/17)
Provision and location of public utilities (social, educational, etc)	10	7	17	0	0	0	0	4.6
Accessibility	9	7	16	1	0	0	1	4.5
Provision and location of open and green spaces.	8	7	15	2	0	0	2	4.4
Site design (the neighbourhood and communal spaces)	5	10	15	2	0	0	2	4.2
Maintenance	6	7	13	3	1	0	4	4.1
Climate responsive design	8	4	12	3	1	1	5	4.0

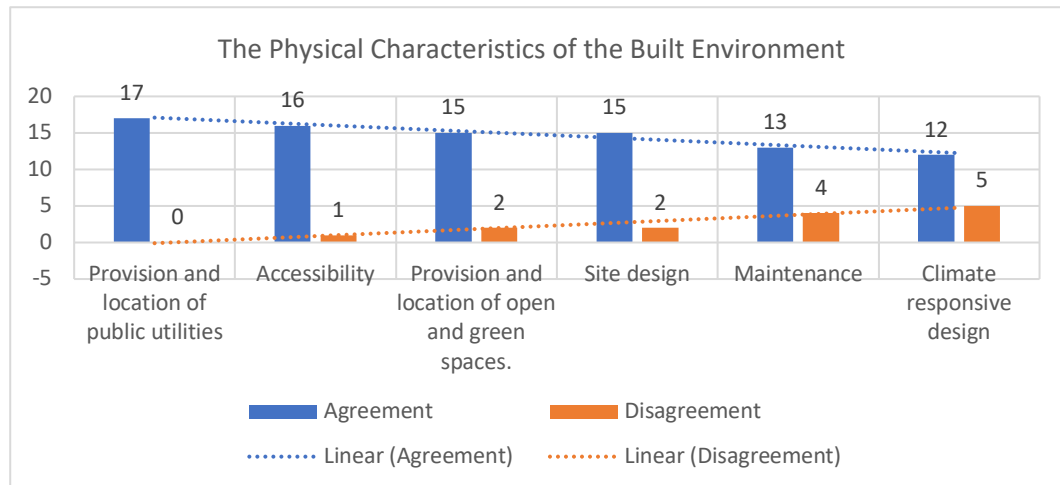


Figure 5-8 Response rates of agreement and disagreement with the physical characteristics of the built environment.

Table 5-6 illustrates the counts and degree of experts' agreement or disagreement with the seventh question from the semi-structured interviews. These are presented within five categories: "Strongly Agree" (SA), "Somewhat Agree" (SWA), "Neither Agree Nor Disagree" (NAND) and "Strongly Disagree" (SD). In addition, three columns are added: the first represents the sum of SA and SWA; the second represents the sum of NAND, SWD, and SD, and the last column represents the average scores (scores/17).

What is notable in Table 5-6 is the significant positive responses for the influence of all the seven PCBE on social interaction among Iraqi residents. According to the results in the "Sum SA & SWA" column that show the total agreement counts, it can be seen that "the provision and location of public utilities..." was ranked highest with a score of 17, and "accessibility" was ranked the second rank with a score of 16. The third rank was "the provision and location of open and green spaces" and "site design of both the neighbourhood and communal spaces" which received a score of 15, while "maintenance" received a score of 13 and was thus ranked fourth. The physical characteristics "climate responsive design" was ranked last.

According to the average scores, it appears that all physical characteristics received average scores equal to or greater than 4.0, which means that the experts agreed with all characteristics. A comparison of the results reveals that "the provision and location of public utilities" received a high average score at 4.6, while "climate responsive design" received low average scores at 4.0.

To summarise, because all PCBE received average scores equal to or greater than 4.0, all of them are essential when considering their effect on social interaction among residents in an Iraqi urban context, and especially in communal spaces within residential developments. Therefore, the current study will consider the provision and location of public utilities (social, educational, etc.); accessibility; the provision and location of open and green spaces; site design (the neighbourhood and communal spaces); maintenance, and climate responsive design.

#### **5.4.2. The Acceptance of the Sub-Variables of the Physical Characteristics of the Built Environment:**

This is the eighth question of the semi-structured interviews, which asked, *"Please indicate your degree of agreement or disagreement with the following list of sub-variables shown in the table below for each of the physical characteristics of the built environment mentioned in the previous question. Please tick (✓) one box in front of each index in the table below"*, (see question eight in Appendix F). The question was close-ended and used a five-point Likert Scale that included: "Strongly agree", "Somewhat agree", "Neither agree nor disagree", "Somewhat disagree", and "Strongly disagree". It also asked another question that offered the opportunity to give reasons for each answer. This question included variables for each physical characteristic of the built environment mentioned in the previous question. The question asked the interviewees to indicate their degree of agreement or disagreement with the sub-variables for each physical characteristic. Table 5-7 shows the answers to this question.

Table 5-7 The response counts and rates to the eighth interviews question about the sub-variables of the physical characteristics of the built environment.

Variables		SA	SWA	Sum SA & SWA	NAND	SWD	SD	Sum SWD, SD &	The average of scores (scores/17)
Provision and location of public utilities (social, educational, etc.)	The location of the infrastructures according to the need of the residential neighbourhood	9	8	17	0	0	0	0	4.5
	The provision of the infrastructures within the residential neighbourhood (social, educational, etc.)	9	7	16	1	0	0	1	4.5
Provision and location of open and green spaces.	Number of green and open spaces within the residential neighbourhood	10	5	15	2	0	0	2	4.5
	Appropriate distribution of green and open spaces within the residential neighbourhood	10	4	14	3	0	0	3	4.4
Accessibility	The accessibility to communal spaces	10	5	15	2	0	0	2	4.5
	The proximity of communal spaces to users in the neighbourhood.	7	10	17	0	0	0	0	4.4
	The number of children with access to communal spaces in the neighbourhood.	8	3	11	3	3	0	6	3.9
	The number of males with access to communal spaces in the neighbourhood.	6	5	11	4	2	0	6	3.9
	The number of females with access to communal spaces in the neighbourhood.	5	2	7	8	2	0	10	3.6
Site design (the neighbourhood & communal spaces)	The layout of the residential neighbourhood	8	8	16	1	0	0	1	4.4
	The area of communal spaces within the residential neighbourhood	9	6	15	2	0	0	2	4.4
	The layout of communal spaces within the residential neighbourhood	8	6	14	3	0	0	3	4.3
	The layout of the dwelling	3	4	7	6	4	0	10	3.4
Climate responsive design	A proper design for the environmental climate of the region	9	7	16	1	0	0	1	4.5
	The selection of building materials that fit the place and region.	11	4	15	2	0	0	2	4.5
	The use of appropriate architectural treatments to the local environment	12	2	14	3	0	0	3	4.5
Maintenance	The maintenance of communal spaces	12	4	16	1	0	0	1	4.6
	The maintenance of the residential neighbourhood	9	6	15	2	0	0	2	4.4

Table 5-7 illustrates the counts of the interviewed experts who indicated their degree of agreement or disagreement with the eighth question of the semi-structured interviews. The responses are classified into five categories: “Strongly Agree” (SA), “Somewhat Agree” (SWA), “Neither Agree Nor Disagree” (NAND) and “Strongly Disagree” (SD). In addition, three columns are included; the first represents the sum of SA and SWA; the second represents the sum of NAND, SWD, and SD, and the last column is for the average scores (scores/17).

An inspection of the data in Table 5-7 reveals that the rate of agreement (the sum of SA & SWA) is higher than the rate of disagreement (sum of NAND, SWD, & SD), as shown in Table 5-7. Therefore, most experts highlighted the importance of considering most of the indicators although they admitted that they usually do not pay much attention to these indicators during the design and implementation stages. The sub-variables of each physical characteristic have been sorted from the largest to the smallest according to the values of the average score. An inspection of the data in Table 5-7 clearly shows that most of the interviewees agreed with the sub-variables of the PCBE examined in this study. This is clear from the values in the “Sum SA & SWA” and “Sum of NAND, SWD & SD” columns.

Regarding the average scores presented in Table 5-7, it can be seen that each of the sub-variables of the “*provision and location of public utilities*” received an average score of 4.5. However, there is a slight difference in the counts of the interviewed experts who agreed with each sub-variable; thus, 17 interviewees agreed with “location of the public utilities”, while 16 interviewees agreed with “the provision of the public utilities”, see Figure 5-9. Also, the following sub-variables “the number of open and green spaces...” and the “appropriate distribution...” of the physical characteristic “*provision and location of open and green spaces*” received average scores of 4.5 and 4.4, respectively. Moreover, 15 interviewees agreed with the first sub-variable, and 14 with the latter, see Figure 5-10.

When considering “*accessibility*”, the sub-variable that received a high average score of 4.5 was “the accessibility to the communal spaces”, and 15 agreed. Meanwhile, the sub-variable “the number of females who have access to the communal spaces” received a low average of score of 3.6, and only seven interviewees indicated their agreement, see Figure 5-11. In terms of the “*site design of the neighbourhood and the communal spaces*”, two sub-variables received a high average score of 4.4: “the layout of the residential neighbourhood” and “the area of communal space”. Thus, 16 interviewees confirmed their agreement with the first sub-variable and 15 interviewees agreed with the second. Meanwhile, the sub-variable “the layout of the dwelling” received a low average of score of 3.4, with only seven interviewees indicating agreement, see Figure 5-12.

Regarding “*climate responsive design*”, and according to the results in Table 5-7, it can be seen that all three sub-variables “a proper design...”, “the selection of building materials...”, and “the use of appropriate architectural treatments” received average scores of 4.5, while the number of interviewees who confirmed their agreement were 16, 15, and 14, respectively, see Figure 5-13. Finally, for the last physical characteristic in the list, “*maintenance*”, the sub-

variables “the maintenance of the communal spaces” and “the maintenance of the residential neighbourhood” received average scores of 4.6 and 4.4, respectively, and the numbers of interviewees who agreed with sub-variables were 16 and 15, respectively, see Figure 5-14.

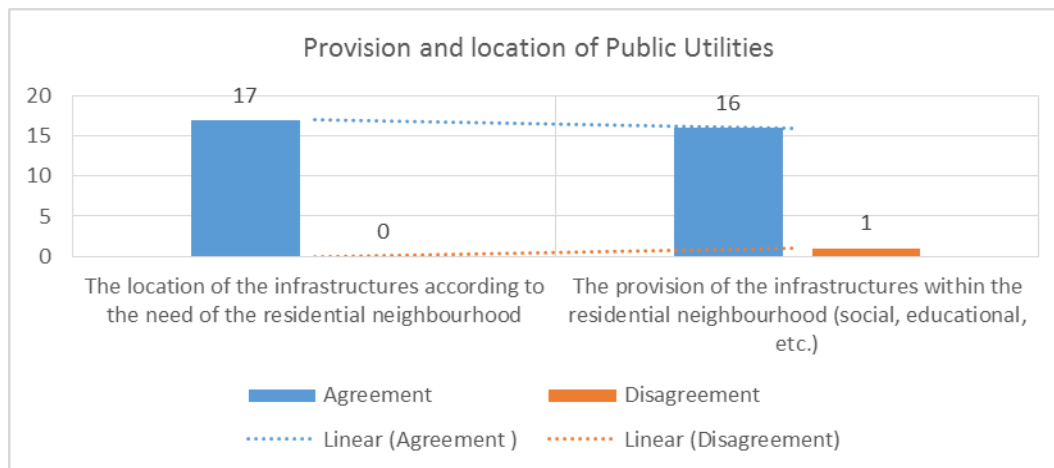


Figure 5-9 Rate of agreement to the sub-variables of the provision and location of public utilities.

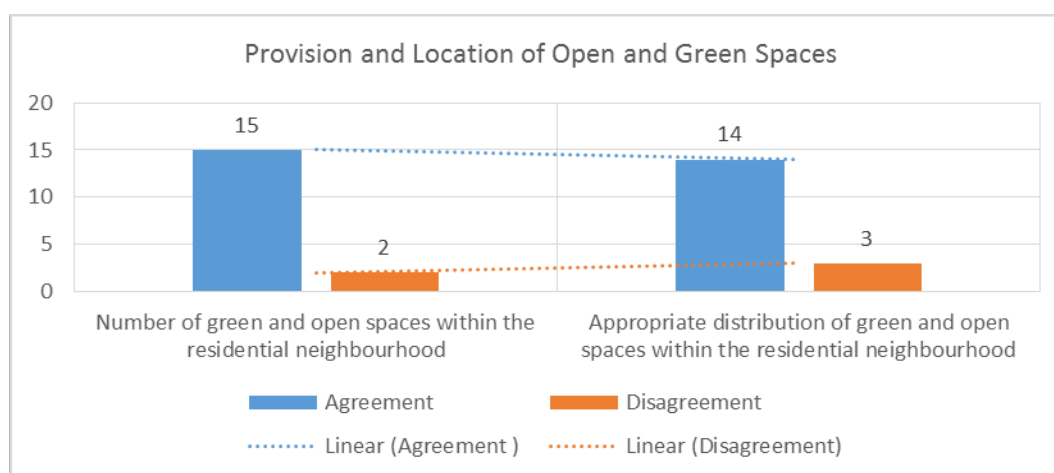


Figure 5-10 Rate of agreement to the sub-variables of the provision and location of open and green spaces.

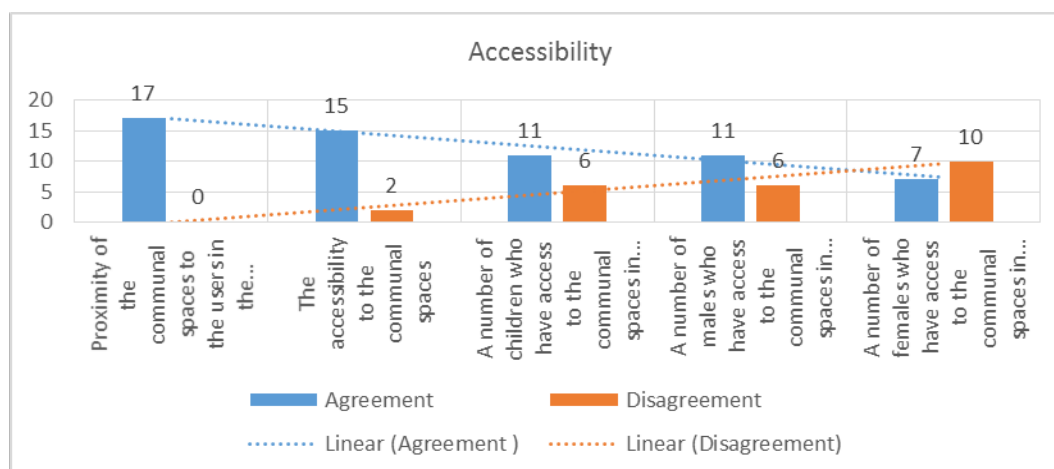


Figure 5-11 Rate of agreement to the sub-variables of accessibility.



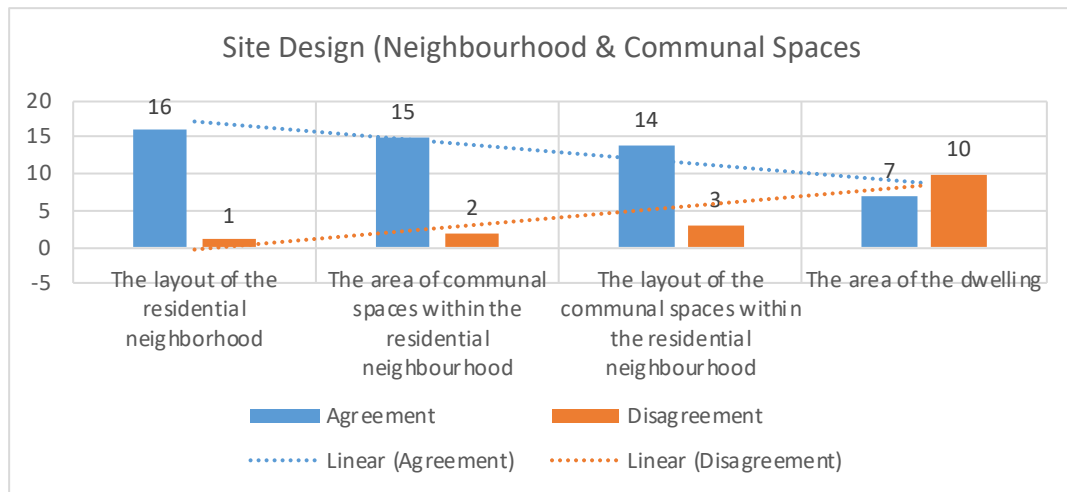


Figure 5-12 Rate of agreement to the sub-variables of the site design (the neighbourhood and communal spaces).

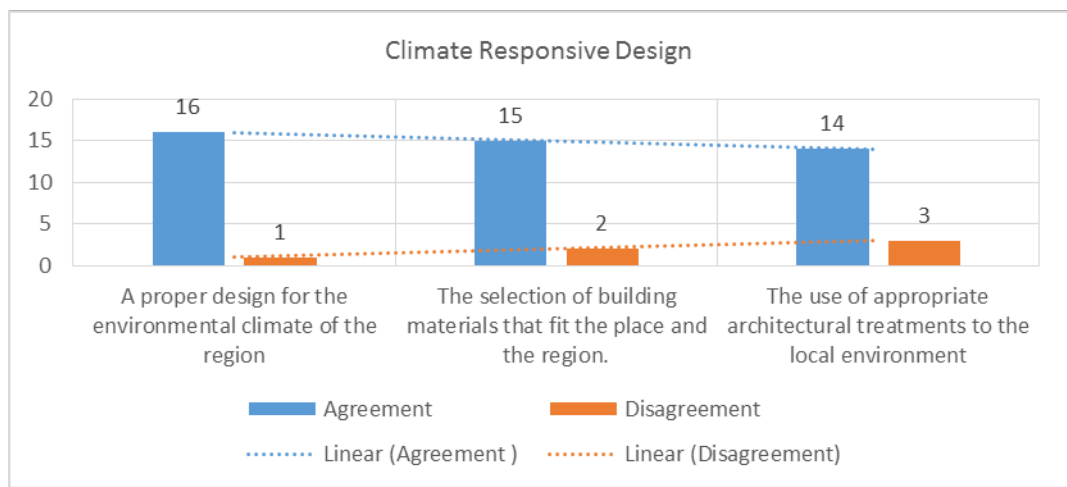


Figure 5-13 Rate of agreement to the sub-variables of the climate responsive design.

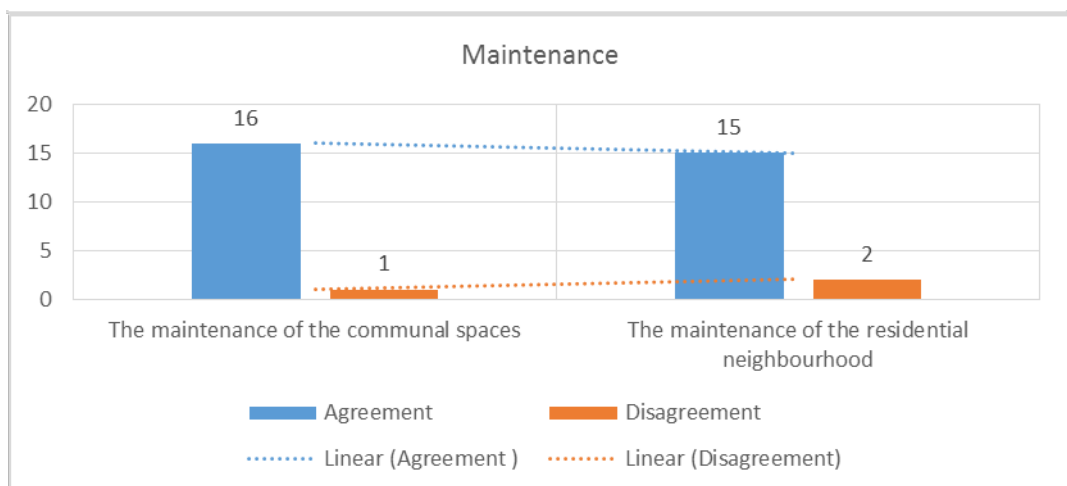


Figure 5-14 Rate of agreement to the sub-variables of the maintenance.

- **Reflective Discussion:**

These results provide important insights into the sub-variables of PCBE, as listed in this question. These sub-variables were collected from the literature review and gathered from different studies that considered the built environment and the urban form. These included: Bramley et al. (2009); Bramley, Dempsey, Power, & Brown (2006); Bramley & Power (2009); Dempsey, Bramley, Power, & Brown (2009); Dempsey, Brown, & Bramley (2012), and Hamiduddin (2015). The results of the semi-structured interviews with Iraqi experts found agreement on all the PCBE and most of their sub-variables, which were considered essential in manifesting the built environment and the urban form of the Iraqi urban context. Experts agreed with some of the sub-variables, where the lowest agreement count was seven interviewees (the rate was 41.1% of the total interviewees). At the same time, the interviewees suggested adding some new sub-variables, which will be explained in the next section.

The sub-variables that received an average score of less than 4.0 are shown in Table 5-8. Interviewees HS and AF argued that, because of the conservative nature of Iraqi society, especially in the southern provinces, counting the number of females with access to communal spaces in the neighbourhood could be an unsuitable measure of accessibility. As a result, they stated that it is less appropriate to include such a sub-variable to demonstrate the accessibility of the areas examined.

*“The woman can be in the open and public spaces with the presence of their male relatives basically. This is because of the customs, traditions and culture of our people that restrict women’s freedom to be alone in public spaces. Although some aspects of lifestyles have changed, this matter still follows customs and traditions. Despite some women going out alone without their male relatives, it just presents a low rate of society, and it is not welcomed by most people” (AF).*

*“Commonly, women are more likely to be at home. Thus, their gathering time differs. According to our customs and traditions, women are not welcomed to socialise and gather alone outside in open or communal spaces. Usually, there are special places for females to gather, which usually is within the zone of the house or on the front doorstep” (HS).*

Nevertheless, other interviewees indicated that lifestyles have changed, especially after the last war in 2003, which means women’s activities are now influenced by these changes. Consequently, it is important to consider the functionality of the neighbourhood components, such as communal spaces to meet the demands of all genders. The same argument has been raised for the sub-variable "the number of children who have access to the communal spaces in the neighbourhood". It was also rejected by some of the experts owing to the current security

situation in the region after the 2003 war, and the potential for car accidents. *“Their presence in the open spaces is discouraged because of social, cultural, and security reasons”* (AS)

*“People, nowadays, have started to prevent their children from playing outside the house because they are afraid of potential car accidents due to the wide and open streets of the neighbourhood. Also, because of the security issues, which could mean kidnapping children for money”* (AF).

Another reason to reject this sub-variable is that numbers do not indicate the accessibility to a place; however, it could be used to evaluate the use of the place, as stated by AG, HS, AS and RR. These interviewees indicated that it is preferable to measure the accessibility of communal spaces by calculating the total number of users of these places without categorising them as male, female and children. However, because the average scores of these sub-variables after rounding them to the nearest integer match the point of Likert Scale “somewhat agree”, these sub-variables will be considered in the observation and behavioural mapping to measure the suitability of communal spaces for use by both genders and all age groups. The excluded sub-variable is “layout of the dwelling” because it is outside the scope of this particular research. Table 5-8 shows the final excluded sub-variables.

*Table 5-8 The excluded sub-variables from some of the physical characteristics of the built environment according to experts’ opinions.*

The Sub-variables	The counts of the answers	The average score	The physical characteristics
The layout of the dwelling	7	3.4	Site design (neighbourhood & communal spaces)

### **5.4.3. Additional Physical Characteristics and/or Sub-variables:**

This is the ninth question of the semi-structured interviews. The text of the question is *‘please indicate if there are additional physical characteristics that you consider important and should be added to the list mentioned previously? Kindly clarify why you think these additional characteristics are important’*. This question was open-ended and was designed to capture detailed information about the preferences and opinions of experts on adding new physical characteristics to the list detailed in the seventh question (section 5.4.1). In addition, it offered interviewees an opportunity to express themselves and to capture their experiences and knowledge in this area.

Generally, interviewees agreed with the original list of PCBE, and 88% did not add any new characteristic or sub-variable. However, suggestions were made by two of the interviewees, as shown in Table 5-9. HS, a lecturer, suggested that it is essential to consider the types of parking

area within the residential neighbourhood. He suggested removing the parking area from the house zone and making one parking area for each block or a couple of blocks within the neighbourhood. He believed that this solution could enhance the chance of meeting neighbours and encourage social interaction. Although this is an important consideration, his suggestion is more likely to be a tool in the design process than used to evaluate the built environment; thus, his addition will be excluded. The assistant lecturer, AF, emphasised the importance of considering the types of single-family houses and their variety within the residential neighbourhood. This suggestion will be taken into account in this research under the urban form features, as it is also mentioned in earlier literature (Abu-Ghazze, 1999; Bramley et al., 2009). Moreover, as mentioned in the reflective discussion in section 5.3.3, five new sub-variables were added under site design (neighbourhood and communal spaces); Table 5-9 shows these additional sub-variables.

*Table 5-9 The additional sub-variables of the physical characteristics of the built environment according to experts' opinions.*

Added Sub-variables	
Site design (neighbourhood and communal spaces).	• The types of single-family housing in the residential neighbourhood.
	• The width of the streets.
	• The design of the street format.
	• Locating the case study from the city centre.
	• Locating the infrastructure services within the case study.
	• The type of communal space, such as a park or a playground area.

## 5.5. Demographic Factors (DF):

Two questions concerning the sample's demographic factors were asked in the semi-structured interviews, which represent the third category of this study. Most of the earlier studies have used DF in the surveys as tools to obtain the socioeconomic background of their participants. However, this study intends to find out firstly, which of these factors have an impact on social interaction among residents in communal spaces within residential neighbourhoods in the Iraqi context and secondly, on social sustainability. The factors in the list were gathered from earlier studies that examined the relationship between social sustainability and its indicators; these were located in similar contexts to the current study (Abu-Ghazze, 1999; Dave, 2011; Farida, 2013; Farshidi, 2016; and Karuppannan & Sivam, 2011). The following sections will analyse the three questions relating to the DF.

### 5.5.1. The Acceptance of the Demographic Factors:

This section is represented in the 12<sup>th</sup> question of the semi-structured interviews. The text of the question is: ‘Please indicate your degree of agreement or disagreement with the following list of demographic factors that can influence the social interaction among residents within residential neighbourhoods and can be applied in the Iraqi urban context. Please tick (✓) one box’, see question 12 in Appendix F. The question was close-ended and used a five-point Likert scale. It also includes an open-ended question that asks interviewees to give reasons for each answer. The question included a list of ten DF. The interviewees were asked, according to their knowledge of their professional field, experiences, and perceptions, to indicate their degree of agreement or disagreement on whether the selected DF have an impact on residents’ social interaction in the communal spaces of SFHNs in Iraq. They were also asked whether these DF can be measured in the Iraqi residential urban context. Table 5-10 and Figure 5-15 detail the answers to this question.

Table 5-10 The counts and rates of the answers to the 12<sup>th</sup> interviews question about the demographic factors.

Demographic Factor	SA	SWA	Sum SA & SWA	NAND	SWD	SD	Sum NAND, SWD & SD	The average of scores (scores/17)
Number of hours and days worked.	9	7	16	0	1	0	1	4.4
Education status.	8	7	15	2	0	0	2	4.4
Length of residence (house/neighbourhood).	10	4	14	2	1	0	3	4.4
Age.	8	6	14	2	1	0	3	4.2
Number of children under 18 years of age at home.	6	7	13	1	3	0	4	3.9
Marital status.	4	9	13	3	1	0	4	3.9
Gender.	3	9	12	4	1	0	5	3.8
Level of Income.	5	5	10	6	1	0	7	3.8
Employment status.	4	5	9	7	1	0	8	3.7
Type of ownership.	6	3	9	5	3	0	8	3.7

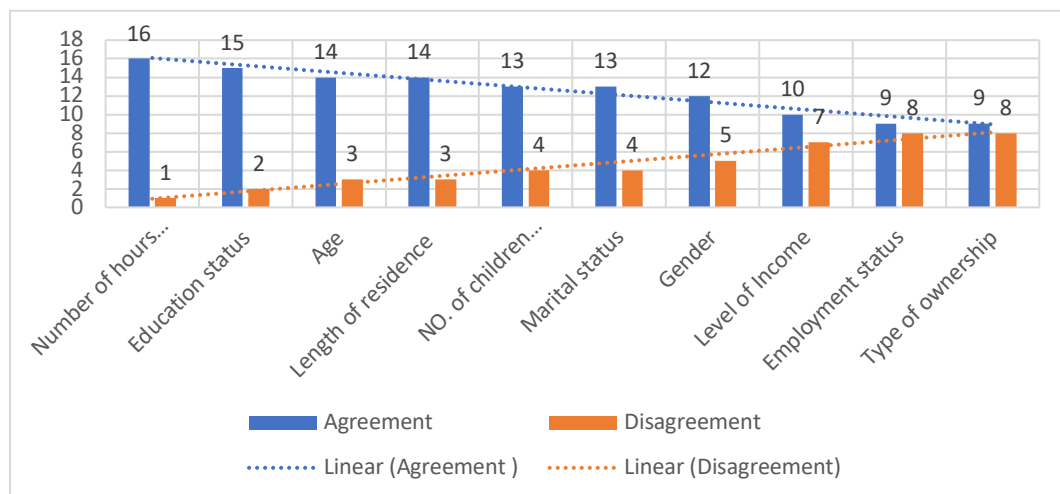


Figure 5-15 The rates of agreement and disagreement on the demographic factors in the 12<sup>th</sup> interviews question.

Table 5-10 and Figure 5-15 illustrate the response counts of the interviewed experts, showing their degree of agreement or disagreement to the 12<sup>th</sup> interviews question. The answers have been grouped into five categories in Table 5-12: “Strongly Agree” (SA), “Somewhat Agree” (SWA), “Neither Agree Nor Disagree” (NAND) and “Strongly Disagree” (SD). Three additional columns represent: firstly, the counts of the sum of SA and SWA; secondly, the sum of NAND, SWD, and SD, and finally, the average scores (scores/17).

What is noticeable from the table is the clear difference between the values in the “Sum SA & SWA” column and the “Sum NAND, SWD & SD” column. In Table 5-10, the factors have been sorted according to the average of scores, ranging from the largest to smallest value. The table shows that the first three DF: “number of hours worked”, “education status”, “length of residence” received higher average scores at 4.4, while the number of interviewed experts agreed with their impact on social interaction were 16, 15, and 14, respectively. The “age” factor received an average score of 4.2, and 14 interviewees agreed that the “age” has an impact on social interaction.

In considering the other factors, the “number of children under 18 years of age at home” and “marital status” received the same average score of 3.9, and 13 interviewees agreed that they impacted social interaction. Although “gender” and “level of income” received the same average score of 3.8, 13 interviewees agreed on the impact of the first factor, while 12 interviewees agreed with the impact of the latter. From the results, it can be seen that “employment status” and “type of ownership” received the same average scores at 3.7 whilst 9 interviewees agreed that they affected social interaction.

- **Reflective Discussion:**

Regarding the results of the semi-structured interviews, Iraqi experts generally agreed on all of the DF which all received an average over 3.5. These results represent the experts’ opinions on the value of the socio-economic background of Iraqi society members which influence on social interaction among residents. At the same time, experts suggested adding factors, which will be explained in the next section. Overall, according to interviewees’ perceptions, four out of ten DF received a score over 4.0, and were more likely to have an impact on social interaction among residents than the other factors; thus, these can be applied and measured in the Iraqi urban context.

“Level of income” received an average score of 3.8, and experts suggested that it does not affect social interaction. *“I do not see the level of income restricting the social communication*

*between neighbours, especially in the southern community*” (IH). However, the literature suggested that the level of income could influence people’s behaviours. Abu Ghazze (1999) highlighted the correlation of some of the DF, like social status, lifestyle, and tastes of people with the strength of neighbourly relationships. He offered this explanation following the conduct of research in Jordan, which is a similar context to Iraq: *“high upper-middle-income people in Jordan have cosmopolitan lifestyles and tend to value friends over neighbours, which opposed the values of the middle-income group in Abu-Nuseir”* (Abu Ghazze, 1999, p.44). However, the interviewees suggested that it could be challenging to gather data on the level of income because this may be confusing and sensitive to people. People may get confused in determining the difference between high, medium and low income, and in most cases may not mention their annual salary for security and privacy. Therefore, it will not be considered in this study.

Furthermore, interviewees SB and AK suggested that “employment status” may or may not affect social interaction, because it can simultaneously be a motivational or withdrawal factor:

*“Employment status affects the psychological state of the individual greatly, and therefore, it can affect the interaction and social relations of individuals negatively. However, at the same time, it may be the reason for interaction and establishing relationships in order to obtain a job or set up communities to find solutions”* (SB).

IH, one of the interviewees who agreed on the influence of “employment status” on social interaction among neighbours, stated that:

*“Social interaction and the intention to interact with other neighbours may increase in a neighbourhood that is customised to a particular employee category, such as a neighbourhood for engineers, doctors, or teachers, which adds a sense of privacy to the place that could relate to the level of available service”*.

MF, an assistant lecturer, offered a similar argument but also stated that *“such kinds of customising might lead to social isolation, where it may reduce the intention to social interaction with others, according to my perception, and I do not know if the effect of this factor has been studied before or not”*. This factor may impact on the way people behave, but it seems that its impact is minor when considering the interaction between neighbours in an Iraqi context. This explains why the rates of the agreement are close to those for disagreement. Although there are not enough studies that have explored the impact of employment status on social communication, it will be included in this study in order to indicate the level of income of the targeted population in the examined areas.



The last factor was “type of ownership”, which received an average score of 3.7. Some of the interviewees (such as BA, an urban planner) argued that a sense of stability increases if a house is owned. This sense of stability will influence both the individuals’ behaviour and feelings towards the place and the community. *“The individual's ownership of a private residential property leads to a sense of privacy, safety and security. The sense of security offers individuals a sense of connection and an attachment to the place, thus, increasing interest in society and the establishment of social relationships”* (SB). In other words, the type of ownership can affect the sense of community, as stated by IH, and the attachment to place, as confirmed by MF. However, others, such as AF, argued that the type of residence is not an essential influence on the social life of a community (Iraq). The reason he gave for this opinion was: *“... Iraqi society, and the southern community, in particular, is social in its nature; so, if an individual is a tenant or owner of a house, this will not be considered a restriction of his social mingling”* (AF).

This factor was highlighted in a study by Bramley & Power (2009) as one of the other factors that could impact on the influence of social sustainability on the urban form. Also, Haggerty (1982, cited by Farida, 2013) indicated that a neighbour's interaction with others and how shared outdoor spaces are used are affected by the socio-demographic characteristics of a neighbourhood. The socio-demographic characteristics presumably associated with social interaction are: the respondent’s stage in the lifecycle, the owner-renter status, the length of residence, educational attainment, and annual income. Therefore, the demographic factor “type of ownership” will be considered in this study within the selected case studies. Table 5-11 shows the factors that were excluded from this study.

Table 5-11 The demographic factors that received lower scores, according to experts’ opinions.

The Demographic Factor	Counts of total agreement	The average of scores
Level of Income	10	3.8

### 5.5.2. Additional Demographic Factors:

This section is represented by the 13<sup>th</sup> question of the semi-structured interviews, and the text of this question is *‘please indicate if there are additional demographic factors that you consider important and should be added to the list mentioned previously? Kindly clarify why you think these additional characteristics are important’*. This question was open-ended and was designed to capture the preferences and opinions of experts on the addition of new DF for adding to the list in the 12th question (section 5.5.1). In addition, it offered interviewees an

opportunity to express themselves and capture relevant professional knowledge and experiences.

Generally, the interviewees agreed with the original list of DFs, except for the level of income, while 70.5% did not add any new factors. However, suggestions were made by five of the interviewees, as shown in Table 5-12. Three of the interviewed experts (the urban designer AF, the urban planner AS, and the architect EA) added the factor "the age of the region – or neighbourhood -". According to AF,

*“The age of the region or neighbourhood represents the duration from the date of that neighbourhood establishment. It affects the quality of residents’ interactions within the residential complex or the residential area, where, over time, the residents change from the time of construction and residence to the present time. This is called the lifecycle of reviving residential neighbourhoods.”*

This suggestion (the age of the neighbourhood) has been considered in some studies, such as Farshidi (2016). Therefore, this factor will be considered in this research when selecting the case studies (the residential neighbourhoods). The selection of case studies (neighbourhoods) depends on the age of the neighbourhood, which should be no less than five years; this is because the social relations between neighbours usually take time to form. Since characters and identities can become stronger and more significant after a certain length of time, neighbourhoods have to be within a certain age to increase the validity of the comparisons between case studies (Farshidi, 2016).

The interviewed architects AG, HI, EA, and the urban planner AS suggested another demographic factor, namely “the relatives' relations”. This factor takes into account the presence of resident’s relations within the neighbourhood that may enhance neighbours' intentions to interact. *“The presence of social or family ties within the neighbourhood is a positive factor”* (AG). This factor will be included in this study to determine whether it represents a motivator for social interaction. Table 5-12 shows the additional demographic factors suggested by the interviewees.

Table 5-12 The additional demographic factors suggested by the experts.

The Additional Demographic Factors	
1	The age of the area (neighbourhood).
2	The presence of relatives' relations in the same neighbourhood.

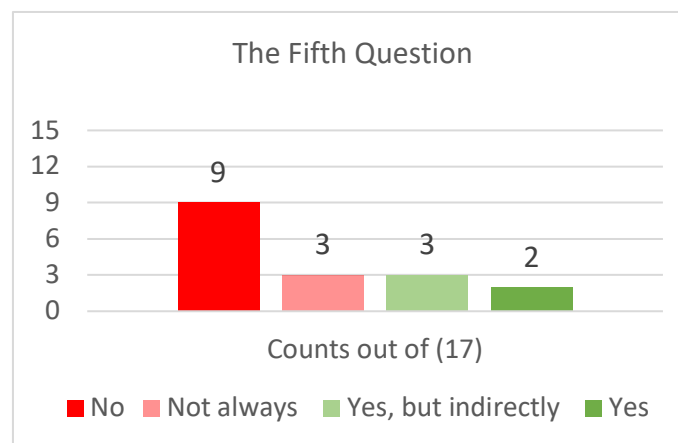
## 5.6. The Consideration of Applying the Indicators of Social Sustainability, Physical Characteristics and Demographic Factors:

Three questions appear under this section regarding SSI, the PCBE, and DF. The questions asked interviewees to indicate whether they consider these three aspects in their work processes. This was designed as an open-ended question to capture detailed information from experts on their consideration on applying any of these three aspects.

In considering SSI, the fifth question asked: ‘*Do you take into account in your work the list indicators of social sustainability that is mentioned in the second question? If not all, which of them? Please indicate the reasons*’. The interviewees were asked whether they consider all or any of the list of SSIs in their work processes (design, implementation, and decision-making). Although most of the responses were negative, interviewees confirmed that these indicators should be considered in their work procedures. The following table presents interviewees’ responses to the fifth question of the semi-structured interviews.

*Table 5-13 The counts of the responses to the fifth interviews question regarding consideration of the indicators of social sustainability in current work procedures.*

The Answers	Counts
No	9
Not always	3
Yes, but indirectly	3
Yes	2
Total	17



*Figure 5-16 The interviewee responses to the question on applying the indicators of social sustainability.*

Table 5-13 and Figure 5-16 present the interviewees’ responses to the fifth question showing a high count in the negative answers regarding the use of SSI in their work procedures. Two of the interviewees were positive and answered “Yes” to use some of the indicators; they mentioned that the density indicator was most used in their work. SB mentioned that the density

indicator is essential in their work when calculating the number of schools that need to be located in a neighbourhood, and this includes: The total number of inhabitants, the total rate of land area, and the maximum limit of the distance from the residential area to the service buildings. Moreover, TY mentioned the same indicator, stating: *“Yes, the department carries out its designs based on the housing standards prepared by the Paul-Service Foundation. The department also approves the designs for others according to these standards”*. The Iraqi housing standards and regulations depend on the density indicator in the design process, the approval of schemes, and some of the DF.

Three of the interviewees (AG, MF, and AF) who are academics, confirmed the use of some SS indicators, namely safety and security, privacy, and density; however, they stated that they use them indirectly, as their replies were “Yes, but indirectly”.

*“We use some of these indicators in directing students in the design of their academic projects; however, we do it in a “sensual” way without depending on specific instructions and without clarifying the idea of the importance of social sustainability indicators in the architectural design”* (MF).

Another three interviewees (IS, EA, and BA), who are architects, and an urban planner, answered “Not always” to the fifth question. They argued that they do not always rely on SSI in their work. The reason stated was the speed required to prepare and complete designs and schemes as well as the lack of accurate population statistics.

*“The social sustainability indicators are not applicable in our work procedures, well, not all of the examined ones, because of many reasons. One of them is the speed that is required in completing schemes and providing as many dwelling units as possible because of the housing crisis that is facing the government. However, as indicators, they exist subconsciously among people”* (IS).

*“... some of these indicators are occasionally used in our work indirectly, and sometimes, we do not use any of them because of the speed required to prepare designs and schemes, also, the absence of accurate statistics of the population”* (BA).

Nine of the interviewees selected “No”, and this relates to reasons mentioned in the mini discussion within section 5.3.1. First of all, Iraqi architects, urban planners and designers, and decision-makers lack knowledge on this concept, and on the required procedures to design and implement their work in the residential sector. Another reason is, as one of the urban planners (AS) states, *“the planning of the city is unregulated and uncontrolled. Also, the demarcation of residential neighbourhoods is compulsory at present”*. Moreover, the housing crisis has neglected to consider the notion of social sustainability and its indicators.

*“In fact, these indicators show the important reflection of daily social life if they would be used in our work as architects, urban planners and designers; but it seems that the role of decision-makers is essential to activate this notion in the government agenda” (IT).*

The tenth interviews question concerned the PCBE, and the text of the question was: *“Do you take into account in your work the list of the physical characteristics of the built environment mentioned in the seventh question? If not all, which of them? Please indicate the reasons”*. Interviewees were asked whether or not they consider all or any of the aforementioned physical characteristics of the built environment in their work (design, implementation, and decision-making). Table 5-14 shows the counts of the responses to the tenth interviews question regarding the consideration of PCBE in experts' current work procedures. Although around 13 of the responses were negative, as represented in Table 5-14 and Figure 5-17, the interviewees confirmed that such indicators should be reconsidered in their work processes, especially at the design stage. The architect SB stated that four physical characteristics are used in their working process (at the design stage). These characteristics are the: “provision and location of open and green spaces”, “site design”, “responsive climate design”, and “maintenance”. The urban planner, BA, highlighted the “provision and location of infrastructure...” and the “provision and location of open and green spaces”. The urban planner TY stated that *“As the housing department responsible for approving the designs of residential complexes for all other sectors, as well as the designs that the department is preparing for its projects, all these characteristics are taken into account and almost equally”*.

Table 5-14 Number of responses to the tenth interviews question from regarding the consideration of the physical characteristics of the built environment in current work procedures.

#	The answers	Counts
1	No	13
2	Yes	4

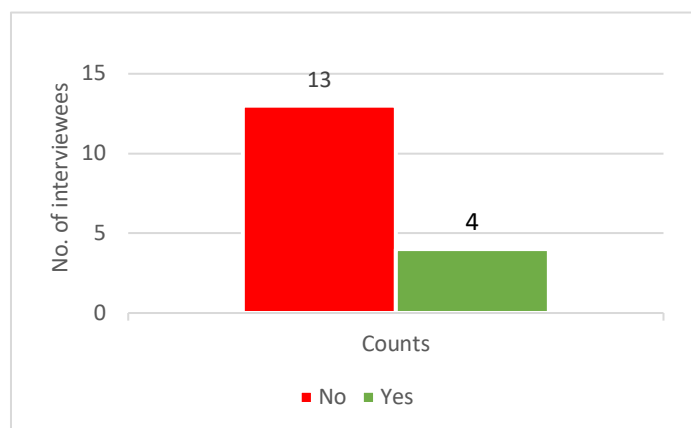


Figure 5-17 Number of responses to the tenth interviews question.

Finally, regarding the DF, the 14th interview question asked: ‘*Do you take into account in your work the list of the demographic factors mentioned in the seventh question? If not all, which of them? Please indicate the reasons.*’ In this question, interviewees were asked whether or not they consider all or any of the aforementioned list of DFs in their work (design, implementation, and decision-making). The architect, SB, indicated that the only demographic factor that they typically use in their work (locating and designing educational buildings) is age. Table 5-15 and Figure 5-18 show the counts of the responses to the 14th question from the semi-structured interviews regarding the consideration of DF in their current work procedure.

*“We estimate, mainly, the "age" factor in determining the type of educational building, whether it is kindergarten, primary or secondary school, or any other educational buildings, where each study stage has its own requirements, and each age has its own architectural and functional requirements” (SB).*

Amongst the interviewed academics, including architects, urban planners and designers who work at Basra University, their responses were yes; however, not all factors are considered in their work. The factors that are typically used are: income level, age, gender, number of children, and marital status. The academics argued that considering these factors depends on the type of the project and its circumstances. *“Well, according to our work, most of these factors are taken into account, but the number of factors used in the project depends on the type of the project, what are the client's requirements and the standards” (AG).* TY, an urban planner who works at the DoH-MoCH in Baghdad, also answered yes, and indicated that according to their work procedures (designing and implementing residential complexes and neighbourhoods), they depend on three factors in their work: education level, number of children, and employment status. However, those who work at Basra Municipality stated that they do not generally use these factors in their work. IS, the manager of MPS-CPD/ BM, said, *“Some of these factors are important in our work; however, they have been applied in some areas/places and not others”*. Moreover, AK, an architect, stated that *“less attention has been paid to these factors.”*

Table 5-15 Counts of the responses to the 14<sup>th</sup> interviews question regarding the consideration of demographic factors in current work procedures.

#	The answers	Counts
1	Not always	12
2	Yes, but not all of them	5

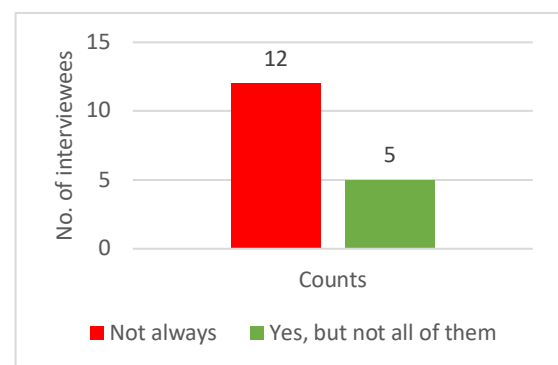


Figure 5-18 Counts of the responses to the 14th question from the semi-structured interviews.

- **Reflective Discussion:**

In summary, there are some key points to address from the results of the fifth interview question. First, it seems that nine of the interviewed experts have shown evidence of a lack of knowledge about social sustainability and the application of its indicators in the processes of designing, planning, implementing, and decision-making for residential environments. This is clear by the “No” and “Not always” answers they gave on whether they use any of the SSI in their work procedures. For those who answered, “Not always”, they noted that the indicators of density and safety and security would mainly be used in their work procedures if it were not essential to prioritise speed in completing the work. Second, the two experts who answered “Yes” to this question demonstrated a limited usage of the indicators, confirming that the density indicator is typically used in the design process. Third, the three experts who responded "Yes, but indirectly" revealed that they rely on the use of safety and security, privacy, and density indicators in their work but in an indirect way. This response shows that they have an unintended orientation towards the notion of social sustainability, and potentially need more knowledge, experience and awareness of this.

Similarly, the results from the tenth and 14<sup>th</sup> interviews questions illustrate a semi-neglect of the importance of both the PCBE and the DF. The reasons for this semi-neglecting are similar to those previously mentioned of SSI. The first is that some of the procedures followed in experts’ work, such as the required speed to complete schemes and plans lead to paying less attention or neglect some of the characteristics and factors. However, the most important reason for the oversight is the housing crisis facing the Iraqi government. IS stated that:

*“The growing housing crisis in Iraq made the demand to increase housing units a high priority, and the implementation of residential design with maximum speed is a must. This leads to the quick creation of designs by architects and urban designers without any importance given to the indicators mentioned above in those designs”.*

From the findings of these two questions, it seems that some of the PCBE and the DF have been given attention at the design stage by architects who work as academics at BU. However, other professional fields also need to focus more on these two categories because of their importance in enhancing the built environment and the social lives of residents.

## **5.7. The Sub-Variables of the Social Interaction:**

This study has identified a list of sub-variables that can be used to encourage social interaction among the inhabitants in residential neighbourhoods of Iraq. This interview section included two questions (16<sup>th</sup> and 17<sup>th</sup>) that asked about interviewees’ perceptions of these sub-variables



of social interaction. Similar to the same previous questions, the list in this question has been collected from earlier studies, as explained in Chapter Three in section 3.2, such as Dave (2011), Dempsey et al. (2012), Farida (2013), and Karuppannan & Sivam (2011). The reason behind the selection of the social interaction sub-variables from these studies is the attempt to cover all aspects of social relationships in developed and developing countries. The following sections will discuss the analysis of these two questions relating to the sub-variables of social interaction.

### 5.7.1. Acceptance of the Sub-Variables of Social Interaction:

This section involves the results of the 16<sup>th</sup> question of the semi-structured interviews. The text of the question is ‘*Please indicate your degree of agreement or disagreement with the following list of sub-variables that can be used to manifest the social interaction in the Iraqi urban context. Please tick (✓) one box for each sub-variable listed in the table below*’, see question 16 in Appendix F. The question was close-ended and used the five-point Likert scale. It also included an open-ended question that asked interviewees to give reasons, if possible, for their answer. The question included a list of sub-variables and asked interviewees to indicate their degree of agreement or disagreement. Table 5-16 shows the answers to this question.

Table 5-16 Counts of the answers to the 16<sup>th</sup> interviews question about the sub-variables of social interaction.

Sub-variables	SA	SWA	Sum SA & SWA	NAND	SWD	SD	Sum NAND, SWD & SD	The average of scores (scores/17)
Stop and chat with neighbours or say hello.	8	9	17	0	0	0	0	4.5
Knowing each other by the name.	10	6	16	1	0	0	1	4.5
The number of neighbours an individual considers as friends.	10	6	16	1	0	0	1	4.5
The number of neighbours whom an individual can ask them for help.	10	6	16	1	0	0	1	4.5
The frequency of meeting neighbours.	11	4	15	2	0	0	2	4.5
Opportunities for formal and informal social gatherings.	8	7	15	2	0	0	2	4.4
The possibility to use open communal spaces with neighbours and friends.	7	8	15	2	0	0	2	4.4
Exchanging small things between neighbours.	6	9	15	1	1	0	2	4.2
The number of neighbours visited.	6	8	14	3	0	0	3	4.2
Visual interaction (passive communication).	3	6	9	4	3	1	8	3.4

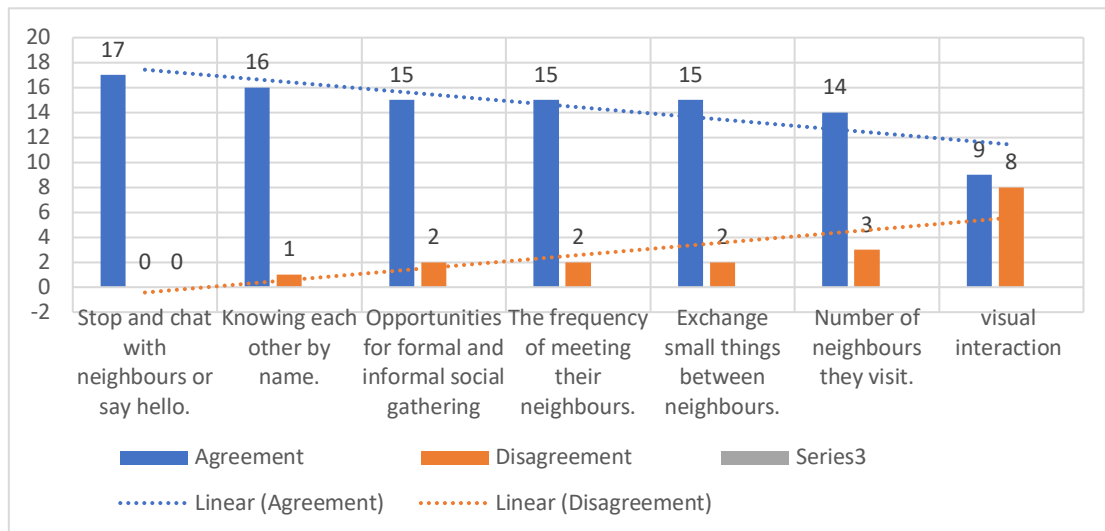


Figure 5-19 The counts of the responses indicating agreement and disagreement with the sub-variables of social interaction in the 16<sup>th</sup> interview question.

Table 5-16 illustrates the counts of respondents, according to their degree of agreement or disagreement with the 16<sup>th</sup> question; the responses were categorised as “Strongly Agree” (SA), “Somewhat Agree” (SWA), “Neither Agree Nor Disagree” (NAND) and “Strongly Disagree” (SD). In addition, three columns were included in the Table: the first represents the sum of SA and SWA; the second represents the sum of NAND, SWD, and SD, and the last column shows the average scores (scores/17).

Table 5-16 and Figure 5-19 represent the answers to the 16th interview question; they show the agreement and disagreement counts concerning the sub-variables that manifest social interaction. In the table, the sub-variables have been sorted according to the values in the average scores’ column, which appear from the largest to the smallest value. The high agreement scores are noticeable within the table, as shown in the “Sum of SA & SWA” column; these scores are mostly higher than those in the “Sum of NAND, SWD, & SD” column, with the exception of “visual interaction (passive communication)” where the agreement scores are close to the disagreement.

According to the average scores, the first nine sub-variables received an average above 4.0, where “stop and chat with neighbours...”, “knowing each other by the name”, “the number of neighbours an individual considers as friends”, “the number of neighbours whom an individual can ask them for help”, and “the frequency of meeting...” all received a score of 4.5. The sub-variables “opportunities for formal and informal social gathering” and “The possibility to use open communal spaces with neighbours and friends” received an average score of 4.4.

Comparing the two results of the sub-variables “exchange small things between neighbours” and “number of neighbours they visit”, it can be seen that each received the same average scores of 4.2, while the last sub-variable “visual interaction” received a score of 3.4.

In terms of the agreement, the majority of participants agreed with the first nine sub-variables, as the results illustrate in “SA & SWA” column in Table 5-16. The interviewees’ count who agreed with these sub-variables ranges from 14 to 17 experts, while only a small number of experts (nine interviewees) agreed that the last sub-variable “visual interaction” is considered one of the positive manifestations of social interaction in Iraq.

- **Reflective Discussion:**

Experts confirmed that most sub-variables mentioned in the 16<sup>th</sup> interview question were significant for social interaction among residents in neighbourhoods. However, the sub-variable “visual interaction (passive communication)” only obtained 53% of experts’ agreement and thus had an average score of 3.4. However, the architect, MF, stated that this was one of the manifestations of social interaction among residents of neighbourhoods:

*“This phenomenon (visual interaction (monitoring the passers-by)) is few exist, but it could be observed when some of the elderly and retired people meeting to chat near a local/corner shop, or in the street in front of the front doorstep of one of their houses within the neighbourhood, or maybe while gathering to go to the mosque or hussainya for prayer”.*

Amongst the interviewees who agreed on this manifestation, it appears that this attitude is still one of the important appearances of social relations among neighbours in traditional residential neighbourhoods. As MF indicated, visual interaction, passive communication, the monitoring the passers-by, or gathering to chat by a front doorstep of one of the houses are actions mainly performed by males. Nevertheless, other interviewees did not tend to agree with this manifestation of social interaction because they think it is not a welcome phenomenon in today’s society, especially for women. However, it is one of the manifestations of social relations in a traditional urban context. The architect, SB, offered a point of view on this sub-variable:

*“People tend to surveil others, whether they are relatives, friends, or even strangers. Despite the recent lack of visual communication between people due to the widespread significant use of social media, we cannot do without such types of communication in human relations. However, it cannot be an important measure of social interaction. Actually, passive communication (observing pedestrians) could have a negative effect on social relations, where it could lead to harassment among people, and perhaps the most harassed group is women”.*

In the past, women did not leave their houses as much as today; women leaving the house and practising new activities outside a buffer zone, such as gathering in malls or parks or work, was not familiar then. Therefore, the monitoring of passers-by or passive communication within residential environments is not welcome as a manifestation of social relations. However, it was mentioned in Jan Gehl's book in (2011) "*Life Between Buildings; Using Public Space*".

### 5.7.2. Additional Sub-Variables of Social Interaction:

This section involves the results of the 17th question of the semi-structured interviews, which is open-ended, and its text is: '*Regarding the previous question (16<sup>th</sup>), according to your experience, are there any other important sub-variables that contribute to clarifying and measuring the social interaction among residents in Iraqi single-family housing neighbourhoods that have not been mentioned previously? Please include them in the following space, with the reasons, if possible*'. The question was designed to capture detailed information about the opinions of experts on new sub-variables of social interaction. In addition, it offered interviewees an opportunity to express their knowledge and experience on other previously unconsidered sub-variables.

Generally, the interviewees agreed with the original list of the sub-variables for social interaction, and 35% suggested new sub-variables for the list. The urban planner, AS, and the architects, MF and EA, argued that "using social media" can affect social interaction among residents in a negative way. It appears that social media is important in that it could represent a motivator or barrier for social interaction. "*Technology, the digital world and social media have all created a social environment in the virtual world outside the spatial environment. Meetings and events in the virtual world have become more than the real and spatial world*" (MF). This suggestion will be excluded, as the study considers the actions within communal spaces. Another suggestion offered was "the presence of relationships amongst the children from families within the neighbourhood", which was noted by the architect IS. Similarly, the architect, AG, suggested a sub-variable, namely "children or teenagers playing in open spaces within the neighbourhood". They deemed this sub-variable one of the manifestations of social relations among residents in a neighbourhood, because "*it is proving the existence of relations among neighbours because of their children's relations with each other*" (IS). In the recent past, one of the common manifestations of social interaction in traditional residential neighbourhoods was children playing in one of the cul-de-sacs whilst mothers chatted near their

houses. This study will consider "children playing in open spaces within the neighbourhood" in the observation and behavioural mapping.

The architect, AG, also suggested "the frequency of attending closed shared places and open spaces", where the closed places are mosques and celebration halls. This is similar to the sub-variable that the urban planner, TY, suggested, namely "meeting when making use of social services within the neighbourhood", where social services include children's playgrounds, mosques, markets (souk), schools, health services, and social clubs. This suggestion was considered in Farshidi's (2016) study that examined the opportunities for social interaction in unintentional communal spaces (public services). TY also added "retired and youth attending cafes within the neighbourhood". TY and AG stated that such meeting places could be seen as a new version of social gathering patterns that used to happen in traditional neighbourhoods, where neighbours used to gather in, cafes, mosques, and markets (souks). Again, this study will consider the suggestions made by AG and TY in the observation and behavioural mapping, namely: "the frequency of meeting in social services and open spaces" and "the retired and youth attending cafes within the neighbourhood". Table 5-17 shows the additional sub-variables for social interaction suggested by the interviewees.

*Table 5-17 The additional sub-variables of social interaction, according to experts' opinions.*

The Suggested Additional Sub-Variables	The Final Additional Sub-Variables
Using social media.	Excluded
Children or teenagers playing in open spaces within the neighbourhood.	Included
The frequency of attending closed shared places and open spaces.	Included
Meeting when making use of social services within the neighbourhood.	Included
The retired and youth attending cafes within the neighbourhood.	Included

## **5.8. The strength of the relationships between social sustainability indicators and physical characteristics and demographic factors:**

This section considers three questions that examine the strength of relationships between the SSI and with the PCBE and DF. The first part of this section examines responses to the sixth question from the semi-structured interviews and will discuss the strength of relationships between the SSI. The second part, which explores responses to the 11<sup>th</sup> question of the semi-structured interviews, will discuss the strength of relationships between SSI and the PCBE. Finally, the last part of this section examines responses to the 15<sup>th</sup> question of the semi-structured interviews and will discuss the strength of relationships between the SSI and DF. These three questions form a matrix, and to answer the question, interviewees had to use

numbers from 1 to 6 to refer to the strength of a relationship from weakest (1) to strongest (6) where; the number 0 signified no relationship. The researcher used a six-point Likert Scale to indicate the strength of the relationship between the three aspects: this allowed interviewees to indicate any potential relationships. Table 5-18 shows the interpretation of the numbers used to indicate the strength of the relationship (according to the Likert Scales). Moreover, each of the three questions includes an open question that asks the experts to give an explanation, if possible, for their choices on whether they think the relationship is strong or weak.

The researcher analysed the data in two ways: first, the researcher analysed the numeric ratings by calculating the average scores of each relationship. Second, the researcher combined the three degrees to analyse the differences between the answers and to synthesise the scale into three points: strong (1, 2, and 3), weak (4, 5, and 6), and no change (0). The next step was to calculate the mean. In this study, average scores above 5.0 indicated a strong relationship (according to the first analysis method) and a mean score of 3.0 (according to the second analysis method).

*Table 5-18 The interpretation of the degrees used to indicate the strength of the relationships among the examined aspects.*

Numbers used in the question	Likert-point scales	Scale
0	No change	0
1	Very weak	0.1 – 1
2	Moderately weak	1.1 – 2
3	Slightly weak	2.1 – 3
4	Slightly strong	3.1 – 4
5	Moderately strong	4.1 – 5
6	Very strong	5.1 - 6

#### **5.8.1. The Strength of Relationship between the Social Sustainability Indicators:**

The sixth interviews question was ‘*Returning to the second question, do you think there are any influential relationships between the social sustainability indicators listed in the second question? Please use a scale from 1 to 6 to describe the relationship from the weak to strong and use 0 if there is no relationship*’, see question six in the Appendix F. Experts were asked, according to their perceptions and experiences, whether there are influential relationships among the indicators of social sustainability. To answer this question, the interviewees used numbers from 1 to 6 to refer to the strength of the relationship, from weakest to strongest, and used number 0 if there was no relationship. Table 5-19 shows the number of responses on the strength of possible relationships among SSIs.

Table 5-19 The number of responses from interviewees on the strength of possible relationships among social sustainability indicators.

The Relationship		0	1	2	3	4	5	6	Total
Sense of community	Attachment to place/Sense of pride.	1	0	0	0	2	4	10	17
	Privacy.	1	2	2	1	2	3	6	17
	Safety and security.	1	1	1	0	3	7	4	17
	Resident satisfaction.	2	0	1	2	4	5	3	17
	Density.	3	1	1	6	0	4	2	17
Attachment to place/Sense of pride	Sense of community.	1	0	0	0	4	2	10	17
	Safety and security.	2	0	0	1	1	5	8	17
	Privacy.	2	1	1	2	3	2	6	17
	Resident satisfaction.	2	0	0	2	4	5	4	17
	Density.	6	0	3	4	0	2	2	17
Resident satisfaction	Safety and security.	2	0	0	2	1	3	9	17
	Privacy.	2	1	1	1	1	2	9	17
	Attachment to place/Sense of pride.	2	0	1	1	2	2	9	17
	Sense of community.	1	0	1	1	3	3	8	17
	Density.	4	0	1	2	4	5	1	17
Privacy	Safety and security.	5	0	2	1	1	2	6	17
	Attachment to the place/Sense of pride.	5	1	1	2	1	1	6	17
	Density.	5	0	4	1	0	2	5	17
	Sense of community.	4	3	1	1	3	1	4	17
	Resident satisfaction.	5	1	1	0	2	5	3	17
Safety and security	Attachment to place/Sense of pride.	3	0	0	1	2	1	10	17
	Privacy.	2	0	2	0	2	1	10	17
	Sense of community.	2	1	1	0	2	3	8	17
	Resident satisfaction.	5	0	1	1	2	3	5	17
	Density.	4	0	1	4	1	2	5	17
Density	Safety and security.	6	0	3	2	1	0	5	17
	Attachment to place/Sense of pride.	6	0	2	2	2	1	4	17
	Sense of community.	4	0	0	5	1	3	4	17
	Resident satisfaction.	5	0	1	4	2	2	3	17
	Privacy.	5	1	3	2	0	3	3	17

Table 5-20 illustrates the results of the sixth interview question and lists the average scores from the strongest to the weakest relationship. According to the data, five out of 15 relationships are considered strong among the SSIs. The data in Table 5-20 shows that the strongest relationship was between the “sense of community and attachment to place”, which has an average of 5.2, and matches the scale for “very strong”. The relationships between “attachment to place and safety and security”, “attachment to place and residents’ satisfaction”, “sense of community and safety and security”, and “sense of community and resident satisfaction” were “moderately strong”, as each relationship received a score greater than 4.0 and less than 5.0 (4.6, 4.4, 4.4, and 4.3, respectively). Also, the results show that the relationship between “residents’ satisfaction and safety and security” was slightly strong as it received an average score of 4.03. For the last strong relationship, the “sense of community and resident



satisfaction” received a score of 4.32. In terms of the weakest relationships between the SSI, the experts indicated that the relationship between “attachment to place and density” was considered the weakest, as it received a score of 2.6.

Table 5-20 The average scores from the responses to the sixth interview question.

The Relationships Between the Social Sustainability Indicators	The Average (scores/17)
Sense of community – Attachment to place/Sense of pride.	5.2
Attachment to place/Sense of pride – Safety and security.	4.6
Attachment to place/Sense of pride – Resident’s satisfaction.	4.4
Sense of community – Safety and security.	4.4
Sense of community – Resident’s satisfaction.	4.3
Resident’s satisfaction – Safety and security.	4.0
Privacy – Safety and security.	3.9
Resident’s satisfaction – Privacy.	3.8
Attachment to place/Sense of pride – Privacy.	3.6
Sense of community – Privacy.	3.4
Sense of community – Density.	3.3
Resident’s satisfaction – Density.	3.0
Safety and security – Density.	3.0
Privacy – Density.	2.9
Attachment to place/Sense of pride – Density.	2.6

The data were analysed by combining the seven-point Likert Scales into three points. Table 5-21 shows the relationships between the SSI according to these three categories - strong, weak, and no change. The results show that the strong relationships between the SSI received a score of 3.0 and are the same relationships illustrated in Table 5-20.

Table 5-21 The mean of the results to the sixth interview question, showing the relationships between social sustainability indicators as synthesised into three categories: strong, weak, and no change.

Question	Strong (3)	Weak (2)	No change (1)	The mean
Sense of community - Attachment to place/Sense of pride.	16	0	1	3
Sense of community - Safety and security.	13.5	2	1.5	3
Sense of community – Residents’ satisfaction.	13	2.5	1.5	3
Attachment to place/Sense of pride - Safety and security.	13.5	1	2.5	3
Attachment to place/Sense of pride – Residents’ satisfaction.	13	2	2	3
Residents’ satisfaction - Safety and security.	11.5	2	3.5	2
Residents’ satisfaction – Privacy.	11	2.5	3.5	2
Privacy - Safety and security.	11	2.5	3.5	2
Sense of community – Privacy..	9.5	5	2.5	2
Attachment to place/Sense of pride – Privacy.	9.5	4	3.5	2
Residents’ satisfaction – Density.	8.5	4	4.5	2
Sense of community – Density.	7	6.5	3.5	2
Safety and security – Density.	7	5	5	2
Privacy – Density.	6.5	5.5	5	2
Attachment to place/Sense of pride – Density.	5.5	5.5	6	2
The sum of	(4,5,6)	(1,2,3)	(0)	(scores/17)

### 5.8.2. The Strength of Relationships between the Physical Characteristics of the Built Environment and the Social Sustainability Indicators:

The 11<sup>th</sup> question of the semi-structured interviews was ‘Returning to the seventh question, do you think there are any influential relationships between the physical characteristics of the built environment and social sustainability indicators that listed in the second question? Please use a scale from 1 to 6 to describe the relationship from the weak to the strong and use 0 if there is no relationship’. In this question, experts were asked, according to their perceptions and experiences, whether there were influential relationships between the indicators of social sustainability, in addition to social interaction and the physical characteristics of the built environment. Table 5-22 shows the response counts of the interviewees to the question.

Table 5-22 The counts of responses from interviewees to the 11<sup>th</sup> question illustrating the strength of relationships between the social sustainability indicators and the physical characteristics of the built environment.

The relationship		0	1	2	3	4	5	6	Total
Accessibility	Social interaction.	1	1	0	0	2	4	9	17
	Safety and security.	4	1	1	0	1	2	8	17
	Residents' satisfaction.	2	1	0	0	2	5	7	17
	Attachment to place/Sense of pride.	4	1	2	2	1	1	6	17
	Privacy.	3	1	0	3	0	4	6	17
	Sense of community.	2	2	0	1	2	5	5	17
	Density.	3	1	2	1	4	1	5	17
Climate responsive design	Residents' satisfaction.	2	1	0	1	2	3	8	17
	Attachment to place/Sense of pride.	4	0	0	3	1	2	7	17
	Social interaction.	2	2	1	0	3	3	6	17
	Privacy.	3	1	2	4	2	1	4	17
	Sense of community.	5	1	1	4	3	1	2	17
	Safety and security.	6	2	1	2	2	1	2	17
	Density.	6	2	1	3	1	1	2	17
Site design (the neighbourhood & communal spaces)	Attachment to place/Sense of pride.	3	1	0	0	0	3	10	17
	Safety and security.	2	1	1	1	0	2	10	17
	Sense of community.	1	0	1	0	2	4	9	17
	Social interaction.	3	1	0	0	0	4	9	17
	Density.	3	1	0	3	1	1	8	17
	Residents' satisfaction.	3	1	0	0	2	4	7	17
	Privacy.	3	1	0	0	1	5	7	17
Maintenance	Residents' satisfaction.	2	1	0	0	0	3	11	17
	Sense of community.	3	1	0	2	2	4	5	17
	Attachment to place/Sense of pride.	4	1	0	0	0	7	5	17
	Safety and security.	2	1	1	1	0	7	5	17
	Density.	6	1	3	0	0	1	5	17
	Privacy.	8	2	1	1	0	1	3	17
	Social interaction.	7	1	0	0	2	4	3	17
Provision and location of infrastructure (social, educational, etc)	Residents' satisfaction.	2	0	0	1	0	3	11	17
	Attachment to place/Sense of pride.	2	1	0	0	1	4	9	17
	Social interaction.	4	1	0	0	0	3	9	17
	Sense of community.	2	1	0	0	1	5	8	17
	Density.	5	1	2	0	0	2	6	17
	Safety and security.	4	1	2	0	2	4	4	17
	Privacy.	7	1	0	2	2	1	4	17
Provision and location of open and green spaces	Social interaction.	2	1	1	0	0	2	11	17
	Sense of community.	2	0	0	1	1	3	10	17
	Attachment to place/Sense of pride.	3	1	0	1	1	1	10	17
	Residents' satisfaction.	2	1	0	1	0	3	10	17
	Privacy.	4	1	1	0	1	2	8	17
	Density.	5	1	1	0	0	4	5	17
	Safety and security.	6	1	1	0	2	3	4	17

Table 5-23 illustrates the results of the average scores for the answers to the 11<sup>th</sup> question from the semi-structured interviews. The question asked experts about their perceptions to indicate the relationships between the PCBE and SSI and social interaction. According to the average scores presented in Table 5-23, the relationships between “accessibility” and each “social interaction” and “residents’ satisfaction” were moderately strong, as each received a score of 4.9, 4.5, respectively. However, this was slightly stronger with the sense of community which received a score of 4.0. The lowest average score was for the relationship between “accessibility and attachment to place” with a score of 3.3, which is a slightly strong relationship.

According to the average scores, the relationship between “climate responsive design, and resident satisfaction” was moderately strong, which received 4.4. In contrast, the relationship between “climate responsive design and density” was a moderately weak, as it received a score of 1.9. It appeared that the relationships between “site design (the neighbourhood and communal spaces)”, with the sense of community, attachment to place, safety and security, social interaction, privacy, and resident satisfaction were moderately strong, as each received a score between 4.9, 4.5, 4.5, 4.4, and 4.2, respectively. However, the relationship between “site design and density” was slightly stronger, with a score of 3.9.

From the results in the table, there are two moderately strong relationships between maintenance and resident satisfaction, and safety and security, which received scores of 4.8 and 4.2, respectively. In contrast, the relationship between “maintenance and privacy” was moderately weak, with a score of 1.7.

Moreover, the provision and location of public utilities (social, educational, etc.) appeared to have four moderately strong relationships with resident satisfaction, attachment to place, sense of community, and social interaction. These received a score of 4.9, 4.6, 4.6, and 4.1, respectively. The relationship between “the provision and location of public utilities and privacy” was slightly weaker as this received a score of 2.6.

For the provision and location of open and green spaces, there are four moderately strong relationships with the sense of community, social interaction, residents’ satisfaction, and attachment to place. These relationships received scores of 4.8, 4.6, 4.6, and 4.3, respectively. The relationship between the provision and location of open and green spaces and safety and security was slightly weaker as it received a score of 2.9. Table 5-23 shows the average scores for the answers to the 11<sup>th</sup> interview question.

Table 5-23 The average scores from the responses to the 11<sup>th</sup> interview question.

The Relationship		The average scores (scores/17)
Accessibility	Social interaction.	4.9
	Residents' satisfaction.	4.5
	Sense of community.	4.0
	Privacy.	3.9
	Safety and security.	3.8
	Density.	3.5
	Attachment to place/Sense of pride.	3.3
Climate responsive design	Residents' satisfaction.	4.4
	Social interaction.	3.9
	Attachment to place/Sense of pride.	3.8
	Privacy.	3.2
	Sense of community.	2.6
	Safety and security.	2.0
	Density.	1.9
Site design (the neighbourhood & communal spaces).	Sense of community.	4.9
	Attachment to place/Sense of pride.	4.5
	Safety and security.	4.5
	Social interaction.	4.4
	Privacy.	4.2
	Residents' satisfaction.	4.2
	Density.	3.9
Maintenance	Residents' satisfaction.	4.8
	Safety and security.	4.2
	Attachment to place/Sense of pride.	3.9
	Sense of community.	3.8
	Social interaction.	2.8
	Density.	2.4
	Privacy.	1.7
Provision and location of infrastructure (social, educational, etc).	Residents' satisfaction.	4.9
	Attachment to place/Sense of pride.	4.6
	Sense of community.	4.6
	Social interaction.	4.1
	Safety and security.	3.4
	Density.	2.9
	Privacy.	2.6
Provision and location of open and green spaces	Sense of community.	4.8
	Social interaction.	4.6
	Residents' satisfaction.	4.6
	Attachment to place/Sense of pride.	4.3
	Privacy.	3.8
	Density.	3.1
	Safety and security.	2.9

The data were analysed by reducing the seven-point Likert Scale into three points; Table 5-24 shows the relationships between the PCBE and the SSI, which were amalgamated into three categories - strong, weak, and no change. The results show that the strong relationships between the two aspects are those with a mean score of 3.0. For the accessibility and site design, maintenance, and the provision and location of open and green spaces, strong relationships are the same as those illustrated in Table 5-23. For climate responsive design, another strong relationship features with social interaction. Regarding the provision and location of public utilities, the strong relationships were mostly the same as those listed in Table 5-23, except for the relationship with social interaction.

Table 5-24 Shows the mean of the results to the 11<sup>th</sup> interview question, showing the relationships between the physical characteristics of the built environment and social sustainability indicators according to the three categories (strong, weak, and no change).

The relationship		Strong	Weak	No Change	The mean of scores
Accessibility	Social interaction	15	1	1	<b>3</b>
	Residents' satisfaction	14	1	2	<b>3</b>
	Sense of community	12	3	2	<b>3</b>
	Safety and security	11	2	4	2
	Privacy	10	4	3	2
	Density	10	4	3	2
	Attachment to place/Sense of pride	8	5	4	2
Climate responsive design	Residents' satisfaction	13	2	2	<b>3</b>
	Social interaction	12	3	2	<b>3</b>
	Attachment to place/Sense of pride	10	3	4	2
	Privacy	7	7	3	2
	Sense of community	6	6	5	2
	Safety and security	5	5	6	2
	Density	4	6	6	2
Site design (the neighbourhood & communal spaces)	Sense of community	15	1	1	<b>3</b>
	Attachment to place/Sense of pride	13	1	3	<b>3</b>
	Safety and security	12	3	2	<b>3</b>
	Social interaction	13	1	3	<b>3</b>
	Residents' satisfaction	13	1	3	<b>3</b>
	Privacy	13	1	3	<b>3</b>
	Density	10	4	3	2
Maintenance	Residents' satisfaction	14	1	2	<b>3</b>
	Safety and security	12	3	2	<b>3</b>
	Sense of community	11	3	3	2
	Attachment to place/Sense of pride	12	1	4	2
	Social interaction	9	1	7	2
	Density	6	4	6	2
	Privacy	4	4	8	2
Provision and location of infrastructure (social, educational, etc)	Residents' satisfaction	14	1	2	<b>3</b>
	Attachment to place/Sense of pride	14	1	2	<b>3</b>
	Sense of community	14	1	2	<b>3</b>
	Social interaction	12	1	4	2
	Safety and security	10	3	4	2
	Density	8	3	5	2
	Privacy	7	3	7	2
Provision and location of open and green spaces	Sense of community	14	1	2	<b>3</b>
	Social interaction	13	2	2	<b>3</b>
	Residents' satisfaction	13	2	2	<b>3</b>
	Attachment to place/Sense of pride	12	2	3	<b>3</b>
	Privacy	11	2	4	2
	Safety and security	9	2	6	2
	Density	9	2	5	2

### 5.8.3. The Strength of Relationships between the Demographic Factors and Social Sustainability Indicators:

This section includes the results of the 15<sup>th</sup> interview question was: ‘*Returning to the 12<sup>th</sup> question, do you think there are any influential relationships between the demographic factors and social sustainability indicators that listed in the second question? Please use a scale from 1 to 6 to describe the relationship from the weaker to stronger and use 0 if there is no relationship*’. In the question, experts were asked whether they thought there were influential relationships between the DF and SSI, in addition to social interaction. Table 5-25 shows the counts of interviewees’ responses to the question.

Table 5-25 Response counts of the potential relationships between the demographic factors, the SS indicators, and social interaction in the 15<sup>th</sup> interview question.

The relationship		0	1	2	3	4	5	6	Total
Age	Sense of community.	4	0	1	0	0	3	9	17
	Attachment to place/ Sense of pride.	4	0	0	2	1	4	6	17
	Resident satisfaction.	5	0	1	0	4	6	1	17
	Safety and security.	6	0	2	2	1	4	2	17
	Privacy.	4	0	1	3	2	3	4	17
	Density.	8	0	0	3	1	3	2	17
	social interaction.	3	0	0	0	2	3	9	17
Gender	Sense of community	7	1	0	0	2	3	4	17
	Attachment to place/ Sense of pride	6	1	0	1	2	3	4	17
	Gender – Resident satisfaction	7	2	1	0	3	2	2	17
	Safety and security	4	1	2	1	2	4	3	17
	Privacy	3	1	0	3	0	3	7	17
	Density	9	1	2	2	0	1	2	17
	Social interaction	3	0	1	1	1	2	9	17
Education level	Sense of community	4		0	2	1	4	6	17
	Attachment to place/ Sense of pride	3	0	1	1	2	4	6	17
	Education level – Resident satisfaction	4	0	0	3	0	3	7	17
	Safety and security	7	0	3	0	1	1	5	17
	Privacy	7	0	1	1	2	4	2	17
	Density	9	0	1	1	1	3	2	17
	Social interaction	4	0	1	0	2	4	6	17
Level of income	Sense of community	4	0	2	2	4	0	5	17
	Attachment to place/ Sense of pride	9	0	2	1	2	0	3	17
	Resident satisfaction	6	1	2	2	2	1	3	17
	Safety and security	6	0	2	0	0	2	7	17
	Privacy	3	0	2	0	2	4	6	17
	Density	8	0	1	2	1	2	3	17
	Social interaction	3	0	2	1	2	3	6	17
Number of children under 18 years of age at home.	sense of community	6	1	1	0	2	4	3	17
	Attachment to place/ Sense of pride	7	1	1	1	3	2	2	17
	Resident satisfaction	6	2	1	3	3	2	0	17
	Safety and security	4	1	1	0	1	1	9	17
	Privacy	5	2	1	2	0	1	6	17
	Density	6	0	1	2	0	3	5	17
	Social interaction	3	1	0	1	1	4	7	17
Employment status	Sense of community	6	0	2	2	1	2	4	17
	Attachment to place/Sense of pride	6	0	1	2	3	2	3	17
	Resident satisfaction	7	0	1	1	3	2	3	17
	Safety and security	8	0	0	0	2	2	5	17
	Privacy	7	0	1	1	0	5	3	17
	Density	8	0	1	1	2	4	1	17

The relationship		0	1	2	3	4	5	6	Total
Number of hours worked	Social interaction	4	0	1	1	2	2	7	17
	Sense of community	5	0	0	1	0	5	6	17
	Attachment to place/Sense of pride	7	0	0	0	3	1	6	17
	Resident satisfaction	8	0	0	3	2	2	2	17
	Safety and security	8	0	1	1	1	3	3	17
	Privacy	7	0	1	2	2	2	3	17
	Density	8	0	1	4	0	2	2	17
	Social interaction	3	0	0	1	0	8	5	17
Marital status	Sense of community	7	0	1	0	2	4	3	17
	Attachment to place/Sense of pride	6	0	2	0	3	4	2	17
	Resident satisfaction	8	0	2	1	3	1	2	17
	Safety and security	8	1	1	0	1	0	6	17
	Privacy	5	0	2	1	1	2	6	17
	Density	8	0	2	1	2	1	3	17
	Social interaction	4	0	1	0	1	5	6	17
Type of the property ownership	Sense of community	5	0	2	1	0	4	5	17
	Attachment to place/Sense of pride	5	1	0	1	1	1	8	17
	Resident satisfaction	4	0	1	1	3	2	6	17
	Safety and security	6	1	3	0	1	1	5	17
	Privacy	6	0	1	0	1	2	7	17
	Density	8	0	1	3	0	2	3	17
	Social interaction	6	0	1	1	1	3	5	17
Length of residence (house/neighbourhood)	Sense of community	4	1	0	1	0	3	8	17
	Attachment to place/Sense of pride	5	0	0	1	1	2	8	17
	Resident satisfaction	5	0	0	1	2	2	7	17
	Safety and security	5	0	1	1	2	3	5	17
	Privacy	4	0	2	1	2	1	7	17
	Density	8	0	1	2	2	1	3	17
	Social interaction	4	0	1	0	1	2	9	17

According to the average scores presented in Table 5-26, six moderately strong influences were found between the DF, SSI and social interaction. Five were found between social interaction and five DF, namely age, gender, number of hours worked, number of children under 18 years of age at home, and the length of residence (in neighbourhood/house). Each of these five relationships received an average score larger than 4.0 and less than 5.0, namely 4.5, 4.3, 4.3, 4.1, and 4.1, respectively. The last moderately strong relationship was between the sense of community and the gender, which received an average score of 4.18.

Moreover, six DF were found to have a slightly strong impact on privacy: the level of income, gender, length of residence, type of ownership, age, and marital status. The average scores for each of these relationships are 4.0, 3.9, 3.7, 3.4, 3.4, and 3.4, respectively. In addition, five factors have a slightly strong impact on social interaction, which are: marital status, education level, level of income, employment status, and type of ownership. The average scores for each of these relationships are 3.9, 3.9, 3.9, 3.8, and 3.2, respectively.

Furthermore, five factors have a slightly strong relationship with attachment to place, which are education level, age, length of residence, type of ownership, and number of hours worked. The



average scores for each of these relationships are 4.0, 3.9, 3.8, 3.6, and 3.1, respectively. Moreover, from the table, it can be seen that the education level, type of ownership, length of residence, and age have a slightly strong relationship with resident satisfaction, where each of these relationships had received average scores of 3.9, 3.7, 3.7, and 3.2, respectively.

According to the average scores, the sense of community had slightly strong relationships with the length of residence (3.9), education level (3.9), the number of hours worked (3.8), the type of ownership (3.4), and the level of income (3.3).

The factors that affect safety and security were: the number of children under 18 years of age at home, the length of residence, the level of income, and gender. These were found to have a slightly strong impact on safety and security, according to the following respective average scores: 3.9, 3.4, 3.3, and 3.2. In comparison, when considering the weak relationships and influences, the results show a moderately weak relationship between the level of income and attachment to place (1.9), and gender and density (1.7).

*Table 5-26 Average scores (scores/17) for the responses to the 15th interview question.*

The Relationship		Average of scores
Age	Social interaction	4.5
	Sense of community	4.2
	Attachment to place/Sense of pride	3.9
	Privacy	3.4
	Resident satisfaction	3.2
	Safety and security	2.7
	Density	2.4
Gender	Social interaction	4.3
	Privacy	3.9
	Safety and security	3.2
	Attachment to place/Sense of pride	3.0
	Sense of community	2.8
	Resident satisfaction	2.2
	Density	1.7
Education level	Attachment to place/Sense of pride	4.0
	Sense of community	3.9
	Resident satisfaction	3.9
	Social interaction	3.9
	Safety and security	2.7
	Privacy	2.7
	Density	2.1
Level of income	Privacy	4.0
	Social interaction	3.9
	Sense of community	3.3
	Safety and security	3.3
	Resident satisfaction	2.5
	Density	2.4
	Attachment to place/Sense of pride	1.9
Number of children under 18 years of age at home.	Social interaction	4.1
	Safety and security	3.9
	Density	3.1
	Privacy	3.0
	Sense of community	2.9
	Attachment to place/Sense of pride	2.4
	Resident satisfaction	2.1

The Relationship		Average of scores
Employment status	Social interaction	2.8
	Sense of community	2.8
	Attachment to place/Sense of pride	2.8
	Safety and security	2.8
	Privacy	2.8
	Resident satisfaction	2.7
	Density	2.3
Number of hours worked	Social interaction	4.3
	Sense of community	3.8
	Attachment to place/Sense of pride	3.1
	Privacy	2.6
	Safety and security	2.5
	Resident satisfaction	2.3
	Density	2.1
Marital status	Social interaction	3.9
	Privacy	3.4
	Sense of community	2.8
	Attachment to place/Sense of pride	2.8
	Safety and security	2.5
	Density	2.2
	Resident satisfaction	2.1
Type of the property ownership	Resident satisfaction	3.7
	Attachment to place/Sense of pride	3.6
	Privacy	3.4
	Sense of community	3.4
	Social interaction	3.2
	Safety and security	2.7
	Density	2.3
Length of residence (house/neighbourhood)	Social interaction	4.1
	Sense of community	3.9
	Attachment to place/Sense of pride	3.8
	Resident satisfaction	3.7
	Privacy	3.7
	Safety and security	3.4
	Density	2.3

Table 5-27 shows the amalgamated Likert Scale, which was reduced from seven into three points (namely strong, weak, and no change) for the relationships between the DF and SSI and social interaction. The results show that strong relationships are those that had received a mean score of 3.0. A comparison of the results reveals that there are six strong relationships between the DF and SSI. Four of these relationships are between social interaction and demographic factors, namely age, gender, number of children under 18 years of age at home, and the number of hours worked. Meanwhile, the other two are between attachment to place and education level, and privacy and level of income. The results in the table show that weaker relationships are found between all the other relationships, which received a score of 2.0 each.

Table 5-27 The mean of scores for the responses to the 15th interviews question.

The Relationship		Strong	Weak	No change	The mean of scores
Age	Social interaction	14	0	3	3
	Sense of community	12	1	4	2
	Attachment to place/Sense of pride	11	2	4	2
	Resident satisfaction	11	1	5	2
	Privacy	9	4	4	2
	Safety and security	7	4	6	2
	Density	6	3	8	2
Gender	Social interaction	12	2	3	3
	Privacy	10	4	3	2
	Safety and security	9	4	4	2
	Attachment to place/Sense of pride	9	2	6	2
	Sense of community	9	1	7	2
	Resident satisfaction	7	3	7	2
	Density	3	5	9	2
Education level	Attachment to place/Sense of pride	12	2	3	3
	Social interaction	12	1	4	2
	Sense of community	11	2	4	2
	Resident satisfaction	10	3	4	2
	Privacy	8	2	7	2
	Safety and security	7	3	7	2
	Density	6	2	9	2
Level of income	Privacy	12	2	3	3
	Social interaction	11	3	3	2
	Sense of community	9	4	4	2
	Safety and security	9	2	6	2
	Resident satisfaction	6	5	6	2
	Density	6	3	8	2
	Attachment to place/ Sense of pride	5	3	9	2
Number of children under 18 years of age at home.	Social interaction	12	2	3	3
	Safety and security	11	2	4	2
	Sense of community	9	2	6	2
	Privacy	7	5	5	2
	Density	8	3	6	2
	Attachment to place/Sense of pride	7	3	7	2
	Resident satisfaction	5	6	6	2
Employment status	Social interaction	11	2	4	2
	Attachment to place/Sense of pride	8	3	6	2
	Sense of community	7	4	6	2
	Resident satisfaction	8	2	7	2
	Safety and security	9	0	8	2
	Privacy	8	2	7	2
	Density	7	2	8	2
Number of hours worked	Social interaction	13	1	3	3
	Sense of community	11	1	5	2
	Attachment to place/Sense of pride	10	0	7	2
	Privacy	7	3	7	2
	Safety and security	7	2	8	2
	Resident satisfaction	6	3	8	2
	Density	4	5	8	2
Marital status	Social interaction	12	1	4	2
	Privacy	9	3	5	2
	Attachment to place/Sense of pride	9	2	6	2
	Sense of community	9	1	7	2
	Safety and security	7	2	8	2
	Resident satisfaction	6	3	8	2
	Density	6	3	8	2
Type of the property ownership	Resident satisfaction	11	2	4	2
	Attachment to place/Sense of pride	10	2	5	2
	Sense of community	9	3	5	2
	Privacy	10	1	6	2
	Social interaction	9	2	6	2
	Safety and security	7	4	6	2
	Density	5	4	8	2
Length of residence (house/neighbourhood)	Social interaction	12	1	4	2
	Sense of community	11	2	4	2

The Relationship	Strong	Weak	No change	The mean of scores
Attachment of place/ Sense of pride	11	1	5	2
Resident satisfaction	11	1	5	2
Privacy	10	3	4	2
Safety and security	10	2	5	2
Density	6	3	8	2

## 5.9. Conclusion:

This chapter provided the analysis of 17 questions that comprised the semi-structured interviews. These were conducted during January and February of 2017 with 17 Iraqi experts, including architects, urban designers and planners, and decision-makers. The results showed the level of knowledge amongst the Iraqi experts about the notion of social sustainability, although this appears to be at the initial stage in their agendas. Although they indicated limited knowledge and utility of the indicators of social sustainability, interviewees confirmed their importance in enhancing the social life of the city by improving its spaces. When considering the application of indicators of social sustainability in current work procedures, almost half of those interviewed (including some of the architects and urban designers who work as academics in the university, architectural engineers and urban planners who work in the private sector), indicated that they do not use them, while other interviewees (who are architectural engineers working in the public sector) indicated that they do not always use them. A possible explanation for these results may be a lack of adequate knowledge about the importance of social sustainability, and its impact on social life in the city. At the same time, there is a lack of proper understanding on how to employ this notion in the design, implementation, development, and maintenance stages in order to improve the city.

Moreover, there seemed to be a lack of interest (and thus a potential neglect of) in both the PCBE and DF in current processes. The experts interviewed confirmed the importance of the examined PCBE and DF in their work processes. However, they declared their semi-neglect of these crucial aspects. The interviews showed that the housing crisis and the priority in finding quick solutions to solve this crisis have pushed architects and urban designers to create designs with less attention paid to the examined PCBE and DF and implemented residential schemes with maximum speed. They may consider specific points without paying attention to their effects on the built environment's social aspect, such as density, safety and security, accessibility, and providing public infrastructure utilities. Some of the experts interviewed indicated that some of the PCBE (i.e., the provision of open green spaces) and DF (i.e., gender and age groups) would be paid attention to depending on whether the project is designed for

the private or public sector. This could be attributed to the absence of, inactivity in, and weaknesses in existing regulations and laws that concern these aspects. This could similarly be explained by a lack of legal observation and by the inefficiency of handling of legal irregularities, which see the overriding of rules and regulations concerning the design and implementation stages.

Furthermore, it can be seen that experts agreed on most aspects and sub-variables for consideration in this study in order to examine their impacts on social interaction in the selected areas. Although most of these results corroborate the findings of a great deal of the previous work, some of the indicators and factors discussed broadly in the literature review (density) received negative responses. Therefore, the current study will consider all of the indicators, factors and physical characteristics considered in the interviews in addition to the sub-variables that were added to the lists. Thus, all will be investigated within the questionnaire, observations and behavioural mapping, and site survey.

The following tables illustrate the final lists of the indicators that affect social interaction among residents in Iraqi context according to perceptions of Iraqi experts interviewed. This study will examine the influence of the refined lists of indicators, factors and their sub-variables, using the questionnaire, observation, and site survey. Table 5-28 shows the final list of SSIs that resulted from the semi-structured interviews. The list includes all six indicators that formed the interviews.

*Table 5-28 Final list of social sustainability indicators that resulted from the semi-structured interviews.*

Final List of The Social Sustainability Indicators That Resulted from The Interviews
Safety and security
Sense of community
Attachment to place/Sense of Pride
Resident satisfaction
Privacy
Density

Table 5-29 shows the final list of the sub-variables of the SSI that resulted from the semi-structured interviews. The list was refined according to the results of the semi-structured interviews, where it includes additional sub-variables suggested by the interviewees. Moreover, the refined list also excludes some sub-variables that received low average scores of 4.0. The final number of sub-variables for the SSI is 25, as shown in Table 5-29.

Table 5-29 Final list of the sub-variables of the social sustainability indicators that resulted from the semi-structured interviews.

Indicator	Sub-variables
Sense of community	Participation in community affairs, social activities and civic responsibilities.
	Knowing the neighbours/sense of community.
	Making new friends.
	Participatory decision-making processes relevant to the neighbourhood.
Safety & Security	The crime rate (criminal code, violent, property crimes) or frequency of conflicts.
	Percentage of residents who feel safe in their neighbourhood during daytime and night.
	Percentage of residents who feel safe in the communal spaces within residential neighbourhood during daytime and night.
	The incidence of crimes committed by youth.
	The rate of car accidents occurring within the residential neighbourhood.
Attachment to the place/Sense of Pride	When I arrive in the neighbourhood, I feel if I have finally arrived at my home.
	Feeling attached to the neighbourhood strongly as being one of its members.
	I feel proud of being living in this neighbourhood for proper planning.
Residents' satisfaction	Resident satisfaction with the planning and design of both the neighbourhood and communal spaces in the residential neighbourhood.
	Satisfaction with provided public utilities in the area as a catalyser factor for long residence stability.
Privacy	Hierarchy in spaces within the residential neighbourhood (open spaces and streets network).
	Perceived privacy and comfort when using communal spaces within the residential neighbourhood.
	Physical or visual boundaries (trees and fences).
	Surveillance for users of the communal spaces (e.g., parents and children).
	Whether the place is used by a single person or a family.
	Considering the time of use for the place.
Density	The number of people per house.
	The number of communal space users.
	The number of people living in the neighbourhood to the total area of the residential neighbourhood.
	The number of households per house.
	Percentage of housing units to the total area of the residential area (comparing the current situation to the standard).

Table 5-30 shows the final list of PCBE that resulted from the semi-structured interviews. It illustrates the list of the second category that this study will examine and includes all seven PCBE from the interviews.

Table 5-30 Final list of the physical characteristics of the built environment resulting from the interviews.

Final List of the Physical Characteristics of the Built Environment Resulting from the Interviews
Provision and location of infrastructure (social, educational, etc).
Provision and location of open and green spaces.
Accessibility.
Site design (the neighbourhood).
Climate responsive design.
Maintenance.

Table 5-31 represents the final list of sub-variables of PCBE that resulted from the interviews. It excludes a sub-variable because it received a low average score of 4.0, on which few interviewees agreed. Thus, the total number of sub-variables for the physical characteristics is 23 characteristics.

*Table 5-31 Final list of the sub-variables of the physical characteristics resulting from the interviews.*

Physical Characteristics	Final List of the Sub-Variables of the Physical Characteristics
Provision and location of infrastructure	The location of infrastructure according to the need of the residential neighbourhood.
	The provision of infrastructure within the residential neighbourhood (social, educational, etc.).
Provision and location of open and green spaces.	Number of green and open spaces within the residential neighbourhood.
	Appropriate distribution of green and open spaces within the residential neighbourhood.
Accessibility	Proximity of communal spaces to users in the neighbourhood.
	The accessibility of communal spaces.
	The number of males with access to communal spaces in the neighbourhood.
	A number of females with access to communal spaces in the neighbourhood.
	A number of children with access to communal spaces in the neighbourhood.
Site design (the neighbourhood)	The area of communal space within the residential neighbourhood.
	The layout of the residential neighbourhood.
	The layout of communal spaces within the residential neighbourhood.
	The types of single-family housing in the residential neighbourhood.
	The width of the streets.
	The design of the street format.
	Locating the case study from the city centre.
	Locating the infrastructure services within the case study.
	The type of communal space, such as a park or playground area.
Climate responsive design	A proper design for the environmental climate of the region.
	The appropriate architectural treatment of the local environment.
	The selection of building materials that fit the place and the region.
Maintenance	The maintenance of communal spaces.
	The maintenance of the residential neighbourhood.

Table 5-32 shows the final list of the DF that resulted from the semi-structured interviews. The list excludes one factor, “level of income” because of the possible difficulty in obtaining accurate responses from participants due to safety and security situation. Also, the final list includes two new factors, which are “the age of the area (neighbourhood)” and “the presence of relations in the same neighbourhood”. The total number of demographic factors is 12 factors.



Table 5-32 Final list of demographic factors that resulted from the semi-structured interviews.

Final List of the Demographic Factors Resulting from the Interviews
Number of hours worked.
Education status.
Length of residence (house/neighbourhood).
Age.
Number of children under 18 years of age at home.
Marital status.
Gender.
Employment status.
Type of ownership.
Number of hours worked.
The age of the area (neighbourhood).
The presence of relations in the same neighbourhood.

Table 5-33 shows the final list of the sub-variables for social interaction that resulted from the semi-structured interviews. The list excludes one of the manifestations of social interaction, which is “the visual interaction (passive communication)”. Also, the final list includes new additional sub-variables, which are represented in the table. Thus, the total sub-variables for social interaction are 11.

Table 5-33 Final list of social interaction’s sub-variables that resulted from interviews.

Final List of Social Interaction Sub-Variables
Stop and chat with neighbours or say hello.
Knowing each other by the name.
Opportunities for formal and informal social gathering.
The frequency of meeting their neighbours.
Exchanging small things between neighbours.
The number of neighbours visited.
The number of neighbours an individual considers as friends.
The number of neighbours whom an individual can ask them for help.
Children playing in open spaces within the neighbourhood.
The possibility to use open communal spaces with neighbours and friends.
The retired and youth attending cafes within the neighbourhood.
The frequency of attending closed shared places and open spaces.
Meeting when making use of social services within the neighbourhood.
The retired and youth attending cafes within the neighbourhood.

## **Chapter 6 Residents' Perceptions and satisfaction of neighbourhoods' social life**

### **6.1. Introduction:**

This chapter provides a full descriptive analysis of the questionnaire. The chapter starts with a discussion on the distribution of the questionnaire, which is followed by the total number and the sample of respondents. The next sections include a descriptive analysis for the questions, which formed the three aspects of demographic factors, the physical characteristics of the built environment, and the social sustainability indicators. The chapter also provides a summary of the quality and quantity of social interaction and the independent variables. Moreover, the chapter analyses the effect of three aspects (demographic factors, physical characteristics of the built environment, and social sustainability indicators) on social interaction and the three indices in separated sections. The last section includes the results and findings regarding the communal spaces in single-family houses neighbourhoods (SFHNs) in Iraq according to residents' experiences.

### **6.2. The Questionnaire Distribution:**

In this research, the questionnaire was distributed randomly in case studies without controlling any of the demographic factors. The questionnaire was distributed in two ways; firstly, online using social media, such as Facebook and WhatsApp groups. The researcher was keen to collaborate with some NGOs' work who were known in the region and helped to distribute the online version of the questionnaire among residents within the case studies. Secondly, paper copies of the questionnaires were delivered in person to each household with the help of three well-known people who lived in the case study area. In total, 145 paper copies of the questionnaire were distributed among the three case studies, although the targeted sample was 275. Having used these arrangements, the average response rate of 95% was achieved (i.e., 221 people completed the questionnaires out of 275 targeted questionnaires). Appendix E presents the questionnaire, both the English and Arabic copies.

### **6.3. The Sample of Respondents:**

The study comprised three case studies within Basra Governorate. Table 6-1 shows the responses to the second question regarding the name of the neighbourhood. The question was posed to identify the name of the neighbourhood where the respondents lived. The text of the second question was *'Please indicate where you live? Hay AlJunainah, Hay AlZahraa, and*

*AlKhalij Alarabi*'. In total, 221 respondents answered the question. According to the statistics represented in Table 6-1, AlKhalij Alarabi neighbourhood had the highest response rate with valid 43.9% replies. The valid response rate for the AlJunainah neighbourhood was 38.5%, while for the AlZahraa neighbourhood was 17.6% from the total.

Table 6-1 The valid response rates regarding Q2 (in percentages): Where do you live?

Name of the Case Studies	n	%	Valid Percent
AlJunainah	85	38.5%	38.5%
AlKhalij Alarabi	97	43.9%	43.9%
AlZahraa	39	17.6%	17.6%
Total	221	100%	100%

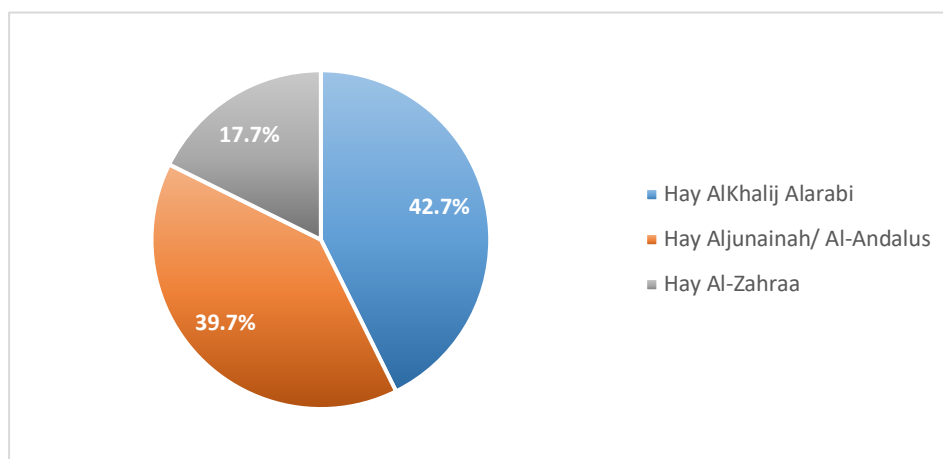


Figure 6-1 the valid percentage of the answers regarding the case studies.

#### 6.4. The Demographic Factors of the Respondents:

In this study, 11 demographic factors have been examined, including age, gender, marital status, number of children, education status, employment status, number of working hours and days, the presence of relatives, the length of residency in the house and neighbourhood, and the type of ownership. Also, it indicates the number of families and the total number of members living in the house. For more detail see Appendix D.

To gain an insight into the demographics of participants in this study, the number of responses to each demographic question was calculated. Table 6-2 shows a summary of the basic demographic factors and shows that 50.7% of the total participants were male, and 49.3% were female. This means that both genders had the opportunity to participate in this survey, which considers their perceptions from different perspectives. The age group of participants lay between 18 and 74. However, 78.3% of the total were relatively young, aged between 18 and

44 years, while the majority were between 25 and 34, which comprised 37.1% of the total sample. Moreover, 21.7% of the total were aged between 35 and 44, whereas 19.5% were between 18 and 24; moreover, close percentages were noted between 45 to 54, and 55 to 64 (at 9% and 9.5%, respectively), while the lowest percentage at 3.2% was for the 65 to 74 age group. Tables D-10 and D-11, and Figures D-4 and D-5 show more detail.

Slightly more than two-thirds of the total surveyed sample were married, 29.9% were single, while only 5.4% were divorced or widowed. This pattern is approximately similar across surveyed neighbourhoods. The educational background of more than half of the respondents had a bachelor's degree or above, 15.4% of the total were undergraduate students, 14.9% held an institute certificate, 13% had a secondary school degree or less, while 1.4% of the respondents had no education background. In terms of their employment status, 31.7% were employed (in public/government organisations), 19.9% were employed (private business), 15.8% were students, 13.1% were unemployed and housewives, and finally only 6.3% were retired. Tables D-12 to D-14 and Figures D-6 to D-8 show more detail. When considering the working hours per day and working days per month, eight hours per day are the average of working hours per day (see Table D-16). In contrast, the average of working days per month is 22 days (see Table D-16).

The length of residence amongst respondents comprised 30.8% for between six to ten years, while 27.6% have occupied their dwellings for more than 20 years. In addition, 25.38% of respondents have occupied their present residence for five years or less, and finally 16.2% of respondents have lived in their current home between 11 and 20 years. For the types of ownership, 70.1% of respondents owned their properties, 13.6% rented, 14.5% were in multi-owned properties, while around 2% of dwellings were government housing. The last factor in Table 6-2 is the presence of relatives living in the same neighbourhood. The data shows that 57% of the surveyed sample indicated the presence of relatives living in the same neighbourhood, while 43% of the total reported no relatives living in the same area. Tables D-27 to D-29 and Figures D-13 and D-14 show more detail.

For the number of households per house, the data shows that 50.7% of the respondents indicated that they live in houses consisting of one family, while 49.3% live in homes of more than one family: 29.9% occupy houses of two families, 17.2% live in houses of three families, and only 2.3% live in houses of four or more families. Regarding the household size, 30.8% of the respondents belong to households of five and six people, while 21.3% of the total comprise households of eight or nine people. In terms of the number of children living in the house, the

data shows that 22.6% of the respondents had no children, whereas 77.4% of the total had children aged ten years old or less: 25.3% of respondents had one child, while the rest of the surveyed sample had more than one child. Tables D-18, D-21, and D-25, and Figures D-9 to D-11 show more detail. The distribution of data across the selected case studies is described in detail in Appendix D, sections D.4.1. to D.4.12.

*Table 6-2 Frequency table for basic demographics (source: the researcher).*

Gender	Number	Percent	Total
Male	112	50.7%	221
Female	109	49.3%	
Age Group			
18 - 24	43	19.5%	221
25 - 34	82	37.1%	
35 - 44	48	21.7%	
45 - 54	20	9.0%	
55 - 64	21	9.5%	
65 - 74	7	3.2%	
Marital Status			
Married	143	64.7%	221
Divorced / Widow	12	5.4%	
Single	66	29.9%	
Education Status			
Secondary school or less	29	13.1%	221
Institute degree	33	14.9%	
University degree and above	122	55.2%	
No degree	3	1.4%	
Undergraduate student	34	15.4%	
Employment Status			
Public sector employee	70	31.7%	221
Private sector employee	44	19.9%	
Student	35	15.8%	
Retired	14	6.3%	
Unemployed	29	13.1%	
Housewife	29	13.1%	
Residency			
Less than two years	22	10.0%	221
2-5 years	34	15.38%	
6-10 years	68	30.8%	
11-15 years	18	8.1%	
16-20 years	18	8.1%	
More than 20 years	61	27.6%	
Ownership			
Owned	155	70.1%	221
Rent	30	13.6%	
Multi-ownership	32	14.5%	
Government Housing	4	1.8%	
The presence of relatives living within the neighbourhood			
No	126	57%	221
Yes	95	43%	

## 6.5. Physical Characteristics of the Built Environment Aspect:

Table 6-3, Figure 6-2, and Figure 6-3 illustrate the mean values of the questions that represent the physical characteristics of the built environment across the three surveyed neighbourhoods. The characteristics are: the accessibility (Q23), the maintenance (Q25), and the area of the house (Q16). The mean value of each of these characteristics was achieved by calculating the mean responses of each participant, and then, calculating the total mean in each case study and overall. Table 6-3 shows the mean values, where (0=SD) Strongly Disagree, (1=D) Disagree, (2=NN) Neither agree Nor disagree, (3=A) Agree, and (4=SA) Strongly Agree.

Table 6-3 Physical characteristics of the built environment: The means of Q16, Q23, and Q25.

		AlJunainah	AlKhalij Alarabi	AlZahraa	Total Average
Accessibility	Mean (Q23)	2.48	2.49	2.26	<b>2.45</b>
Maintenance	Mean (Q25)	1.28	1.19	1.22	<b>1.23</b>
Area	Mean (Q16)	2.01	2.27	2.36	<b>2.19</b>

0=SD, 1=D, 2=NN, 3=A, 4=SA

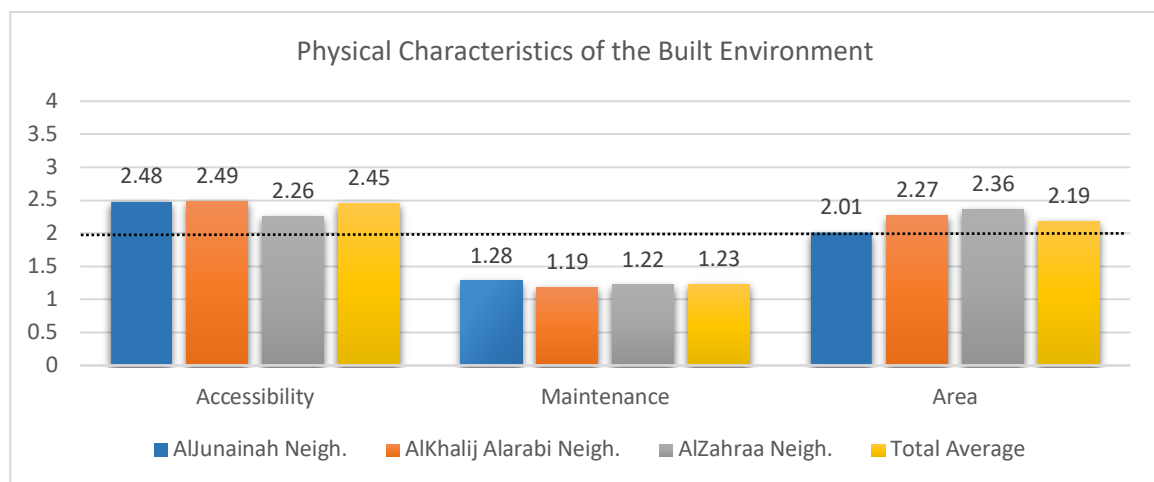


Figure 6-2 Physical characteristics of the built environment: The means of Q23, Q25, Q16.

The table represents the accessibility to available communal spaces within the neighbourhood, where it included statements about the possibility of safely and comfortably using communal spaces by kids, family, friends or neighbours. The overall mean value of accessibility is 2.45 (after rounding the mean value to the nearest integer), which means that respondents had a neutral position about using these spaces. This neutral position could be interpreted as an inability to use these spaces as residents wish. Data in the same table shows similar patterns across the neighbourhoods. Table 6-3 also shows that respondents disagreed with the maintenance level of the neighbourhood's local utilities, communal spaces, and streets with an overall mean value of 1.23. This demonstrates that respondents disagreed, after rounding the

mean value to the nearest integer, as the breakdown shows approximately similar patterns across the surveyed neighbourhoods.

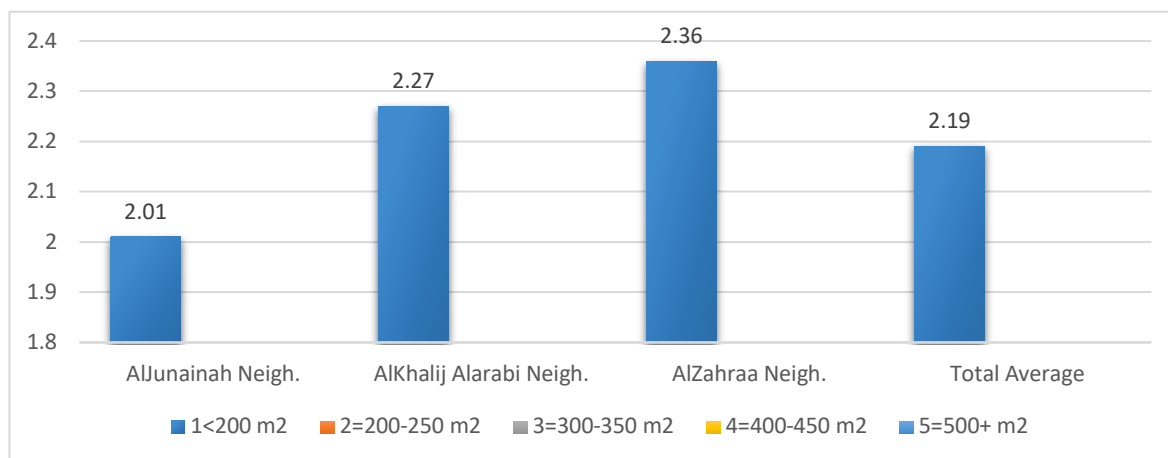


Figure 6-3 The total area of houses (Q32).

The total area of the house has been examined across the case studies to determine whether it affects social interaction. The last row in Table 6-3 presents the average of respondents' answers regarding the total area of their houses in each neighbourhood and in general. Overall, the average areas of the houses range from 200 m<sup>2</sup> to 250 m<sup>2</sup>, which is similar across the three neighbourhoods.

### 6.5.1. Frequencies:

The following sections represent the descriptive analysis of questions listed under the physical characteristics of the built environment, where respondents' answers have been analysed by calculating their frequencies.

- **Area of the House:**

Table 6-4 shows the area of houses in each of the surveyed case studies. Overall, more than a third of the houses range from 200m<sup>2</sup> to 250m<sup>2</sup>, 28.1% of the houses are less than 200m<sup>2</sup>, and 26.7% of the houses range from 300m<sup>2</sup> to 350m<sup>2</sup>, while 9% of the houses range from 400m<sup>2</sup> to more than 500m<sup>2</sup>. The breakdown of the data shows a similar pattern in AlJunainah neighbourhood, whilst for AlKhalij Alarabi neighbourhood, 70.8% of the houses range from 200m<sup>2</sup> to 350m<sup>2</sup>, and in AlZahraa neighbourhood, 38.5% of the houses range from 300m<sup>2</sup> to 350m<sup>2</sup> and 33.3% of the houses there range from 200m<sup>2</sup> to 250m<sup>2</sup>.



Table 6-4 Total house area (Question 16).

		AlJunainah		AlKhalij Alarabi		AlZahraa		Overall	
		N	%	N	%	N	%	N	%
Q16 The total area of the house	less than 200 m2	28	32.9%	26	26.8%	8	20.5%	62	28.1%
	200—250 m2	37	43.5%	30	30.9%	13	33.3%	80	36.2%
	300-350 m2	14	16.5%	30	30.9%	15	38.5%	59	26.7%
	400-450 m2	3	3.5%	11	11.3%	2	5.1%	16	7.2%
	500+ m2	3	3.5%	0	0.0%	1	2.6%	4	1.8%
Total		85	100%	97	100%	39	100%	221	100.0%

- **The Accessibility**

Table 6-5 demonstrates the frequencies of answers to question 23, which related to accessibility. This question included three statements, and answers were given on a five Likert point scale. The table shows each statement with the frequency of three main Likert scale points (disagree, neither agree nor disagree and agree) after adding the counts of strongly agree to agree and strongly disagree to disagree. The data shows that the first two statements regarding the accessibility of local utilities and communal spaces and their proximate location to users' dwellings received a high level of agreement at around 80%, while the third statement, the ability of both genders to use communal spaces, received a score of 42.5% with 52% disagreement. The data breakdown shows approximately similar patterns across the surveyed neighbourhoods.

Table 6-5 The frequencies of Q23: accessibility.

Q23			AlJunainah		AlKhalij Alarabi		AlZahraa		Overall	
			N	N %	N	N %	N	N %	N	N %
It is easy to access public services of the neighbourhood and communal spaces because there is a clear, direct path, in addition to the availability of visual signs.	Disagree		14	16.5	16	16.5	12	30.8	42	19.0
	Neither agree nor disagree		1	1.2	2	2.1	0	0.0	3	0.0
	<b>Agree</b>		<b>70</b>	<b>82.4</b>	<b>79</b>	<b>81.4</b>	<b>27</b>	<b>69.2</b>	<b>176</b>	<b>79.6</b>
Public services and communal spaces in the neighbourhood are close to my house (about a ten-minute walk).	Disagree		11	12.9	19	19.6	9	23.1	39	17.6
	Neither agree nor disagree		1	1.2	3	3.1	0	0.0	4	1.8
	<b>Agree</b>		<b>73</b>	<b>85.9</b>	<b>75</b>	<b>77.3</b>	<b>30</b>	<b>76.9</b>	<b>178</b>	<b>80.5</b>
Communal spaces within the neighbourhood, such as the common garden between houses, sidewalks, and streets, can be used by both genders at any time during the day.	<b>Disagree</b>		<b>42</b>	<b>49.4</b>	<b>48</b>	<b>49.5</b>	<b>25</b>	<b>64.1</b>	<b>115</b>	<b>52.0</b>
	Neither agree nor disagree		3	3.5	9	9.3	0	0.0	12	5.4
	<b>Agree</b>		<b>40</b>	<b>47.1</b>	<b>40</b>	<b>41.2</b>	<b>14</b>	<b>35.9</b>	<b>94</b>	<b>42.5</b>

- **Maintenance:**

Regarding the level of maintenance, which represented question 25, the data in Table 6-6 demonstrates the frequencies of the answers to this question. Question 25 included two statements and responses were given on a five Likert point scale. The table shows each statement with the frequency of three main Likert scale points (disagree, neither agree nor

disagree and agree) after adding the counts of strongly agree to agree and strongly disagree to disagree. Closer inspection of the data shows that, overall, more than two-thirds of respondents disagreed and were dissatisfied with the current level of maintenance. The majority of respondents (72.4%) were dissatisfied with the level of service maintenance and renovation of the neighbourhood. Furthermore, 76% of participants disagreed when were asked whether the furnishing and maintenance level of their neighbourhood streets and sidewalks were well established (see Table 6-6). The data breakdown shows that there are approximately similar patterns of agreement level across the three case studies.

Table 6-6 Frequencies of question 25 overall and cross the case studies.

Q25		AlJunainah		AlKhalij Alarabi		AlZahraa		Overall	
		N	N %	N	N %	N	N %	N	N %
Feeling satisfied with the level of maintenance and renovation of the services of the neighbourhood.	<b>Disagree</b>	<b>60</b>	<b>70.6</b>	<b>73</b>	<b>75.3</b>	<b>27</b>	<b>69.2</b>	<b>160</b>	<b>72.4</b>
	Neither agree nor disagree	0	0.0	0	0.0	0	0.0	0	0.0
	<b>Agree</b>	25	29.4	24	24.7	12	30.8	61	27.6
The furnishing and maintenance of the streets and sidewalks of the neighbourhood are well established.	<b>Disagree</b>	<b>60</b>	<b>70.6</b>	<b>78</b>	<b>80.4</b>	<b>30</b>	<b>76.9</b>	<b>168</b>	<b>76.0</b>
	Neither agree nor disagree	0	0.0	0	0.0	0	0.0	0	0.0
	<b>Agree</b>	<b>25</b>	<b>29.4</b>	<b>19</b>	<b>19.6</b>	<b>9</b>	<b>23.1</b>	<b>53</b>	<b>24.0</b>

## 6.6. Social Sustainability Indicators:

Table 6-7 and Figure 6-4 illustrate the mean values from the questions that represent the indicators of social sustainability, as investigated across the three surveyed neighbourhoods. The indicators are: Safety and Security of the neighbourhood and its communal spaces (Q19), Attachment to the Place (Q20), Sense of Community (Q21), Privacy (Q22), and Resident Satisfaction with the Design of the Built Environment (*RS-DBE*) (Q24). The table also shows what the mean values indicate, where (0=SD) Strongly Disagree, (1=D) Disagree, (2=NN) Neither agree Nor disagree, (3=A) Agree, and (4=SA) Strongly Agree.

Table 6-7 Indicators of social sustainability: The mean of Q19, Q20, Q21, Q22, and Q24.

		AlJunainah	AlKhalij Alarabi	AlZahraa	Overall Mean
Safety and Security	Mean (Q19)	2.51	3.02	2.49	2.73
Attachment to the Place	Mean (Q20)	2.83	2.94	2.44	2.81
Sense of Community	Mean (Q21)	2.45	2.28	1.75	2.25
Privacy	Mean (Q22)	2.2	2.1	1.6	2.0
RS-DBE	Mean (Q24)	2.72	2.46	2.47	2.56
0=SD, 1=D, 2=NN, 3=A, 4=SA					

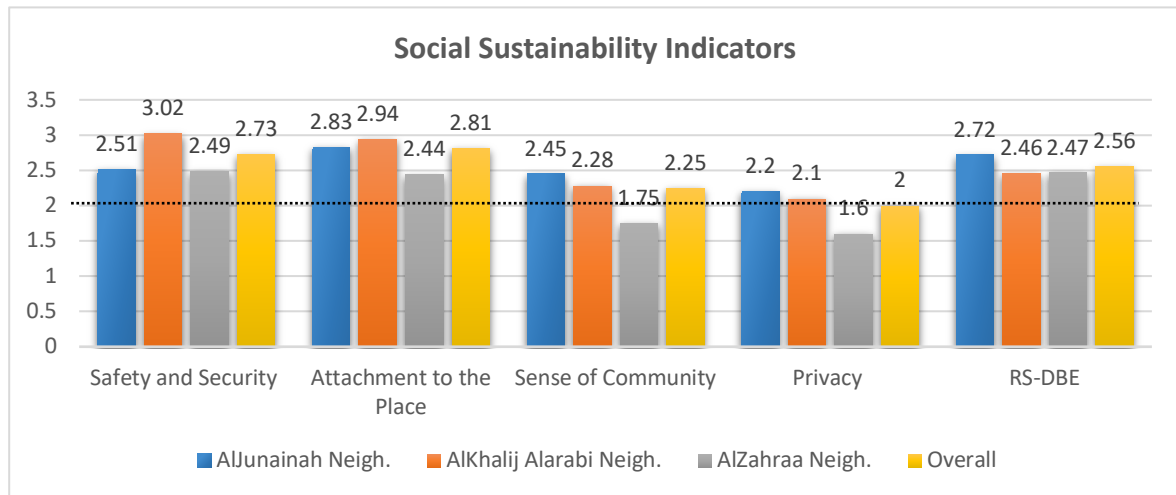


Figure 6-4 Indicators of social sustainability (the mean of Q19, Q20, Q21, Q22, and Q24).

The indicator of safety and security considers both the neighbourhood and its communal spaces. Table 6-7 shows that the mean value of safety and security is 2.73 and is categorised as ‘Agree’ on the Likert scale. In other words, the respondents have indicated that they feel safe in their neighbourhoods and the available communal spaces within. The breakdown of the data across the neighbourhoods shows a similar pattern across the surveyed neighbourhood, which means that the level of safety and security of the neighbourhoods could be considered comparable. The higher mean was in AlKhalij Alarabi, followed by AlJunainah, and then AlZahraa neighbourhood, at 3.02, 2.51, and 2.49, respectively.

What stands out in the table is that respondents indicated a level of attachment to their place where they live, where the mean value of the associated question is 2.81. After rounding it to the nearest integer, the mean value equates to 3 and is categorised as ‘Agree’ on the Likert scale. The breakdown in the table shows that there is an attachment to place in AlJunainah and AlKhalij Alarabi, where the mean values are 2.83, 2.94, respectively. At the same time, in AlZahraa neighbourhood, the respondents indicated a neutral level of attachment to where they live with a mean value of 2.44, which equates to 2, after rounding the value to the nearest integer, and is categorised as ‘Neither Agree Nor Disagree’ on the Likert scale.

Moreover, the data in Table 6-7 shows a neutral level for the sense of community among respondents, where the mean value of the associated questions is 2.25. The mean value equates to 2 after rounding it to the nearest integer and is categorised as "Neither Agree Nor Disagree" on the Likert scale. The data breakdown shows a similar level of the sense of community across the case studies. The higher is in AlJunainah (2.45), followed by AlKhalij Alarabi (2.28), and the lower level is in AlZahraa (1.75).

Table 6-7 also shows the level of the Privacy of the built environment overall and across the case studies. Overall, the data shows a neutral level of the privacy, where the total mean value is 2.0, which is categorised as ‘Neither Agree Nor Disagree’ on the Likert scale. According to the mean values' breakdown, the Privacy level is similar in the case studies, where the mean value of Privacy is 2.2 in AlJunainah, 2.1 in AlKhalij Alarabi, and 1.6 in AlZahraa.

The table shows that the total mean value of the RS-DBE is 2.56, which equates to 3, as the value is classed as ‘Agree’ on the Likert scale. This indicates that respondents are satisfied with the built environment’s design and physical characteristics. The data breakdown shows that the level of resident satisfaction is higher in the AlJunainah neighbourhood (i.e., 2.72), and it equates to 3 after rounding to the nearest integer, categorised as “Agree” on the Likert scale. However, in AlZahraa and AlKhalij Alarabi neighbourhoods, the level of satisfaction with the built environment is low; the mean values for resident satisfaction are 2.47 and 2.46, respectively, which are classed as “neither agree nor disagree” on the Likert scale.

#### **6.6.1. Frequencies:**

The following sections represent the descriptive analysis of the questions listed under the aspect of the indicators of social sustainability, where respondents’ answers have been analysed by calculating their frequencies.

- **Safety and Security:**

This section includes two questions (Q18 and Q19). Table 6-8 demonstrates the counts and percentages of the responses to question 18 that represented the safety and security of using communal spaces within the neighbourhood. In this question, participants were asked about how safe they feel while using eleven communal spaces available in their neighbourhood; this question was answered using a five-point Likert scale (extremely unsafe, unsafe, do not know, safe, and extremely safe). The table shows each statement with the frequencies of three main Likert scale points (unsafe, do not know, and safe) after adding the counts for extremely safe to safe and extremely unsafe to unsafe. From the data in the table, it appears that there are missing answers, and the range varies from only 9 to 95 missing answers overall.

Thus, as question 18 has a large number of missing responses in some statements, which could affect the analysis of the rest of the questionnaire, this could impact on how the research questions are addressed; therefore, this question has been excluded from consideration in the main analysis.

Table 6-8 Question 18: The safety and security of local communal spaces and recreational places.

Safety and Security of the CSs		AlJunainah			AlKhalij Alarabi			AlZahraa			Overall		
		N	N %	Total N %	N	N %	Total N %	N	N %	Total N %	N	N %	Total N %
Q18 Safety and security: how safe do you feel when using the area in front of the main entrance?	Unsafe	12	15.0	14.1	11	11.7	11.3	2	5.3	5.1	25	12	11.3
	Don't Know	0	0.0	0.0	10	10.6	10.3	1	2.6	2.6	11	5	5
	Safe	68	85.0	80.0	73	77.7	75.3	35	92.1	89.7	176	83	79.6
	Missing	5		5.9	3		3.1	1		2.6	9		4.1
Q18 Safety and security: how safe do you feel when using streets and sidewalks	Unsafe	26	32.9	30.6	33	35.9	34.0	7	20.0	17.9	66	32	29.9
	Don't Know	2	2.5	2.4	2	2.2	2.1	0	0.0	0.0	4	1.9	1.8
	Safe	51	64.6	60.0	57	62.0	58.8	28	80.0	71.8	136	66	61.5
	Missing	6		7.1	5		5.2	4		10.3	15		6.8
Q18 Safety and security: how safe do you feel when using children's playground	Unsafe	19	33.3	22.4	24	40.7	24.7	7	28.0	17.9	50	35.5	22.6
	Don't Know	9	15.8	10.6	6	10.2	6.2	10	40.0	25.6	25	17.7	11.3
	Safe	29	50.9	34.1	29	49.2	29.9	8	32.0	20.5	66	46.8	29.9
	Missing	28		32.9	38		39.2	14		35.9	80		36.2
Q18 Safety and security: how safe do you feel when using public gardens between houses	Unsafe	18	30.5	21.2	15	32.6	15.5	5	23.8	12.8	38	30.2	17.2
	Don't Know	12	20.3	14.1	4	8.7	4.1	7	33.3	17.9	23	18.3	10.4
	Safe	29	49.2	34.1	27	58.7	27.8	9	42.9	23.1	65	51.6	29.4
	Missing	26		30.6	51		52.6	18		46.2	95		43.0
Q18 Safety and security: how safe do you feel when using mosques, churches and hussainya	Unsafe	0	0.0	0.0	4	4.4	4.1	0	0.0	0.0	4	2	1.8
	Don't Know	9	12.2	10.6	7	7.8	7.2	4	11.1	10.3	20	10	9.0
	Safe	65	87.8	76.5	79	87.8	81.4	32	88.9	82.1	176	88	79.6
	Missing	11		12.9	7		7.2	3		7.7	21		9.5
Q18 Safety and security: how safe do you feel when using local shops	Unsafe	2	2.7	2.4	5	5.3	5.2	2	5.4	5.1	9	4.4	4.1
	Don't Know	4	5.4	4.7	8	8.5	8.2	0	0.0	0.0	12	5.9	5.4
	Safe	68	91.9	80.0	81	86.2	83.5	35	94.6	89.7	184	89.8	83.3
	Missing	11		12.9	3		3.1	2		5.1	16		7.2
Q18 Safety and security: how safe do you feel when using local market or malls	Unsafe	13	16.9	15.3	10	11.9	10.3	5	14.3	12.8	28	14.3	12.7
	Don't Know	4	5.2	4.7	8	9.5	8.2	2	5.7	5.1	14	7.1	6.3
	Safe	60	77.9	70.6	66	78.6	68.0	28		71.8	154	78.6	69.7
	Missing	8		9.4	13		13.4	4		10.3	25		11.3
Q18 Safety and security: how safe do you feel when using local restaurants	Unsafe	7	9.7	8.2	6	8.5	6.2	1	3.3	2.6	14	8.1	6.3
	Don't Know	14	19.4	16.5	6	8.5	6.2	8	26.7	20.5	28	16.2	12.7
	Safe	51	70.8	60.0	59	83.1	60.8	21	70.0	53.8	131	75.7	59.3
	Missing	13		15.3	26		26.8	9		23.1	48		21.7
Q18 Safety and security: how safe do you feel when using local cafes	Unsafe	10	15.6	11.8	31	38.3	32.0	6	20.7	15.4	47	27	21.3
	Don't Know	21	32.8	24.7	15	18.5	15.5	8	27.6	20.5	44	25.3	19.9
	Safe	33	51.6	38.8	35	43.2	36.1	15	51.7	38.5	83	47.7	37.6
	Missing	21		24.7	16		16.5	10		25.6	47		21.3
Q18 Safety and security: how safe do you feel when using the gym	Unsafe	9	13.6	10.6	11	15.3	11.3	1	3.3	2.6	21	12.5	9.5
	Don't Know	26	39.4	30.6	12	16.7	12.4	11	36.7	28.2	49	29.2	22.2
	Safe	31	47.0	36.5	49	68.1	50.5	18	60.0	46.2	98	58.3	44.3
	Missing	19	0.2	22.4	25	0.3	25.8	9	0.2	23.1	53		24.0

Continuing with describing the data related to social sustainability indicators, Table 6-9 demonstrates the frequencies of the answers to question 19, which related to the safety and security of both the neighbourhood and its communal spaces. This question included five statements that should be answered using five-points of the Likert scale. The table shows each statement with the frequencies of three main Likert scale points (disagree, neither agree nor disagree and agree) after adding the counts of strongly agree to agree and strongly disagree to disagree. The data in the table shows that all six statements for Q19 obtained an agreement from

the majority of respondents. What stands out in the table is that the majority of respondents (90.5%) agreed with the first statement, “The neighbourhood is safe to live in”. The breakdown of the answers shows a similar pattern across the surveyed case studies.

Slightly more than three-quarters of respondents agreed with the second and third statements of Q19, which are “feeling safe walking around the neighbourhood during the day” and “feeling safe when using the available enclosed and open communal spaces within the neighbourhood for gatherings during the daytime”. The data breakdown for these two statements shows approximately similar patterns across the surveyed neighbourhoods (see Table 6-9).

Moreover, the data in the table shows that 67.9% of the surveyed sample agreed with the fourth statement of Q19, in that they feel safe when using enclosed and open communal spaces within the neighbourhood for gatherings during the evening. The data breakdown demonstrates a similar pattern across the examined case studies. Over half of those who surveyed (56.1%) reported that they feel safe from car accidents when in the street in front of their houses due to the short length of roads and intersections. The data breakdown demonstrates an approximately similar pattern in AlJunainah and AlKhalij Alarabi neighbourhoods, while in AlZahraa neighbourhood, 66.7% of the respondents there feel unsafe, i.e., they disagree with the fourth statement of Q19.

Table 6-9 Question 19: Safety and security of the neighbourhood and its communal spaces.

Q19 Safety and Security of the Neigh. and CSs		AlJunainah		AlKhalij Alarabi		AlZahraa		Overall	
		N	%	N	%	N	%	N	%
1. The neighbourhood is safe to live in.	Disagree	14	16.5%	4	4.1%	3	7.7%	21	9.5%
	Neither agree nor disagree	0	0.0%	0	0.0%	0	0.0%	0	0.0%
	<b>Agree</b>	<b>71</b>	<b>83.5%</b>	<b>93</b>	<b>95.9%</b>	<b>36</b>	<b>92.3%</b>	<b>200</b>	<b>90.5%</b>
2. Feeling safe walking around the neighbourhood during the day.	Disagree	18	21.2%	10	10.3%	7	17.9%	35	15.8%
	Neither agree nor disagree	3	3.5%	0	0.0%	0	0.0%	3	1.4%
	<b>Agree</b>	<b>64</b>	<b>75.3%</b>	<b>87</b>	<b>89.7%</b>	<b>32</b>	<b>82.1%</b>	<b>183</b>	<b>82.8%</b>
3. Feeling safe when using available enclosed and open communal spaces within the neighbourhood for gatherings during the daytime.	Disagree	20	23.5%	15	15.5%	8	20.5%	43	19.5%
	Neither agree nor disagree	1	1.2%	0	0.0%	0	0.0%	1	0.5%
	<b>Agree</b>	<b>64</b>	<b>75.3%</b>	<b>82</b>	<b>84.5%</b>	<b>31</b>	<b>79.5%</b>	<b>177</b>	<b>80.1%</b>
4. Feeling safe when using available enclosed and open communal spaces within the neighbourhood for gatherings during the evening.	Disagree	31	36.5%	22	22.7%	15	38.5%	68	30.8%
	Neither agree nor disagree	2	2.4%	1	1.0%	0	0.0%	3	1.4%
	<b>Agree</b>	<b>52</b>	<b>61.2%</b>	<b>74</b>	<b>76.3%</b>	<b>24</b>	<b>61.5%</b>	<b>150</b>	<b>67.9%</b>

Q19 Safety and Security of the Neigh. and CSs		AlJunainah		AlKhalij Alarabi		AlZahraa		Overall	
		N	%	N	%	N	%	N	%
5. Feeling safe from car accidents when in the street in front of my house due to the short length of streets and increased intersections.	Disagree	39	45.9%	30	30.9%	26	66.7%	95	43.0%
	Neither agree nor disagree	2	2.4%	0	0.0%	0	0.0%	2	0.9%
	Agree	44	51.8%	67	69.1%	13	33.3%	124	56.1%

- **Attachment to The Place**

Table 6-10 represents the frequencies of the responses to question 20 and related to attachment to place. This question included four statements that were answered using a five-point Likert scale. The table shows each statement with the frequencies of three main Likert scale points (disagree, neither agree nor disagree and agree) after adding the counts of strongly agree to agree and strongly disagree to disagree. A closer inspection of the data, it is noted that a higher rate of respondents agreed with the statements of this question. The statement that obtains the highest rate of agreement from respondents is the third one, where 80.5% of respondents confirm that they feel at home when arriving in the neighbourhood, while 19% report that they do not experience such a feeling. The data breakdown demonstrates a similar pattern across the surveyed neighbourhoods. The majority of respondents (78.8%) reported that they feel strongly attached to the neighbourhood as one of its members, while 21.2% of respondents disagreed with this feeling. The data breakdown in response to this statement shows a similar pattern in AlJunainah and AlKhalij Alarabi neighbourhoods, while in AlZahraa, only 58.9% of respondents agreed with this feeling.

Regarding the last statement, 76.9% of the respondents reported that they plan to stay in their neighbourhood as long as possible. However, 22.2% of the respondents disagree with the statement, indicating their desire to move from their current neighbourhood. The data breakdown shows a similar pattern across the case studies. Finally, for the second statement, 75.6% of the respondents reported that they feel proud of living in their neighbourhoods, while less than a quarter of respondents disagreed. This statement's data breakdown shows a similar pattern across the surveyed neighbourhoods, but the lower rate was in AlZahraa (i.e., 64.1%).



Table 6-10 Question 20: Attachment to place.

Q20		AlJunainah		AlKhalij Alarabi		AlZahraa		Overall	
		N	N %	N	N %	N	N %	N	N %
1. Feeling strongly attached to the neighbourhood as one of its members.	Disagree	12	14.2	19	19.6	16	41	47	21.2
	Neither agree nor disagree	0	.0	0	.0	0	.0	0	0.0
	Agree	73	85.9	78	80.5	23	58.9	106	78.8
2. Feeling proud of living in this neighbourhood.	Disagree	18	21.2	21	21.6	14	35.9	53	24.0
	Neither agree nor disagree	0	.0	1	1.0	0	.0	1	0.5
	Agree	67	78.8	75	77.3	25	64.1	167	75.6
3. Feeling at home when arriving in the neighbourhood.	Disagree	21	25	12	12	10	26	43	19
	Neither agree nor disagree	0	.0	0	.0	0	.0	0	0.0
	Agree	64	75.3	85	87.6	29	74.4	178	80.5
4. Planning to stay in the neighbourhood as long as possible.	Disagree	20	23.5	18	18.6	11	28.2	49	22.2
	Neither agree nor disagree	2	2.4	0	.0	0	.0	2	0.9
	Agree	63	74.1	79	81.4	28	71.8	170	76.9

- **The Sense of Community**

Table 6-11 shows the frequencies of responses to question 21, which related to the sense of community indicator. The table represents eight statements that should be answered using five Likert scale points. The table shows each statement with the frequency of three main Likert scale points (disagree, neither agree nor disagree and agree) after adding the counts of strongly agree to agree and strongly disagree to disagree. Overall, according to the data, 68.8% of respondents agreed with the first statement of Q21: “The friendships and relationships I have with neighbours in the neighbourhood mean a lot to me.” The data breakdown shows a similar pattern across the surveyed neighbourhoods. The same thing happened with the second statement, where 68.3% of respondents indicated that they agreed with the statement “*I have made new friends while living here*”. The breakdown of this statement presents a similar pattern across most surveyed neighbourhoods, except in AlZahraa neighbourhood, where more 59% of respondents disagreed with the statement, and had not made new friends while living in this neighbourhood.

The table shows that 48.4% of respondents disagreed with the third statement of Q21, “*if I need a little company, I can stop by a neighbour I know*”, while 47.5% agree. The data breakdown shows that the respondents’ disagreement rate with this statement is 76.9% in AlZahraa, while the respondents’ agreement rates with the statement are more significant in AlJunainah and AlKhalij Alarabi (i.e., 56.5% and 49.5% of the respondents, respectively). Table 6-11 also shows that slightly more than three-quarters of respondents agreed with the fourth statement of

Q21, which relates to attending social gatherings organised in the neighbourhood. The data breakdown demonstrates an approximately similar pattern across the surveyed neighbourhoods, while in AlZahraa, the agreement rate was lower, 59%. Data from the last statement of Q21 shows that 52% of the respondents agreed with participating in decision-making processes relevant to the neighbourhood. This agreement level is similar in the AlJunainah neighbourhood (70.6%), while in AlKhalij Alarabi and AlZahraa, more than half of respondents (54.6% and 59%, respectively) had disagreed.

Table 6-11 Frequencies of question 21.

Q21 Sense of Community			AlJunainah		AlKhalij Alarabi		AlZahraa		Overall	
			N	%	N	%	N	%	N	%
1. The friendships and relationships I have with neighbours in the neighbourhood mean a lot to me.	Disagree		19	22.4%	25	25.8%	19	48.7%	63	28.5%
	Neither agree nor disagree		3	3.5%	3	3.1%	0	0.0%	6	2.7%
	Agree		63	74.1%	69	71.1%	20	51.3%	152	68.8%
2. I have made new friends while living here.	Disagree		17	20.0%	26	26.8%	23	59.0%	66	29.9%
	Neither agree nor disagree		1	1.2%	3	3.1%	0	0.0%	4	1.8%
	Agree		67	78.8%	68	70.1%	16	41.0%	151	68.3%
3. If I need a little company, I can stop by a neighbour I know.	Disagree		35	41.2%	42	43.3%	30	76.9%	107	48.4%
	Neither agree nor disagree		2	2.4%	7	7.2%	0	0.0%	9	4.1%
	Agree		48	56.5%	48	49.5%	9	23.1%	105	47.5%
4. Attending most of the social gatherings organised in the neighbourhood.	Disagree		16	18.8%	19	19.6%	16	41.0%	51	23.1%
	Neither agree nor disagree		0	0.0%	3	3.1%	0	0.0%	3	1.4%
	Agree		69	81.2%	75	77.3%	23	59.0%	167	75.6%
5. Participating in decision-making processes relevant to the neighbourhood.	Disagree		25	29.4%	53	54.6%	23	59.0%	101	45.7%
	Neither agree nor disagree		0	0.0%	5	5.2%	0	0.0%	5	2.3%
	Agree		60	70.6%	39	40.2%	16	41.0%	115	52.0%

- **Privacy:**

Table 6-12 shows the frequencies of responses to question 22 related to the privacy indicator. What stands out in the table is that more than half (59.3%) of the respondents indicated that children could use open communal spaces and could be watched easily. According to the data breakdown, a similar level of agreement with the first statement of Q22 can be seen across the three surveyed neighbourhoods. However, this was not the situation with the second statement for Q22. Table 6-12 shows that 51.6% of the respondents indicated that they could not use open communal spaces within the neighbourhood with their family. The data breakdown shows an approximately similar pattern across AlKhalij Alarabi and AlZahraa neighbourhoods. In

contrast, in AlJunainah neighbourhood, more than half of the surveyed residents use these spaces with their family members.

Nevertheless, 52.9% of the respondents indicated that they could use open communal spaces with neighbours and friends. The data breakdown illustrates an approximately similar pattern in AlJunainah and AlKhalij Alarabi neighbourhoods, while in AlZahraa, 66.7% of the respondents indicated that they cannot use these spaces with neighbours or friends.

Table 6-12 Frequencies of question 22.

Q22 Privacy		AlJunainah		AlKhalij Alarabi		AlZahraa		Overall	
		N	%	N	%	N	%	N	%
1. The possibility of using open communal spaces with the kids and watching them easily.	Disagree	28	32.9%	35	36.1%	15	38.5%	78	35.3%
	Neither agree nor disagree	0	0.0%	12	12.4%	0	0.0%	12	5.4%
	<b>Agree</b>	<b>57</b>	<b>67.1%</b>	<b>50</b>	<b>51.5%</b>	<b>24</b>	<b>61.5%</b>	<b>131</b>	<b>59.3%</b>
2. The possibility of using open communal spaces in the neighbourhood with the family.	<b>Disagree</b>	37	43.5%	<b>48</b>	<b>49.5%</b>	<b>29</b>	<b>74.4%</b>	<b>114</b>	<b>51.6%</b>
	Neither agree nor disagree	2	2.4%	13	13.4%	0	0.0%	15	6.8%
	<b>Agree</b>	<b>46</b>	<b>54.1%</b>	36	37.1%	10	25.6%	92	41.6%
3. The possibility of using open communal spaces in the neighbourhood with friends and neighbours.	Disagree	32	37.6%	37	38.1%	26	<b>66.7%</b>	95	43.0%
	Neither agree nor disagree	1	1.2%	8	8.2%	0	0.0%	9	4.1%
	<b>Agree</b>	<b>52</b>	<b>61.2%</b>	<b>52</b>	<b>53.6%</b>	13	33.3%	<b>117</b>	<b>52.9%</b>

- **Resident Satisfaction:**

Participants responded to seven statements on their satisfaction with the design of the neighbourhood and its communal spaces (question 24). Replies represent the level of agreement with the statements based on a five-point Likert scale, as shown in Table 6-13. The table shows each statement with the frequency of three main Likert scale points (disagree, neither agree nor disagree and agree), which were determined after adding the counts of strongly agree to agree and strongly disagree to disagree. From the table, it can be seen that more than half of the respondents agree on the diversity of available communal spaces within the neighbourhood, the area of the open communal spaces, and the availability of visual attractions in these spaces, such as shaded seats, trees, and water figures, i.e., 61.1%, 59.7%, and 73.8%, respectively. The data breakdown shows similar patterns across the case studies, as the majority of respondents in the neighbourhoods indicated that they are satisfied; the lower rates of agreement appear in AlJunainah neighbourhood for the three first statements (i.e., 52.9%, 48.2%, and 61.2%, respectively).

The remaining statements of Q24 obtain higher rates for neutral responses. The table shows that 49.3% of respondents neither agree nor disagree with the fourth statement for Q24 “*feeling satisfied with the distribution of houses and the location of public services...*” This statement’s breakdown shows that neutral answers are at similar levels across two of the surveyed neighbourhoods, except in AlZahraa where 56.4% of respondents agree with the statement.

The last three statements obtained higher neutral response rates (neither agree nor disagree), where more than half of the respondents are not satisfied with: the shape of the neighbourhood's internal streets, their direct connection to main streets outside the area, their width, and the presence of sidewalks with a suitable width, i.e., 56.6%, 52%, and 51.6%, respectively. The data breakdown for these statements shows that the proportions of answers are similar across the case studies. The data breakdown for the statement “*feeling satisfied with the width of the internal neighbourhood's streets*” signifies that there is an approximately similar pattern in AlKhalij Alarabi neighbourhood, while in AlJunainah and AlZahraa, less than half of respondents (49.4% and 48.7%, respectively) neither agree nor disagree with this statement. The data breakdown for the sixth statement represents a similar pattern across two of the surveyed neighbourhoods, while in AlJunainah, the rate is low at 47.1%. The data breakdown of the last statement shows similar patterns across the three surveyed neighbourhoods.

Table 6-13 Resident satisfaction with the built environment (Q24).

Resident Satisfaction (Q24)			AlJunainah		AlKhalij Alarabi		AlZahraa		Overall	
			N	N %	N	N%	N	N %	N	Total N %
Satisfaction with the communal spaces	1. Feeling satisfied with the diversity of communal spaces in the neighbourhood.	Disagree	10	11.8	4	4.1	3	7.7	17	7.7
		Neither agree nor disagree	30	35.3	29	29.9	10	25.6	69	31.2
		Agree	45	52.9	64	66.0	26	66.7	135	61.1
	2. Feeling satisfied with the area of open communal spaces within the neighbourhood.	Disagree	6	7.1	5	5.2	2	5.1	13	5.9
		Neither agree nor disagree	38	44.7	26	26.8	12	30.8	76	34.4
		Agree	41	48.2	66	68.0	25	64.1	132	59.7
	3. Feeling satisfied with the availability of visual attractions in the public garden between houses, e.g., shaded seats, trees, water figures.	Disagree	8	9.4	1	1.0	3	7.7	12	5.4
		Neither agree nor disagree	25	29.4	17	17.5	4	10.3	46	20.8
		Agree	52	61.2	79	81.4	32	82.1	163	73.8
Satisfaction with the	4. Feeling satisfied with the distribution of houses and the location of public services within the neighbourhood.	Disagree	11	12.9	5	5.2	4	10.3	20	9.0
		Neither agree nor disagree	43	50.6	53	54.6	13	33.3	109	49.3
		Agree	31	36.5	39	40.2	22	56.4	92	41.6

Resident Satisfaction (Q24)			AlJunainah		AlKhalij Alarabi		AlZahraa		Overall	
			N	N %	N	N%	N	N %	N	Total N %
5. Feeling satisfied with the width of the internal neighbourhood's streets.	Disagree		10	11.8	11	11.3	7	17.9	28	12.7
	Neither agree nor disagree		42	49.4	54	55.7	19	48.7	115	52.0
	Agree		33	38.8	32	33.0	13	33.3	78	35.3
6. Feeling satisfied with the presence of sidewalks with a suitable width to neighbourhood streets.	Disagree		11	12.9	11	11.3	7	17.9	29	13.1
	Neither agree nor disagree		40	47.1	52	53.6	22	56.4	114	51.6
	Agree		34	40.0	34	35.1	10	25.6	78	35.3
7. Feeling satisfied with the shape of the neighbourhood's internal streets and their direct connection to main streets outside the neighbourhood.	Disagree		14	16.5	11	11.3	7	17.9	32	14.5
	Neither agree nor disagree		46	54.1	58	59.8	21	53.8	125	56.6
	Agree		25	29.4	28	28.9	11	28.2	64	29.0

## 6.7. The Quantity and Quality of Social Interaction (Social Interaction Measures):

As mentioned in the Methodology Chapter, the dependent variable is social interaction. Table 6-14 shows the descriptive statistics of social interaction across the surveyed case studies. Table 6-14 reveals that the mean is highest in AlJunainah (5.3706), then in AlKhalij Alarabi (3.7599), while AlZahraa has the lowest mean value (3.4451). This was computed from 14 statements in the questionnaire. Social interaction has also been measured using three indices that were adopted and developed from previous studies. The indices are the Neighbouring Index (N\_Index), the Social Networks Index (SN\_Index), and the Social Relationships Index (SR\_Index) (see section 4.8.1 in Chapter 4).

Table 6-14 The descriptive statistics of social interaction across the case studies.

	N	Range	Minimum	Maximum	Mean	Std. Deviation	Variance
AlJunainah	85	23.36	0.57	23.93	5.3706	5.31331	28.231
AlKhalij Alarabi	97	22.21	0.86	23.07	3.7599	3.41213	11.643
AlZahraa	39	21.79	0.5	22.29	3.4451	4.2963	18.458

Table 6-15 represents the descriptive statistics of the three social indices overall and across the surveyed neighbourhoods. The N\_Index, described in Chapter 4, concerns a set of eight statements about the relationship with neighbours and residents' reports on their perceptions of the neighbouring level at their residence. According to the breakdown of the N\_Index across the three case studies (shown in Table 6-15), it can be seen that the maximum value is 63, which represents the highest level of neighbouring for a resident, while the minimum value of the N\_Index is 2, which represents the lowest level of neighbouring. From the mean values in the

fourth row of Table 6-15, the level of neighbouring acts is higher in AlJunainah, then in AlKhalij Alarabi, and finally AlZahraa neighbourhoods (see Figure 6-5).

The SN\_Index, described in Chapter 4, is a composite measure demonstrating ‘the quantity of residents’ social networks. The Transform Variable in SPSS was used to achieve the SN\_Index for each resident; this is entailed by summing the answers of four questions and then dividing the result by the number of dwellings (see Figure 6-6). Data in Table 6-15 reveals that AlJunainah neighbourhood comes with a higher social network level among residents, i.e., at 0.60, followed by AlZahraa and AlKhalij Alarabi neighbourhoods with mean values of 0.58 and 0.37, respectively. The value 4.33 in the “Maximum” row represents the highest social network level for a resident, while 0 represents the lack of social networks.

The SR-Index, described in Chapter 4, is a composite measure demonstrating ‘the strength of the residents’ social ties. A higher index value represents stronger social relationships among residents within a neighbourhood (see Figure 6-7). By considering the overall mean of the SR\_Index, the stronger social relationships were found between respondents who live in AlKhalij Alarabi (0.42), followed by those who live in AlJunainah (0.40) and AlZahraa (0.38) (see Table 6-15). The value 1.00 represents the highest level of strong social ties for residents, while the value 0 represents the lack of social ties between residents. As a further step, a normality test was conducted using the Kolmogorov-Smirnov Test to determine which test should be used for this study (see section D.3 in Appendix D). It showed that the dependent variable data has a non-normal distribution because the *p*-value is less than 0.05; therefore, the study will use non-parametric tests.

Table 6-15 The descriptive statistics of the N\_Index, SN\_Index, and SR\_Index across the three case studies.

Neighbouring Index (N_Index)	AlJunainah	AlKhalij Alarabi	AlZahraa	Overall
Minimum	4.00	4.00	2.00	2.00
Maximum	63.00	32.00	32.00	63.00
<b>Mean</b>	<b>20.35</b>	<b>17.03</b>	<b>14.23</b>	17.8145
Standard Deviation	9.89	6.01	7.15	8.18574
Variance	97.87	36.11	51.18	67.006
Missing	0	0	0	0
Total N	85	97	39	221
Social Network Index (SN_Index)				
Minimum	0.00	0.05	0.04	0.00
Maximum	3.35	3.39	4.33	4.33
<b>Mean</b>	<b>0.60</b>	<b>0.37</b>	<b>0.58</b>	0.4965
Standard Deviation	0.77	0.54	0.93	0.71796
Variance	0.59	0.29	0.87	0.515
Missing	0	0	0	0
Total N	85	97	39	221
Social Relationship Index (SR_Index)				
Minimum	0.00	0.00	0.00	0.00
Maximum	0.67	1.00	1.00	1.00
<b>Mean</b>	<b>0.40</b>	<b>0.42</b>	<b>0.38</b>	0.4059
Standard Deviation	0.18	0.19	0.20	0.18886
Variance	0.03	0.04	0.04	0.036
Missing	2	0	1	3
Total N	85	97	39	218

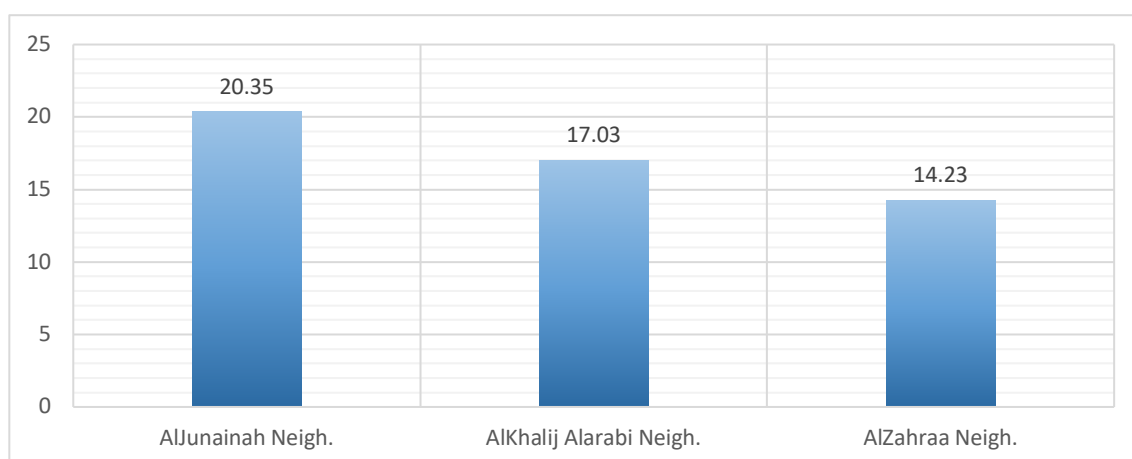


Figure 6-5 The level of Neighbouring Index in the selected case studies.

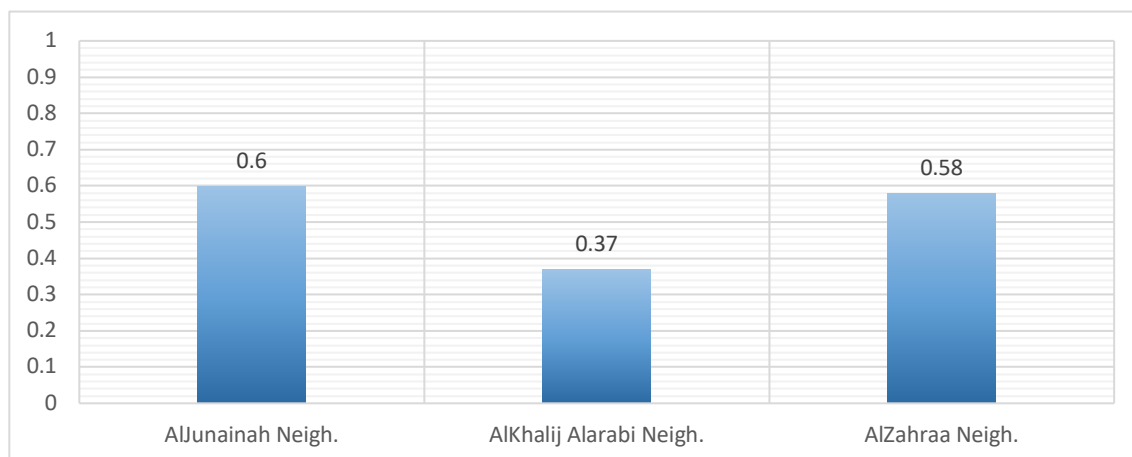


Figure 6-6 The Social Network Index.



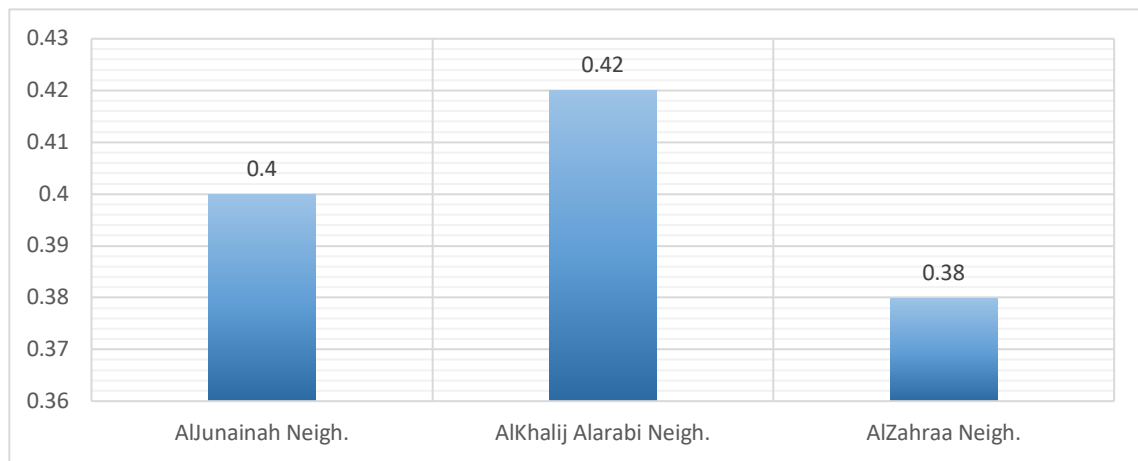


Figure 6-7 The Strong Social Relationships Index.

## 6.8. The Independent Variables:

The independent variables examined in this study are demographic factors (DF), physical characteristics of the built environment (PCBE), and social sustainability indicators (SSI). The Methodology chapter presented the factors, characteristics, and indicators involved under each aspect. Conducting a PCA test and checking the rotated component matrix (see Table 4-7, Table 4-9, and Table 4-11) achieved this. The following sections demonstrate the factors that affect the level of social interaction, neighbouring, social networks, and social relationships.

## 6.9. Factors Affecting Social Interaction and Social Indices in the Iraqi Context, According to Residents' Perceptions:

The analysis of the survey has been divided into four sections to identify which of the factors in the three examined categories significantly affect social interaction, neighbouring, social networks, and social relationships. In each section, the effects of the factors for the PCBE, SSI and DF have been examined on social interaction, neighbouring, social networks, and social relationships. Because the questionnaire data are non-normally distributed, the Generalised Linear Model (GLM), Kruskal-Wallis Test, and Spearman correlation were applied. The GLM generates a model that includes the intercept and independent variables; these are tested to identify those that influence the dependent variable. This procedure tests a continuous dependent variable and continuous independent variables. The second test used in this study is the Kruskal-Wallis H test (sometimes also called the "one-way ANOVA on ranks"). It is a rank-based nonparametric test that can be used to determine if there are statistically significant differences between two or more groups of an independent variable (categorical) on a continuous or ordinal dependent variable.

### 6.9.1. Social Interaction and the Physical Characteristics of the Built Environment (PCBE):

The questionnaire analysis results show that the *design of communal spaces* influences the overall level of social interaction. This includes the diversity of communal spaces in the neighbourhood, their area, and the availability of visual attractions, such as shaded seats, trees and water figures. The data in Table D-30 in Appendix D shows that satisfaction with the design of communal spaces is statistically significant ( $p=.010$ ). Most surprisingly, according to data on residents' perceptions, *the accessibility* of communal spaces and their *maintenance* did not affect the level of social interaction among residents in the surveyed neighbourhoods in Iraq, where  $p\text{-value} > .05$ . In the meantime, the data shows that the examined physical characteristics of the built environment have no impact on social interaction within the surveyed neighbourhoods as they are not statistically significant ( $p\text{-value} > .05$ ).

The level of social interaction among residents in communal spaces was not affected by the total area of their houses when considering the influence of the total area of the house (overall and across the case studies). The Kruskal-Wallis H test showed no statistically significant difference in the level of social interaction between the different areas of the houses in the surveyed neighbourhoods. More statistical detail is given in section D.5 in Appendix D.

### 6.9.2. Social Interaction and the Social Sustainability Indicators (SSI):

Overall, the questionnaire analysis results show the indicators of social sustainability that affect social interaction. The GLM test was run, and the results showed that the *number of families living in the house*, *the attachment to place*, *the sense of community*, and *privacy* significantly influence social interaction among residents in the surveyed neighbourhoods. The data in Table 6-16 shows that the covariates of these indicators are statistically significant ( $p\text{-value} < .05$ ). Moreover, the data shows that the signs of the **B** value covariates for *the number of families living in the house* and *the sense of community* are positive. This means there is a positive relationship between social interaction and these indicators, as the density of residents and the level of sense of community increases, social interaction also increases. However, the negative sign of the **B** value covariates of attachment to place and privacy indicates that, as the level of place attachment and privacy decreases, social interaction increases.

The breakdown of the data in Table 6-16 also shows the indicators that influence social interaction across the examined case studies. The data in Table 6-16 showed that, in AlJunainah neighbourhood, the *safety and security* of the neighbourhood and its communal spaces and the *sense of community* are statistically significant ( $p\text{-value} < .05$ ). In AlKhalij Alarabi

neighbourhood, *the number of people living in the house*, *the sense of community*, and *privacy* are statistically significant ( $p$ -value < .05), while, in AlZahraa neighbourhood, *the sense of community* was found to be statistically significant, as its  $p$ -value < .05. For more statistical detail, see section D.6 in Appendix D.

Due to the positive signs of the **B** values for the previously highlighted indicators, there is a positive relationship between social interaction and these indicators, with the exception of *privacy*. This indicates that, as the number of people living in the house, their sense of community, and the level of safety and security increase, social interaction among residents also increases. However, the relationship is negative between privacy and the level of social interaction in AlKhalij Alarabi, indicating that social interaction among residents increases when privacy decreases. This can be attributed to the understanding that some individuals tend to social isolation or social withdrawal from places that are crowded with people. This could be attributed to their personal desires, psychological behaviours, and individual characteristics, some of which may be measurable (age, occupation, household type) while some may not. Westin (1970) claimed that privacy is perceived as the withdrawal of the individual from society through the use of physical and behavioural boundaries.

Table 6-16 The social sustainability indicators that influence social interaction.

SSI		B	Sig.
Overall	The number of families living in the house.	0.221	.020
	Attachment to the Place.	-0.210	.017
	Sense of community.	0.564	.000
	Privacy.	-0.251	.028
AlJunainah	Safety and security.	0.247	.015
	Sense of community.	0.565	.012
AlKhalij Alarabi	The number of people living in the house.	0.053	.003
	Sense of community.	0.436	.000
	Privacy.	-0.205	.022
AlZahraa	Sense of community.	1.139	.006
Dependent Variable: Social Interaction			

### 6.9.3. Social Interaction and Demographic Factors (DF):

In order to identify the demographic factors that influence the level of social interaction, the GLM and Kruskal-Wallis H tests were run. Table 6-17 represents the results of the GLM test that showed the demographic factors that affect social interaction overall and across the case studies. Overall, *the number of children aged ten years living in the house* affect the level of social interaction amongst residents, where it is statistically significant ( $p$ -value<.05). Table 6-17 also shows that, in AlJunainah, the level of social interaction is influenced by *the number of*

*working hours per day* and *the number of children aged ten years or less living in the house*, which are statistically significant ( $p$ -value  $<.05$ ). Closer inspection of the data shows that the level of social interaction in AlKhalij Alarabi neighbourhood is influenced by *the number of children aged ten years or less in the house*, which is statistically significant ( $p$ -value $<.05$ ), while in AlZahraa, none of these factors influence the level of social interaction. Section D.7 in Appendix D shows more statistical detail. The sign of the **B** value covariates for *the number of working hours per day* and *the number of children aged ten years or less in the house* are positive. This means that there is a positive relationship between social interaction and these two covariates, indicating that, as the numbers of working hours per day and children in the house increase, the level of social interaction among residents in the neighbourhood increases.

Table 6-17 The demographic factors that affect social interaction according to GLM.

	DF	B	Sig.
Overall	Number of children aged <10 Y in the house	0.193	.000
AlJunainah	Number of working hours per day	0.042	.036
	Number of children <10 Y in the house	0.241	.000
AlKhalij Alarabi	Number of children <10 Y in the house	0.136	.000
Dependent Variable: Social Interaction			

The Kruskal-Wallis H test was run to examine the impact of eight categorical independent variables (demographic factors) on the level of social interaction. The results suggested that *gender, age groups, marital status, education level, employment status, length of residency in the neighbourhood, and the presence of relatives living within the neighbourhood* influence the level of social interaction amongst residents in communal spaces (see Table 6-18). These are statistically significant ( $p$ -value  $<.05$ ). Section D.7 in Appendix D gives a statistical explanation. The data breakdown across the case studies in Table 6-18 shows that *gender* and *the presence of relatives living in the neighbourhood* influence the level of social interaction within AlJunainah neighbourhood, as these factors are statistically significant ( $p$ -value  $<.05$ ). Closer inspection of the data in the same tables shows that the level of social interaction in AlKhalij Alarabi is affected by *gender, age group, marital status, education level, and employment status* ( $p$ -value  $<.05$ ). Regarding AlZahraa neighbourhood, the data shows that *gender* and *the length of residence in the neighbourhood* are statistically significant (their  $p$ -value $<.05$ ); in other words, they affect the level of social interaction.

Table 6-18 The demographic factors that affect social interaction according to Kruskal-Wallis H Test.

	AlJunainah	AlKhalij Alarabi	AlZahraa	Overall
	Sig.	Sig.	Sig.	Sig.
Gender	<b>.000</b>	<b>.000</b>	<b>.001</b>	<b>.000</b>
Age group	.627	<b>.000</b>	.091	<b>.000</b>
Marital status	.089	<b>.000</b>	.344	<b>.000</b>
Education level	.088	<b>.000</b>	.317	<b>.000</b>
Employment status	.577	<b>.000</b>	.635	<b>.000</b>
Type of ownership	.782	.592	.381	.154
Length of residence in the neighbourhood.	.052	.080	<b>.008</b>	<b>.000</b>
The presence of relatives living within the neighbourhood.	<b>.003</b>	.110	.799	<b>.001</b>

#### 6.9.4. Reflective Discussion:

According to results derived from the residents' questionnaire, it was found that factors from the three examined aspects affect social interaction. For the PCBE, the *design of communal spaces* significantly affects social interaction among residents in the communal spaces of SFHNs in Iraq. This includes: the diversity in communal spaces within the neighbourhood, their total area, and their design and supply with soft and hard landscapes.

Regarding the SSI, four indicators significantly affect the level of social interaction among residents, namely *the number of families living in the house*, *attachment to place*, *the sense of community*, and *privacy*. The breakdown of the data across the surveyed neighbourhoods shows that the level of social interaction among residents in AlJunainah is significantly influenced by *the sense of community* and *the safety and security* of both the neighbourhood and its communal spaces. In AlKhalij Alarabi, the data shows that social interaction among residents is affected by *the number of people living in the house*, *the sense of community*, and *privacy*, while in AlZahraa, it is influenced by the *sense of community*.

In terms of the DF, the analysis revealed that, eight out of eleven demographic factors significantly influence the level of social interaction among residents in the examined context. This includes *gender*, *age groups*, *marital status*, *education level*, *employment status*, *length of residency in the neighbourhood*, *the presence of relatives living within the neighbourhood*, and *the number of children aged ten years or less living in the house* ( $p\text{-value} < .05$ ). Across the case studies, the results show that the number of working hours per day, the number of children aged ten years or less living in the house, gender, and *the presence of relatives living within the neighbourhood* significantly influence AlJunainah residents' social interactions. For AlKhalij Alarabi, gender, age group, marital status, education level, employment status, and *the number*

of children aged ten years or less living in the house influence the level of social interaction amongst residents, while in AlZahraa, gender and length of residency in the neighbourhood affect its residents' social interactions.

## 6.10. Factors Affecting the Neighbouring Index:

The first social index is Neighbouring Index (N\_Index). The following sub-sections describe the influential factors of the PCBE, SSI, and DF on the level of neighbouring acts among residents in communal spaces within SFHNs.

### 6.10.1. Neighbouring Index and Physical Characteristics of the Built Environment (PCBE):

Table 6-19 shows the PCBE that influence the level of neighbouring acts among residents. From the data, it can be seen that the level of neighbouring among the residents is significantly influenced by *accessibility* and satisfaction with *the design of communal spaces* ( $p$ -value  $<.005$ ). The breakdown of the data across the surveyed neighbourhoods in Table 6-19 shows that, in AlJunainah neighbourhood, the level of neighbouring acts among residents is not influenced by any of the examined PCBE, which are not statistically significant ( $p$ -value  $>.05$ ). In the meantime, the data show that, in AlKhalij Alarabi, the *accessibility* of communal spaces within the area, and satisfaction with *the physical attributes of the neighbourhood* affect the neighbouring acts amongst residents, as these two characteristics are statistically significant (their  $p$ -value  $<.05$ ). Moreover, the data in Table 6-19 show that *the design of communal spaces* influences the neighbouring acts amongst residents in AlZahraa. The negative signs of the **B** values refer to a negative relationship between neighbouring acts and people's satisfaction with the physical attributes of both the neighbourhood and communal spaces.

Table 6-19 The physical characteristics of the built environment that affect the Neighbouring Index.

PCBE		B	Sig.
Overall	Accessibility	1.441	.016
	The design of communal spaces.	-2.538	.004
AlKhalij Alarabi	Accessibility	0.020	.005
	The design of the neighbourhood.	-0.020	.022
AlZahraa	The design of communal spaces.	-0.099	.017
Dependent Variable: Social Network Index			

Moreover, the Kruskal-Wallis test shows that *the total area of the house* does not influence the level of neighbouring acts among residents overall and in the surveyed neighbourhoods. Table D-39 in section D.8 in Appendix D shows no statistically significant difference in the level of neighbouring acts between the different total areas of the house across the surveyed neighbourhoods, where  $p$ -value  $>.05$ . Section D.8 in Appendix D provides more statistical detail.

#### 6.10.2. Neighbouring Index and Social Sustainability Indicators (SSI):

The GLM test was run to determine the influence of SSI on the N-Index. The data in Table 6-20 shows that, overall, *the number of families and people living in the house, the sense of community* and *residents' satisfaction* significantly influence the level of neighbouring acts among residents. The positive sign of the **B** value covariates for *the number of families living in the house* and *the sense of community* demonstrate a positive relationship with the level of neighbouring acts. This indicates that, as the number of families living in the house and the sense of community increase, the level of neighbouring acts among residents increases.

Closer inspection of the table shows that *the number of both families and people living in the house* and *the sense of community* affect the neighbouring acts among AlJunainah's residents ( $p$ -value  $< .05$ ). According to the data for AlKhalij Alarabi neighbourhood, both *the safety and security* and *the sense of community* are statistically significant ( $p$ -value  $< .05$ ) and influence the level of neighbouring acts in the area. Moreover, the data in Table 6-20 shows that *the number of families living in the house, the total number of people living in the house, safety and security, attachment to place, and the sense of community* influence the neighbouring acts in AlZahraa. Data across the surveyed neighbourhoods show a negative relationship between the neighbouring acts amongst residents and *the total number of people living in the house* in AlJunainah and AlZahraa, *safety and security* in AlKhalij Alarabi, and *attachment to place* in AlZahraa. The level of neighbouring acts among residents in these areas increase when the number of people living in the house, the level of safety and security, or the attachment to place decreases. Section D.9 in Appendix D shows more statistical detail.



Table 6-20 The social sustainability indicators that affect the Neighbouring index.

SSI		B	Sig.
Overall	The number of families living in the house.	0.049	.000
	The number of people living in the house.	-0.008	.014
	Sense of community	0.073	.000
	Residents' satisfaction	-0.034	.007
AlJunainah	The number of families living in the house.	0.043	.005
	The number of people living in the house.	-0.011	.004
	Sense of community	0.100	.000
AlKhalij Alarabi	Mean of safety and security.	-0.017	.001
	Sense of community	0.075	.000
AlZahraa	The number of families living in the house.	0.073	.002
	The number of people living in the house.	-0.015	.009
	Safety and security	0.063	.000
	Attachment to the Place	-0.057	.002
	Sense of community	0.184	.000
Dependent Variable: Neighbouring Index			

### 6.10.3. Neighbouring Index and Demographic Factors (DF):

The results of the GLM showed that *the number of children living in the house aged ten years or less* significantly relates to the level of neighbouring acts among residents in the investigated context, where  $p$ -value  $<.05$ , (see Table D-41 in Appendix D). The sign of the covariate for *the number of children* is positive, which means there is a positive relationship between the number of children living in the house and the level of neighbouring acts among residents. This indicates that the more children aged ten years or less living in the house, the higher the level of neighbouring acts among residents. Table D-41 in section D.10 of Appendix D also demonstrates the demographic factors that affect the level of neighbouring acts among residents across the surveyed neighbourhoods. It shows that the level of neighbouring acts among residents in AlJunainah is influenced by *the number of children living in the house aged ten years or less* ( $p$ -value  $<.05$ ).

The results of the Kruskal-Wallis H test in Table 6-21 indicate that, overall, there are statistically significant differences in the level of neighbouring between six demographic factors including *gender, age, marital status, education background, employment status, and length of residency in the neighbourhood* ( $p$ -value  $<.05$ ). The breakdown of the data in Table 6-21 shows that *gender, education status, and the presence of relatives living within a neighbourhood* are statistically significant ( $p$ -value  $<.05$ ) and influence the level of neighbouring acts amongst AlJunainah's residents. Moreover, *the age group, marital status, education level, employment status, and length of residence in the neighbourhood*, are statistically significant ( $p$ -value  $<.05$ ) and affect the level of neighbouring acts among residents

in AlKhalij Alarabi neighbourhood. Regarding the level of neighbouring acts among residents in AlZahraa neighbourhood, the data shows that it is only affected by *gender*, as it is statistically significant ( $p=.005$ ). Section D.10 in Appendix D offers more statistical detail.

Table 6-21 The demographic factors that affect Neighbouring Index according to Kruskal-Wallis H Test.

DF	AlJunainah	AlKhalij Alarabi	AlZahraa	Overall
	Sig.	Sig.	Sig.	Sig.
Gender	<b>.000</b>	.065	<b>.005</b>	<b>.000</b>
Age group	.725	<b>.005</b>	.802	<b>.011</b>
Marital status	.157	<b>.001</b>	.509	<b>.006</b>
Education level	<b>.041</b>	<b>.022</b>	.479	<b>.010</b>
Employment status	.609	<b>.011</b>	.769	<b>.009</b>
Length of residence in the neighbourhood	.230	<b>.016</b>	.098	<b>.013</b>
The presence of relatives living within the neighbourhood.	<b>.024</b>	.381	.619	.235

#### 6.10.4. Reflective Discussion:

It was found that factors from the three examined aspects affect the Neighbouring Index. Regarding the PCBE, the results derived from the questionnaire show that the level of neighbouring acts among residents is influenced by *the accessibility* of communal spaces within the neighbourhood and satisfaction with their *design*. The influence of the latter factor was seen in AlZahraa. However, in AlKhalij Alarabi, the level of neighbouring acts among its residents is influenced by *accessibility* to communal spaces within the neighbourhood and satisfaction with *the physical attributes of the neighbourhood*.

Considering the SSI, the numbers of both families and people living in the house, *the sense of community*, and *resident satisfaction* significantly affect the level of neighbouring acts among residents. The breakdown across the surveyed neighbourhoods shows that the aforementioned indicators, except for *resident satisfaction with the built environment*, significantly affect the level of neighbouring acts among AlJunainah's residents. In the meantime, only *safety and security* and *the sense of community* influence the level of neighbouring acts among residents in AlKhalij Alarabi. Moreover, it was found that *the number of both families and people living in the house*, *the safety and security* of the neighbourhood and its communal spaces, *attachment to place*, and *sense of community* significantly affect the level of neighbouring acts among AlZahraa's residents.

In terms of the DF, the analysis revealed that, overall, only two demographic factors significantly relate to the level of neighbouring acts among residents in the examined context,

including *the number of children living in the house* and *gender*. The breakdown across the surveyed case studies indicates that, in AlJunainah, *gender*, *education background*, *the presence of relatives living within the neighbourhood*, and *the number of children living in the house* significantly affect the level of neighbouring in the area. In AlKhalij Alarabi, age groups, marital status, education level, employment status, and *length of residency in the neighbourhood* were found to significantly relate to the level of neighbouring in the area, while in AlZahraa, only *gender* significantly relates to the Neighbouring Index.

## **6.11. Factors Affecting the Social Network Index:**

The second index is Social Network (SN\_Index). The following sub-sections describe the influential factors for the PCBE, SSI, and DF of the level of social network between residents in communal spaces within SFHNs.

### **6.11.1. Social Network Index and Physical Characteristics of the Built Environment (PCBE):**

The GLM was run to identify the influence of three physical characteristics on the social network level. The data in Table D-44 of Appendix D shows that satisfaction with *the design of communal spaces* is statistically significant ( $p\text{-value} < .05$ ), which means that it influences social networks. However, the breakdown of the data in Table D-44 shows that no PCBE has an impact on social networks among residents across the case studies. Moreover, the results of the Kruskal-Wallis H test show no statistically significant difference in the SN\_Index between the total areas of the house overall. This means *that the total area of the house* did not affect the number of social networks among respondents. However, the breakdown of the data in Table D-46 shows that *the total area of the house* in AlZahraa neighbourhood influences the level of social networks among its residents. In the meantime, there is no statistically significant difference in the SN\_Index between the different total areas of the houses in the other two neighbourhoods (see Tables D-45 and D-46 in section D.11 of Appendix D).

### **6.11.2. Social Network Index and Social Sustainability Indicators (SSI):**

According to Table 6-22, the *safety and security* of the neighbourhood and its communal spaces, *attachment to place*, *the sense of community*, and *privacy* affect the level of social networks amongst respondents, as are statistically significant ( $p\text{-value} < .05$ ). The sign of the **B** value covariates for *attachment to place* and *privacy* indicates a negative relationship with the level of social networks amongst respondents. However, the signs of the covariates for *safety and*

*security* and the *sense of community* indicate a positive relationship with the social network level. The breakdown of the data in Table 6-22 shows different patterns across the surveyed neighbourhoods. The *safety and security* indicator affects the level of social network amongst respondents in AlJunainah neighbourhood ( $p=.004$ ). The *sense of community*, *privacy*, and *the number of total people living in the house* influence the level of social networks amongst respondents in AlKhalij Alarabi neighbourhood ( $p\text{-value}<.005$ ), while, in AlZahraa, the level of social networks amongst respondents is influenced by the *sense of community* ( $p=.038$ ). The negative signs of the **B** value covariates for *attachment to place* (-0.185) and *privacy* (-0.199, overall, and -0.210, in AlKhalij Alarabi) indicate that, as the level of attachment to place and privacy decrease, the social network level amongst respondents increases. Section D.12 in Appendix D provides more statistical detail.

Table 6-22 The social sustainability indicators that affect Social Network Index.

SSI		B	Sig.
Overall	Safety and security	0.145	.015
	Attachment to Place	-0.185	.006
	Sense of community	0.402	.000
	Privacy	-0.199	.023
AlJunainah	Safety and security	0.260	.004
AlKhalij Alarabi	The number of people living in the house.	0.056	.006
	Sense of community	0.346	.009
	Privacy	-0.210	.039
AlZahraa	Sense of community	0.557	.038
Dependent Variable: <b>Social Network Index</b>			

### 6.11.3. Social Network Index and Demographic Factors (DF):

Table 6-23 shows that *the number of working hours per day* and *the number of children living in the house aged ten years or less* significantly influence the SN\_Index, as they are statistically significant ( $p\text{-value}<.05$ ). The positive signs of the covariates' highlighted coefficients indicate a positive relationship between these factors and the level of social networks. This suggests that the more children living in the house (aged ten years or less) and the greater number of working hours per day mean a greater level of social networks amongst respondents. These demographic factors are shown in the AlJunainah neighbourhood, where their  $p\text{-value}<.05$ . A closer inspection of the data in Table 6-23 illustrates that the level of social networks in AlKhalij Alarabi is influenced by *the number of children aged ten years or less living in the house*, as it is statistically significant ( $p=.000$ ).

Table 6-23 The demographic factors that affect Social Network Index according to GLM test.

DF		B	Sig.
Overall	Number of working hours per day	0.041	.002
	The number of children aged ten years or less in the house	0.166	.000
AlJunainah	Number of working hours per day	0.049	.003
	The number of children aged ten years or less in the house	0.231	.000
AlKhalij Alarabi	The number of children aged ten years or less in the house	0.147	.000

Dependent Variable: Social Network Index

The Kruskal-Wallis H test was conducted and showed statistically significant differences in the SN\_Index between seven DF. The data in Table 6-24 indicates that *gender, age, marital status, education background, employment status, length of residence in the neighbourhood, and the presence of relatives living in the same neighbourhood* affect the level of the social networks among residents. The breakdown of the data in Table 6-24 illustrates the DF that influence the social network level across the case studies. In AlJunainah neighbourhood, *gender, education status, the length of residence in the neighbourhood, and the presence of relatives living in the neighbourhood* ( $p$ -value  $<.05$ ) affect the social network level amongst its residents. A closer inspection of the data in the same table demonstrates that the social network level in AlKhalij Alarabi neighbourhood is statistically impacted by *gender, age group, marital status, education level, employment status, and the presence of relatives living in the same neighbourhood* ( $p$ -value  $<.05$ ). However, the social network level in AlZahraa neighbourhood is statistically affected by *gender and the length of residence in the neighbourhood* ( $p$ -value  $<.05$ ). Section D.13 in Appendix D offers more statistical detail.

Table 6-24 The demographic factors that affect Social Network Index according to Kruskal-Wallis H Test.

DF	AlJunainah	AlKhalij Alarabi	AlZahraa	Overall
	Sig.	Sig.	Sig.	Sig.
Gender	.000	.000	.001	.000
Age group	.605	.000	.056	.000
Marital status	.190	.000	.344	.000
Education level	.040	.000	.223	.000
Employment status	.456	.000	.644	.000
Length of residence in the neighbourhood	.036	.058	.011	.000
The presence of relatives living within the neighbourhood.	.001	.012	.497	.000

#### 6.11.4. Reflective Discussion:

The results indicate that factors from the three examined aspects affect the SN-Index. Regarding the PCBE in general, the level of social networks is affected by *the design of the communal spaces*. Moreover, *the total area of the house* was found to affect the level of social networks

in AlZahraa neighbourhood. However, the data show that no built environment physical characteristics relate to the level of social networks amongst the surveyed sample across the other two case studies.

As regards the SSI, *safety and security, attachment to place, the sense of community, and privacy* were found to influence the level of social networks. Across the case studies, it was found that the level of social networks amongst the surveyed residents is significantly influenced by *the safety and security* indicator in AlJunainah; *the number of people living in the house, the sense of community, and privacy* in AlKhalij Alarabi, and the *sense of community* in AlZahraa.

Moreover, the analysis revealed that nine of the eleven demographic factors significantly relate to the level of social networks in the examined context. These factors are: *gender, age group, marital status, education level, employment status, length of residence in the neighbourhood, the presence of relatives living in the same neighbourhood, the number of children aged ten years or less living in the house, and the number of working hours per day* ( $p$ -value  $< .05$ ). These factors were seen across the case studies. In AlJunainah, *gender, education background, length of residency in the neighbourhood, the presence of relatives living within the neighbourhood, the number of children aged ten years or less living in the house, and the number of working hours per day* affect the level of residents' social networks. In AlKhalij Alarabi, *gender, age group, education background, marital status, employment status, the presence of relatives living within the neighbourhood, and the number of children aged ten years or less living in the house* influence residents' social networks. However, only two demographic factors affect the level of social networks amongst AlZahraa's neighbourhood residents, which are *gender and the length of residency in the neighbourhood*.

## 6.12. Factors Affecting the Social Relationships Index

The third index is Social Relationships (SR\_Index). The following sub-sections describe the influential factors of the PCBE, SSI, and DF when building strong social relationships between residents in communal spaces within SFHNs.

### 6.12.1. Social Relationships Index and Physical Characteristics of the Built Environment (PCBE):

The data in Table D-51 in Appendix D shows that none of the examined PCBE are statistically significant ( $p$ -value  $>.05$ ). However, the breakdown of the data in Table D-51 shows that the level of resident satisfaction with *the design of the neighbourhood* influences the social relationships of residents in AlKhalij Alarabi. This includes the layout of housing units and the location of public services within the neighbourhood, the design of the internal neighbourhood streets (involving their width), the presence of sidewalks with a suitable width, and the streets' design and their direct connection to the main streets outside the neighbourhood. In comparison, in AlZahraa, *maintenance* influences the strength of social relationships among residents, as it is statistically significant ( $p=.044$ ) (Table D-51 in Appendix D). The sign of the **B** value covariate for *the design of the neighbourhood* indicates a negative relationship between this factor and strong social relationships. This means that, when the level of satisfaction with *the design of the neighbourhood* decreases, strong social relationships (SR\_Index) between residents increases. In the meantime, the relationship between the SR\_Index and *maintenance* is positive, indicating that strong social relationships amongst residents increase when the level of maintenance of the neighbourhood and its communal spaces increases. Moreover, the result of the Kruskal-Wallis test revealed that *the house's area* has no impact on building strong social relationships amongst residents in communal spaces (see Table D-53 in Appendix D in section D.14).

### 6.12.2. Social Relationships Index and Social Sustainability Indicators (SSI):

The GLM was run to identify which of the tested SSI influence the SR\_Index. Table D-54 in section D.14 in Appendix D shows that the SR\_Index is not affected by any of the examined indicators of social sustainability, as there is no statistically significant SSI,  $p$ -value  $>.05$ . However, the data breakdown in the same table shows that *safety and security* in AlJunainah neighbourhood and *resident's satisfaction* with the built environment in AlKhalij Alarabi are statistically significant ( $p$ -value  $<.05$ ). This means that *safety and security* and the level of *resident satisfaction* with the built environment influence the building of strong social relationships among residents in these two neighbourhoods. The negative sign of the **B** value



for *safety and security* and *resident satisfaction* in Table D-54, confirming a negative relationship between the SR\_Index and these two indicators. This suggests that, when the level of safety and security and resident satisfaction with the built environment decreases, strong social relationships between residents increase.

### 6.12.3. Social Relationships Index and Demographic Factors (DF):

Table D-55 shows that *the number of working hours per day* is statistically significant ( $p$ -value  $<.05$ ), indicating that it affects the building of social relationships amongst residents in the communal spaces. The negative sign of the **B** value for *the number of working hours per day* (shown in Table D-55) suggests a negative relationship between this covariate and the level of social relationships. This indicates that, as the number of working hours per day decreases, the level of strong social relationships (SR\_Index) amongst respondents increase. The breakdown of data in Table D-55 represents a similar pattern in AlJunainah neighbourhood, as *the number of working hours per day* is statistically significant ( $p$ -value  $<.05$ ) and has a negative relationship with the SR\_Index. In the meantime, none of the examined DF have an impact on the level of strong social relationships in AlKhalij Alarabi and AlZahraa, as  $p$ -value  $>.05$ .

The Kruskal-Wallis H test indicates that *gender*, *education background*, *employment status*, and *the presence of relatives living in the same neighbourhood* statistically significant affect the building of healthy relationships amongst residents in the communal spaces ( $p$ -value  $<.05$ ). Table 6-25 shows the DFs that affect social relationships according to the Kruskal-Wallis H test. The data breakdown demonstrates that three demographic factors influence the level of strong social relationships between the residents of AlKhalij Alarabi, namely *gender*, *employment status*, and *the presence of relatives living in the same neighbourhood* ( $p$ -value  $<.05$ ). For AlJunainah and AlZahraa neighbourhoods, there are no statistically significant differences in the SR\_Index between the examined DF in the Kruskal-Wallis H test.

Table 6-25 The demographic factors that affect Social Relationship Index according to Kruskal-Wallis H test.

	AlKhalij Alarabi	Overall
Gender	.000	.000
Education level	.167	.012
Employment status	.018	.001
The presence of relatives living within the neighbourhood	.020	.011

#### 6.12.4. Reflective Discussion:

Factors from the three examined aspects affect the Social Relationships Index. In general, none of the physical characteristics of the built environment affected the level of social relationships. However, the data breakdown across the case studies showed that *the design of the neighbourhood* in AlKhalij Alarabi and the *maintenance* in AlZahraa are significantly related to building of strong social relationships between residents ( $p$ -value  $<.05$ ). Furthermore, although the results overall showed none of the SSI influenced the level of strong social relationships, the data breakdown across the case studies revealed that social relationships are influenced by *safety and security* in AlJunainah neighbourhood, and *resident satisfaction* in AlKhalij Alarabi ( $p$ -value $<.05$ ).

Concerning the DF, the analysis revealed that five out of eleven demographic factors significantly relate to the level of social relationships in the examined context. These factors are *gender*, *education background*, *employment status*, *the presence of relatives living in the same neighbourhood*, and *the number of working hours per day* ( $p$ -value  $<.05$ ). The data breakdown revealed that gender, employment status, and *the presence of relatives living in the same neighbourhood* influence strong social relationships in AlKhalij Alarabi ( $p$ -value  $<.05$ ), while was none of the examined DF influenced social relationships in the other two case studies.

#### 6.13. The Communal Spaces in SFHNs in Iraq According to Residents' Experiences:

Before setting up any measure to determine communal spaces, it is necessary to define the boundaries of each communal space within the residential developments. The boundaries were either set where there was a significant physical boundary (e.g., walls, doors, fences and plants) between spaces or where there was a significant change in function (e.g., transition from a sidewalk and street to a shared garden) for the spaces. Those spaces with the same functions and physical attributes (e.g., integration value, exposure to daylight, visibility, finishing materials, etc.) were considered one type of communal space, such as the space in front of the main entrance of the house, sidewalk, street, shared garden, which have all been considered open communal spaces.

How frequently residents use each communal space can affect both the determination of the most used communal space and the chance of meeting one of their neighbours in that particular space. Also, the number of social interaction incidents may encourage more residents to make use of the communal space and accordingly affect social interaction. Thus, two main measures

have been used to capture the frequency of use and the density of social interaction incidents within each communal space.

#### **6.13.1. Interactional Space Index (IS-Index) the communal space in SFHNs**

The *Interactional Space Index (IS-Index)*, as described in the Methodology Chapter, is a composite measure representing the extent to which a communal space facilitates a *regular* and *formal* contact between residents. Two questions were asked to report on those communal spaces where residents regularly meet their neighbours, and where they meet neighbours for formal gatherings (questions 30 and 33 of the questionnaire). Actual places of contact are communal spaces with a higher IS-Index. This was achieved by summing the number of respondents, indicating a communal space as a regular contact place or formal contact place, and then the number was divided by the number of respondents to achieve the final value of the index for each communal space, which is a number between 1 (marked by all residents as regular and/or formal contact) and 0 (never marked).

- **Communal Space for Regular Gatherings:**

Table 6-26 represents the IS\_Index for each examined communal space for regular contact - both overall and across the surveyed neighbourhoods. By considering that the IS\_Index of each communal space equates to at least 0.5, it can be seen that "the space in front of the main entrance of the house" is used by the residents for regular contact with their neighbours at IS\_Index=0.59; meanwhile, others have obtained scores lower than 0.5. The data breakdown in Table 6-26 shows an approximately similar pattern across the surveyed neighbourhoods. The space in front of the main entrance of the house was used for regular meetings across the surveyed neighbourhoods, the IS\_Index=0.52 in AlJunainah neighbourhood, IS\_Index=0.62 in AlKhalij Alarabi neighbourhood, and IS\_Index=0.69 in AlZahraa neighbourhood. However, the data shows that, in AlKhalij Alarabi neighbourhood, the worship facility was selected for regular contact, IS\_Index=0.49, after rounding the value to the nearest integer.

Table 6-26 IS\_Index for each communal space used for regular contact both overall and across the surveyed case studies (Q30).

Communal space for regular contact	AlJunainah	AlKhalij Alarabi	AlZahraa	Overall
<b>The space in front of the main entrance of the house.</b>	<b>0.52</b>	<b>0.62</b>	<b>0.69</b>	<b>0.59</b>
Streets and sidewalks.	0.40	0.33	0.44	0.38
Children playground	0.05	0.00	0.05	0.03
The garden of the neighbourhood.	0.25	0.14	0.03	0.16
<b>Masjid/church/hussainya</b>	0.26	<b>0.49</b>	0.23	0.36
Local shops	0.32	0.33	0.41	0.34
Local market or malls	0.24	0.37	0.13	0.28
Local restaurants	0.11	0.07	0.00	0.07
Local cafe	0.07	0.07	0.05	0.07
Gym	0.07	0.03	0.05	0.05
Others	0.14	0.06	0.10	0.10

The frequency of responses amongst the surveyed sample when selecting the communal space used by residents for *regular gatherings* within the neighbourhood is shown in Table D-58 in Appendix D. Overall, six out of 11 examined communal spaces obtained higher frequencies, (see Figure 6-8). They are the space in front of the main entrance of the house, followed by streets and sidewalks, the masjid/church, local shops, the local market or malls, and the shared neighbourhood garden. The dominant gender selecting these spaces was male (see Table D-59). The data breakdown presents different patterns of communal space use across the case studies; however, the space in front of the main entrance of the house was the highest frequency in all surveyed neighborhoods (for more detail, see section D.17 of Appendix D).

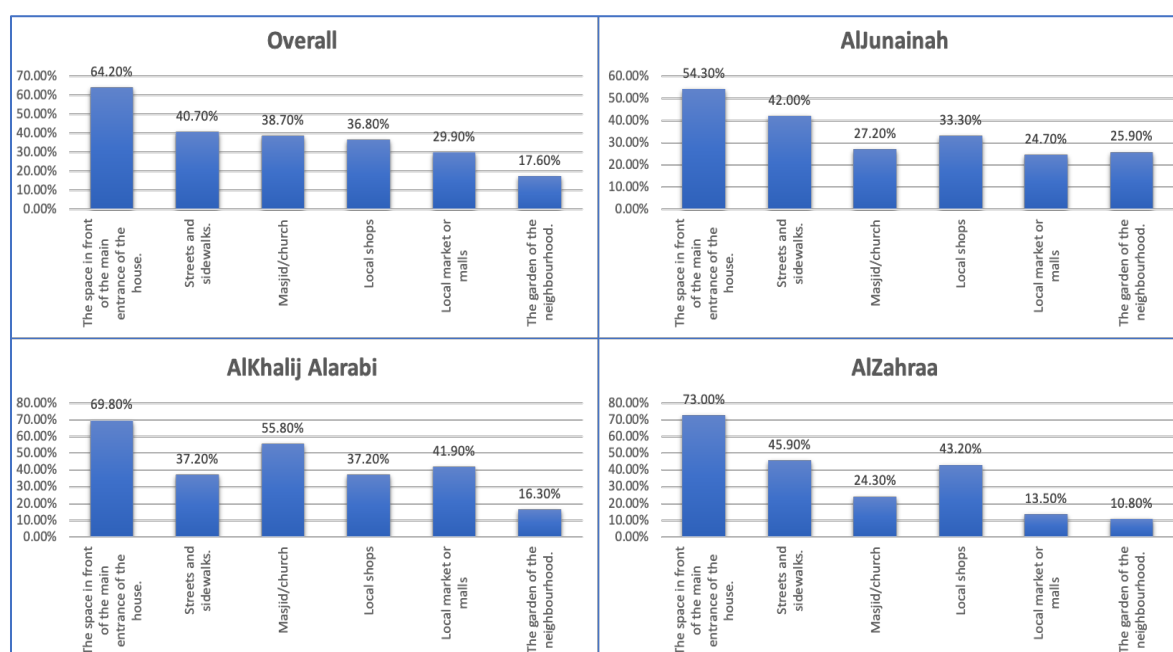


Figure 6-8 The highest frequencies for question 30 of the questionnaire (communal space for regular contacts).

- **Communal Space for Formal Gatherings:**

Table 6-27 represents the IS\_Index for each examined communal space for formal contact, both overall and across the surveyed neighbourhoods. By considering the IS\_Index of each communal space that equates to at least 0.5, the communal space that has been used by residents for formal interactions is the worship facility, namely the masjid (mosque) or church, where the IS\_Index=0.57. The data breakdown demonstrates a similar pattern across AlJunainah, AlKhalij Alarabi, and AlZahraa neighbourhoods, where the worship facility (the mosque or church) obtains an IS\_Index score of 0.61, 0.57, and 0.49, respectively.

*Table 6-27 Communal space for formal contact both overall and across the surveyed case studies (Q39).*

Communal Space for Formal Contact	AlJunainah	AlKhalij Alarabi	AlZahraa	Overall
The space in front of the main entrance of the house.	0.29	0.38	0.31	0.33
Streets and sidewalks.	0.35	0.23	0.33	0.29
Children's playground	0.00	0.03	0.05	0.02
The garden of the neighbourhood.	0.36	0.30	0.13	0.29
<b>Masjid/church/hussainya</b>	<b>0.61</b>	<b>0.57</b>	<b>0.49</b>	<b>0.57</b>
Local shops	0.01	0.07	0.05	0.05
Local market or malls	0.01	0.08	0.05	0.05
Local restaurants	0.02	0.03	0.03	0.03
Local cafe	0.04	0.01	0.03	0.02
Gym	0.01	0.01	0.03	0.01
Other	0.24	0.09	0.21	0.17

Table D-60 shows the frequency of responses amongst the surveyed sample when selecting the communal space used by residents for *formal gatherings* within the neighbourhood. Overall, five of the 11 examined communal spaces had the highest frequency for formal contact (see Figure 6-9). They are the worship facility (masjid/church) followed by the space in front of the main entrance of the house, streets and sidewalks, the shared garden of the neighbourhood, and the house and halls for weddings, while the remaining respondents selected other types of communal space (i.e., local shops, mall, local restaurants, local café, and gym). The data breakdown presents different patterns across the case studies. See section D.18 in Appendix D for more detail.

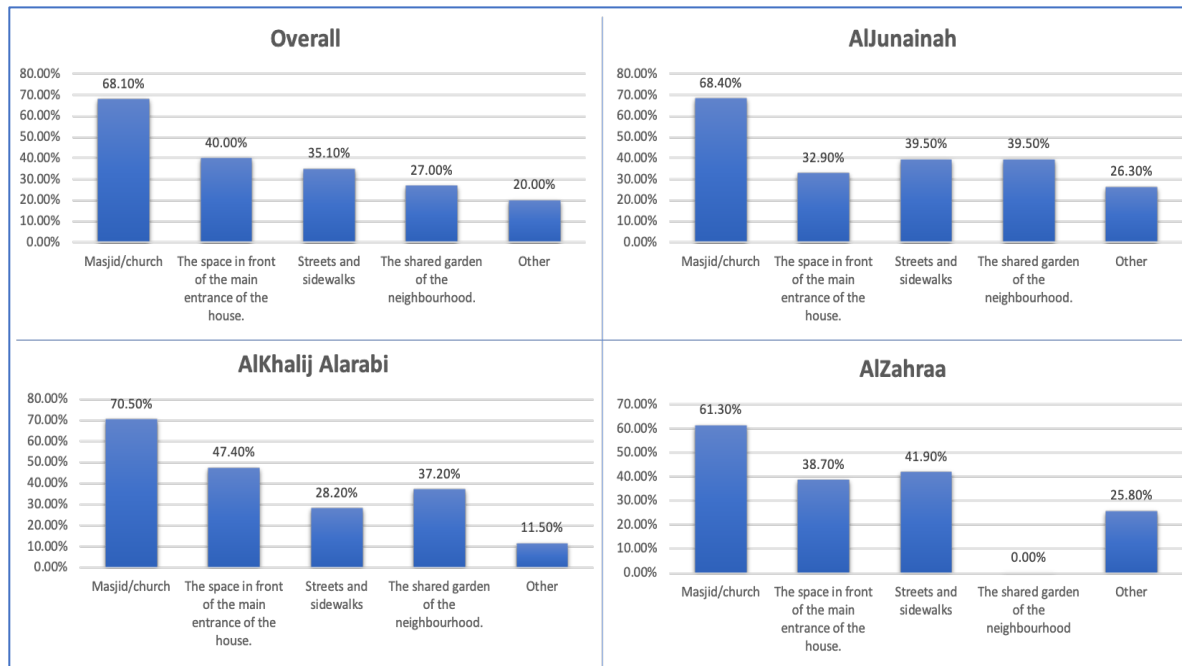


Figure 6-9 The highest frequency of using the communal space for formal contact: Q33 of the questionnaire.

### 6.13.2. The Frequency of Using Communal Spaces:

As described in Chapter Four, the frequency of use index (FU-Index) is a composite measure that introduces explicit knowledge about social life in the examined context by demonstrating ‘how frequently the residents use each communal space within the residential development’. The respondents were asked one question (question 34 of the questionnaire) to indicate whether the residents use each communal space daily, weekly, monthly or twice a year, for social interaction, or had never used it before. Potential places of contact are the communal spaces with a higher FU-Index. This was achieved when the respondents’ frequencies of use were summed and then divided by the number of respondents to achieve the final value of the index for each communal space, which is a number between 4 (the most frequently used space by all residents) and 0 (never used by any resident). This index will help to recognise the most frequently used communal spaces.

Table 6-28 represents the FU\_Index value of each communal space after rounding the mean values to the nearest integer. Overall, it can be seen that the frequencies for using "the space in front of the main entrance of the house", "streets and sidewalks", "local shops", "local market or malls" within the neighbourhood were monthly (FU\_Index =2). This indicates that these spaces are the most used communal spaces in SFHNs in Basra according to residents’ experiences. Moreover, the FU\_Index for “the shared garden of the neighbourhood”, “the worship facilities (masjid, church, or hussainya)”, “local restaurants”, and “local cafés” equates

to 1, indicating that each of these communal spaces are used once or twice a year by respondents. Furthermore, the data in Table 6-28 indicate that the IS\_Index=0 for the “gym” and “the children’s playground”, meaning that residents did not use them.

The data breakdown shows similar patterns across the case studies for the frequency of use for “streets and sidewalks”, children’s playground, “local shops”, “local restaurants”, and “gym”. However, the data breakdown for the other communal spaces shows different patterns across the case studies. “The space in front of the main entrance of the house” was used weekly (FU\_Index=3) in the AlKhalij Alarabi neighbourhood. Moreover, “the local market or malls” were used once or twice a year (FU\_Index=1) in the AlZahraa neighbourhood. The FU\_Index=0 for “the shared garden of the neighbourhood” indicates that respondents did not use it in the AlZahraa neighbourhood. In AlKhalij Alarabi neighbourhood, “worship facilities” were used monthly (IS\_Index=2), and in AlKhalij Alarabi and AlZahraa neighbourhoods, “local cafes” located within these neighbourhoods were not used (IS\_Index=0). Table D-62 reveals the count and percentage of the answers for each communal space’s frequency of use, both overall and across the case studies (see more details in section D.19 of Appendix D). Figure 6-10 represents the overall percentages of the frequency of use for each communal space.

*Table 6-28 The Frequency of Use Index for the communal spaces both overall and across the surveyed neighbourhoods (Q34).*

Q34: How often do you use each of the following communal spaces?	FU_Index			
	AlJunainah	AlKhalij Alarabi	AlZahraa	Overall
The space in front of the main entrance of the house	2	3	2	2
Streets and sidewalks.	2	2	2	2
Children’s playground	0	0	0	0
The garden of the neighbourhood.	1	1	0	1
Masjid/church/hussainya	1	2	1	1
Local shops	2	2	2	2
Local market or malls	2	2	1	2
Local restaurants	1	1	1	1
Local cafes	1	0	0	1
Gym	0	0	0	0
0=Never used before, 1= Once or twice a year, 2= Monthly, 3= Weekly, 4= Daily				



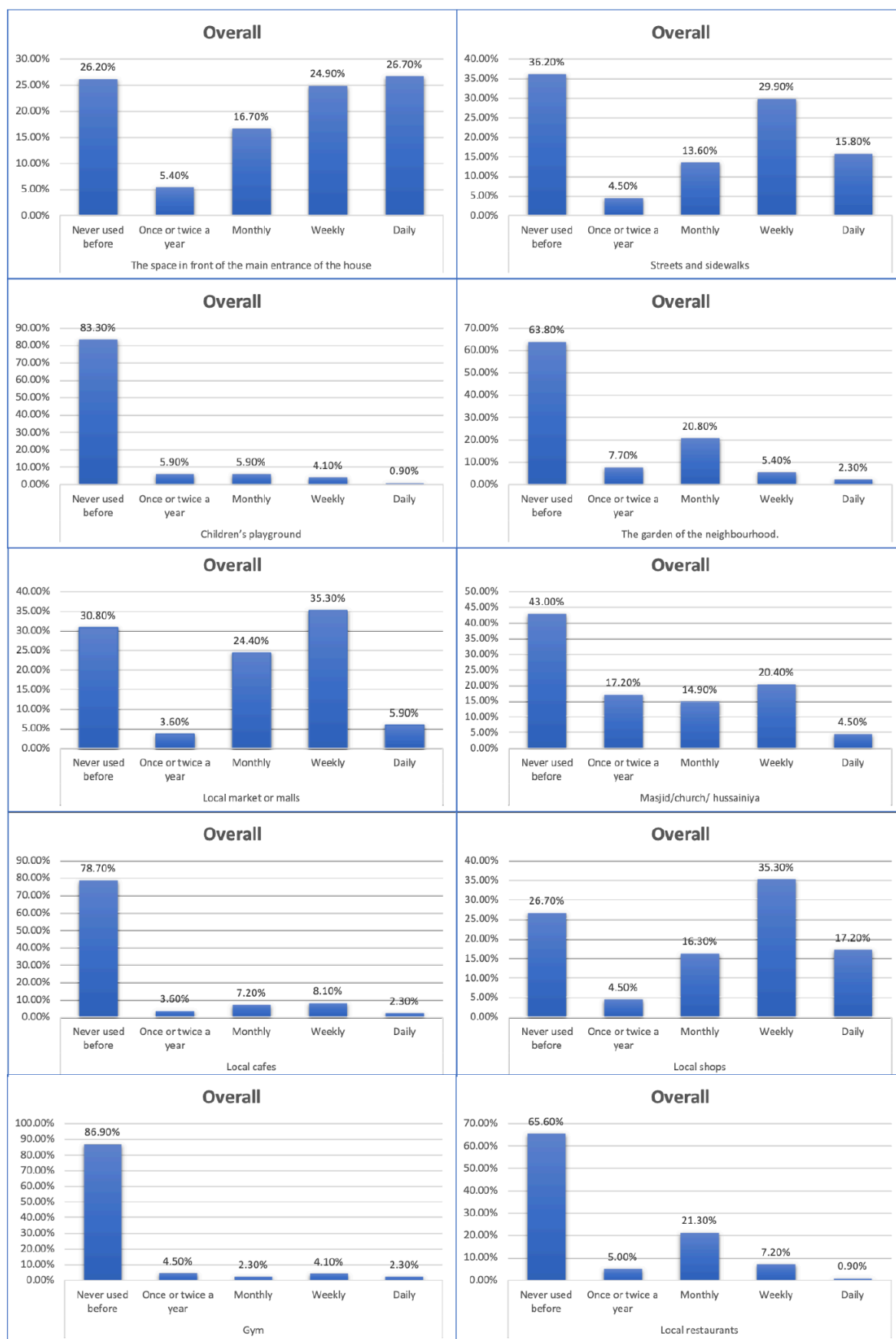


Figure 6-10 The overall percentages of the frequency of use of each communal space.

### 6.13.3. The Nearest Communal Space to the Residents' Houses:

The residents were asked to identify the nearest communal space to their houses that they use to contact others (question 35). Table 6-29 shows the percentages and numbers of the nearest used communal spaces to respondents' houses. Table 6-29 shows that 41.3% indicated that "the space in front of the main entrance to the house" is the closest used communal space, while 22.1% indicated that "streets and sidewalks" are the closest. Also, 15.0% of the responses indicated "the shared garden of the neighbourhood" was the closest used communal space to the house, while 12.2% of the responses selected the option "None". The data breakdown shows that "the space in front of the main entrance of the house" was selected by a high percentage of AlJunainah's respondents (34.5%) as the nearest communal space to the housing units. This is followed by "the garden of the neighbourhood" (25.3%), then "street and sidewalks" (21.8%), while 12.6% of respondents selected "other", which was mainly the house (Table D-63 in Appendix D). In AlKhalij Alarabi, the nearest communal space to the housing units selected by respondents was "the space in front of the main entrance of the house" (49.6%). This was followed by "street and sidewalks" (18.6%), then "the garden of the neighbourhood" (15%), while only 5% of respondents selected "the children's playground", and 6% selected "other", which was mainly the house. In AlZahraa, both "the space in front of the main entrance of the house" and "street and sidewalks" were selected as the closest used communal spaces to houses by 32.5% of respondents, while 12.5% selected "other", including local shops, the house, and hussainya. Figure 6-11 shows the closest used communal spaces across the surveyed neighbourhoods.

Table 6-29 Nearest used communal space to residents' houses across the case studies and overall.

	AlJunainah		AlKhalij Alarabi		AlZahraa		Overall	
	N	%	N	%	N	%	N	%
The space in front of main entrances of houses.	30	<b>34.5%</b>	56	<b>49.6%</b>	13	<b>32.5%</b>	99	<b>41.3%</b>
Streets and sidewalks	19	<b>21.8%</b>	21	<b>18.6%</b>	13	<b>32.5%</b>	53	<b>22.1%</b>
Garden of the neighbourhood.	22	<b>25.3%</b>	14	<b>15.0%</b>	0	0.0%	36	<b>15.0%</b>
Children's playgrounds	0	0.0%	2	5.0%	0	0.0%	2	0.8%
Other	11	12.6%	7	6.2%	5	12.5%	23	9.6%
None/Do not use any	5	5.7%	15	13.3%	7	17.5%	27	11.3%
Total	87	36.3%	113	47.1%	40	16.7%	240	100%

Percentages and totals are based on responses.

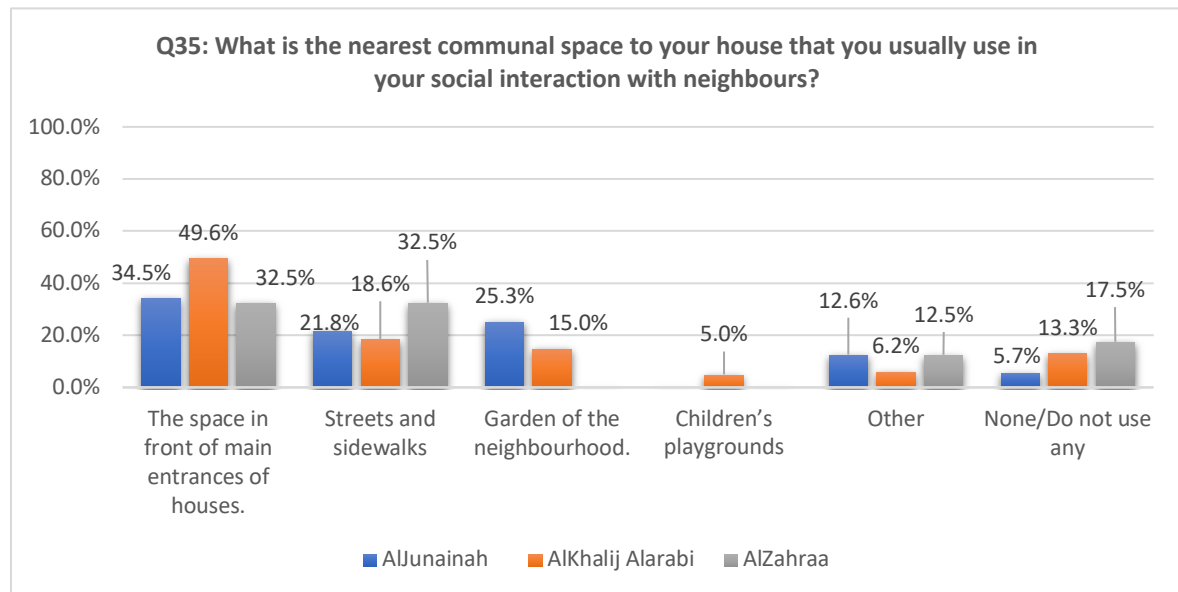


Figure 6-11 The percentages of the nearest used communal space to the respondents' houses across the case studies.

Moreover, when considering the nearest used communal space to the house for social contact, the analysis shows some differences between the genders. Table 6-30 represents the closest used communal spaces to the houses according to choices by each gender. Overall, the nearest communal space to the house for females for social contact is “the space in front of the main entrance of the house”, which was selected by 47.7% of females, while only 42% of males selected this space. This was seen in AlJunainah neighbourhood, while in AlKhalij Alarabi and AlZahraa, the proportions of males who selected “the space in front of the main entrance of the house” as the closest used communal space were higher than females. For “streets and sidewalks” and “the shared garden of the neighbourhood”, the proportion of males (33% and 26.8%, respectively) selecting these two options was higher than females (14.7% and 5.6%, respectively). This pattern was approximately similar across the surveyed neighbourhoods.

Moreover, the proportion of females who were not using any of the available communal spaces within their neighbourhoods (19.3%) was higher than males (5.6%). This pattern is approximately similar both overall and across the case studies. Furthermore, the overall proportion of females who indicated other communal spaces/places (mainly houses) as a nearest used communal space social contact was higher than males, i.e., 15.6% and 5.4%, respectively. The data breakdown represents a similar pattern across the surveyed neighbourhoods, except in AlZahraa neighbourhood.

According to residents' experiences, "the space in front of the main entrance of the house" appears to be the most used communal space in SFHNs in Basra, which was mostly used by females. This is followed by "streets and sidewalks" and "the shared garden of the neighbourhood" used by males frequently.

Table 6-30 The closest used communal space to residents' houses regarding gender across the case studies.

	AlJunainah				AlKhalij Alarabi				AlZahraa				Overall			
	Male		Female		Male		Female		Male		Female		Male		Female	
	N	N %	N	N %	N	N %	N	N %	N	N %	N	N %	N	N %	N	N %
The space in front of the main entrance of the house	13	26%	17	48.6%	28	60.9%	28	54.9%	6	37.5%	7	30.4%	47	42.0%	52	47.7%
Streets and sidewalks	13	26%	6	17.1%	17	37.0%	4	7.8%	7	43.8%	6	26.1%	37	33.0%	16	14.7%
The garden of the neighbourhood.	19	38%	3	8.6%	11	23.9%	3	5.9%	0	0.0%	0	0.0%	30	26.8%	6	5.6%
None/Do not use any	2	4.0%	3	8.6%	4	8.7%	11	21.6%	0	0.0%	7	30.4%	6	5.4%	21	19.3%
Other	3	6.0%	8	22.9%	0	0.0%	7	13.7%	3	18.8%	2	8.7%	6	5.4%	17	15.6%
Total	50		35		46		51		16		23		112		109	
% within Q2_Gender	% = n/50		% = n/35		% = n/46		% = n/51		% = n/16		% = n/23		% = n/112		% = n/109	

#### 6.13.4. Activities Undertaken in The Closest Communal Space to The House:

According to residents' responses, the results for question 36 revealed six types of activities that were specified in the nearest used communal space to residents' dwellings, namely sitting and chatting, passing, observing pedestrians, cultivating plants, parking, and children playing. According to the data in Table 6-31, sitting and chatting was the most common activity amongst 56% of respondents; passing through, which was selected by 35.2% of respondents, followed this. Slightly more than a quarter of respondents (25.4%) used the closest communal space for parking their cars, whilst 19.7% of respondents used the nearest communal space for other activities. In addition, 16.6% of respondents used the most adjacent communal space for their children to play, and 13% of respondents used the shared area for observing pedestrians. In comparison, 10.4% of respondents indicated that they use the closest communal space for cultivating plants. These activities were also considered in the observations and behavioural mapping. Section D.22 in Appendix D shows further detail on the types of activity conducted in the nearest communal space to residents' houses.

Table 6-31 The frequency of activities used in the closest communal space to residents' houses (Q36).

	Responses		Percent of Cases
	N	%	
Sitting & chatting with others.	108	31.8%	56.0%
For passing	68	20.0%	35.2%
For parking	49	14.4%	25.4%
Other	38	11.2%	19.7%
Children playing	32	9.4%	16.6%
Observing pedestrians.	25	7.4%	13.0%
Cultivating some plants	20	5.9%	10.4%
Total	340	100.0%	176.2%

#### 6.13.5. The Preferred Time for Using the Closest Communal Space for Social Interaction:

This section describes the responses to question 37 of the questionnaire, which asked residents to select their preferred time to use communal spaces - morning, afternoon or evening. Figure 6-12 shows that most of the communal spaces were used at different times during the day (see Table D-64 in Appendix D). “The space in front of the main entrance of the house” and “streets and sidewalks” were used frequently more than other spaces, and mainly in the morning (54.9% and 33.8%, respectively). This is probably because these spaces are in the way of residents’ daily movement. However, “the garden of the neighbourhood” was used more frequently during the evenings (26.4%) than at any other time. This is probably because of the climatic conditions of the examined area. The other spaces indicated as the nearest communal space to respondents’ houses were used most during the evenings.

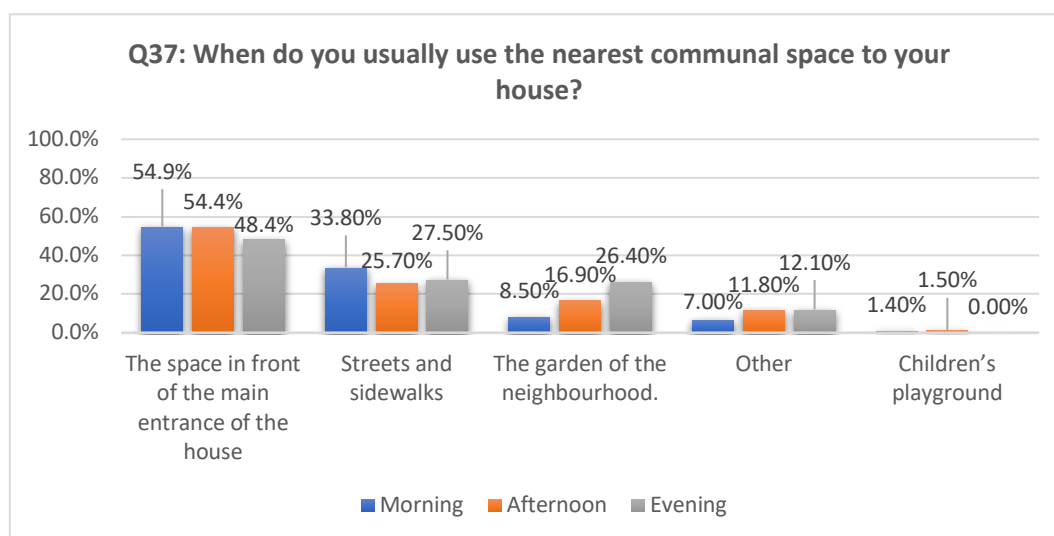


Figure 6-12 The preferred time of using the closest communal space to the house during the day (Q37).

### 6.13.6. The Preferred Place for Spending Free or Rest Time:

This section includes the responses of the ninth question indicating the preferred place within the neighbourhood to spend free and rest time, which was answered by all the participants. The question included four choices: a) at home, b) in enclosed communal spaces such as cafés, c) in open communal spaces such as the neighbourhood garden, sidewalks, or street, d) other. Table 6-32 shows the counts and percentages of question nine of the questionnaire overall and across the case studies. Overall, Table 6-32 shows that the majority of respondents selected the house as a preferable place to spend free time, i.e., 83.7%. In comparison, 10.9% of the surveyed residents prefer to use enclosed communal spaces, and 6.8% prefer to use open communal spaces in the neighbourhood. Moreover, the data demonstrates that 2.7% of respondents use places outside the neighbourhoods as preferred locations for rest time. The data breakdown in Table 6-32 shows approximately similar patterns across the surveyed neighbourhoods. The enclosed communal spaces were mostly used in AlJunainah neighbourhood (14.1%) then in AlKhalij Alarabi (9.3%), and AlZahraa (7.7%). The open communal spaces were mostly used in AlKhalij Alarabi neighbourhood (8.2%) then in AlJunainah (5.9%), and AlZahraa (5.1%). Table 6-33 shows the places that respondents indicated were used for spending free time or entertaining with the friends or family. Most of these places are not located within the surveyed neighbourhoods. According to the data in Table 6-33, the mall was a preferred place by respondents from AlJunainah and AlZahraa, which is closer to these two neighbourhoods.

Table 6-32 Preferred place for free time across the surveyed neighbourhoods overall and within each neighbourhood, (Q9).

	AlJunainah		AlKhalij Alarabi		AlZahraa		Overall	
	N	%	N	%	N	%	N	%
At Home	71	83.5%	83	85.6%	31	79.5%	185	83.7%
At enclosed communal spaces such as cafés.	12	14.1%	9	9.3%	3	7.7%	24	10.9%
At open communal spaces such as the garden of the neighbourhood.	5	5.9%	8	8.2%	2	5.1%	15	6.8%
Other	3	3.5%	0	0.0%	3	7.7%	6	2.7%
Total	85	38.5%	97	43.9%	39	17.6%	221	100%

Percentages and totals are based on respondents

a. Dichotomy group tabulated at value 1.

Table 6-33 Preferred places to spend free and rest time: Other text.

Q9:Other (Text)	AlJunainah		AlKhalij Alarabi		AlZahraa		Total	
The mall (e.g., Basra Times Square)	4	4.7%	0	-	2	5.1%	6	2.7%
The shop where I work	1	1.2%	0	-	0	-	1	0.5%
Parks	0	-	0	-	1	2.6%	1	0.5%
With friends anywhere	0	-	0	-	1	2.6%	1	0.5%

The house was chosen by those who select Other as the preferable place to spend free time within the three areas. This could be because it is a private place that offers shelter from the vagaries of the atmosphere that the region is known for. Moreover, the available open and enclosed communal spaces may not meet residents' demands and interests, which explains the low proportion of respondents who use enclosed and open communal spaces within the neighbourhoods for their rest or free time. This could be due to the misalignment between the design and planning of residential neighbourhoods with the development in lifestyles and the reflection of people's perceptions and opinions (as mentioned by respondents in questions 26 and 27 of the questionnaire). More detail is given in section D.23 of Appendix D on the preferred place to spend free time within neighbourhoods depending on gender and age.

#### **6.13.7. Residents' Perceptions of Current Communal Spaces:**

This section covers the findings of question 26, which was open-ended. The question asked for suggestions from respondents about changes to current communal spaces within their neighbourhoods. The text of the question is, "*if you could choose to add/change any of the communal spaces within your neighbourhood, what would you suggest? Please state your main reasons*". Surprisingly, the majority of respondents (i.e., 84.6%) answered this question. During the initial coding process, several codes were excluded because they do not relate to the research subject. The initial list of codes was edited and reviewed, which led to the development of the final codes and categories. At this stage, the categories and themes were formed by finding connections between the codes. The content analysis showed that respondents mentioned three main themes; urban planning, maintenance, and safety and security. These main themes include local and sub-themes, as detailed in Table 6-34, which shows the main, local and sub-themes with the number of repetitions for each code or theme.

In terms of urban planning, five local themes were suggested by respondents for development and adding. The most weighted local theme from the analysis was *the provision of public services and utilities*. These public services within the neighbourhood are considered communal spaces according to their classification at the service level. This local theme involved *recreational centres, worship, parks, playgrounds for children, and sports facilities*. *Public parks* were considered as most important, and this suggestion includes adding several points. Providing parks within neighbourhoods that have no such communal spaces was a considerable requirement amongst respondents; this was followed by *maintaining, afforesting, increasing the number of public parks, and expanding their area*. Further suggestions include developing



and sustaining existing parks by providing appropriate kiosks, fences, identified entrances, and lighting, to increase the sense of security when using these parks.

Regarding building *recreational facilities*, suggestions include building malls, restaurants, cafes, cafeterias, youth care centres, complexes for public gatherings, and providing recreational, and beauty and fitness centres for women. Also, respondents indicated the provision of *sports utilities*, such as gyms, sport equipment, football and grassy arenas as well as providing gym for women. Moreover, the findings revealed another local theme, namely *facilities for children*. Respondents focused on the importance of providing and/or increasing the number of children's playgrounds within the neighbourhood in addition to providing seats. *Worship facilities* are another source of concern under the public services local theme although had a low number of repetitions. The suggestions of respondents added building mosques for women for religion gatherings, increasing the number of neighbourhood mosques, and building new mosques.

The other local theme under urban planning that was highly weighted is the *streets of the neighbourhood*. This local theme was weighted on the number of repetitions. Respondents highlighted important sub-themes that overlap with the main theme of *maintenance*. The sub-themes include *developing streets* with a focus on paving and expanding their width in some areas. Also, respondents suggested providing neighbourhood streets with sidewalks, illumination, and traffic lights, and considering the addition of parking lots when planning the neighbourhood's streets.

The last three local themes under the main theme of urban planning indirectly linked to the purpose of question 30, although they were less repeated in the answers. *Preserving the state's properties* encourages residents to participate in the sustaining process. Moreover, *applying modern designs* resulted from the findings of question 26, and offered an invitation to architects, urban professionals to consider modern trends in the design of the neighbourhood, in general, and communal spaces, particularly. Finally, *providing residents with a badge* to enter their neighbourhood was noted as a call to consider the concept of gated communities.

The second main theme extracted from the findings from question 26 is *maintenance*. Its local themes involve sustaining public services, cleaning the streets, open spaces, and parks, eliminating overrides and waste, and sustaining the sanitation system. These local themes are considered at the level of communal spaces as well as the neighbourhood.

The third main theme is *safety and security*; this includes providing safety and security within the neighbourhood by considering security when designing safe parks for both genders, safe streets from car accidents, and playgrounds for children.

Table 6-34 The final codes of question 26 of the questionnaire.

Main Theme	Local themes	Sub-themes
1. Urban planning (4)	a) Providing public services and utilities: (1)	
	▪ Public parks	<ul style="list-style-type: none"> <li>- Creating public parks (36)</li> <li>- Increasing the number of public parks. (6)</li> <li>- Expanding the area of public parks (2)</li> <li>- Maintaining public parks (9), fencing (5), increasing lighting (1), afforestation (7), providing kiosks (1), increasing the sense of security in existing parks (1).</li> </ul>
	▪ Recreational centres	<ul style="list-style-type: none"> <li>- Building: recreational centres (6), malls (3), restaurants (2), cafes (2), cafeterias (2), youth care centres (1), complexes for public gathering (3).</li> <li>- Proving recreational centres for women (6), beauty and fitness centers (1).</li> </ul>
	▪ Sports services	<ul style="list-style-type: none"> <li>- Providing gyms (6), sporting equipment (1), and gym for women (1).</li> <li>- Building football (1) and grassy arenas (1).</li> </ul>
	▪ Facilities for children	<ul style="list-style-type: none"> <li>- Providing playgrounds (18) and chairs (9).</li> <li>- Increasing playgrounds (3).</li> </ul>
	▪ Worship facilities	<ul style="list-style-type: none"> <li>- Building mosques (masjid) for women (1).</li> <li>- Increasing the number of mosques in neighbourhoods (1)</li> <li>- Building new mosques (1)</li> </ul>
	b) Streets of the neighbourhood	<ul style="list-style-type: none"> <li>- Developing the streets (6), paving (5), expanding the streets (2).</li> <li>- Providing sidewalks (14), illumination (10), traffic lights on the streets (2) and parking lots for cars within the streets (5).</li> </ul>
	c) Preserving the state's properties (1), d) Applying modern designs (1), e) Providing badges for residents' entry (1)	
1. Maintenance	a) Maintaining public neighbourhood's services (4)	- Cleaning the neighbourhood (2), open spaces and parks (11) and streets (22)
	b) The overrides	- Eliminating the overrides. (13)
	c) Sanitation	- Developing the sanitation system (3)
	d) Waste	- Removing the waste (4)
2. Safety and security	a) Providing safety and security within the neighbourhood (2).	- Increasing the security by designing safe parks (4), streets (7), and playgrounds for children (3)

#### 6.13.8. Residents' Perceptions of Ideal Communal Spaces:

This section covers the findings of question 27, which was open-ended. The question asked respondents to indicate their ideal communal spaces within the neighbourhood. The text of the question was “*what is the ideal communal space for social contact with others that you prefer to be in your residential neighbourhood? What would you like to see and have in it? Please state your main reasons.*”. Unexpectedly, the majority of respondents (i.e., 72.9%) answered this question. During the initial coding process, some codes were excluded because they did not relate to the research subject or was related to the previous question. The initial list of codes was edited and reviewed, which led to development of the final codes and categories. At this stage, the categories and themes were formed by finding connections between the codes. The content analysis shows that respondents mentioned a number of main themes, which included sub-themes. Table 6-35 shows the findings for question 27, which are the ideal communal spaces within the neighbourhood as indicated by the respondents. The table includes the main and sub-themes with their number of repetitions.

*Public parks or gardens* obtained the highest number of repetitions. The main reason mentioned was that parks and open spaces encourage social interaction amongst residents. Respondents indicated that they would prefer shaded seats, children’s playgrounds, pedestrian routes, fountains, and some sports equipment. Also, the number of responses highlighted the importance of providing privacy and safety in these parks especially for women. The second main theme that resulted from the responses, and mostly from women, was *the house*. According to the responses, the house is preferred as the safer place for women’s gatherings and for preserving their privacy because there are no sufficient public places for women. *Cafes* are the third most common response with categorisations including cafes for women and retirees. The respondents’ reasons were that such places embrace people who want to entertain themselves, especially as the problems and difficulties of life increase. Also, cafes provide a kind of freedom, privacy and security to spend time with friends. In addition, cafes are traditional popular gathering places, especially for men in the past; therefore, these are suitable for social networking and can be available for both genders and different age groups. *Religious places*, including mosques and hussainya, were frequently mentioned as an ideal communal space within the neighbourhood. Participants mentioned the reasons for considering a mosque or hussainya an ideal communal space, stating that it is a basic religious, cultural, and spiritual facility in the Basrawi society. Also, it brings people together, offers privacy and comfort, and facilitates social communication, especially on religious occasions.

Moreover, the findings of the question revealed that respondents preferred having an *association, forum*, or guild that various social strata could attend. Respondents mentioned that such facilities could contribute to the development of cultural conversations between people, encourage the participation in civic affairs, and the solving of public issues. *The mall, restaurant, public library, market, and multi-purpose hall* received a similar number of repetitions as ideal places within the neighbourhood. *Sports facilities* also appeared in the responses, such as gym, gyms for women, sports playgrounds (football playground), sports clubs, and open spaces including some sports facilities.

Table 6-35 The final codes of question 27 of the questionnaire.

Ideal communal space (main theme)	Sub-themes
1. Public parks or gardens (67)	
2. Houses (26)	
3. Cafés (24)	Cafés for women (1), families (1), retirees (1)
4. Religious places (18)	Mosques (8), Hussainya (10) for both genders
5. Associations or guilds (8)	
6. Restaurants (6)	Restaurants for women (1)
7. Malls (6)	
8. Public libraries (6)	
9. Multi-purpose halls (6)	
10. Open spaces (squares) (5)	
11. Sports facilities:	Gyms for women (5)
	Sports playgrounds (5)
	Sports clubs (7)
	Gyms (2)
12. Market (3)	

#### 6.14. Conclusion:

The chapter discussed the results and analysis of the questionnaire. The following were the key areas of discussion. The test of normality distribution for the dependent variable data, which is social interaction, and the three indices in this study, revealed that the data followed a non-normal distribution because the *p*-value was less than 0.05. Therefore, GLM and Kruskal-Wallis H test were run to analyse the data. The chapter also discussed the descriptive analysis of the questions concerning the DF, PCBE, and SSI. The latter two sections included subsections that demonstrated statistics on the frequency of the responses. Moreover, the chapter described the dependent variable, which was represented in the social interaction section of the questionnaire. The impacts of DF, PCBE, and SSI were analysed on social interaction in three separate sections, followed by a reflective discussion section. Similar analysis arrangement was applied to the social indices: The Neighbouring Index (N\_Index), Social Networks Index (SN\_Index), and Social Relationships Index (SR\_Index).

The chapter also discussed the analysis of the results for communal spaces in the SFHNs in Iraq. It identified the interactional spaces for regular and formal gatherings and meetings by applying the Interactional Space Index (IS\_Index). Also, it calculated the frequency of the use of these spaces by applying the frequency of use index (FU-Index). The space in front of the main entrance of the house was mostly used for regular meetings, while worship facilities (Masjid /church /hussainya) were the most commonly used communal space for formal gatherings. Moreover, the chapter also analysed the data to identify the nearest communal spaces to housing units that used for social contact, the preferable place in which residents chose to spend their free time, the preferred time to use them, and the activities frequently undertaken.

Moreover, the chapter discussed residents' suggestions to add or change communal spaces and the ideal areas that they would like to have within their neighbourhoods. Respondents highlighted three important items, which are urban planning, maintenance, and developing the safety and security aspects of the neighbourhood. Also, according to respondents' perceptions and suggestions, public parks and shared gardens, recreational facilities, such as cafes, restaurants, malls and religious facilities (masques and hussainya) are ideal communal spaces within neighbourhoods for social interaction.

## **Chapter 7 The Socio-Spatial Practices of Residents**

### **7.1. Introduction:**

This chapter describes the observation and behavioural mapping that were conducted in the three case studies and discusses how the selected methods and techniques were applied to the thesis. As mentioned in Chapter 4 (section, 4.7.1/d), observation and behavioural mapping were conducted in order to explore what people do in particular spatial settings. According to Alsumsam (2017), Bechtel, Marans, & Michelson (1987), Cosco, Moore, & Islam (2010) and Goličnik (2005), observation and behavioural mapping consists of gathering the responses to ‘where, how, and what is going on’ in a comprehensive way to study the pattern of behaviours and physical activities in a given space, by locating the behaviour on the map itself. The primary data collection phase is based on observation and behavioural mapping, and the creation of digital databases for these data; this represents the operative nature of the application of the research methods and techniques. Supporting evidence is needed from the case studies and the improved, renewed, and adjusted observations and mapping techniques for application in this research. These case studies will provide a thoroughly considered environment for the observation and behavioural mapping method.

The chapter addresses the following steps: Firstly, comments on the improvement, revision and adjustment of the observation and mapping techniques are discussed. Secondly, the chapter reviews the data collection for each case study including the number of users, type of activities, and photographs taken by the researcher. The motives and barriers to the use communal spaces according to the findings of the observations were discussed after considering a comparison between the observations of the case studies.

### **7.2. The Observations and Behavioural Mapping:**

This section presents users’ behaviour in the communal spaces of the three selected case studies in order to understand how these spaces are used and what motivate users to visit. As mentioned in section 4.7.1/d, the attributes recorded were: who uses the place (men, women, children, families, or singles), what are the users’ age groups, and where do they tend to gravitate (sun, shade, a particular form of setting, or anywhere). Also, what type of activities take place, when they are using the space (time of week of occupancy, time of day of occupancy), and what are the weather conditions at the time of the activity (Marcus & Francis, 1997).

The researcher used methods and tools for observation and behavioural recording. Firstly, a table was prepared and used to record the day, time, and the weather condition, who was using the place, the users' age groups, where they tended to gravitate, the type of activity taking place, and when they used the space. Also, the researcher used modified maps for the areas to roughly represent the overall location of activities within the observation period. Figure 7-1 represents the symbols used to manifest the activities of users in behavioural mapping for men, women, and children/teens. Secondly, a camera phone was also used to take photos and record videos during the behavioural mapping, when possible. The video recording was used for observation in some communal spaces within the case studies, such as streets, open spaces in front of mosques, and local shops to facilitate the process for the researcher. This is because, culturally, it is difficult for a female to stand around manually recording information. The three observed case studies are residential neighbourhoods: AlJunainah, AlKhalij Alarabi, and AlZahraa neighbourhood. Each case study has been divided into zones (Z1, Z2, Z3) to ease recording and distinguishing the information of each communal spaces in each case study. In each zone, more than one communal space has been observed.

The observations took place in December 2018 and February 2019 (the end of winter and the beginning of spring, where the weather is considered most temperate in the southern region of Iraq). The observations took place twice - once during the weekday and once at the weekend - and twice a day, namely in the morning between 9:00 and 11:00 pm and late afternoon between 15:00 and 18:00. Each zone was observed for around 30 minutes, where each spatial unit within it was observed for 10 minutes. The number of people using the space was counted during a 10-minute observation slot on weekdays and weekends and was recorded in prepared tables (see Table 4-5 in Chapter Four). During the observation periods, the weather was mostly sunny, and even the cloudy days tended to be very bright, with the exception of a few days when the weather was cloudy and rainy. The temperature ranged between 21°C and 24°C. During most of the evening, there was a cool breeze blowing across the sites, while in the morning a cool pleasant breeze was blowing in shaded areas. The observation points were chosen strategically to allow for as clear vision as possible. The case studies are analysed and presented in sequence. First, the 'people counts' concerning those who used the observed communal spaces are presented; secondly, people's behaviours and activities are recorded, including whether users were male, female or children. The behavioural maps, photographs, and videos support the observed data.



Male	Female		Children & Teens	
▲	△	Sitting on a bench/chair and chatting	✂	Cycling
▲	△	Sitting on the ground and chatting	●	Playing football
▲	△	Sitting on the ground and watching pedestrians	●	Walking and chatting
▲	△	Standing and chatting	●●	Children playing
▲	△	Standing and chatting	●	Children sit on the sidewalk
▲	△	Standing and waiting	●	Standing and chatting
▲	△	Standing and watching pedestrians	●	Walking
■	□	Washing/cleaning the adjacent street	●	Playing in playground
■	□	Throwing trash		
■	☒	Watering the plants		
■	☒	Doing construction works		
■		Washing/fixing a car in the street		
✂		Cycling/motorcycle		

Figure 7-1 Symbols used by the researcher to represent the activities of users in behavioural mapping for three categories (men, women, and children/teens).

### 7.2.1. Case 1: AlJunainah Neighbourhood:

AlJunainah neighbourhood was divided into six zones, as shown in Figure 7-2, to ease the observation and data recording in each zone within the neighbourhood. The communal spaces observed were located in front of the main entrances of houses, sidewalks, streets, shared gardens, and a children's playground. Some public places, such as cafes, restaurants and local shops that are distributed along AlBaho Street and Al-Maslaha Street were observed. The observation and behavioural mapping were conducted once during weekdays (Wednesday, 19 December 2018 and Monday, 14 January 2019) and once during the weekends (Saturday, 26 January and Friday, 8 February 2019).



Figure 7-2 Aerospace photograph for AlJunainah neighbourhood and the observed zones (source: maps adapted by the researcher from Esri, accessed 2019).

There was a significant difference between the number of people using the communal spaces within the neighbourhood (shared gardens, spaces in front of the main entrances of houses, streets and sidewalks) on weekdays and weekends. As shown in Table 7-1, the greatest number of users in the late afternoon were men and children, while in the morning the number of men was slightly lower. Although the number of women was lower than that of men, the number of women was the same in the morning and late afternoon during the weekends, and higher in the late afternoon during weekdays. The smallest number was recorded in the morning, as usually everyone is at work. From Table 7-1, it appears that the men more frequently use the communal spaces within AlJunainah neighbourhood than women. The number of women using communal spaces within the neighbourhood is slightly less than a third than that of men and children. This is probably because of the customs and traditions of conservative Iraqi society, where is not culturally acceptable for females to leave their houses without accompanying by males; this may also, be due to their duties as housewives.

*Table 7-1 Number of people using communal spaces in AlJunainah neighbourhood. (The percentage is calculated from the total number of users at the same time).*

AlJunainah Neighbourhood					
Gender	weekdays		weekends		Overall
	Morning	Late Afternoon	Morning	Late Afternoon	
Men	24	30	25	39	118
Percentage	70%	57.4%	43.9%	34.2%	43.1%
Women	6	10	9	13	38
Percentage	16.7%	12.8%	15.8%	11.4%	13.9%
Children	11	22	23	62	118
Percentage	13.3%	29.8%	40.4%	54.4%	43.1%
Total	41	62	57	114	274

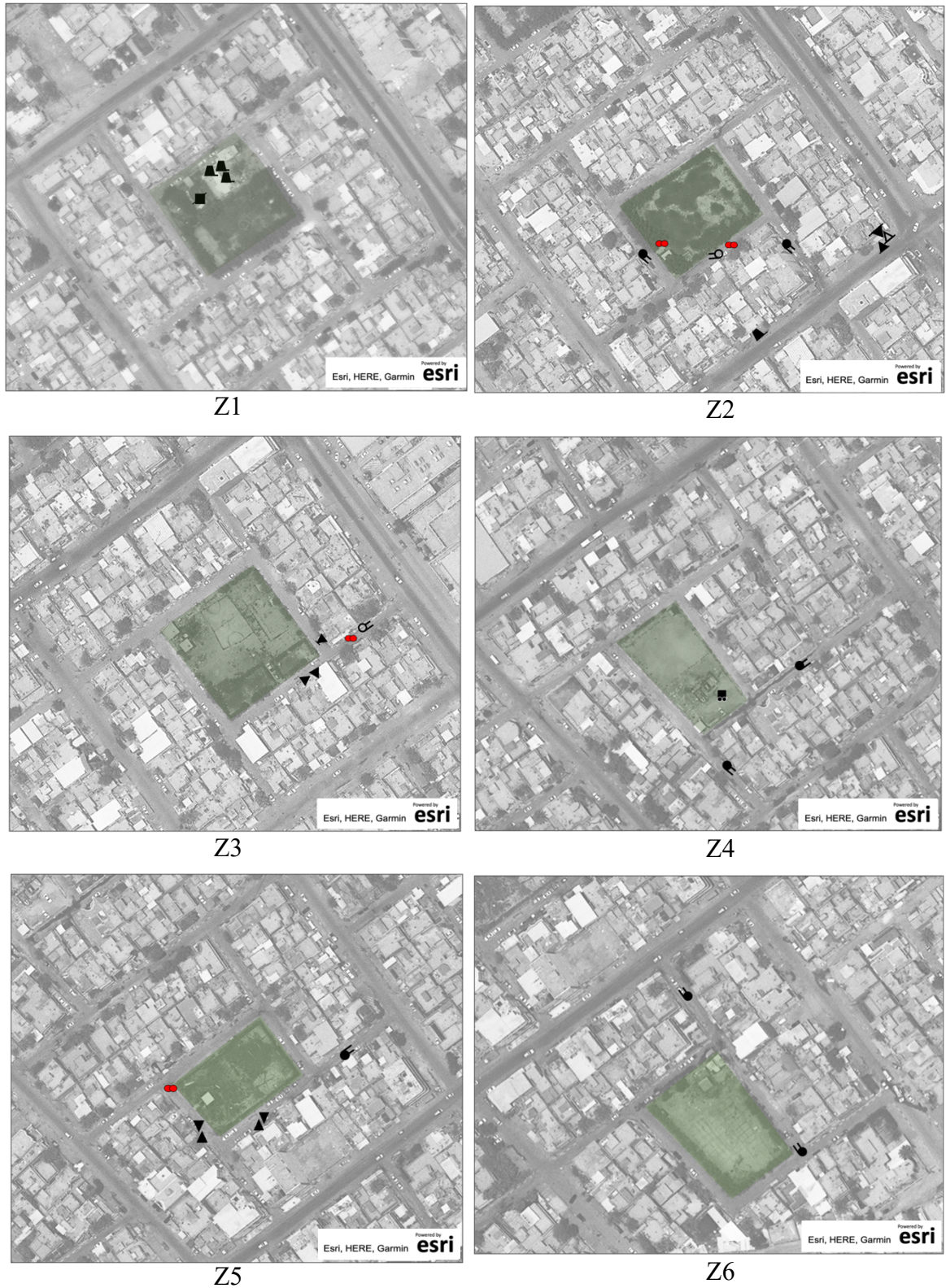


Figure 7-3 Users' activities in AlJunainah neighbourhood in the morning during the weekdays (source: maps adapted by the researcher from Esri, accessed 2019).



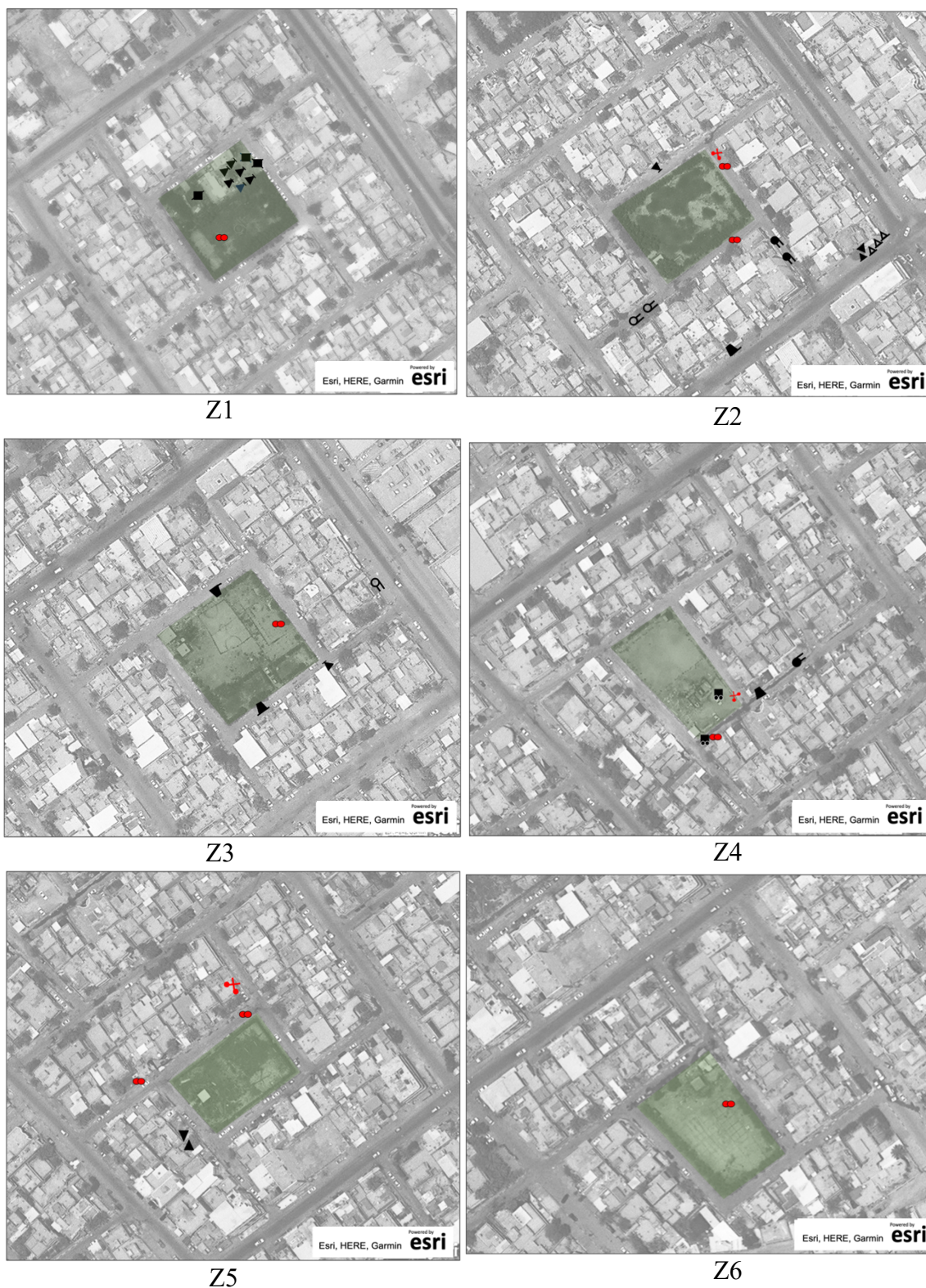


Figure 7-4 Users' activities in AlJunainah neighbourhood in the late afternoon during weekdays (source: maps adapted by the researcher from Esri, accessed 2019).



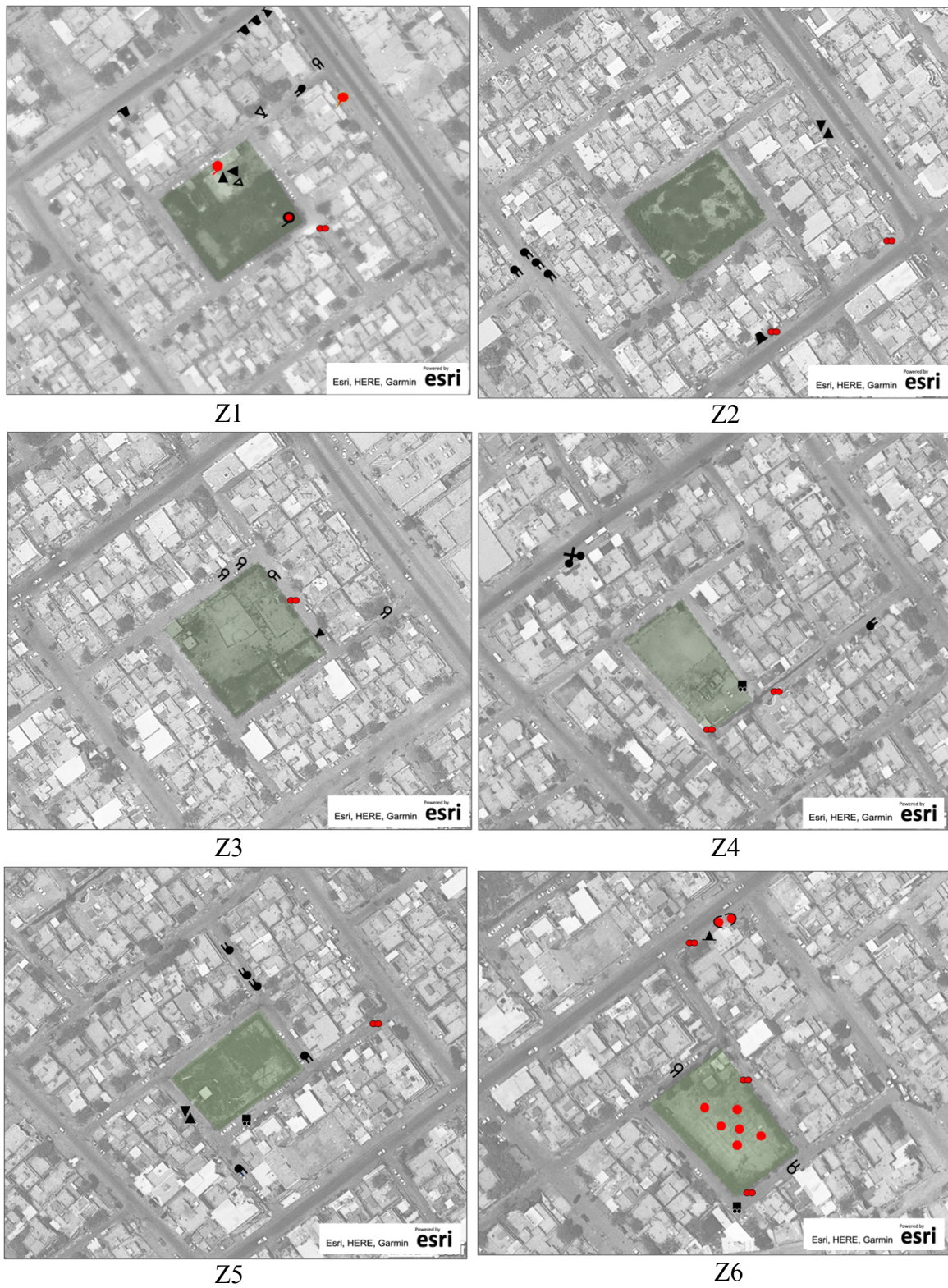


Figure 7-5 Users' activities in AlJunainah neighbourhood in the morning during the weekends (source: maps adapted by the researcher from Esri, accessed 2019).



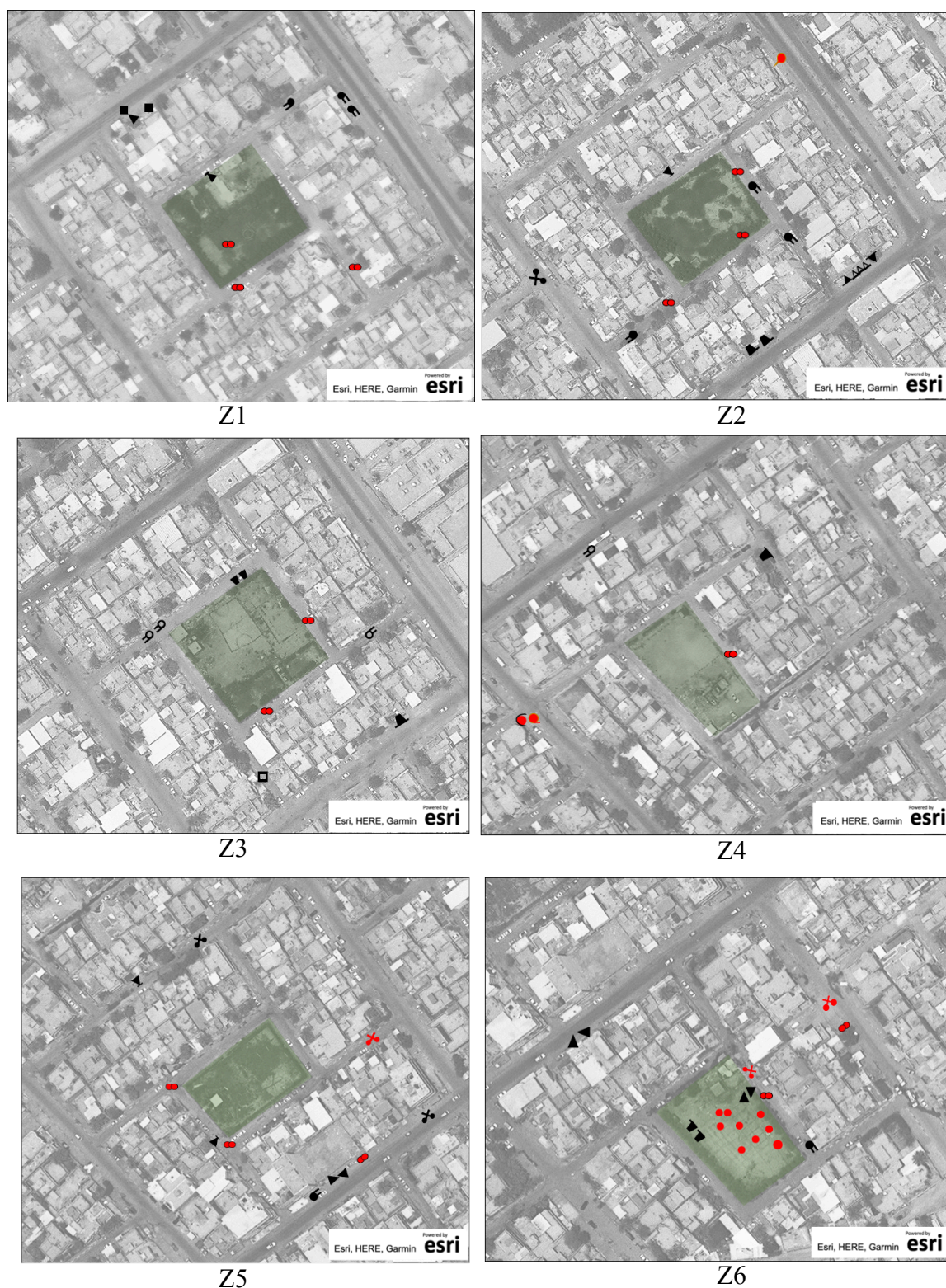


Figure 7-6 AlJunainah neighbourhood: observation-weekend-late afternoon. (Source: maps adapted by the researcher from Esri, accessed 2019).

Figure 7-3 and Figure 7-4 represent the observed, recorded activities during the mornings and late afternoons of the weekdays, respectively. Figure 7-5 and Figure 7-6 represent the observed, recorded activities during the mornings and late afternoons of the weekends, respectively. From the observations conducted during the weekdays and weekends, it can be seen that the

communal spaces within the neighbourhood were used mostly by males and children, and less frequently by females. It was also noticed that these spaces were used more frequently in the late afternoon than the morning. It was observed that the internal streets and sidewalks located around each of the shared gardens in all the six zones were mostly used by males from different age groups and children aged between five to 16 years old.

The most frequently observed activity amongst children using the streets was playing football, followed by cycling and chasing each other. It was also observed that males used the streets and sidewalks for moving individually to their jobs, while a few groups of two or three men of middle age were observed sitting or standing in the space in front of their house entrances watching pedestrians and/or chatting with neighbours. It was also observed that a group of eight people were doing some construction work, while single individuals were observed fixing or washing their cars. Furthermore, it was noticed that females rarely used the streets and sidewalks of the neighbourhood compared with males. The most frequently observed activities conducted by females were women greeting neighbours when meeting on the street; another woman was observed throwing garbage bags in the dumpsters. Furthermore, a group of two women and a child were observed walking, and it seems they were going to visit a neighbour's house. In comparison, single individuals were observed going to the market (souq) or local shops within the area. Females who were employed or studying were observed using the streets and sidewalks as a transit area to go or come back from their work.

Regarding the shared gardens within zones 1, 2, 3, and 6 of the neighbourhood, it was noticed that these areas were mostly used by children, while there was a presence of males in the gardens in zones 4 and 6. In Zone 5, the shared garden was closed. After asking one of the residents about the reason for the closure, it was revealed that the person chosen by the municipal council for garden maintenance closed it claiming to preserve its contents from vandalism by young people. Therefore, the children of this zone were potentially using the streets and sidewalks for playing. The most frequently observed activity within the neighbourhood in the shared gardens of Z1, Z2, Z3, and Z6 was children playing football; this was followed by adults sitting and chatting. According to the keeper of the garden in Z1, the garden was used by older men and retirees from different religious backgrounds (Muslims, Christians, and Armenians) who gather and chat about life before the war of 2003. Although there was an apparent deficiency in the quality of both gardens design and furniture in AlJunainah neighbourhood, some such spaces have still been used by children aged ten years and less, by teenagers, and by men aged between 30 to 55 years.



In terms of the social and commercial facilities within the neighbourhood, such as local shops, cafes, restaurants, or gyms, the observations revealed that most users (the majority were men) from different age groups used such places in the late afternoon and evening for gathering and chatting. Figure 7-7 and Figure 7-8 show some photographs of the observations during the morning, late afternoon, and evening in AlJunainah neighbourhood.

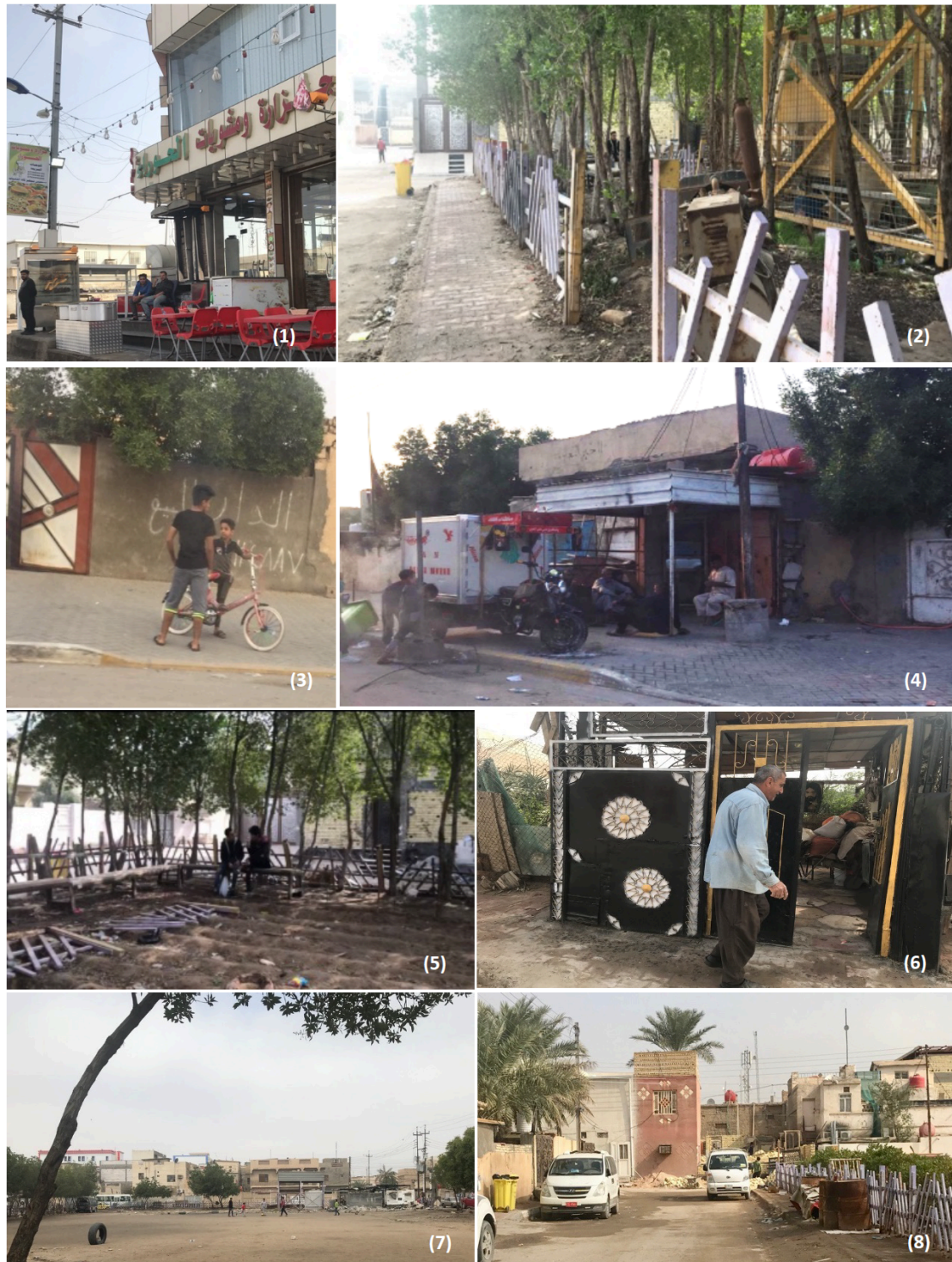


Figure 7-7 photographs of the observations show the activities conducted by the residents in the morning during the weekdays and weekends in AlJunainah neighbourhood (source: photos took by the researcher).





Figure 7-8 Photographs of the observations showing activities conducted by residents in the late afternoon during weekends in AlJunainah neighbourhood (source: photos took by the researcher).

### 7.2.2. Case 2: AlKhalij Alarabi Neighbourhood:

Regarding the second case study, AlKhalij Alarabi neighbourhood, three places were observed, as shown in the aerospace photograph obtained from Esri (see Figure 7-9). The communal spaces observed are the spaces in front of the main entrances of houses, sidewalks, streets, shared gardens, and children's playgrounds. Some public places, such as restaurants, local shops, mosques, bakeries, and fish shops, that are distributed within the neighbourhood were observed. The observation and behavioural mapping were conducted during the weekdays (Wednesday and Monday, 19 and 24 December 2018) and during the weekends (Friday and Saturday, 22 and 23 February 2019).



Figure 7-9 Aerospace photograph for AlKhalij Alarabi neighbourhood (source: maps adapted by the researcher from Esri, accessed 2019).

There was a significant difference between the number of people using communal spaces within the neighbourhood on weekdays and at weekends. The observed communal spaces were the spaces in front of main entrances, three shared gardens, enclosed public places, streets and sidewalks. As shown in Table 7-2, the highest number of users was amongst men and children in the late afternoon, while in the morning, the number of users was lower. In comparison, the observations showed no activity for women in the communal spaces within the neighbourhood, except for when walking in the street to go to the market for shopping or to visit others in their houses. The smallest number was recorded in the weekday mornings, as everyone is usually at work, and the weather would have affected engagement. From Table 7-2, it appears that men more frequently use of the communal spaces within AlKhalij Alarabi neighbourhood than women, while children use the communal spaces more frequently than men. The number of men using the communal spaces is around more than half that of the children, while the proportion of women using communal spaces is less than a quarter than that of men and around



13.5% of the number of children. This is probably because it is not culturally acceptable for women to be alone outside; thus, the low number of women using communal spaces within the neighbourhood is probably due to the customs and traditions of the conservative Iraqi society, where deems it not culturally acceptable.

Table 7-2 Number of people using the communal spaces of AlKhalij Alarabi neighbourhood.

AlKhalij Alarabi Neighbourhood					
Gender	weekdays		weekends		Total
	Morning	Late Afternoon	Morning	Late Afternoon	
Men	16	19	20	35	90
Percentage	42.9%	35.8%	50%	23.8%	32.7%
Women	7	3	4	8	22
Percentage	20%	5.7%	10%	5.4%	8%
Children	12	31	16	104	163
Percentage	34.3%	58.5%	40%	70.7%	59.3%
Total	35	53	40	147	275



Z1- Morning



Z1- Late Afternoon



Z2\_a- Morning



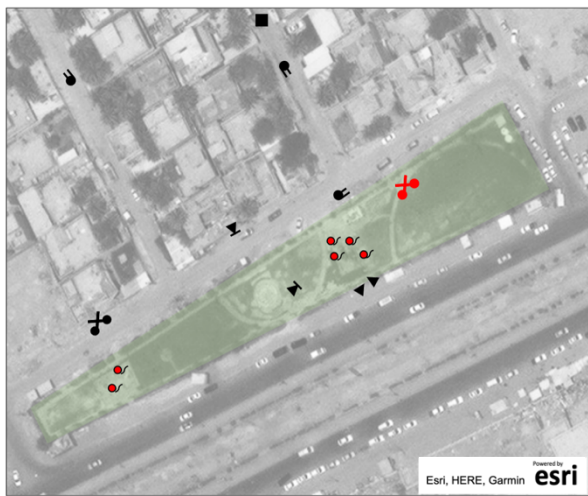
Z2\_a- Late Afternoon



Z2\_b- Morning



Z2\_b- Late Afternoon



Z3- Morning



Z3- Late Afternoon

Figure 7-10 Users' activities in AlKhalij Alarabi neighbourhood in the morning and late afternoon during the weekdays.  
(Source: maps adapted by the researcher from Esri, accessed 2019).



Z1- Morning



Z1- Late Afternoon





Z2\_a- Morning



Z2\_a- Late Afternoon



Z2\_b- Morning



Z2\_b- Late Afternoon



Z3- Morning



Z3- Late Afternoon

Figure 7-11 Users' activities in AlKhalij Alarabi neighbourhood in the morning and late afternoon during the weekend.  
(Source: maps adapted by the researcher from Esri, accessed 2019).

Figure 7-10 and Figure 7-11 represent observed activities in AlKhalij Alarabi neighbourhood during the mornings and late afternoons of the weekdays and weekends, respectively. It was found that the open communal spaces within the neighbourhood were used more in the late afternoon than the morning, most frequently by children, less often by men, and rarely used by women. The streets and sidewalks were used less frequently than the other two case studies, where children and teens, whose houses were located away from shared gardens, used these spaces. Also, it was observed that some residents were reconstructing a sidewalk adjacent to their house (see photo 16 in Figure 7-15). Moreover, some sidewalks were overtaken by residents to expand a house, or to build a shop, where it was mostly used by the elderly as a place for sitting and chatting. Moreover, the observation revealed that some residents attend the mosque in the neighbourhood. In addition to praying, the photos seven and eight in Figure 7-13 illustrate residents greeting each other after finishing Friday prayer, and some talking with the Imam of the mosque. The photographs in Figure 7-12 and Figure 7-13 represent side of residents' activities in the mornings during the weekdays and weekends respectively. The photographs shown in Figure 7-14 represent residents' activities in the late afternoon during the weekdays and weekends near the houses and local shops, streets, and shared gardens. These photos were taken by the researcher and a volunteer in one of the NGO organisations, who lives in the neighbourhood.

Moreover, all observed shared gardens within the neighbourhood were used by residents, although mainly by children and men. The photographs from 18 to 30 in Figure 7-15 and Figure 7-16 show side of residents' activities in the observed shared gardens in AlKhalij Alarabi neighbourhood (zone one, two, and three). The most frequently observed activity in the selected zones was play by children. Another group of children were observed playing football, while a small group of children were observed chasing each other within the gardens. The second most frequently observed activity in the gardens was sitting on the ground, chatting, and observing. It was noted that single individuals sat near the playgrounds on the ground, while others stood and watched the children while they played. Also, a group of three men and four teenagers were observed sitting on the ground chatting with each other, while a group of children also sat on the grass. In the large park, in zone 1, the densely planted area was rarely used, where only a few groups of two people were observed sitting on benches, meanwhile the open part was used by children who played football. It was found that fewer women were observed than men in using the areas noted, probably because, as previously mentioned, it is not culturally acceptable.





*Figure 7-12 Photographs of residents' activities near their houses, mosque, and local shops in AlKhalij Alarabi neighbourhood in the morning during the weekdays (source: photos took by the researcher).*



Figure 7-13 Photographs of residents' activities near their houses, mosque, and local shops in ALKhalij Alarabi neighbourhood in the morning during the weekends (source: photos took by the researcher).



Figure 7-14 The activities of residents in Z2 and Z3 in ALKhalij Alarabi neighbourhood. (Source: photos 11 & 12 adopted from Google: Google Earth took by Qaisa 1200. Photos 13 & 14 adopted from Google: Google Maps took by Qaisa 1200 in 2017 and Khaldoon Al Shareea in 2016, respectively.

([https://lh5.googleusercontent.com/p/AF1QipPPUcj0l5OqwyEdZxWCuNTo1LesCraaekanSHI\\_h1440](https://lh5.googleusercontent.com/p/AF1QipPPUcj0l5OqwyEdZxWCuNTo1LesCraaekanSHI_h1440),  
[https://lh5.googleusercontent.com/p/AF1QipMdWqInGod6lCNMD0Quz-NBWm2cHh6h6PCJQViU\\_h1440](https://lh5.googleusercontent.com/p/AF1QipMdWqInGod6lCNMD0Quz-NBWm2cHh6h6PCJQViU_h1440),  
<https://goo.gl/maps/SmSvTEq3FbmSXf7y6>,  
<https://goo.gl/maps/wACpuitkpDhV6nbv5>).



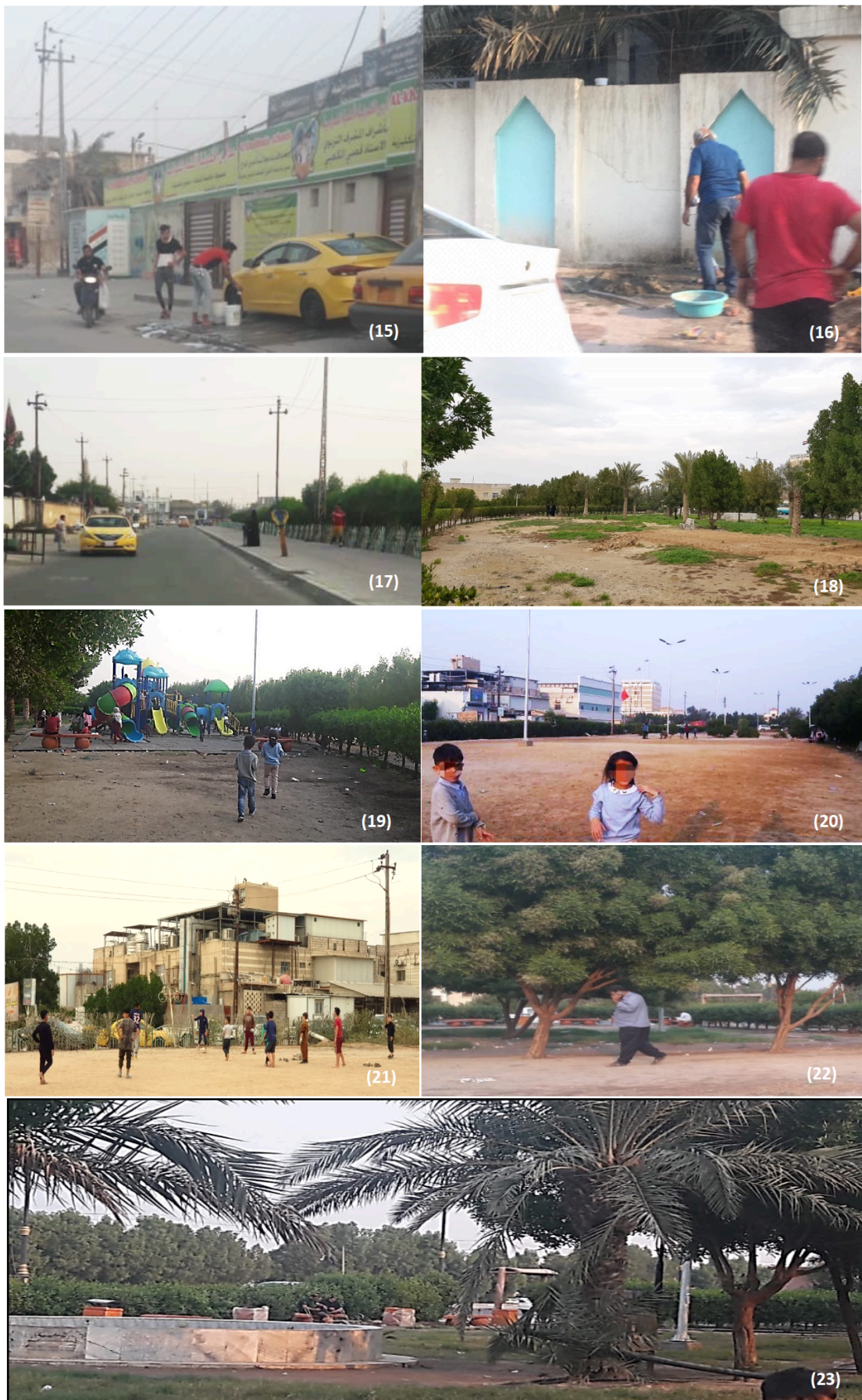


Figure 7-15 Photographs of residents' activities near their houses and in the shared garden (Z1) in AlKhalij Alarabi neighbourhood in the late afternoon during the weekends (source: photos took by the researcher).





*Figure 7-16 Photographs of users' activities in the shared gardens and playgrounds (Z2 and Z3) in AlKhalij Alarabi neighbourhood in the late afternoon during the weekends (source: photos took by the researcher).*

### 7.2.3. Case 3: AlZahraa Neighbourhood:

As can be seen from Figure 7-17, AlZahraa neighbourhood was divided into four zones, as shown, to ease the observation and to record the data in each zone within the neighbourhood. The communal spaces observed are the space in front of the main entrance of the house, sidewalks, streets, and shared gardens. Some public places were observed, such as cafes, restaurants, and local shops. Observations and behavioural mapping were conducted once during the weekdays (Wednesday, 19 December 2018) and once during the weekends (Saturday, 20 January 2019).



Figure 7-17 Aerospace photograph for AlZahraa neighbourhood (source: maps adapted by the researcher from Esri, accessed 2019).

There was a significant difference between the number of people using communal spaces within the neighbourhood on weekdays and at weekends. As shown in Table 7-3, the number of users in the late afternoon was greatest for men and children, while in the morning the number of users was generally slightly lower, except for the number of women, which was slightly higher. The smallest number was recorded in the morning, as everyone is usually at work. From Table 7-3, it appears that men more frequently use communal spaces within AlZahraa neighbourhood than women. The number of women using the communal spaces is less than half that of the men and around 15.5% of the children. The reason for this is probably due to the customs and traditions of the conservative Iraqi society, where women are not encouraged to be out without men.



Table 7-3 Number of people using communal spaces in AlZahraa neighbourhood.

AlZahraa Neighbourhood					
Gender	weekdays		weekends		Overall
	Morning	Late Afternoon	Morning	Late Afternoon	
Men	8	5	10	16	39
Percentage	29.6%	8.9%	27.8%	29.6%	22.5%
Women	5	3	5	5	18
Percentage	18.5%	5.4%	13.9%	9.3%	10.4%
Children	14	48	21	33	116
Percentage	51.9%	85.7%	58.3%	61.1%	67%
Total	27	56	36	54	173



Z1- Morning



Z1- Late Afternoon



Z2- Morning



Z2- Late Afternoon





Z3- Morning



Z3- Late Afternoon



Z4- Morning



Z4- Late Afternoon

Figure 7-18 Users' activities in AlZahraa neighbourhood in the morning and late afternoon during the weekdays. (Source: maps adapted by the researcher from Esri, accessed 2019).



Z1- Morning



Z1- Late Afternoon





Z2- Morning



Z2- Late Afternoon



Z3- Morning



Z3- Late Afternoon



Z4- Morning



Z4- Late Afternoon

Figure 7-19 Users' activities in AlZahraa neighbourhood in the morning and late afternoon during the weekends. (Source: maps adapted by the researcher from Esri, accessed 2019).

It was found that the open communal spaces within the neighbourhood were used most frequently in the late afternoon than the morning. The most frequent users were children followed by men, and finally women. Figure 7-18 and Figure 7-19 represent observed activities in AlZahraa neighbourhood during the mornings and late afternoons of the weekdays and weekends, respectively. It was observed that the internal streets and sidewalks were used most frequently in the late afternoon by children and teens (aged between four to 16 years old) during weekdays and weekends. During the weekday mornings, the main activity was passing through when a few people were observed passing through, and some teenagers were seen walking back from their schools. However, it was observed that a group of three men stood in front of their house's main entrance chatting, while a single individual was seen sitting on the sidewalk of the shared garden watching pedestrians and vendors. Also, a group of three workers was observed undertaking some construction in the area. During the late afternoon, the most frequently observed activities in the streets and sidewalks were conducted by a group of children, who were playing with a ball or chasing each other, while another group was observed sitting on the sidewalk kerbstone. For men, the same activity was conducted in the morning, namely sitting on the sidewalks or standing watching pedestrians. The activities were similar during the morning and late afternoons at the weekends, although the number of users was greater.

Regarding the shared gardens within the neighbourhood, it was noticed that children were aged between four to eight years, teens ranged between 12 to 16 years, young adults aged between 18 to 20 years, and the elderly between 50 to 60 years; these were the primary users of the spaces. In contrast to the quality of the gardens in AlJunainah neighbourhood, the quality of both the design and furniture of the shared gardens within AlZahraa neighbourhood seemed well-maintained. This could explain the higher number of children using these spaces than those in AlJunainah neighbourhood. However, there were not large numbers of users of these gardens. During the weekday mornings, there was almost no activity, except for a small group of two teenagers who were observed sitting on the bench studying, while single individuals were seen passing through. During the late afternoon at weekdays and weekends, the most frequently observed activity in the shared garden was children playing. Children in the medium groups were observed playing and chasing each other, although there were no playgrounds. The shared gardens in AlZahraa neighbourhood were used by children aged four to 16 and by adults aged 18 to 23 years. Also, in comparison with men, teens, and children, it was noted that women rarely used the streets and sidewalks of the neighbourhood for social interaction with their neighbours. The main observed activities undertaken by a single woman was throwing garbage

bags in the dumpsters, whilst a group of two women were observed going to the local shops. In terms of the social and commercial facilities within the neighbourhood, such as local shops, and cafes, the observations revealed that most users (men) from different age groups used such places for gathering and chatting in the late afternoon and evening. Figure 7-20 and Figure 7-21 show some photographs of the observations during the morning, late afternoon, and evening in AlZahraa neighbourhood.



*Figure 7-20 Photographs of users' activities in AlZahraa neighbourhood in the morning during the weekdays (source: photos took by the researcher).*





Figure 7-21 Photographs of users' activities in AlZahraa neighbourhood in the late afternoon during the weekdays (source: photos took by the researcher).

### 7.3. Observation and Behavioural Mapping: Comparison

According to the analysis of the observation survey, the number of people using the communal spaces and the intensity of activities are different between weekdays and weekends. On the observed weekdays and weekends, the largest number of people in the communal spaces was observed in the late afternoon, whilst the second largest was observed in the morning. This could be explained by the fact that late afternoon is a pleasant time of the day in December and February in Basra. During the weekdays, there was a slight difference in the number of users and observed activities in the morning within the examined neighbourhoods. Also, there was a significant difference in the number of users and observed activities in the weekday late afternoons. During the weekends, the number of users and activities in AlJunainah neighbourhood were more significant than those in the other two neighbourhoods in the morning. Also, it was found that the number of users and observed activities were greatest in the late afternoon at the weekend than in the morning. Regarding users' gender, it was found that the main users of these spaces were men and children, with very few women.

Although there were more men than women in all the case studies, in AlJunainah neighbourhood the number of observed women was more than that in the other neighbourhoods. This is possibly because the presence of relatives in this neighbourhood was higher compared to the other two neighbourhoods (as according to the results in section D.4.12 in Appendix D). Another reason could be because of the commercial surroundings of this area, making it more mixed-use compared to the other two neighbourhoods which have less mixed-use surroundings. The findings were categorised according to the intensity of the activities. In the weekday mornings, the intensity of activities was significantly low (see Table 7-4 and Table 7-5). During the weekend observations, the most frequent activity was sitting, while walking and standing were the other two main activities. These activities were carried out by all age and gender groups in the three neighbourhoods, although some were more dominant in one gender group (male) as previously explained.

*Table 7-4 Number of people using the communal spaces of AlJunainah neighbourhood.*

Activities	Weekdays	Weekends	Total
Playing	59	172	231
Gathering in close places (such as cafes, mosque, and hussainya)	45	125	170
Walking/passing through/ going somewhere	25	71	96
Standing	18	75	93
Sitting	11	51	62
Cleaning/constructing functions	12	33	45
Cycling	10	22	32

Table 7-5 Number of people using the communal spaces across the case studies during weekdays and weekends.

Activity	Weekdays			Weekends		
	AlJunainah	AlKhalij Alarabi	AlZahraa	AlJunainah	AlKhalij Alarabi	AlZahraa
1 Walking and chatting.	2	2	10	3	3	8
2 Walking in the garden talking on the phone.	-	-	1	-	-	-
3 Passing through the streets/going somewhere.	14	26	7	31	31	3
4 Standing in the street near a house and chatting with neighbours/friends.	8	-	3	10	10	6
5 Standing near a house or garden watching pedestrians.	8	1	2	2	2	3
6 Standing and waiting near a school.	6	-	-	5	5	-
7 Standing near the main door/street waiting for a car.	-	-	-	-	2	-
8 Standing near a shop and chatting.	8	4	-	2	6	5
9 Standing near a shop and watching pedestrians.	1	3	-	4	6	-
10 Standing near a mosque or hussainya and chatting/waiting.	-	4	-	-	5	1
11 Standing near playgrounds and chatting.	-	2	-	-	-	-
12 Standing near playgrounds watching the children.	-	4	-	-	-	-
13 Standing in a garden and chatting.	-	-	-	-	4	-
14 Sitting near a shop and chatting.	-	-	-	1	5	2
15 Sitting near a shop and watching pedestrians.	2	-	-	5	5	1
16 Sitting on a sidewalk adjacent to a house and chatting.	-	-	-	3	3	-
17 Sitting on a sidewalk adjacent to a house/garden and watching pedestrians.	2	1	5	2	2	2
18 Sitting on a bench in a garden and watching children.	-	1	-	-	-	-
19 Sitting on a bench in a garden and studying.	-	-	2	-	-	-
20 Sitting on a bench/rock/ground in a garden and chatting.	2	-	-	10	10	2
21 Constructing/repairing new buildings/sidewalks.	4	-	3	7	7	3
22 Fixing a car in the street near a house.	1	-	1	3	3	1
23 Cleaning/washing car in the street near a house.	2	1	1	-	4	2
24 Cleaning/washing street in front of the house.	-	2	-	3	4	1
25 Cleaning/washing the street in front of a shop.	4	-	-	2	2	-
26 Throwing garbage.	2	-	1	1	3	1
27 Working in the garden to livestock breeding watering plants.	3	-	-	3	3	-
28 Gathering in mosque or hussainya.	5	5	5	20	20	20
29 Gathering in cafes.	-	-	30	-	-	50
30 Cycling playing in the garden.	-	1	-	-	-	-
31 Cycling playing in the street.	3	1	2	3	3	2
32 Cycling playing on sidewalk.	-	-	-	-	2	-
33 Motorcycle/bicycle.	2	3	2	6	6	1
34 Playing football in the garden.	-	4	-	16	16	3
35 Playing with playgrounds.	-	13	-	-	-	-
36 Playing/hanging out in street.	-	-	16	4	8	20
37 Playing/hanging out in the shared garden.	8	10	9	4	5	7
38 Playing/hanging out on a sidewalk adjacent to a house's main entrance or a shop.	16	5	18	4	6	17
<b>Total</b>	<b>103</b>	<b>93</b>	<b>118</b>	<b>191</b>	<b>222</b>	<b>160</b>

According to the data in Table 7-4, it was found that playing was the dominant activity during the weekdays and weekends amongst children in all neighbourhoods. The dominant gender was male in AlJunainah neighbourhoods for the observed children, while both gender groups were seen in the presence of adults in AlKhalij Alarabi neighbourhood. In AlJunainah and AlZahraa neighbourhoods, children were seen using internal streets and sidewalks near their houses for cycling and playing with each other, while in AlJunainah and AlKhalij Alarabi neighbourhoods



they used the shared gardens to play football. The majority of the observed children used the playgrounds available in the shared gardens within AlKhalij Alarabi neighbourhood.

Gathering in cafes, mosques, and hussainya was the second most intense activity at specific times during the day. During the weekdays and weekends, residents tended to go to the mosque or hussainya in small groups or individually up to three to four times a day, which are the prayer times. During these times, there was an opportunity for social communication, where people sit after prayer to discuss life or personal matters with the Imam of the mosque or hussainya. In the weekday late afternoons, young adults (mostly men) aged 25 to 40 years were observed using commercial facilities within the neighbourhoods to gather. For instance, they used the local shops, malls, and cafes located within the neighbourhoods. The reason for this could be due to the weather, which is pleasant at this time of year and day. At the weekends, the number of users increased in cafes, shops and malls, especially in central mall (Basra Times Square Mall located near AlJunainah neighbourhood). Women were seen using some of these places, either in small groups that include at least one woman aged over 40 years or in the presence of men from the family; this is due to the conservative traditions of the people in Basra.

Walking or passing through the streets to go somewhere else was the third most frequently observed activity in the case studies and the dominant activity in AlJunainah in particular. Although men were the dominant group within this activity, the number of women seen walking or passing through the streets in AlJunainah was greater than in the other two neighbourhoods. People of all age and gender groups were observed either going to their work, local shops, the market, schools, or just walking. The time of walking was different in the observed case studies, where the number of people who were passing through or walking in AlJunainah neighbourhood was higher in the weekday and weekend mornings, and higher in the late afternoon in AlKhalij Alarabi neighbourhood. Generally, the number of people observed passing through or walking in the late afternoon was more than double the number at other times of the day. Women (aged 35-55 years) were observed walking in small groups in the street in the observed neighbourhoods, while a very few of them were individually walking in AlKhalij Alarabi neighbourhood. A group of women was observed walking their children back from school, while other groups and individuals were probably going for shopping or visiting neighbours within the area. Similarly, small groups of teens (comprising three or four) were seen walking and chatting after school in the streets, or near the junctions of the main roads of the case studies, while individual men were seen transiting the streets in order to either go to work or to another destination. This walking activity was sometimes associated with either chatting, if users were in a group, or with greeting others while passing by.

Standing was associated with other activities, such as chatting, watching pedestrians, eating, playing with a mobile, washing, or waiting. It was an activity carried out by all gender groups; however, men comprised the dominant group in almost all neighbourhoods. People in small groups of all age groups were observed standing adjacent to the main entrance of houses or local shops and conversing with others across the neighbourhoods. Also, single individuals were seen observing pedestrians while standing adjacent to the main entrance of a house, shared garden, or local shop. Moreover, throughout the neighbourhood groups of three to four men were seen standing near the mosque or hussainya waiting and conversing, but this mostly occurred in AlJunainah and AlKhalij Alarabi. In AlKhalij Alarabi, a few individuals and a few groups of three to four people (mostly men) were seen standing near the playgrounds that were located within shared gardens and either observing their children and teens or chatting with friends. Also, an individual was observed standing and waiting for a friend on the sidewalk of the shared garden in AlZahraa neighbourhood. In AlKhalij Alarabi neighbourhood, standing tended to be associated with users chatting with others or watching children play in the late afternoon; this mostly occurred during the weekends.

The fourth frequently observed activity was sitting, which was associated with other activities, such as watching pedestrians, eating, and chatting with neighbours or friends. Men were the dominant group, while women were absent from this activity; this could be related to the aforementioned cultural issues. Users sat on sidewalks or available benches and chairs adjacent to houses, shared gardens or local shops in order to watch pedestrians or chat with others. These activities were observed during weekdays and weekends in all neighbourhoods but were more frequent noted in AlJunainah neighbourhood. Studying was another activity associated with sitting, as observed in one of the weekdays mornings in AlZahraa neighbourhood in one of the shared gardens. In AlKhalij Alarabi neighbourhood, users sat on available benches, or on the ground of one of the shared gardens whilst watching children playing in the playgrounds or chatting with friends. The use of shared gardens for sitting and conversing with others was most frequently seen in the late afternoon during the weekends in AlKhalij Alarabi and AlJunainah neighbourhood. It was found that most benches in shared gardens in AlJunainah and AlZahraa were not used, except by a very few numbers of teens. This could be because, in addition to the lack of quality and maintenance, the choice of seating places does not match Gehl's (1987) finding, which suggests that benches that provide a good view of surrounding activities are used more than those with less or no view of others.

The observed elderly tended to sit on the sidewalk adjacent to the house; this could be because most of the available shared gardens were not appropriately designed and supplied with garden furniture that could be used by different age groups. This could also be attributed to the lack of social facilities within residential neighbourhoods for such age margins; hence, sidewalks were the nearest communal space for the elderly.

Cleaning and washing the space in front of the house or a local shop were sometimes associated activities with standing activities in all neighbourhoods. Single individuals from all gender groups were seen cleaning and washing the adjacent street to the house in the late afternoon on weekends in all the neighbourhoods. This is typical of the culture of residential areas within Iraq society in general and Basra society in particular. On weekdays and weekends and in all the neighbourhoods, the owners of local shops either in groups of two men or individually were seen washing the adjacent sidewalk and street of a local shop, while sometimes in the late afternoon they chatted with others or watched pedestrians while cleaning the place. Also, some individuals were fixing or washing their cars in the street adjacent to their houses at different times of the day.

In the three neighbourhoods, it was noted that there was an orientation towards rebuilding existing houses in addition to new commercial facilities, such as marketing centres. Also, small groups of residents were observed reconstructing damaged sidewalks adjacent to their dwellings in AlJunainah and AlKhalij Alarabi. Because the internal streets of the three neighbourhoods are directly linked with wide surrounding external streets, it was noted that people tended to add artificial speed bumps to the inner roads to calm the traffic that usually comes from the external streets, see Figure 7-22. The apparent reason is because these streets are mostly used as a play place for children and a gathering place for neighbours.



Figure 7-22 Speed bumps to the inner roads to calm the traffic that usually comes from the external streets using rope or cement, (source: photos took by the researcher).

#### 7.4. Motives and Barriers to Using Communal Spaces:

From the observations, the researcher highlighted the potential barriers and motivations for using communal spaces for social activities within the case study neighbourhoods. Before mentioning the motivations and barriers, it is important to highlight the shared circumstances that were noted in all case studies during the observations. Firstly, from observing the communal spaces available at the weekdays and weekends generally, it was found that fewer activities and users were noted in the morning and afternoon (2pm) than during late afternoon. A reason for this could be the climatic conditions of the area. Moreover, during the weekends, the number of children using the available communal spaces was higher than during weekdays. This was probably because there was no school at the weekend. The observed activities were undertaken mainly by children (males and females aged 4-10 years), teenagers (aged 11-17 years), and adults (male aged 19-25). This was seen more frequently in AlJunainah and AlKhalij Alarabi neighbourhoods than AlZahraa.

Furthermore, a decrease in the number of women was observed using the communal spaces in the neighbourhoods, compared to men, whether for passing by, shopping at local stores or greeting their neighbours when meeting on the street. However, it was found that the number of women observed using the communal spaces within AlJunainah neighbourhood was higher than in the other two neighbourhoods. Their practical activities were either walking individually or in groups of two to the local shops and market or visiting other houses in small groups. This could probably be because there are more commercial facilities available in this neighbourhood than in the other two neighbourhoods. Also, it is probably because of the high percentage of relatives who live in the same neighbourhood in AlJunainah. Most importantly, the cultural and traditional restrictions of the community could explain why women use the available communal spaces within their neighbourhoods, namely for security.

The observations revealed that, during the weekends, users tended to gather in enclosed public places more than the open communal spaces that are near the houses, such as streets, sidewalks, and shared gardens. It was noted that men gathered in enclosed public places, such as malls, cafes, ice cream shops, and restaurants, during the late afternoon at weekends. Similarly, women, although low in number compared to men, were observed using closed communal places, mainly malls for social gatherings. This could indicate a change in users' preferences and interests for new recreational amenities within or near the neighbourhoods. However, the situation was different during weekdays. From previous discussions, the motives and barriers for using communal spaces for social gatherings can be deduced; they will be discussed in the following sub-sections.

#### **7.4.1. Climatic Conditions:**

By considering the previously mentioned points, it can be seen that there are some barriers to the use of communal spaces within the three neighbourhoods; these barriers appear associated. Climatic conditions can simultaneously be considered both a barrier and motive. It can function as one of the obstacles to the use communal spaces for social activities, especially during the morning period. The weather in Basra city during the year is considered sunny, very warm, with a high humidity, yet, it is slightly better during winter and spring. Although the observations were conducted at the end of winter and the beginning of spring, which is considered a pleasant time of the year, the weather during the morning until 3:00 pm was hot and sunny. Therefore, this offers a potential reason why most residents avoid using open communal spaces as a place for social gatherings, in general, and during the morning period, in particular, especially when the design of these spaces does not consider the climatic conditions of the area. Also, during

the weekday mornings, the number of users is lower than during the late of the afternoon when people are usually at work.

In considering the climatic conditions as a motive for using some of the communal spaces within neighbourhoods, during the afternoons, it was noted that open spaces, such as shared gardens and the main entrances of houses or shops, were mostly used by males across different age groups. This usage is probably because the weather at this time of year is considered pleasant. Such spaces were used for sitting or standing and watching pedestrians or chatting, although there was a low number of users. Nevertheless, because Basra has a desert climate, people prefer to gather in enclosed public places within neighbourhoods where the temperature is acceptable and there are dedicated places for sitting, eating or shopping, such as cafes, malls, mosques, and hussainya.

#### **7.4.2. The Quality Design of the Communal Spaces and Their Physical Attributes:**

The design of communal spaces within residential areas should meet the demands posed by the region's climatic conditions. Sitting and watching pedestrians or sitting and chatting with neighbours and friends were the dominant activities observed within the surveyed neighbourhoods. These activities frequently took place in front of the main entrances of houses and local shops, and shaded areas of the streets' sidewalks. Also, they took place in specific spots within the shared gardens of the neighbourhood. Choosing unintentional communal spaces for social communication indicates a problem with the intentional communal spaces available within the neighbourhoods. In other words, the shape and design of the available intentional communal spaces within neighbourhoods do not seem to match the level of user satisfaction. Thus, the quality design of communal spaces and their physical attributes, such as providing the right garden furniture, is a motive to use communal spaces for social gathering.

From the site survey findings, it seems that open spaces did not meet the demands of the majority of users because of their poor quality of design and shape. There is an apparent deficiency in the open space design and furnishing that does not meet the required landscape components and long-term maintenance (see Figure 7-23). For instance, there is a lack of artificial lighting, fencing, seats, and planting bushes and grass. This was the situation in most of the shared gardens in AlJunainah and some of those in AlKhalij Alarabi, while AlZahraa's shared gardens were slightly better. Moreover, the available children's playgrounds in AlJunainah were worse than those in AlKhalij Alarabi, as they were broken and unmaintained. There were no children in the playgrounds in the AlZahraa's shared gardens, which explains



why the children observed were playing on the street and sidewalks. In AlZahraa, the children were observed using streets and sidewalks for playing instead of the shared gardens; this is probably because the available gardens' design did not meet children's perceptions and needs. Moreover, the climatic conditions have not been considered when designing the open spaces, as providing seats without shading in shared gardens makes them unusable in hot and sunny weather. Furthermore, the seats' locations and orientations were not considered when determining distribution to assure the privacy of both users of the gardens and people who pass nearby; instead, this process appeared random and unthoughtful.

Furthermore, there were no clear, determined entrances to the gardens. Moreover, the damage was sustained to parts of the gardens' surrounding physical fences. This could be generating feelings of unsafety and insecurity. These were the circumstances of all surveyed shared gardens in the selected neighbourhoods. Few of the available benches were used in the shared gardens, as most were broken; this was the case in AlJunainah and AlKhalij Alarabi. In AlJunainah, some of the used seats were concrete blocks that resulted from nearby construction. In AlZahraa, the benches' quality was better compared to those in the other case studies, except their orientation did not seem appropriately considered. The available seats were partially surrounded by physical boundaries, such as bushes, trees or a fence. Such physical boundaries would increase users' sense of privacy, containment, and stability, also provide shade for the benches. Hence, this would encourage the use of these spaces. A lack of soft landscapes was noted in most neighbourhoods' shared gardens, such as plants, trees, grass, and water fountains, which made these spaces unattractive and could discourage people from using them.

The concept of the public domain has changed to become represented by squares and wide linear streets exclusively. The idea of the semi-private space and the concept of everyday life have been rendered undesirable and are set to be replaced with rigid physical barriers between the private and public. The provision of in-between areas in the traditional quarters has met human social and cultural needs in a more sensitive way than contemporary methods (Bianca, 2000; Mousavi, 1998; Ramezani & Hamidi, 2010). As a natural result of modernity and its ideology, the concept of the neighbourhood as a home cannot effectively accommodate coherent relations between former neighbouring families within the 'mahalla'. At the same time, the sensitive hierarchy of the different subdivisions of spaces, where the individual can locate his/her social, cultural and behavioural values within a clear system, is broken by the concept of the strict separation. This is represented by the rigid physical boundary of the outer wall in contemporary designed residential quarters (Abdelmonem, 2011). The lack of social

and cultural considerations represents the main weakness in the architecture of the home (Hashim and Rahim, 2008), and thus, in the design of the built environment of the neighbourhood.

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*Figure 7-23 The poor-quality design of the communal spaces in the surveyed neighbourhoods (source: photos took by the researcher).*

#### 7.4.3. The Proximity of Communal Spaces

It is important to identify the most used communal spaces to highlight the motives that encourage people to use such spaces within their neighbourhoods. In AlJunainah neighbourhood, men aged 18 and above used the streets and sidewalks adjacent to the house and nearby local shops for some daily observed activities, such as sitting or standing and chatting or watching pedestrians; this occurred more frequently than in AlZahraa neighbourhood. This could be because AlZahraa has fewer commercial facilities than those in AlJunainah. Also, from the observations, it was found that fewer men use the shared gardens for the same daily observed activities in AlJunainah neighbourhood. This is probably because, as previously mentioned, the gardens' poor quality does not motivate users. However, children and teens were observed playing in some of these gardens despite the facilities' poor condition. This is probably because it is the closest communal space for such activity and is safer than the street. Some residents who were asked whether the shared gardens were used stated that some of the gardens were typically frequented for social and formal gatherings, such as a wedding, cooking on Muharram for the Martyr Imam Hussian's ceremony (Ashura ordinances), and mourning ceremonies. The latter activity also takes place on the streets when there is no nearby open space or shared garden.

The types of communal spaces used in AlZahraa neighbourhood for carrying out daily social activities were similar to those in AlJunainah, although the number of children using the available open communal spaces, was higher. In AlKhalij Alarabi neighbourhood, more people were observed using the shared gardens and enclosed public places for gathering and chatting than the streets and sidewalks. As mentioned in the previous section, the children in AlZahraa and AlJunainah neighbourhoods were observed using the adjacent streets and sidewalks for playing instead of the shared gardens. This is because of these streets and sidewalks' closeness to the housing units, and the shared gardens' poor design quality.

From the above discussions, most of the observed activities took place in adjacent communal spaces, such as streets, sidewalks, in front of the main entrances of the shops or houses, cafes, ice cream shops, fast food shops, malls, mosques and hussainya. This suggests that communal spaces' proximity to the dwellings motivates users, especially children and marginal age groups, to use these spaces.

#### **7.4.4. Cultural Considerations in The Design Process:**

From the observation, it seems that females rarely used the available communal spaces within neighbourhoods. It is believed that Iraqi society's customs and traditions are one of the important limitations that prevent women from using communal spaces within their neighbourhoods. This seems to have not been considered when developing the current schemes for residential areas. It is known that the southern part of Iraq is characterised as a tribal society ruled by customs, traditions and cultural judgments. Until recently, the design of traditional residential areas provided privacy by taking into account society's culture. For instance, the dead-end roads (cul-de-sacs) were typically used by women and children for social interactions with neighbours in addition to other daily activities. This indicates that privacy and everyday life determine the physical characteristics of built and urban fabric. Also, these have an impact on traditional settlements and the architecture of the home in contemporary Iraq (Al-Thahab et al., 2014).

Due to the changes in people's thinking and lifestyles and the development of the built environment's physical characteristics, the cultural aspect has been neglected or given less attention when designing the current schemes. The main problem regarding privacy and communal social communication emerges from paying no attention to the traditional inherited values. This is represented by increasing the social spaces' openness to the outside and making them universally accessible, while the semi-private zones are absent. It is culturally not welcome for women to be outside their houses using communal spaces for social activities unless there is an acceptable level of privacy and security present in that used space. Because of the poor design quality of the current communal spaces, women may not feel comfortable using these spaces without males from their families. This could explain why the number of women using the communal spaces is lower than that of men within the neighbourhoods.

#### **7.4.5. The Economic and Political Transformations:**

The rapid and successive economic and political changes in Iraq in the last three decades, especially after 2003, and Iraq's entry into a new transitional stage have affected people's social and cultural values and their associated psychological and behavioural traits. Moreover, the internet, technology, and social media affect people's lives and lifestyles and have simultaneously become an essential luxury and an extraneous influence on Basra's society life and culture. Although the poverty level has continued to exist in Iraqi society and Basra, the general economic and purchasing powers have been changing, especially after permitting entry



to foreign oil companies after the war in 2003. These changes can be seen by increasing the number of cars owned by each family. The internet, social media and smart devices have become essential luxuries in many families' lives. Besides, the growing demand for tourist travel flights outside Iraq. Travelling to new places has introduced Iraqi people to new cultures and customs, impacting people's lifestyles, perceptions and preferences. These facets have influenced people's desires and choices in their social lives and their communication with others. When there are no developed communal spaces that accommodate people's new lifestyles and interests, they tend to socialise and gather outside the neighbourhood in enclosed communal places. At the neighbourhood level, residents are becoming more selective of social groups, whilst their social ties outside the neighbourhood are stronger than those within (Guest & Wierzbicki, 1999b). The elimination of transitional social spaces has forced people to limit their social relations to some formal visits that frequently take place within the house's physical properties (Al-Wardi, 1965).

## **7.5. Conclusion:**

The chapter analysed the observations and behavioural mapping of three case studies. A description of where and when the observations were conducted in addition to the observation methods used were explained. The findings of each case study showed the number of users, age groups, observed activities, and most used communal spaces. The findings of the observations indicated that observed activities were mostly undertaken by one dominant gender group (male). In some of the case studies, the communal spaces were used by children and teens more than men, while women were rarely observed using these spaces. Generally, communal spaces were used more frequently in the weekday late afternoons than the morning; this is probably because of the area's climatic conditions. At the weekends, people tended to leave the neighbourhoods and used closed public places, such as malls, mosques, hussainya, local shops, and cafes.

According to the observations, the communal spaces frequently used by children were the streets and sidewalks adjacent to their houses and the shared garden. In AlJunainah and AlKhalij Alarabi neighbourhoods, and as an alternative to football playground, children were observed using open spaces in shared gardens to play football. Although the quality of the available shared gardens was better than the other two neighbourhoods, in AlZahraa, children were observed using streets and sidewalks to play. This is probably because such spaces were not designed to meet their needs. This is similar to what Gehl (2011, p. 25) stated:

*“Both in areas with single-family houses and in apartment house surroundings, children tend to play more on the streets, in parking areas, and near the entrances of dwellings than in the play areas designed for that purpose but located in backyards of single-family houses or on the sunny side of multi-story buildings, where there are neither traffic nor people to look at.”*

The chapter showed that most of the observed activities took place in adjacent streets and sidewalks, near the shops or the main entrance of houses. People were observed using streets and sidewalks to gather, sit and chat or watch pedestrians because these were the nearest spaces to users, and functioned as a replacement for the poor-quality shared gardens available. Although the shared gardens lacked basic design standards and facilities, in AlJunainah and AlKhalij Alarabi children and teens were observed using the open part of these spaces in the late afternoon to play football because these were the closest communal space for such activity, and were safer than the street. Enclosed public places, such as cafes, ice cream shops, fast food shops, malls, mosques and hussainya, were observed as frequently used by people in all neighbourhoods, especially in the late afternoon at the weekend.

The findings also illustrated that men from different age groups used enclosed places for socialising, such as standing or sitting near local shops, the mosque, and hussainya, and by gathering in cafes and restaurants that were located within the neighbourhood. Most of the elderly (men) were observed sitting in front of the main entrances of houses or sitting on the kerbstone of a shared garden sidewalk, watching pedestrians and passing vendors or socialising with neighbours. This highlighted the lack of social services and facilities for such marginal age groups. In AlKhalij Alarabi neighbourhood, the observation revealed that men from different age groups were observed gathering inside or near shared gardens to converse with friends and neighbours while watching their children play in nearby playgrounds.

This chapter also highlighted some motives and barriers to the use of communal spaces within the neighbourhood. The climatic condition is the first obstacle to the use of open communal spaces in the morning period, which is attributed to the fact that Basra city has a desert climate. The cultural considerations of Iraqi society in general and of the southern community in particular, play an essential role in restricting the use of communal spaces for socialising with neighbours by females, which is contrary to what was prevalent in the traditional urban form in Basra city. This barrier could be mostly due to insufficient design and poor-quality physical characteristics of the communal spaces provided within neighbourhoods, which could thus be considered the third barrier to the use of communal spaces. The lack of well-designed communal spaces that meet users' needs could be attributed to a disregard for the cultural aspect



of society within the new urban form of the city. Additionally, this can mean the neglect of privacy and the absence of semi-private spaces, which are fundamental elements for communication with others, especially in the examined area. The changes that have occurred to architectural privacy and the urban form of Basra could result in a lack of safety and security when using specified spaces for social interactions within neighbourhoods. This is evident in the low number of women using communal spaces for socialising with neighbours, and in the lack number of users with shared gardens in AlZahraa and AlJunainah neighbourhoods. Also, the design of communal spaces is a barrier to social gatherings when they do not meet the expectations of users. This was mainly seen in AlZahraa neighbourhood where children were observed playing on the streets and sidewalks instead of the shared gardens.

Moreover, the proximity of communal spaces to users' housing units could be a motive to use such spaces for socialising. This is evident from the use of the space in front of the main entrance of houses where most observed people either watched pedestrians (the weakest activity of social interaction), chatted with neighbours and friends, played, or fixed and washed a car. Also, male users were observed using streets and sidewalks adjacent to the houses or local stores for chatting. The closeness of the sidewalks used motivated the elderly to sit and chat with neighbours or watch pedestrians. This was because there were no other social facilities that considered the comfort of these age groups.

The rapid, successive economic and political changes in Iraq in the last three decades, especially since 2003, and Iraq's entry into a new transitional stage of social, cultural, religious and intellectual transformative conflict, have affected people's social and cultural values and the associated psychological and behavioural adherence to contemporary principles of the home environment. This transitional phase has affected people's choices and preferences when socialising and represents an important barrier to the use of available, undeveloped communal spaces within neighbourhoods. When the neighbourhood lacks new diverse communal spaces that match people's new lifestyles and needs, residents tend to gather and socialise outside the neighbourhood.

## Chapter 8 Discussion

### 8.1. Introduction:

The current research aims to determine the factors that affect social interaction amongst residents in single-family houses neighbourhoods (SFHNs) in Basra. It examines the influence of three aspects, namely social sustainability indicators (SSI), the physical characteristics of the built environment (PCBE) and users' demographic factors (DF) on the level of social interaction in the communal spaces of SFHNs. It also evaluates, from user and socio-spatial practice perspectives, the degree to which the current design of communal spaces sets an appropriate context for users' diverse activities and maintains social interaction, neighbouring, and social relationships.

This chapter synthesises the findings of the method tools utilised within the case studies in order to arrive at the influential factors on social interaction amongst residents in communal spaces within SFHNs in Basra city. Findings from the previous three chapters (5, 6 and 7) reveal how factors from the three examined aspects affect the level of social interaction, neighbouring, social networks, and social relationships among residents in communal spaces. In other words, this chapter will discuss the findings from decision-makers, user perceptions and the socio-spatial practices of residents.

### 8.2. Discussion of the Research Findings:

This study investigates the factors affect social interaction among residents in communal spaces within SFHNs in Basra. Chapters 5, 6, and 7, discussed the analysis of the tools utilised, namely semi-structured interviews, the questionnaire, and behavioural observations, respectively. The theoretical framework established in Chapter 4 is applied to investigate the impact of the three aspects (SSI, PCBE, and DF) on social interaction amongst residents in communal spaces in the three case studies in Basra.

The following sections discuss the research findings. First, the chapter reviews the discussions of the decision-makers' perceptions of the factors that affect social interaction and consideration of the SSI, PCBE and DF in experts' work procedures; these were developed from Chapter 5. After that, to identify the final affective factors, three sub-sections synthesised the findings from the experts' points of view (interviews), people's experiences (questionnaire), and the researcher's perception of residents' socio-spatial (observations and behavioural mapping), which are all compared to theory. Next, a summary of the influential factors will be represented.

Finally, the typologies of communal spaces that residents preferred for regular and/or formal social gatherings in some of Basra's surveyed neighbourhoods will be discussed. This section also exemplifies the barriers and motives to using communal spaces for social gatherings. This is accomplished by synthesising the findings of the questionnaire and observations and behavioural mapping.

### **8.3. Reflective Discussion on the Decision-Makers' Perceptions:**

The findings of the semi-structured interviews confirm that all interviewees agreed on the necessity of considering the examined factors that are clustered under the aspects: SSI, PCBE, and DF in their working processes. This is due to the impact of these factors on social interaction, their influence on each other and their role in improving the residential environments' quality of life and social sustainability. According to experts' perceptions, these aspects are applicable and measurable in the Iraqi urban context. However, the findings showed that not all the examined factors clustered under these aspects are paid attention to in the experts' work despite their importance for design, planning, development and decision-making.

The findings showed that experts have a lack of knowledge on social sustainability and the application of its indicators to the processes of designing, planning, implementing and decision-making of residential environments. This is clear from the broad negative answers of the experts on considering SSI in their work procedures. This lack can be because social sustainability is a new, complex concept that has been granted little attention in the Middle East, in general, and the Iraqi context in particular. This reason explains the poor application for the procedures (indicators) of social sustainability in the residential sector. The interviewed experts stated that they do not usually pay attention to the social sustainability aspect when considering residential developments, especially when there is a housing crisis. The findings reflect an unintended and unplanned orientation towards the notion of social sustainability, and potentially the need for more knowledge, experience and awareness.

Regarding the consideration of PCBE and DF, The interviewees' perceptions illustrated their semi-neglect of these crucial aspects. The prioritisation of speedy completion in experts' work procedures was one of the main reasons for the less attention paid to, or the neglect of, some of the characteristics and factors. The other reason was the housing crisis facing the Iraqi government. According to the interviewees, this crisis has increased the demand for housing units, which has become a high priority. Moreover, the implementation of residential scheme designs with maximum speed is considered essential. This pushes architects and urban

designers to the quick creation of designs with less attention paid to the examined indicators in those designs. Notably, the findings revealed that some attention was paid to the physical characteristics of the built environment and some of the demographic factors at the design stage by architects and urban professional in the academic field. Nonetheless, other professional fields need to focus more on these two categories due to their importance in enhancing the built environment and residents' social lives.

## 8.4. Social Sustainability Indicators (SSI):

### 8.4.1. Social Sustainability Indicators Affecting Social Interaction:

This section discusses the SSI that affect social interaction amongst residents in communal spaces of SFHNs. It combines the semi-structured interviews and questionnaire's results and confirms them, where possible, with the residents' socio-spatial practices. Table 8-1 and Table 8-2 show the influential factors on residents' social interaction according to the experts and residents' perceptions. Figure 8-1 illustrates the total agreement and disagreement amongst experts for each social sustainability indicator. In the semi-structured interviews, experts were asked to indicate to what extent they agree with the SSI's influence on social interaction. The experts confirmed the impact of the examined SSI on social interaction, their influence on each other and their role in improving the quality of life and social sustainability of residential environments in the Iraqi context.

*Table 8-1 The counts and average scores of the second question of the semi-structured interviews regarding the social sustainability indicators.*

Indicators	Total Agreement	Total Disagreement	The average of scores (scores/17)
Sense of community	16	1	4.6
Safety & security	16	1	4.5
Attachment to place/Sense of pride	13	4	4.1
Privacy	13	4	4.0
Resident satisfaction	12	5	4.0
Density	11	6	3.9

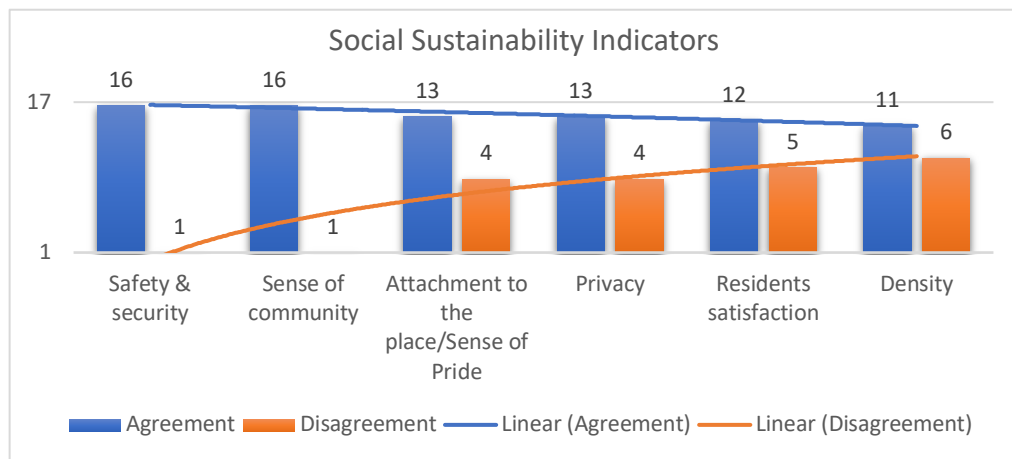


Figure 8-1 The counts of agreement and disagreement of the social sustainability indicators.

Table 8-2 The social sustainability indicators that affect social interaction amongst residents overall and across the case studies.

Indicators	Overall		AlJunainah		AlKhalij Alarabi		AlZahraa	
	B	Sig.	B	Sig.	B	Sig.	B	Sig.
The number of families living in the house.	<b>0.221</b>	<b>.020</b>	0.257	.066	0.080	.247	-0.047	.914
The number of people living in the house	0.005	.832	-0.035	.327	<b>0.053</b>	<b>.003</b>	0.039	.716
Safety and security	0.138	.079	<b>0.247</b>	<b>.015</b>	0.028	.683	0.393	.247
Attachment to place	<b>-0.210</b>	<b>.017</b>	-0.167	.159	-0.112	.102	-0.454	.195
Sense of community	<b>0.564</b>	<b>.000</b>	<b>0.565</b>	<b>.012</b>	<b>0.436</b>	<b>.000</b>	<b>1.139</b>	<b>.006</b>
Resident satisfaction	-0.135	.180	0.014	.913	0.082	.293	-0.458	.359
Privacy	<b>-0.251</b>	<b>.028</b>	-0.192	.276	<b>-0.205</b>	<b>.022</b>	-0.310	.396

Dependent Variable: Mean of Social Interaction

The effective factors are those with Sig.  $p$ -value < .05.

- **Sense of Community and Social Interaction:**

According to the experts' perceptions, the sense of community was the most influential on social interaction among the examined SSI. As shown in Table 8-1, it scored an average of 4.6, and 16 out of 17 interviewed experts agreed on its influence on social interaction. This is similar to the results of the questionnaire analysis. Table 8-2 shows that the sense of community significantly related to the level of social interaction among residents, as it obtained a higher coefficient of  $B = 0.564$  and  $p = .000$ . Also, it was the most effective indicator on social interaction across the three case studies, as it obtained a higher coefficient, as shown in Table 8-2. The mean value of the level of sense of community in the surveyed neighbourhoods was 2.25, which equated to 2 after rounding to the nearest integer. This was categorised as 'neither agree nor disagree' on the Likert scale, indicating that the level of sense of community amongst residents was neutral, which was similar across the three case studies (i.e., AlJunainah 2.45, AlKhalij Alarabi 2.28, and AlZahraa 1.75 - see Table 6-7 in section 6.6 in Chapter 6).

The sense of community is more subjective than an objective indicator; therefore, its measurement via behavioural observations proved challenging. However, one of the sub-variables under this indicator, ‘participation in community affairs, social activities, and civic responsibility’ could be seen in daily life activities. The researcher observed some activities, such as gathering for chatting, washing or cleaning streets in front of the house or local shops, although these were low-frequency, and males tended to undertake these activities rather than females. At the same time, a higher number of users of communal spaces occurred amongst children who were observed playing in groups or individually in some of the shared neighbourhood gardens, streets, and sidewalks, although these spaces lacked good quality design.

Notably, the findings show that the relationship between the sense of community and the level of social interaction amongst residents is positive. The interviewed experts confirmed this relationship and indicated that, as the sense of community increased, social interaction among residents also increased. Also, it was supported by the questionnaire analysis, as the B values’ indicator sign is positive, which suggests a positive relationship with the level of social interaction. The impact of the sense of community on social interaction in this study corresponds with the arguments in earlier studies that highlighted the importance of the sense of community in forming and enhancing social interaction (Holland et al., 2007). In comparison, others (Duany & Plater-Zyberk, 1992) indicate that losing a sense of community is a modern social problem. Yet, no studies examine the impact of the sense of community on social interaction amongst residents in communal spaces.

- **Safety and Security and Social Interaction:**

The second influential indicator, according to the results of the semi-structured interviews, is safety and security. This has an average of score of 4.5, and 16 out of 17 experts interviewed agreed on the impact of this indicator on social interaction, as shown in Table 8-1. In terms of the questionnaire results, the level of social interaction did not seem to be influenced by the safety and security indicator, as shown in Table 8-2. However, it was statistically significant in AlJunainah neighbourhood ( $p=.018$ ). The mean value of safety and security in the surveyed neighbourhoods was 2.73, which is categorised as ‘agree’ on the Likert scale after rounding to the nearest integer and equates to 3. This indicates that the level of safety and security is good in the case studies. This was similar in AlJunainah and AlKhalij Alarabi (i.e., 2.51 and 3.02, respectively), where the level of safety and security was higher in the latter neighbourhood. In comparison, it was neutral in AlZahraa at 2.49 (see Table 6-7).



The findings of the behavioural observations confirm the impact of safety and security on residents' social interaction in communal spaces. The reduction in the use of open communal spaces within neighbourhoods by adults from both genders can be attributed to a lack safe conditions, such as the provision of physical boundaries (fences) surrounding the open communal spaces, the existence of defined entrances to these spaces, and reduced direct links between streets.

To conclude, the relationship between the safety and security of the built environment and social interaction is positive. This relationship was evident in the semi-structured interviews and the questionnaire analysis. The experts interviewed indicated that, as the level of safety and security of the built environment, including the neighbourhood and its communal spaces increases perceivably and/or physically, social interaction among residents also increases. Also, the questionnaire analysis confirmed that the B values' indicator sign is positive, indicating a positive relationship with the level of social interaction.

Within a neighbourhood, safety is a basic requirement that needs to be achieved before any other elements of social sustainability can be considered (Barton et al., 2003; Vallance et al., 2011). The results of the current study concerning the influence of the safety and security of the built environment on social interaction support the results of Francis et al. (2012) and Reid (2015). Moreover, it is clear that no community in which residents feel unsafe is socially sustainable (HACT, 2015).

- **Attachment to the Place and Social Interaction:**

According to the results of the semi-structured interviews, the indicator of attachment to the place was ranked third regarding its influence on social interaction among residents in communal spaces within SFHNs in Basra. According to the data in Table 8-1, the indicator 'attachment to place' obtained an average score of 4.1, with a total agreement count of 13 amongst the 17 experts interviewed. The experts interviewed indicated that there could be a reverse relationship between the level of people's attachment to their place and their social interactions, as communication with others is an individual tendency and desire, even if there is attachment to place.

This was confirmed by the results of the questionnaire analysis represented in Table 8-2, where the indicator of attachment to place significantly related to the level of social interaction among residents. This indicator has a negative relationship with social interaction, indicating that as the level of place attachment decreases, social interaction increases. However, this indicator's

impact on social interaction amongst residents was not seen across the surveyed neighbourhoods. According to the data in Table 6-7, the overall mean value of the attachment to the place was 2.81, which is close to the category 'Agree' on the Likert scale after rounding it to the nearest integer (i.e., 3). This indicates that people have an attachment to their built environment. This is seen in AlJunainah and AlKhalij Alarabi neighbourhoods (i.e., the mean values are 2.83 and 2.94, respectively). However, in AlZahraa neighbourhood, the residents expressed a neutral level of attachment to where they live, as the mean value after rounding to the nearest integer is 2, which is categorised as 'neither agree nor disagree' on the Likert scale. This may create the relationship with social interaction.

This kind of negative relationship could be explained by perceptions of the built environment amongst respondents of the examined neighbourhoods, or it could be understood that social interaction is an individual decision. It is claimed that pride/sense of place can be affected by a place's perceived quality (Talen, 1999). Consequently, this feeling closely relates to the built environment. For example, if a place has high litter and vandalism levels, suggesting it is not looked after, this is likely to affect inhabitants' sense of attachment to the location (Nash & Christie, 2003). This could then have adverse effects on feelings of safety, which might, in turn, decrease levels of social interaction and community participation. This could lead to another reason: the lack of attachment and a sense of community to encourage social interaction amongst residents. While it is acknowledged that residents' sense of place attachment relates to the physical environment in which they live, the socio-spatial interpretation of neighbourhood and community adopted in this research also acknowledges the attachment that residents have to the people living there. This is often described as a 'sense of community' and relates not only to other residents, but also to the social order, common norms and, to a lesser extent, the civic culture of a neighbourhood (Kearns & Forrest, 2000).

The negative relationship between the attachment to place and social interaction is not reflected in earlier studies (Ahlbrandt, 1984; Dempsey, 2006; Unger & Wandersman, 1982). Dempsey (2006) claimed that without social interaction, people living in a given area can only be described as a group of individuals living separate lives, with little sense of community or sense of pride or place attachment to indicate a positive relationship.

Moreover, the result of the current study contrasts with the conclusion of Henning and Lieberg's (1996) study of a Swedish residential development that implies a positive relationship between social interaction and the sense of attachment to place, where even very weak forms of social interaction, such as visual contact and greetings, can generate a 'feeling of home' and 'security'

among residents. Furthermore, attachment and a sense of community relate positively to social interaction among neighbours (Ahlbrandt, 1984; Unger & Wandersman, 1982). As a result, the outcome of the negative impact of attachment to a place on social interaction amongst residents in communal spaces within Basra's neighbourhoods could be exclusive to the current study's situation.

- **Privacy and Social Interaction:**

According to the decision-makers' perceptions, privacy was ranked fourth most effective for its impact on the level of social interaction amongst residents in communal spaces within SFHNs in Basra. According to the data in Table 8-1, the average score for privacy was 4.0, and 13 out of 17 experts interviewed agreed on its impact on social interaction. The questionnaire analysis supports the influence of privacy on social interaction; however, it was ranked second after the sense of community when considering its impact on social interaction. The results in Table 8-2 show a negative relationship, indicating that as the level of privacy decreases, the level of interaction among residents increases. This was seen in the AlKhalij Alarabi case study.

According to the experts' arguments, privacy could positively and negatively impact on social interaction depending on the nature of privacy examined. They categorised privacy into two types: personal/individual and the privacy of the place/space. These are similar to three of the four states of privacy proposed by Westin (1970), namely solitude, intimacy, and reserve. Solitude is the state of being alone and unobserved; intimacy is the establishment of intimate relations with fellow members in various small social units; anonymity is the potential to remain unrecognized in public places; the reserve is the ability to protect personal information and to maintain psychological barriers.

In terms of personal/individual privacy, the experts interviewed indicated that there could be a reverse relationship between people's social interactions with others and their personal/individual privacy or tendency. This is because some individuals tend to social isolation or social withdrawal from places that are crowded with people, which could be attributed to their personal desires, psychological behaviours, and their individual characteristics, some of which may be measurable (age, occupation, household type) while some may not. This supports the argument of Westin (1970) who claimed that privacy is perceived as the withdrawal of the individual from society through the use of physical and behavioural boundaries. Some experts interviewed (AG and HS) stated that decreased social interaction amongst residents could be explained by the individuals' tendencies, for example a preference for not leaving a personal comfort zone, which could be understood according to

their cultural backgrounds and psychological behaviours. Consequently, individuals tend to reduce their social interactions with others, even if communal spaces suit their privacy. However, striving for a degree of privacy does not mean the desire to achieve social isolation but rather is a communicative mechanism and guide for human social behaviour and shows, at the same time, the socio-physical boundary that isolates two different spaces (Georgiou, 2006). This could explain the negative relationship shown in the analysis of the questionnaire. Accordingly, privacy has to be conceptualised according to its relation to the different meanings of private and public realms, which have been considered in this research.

The privacy of a place/space is the sphere that is designed according to both genders and across different age groups, and it accounts for cultural and traditional backgrounds. For example, the design of a neighbourhood garden within an SFHN that considers the privacy of both genders from different age groups in a conservative society such as Basra city. The experts highlighted that designing communal spaces by considering the privacy of the function and its users regarding their cultural and traditional requirements can play an essential role in encouraging the use of these spaces for social interaction, especially for women. Thus, this kind of privacy of place also somehow relates to personal tendencies. The observation and site survey revealed the lack of considering the privacy aspect in the communal spaces' current built environment. The findings regarding the impact of privacy on social interaction among residents support the arguments and discussions of earlier studies (Abdelmonem, 2010; Abu-Ghazze, 1993; Ahmed, 2012; Al-Thahab et al., 2014, and Ramezani & Hamidi, 2010), which highlighted privacy as an important factor in a residential environment. This is widely examined in the analysis of the architecture of home and the organisation of social spaces in Arab countries, such as Saudi Arabia, UAE, Egypt, Iran and Iraq, due to their social and cultural values. In terms of both social and cultural aspects, privacy is a significant matter for the spatial formation and manifestation of the built environment in Iraq (Al-Thahab et al., 2014). They concluded that privacy plays an important role for communities in enhancing and adapting community social interactions thus strengthening the ability of a space to achieve a more sustainable and secure housing environment. In other words, privacy helps to improve the interrelationship of spaces within a living unit or between the unit and the external context (Stewart, 2001).

- **Resident Satisfaction with the Built Environment and Social Interaction:**

Resident satisfaction with the built environment was also ranked as the fourth significant indicator on the level of social interaction amongst residents in communal spaces within SFHNs in Basra, according to the experts' perceptions. As shown in Table 8-1, the indicator obtained an average score of 4.0, and 12 out of 17 experts interviewed agreed on the influence of this

indicator on social interaction. Resident satisfaction is an essential, necessary step to form cumulative and overlapping relationships between users and the built environment, which, in turn, affect the sense of community, attachment to place, and subsequently, social interaction. This was approved by the agreement amongst the experts interviewed, who offered reasons to explain the influence of this indicator. First, satisfaction with the built environment is considered a catalyst for the use of communal spaces, as it improves the sense of community and attachment to place, which, in turn, encourages gatherings and meetings, and increases the number of users of communal spaces. Second, the physical characteristics of the residential environment play an essential role in influencing the social and psychological lives of individuals, which can strengthen or weaken their bonds of social relations. Therefore, some experts interviewed reflected the positive relationship between social interaction and residents' satisfaction with the built environment.

However, this impact has not been confirmed by the questionnaire analysis. Resident satisfaction with the built environment - both overall and across the case studies - did not significantly relate to the level of social interaction among residents, as shown in Table 8-2. The total mean value of the level of residents' satisfaction with the design of built environment was 2.56 (see Table 6-7), which equates to 3. This indicated that respondents were satisfied with the design of the built environment and its physical characteristics, as the mean value was classed as 'Agree' on the Likert scale. Similarly, resident satisfaction with AlJunainah neighbourhood was calculated at the same level, which equated to 3 after rounding its mean value (2.72) to the nearest integer. However, in AlZahraa and AlKhalij Alarabi, the level of satisfaction with the built environment was neutral, as residents were neither satisfied nor dissatisfied (the mean values were 2.47 and 2.46, respectively, which were classed as "neither agree nor disagree" on the Likert scale). This measurement considered residents' satisfaction with the diversity of communal spaces within the neighbourhood, their total area, and the design and supply of soft and hard landscapes, such as plants, trees, fountains, shaded seats, fences, pedestrians' routes, and playgrounds. The measurement of this indicator also included satisfaction with the layout of dwelling units and the location of public services within the neighbourhood; the design of the internal neighbourhood's streets, involving their width, presence of sidewalks with a suitable width, and streets' design and their direct connection to the main streets outside the neighbourhood.

The experts pointed out that resident satisfaction with the built environment is a subjective judgment based on people's perceptions and opinions, which means it is intangible. This aligns with a previous study (Chan, 1999) that highlighted the importance of achieving satisfaction by

considering privacy within space's physical conditions. However, some experts indicated that people would integrate socially, even if they are dissatisfied with the surrounding built environment. The observations showed that a range of residents was dissatisfied with some characteristics of the built environment. For example, in all of the surveyed case studies, artificial bumps were placed on the internal streets directly linked to the main road to reduce possible car accidents. Nevertheless, the streets and neighbourhood gardens of the Aljunainah neighbourhood were used by children to play, despite dissatisfaction with the built environment.

The experts highlighted the indirect impact of satisfaction with the built environment on social interaction, which is improved by the presence of other factors, such as providing open spaces, and considering privacy and cultural concerns. This echoes the results of a previous study (Kennedy & Buys, 2015), which showed that *spaciousness* for diverse activities, *privacy* and *climate responsive design* could enhance resident satisfaction with the built environment and the contribution of collective open spaces to apartment liveability. Furthermore, many studies have consistently revealed that satisfaction with a neighbourhood's-built environment is positively affected by the presence of common areas or a public realm, such as open spaces at various levels of the neighbourhood, which, in return, influence interactions within a community. Karuppannan and Sivam (2011) showed that the presence of the precinct level open space can strengthen satisfaction with the neighbourhood as well as enhance the well-being of residents. Moreover, the outcomes of their study confirmed that the presence of open spaces in a residential neighbourhood relates to better relationships among neighbours, reduced violence, and raised overall satisfaction with one's home.

- **Density and Social Interaction:**

According to the interview results, density is the last indicator to affect social interaction amongst residents in communal spaces within SFHNs in Basra. It had an average score of 3.9, and 11 out of experts agreed on its influence on social interaction (see Table 8-1). The experts divided the impact of density on social interaction into two parts. One of the estimations from the interviewed experts (architects) confirmed the influence of density on social interaction. They recommended a new strategy to address the increasing population in the city centre, namely adopting multi-rise residential buildings but stipulated they should not negatively affect the social aspect. Another opinion offered by the interviewees claimed that the impact of density leads to population affinity, which leads to increased opportunities for social meetings. In other words, social interaction increases in high-density areas, which is similar to the arguments in earlier literature that indicated higher densities could make access to services and facilities both



easier and more economically viable (Burton, 2000b; Collie, 1990; Haughton et al., 2003; ODP, 2003), although this may vary between services and when considering other issues (e.g. job access) (Burton, 2000a, 2000b). Higher densities may also mean that people are more likely to meet each other on the street than in lower-density areas (Talen, 1999).

However, experts also highlighted an alternative argument that greater density means less social interaction, as it can cause social withdrawal. This is similar to the argument discussed by other researchers (Bridge, 2002; Freeman, 2001; Simmel, 1995; Wirth, 1938) who claimed that physical and social withdrawal might occur in a higher density community; people may withdraw from social contact and experience stress. Some of the experts argued that following a standard regarding density is important when designing a neighbourhood, indicating that medium-dense residential areas are preferable because highly-dense areas could cause social withdrawal, while low-dense areas could give a sense of alienation, which might affect social interaction among residents.

In terms of the results of the questionnaire, density was represented by the number of both families and people living in the house. According to Table 8-2, the data showed that the number of families living in the house and the number of people living in the house in AlKhalij Alarabi neighbourhood significantly related to the level of social interaction amongst residents. The surveyed sample showed diversity in the number of families living in their houses; a higher rate was noted for houses with one family, followed by houses of two, three, four, and five families, sequentially. A similar pattern was found in AlKhalij Alarabi, while in AlZahraa, the highest rate was for one family houses followed sequentially by three, two, and four families. In comparison, in AlJunainah, the highest rate was for two families houses, followed by one, three, four, and five families, sequentially. Because of the positive sign of the B values for these two factors, their relationships with social interaction are positive, indicating that when the number of both families and people living in the house increases, social interaction also increases.

The observations and behavioural mapping revealed that communal spaces were used more by males from different age groups than females. The findings showed that the number of users varied according to the type of communal space/place. For example, open communal spaces, such as street, spaces in front of the main entrance of houses, and the neighbourhood's gardens were observed used by a high number of males, while it can be seen a noticeable females' users in malls. It was also found that users' density in any communal space/place impacts the dominant gender using that space/place for social interaction. For example, in AlJunainah

neighbourhood, the high number of males observed using a shared neighbourhood garden (if we compare it with the number of female users in the same communal space) could be a reason for females' physical and social withdrawal from such spaces. This is probably because of the region's cultural and traditional restrictions that do not welcome women's presence with unknown men in one place together.

Moreover, communal spaces/places of high-density did not affect social interaction amongst residents; on the contrary, these spaces/places were used for informal social gatherings. For example, children's playgrounds in AlKhalij Alarabi were used frequently and by a high number of children and males. Similarly, the spaces in front of the local shops were used by a noticeable number of adult males in the late afternoon in the three case studies. It was also observed that females used malls, markets, and some local shops for meeting and chatting for a limited time as these places offer a kind of privacy.

Thus, the study confirms that the density indicator influences social sustainability and social interaction among residents in communal spaces within SFHNs in Basra. This reflects previous studies' results (Bramley & Power, 2009; Dave, 2011; Karuppannan & Sivam, 2011). However, according to the questionnaire results, the positive relationship between social interaction and density does not support the outcome of a previous study by Dempsey (2006), who established that density is negatively associated with social interaction and perceptions of trust. Nevertheless, Dempsey's study (2006) could support the findings of the current study regarding females' physical and social withdrawal, where users' density negatively affects the gender who uses communal spaces for social interaction.

The following section will discuss the SSIs that affect the social indices, Neighbouring Index (N-Index), Social Relationship Index (SR-Index), and Social Networks Index (SN-Index).

#### **8.4.2. Social Sustainability Indicators Affecting the Social Indices:**

The following section discusses the SSI that affect the social indices, the N-Index, SN-Index, and SR-Index. Table 8-3 combines the results of three tables showing the B values and *p*-values (significances) of each of social sustainability indicator within the three social indices. However, earlier studies whose findings and results have been compared with the results of the current study did not consider communal spaces in their investigations. However, they are close enough to depend on for a comparison of results, as they have examined similar factors to those considered in the present study.

Table 8-3 The social sustainability indicators affecting the social indices, Neighbouring Index (N-Index), Social Networks Index (SN-Index), and Social Relationship Index (SR-Index), overall and across the case studies.

Parameter		Neighbouring		Social Networks		Social Relationships	
		B	Sig.	B	Sig.	B	Sig.
Overall	The number of families living in the house.	<b>0.049</b>	<b>.000</b>	0.138	.056	-0.013	.511
	The number of people living in the house	<b>-0.008</b>	<b>.014</b>	0.022	.244	-0.003	.526
	Safety and security	-0.004	.663	<b>0.145</b>	<b>.015</b>	-0.018	.289
	Attachment to place	-0.012	.281	<b>-0.185</b>	<b>.006</b>	0.029	.118
	Sense of community	<b>0.073</b>	<b>.000</b>	<b>0.402</b>	<b>.000</b>	-0.007	.829
	Resident satisfaction	<b>-0.034</b>	<b>.007</b>	0.004	.955	-0.025	.258
	Privacy	-0.010	.478	<b>-0.199</b>	<b>.023</b>	0.016	.516
AlJunainah	The number of families living in the house.	<b>0.043</b>	<b>.005</b>	0.195	.120	0.002	.956
	The number of people living in the house	<b>-0.011</b>	<b>.004</b>	-0.013	.690	-0.013	.079
	Safety and security	0.006	.557	<b>0.260</b>	<b>.004</b>	-0.047	<b>.028</b>
	Attachment to place	-0.005	.705	-0.173	.106	0.013	.604
	Sense of community	<b>0.100</b>	<b>.000</b>	0.382	.060	0.005	.909
	Resident satisfaction	-0.004	.799	0.064	.585	-0.013	.653
	Privacy	-0.017	.366	-0.162	.309	0.042	.266
AlKhalij	The number of families living in the house.	0.002	.703	0.083	.293	-0.006	.845
	The number of people living in the house	0.002	.098	<b>0.056</b>	<b>.006</b>	0.001	.919
	Safety and security	<b>-0.017</b>	<b>.001</b>	0.042	.579	0.006	.847
	Attachment to place	-0.001	.915	-0.134	.087	0.052	.087
	Sense of community	<b>0.075</b>	<b>.000</b>	<b>0.346</b>	<b>.009</b>	-0.034	.501
	Resident satisfaction	0.000	.948	0.108	.223	-0.072	<b>.034</b>
	Privacy	-0.007	.282	<b>-0.210</b>	<b>.039</b>	0.007	.867
AlZahraa	The number of families living in the house.	<b>0.073</b>	<b>.002</b>	-0.018	.948	-0.003	.970
	The number of people living in the house	<b>-0.015</b>	<b>.009</b>	0.029	.673	0.001	.963
	Safety and security	<b>0.063</b>	<b>.000</b>	0.260	.234	0.032	.580
	Attachment to place	<b>-0.057</b>	<b>.002</b>	-0.285	.207	0.001	.986
	Sense of community	<b>0.184</b>	<b>.000</b>	<b>0.557</b>	<b>.038</b>	0.010	.882
	Resident satisfaction	-0.001	.965	-0.269	.401	0.077	.384
	Privacy	0.013	.510	-0.190	.418	0.010	.865

Dependent Variable: Social interaction, Neighbouring, Social Networks, Social Relationships  
The effective factors are those with Sig. *p*-value <.05.

- **N-Index:**

In terms of the *N-Index*, the results obtained from the GLM test in section 6.10.2 in Chapter 6 established that the sense of community, the number of both families and people living in the house, and resident satisfaction significantly related to the level of neighbouring acts among residents in the examined case studies. The sense of community is considered the most effective indicator on the neighbouring level both overall and across each of the three case studies. This was followed by the number of families living in the house, resident satisfaction with the built environment, and the number of people living in the house, as confirmed by the descending order of B values. The breakdown across the surveyed neighbourhoods shows that most of the aforementioned indicators, excepting resident satisfaction with the built environment, significantly related to the level of neighbouring acts among AlJunainah's residents. In AlKhalij Alarabi, the safety and security of the neighbourhood and its communal spaces affected the N-Index alongside the sense of community. The breakdown across the surveyed neighbourhoods also reveals additional indicators affecting the level of neighbouring acts among residents in communal spaces within SFHNs. The results confirm that attachment to place, the sense of

community, the number of families, the total people living in the house, and safety and security significantly related to the level of neighbouring acts among residents in communal spaces within AlZahraa neighbourhood.

The results also suggest that there are negative relationships between the neighbouring acts amongst residents and three indicators in the case studies. They are: the number of people living in the house in both AlJunainah and AlZahraa; attachment to the place in AlZahraa, and safety and security in AlKhalij Alarabi (although it was positive in AlZahraa). This indicates that the level of neighbouring among residents in these areas increases when the number of people living in the house, the level of safety and security, or the attachment to place decreases.

Although safety and security in AlKhalij Alarabi was higher than the other two case studies (mean value =3.02), it had a negative relationship with the level of neighbouring acts amongst residents. This could be explained by the rationale offered by Buonfino and Hilder (2006, p. 35) that, *“feeling unsafe can have two effects in a neighbourhood: it can unite people (e.g. to fight crime collectively) or it can intensify the feeling of mistrust”*. The first phase *“it can unite people (e.g., to fight crime collectively)”* could explain the negative relationship between neighbouring acts amongst residents and the safety and security indicator in the area. Also, although residents agreed on the level of safety and security of the built environment in AlKhalij Alarabi, which was higher than the other two neighbourhoods, there may be mistrust between residents. Therefore, they may tend either to secure themselves by communicating with others and/or interacting to fight crime collectively. In other words, the intention to undertake neighbouring acts with others could be related to the perceived feeling of safety and security amongst participants themselves, which was different from the level of safety of the built environment. The rest of the results within this section reflect those of previous studies by Buonfino and Hilder (2006) and Unger and Wandersman (1985) which discussed neighbourliness in contemporary Britain and identified important factors affecting neighbourliness, and an expanded review of the concept of neighbouring.

In AlZahraa neighbourhood, the level of attachment to place for respondents was 2.44 (see Table 6-7), which means that it is considered neutral or near to no attachment to their lived place. This could explain the negative relationship with the level of neighbouring in the area. The negative relationship between the level of neighbouring and the decrease in the number of people living in a house could be proof of the global argument of the phenomenon of social withdrawal within high-dense areas.

- **SN-Index:**

Regarding the *SN-Index*, the results in section 6.11.2 indicate that the sense of community, privacy, attachment to place, and safety and security significantly related to the quantity of social networks amongst the surveyed residents (see Table 8-3). Across the surveyed neighbourhoods, it was found that the quantity of social networks amongst residents was significantly influenced by safety and security within AlJunainah neighbourhood and its communal spaces; the number of people living in the house, the sense of community, and privacy in AlKhalij Alarabi, and the sense of community in AlZahraa. Most of these indicators (except attachment to place and privacy) have a positive relationship with the SN-Index. This indicates that, as the level of safety and security, sense of community, and the number of families and people living in a house increases, the quantity of social networks amongst residents also increases. However, attachment to place and privacy have a negative relationship with the level of social networks amongst respondents. This indicates that, as the level of personal privacy and attachment to place decreases, the quantity of residents' social networks increases.

In terms of privacy, this may indicate that people can build wide social networks within the neighbourhood when they reduce the required level of privacy in the communal spaces used. For attachment to the place, although residents have a low attachment to the place where they live, they may tend to have social networks within the neighbourhood to overcome their relationship with the built environment. Also, even if people have an attachment to place, they have social networks outside their neighbourhood. This does not align with the results of a previous study by Mesch and Manor (1998) that investigated the determinants of place attachment and claimed that the level of social networks increased when people had an attachment to their place.

- **SR-Index:**

Finally, the results in section 6.12.2 concerning the *SR-Index* showed that none of the SSI significantly (statistically) affected the level of social relationships amongst residents in communal spaces within SFHNs in Basra. However, according to the data breakdown across the case studies in Table 8-3, social relationships were influenced by safety and security in AlJunainah neighbourhood, and resident satisfaction in AlKhalij Alarabi ( $p$ -value  $< .05$ ). These results echoed those of Buonfino and Hilder (2006) regarding the impact of these two indicators on the formation of social interactions amongst residents, and in turn, on building social relationships between them. Moreover, the numbers of families and people living in the house

(which represent the density in this study) did not affect the social ties among residents. This supports the results of a previous study by Freeman (2001) that investigated the notion of sprawl, in the form of low-density, auto-dependent neighbourhoods, which is inimical to neighbourhood social bonds.

The relationships between the SR\_Index and both safety and security and resident satisfaction with the built environment are negative, indicating that, when the level of safety and security, and resident satisfaction with the built environment decreases, strong social relationships increase. The negative relationship between social ties and resident satisfaction with the built environment contradicts the suggestion by Buonfino and Hilder (2006). However, the negative relationship between the social relationships amongst residents, and safety and security could be interpreted according to the findings of Buonfino and Hilder (2006, p. 35) who stated that feeling unsafe can have two effects, one of which is the to unite people *“to fight crime collectively”*. They also indicated that more reliable connections with neighbours, in addition to collective action and social capital, could help people feel that they have someone to rely on in case of a crisis or to work to improve the local area. Moreover, neighbourhood problems themselves may drive people into action on a common concern and create the basis to establish ties. However, the negative relationship with safety and security contradicts the results of Kuo et al. (1998) who suggested that the formation of neighbourhood social ties may significantly depend on informal social contact, which occurs in common neighbourhood spaces. They indicated that vegetation and neighbourhood social ties significantly related to residents' sense of safety and adjustment (Kuo et al., 1998, p. 823).

Neighbourhoods may be losing some of the importance they once had because of technology, communication, transportation, and lifestyles, which have advanced and made the city "smaller" (Wellman, 1979). Many of the relationships between people, and many of the activities people engage in can and do take place outside a person's neighbourhood. Also, relatives, friends, work settings, and associations are often located outside the neighbourhood (Unger & Wandersman, 1985). Moreover, after these changes in lifestyle, people seem to have new orientations in their preferences, and in return, their social lives.

*“There may be a shift from a neighbouring of place to neighbouring of taste” (Keller, 1968, p. 61). More typical of the realities of this century are those individuals and families seeking more space, better jobs, higher status, or greater amenities. For these people local areas of neighbourhoods are but steppingstones-not necessarily devoid of sentimental value-in the pursuit of happiness. Perhaps future research will tell us that twentieth century urban man had a utilitarian rather than a sentimental attitude to the areas in which he resided” (p. 123).*



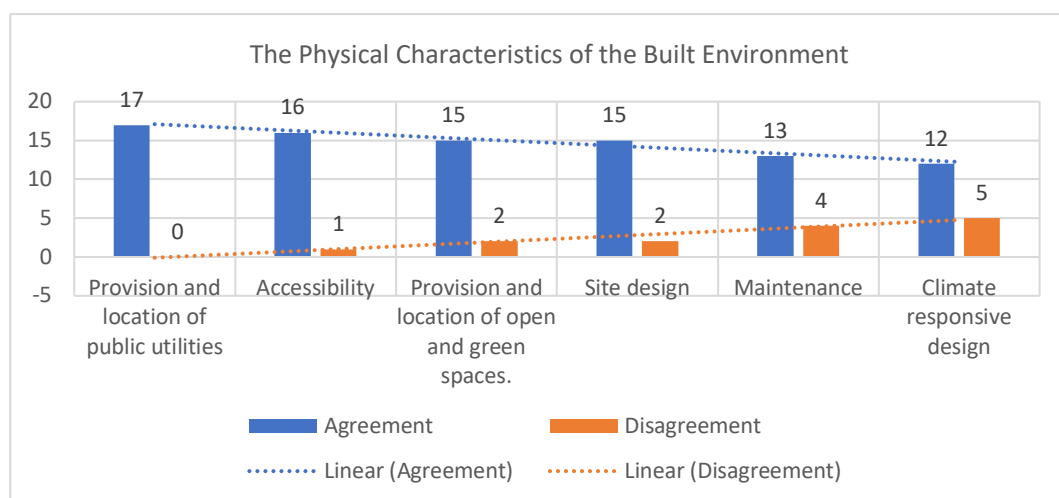
## 8.5. Physical Characteristics of the Built Environment (PCBE):

### 8.5.1. Physical Characteristics of the Built Environment Affecting Social Interaction:

This section combines the results of the semi-structured interviews and questionnaire. The results will be confirmed by the socio-spatial practices' findings, if provided, to identify the PCBE that affect social interaction amongst residents in an Iraqi context, especially in communal spaces within SFHNs. Iraqi decision-makers were asked to indicate to what extent they agree with the PCBE's influence on social interaction among residents in communal spaces within SFHNs in Basra. Table 8-4 presents the results from analysing question seven of the semi-structured interviews for the PCBE. It shows the counts of agreement and disagreement amongst the experts and the average score for each physical characteristic. Figure 8-2 shows the total agreement and disagreement amongst the experts for each physical characteristic of the built environment.

*Table 8-4 The counts and average of scores of the answers to question seventh of the semi-structured interviews about the physical characteristics of the built environment.*

Physical Characteristics	Total Agreement	Total Disagreement	The average of scores (scores/17)
Provision and location of public utilities (social, educational, etc)	17	0	4.6
Accessibility	16	1	4.5
Provision and location of open and green spaces.	15	2	4.4
Site design (the neighbourhood and communal spaces)	15	2	4.2
Maintenance	13	4	4.1
Climate responsive design	12	5	4.0



*Figure 8-2 The counts of agreement and disagreement of the physical characteristics of the built environment.*

*Table 8-5 The B and p values of the four physical characteristics of the built environment (accessibility, maintenance, satisfaction with the design of both the neighbourhood and communal spaces) that could affect social interaction amongst residents overall and across the case studies.*

Indicators	Overall		AlJunainah		AlKhalij Alarabi		AlZahraa	
	B	Sig.	B	Sig.	B	Sig.	B	Sig.
Accessibility	-0.001	.876	-0.002	.986	-0.022	.726	-0.037	.917
Maintenance	-0.011	.622	-0.029	.732	-0.034	.531	0.031	.888
Satisfaction with communal spaces	-0.305	<b>.010</b>	-0.247	.175	-0.086	.390	-0.854	.055
Satisfaction with the neighbourhood	0.000	.492	0.004	.985	0.078	.321	-0.234	.712

Dependent Variable: Mean of Social Interaction  
The effective factors are those with Sig. p-value <.05.

All the investigated PCBE receive average scores equal to or greater than 4.0, with high rates of agreement. This means that the experts interviewed confirm that all these characteristics are essential when considering their effect on social interaction among residents in communal spaces within residential developments.

- **The Provision and Location of Public Utilities**

As shown in Table 8-4, the physical characteristic that obtained the highest agreement count and average score is the provision and location of public utilities, such as social, educational, health, commercial utilities. It had an average score of 4.6, and all the experts interviewed (17) agreed on this physical characteristic's influence on social interaction. This attribute is significant in creating social environments that encourage social interactions amongst residents. This is noted from the mean value of social interaction across the case studies, where the level of social interaction was higher in AlJunainah (5.3706), then in AlKhalij Alarabi (3.7599), and AlZahraa (3.4451), see Table 6-14. Moreover, when considering people's perceptions and satisfaction with the communal spaces within the neighbourhood, the data in Table 6-13 shows that more than half of the surveyed residents were satisfied with the diversity of these spaces, both overall and across the case studies. Furthermore, under the suggestions, the majority of surveyed residents indicated the need to enhance and increase the quantity of all types of public service.

The findings of the behavioural observations proved the influence of the provision and location of public utilities on social interaction amongst residents in communal spaces. It was observed that the quantity of social activates and users in the communal spaces within AlJunainah and AlKhalij Alarabi neighbourhoods were higher than those in AlZahraa. This could probably because of the presence of different types of communal spaces within these two neighbourhoods, especially commercial. This reflects the findings of previous studies (Bramley et al., 2009; Bramley & Power, 2009; Karuppannan & Sivam, 2011) which established the

importance of presence and diversity amongst public services within the built environment, such as schools, healthcare centres, shops, cafes, restaurants, and pubs, as all these public utilities create social built environments. When considering the research context, it is important to provide communal spaces that relate to the background and needs of users. It is generally accepted that a city's vitality is linked to its human scale, diversity and quality of public space (Leccese and McCormick, 2000; Talen & Ellis, 2002).

- **Accessibility**

Accessibility is the second physical characteristic examined for its influence on social interaction amongst residents in communal spaces. In this study, accessibility was measured on three points: the accessibility of public services and communal spaces within the neighbourhood in terms of the availability of visual signs and clear, direct paths to them; their proximity to residents' dwelling units, and the possibility of using these services and communal spaces by both genders. The Iraqi experts confirmed the important role of accessibility in facilitating and encouraging social interactions amongst residents in communal spaces. This physical characteristic obtained an average score of 4.5, and the total number of experts interviewed who agreed on the influence of accessibility on social interaction was 16 out of 17.

Interestingly, although the experts' perceptions regarding the influence of accessibility on social interactions amongst residents in communal spaces, the questionnaire analysis shown in Table 8-5 indicated that accessibility had no impact on social interaction amongst residents, neither overall nor across the case studies. Moreover, accessibility to communal spaces and public services within the neighbourhood was neutral - neither positive nor negative. This measurement revealed residents' level of agreement with the level of accessibility (neither agree nor disagree), where the mean values were 2.45 overall, 2.48 for AlJunainah, 2.49 for AlKhalij Alarabi, and 2.26 for AlZahraa (see Table 6-3).

From the observations and fieldwork site survey, it was found that most communal spaces, such as the shared neighbourhood garden, cafes, restaurants, malls, and local shops are within close distances from dwelling units in the three case studies. Moreover, the paths that lead to enclosed communal places within the surveyed neighbourhoods were explicit and identified. Also, the shop front signs were available for some of the enclosed communal places, such as cafes and malls, with the exception of some local corner shops. Furthermore, the significant presence of female users was observed within some of these places, such as malls, local market or corner shops, for socialising and chatting. However, for the shared gardens, it was noted that there

were no identified accesses or gates, no proper seats or pedestrian routes inside the gardens, or secure, complete fences that define the boundaries of the open space. In contrast, the paths that lead to these gardens were well-defined as they form the internal streets of the neighbourhoods. Besides, there were no visual signs stating the name of the open spaces. This description applied to most of the public gardens surveyed within AlJunainah, whereas the situations in AlKhalij Alarabi and AlZahraa are better in terms of the fences, plants, and pedestrian routes.

Despite the previous descriptions of accessibility, it was noted that the gardens in AlJunainah and AlKhalij Alarabi were used most frequently by male users of different age groups than those in AlZahraa. Although females were observed using some of the open communal spaces for weak social interactions in AlKhalij Alarabi, this was in the presence of men from their families, such as a husband or brother. Thus, the percentage of female users was meagre in comparison to that of males, which was far higher. Thus, it could mean that the level of social interaction for females is not as affected by the accessibility of communal spaces as the culture and custom of Iraqi society. Moreover, although there appeared to be a lack of accessibility to some of the open spaces, this does not prevent residents (males) from using these spaces. This means the accessibility did not affect the level of social interaction among males, particularly in the observed areas, although it has an important role in encouraging people to use these spaces for social gatherings. This does not support the findings of previous studies (Buonfino & Hilder, 2006; Karuppannan & Sivam, 2011) which emphasised the significance of accessibility to communal and public utilities and their location in encouraging or discouraging social interaction.

According to the findings of the behavioural observation, it seems that accessibility affect the use of communal space in terms of gender. It is believed that this physical characteristic could influence social interaction among residents in communal spaces in Basra with the presence of other factors, such as site design that considered the culture and custom of the society, privacy, and safety and security. Accordingly, this physical characteristic needs further research in future studies in Iraq.

### **The Provision and Location of Open and Green Spaces**

Under the list of physical characteristics of the built environment, the provision and location of open and green spaces was the third ranked factor to affect social interaction among residents, according to the decision-makers' perceptions. It obtained an average score of 4.4, and 15 out of 17 experts agreed on the influence of this factor on social interaction. They agreed on the idea of providing open and green spaces within the neighbourhood and considered their location

to be between dwelling units and that proximate distances would enhance residents' social lives. They praised the open green spaces within AlKhalij Alarabi, as it was the first in Basra's masterplan to include such components in the urban design of new residential neighbourhoods. However, they emphasised the importance of managing, maintaining, and sustaining these spaces with users.

Similarly, residents' perceptions indicated the influence of the provision of open and green spaces within their neighbourhoods on their social lives positively. Also, they recommended increasing the number of open green spaces to an acceptable size, locating them close to dwelling units, and providing maintenance to existing open green spaces (see section 6.13.7). From the observations and fieldwork site survey, it was noted that there were more green areas in AlKhalij Alarabi than in the other two neighbourhoods. This could be one of the reasons for the high number of users in these spaces in AlKhalij Alarabi. It was also observed that a number of adult users gather within these open green spaces, where they benefit from its containment and the shade it offers.

The results for this factor were similar to those of Bramley et al. (2006), and Karuppannan and Sivam (2011) who examined the impact of urban form on social sustainability at the neighbourhood level. Their studies verified that social interactions within communities are higher when dwelling units are placed around the public realm or offer a common open space. The study demonstrated that the provision of high quality, well-located open spaces at the precinct level, mixed land use and good accessibility to the public realm and social infrastructure play an important role in increasing the neighbourhood's social sustainability.

- **The Site Design of Neighbourhood and its Communal Spaces:**

The site design, including the neighbourhood and its communal spaces, attracted the experts' attention, for which it obtained an average of score of 4.2, whilst 15 out of 17 experts interviewed agreed on the influence of this factor on social interaction amongst residents. The experts indicated that there seems to be an apparent relationship between the design of the built environment and social interactions among residents. For example, in the old city, some social activities occurred due to the presence of a shaded space or winding cul-de-sac (close-ended alleys), which was considered appropriate for use by women of the neighbourhood for chatting, or an open space near the mosque. Nowadays, malls, cafes, and public parks have become suitable alternative places for some social gatherings as long as their design consider the cultural and traditional backgrounds of users.

According to the results derived from the questionnaire, the design of the built environment of the communal spaces significantly related to social interactions among residents in the communal spaces of SFHNs in Iraq, as shown in Table 8-5. This included the diversity in communal spaces within the neighbourhood, their total area, and the design and supply of soft and hard landscapes, such as trees, hedging plants, grass, fountains, fences, and gates. This was also confirmed by the results of question 26 (see section 6.13.7) that showed people's perceptions regarding the effect of the built environment on social interaction.

According to the observations and behavioural mapping, it was clear that the design of the communal spaces has a significant impact on the total number, gender, and age groups of users. Some popular activities were observed, such as sitting and watching pedestrians or sitting and chatting with neighbours and friends, in front of the main entrances of houses, on the sidewalk of streets under shade, or at the entrance of some local shops. Choosing such unintentional communal spaces for communication reflected a problem with the intentional communal spaces within the neighbourhoods. For instance, there is a lack of design in the soft and hard landscapes, such as providing artificial lighting, fencing, seating, bushes, and grass planting for the neighbourhood's shared gardens. Moreover, the seats' distribution and orientation were not considered to assure the privacy of gardens' users and people who pass nearby as this appears to be random and without study. Furthermore, residential neighbourhood planning did not take into account the provision of new diversified community spaces.

Additionally, there were no clearly determined entrances to the gardens, and the damage was sustained to part of the gardens' surrounding physical fences, which could generate feelings of insecurity and a lack of safety. All these were seen more in AlJunainah and AlZahraa's shared gardens than in AlKhalij Alarabi. Moreover, a few benches were used in the shared gardens, where they were partially surrounded by physical boundaries, such as bushes, trees or a fence. Providing such boundaries increases the sense of privacy, containment and stability, and therefore, encourages the use of such spaces. A lack of soft landscapes was noted more in the shared gardens within AlJunainah and AlZahraa than in AlKhalij Alarabi - such as plants, trees, and water fountains - which makes these spaces unattractive and could discourage people from using them.

To conclude, the research findings suggest that the built environment's design, including the neighbourhood layout and its communal spaces, had an important impact on using such spaces for social interactions amongst residents. This supports the findings of previous studies (Abu-Ghazze, 1999; Alahmed et al., 2014; Farida, 2013; Farshidi, 2016; Huang, 2006; Kennedy &



Buy, 2015) that established the impact of the design of communal spaces on social interaction among residents in different residential developments.

- **Climate Responsive Design**

The climate responsive design of any built environment has been seen to have a significant impact on social interaction among residents. This was proved by the results of the interviews and socio-spatial practices. Both confirmed the influence of the climatic conditions of Basra city on social activities in the area as well as the need to integrate specific designs for communal spaces within neighbourhoods to encourage usage. Furthermore, the experts agreed that a climate responsive design has an impact on people's behaviour, and, in turn, on their social interactions. The climate responsive design factor obtained an average score of 4.0, where 12 out of 17 experts interviewed agreed on the influence of this factor on social interaction. The experts highlighted the importance of considering building technology in constructing the built environment.

The residents' socio-spatial practices of, including behavioural observations, revealed the most used communal spaces by residents: the spaces in front of the main entrance of houses, streets, sidewalks, shared neighbourhood gardens, children's playgrounds, and local shops. These spaces were observed as used by varying numbers of users, especially by children. Yet, the use of these open spaces was low compared to enclosed public places within the neighbourhood. Because Basra has a desert climate, shared gardens within the surveyed neighbourhoods were used by a few users, although these numbers were higher in AlKhalij Alarabi, followed by AlJunainah, then AlZahraa. This related to the fact that these spaces were not designed to correspond to the area's desert weather. In other words, the climatic conditions were not considered when designing the open spaces, such as providing seats without shading in shared gardens, which made them unusable in hot and sunny weather. Therefore, most residents tended to avoid using open communal spaces as a place for social gatherings in general and during the morning period, in particular. Also, the number of users during the weekdays' morning was lower than during the late afternoon as people are usually at work. Accordingly, people preferred to gather in enclosed public places within neighbourhoods where the temperature is acceptable and there are dedicated places for sitting, eating or shopping, such as cafes, malls, mosques, and hussainya.

This study confirms the impact of the communal spaces designed in response to the climate on social interaction among residents in these of SFHNs in Basra. This result is similar to those of Kennedy and Buys (2015), who established that resident satisfaction would be enhanced by

spaciousness for diverse activities, privacy and climate responsive design. Their study aimed to identify the specific physical and spatial design characteristics that residents perceive as important in open spaces when associated with their private dwellings and shared open spaces. Also, their study explored the relationship between open space design, the factors impacting open space provision, and resident satisfaction with open spaces in multi-storey apartment buildings in the context of the subtropical lifestyles and the climate of Brisbane, Australia.

- **Maintenance:**

The influence of maintenance of both the neighbourhood and its communal spaces on the level of social interactions amongst residents was obvious for most of the experts interviewed. This factor obtained an average score of 4.1, and the total number of experts who agreed on its influence was 12 out of 17. Five experts disagreed on the influence of maintaining the built environment on social interaction and attributed this to the understanding that most people in Iraq do not abandon neighbouring with others even if the surrounding built environment is not maintained. The popular compact residential neighbourhoods in Basra, such as Al-Hussein (also known as AlHayaniya), were offered as examples to explain their view.

In terms of the residents' perceptions, the questionnaire data showed surprising results. The neighbourhood and communal spaces' maintenance did not statistically affect the level of social interaction among residents in the surveyed neighbourhoods (see Table 8-5). This result supported the views of the experts who disagreed with the influence of maintenance on social interaction.

Despite the low level of maintenance amongst some of the open communal spaces in the surveyed neighbourhoods, the observations recorded their use by individuals of different age groups. It was noted that some of these spaces were often used by males from specific age groups (children aged 6-10, adolescents aged 12-18, and a few adults aged 18-24) and during particular times of every day. This phenomenon was seen mainly in AlJunainah, followed by AlKhalij Alarabi. At the same time, some shared gardens were not used due to their poor quality. In contrast, two of the shared gardens in AlZahraa neighbourhood had a medium level of maintenance, which included cleaning waste from the areas, the presence of medium quality public seats, and plants. These were observed as unused by residents at the time of the behavioural observations. From these findings and considering the number of users, it was found that maintenance did not affect social interaction in communal spaces within SFHNs in Basra. These findings do not reflect the findings of previous studies by Dempsey (2008), Dempsey et al. (2008), and Farrell et al. (2004), who argued that particular elements of the

quality of the built environment, such as the level of maintenance, have a significant impact on residents' sense of community and social interaction.

Nevertheless, maintenance could affect the gender and number of users of the communal spaces within the surveyed neighbourhoods. From the observations and behavioural mapping, it was observed that some residents (mostly elderly and children) were seen using sidewalks or the space in front of the main entrance of houses instead of the available shared gardens of the neighbourhoods, and the activities undertaken included chatting with neighbours and friends, sitting and watching pedestrians, or playing games (such as football, chasing each other or cycling). This was probably due to the poor level of both maintenance and the design quality of these gardens. Residents' responses to question 26 highlighted these reasons when they were asked what they would add or change in any of the communal spaces within their neighbourhood. Some responses highlighted the maintenance, which includes: maintaining the neighbourhood's public services; sustaining and cleaning the neighbourhood's open spaces, shared gardens, and streets; sanitation, which involves developing the sanitation system of the neighbourhood; removing the waste, and eliminating overrides on the open spaces within the area.

As a result, the low level of maintenance could indirectly affect the level of social interaction by influencing both the level of resident satisfaction with the built environment and feelings of safety when using communal spaces for neighbourhood social gatherings. In other words, the maintenance of the neighbourhood and its communal spaces can play an essential role in increasing their use by making them attractive; thus, maintaining communal spaces helps to indirectly encourage and increase the number of users for social interactions. In this case, these findings correspond those of the previous studies (Dempsey, 2008; Dempsey et al., 2008; Farrell et al., 2004).

The following section will discuss the PCBE that affects the social indices, including the N-Index, SR-Index, and SN-Index.

#### **8.5.2. Physical Characteristics of the Built Environment Affecting Social Indices:**

The following section discusses the PCBE that affects the social indices, including N-Index, SN-Index, and SR-Index. Table 8-6 combines the results of three tables showing the B values and the *p*-values (significances) of each of social sustainability indicator on the three social indices, i.e., N-Index, SN-Index, and SR-Index.

Table 8-6 The physical characteristics of the built environment affecting the social indices, Neighbouring Index (N-Index), Social Networks Index (SN-Index), and Social Relationship Index (SR-Index), overall and across the case studies.

	Parameter	Neighbouring		Social Networks		Social Relationships	
		B	Sig.	B	Sig.	B	Sig.
Overall	Accessibility	<b>1.441</b>	<b>.016</b>	-0.013	.835	-0.013	.412
	Maintenance	-0.264	.561	-0.023	.618	-0.004	.771
	Satisfaction with communal spaces	<b>-2.538</b>	<b>.004</b>	<b>-0.211</b>	<b>.019</b>	-0.022	.354
	Satisfaction with the neighbourhood	-1.222	.146	0.092	.280	-0.033	.142
AlJunainah	Accessibility	0.003	.862	-0.004	.972	-0.018	.462
	Maintenance	-0.003	.795	-0.05	.503	-0.006	.719
	Satisfaction with communal spaces	-0.032	.161	-0.168	.294	-0.063	.087
	Satisfaction with the neighbourhood	-0.022	.354	0.045	.786	0.011	.763
AlKhalij Alarabi	Accessibility	<b>0.020</b>	<b>.005</b>	-0.066	.321	0.010	.655
	Maintenance	0.001	.864	-0.035	.550	-0.011	.596
	Satisfaction with communal spaces	-0.002	.888	-0.093	.386	-0.017	.645
	Satisfaction with the neighbourhood	<b>-0.020</b>	<b>.022</b>	0.151	.073	<b>-0.073</b>	<b>.013</b>
AlZahraa	Accessibility	0.017	.600	-0.014	.950	-0.042	.395
	Maintenance	-0.016	.422	0.009	.948	<b>0.060</b>	<b>.044</b>
	Satisfaction with communal spaces	<b>-0.099</b>	<b>.017</b>	-0.431	.119	-0.024	.692
	Satisfaction with the neighbourhood	-0.086	.146	-0.086	.828	0.075	.399

Dependent Variable: Social interaction, Neighbouring, Social Networks, Social Relationships

The effective factors are those with Sig. p-value <.05.

#### • N\_Index:

In terms of *N\_Index*, the data in Table 8-6, which presents the results derived from the residents' questionnaire (see section 6.10.1), shows that the level of neighbouring acts among residents was significantly influenced by two factors. The most effective factor was users' satisfaction with the physical attributes of the communal spaces, whilst the other was the accessibility of these spaces. The data breakdown shows that, in AlZahraa, resident satisfaction with the physical attributes of the communal spaces affected the level of neighbouring acts amongst residents. In comparison, the level of neighbouring acts among residents in AlKhalij Alarabi was influenced by the accessibility of communal spaces within the neighbourhood and resident satisfaction with the physical attributes of the neighbourhood. To conclude, the neighbouring acts among residents were influenced by the accessibility of communal spaces within the neighbourhood, the design of the neighbourhood and its communal spaces. The results regarding the accessibility to the communal spaces and resident satisfaction with the built environment of both the neighbourhood and its communal spaces reflect the findings of previous studies by Buonfino and Hilder (2006), and Hastings et al. (2005). They argued that neighbourhoods that are people-friendly and well-designed, where people can spend time outside their homes are usually successful in providing opportunities for residents to 'use' and enjoy their local areas and to meet other residents.

Furthermore, the questionnaire results showed that the maintenance of the built environment had no impact on the level of neighbouring. Moreover, the results showed a negative

relationship between neighbouring and satisfaction with the design of the built environment due to the negative signs of the B values (-2.538, -0.020, and -0.099), indicating that, when resident satisfaction with the design with the built environment decreases, the level of neighbouring increases. These results contrast with those of previous studies; for example Hastings et al. (2005) showed that residents tend to lose the motivation to maintain their surroundings and a sense of collective efficacy can be lost when environmental services fail to clean up the graffiti or the dirt. Also, Buonfino and Hilder (2006) claimed that well-kept public spaces are usually successful in providing the opportunity for residents to ‘use’ and enjoy their local areas and to meet other residents.

- **SN-Index:**

In terms of the *SN-Index*, it is found that the level of social networks was affected by resident satisfaction with the design of the communal spaces, according to the GLM test results. This means the influence of diversity in communal spaces within the neighbourhood, their total area, and their design and supply with soft and hard landscapes. Moreover, the data breakdown shows that no PCBE significantly related to the level of social networks amongst the surveyed sample across the case studies, where  $p$ -value  $>.05$ . Satisfaction with the diversity of the available communal spaces within the neighbourhood, their total areas, and their design influenced the social networks of residents. This echoes the findings of Buonfino and Hilder (2006), which claimed that the lack of neighbourhood spaces for interaction could lead to a shared lack of information; in other words, not knowing close neighbours and what they have in common. Moreover, they argued that satisfaction with the local area could be the basis for neighbouring relations. This is when the local area is a pleasant place in which to spend time, residents are more willing to engage with others and take part in activities. On the other hand, high levels of dissatisfaction with the neighbourhood did not encourage residents to spend time with neighbours or engage in local area activities.

- **SR\_Index:**

Regarding the *SR\_Index*, the GLM test results show that none of the factors from the PCBE affect the level of social relationships between residents. Nevertheless, the data breakdown across the case studies shows that the resident’s satisfaction with the neighbourhood design in AlKhalij Alarabi negatively affected the level of strong social relationships ( $p$ -value $<.05$ ). This result does not support the findings of previous studies (Buonfino & Hilder, 2006; Rogers, 2005). Moreover, the data breakdown shows that the maintenance in AlZahraa significantly

affected the level of strong social relationships ( $p$ -value<.05); this echoes previous studies' findings (Buonfino & Hilder, 2006; Rogers, 2005). People-friendly neighbourhoods that have well-designed and well-kept public spaces, where people can spend time outside their homes, are usually successful in providing opportunities for residents to meet other residents and help develop social relations between neighbours (Buonfino & Hilder, 2006). Furthermore, the Urban Task Force report in 2005 suggested that neighbourhoods, where public spaces are well maintained and safe, can create a better basis for human relations (Rogers, 2005).

The data in Table 8-6 showed that satisfaction with communal spaces' physical characteristics did not significantly affect the social relationships between residents. This can be attributed to the understanding that building social relationships with others depends on personal feelings/senses more than the physical environment. This finding contrasts with Fleming et al. (1985), who found that the characteristics of neighbourhood's common spaces play a material role in the development of neighbours' social ties, where common spaces are one of the most important settings for casual social contact among neighbours. The earlier studies whose findings were compared with those of the present study did not consider communal spaces in their investigations. However, they are close enough to depend on when comparing the results, as they have examined similar factors to those in the present study.

## **8.6. Demographic Factors (DF):**

### **8.6.1. Demographic Factors (DF) Affecting Social Interaction**

In terms of the last examined aspect in this study, this section combines the questionnaire and semi-structured interviews' results. These will be confirmed, if provided, by residents' socio-spatial practices to identify the DFs that affect social interactions amongst residents in Iraq, especially in communal spaces within SFHNs. According to the semi-structured interviews, Iraqi experts were asked to indicate to which extent they agree with the DF's influence on residents' social interaction in communal spaces within SFHNs in Basra. Table 8-7 shows the results from analysing question 12 of the semi-structured interviews; it presents the counts of agreement and disagreement amongst experts and the average score for each demographic factor. Figure 8-3 shows the total numbers of agreement and disagreement amongst the experts for each DF.



Table 8-7 The count and average of scores of the question 12 of the semi-structured interviews regarding the demographic factors.

Demographic Factors	Total Agreement	Total Disagreement	The average of scores (scores/17)
Number of hours and days worked	16	1	4.4
Education status	15	2	4.4
Length of residence (house/neighbourhood)	14	3	4.4
Age	14	3	4.2
Number of children under 10 years of age at home.	13	4	3.9
Marital status	13	4	3.9
Gender	12	5	3.8
Employment status	9	8	3.7
Type of ownership	9	8	3.7

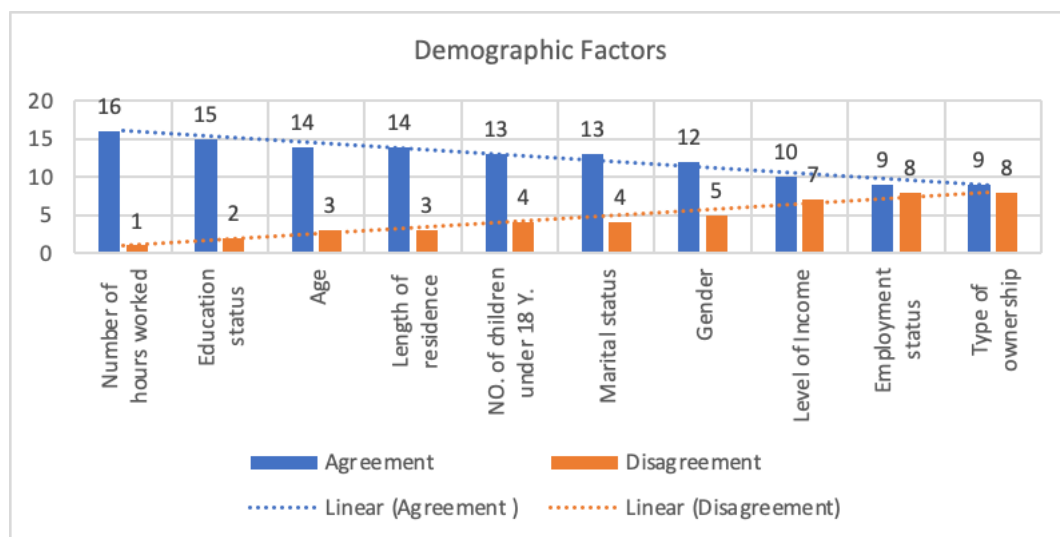


Figure 8-3 The counts of agreement and disagreement of the demographic factors.

The Iraqi experts interviewed generally agreed on all DF's effect, as all received an average score of over 3.5, which was close to "Agree" on the Likert Scale points. These results represented the experts' opinions on the value of the socio-economic background of Iraqi society members and their influence on social interaction among residents. According to their answers to question 15, the most effective DF on social interaction amongst residents, were the age group, gender, length of residency, number of children living in the house, number of hours worked, and education level.

Some of the experts suggested adding two demographic factors: the presence of relatives in the same neighbourhood and the age of the area (neighbourhood). According to interviewees' perceptions, four demographic factors received an average score of over 4.0, which equates to "Agree" on the Likert scale. These four demographic factors were more likely to have a higher impact on social interaction among residents than the other factors. They are the number of working hours per day (4.4), education status (4.4), the length of residence (in house/neighbourhood) (4.4), and age group (4.2), see Table 8-7. These factors were followed

by the number of children aged ten years and less at home (3.9), marital status (3.9), gender (3.8), employment status (3.7), and the type of ownership (3.7).

“Level of income” received an average score of 3.8. Earlier studies suggested that the level of income could influence people’s behaviours. Abu Ghazze (1999) highlighted the correlation of some DF, like social status, lifestyle, and tastes, with the strength of neighbourly relationships. He offered this explanation following the conduct of his research in Jordan, which represented a similar context to Iraq: *“high upper-middle-income people in Jordan have cosmopolitan lifestyles and tend to value friends over neighbours, which opposed the values of the middle-income group in Abu-Nuseir”* (Abu Ghazze, 1999, p.44). However, this factor was excluded in this study, as some of the experts suggested it could be challenging to gather such data, which could be confusing and sensitive to people. Respondents could become confused when determining the difference between high, medium and low income, and in most cases, they may not mention their annual salary for security and privacy issues.

For “employment status”, one argument indicated that diversity in the employment status of residents who live in the same neighbourhood could positively or negatively affect social interaction, because it could simultaneously be a motivational or withdrawal factor. Experts argued that the employment status could significantly influence individual’s psychological state, which, in return, negatively affect individuals’ social interactions and relations. This can be seen when residents cluster according to their employment status; in other words, based on their jobs. For example, groups of residents who work as engineers tend to socialise between themselves more than with others who may work as greengrocers. However, the diversity in employment status amongst residents who live in the same neighbourhood may be a reason for interacting and establishing relationships; for example, in order to obtain a job or set up communities to find solutions, such as communicating with plumbers, blacksmiths, and carpenters who may live in the same neighbourhood.

In comparison, another argument amongst the experts claimed that social interaction and the intention to interact with other neighbours could increase in a neighbourhood customized to a particular employee category, such as a neighbourhood for engineers, doctors, or teachers, which adds a sense of privacy and community. Such customizing, however, might lead to social isolation, as it may reduce the intention to interact with others socially. To conclude, the Iraqi experts suggested that employment status could impact the way people behave, but it seems that its impact is minor when considering interactions between neighbours in an Iraqi context. This explains why the agreement rates were close to those for disagreement. Although not

enough studies have explored the impact of employment status on social communication, it was included in this study in order to indicate the level of income of the targeted population in the examined areas.

Regarding “type of ownership”, which received an average score of 3.7, some experts argued that a sense of stability increases if a house is owned. This sense of stability would influence the individuals’ behaviour and their feelings towards the place and community. Owning the residential property has an impact on the sense of privacy, safety and security. In return, the sense of security offers individuals a sense of connection and an attachment to place, which increases interest in society and establishes social relationships. In other words, the type of ownership can affect the sense of community, attachment to place, and residents’ social interactions. An opposite argument submitted by some experts claimed that the type of residence is not an essential influence on the community’s social life. This is probably because Iraqi society in general and the southern community, in particular, are social in nature. Therefore, the status of a tenant or owner is not considered a restriction to social mingling.

Suggestions were made by five experts interviewed to add two more demographic factors, “the age of the region – or neighbourhood -” and “the presence of relatives living in the same neighbourhood”. The neighbourhood’s age represents the duration of time from the date of that neighbourhood establishment and affects the quality of residents’ interactions. “The presence of relatives living in the same neighbourhood” considers whether the residents have relatives live in their neighbourhood, which may enhance neighbours' intentions to interact. This factor was included in this study to determine whether it represents a motivate for social interaction.

The questionnaire results concerning some the DF’s influence were similar to those of the semi-structured interviews. Table 8-8 and Table 8-9 show the results of both overall and across the case studies. The questionnaire analysis revealed that eight out of the 11 demographic factors significantly related to residents’ social interaction in the examined context. This included gender, age groups, marital status, education level, employment status, the length of residency in the neighbourhood, the presence of relatives living within the neighbourhood, and the number of children aged ten years or less living in the house ( $p\text{-value} < .05$ ). The data in Table 8-8 show that the B values for the number of working hours per day (0.042) and the number of children aged ten years or less in the house (0.241) are positive. This means that there is a positive relationship between social interaction and these two factors, indicating that, as the numbers of working hours per day and children in the house increases, the level of social interaction among residents in the neighbourhood increases.

Table 8-8 The B and p values of the three demographic factors on the mean of social interaction, overall and across the case studies.

Parameter	AlJunainah		AlKhalij Alarabi		AlZahraa		Overall	
	B	Sig.	B	Sig.	B	Sig.	B	Sig.
Number of working hours per day	0.042	<b>.036</b>	0.026	.112	-0.057	.638	0.031	.094
Number of working days per month	-0.002	.861	-0.006	.317	0.011	.785	-0.003	.645
The number of children aged ten years or less in the house	0.241	<b>.000</b>	0.136	<b>.000</b>	0.189	.184	0.193	<b>.000</b>
Dependent Variable: Social Interaction								
The effective factors are those with Sig. p-value <.05								

Table 8-9 The p values of eight demographic factors examined their influence on social interaction among residents, overall and across the case studies.

Demographic Factors	AlJunainah	AlKhalij Alarabi	AlZahraa	Overall
	Sig.	Sig.	Sig.	Sig.
Gender	<b>.000</b>	<b>.000</b>	<b>.001</b>	<b>.000</b>
Age group	.627	<b>.000</b>	.091	<b>.000</b>
Marital status	.089	<b>.000</b>	.344	<b>.000</b>
Education level	.088	<b>.000</b>	.317	<b>.000</b>
Employment status	.577	<b>.000</b>	.635	<b>.000</b>
Type of ownership	.782	0.592	.381	.154
Length of residence in the neighbourhood	.052	.080	<b>.008</b>	<b>.000</b>
The presence of relatives living within the neighbourhood	<b>.003</b>	.110	.799	<b>.001</b>
The effective factors are those with Sig. p-value <.05				

According to Table 8-8, the number of children aged ten years or less living in the house was found to be effective on the level of social interaction overall and in AlJunainah and AlKhalij Alarabi neighbourhoods. Moreover, the number of working hours per day was found to be influential on the level of social interaction amongst residents in AlJunainah neighbourhood. Table 8-9 shows that gender and the presence of relatives living within the neighbourhood significantly related to the level of AlJunainah residents' social interactions. For AlKhalij Alarabi, gender, age groups, marital status, education level, and employment status influenced the level of social interaction amongst its residents, while gender and length of residency in the neighbourhood influenced the level of social interactions in AlZahraa.

When combining the interviews and questionnaire results, the number of working days per month and type of ownership were not related to the level of social interaction amongst residents in communal spaces within SFHNs in Basra, as shown in Table 8-8 and Table 8-9. At this point, the findings regarding the type of ownership factor in the current study did not support the findings of previous studies (Bramley & Power, 2009; Haggerty, 1982). Haggerty (1982, as cited by Farida, 2013) indicated that a neighbour's interaction with others and how

shared outdoor spaces are used are affected by the socio-demographic characteristics of a neighbourhood, of which the owner-renter status is one such factors.

The residents' socio-spatial practices revealed that gender, age groups, and the number of children were the most clearly effective demographic factors on social interactions amongst residents in communal spaces within SFHNs in Basra. These factors were obvious to the observer and easy to indicate. Moreover, gender was a dominant demographic factor in terms of using specific communal spaces. It was noted that males from most age groups were the dominant gender using shared gardens within the neighbourhood, streets, and sidewalks, while females of a specific age group (40-55) rarely used the spaces in front of houses for greeting and talking with neighbours. Most of the enclosed communal places were observed as used by males more than females, such as cafes and restaurants, although females using these places are more than those using open spaces.

Therefore, the current study's finding generally agreed with previous studies' findings (Abu-Ghazze, 1999; Haggerty, 1982; Harris & Gale, 2004; Skjæveland et al., 1996; Unger & Wandersman, 1982) that mentioned the impact of socio-demographic characteristics on social interaction. Haggerty (1982, as cited by Farida, 2013) indicated that age, marital status, and presence of children at home, the length of residence, and educational background associated with social interaction and how shared outdoor spaces are used. Furthermore, Abu-Ghazze (1999) revealed that local casual contact in residential areas related to demographic variables and casual contact, whilst a sense of community in the neighbourhood was expected to be higher amongst married couples (marital status) and couples with children (the number of children in the house).

Moreover, the findings regarding the impact of both employment status and gender on social interaction among residents supported earlier studies' findings, such as the Manchester Neighbourliness Review (Harris & Gale, 2004). The authors suggested that employment status and gender (women with children, retired or in part-time work) have an effect on contact within the neighbourhood, in general, and on social networks and ties, in particular. This means extra-neighbourhood contacts and a stronger and more intense pool of neighbourhood contacts. The impact of relatives living in the same neighbourhood on residents' social interactions agreed with the findings by Dench et al. (2006). They suggested that the kinship basis of the Bangladeshi community helps to determine high levels of neighbouring and social connections. The next sections describe the three indices with the factors that affect them.

### 8.6.2. The Demographic Factors Affecting Social Indices:

The following section reviews the demographic factors that affect social indices, involving the N-Index, SN-Index, and SR-Index. Table 8-10 combines the results of the three tables that have been described previously in Chapter 6, showing the B and the *p* values (Sig.) of each of three demographic factors for the three social indices (overall and for each case study). Table 8-11 combines the results of the three tables that have also been described previously in Chapter 6, showing the *p* values (Sig.) of eight demographic factors for the three social indices (overall and for each case study). The earlier studies' findings compared with the current study did not consider communal spaces in their investigations. However, they are close enough to consider when comparing results, as they have examined similar factors to the present study.

Table 8-10 The B and *p* values of the three demographic factors on the mean of Neighbouring, Social Networks, and Social Relationships, overall and across the case studies.

Parameter		Neighbouring		Social Networks		Social Relationships	
		B	Sig.	B	Sig.	B	Sig.
Overall	Number of working hours per day	-0.001	.833	<b>0.041</b>	<b>.002</b>	<b>-0.013</b>	<b>.001</b>
	Number of working days per month	0.000	.767	-0.007	.232	0.001	.492
	The number of children aged ten years or less in the house	<b>0.014</b>	<b>.014</b>	<b>0.166</b>	<b>.000</b>	-0.009	.245
AlJunainah	Number of working hours per day	0.012	.963	<b>0.049</b>	<b>.003</b>	<b>-0.014</b>	<b>.001</b>
	Number of working days per month	-0.059	.606	-0.002	.743	0.001	.646
	The number of children aged ten years or less in the house	1.778	<b>.014</b>	<b>0.231</b>	<b>.000</b>	-0.012	.327
AlKhalij Alarabi	Number of working hours per day	-0.078	.725	0.034	.052	-0.013	.054
	Number of working days per month	-0.016	.855	-0.008	.259	0.002	.524
	The number of children aged ten years or less in the house	0.401	.329	<b>0.147</b>	<b>.000</b>	-0.019	.139
AlZahraa	Number of working hours per day	0.029	.958	-0.044	.532	-0.005	.755
	Number of working days per month	0.086	.645	0.006	.785	-0.001	.789
	The number of children aged ten years or less in the house	0.117	.858	0.125	.134	0.013	.515

Dependent Variable: Social interaction, Neighbouring, Social Networks, Social Relationships

Table 8-11 The *p* values of eight demographic factors examined their influence on social interaction among residents, overall and across the case studies.

Parameter		Neighbouring	Social Networks	Social Relationships
		Sig.	Sig.	Sig.
Overall	Gender	<b>.000</b>	<b>.000</b>	<b>.000</b>
	Age group	<b>.011</b>	<b>.000</b>	.075
	Marital status	<b>.006</b>	<b>.000</b>	.276
	Education level	<b>.010</b>	<b>.000</b>	<b>.012</b>
	Employment status	<b>.009</b>	<b>.000</b>	<b>.001</b>
	Type of ownership	.285	.199	.807
	Length of residence in the neighbourhood	<b>.013</b>	<b>.000</b>	.559
	The presence of relatives living within the neighbourhood	.235	<b>.000</b>	<b>.011</b>
AlJunainah	Gender	<b>.000</b>	<b>.000</b>	.295
	Age group	.725	.605	.360
	Marital status	.157	.190	.966
	Education level	<b>.041</b>	<b>.040</b>	.078
	Employment status	.609	.456	.070



Parameter		Neighbouring	Social Networks	Social Relationships
		Sig.	Sig.	Sig.
	Type of ownership	.694	.787	.764
	Length of residence in the neighbourhood	.230	<b>.036</b>	.605
	The presence of relatives living within the neighbourhood	<b>.024</b>	<b>.001</b>	.186
AlKhalij Alarabi	Gender	.065	<b>.000</b>	<b>.000</b>
	Age group	<b>.005</b>	<b>.000</b>	.153
	Marital status	<b>.001</b>	<b>.000</b>	.340
	Education level	<b>.022</b>	<b>.000</b>	.167
	Employment status	<b>.011</b>	<b>.000</b>	<b>.018</b>
	Type of ownership	.698	.451	.700
	Length of residence in the neighbourhood	<b>.016</b>	.058	.411
	The presence of relatives living within the neighbourhood	.381	<b>.012</b>	<b>.020</b>
AlZahraa	Gender	<b>.005</b>	<b>.001</b>	.131
	Age group	.802	.056	.744
	Marital status	.509	.344	.592
	Education level	.479	.223	.822
	Employment status	.769	.644	.731
	Type of ownership	.683	.445	.226
	Length of residence in the neighbourhood	.098	<b>.011</b>	.813
	The presence of relatives living within the neighbourhood	.619	.497	.758

Dependent Variable: Social interaction, Neighbouring, Social Networks, Social Relationships

- **N\_Index:**

The questionnaire analysis considering the DF's influence on the *N\_Index* revealed that seven of the 11 demographic factors significantly influenced the level of neighbouring acts among residents in communal spaces within SFHNs in Basra. These are gender, age groups, marital status, education level, employment status, length of residency in the neighbourhood, and the number of children aged ten years or less living in the house, where their *p*-value<.05. The data breakdown across the case studies in Tables 8-10 and 8-11 shows that the number of children aged ten years or less living in the house, gender, education level, and the presence of relatives living within the neighbourhood significantly affected the level of neighbouring in AlJunainah. It also shows that AlKhalij Alarabi's neighbouring level was influenced by the age group, marital status, education level, employment status, and length of residency in the neighbourhood, while in AlZahraa, it was only influenced by gender.

Although the lack of studies examined the DF's effect on residents' neighbouring acts in communal spaces within SFHNs, the present study's findings regarding some of the DF examined agreed with other studies' findings. Regarding the presence of relatives living in the neighbourhood, Dench et al. (2006) suggested that the kinship basis helps determine a high level of neighbouring in the Bangladeshi community. Also, the findings regarding the influence of the length of residency on the neighbouring level in this study were similar to the findings of previous studies, which revealed that even if local ties are generally weak, families with long-term residencies in the neighbourhood tend to have more connections and richer mutual

support networks (Buckner, 1988; Chavis, Hogge and McMillan, 1986; Skjaeveland, Garling and Maeland, 1996).

The findings of the present study on the influence of gender, marital status, and education level on neighbouring acts among residents agreed with the findings of Campbell and Lee's (1990, p.506), who declared that the “*SES (socioeconomic status) is positively, but not strongly, related to neighbouring*”. Regarding gender, Campbell and Lee (1990) revealed that women engage in more neighbourly acts than men, which suggested the influence of gender roles rather than available time or presence in a neighbourhood. They revealed that the respondent's gender more powerfully correlated with neighbouring than either lifecycle or SES. Moreover, they claimed that being married shapes some types of neighbouring and tends to limit contact with neighbours. In addition, persons of higher education are more familiar with their nearest neighbours, supporting the belief that more leisure residence in a "valued community" (Hunter, 1974, p. 120) encourages relations between neighbours.

However, the findings of Campbell and Lee (1990) contrast with those of the current study in terms of the influence of the number of children, as they stated that children's presence has no effect. Children do not restrain or facilitate neighbouring appreciably, but attachment to another limits some kinds of neighbourhood interaction (Campbell & Lee, 1990). Nevertheless, the influence of the number of children on the level of neighbouring acts among residents reflects a previous study by Nasar and Julian (1995). They revealed that neighbourhoods with children and young families tend to have a higher level of neighbourliness due to both the need and the time available amongst children and mothers to make connections with others in a park or a primary school, or with their immediate neighbours (Buonfino & Hilder, 2006).

- **SN-Index:**

In terms of the *SN-Index*, the questionnaire analysis revealed that, overall, nine of 11 demographic factors significantly related to the social network level of residents in the examined context. These factors are gender, age group, marital status, education level, employment status, length of residence in the neighbourhood, the presence of relatives living in the same neighbourhood, the number of children aged ten years or less living in the house, and the number of working hours per day ( $p\text{-value}<.05$ ). The influence of these factors was seen across the case studies. In AlJunainah, the data showed that six factors affected the level of its residents' social networks. They are the gender, education level, length of residency in the neighbourhood, the presence of relatives living within the neighbourhood, the number of children aged ten years or less living in the house, and the number of working hours per day. In

AlKhalij Alarabi, seven demographic factors influenced its residents' social networks. They are the gender, age group, education background, marital status, employment status, presence of relatives living within the neighbourhood, and the number of children aged ten years or less living in the house. However, the results showed that gender and residency length in the neighbourhood affected the social networks of AlZahraa neighbourhood residents.

Despite the lack of studies examining the DF's influence on social networks within neighbourhood communal spaces, the present study's findings that relate to the effect of age, gender, marital status, education level, employment, and the number of children living in the neighbourhood were consistent with the findings of Campbell and Lee (1992). Their study examined three theoretical perspectives that aimed to explain the links between status and neighbour network, social integration, need, and available time. They revealed that larger social networks tend to occur more amongst individuals in "well-integrated" groups (married couples, educated, high income) than those with no children or partners. Abu-Ghazze (1999) suggested that casual contact and a sense of community in the neighbourhood was expected to be greater amongst married couples and couples with children. Thus, the presence of children in a family has an impact on social contact. Children serve as important information links among neighbours (Keller, 1968).

Moreover, the influence of the presence of relatives living within the neighbourhood on the SN\_Index in this study echoed the findings of Dench et al. (2006). They suggested that kinship helps determine the high level of social connections in the Bangladeshi community. The influence of residency length in a neighbourhood on the social networks of residents of this study agree with the findings of previous studies (Buckner, 1988; Buonfino & Hilder, 2006; Chavis et al., 1986; B. A. Lee et al., 1991; Skjæveland et al., 1996). Buonfino and Hilder (2006) revealed that a long-period residency in a neighbourhood affect the quantity of social networks and, in return, social relationships. This is similar to the findings of Buckner (1988), Chavis et al. (1986), and Skjæveland et al. (1996), who revealed that families with long-term residencies in the neighbourhood tend to have more connections and richer mutual support networks even if the local ties are generally weak. In a US context, Lee et al. (1991) noticed that long-time residents in a neighbourhood in Nashville, Tennessee had larger networks of more intense relationships.

However, only a study by Buonfino and Hilder (2006) was found to discuss the influence of the number of working hours per day on residents' social networks, which has similar findings to this study. It was apparent that the number of working hours per day linked to the employment

status of individuals. In this regard, Buonfino and Hilder (2006, p.32) stated that *“neighbourliness is particularly important for those who spend more time in the neighbourhood”*. Harris and Gale (2004) and Guest and Wierzbicki (1999) indicated that people whose employment status meant that they spent a more significant proportion of time within their neighbourhoods (i.e., flexible workers; unemployed; housewives etc.) scored very highly on the neighbourliness index. Neighbourliness levels are usually low in areas where there is a high proportion of second homes or commuters. In other words, when the number of working hours outside the neighbourhood decreases, the level of neighbouring increases, which in turn means the quantity of social networks of residents also increases.

- **SR\_Index:**

The questionnaire analysis concerning the DF's effect on the *SR\_Index* confirms that five of the eleven demographic factors significantly related to the level of strong social relationships in the examined context. These factors are: gender, educational level, employment status, the presence of relatives living in the same neighbourhood, and the number of working hours per day ( $p$ -value<.05). The data breakdown shows that strong social relationships in AlKhalij Alarabi were influenced by gender, employment status, and the presence of relatives living in the same neighbourhood ( $p$ -value<.05).

Moreover, the lack of effect between the length of residency in the neighbourhood on strong relationships does not support the findings of Lee et al. (1991). They discovered that, in the US context, long-time residents in a neighbourhood in Nashville, Tennessee had larger networks of more intense relationships. Furthermore, the analysis shows that the number of children aged ten years or less living in the house did not significantly relate to strong social relationships among residents in the communal spaces of Basra's neighbourhoods. In other words, the number of children living in the home (or their presence) did not affect the presence of strong social relationships among residents, which contradicts the findings of Guest and Wierzbicki (1999). Their US survey showed that those with the greatest local ties also had a large number of children (also see Buckner, 1988; Nasar & Julian, 1995; Riger & Lavrakas, 1981; Skjæveland et al., 1996; Unger & Wandersman, 1982). Earlier studies' findings (Buckner, 1988; Campbell & Lee, 1992; Riger & Lavrakas, 1981) claimed that people with low income and/or a low level of education also tend to have very intense relations with their neighbours, due to a greater need for local support and social bonds. This is similar to the current study's findings regarding the influence of education level on residents' social relationships. However, no studies confirm the effects of gender, employment status, and the number of working hours per day on social relationships between residents in communal spaces. Hence, the present study's findings

suggest that these demographic factors influence the development of strong social relationships among residents in communal spaces within SFHNs in Basra.

### **8.7. Summary of the Effective Factors:**

Section 8.4 discussed the final results, which identified the SSI that affect social interaction, neighbouring acts, social networks, and social relationships among residents in communal spaces within SFHNs in Basra. The data in Table 8-12 presents the indicators of social sustainability that affect social interaction, neighbouring acts, social networks, and social relationships that resulted from combining the findings of the semi-structured interviews, questionnaire and socio-spatial practices, including observations and behavioural mapping. The table shows the number of times each indicator was repeated as an influential factor on social interaction (according to the interviews and questionnaire results), neighbouring acts, social networks, and social relationships (according to the questionnaire results), both overall and in each of the three surveyed neighbourhoods.

The current study's findings suggest that the sense of community seemed to be the most effective indicator on social interaction and neighbouring, both overall and for each case study. Also, the findings indicate that the sense of community influenced the social networks of residents, both overall and in two surveyed neighbourhoods. However, it did not have any impact on the social relationships between residents. The findings revealed that the safety and security indicator only influenced the level of social interaction in one of the case studies, and the observations proved the impact of this indicator on social interaction among residents. Safety and security also affected the level of neighbouring acts among residents in two case studies - AlJunainah and AlZahraa - and affected residents' social networks overall and in one surveyed neighbourhood, AlZahraa. For social relationships, the safety and security indicator influenced the building of strong social ties in only one case study. Moreover, the findings of the study also suggest that attachment to the place affected the level of social interaction and the social networks of residents overall, although it only seemed to have an impact on the neighbouring acts among residents in one surveyed neighbourhood, AlZahraa.

Residents' satisfaction with the built environment - in terms of the neighbourhood and communal spaces - did not influence their social interaction and social networks. However, the questionnaire results showed that residents' satisfaction with the built environment affected the level of neighbouring acts overall, while it affected the development of strong social relationships in AlZahraa neighbourhood.

The privacy indicator, including the privacy of the spaces/place, had a significant influence on social interaction among residents in communal spaces in Basra's SFHNs. This was seen overall and in one of the surveyed neighbourhoods. Similarly, the privacy indicator had an impact on the social networks between residents overall and in one case study.

Although residents' satisfaction with their neighbourhood and communal spaces had no influence on their social interaction, the overall outcomes suggested that their satisfaction with the built environment could have an indirect impact on the level of social interaction among residents in the communal spaces of SFHNs in Basra.

The density indicator is presented in the current study by the number of families living in the house and the number of people living in the house. Both variables seem to have an impact on residents' social interaction overall. Moreover, they influenced neighbouring acts amongst residents overall and in two case studies: AlJunainah and AlZahraa neighbourhoods. The number of people living in the house seemed to influence building wide social networks among residents in one of the case studies: AlZahraa neighbourhood. Determining the dominant gender enabled the researcher to measure density's impact on residents' social interaction in communal spaces.

*Table 8-12 The social sustainability indicators affecting Social Interaction, Neighbouring, Social Networks, and Social Relationships.*

Indicators	Social Interaction					Neighbouring				Social Networks				Social Relationships			
	Interv. <sup>b</sup>	Ques. <sup>c</sup>				Ques. <sup>c</sup>				Ques. <sup>c</sup>				Ques. <sup>c</sup>			
		Overall	C1 <sup>a</sup>	C2 <sup>b</sup>	C3 <sup>c</sup>	Overall	C1 <sup>a</sup>	C2 <sup>b</sup>	C3 <sup>c</sup>	Overall	C1 <sup>a</sup>	C2 <sup>b</sup>	C3 <sup>c</sup>	Overall	C1 <sup>a</sup>	C2 <sup>b</sup>	C3 <sup>c</sup>
Sense of community	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓		✓	✓				
Safety and security	✓		✓				✓		✓	✓			✓			✓	
Attachment to the place	✓	✓							✓	✓							
Resident satisfaction	✓					✓											✓
Privacy	✓	✓		✓						✓			✓				
The number of families living in the house	✓	✓				✓	✓		✓								
The number of people living in the house	✓	✓				✓	✓		✓				✓				
a. AlJunainah, b. AlKhalij Alarabi, c. AlZahraa.    b. Semi-structured interviews.    c. Questionnaire																	

Sections 8.5 discussed the final results that identified the PCBE that affect social interaction, neighbouring acts, social networks, and social relationships among residents in communal spaces within SFHNs in Basra. Table 8-13 presents the PCBE that affected social interaction, neighbouring acts, social networks, and social relationships according to the combination of the semi-structured interviews, questionnaire and observations findings. Table 8-13 shows the number of times each physical characteristic was repeated as an influential factor on social interaction (according to the interviews, questionnaire, and observations findings),



neighbouring acts, social networks, and social relationships (according to the questionnaire and observations), both overall and in each of the three surveyed neighbourhoods.

The findings revealed that the provision and location of public utilities, and open and green spaces within the neighbourhood affect the level of social interaction among residents. These findings synthesised the interviews and questionnaire and was confirmed by the behavioural observations. Similarly, the climate responsive design of any built environment was seen to have a significant impact on social interaction among residents. The interviews and behavioural observations findings confirmed the influence of the climatic conditions of Basra city on the type social activities undertaken in the area as well as the need to follow specific designs for communal spaces within neighbourhoods to encourage people to use them. Therefore, the researcher believes that the provision and location of public utilities, open and green spaces, and communal spaces designed in response to the climate for a particular neighbourhood could significantly improve the level of neighbouring acts among residents. This could, thereby, affect the development of strong social relationships between residents. Simultaneously, the quantity of social networks between individuals might develop and grow when such elements exist within a neighbourhood because such places would offer people a chance to meet others.

Accessibility to communal spaces within the neighbourhood seemed to have no impact on the level of social interaction among residents, the number of social networks amongst residents, or the social relationships between them. Yet, the findings suggest that accessibility affects the use of communal space in terms of gender. It is believed that accessibility could affect the level of social interaction among residents in communal spaces in Basra with the presence of other factors, such as site designs that consider the culture and custom of society, alongside privacy, safety and security. Notwithstanding, the findings reveal that the accessibility of communal spaces influenced the level of neighbouring acts among residents. According to the questionnaire results, its influence was measured overall and in AlKhalij Alarabi neighbourhood.

The results for the site design in 8.5.1 confirmed that the design of communal spaces had an impact on the level of social interaction among residents and social networks, which was demonstrated by the combined findings, and noted overall according to the questionnaire results. This physical characteristic included the diversity of communal spaces within the neighbourhood, their total area, and their design and supply with soft and hard landscapes, such as plants, trees, fountains, shaded seats, fences, pedestrians' routes, and playgrounds. The questionnaire results also confirmed this factor affects the level of neighbouring acts among

residents overall and in one of the surveyed neighbourhoods: AlZahraa. Moreover, the site design of the neighbourhood was found to have an impact on the level of neighbouring acts and social relationships among residents in one of the case studies: AlKhalij Alarabi neighbourhood.

By considering the questionnaire results regarding the last physical characteristic, it was found that maintenance did not affect residents' social interaction in communal spaces within SFHNs in Basra. Despite the low level of maintenance of open communal spaces in the surveyed neighbourhoods, users from different age groups frequented these spaces. However, it is possible to predict that the surveyed sample presented a low level of satisfaction with the communal spaces, and this could be due to their reduced level of maintenance. In this case, maintenance affected resident satisfaction with the built environment and feelings of safety when using communal spaces within the neighbourhood for social gatherings. Accordingly, the maintenance of the neighbourhood and its communal spaces can play an essential role in increasing usage by making them attractive. Thus, maintaining communal spaces indirectly helps to encourage and increase the number of users for social interactions.

Table 8-13 The physical characteristics of the built environment affecting Social Interaction, Neighbouring, Social Networks, and Social Relationships.

Physical Characteristics of the Built Environment			Interv.	Questionnaire				Obs.	
				Overa II	C1 <sup>a</sup>	C2 <sup>b</sup>	C3 <sup>c</sup>		
Social Interaction	Provision and location of public utilities		✓		✓	✓	✓	✓	
	Accessibility		✓						
	Provision and location of open and green spaces.		✓		✓	✓	✓	✓	
	Site design	Neighbourhood	✓						
		Communal spaces	✓	✓				✓	
	Maintenance		✓					✓	
Climate responsive design			✓	-	-	-	-	✓	
Neighbouring	Provision and location of public utilities		-	-	-	-	-	✓	
	Accessibility		-	✓		✓			
	Provision and location of open and green spaces.		-	-	-	-	-	✓	
	Site design	Neighbourhood	-			✓			
		Communal spaces	-	✓			✓	✓	
	Climate responsive design			-	-	-	-	-	✓
Social Networks	Provision and location of public utilities		-	-	-	-	-	✓	
	Provision and location of open and green spaces.		-	-	-	-	-	✓	
	Site design	Communal spaces	-	✓				✓	
		Climate responsive design			-	-	-	-	✓
Social Relationship	Provision and location of public utilities		-	-	-	-	-	✓	
	Provision and location of open and green spaces.		-	-	-	-	-	✓	
	Site design	Neighbourhood	-			✓		✓	
		Communal spaces	-					✓	
	Climate responsive design			-	-	-	-	-	✓

a. AlJunainah, b. AlKhalij Alarabi, c. AlZahraa

Section 8.6 discussed the final results that identify the DF that affect social interaction, neighbouring acts, social networks, and social relationships among residents in communal spaces within SFHNs in Basra. Therefore, Table 8-14 shows the final effective DF that resulted from combining the findings of the semi-structured interviews, questionnaire and observations and behavioural mapping. The table shows the number of times each demographic factor was repeated as an influential factor on social interaction, neighbouring acts, social networks, (according to the interviews, questionnaire, and observations results) and social relationships (according to the questionnaire results), both overall and in each case study.

The final findings suggest that gender significantly affected the level of social interaction among residents. Interviews, questionnaire and observational data in Table 8-14 reveal the influence of gender overall and across the surveyed neighbourhoods. Also, the number of children aged ten years or less in the house appeared to have an influence on the level of social interaction among residents. As shown in the table, the influence of this demographic factor was noted overall and in two case studies: AlJunainah and AlKhalij Alarabi.

Moreover, the findings show that age group, marital status, education level, employment status, the length of residence in the neighbourhood, and the presence of relatives living within the neighbourhood had an influence on social interaction, according to the interview and questionnaire results. The questionnaire results revealed that these demographic factors impacted overall and in one case study. The number of working hours per day had a minor effect on the level of social interaction among residents in communal spaces, as its impact transpired in only one case study.

In terms of the social indices, it was found that gender and education level affected the level of neighbouring acts among residents; their influence was seen overall and in two case studies (see Table 8-14). As the results of the questionnaire show, age, marital status, employment status, length of residence in the neighbourhood, and the number of children aged ten years or less in the house affected the level of neighbouring acts among residents overall and in one of the surveyed neighbourhoods. The presence of relatives living within the neighbourhood seemed to have a limited effect on the level of neighbouring acts among residents in communal spaces, as its impact transpired in only one case study.

Table 8-14 The demographic factors affecting Social Interaction, Neighbouring, Social Networks, and Social Relationships.

Demographic Factors			Questionnaire				Observation
			Overall	C1 <sup>a</sup>	C2 <sup>b</sup>	C3 <sup>c</sup>	
Social Interaction	Gender	✓	✓	✓	✓	✓	✓
	Age group	✓	✓		✓		✓
	Marital status	✓	✓		✓		
	Education level	✓	✓		✓		
	Employment status	✓	✓		✓		
	Type of ownership	✓					
	Length of residence in the neighbourhood	✓	✓			✓	
	The presence of relatives living within the neighbourhood	-	✓	✓			
	The number of children aged ten years or less in the house	✓	✓	✓	✓		
	Number of working hours per day	✓		✓			
Neighbouring	Gender	-	✓	✓		✓	✓
	Age group	-	✓		✓		✓
	Marital status	-	✓		✓		
	Education level	-	✓	✓	✓		
	Employment status	-	✓		✓		
	Type of ownership	-					
	Length of residence in the neighbourhood	-	✓		✓		
	The presence of relatives living within the neighbourhood	-		✓			
	The number of children aged ten years or less in the house	-	✓	✓			
	Number of working hours per day	-					
Social Networks	Gender	-	✓	✓	✓	✓	✓
	Age group	-	✓		✓		✓
	Marital status	-	✓		✓		
	Education level	-	✓	✓	✓		
	Employment status	-	✓		✓		
	Type of ownership	-					
	Length of residence in the neighbourhood	-	✓	✓		✓	
	The presence of relatives living within the neighbourhood	-	✓	✓	✓		
	The number of children aged ten years or less in the house	-	✓	✓	✓		
	Number of working hours per day	-	✓	✓			
Social Relationships	Gender	-	✓		✓		
	Age group	-					
	Marital status	-					
	Education level	-	✓				
	Employment status	-	✓		✓		
	Type of ownership	-					
	Length of residence in the neighbourhood	-					
	The presence of relatives living within the neighbourhood	-	✓		✓		
	The number of children aged ten years or less in the house	-					
	Number of working hours per day	-					

a. AlJunainah, b. AlKhalij Alarabi, c. AlZahraa

Furthermore, according to the questionnaire and observations and behavioural mapping, gender significantly affected the level of social networks among residents in communal spaces in Basra's SFHNs. In contrast, according to the questionnaire results, education level, the length of residence in the neighbourhood, the presence of relatives living within the neighbourhood, and the number of children aged ten years or less in the house were found to influence the level of social networks among residents. Their influences were repeated overall and in two of the

case studies, AlJunainah and AlKhalij Alarabi. However, as the effect of these two factors was repeated overall and in one case study, employment status and the number of hours worked per day only appeared to slightly impact on the opportunities to increase the level of social networks among residents.

In comparison, it was found that the building strong relationships among residents who use communal spaces within SFHNs in Basra were affected by gender, employment status, and the presence of relatives living within the neighbourhood. In contrast, education level was only slightly impacted. The effect of employment status and the presence of relatives was repeated overall and in one case study, while the influence of education level was only noted in one case study.

### **8.8. The Communal Spaces within Single-Family Houses Neighbourhoods (SFHNs) in Basra:**

A strong focus in urban sociology literature maintains that the neighbourhood is an important arena in which social activity occurs, although extra-local social networks are increasing and becoming more dissociated from forms of local interaction (Forrest & Kearns, 2001; Stafford et al., 2003). Neighbourhoods in the contexts of developed countries include local meeting places, such as pubs, cafés, community or leisure centres. Also, neighbourhoods in developing countries include local meeting places and spaces, such as mosques, local shops, malls and cafes, in addition to open spaces and children's playgrounds, which provide opportunities for social interactions. The physical surroundings, social contexts and environment improve social interactions, which illustrate various aspects of society, including its social life and the social ties between individuals and groups.

The following sub-sections integrates the findings of the questionnaire and residents socio-spatial practices, which included observations and behavioural mapping. The integration of these findings, firstly, will identify the most used communal spaces by residents for regular and formal gatherings within SFHNs in Basra city. In order to identify these spaces for regular and/or formal contacts, the researcher employed the Interactional Space Index (IS\_Index), as shown in Chapter 6 (see section 6.13.1). The questionnaire analysis of the present study considered two types of communal spaces within SFHNs depending on the type of social activities. They are the communal spaces used by residents for regular gatherings, and those used for formal gatherings within the neighbourhood. After that, the social activities that occurred in these examined communal spaces will be illustrated. Moreover, the main obstacles

and motives for the use of communal spaces for social activities within the case study neighbourhoods will be reviewed by extrapolating the synthesised findings.

#### **8.8.1. Communal Spaces for Regular Gatherings:**

In terms of the frequencies, as shown in Table D-58 in Appendix D, “the spaces in front of main entrances of houses” seem to be frequently selected for regular contact by the majority of residents; this was followed by “streets and sidewalks”, “worship facilities (e.g., mosque/hussainya/church)”, “local shops”, and “the local market or malls located within the neighbourhood”. The data also showed that a low proportion of the surveyed residents used the shared neighbourhood garden, while a minority - predominantly female - indicated that the house was the most used communal space for regular gatherings. The patterns of these communal spaces were varied across the case studies, (see the data in Table D-58). The result regarding “the spaces in front of main entrances of houses” was also supported by those described in section 6.13.3 in Chapter 6 regarding the nearest communal spaces to residents’ houses used social contact.

Table 8-15 shows the IS-Index values for the examined communal spaces for regular gatherings. The results in Table 8-15 signify that “the space in front of the main entrance of the house” was the most common communal space for regular meetings, as the IS\_Index score equated to more than 0.5. This result was seen across the surveyed neighbourhoods; besides, in AlKhalij Alarabi, the worship facilities (mosque, church, hussainya) were found to be a place for regular meetings by residents within SFHNs. These results were supported by the findings of the observations and behavioural mapping. The findings showed that residents in AlJunainah and AlZahraa neighbourhoods tended to use the spaces in front of the main entrances of houses for chatting although the number of users was low. In comparison, a larger number of residents was observed using the space in front of local shops or malls which are located within neighbourhoods as well as other communal spaces; this was seen almost across the three surveyed neighbourhoods. Also, the observations in AlKhalij Alarabi showed such gathering on Friday.



Table 8-15 *IS\_Index for each communal space used for regular meetings overall and across the surveyed case studies (Q30).*

Communal space		AlJunainah	AlKhalij Alarabi	AlZahraa	Overall
		IS	IS	IS	IS
Regular contacts	<b>Spaces in front of main entrances of houses.</b>	<b>0.52</b>	<b>0.62</b>	<b>0.69</b>	<b>0.59</b>
	Streets and sidewalks.	0.40	0.33	0.44	0.38
	Children playground	0.05	0.00	0.05	0.03
	The garden of the neighbourhood.	0.25	0.14	0.03	0.16
	<b>Mosque/church/hussainya</b>	0.26	<b>0.49</b>	0.23	0.36
	Local shops	0.32	0.33	0.41	0.34
	Local market or malls	0.24	0.37	0.13	0.28
	Local restaurants	0.11	0.07	0.00	0.07
	Local cafe	0.07	0.07	0.05	0.07
	Gym	0.07	0.03	0.05	0.05
	Others	0.14	0.06	0.10	0.10

By asking residents ‘how often do you use each communal space’, the data analysis showed that a high percentage of residents indicated that they used “the space in front of the main entrance” of their house for daily social meetings. Also, a high percentage of residents indicated that they used local shops and local markets or malls weekly for the same purpose (see Table D-62). The frequency of use for regular meetings in each communal space was examined by calculating the Frequency of Use Index (FU\_Index) overall and for each of the case studies. As shown in Table 6-28 in Chapter 6, "the space in front of the main entrance of the house", "streets and sidewalks", "local shops", "local market or malls" within the neighbourhood were used monthly for social gatherings.

The data breakdown shows approximately similar patterns across two case studies, except for AlKhalij Alarabi, where “the space in front of the main entrance of the house” was used weekly (FU\_Index=3). These results could be explained by the fact that some of these communal spaces are the nearest to residents’ housing units, which play an important role in facilitating regular contact, see section 6.13.3 in Chapter 6. Also, it could be because these are the only available communal spaces within neighbourhoods that can be used, as described in section 7.4.2 in Chapter 7. This was seen at most in AlJunainah and AlZahraa neighbourhoods.

### 8.8.2. Communal Spaces for Formal Gatherings:

According to Table D-60 in Appendix D, “worship facilities (mosque, church, or hussainya)” were selected frequently for formal contact by more than two-third of the surveyed residents (68.1%). This was followed by “the space in front of the main entrance of the house”, then “the streets and sidewalks”, and “the shared garden of the neighbourhood”. Furthermore, 20% of the surveyed sample indicated the house and halls for formal (schedule) gatherings, such as weddings, while the remaining respondents selected the other types of communal space (i.e.,

local shops, mall, local restaurants, local café, and gym). The data showed that the unintentional communal space “worship facilities” were the most used communal space for formal gatherings across the case studies. The pattern of selecting the “worship facilities” for formal contact was similar across the case studies, while it was varied for the other communal spaces, (see the data in Table D-60).

Again, the researcher employed the IS\_Index to identify the most used communal space within the SFHNs for formal meetings. The results in Table 8-16 show that “worship facilities (the mosque, church, or hussainya)” were the most used places overall and within the surveyed neighbourhood, as the IS\_Index scores were higher than 0.5. Unfortunately, the behavioural observations did not note any type of formal gathering within the surveyed neighbourhoods during the observing periods, except for a board of consolation that was held in the street.

*Table 8-16 IS\_Index for each communal space used for formal contact overall and across the surveyed case studies (Q33).*

Communal space		IS_Index			
		AlJunainah	AlKhalij Alarabi	AlZahraa	Overall
Formal contacts	Spaces in front of main entrances of houses	0.29	0.38	0.31	0.33
	Streets and sidewalks.	0.35	0.23	0.33	0.29
	Children's playground	0.00	0.03	0.05	0.02
	The garden of the neighbourhood.	0.36	0.30	0.13	0.29
	<b>Mosque/church/hussainya</b>	<b>0.61</b>	<b>0.57</b>	<b>0.49</b>	<b>0.57</b>
	Local shops	0.01	0.07	0.05	0.05
	Local market or malls	0.01	0.08	0.05	0.05
	Local restaurants	0.02	0.03	0.03	0.03
	Local cafe	0.04	0.01	0.03	0.02
	Gym	0.01	0.01	0.03	0.01
	Other	0.24	0.09	0.21	0.17

From the questionnaire and the behavioural observations results, the communal spaces most used by residents can be categorised into two types - the intentional and unintentional. The communal spaces that were most used for regular gatherings by residents, in terms of frequency, are “the spaces in front of main entrances of houses”, “the streets and sidewalks”, “worship facilities (mosque/hussainya)”, “local shops”, and “the local market or malls” located within the neighbourhood. These are considered unintentional communal spaces and related to all communal spaces that were originally designed for service purposes, which also naturally adapted to different levels of social interaction. These spaces were not intentionally designed for social interaction so could be called “unintentional communal spaces”. The results of the IS\_Index showed that the communal space used for regular meetings was the unintentional communal space, namely “the space in front of the main entrance of the house”.

The communal spaces that were mostly used for formal gatherings were “worship facilities (mosque, church, or hussainya)”, and these were followed by “the space in front of the main entrance of the house”, “streets and sidewalks”, and “the shared garden of the neighbourhood”. Again, these spaces are unintentional communal spaces, except for the shared garden of the neighbourhood, which is an intentional communal space for formal gatherings. The intentional communal space refers only to those shared spaces that are initially designed for social interaction, such as gathering rooms, shared gyms and leisure facilities, roof terraces, courtyards (patios), front gardens, backyards that are sufficiently covered, balconies, and neighbourhood parks or open spaces (Gehl, 2011; Heckscher & Robinson, 1977; Kennedy & Buys, 2015; Newman, 1996). The results of the IS\_Index showed that the communal space used for formal gatherings was the unintentional communal space, namely “worship facilities (mosque, church, or hussainya)”.

### **8.8.3. Social Activities and The Obstacles and Motives of Their Performing in Communal Spaces:**

The questionnaire’s findings and observations and behavioural mapping show that different social activities amongst residents took place within different communal spaces within neighbourhoods. They are: observing pedestrians or what was happening; noting children when playing either in the streets, the shared garden within the neighbourhood, or in playgrounds; people sitting and chatting, or in some cases, engaging in formal gatherings. This was also indicated in the results described in section 6.13.4 in Chapter 6. This agreed with Gehl's (2011) discussion on the concept of public spaces within the city. Social activities involved the presence of people and included all types of communication in city spaces. In this regard, many people performed passive activities, which included seeing and hearing contacts, watching people, and observing what was happening.

However, active relations also appeared that included the exchange of greetings and talking to neighbours. Extensive contacts further grew from smaller contacts; children’s play or contacts between younger age groups who have meeting places are more extensive contacts. This supports the most used communal spaces within SFHNs in Basra, as shown in the present study. According to Gehl (2011), the concept of the ‘lively city’ concerns dynamic public spaces that enable direct contact between people and society around them, and create a collaborative, enjoyable experience for social interaction. ‘People come where people are’ is an old proverb in Scandinavia, which is commonly seen as the example of children seeing other children play and wanting to join them. It is, therefore, essential to assemble people and events (Gehl, 2011).

These activities that occurred within the unintentional communal spaces (those used for regular contacts) seemed to be a combination of three types of activity, namely necessary, optional, and social activities (Gehl, 2011). For the necessary activities, such as going to work, shopping, waiting for a bus or a person, they were occurring throughout the observing time under almost all circumstances and are approximately independent of the exterior environment. These activities were noted within the context of the surveyed neighbourhoods. The optional activities, such as walking to enjoy fresh air, standing around enjoying life, or sitting and sunbathing were almost minimal within the case study neighbourhoods due to the lack of intentional communal spaces and the poor quality of existing places. These activities happen only when exterior conditions are optimal, especially when the weather and place encourage them (Gehl, 2011). The third type, social activities, such as those mentioned previously at the beginning of this sub-section are indirectly supported whenever necessary and optional activities are offered better circumstances in public spaces (Gehl, 2011). Since social activities occur spontaneously as a direct outcome of people moving about and being in the same spaces, these activities could also be described as "resultant" activities. Such activities were observed frequently in the case studies, which confirmed the responses of residents to the type of activities they perform within the closest communal spaces to their dwellings.

The residents' socio-spatial practices of Basra helped determine the barriers and motives for the use of existing communal spaces within neighbourhoods. The climatic conditions are considered a barrier and, at same time, a motive to use communal spaces in a city with a desert climate, such as Basra. These conditions offered a potential reason why most residents avoided using open communal spaces as social gathering places, particularly during the morning period. 26.4% of respondents indicated using the shared garden of the neighbourhood during the evenings. At the same time, the observations recorded that some communal open spaces were used in the morning during the winter season or late afternoons because the sunlight at this time of year was tolerable; this led to the second factor, namely the quality of communal spaces design.

Unfortunately, the findings indicated that the design of most open communal spaces does not consider the area's climatic conditions. This was also clear in the respondents' suggestions in question 26, section 6.13.7. They indicated the importance of providing more recreational facilities, such as sport services, parks, malls, children's playgrounds and paying attention to the level of maintenance and using modern designs. This could explain the unwillingness amongst most residents to use the available, intentional open communal spaces for social

gatherings at specific times during the day and year. The layout and location of communal spaces within the neighbourhood could play an essential role as a barrier or motive to use these spaces.

Moreover, the findings insinuate that the proximity of communal spaces to dwelling units can be a motive to residents to utilise these spaces for social meetings. This was evident from the use of adjacent streets and sidewalks to dwelling units, which were mainly frequented by children and males from different ages groups for various social activities. Also, the spaces in front of both the main entrances of houses and local shops were used for sitting or standing and chatting, mainly amongst males. This can explain the results in section 6.13.3 in Chapter 6.

Furthermore, it is believed that the customs and traditions of Iraqi society are significant barriers that limit women from freely using the communal spaces within their neighbourhoods. It is culturally unacceptable for women to be outside their houses to use communal spaces for social activities unless there is an acceptable kind of privacy and security present in that used space. It seems that this aspect has not been considered when designing and developing the current condition of communal spaces within residential areas. Thus, it was observed that females rarely used the available communal spaces within neighbourhoods despite the development of people's lifestyles.

This barrier leads to the last barrier and motive to use communal spaces within Basra's neighbourhoods: economic and political transformation. The development in people's lifestyles has been affected by the rapid and successive economic and political changes in Iraq over the last three decades, especially after 2003. These transformations play an essential role in the social and cultural values and the associated psychological and behavioural traits that represent the contemporary principles of the home environment. For example, the absence of semi-private spaces and developed communal spaces that match people's changing lifestyles and interests have influenced residents' intention to socialise and gather outside their neighbourhoods in enclosed communal places. The previously analysed facets have impacted people's desires and choices in their social lives and communication with others.

Consequently, it is safe to conclude that there is a weakness in the current urban design of the residential built environment, which is from the early 1960s and 1970s and has not been updated since then. Also, there is a low level of satisfaction amongst residents with the built environment of public services. It has been observed that the residential built environment, especially the

urban design of communal spaces, is dissimilar and misaligned with the socio-cultural backgrounds of the community. The previously outlined obstacles to using communal spaces for social gatherings in the neighbourhood indicated the current urban design deficiencies. However, the application of these facets was not perceived in developing the planning and urban design systems of SFHNs in Basra. Furthermore, the influence of both the socio-cultural values of society and the development of people's lifestyles have not been seriously considered in developing the urban design of Basra's current built environment, especially its communal city spaces. Besides, the factors that influence and promote social interaction among residents in communal spaces appear to be neglected. These indications are the research findings from decision-makers' perceptions and residents' socio-spatial practices in the selected neighbourhoods. The experts interviewed claimed that most of these indications and factors that affect residents' social interaction are usually ignored due to several reasons mentioned in Chapter 5. Therefore, residents neglected some communal spaces within neighbourhoods due to their low quality of design.

## **8.9. Conclusion:**

This chapter discussed the research findings by synthesising and discussing the key findings from three chapters that involved semi-structured interviews with Iraqi experts, users' urban and social sense questionnaire, and residents' socio-spatial practices (which involved observations and behavioural mapping). The chapter discussed the outcomes of the semi-structured interviews. This involved decision-makers' perceptions of the factors that affect social interaction, experts' consideration of three examined aspects (SSI, PCBE and DF) in work procedures, and their acceptance of the factors that underpin each of the examined aspects. Additionally, the study found a lack of both knowledge and implementation of social sustainability by Iraqi experts. Moreover, the influence of the examined factors on social interaction amongst residents in communal spaces was confirmed. Nevertheless, it was reported that these factors were not considered in experts' work procedures, which include designing, developing and implementing residential neighbourhoods in Iraq.

The chapter also synthesised the findings of the questionnaire, semi-structured interviews, and observations and behavioural mapping and discussing them into three sections. This helped to identify the factors that affect social interaction, neighbouring acts, social networks, and social relationships amongst residents in the communal spaces within SFHNs in Basra. These sections represented the influential factors of the three examined aspects: the social sustainability



indicators, the physical characteristics of the built environment, and the demographic factors. A summary of the key findings was showed in a separate section.

The findings revealed that factors from the three examined aspects affect social interaction in addition to neighbouring acts, social networks, and social relationships among residents in the communal spaces of SFHNs. For the SSI, the sense of community, safety and security, privacy, density, and attachment to place were found to impact the level of social interaction. In contrast, the sense of community, density, safety and security, attachment to place, and satisfaction with the built environment were found to influence the neighbouring acts among residents. While the sense of community, safety and security, privacy, attachment to place, and density affect the level of social networks among residents, safety and security and resident satisfaction with the built environment affect the development of strong social relationships amongst residents.

For the PCBE, the provision of public utilities, open and green spaces, their location within the neighbourhood, and communal spaces designed to suit the area's climate affect social interaction. These could improve the level of neighbouring acts among residents significantly, thereby affecting the development of strong social relationships. At the same time, the quantity of social networks between individuals might develop and grow when such elements exist within a neighbourhood since such places offer people a chance to meet. The findings also revealed that accessibility does not affect the level of social interaction; however, it can affect the use of communal space in terms of gender. Moreover, the maintenance of both the neighbourhood and its communal spaces affects social interaction, as it helps encourage and increase the number of users for social interaction. The site design of the neighbourhood and its communal spaces were found to have an impact on the level of social interaction, neighbouring acts, social networks, and social relationships among residents.

In terms of the DF, gender, age, marital status, education level, employment status, length of residence in the neighbourhood, number of children aged ten years or less in the house and the presence of relatives living within the neighbourhood appear to influence social interaction. The number of working hours per day seems to have a minor effect on social interaction among residents in communal spaces. Moreover, gender, education level, age, marital status, employment status, length of residence in the neighbourhood, and the number of children aged ten years or less were found to affect the level of neighbouring acts among residents. The presence of relatives living within the neighbourhood seems to have a limited effect on residents' neighbouring acts in communal spaces.

Furthermore, gender significantly affects the level of social networks among residents in communal spaces in Basra's SFHNs. This was followed by education level, length of residence in the neighbourhood, the presence of relatives living within the neighbourhood, and the number of children aged ten years or less in the house. The employment status and number of working hours per day seem to have a slight impact on increasing social networks among residents. The findings also revealed that gender, employment status, and the presence of relatives living within the neighbourhood influence the building of strong relationships among residents, who use communal spaces within SFHNs in Basra. In contrast, the education level has a minor impact.

The distance of the case studies from the city centre shows a slight effect on social interaction in the communal spaces within SFHNs. The number of communal spaces' users may differ, as the questionnaire and observations showed some participants prefer gatherings in malls that are located either near the city centre or near one of the case studies at the weekends. The available communal spaces, social and commercial services provided in each neighbourhood showed an effect on social interaction among residents. This is presented by the intensity of social gatherings near the commercial shops like the case in AlJunainah and AlKhalij Alarabi neighbourhoods (see section 8.5.1, "the provision and location of public utilities"). Although the availability of open communal spaces within the case studies, the findings showed that these spaces' use was not at a high level from all users. These communal spaces were used by males from different age groups more than females because of their poor-quality design. The difference between the case studies in the occupational status was examined. The findings showed that a large proportion of occupants across the case studies work in the public sector and have similar working hours' patterns. Therefore, the influence of both occupational status and the number of working hours per day on social interaction and social indices was examined. The occupational (employment) status influence social interaction, the level of neighbouring acts, social networks, and social relationships among residents, and it appeared in one of the case studies, AlKhalij Alarabi neighbourhood. The case studies' total population was approximately close. However, it was investigated by considering the household size and the number of families in each house on social interaction and social indices.

Finally, the chapter identified the typologies of the communal spaces within SFHNs in Basra that were used for regular and formal gatherings. The findings showed that formal and regular meetings mostly take place in unintentional communal spaces. The spaces in front of the main

entrances of houses are the most commonly used communal space for regular meetings by residents, while worship facilities (mosques and hussainya) are most used for formal gatherings. Also, the findings revealed that social activities were mainly conducted by males and children and rarely by females. Furthermore, five barriers and motives for using communal spaces for social gatherings amongst Basra's residents were identified.

The diversity of method tools used in this research was very relevant to the scope of the research. Each tool generates outcomes that show the scope from a specific perceptive, including providing the experts' experiences, residents' perceptions, and socio-spatial practises. In other words, this diversity provides layers of results to reach as accurate findings as possible that relevant to the research context, and at the same time, it has assisted in verifying each other's results.

## Chapter 9 Conclusion

### 9.1. Introduction:

The research aims to address the research questions and related objectives. Mainly, it investigates the factors that affect social interaction among residents in the spaces of single-family house neighbourhoods (SFHNs) in Basra. Furthermore, it explores the key concepts, indicators and main determinants that drive the understanding of social sustainability as it relates to the built environment of residential neighbourhoods. Finally, the research provides a list of recommendations to improve the social life, and accordingly, the social sustainability of the city by improving the quality of existing communal spaces.

This chapter presents the conclusions from this research by, firstly, discussing the way in which the research questions and related objectives have been achieved; this is outlined before considering the overall research contribution. Limitations are noted alongside recommendations that are drawn to improve and enhance existing and future communal spaces within SFHNs. Finally, opportunities for further research are outlined. This chapter reviews the research questions that formed the focus for the collection of both primary and secondary data. The secondary data were gathered from literature, governmental documents, and a site survey that involved an urban design audit whilst the primary data emerged from the case study fieldwork, which included semi-structured interviews with Iraqi experts, a questionnaire, observations and behavioural mapping. Based on the findings, answers to the research questions outlined in this chapter provided a basis for the overall conclusions.

## 9.2. Key Findings

This section discusses the key findings of the research that correspond to the research questions established in Chapter 1 (see Table 1-1, page 14).

***RQ. 1: What are the key concepts, indicators and main determinants that drive the understanding of social sustainability as it relates to the built environment of residential neighbourhoods?***

***Objective:*** *To explore the key concepts, indicators and main determinants that guide the understanding of the notion of social sustainability as it relates to the built environment, in general, and to residential neighbourhoods.*

The first question and related objective formed the initial stage of the research, which was addressed by the literature review in Chapter 2 (see Appendix A for more detail). A comprehensive literature review provided essential knowledge and a general understanding of the key concepts of social sustainability as they relate to the built environment of residential neighbourhoods in different worldwide contexts, and particularly in the Middle East. The chapter also provided particular emphasis on the critical indicators and primary determinant of social sustainability that will lead to learning in similar contexts.

Social sustainability is one of the three dimensions of the concept of sustainable development that has been widely used over an extended period of international discourse since the 1960s, and particularly following the publication of the Brundtland Report (WCED, 1987). The literature shows that attaining urban social sustainability is a dynamic, complicated process; therefore, a growing body of literature attempts to define this “nebulous” concept. Consequently, overlapping concepts and theories that discussed the notion of social sustainability were reviewed, as indicated in Appendix A. Additionally, a significant gap was identified through the current urban-related literature on social sustainability as it is a dynamic concept and has changed with time. The review specified a gap in the concept of social sustainability in the Middle East region, as developed countries tend to address the concept of social sustainability more than developing countries. In other words, while it is widely integrated in developed countries, many developing countries are yet to apply the theories, concepts and ideas of social sustainability. The transient nature of countries in the Middle East has yet to be fully addressed by academic researchers. As a result, the concept of social sustainability has been inadequately discussed academically in Iraq, and in isolation from the urban form and people’s participation.

The indicators of social sustainability are significant and thus need to be addressed in order to build communities with such qualities. However, in the context of the neighbourhood, urban planners and architects can play an important role in the successful building of communities; this also lies within the remits of authorities, key stakeholders and the residents themselves. Therefore, an integrated approach at a broader level can help to achieve social sustainability. As a result, two main dimensions of social sustainability - social equity and the sustainability of communities - were employed in order to identify the *indicators and main determinants that guide the understanding of social sustainability as it relates to the built environment*. The critical analysis in Chapter 2 identified nine social sustainability indicators that were clustered under the dimension of community sustainability. Five of these indicators were identified by Bramley et al. (2006): social interaction and networks, sense of community, community stability, pride or sense of place, and safety and security. The other four indicators were density, urban form, resident satisfaction, and privacy and cultural aspects. Furthermore, accessibility is another indicator that represented social sustainability from a position of social equity. Additionally, a comprehensive analysis of relevant studies advocated that social interaction is the primary determinant of social sustainability as these studies discussed this indicator in different contexts. The urban form in developed and developing contexts influences social sustainability revealing the role of planners and designers in creating physical elements that enhance social interaction among residents. Thus, urban planners can be inspired by traditional urban forms to create integrated urban environments which are more socially sustainable (Sharifi & Murayama, 2013).

***RQ. 2: What are the possible aspects that affect local social interaction among residents in different types and contexts of residential environments?***

***Objective:*** *To explore the nature and type of aspects that affect local social interactions among residents in different residential environments and contexts.*

The second question and its related objective were also addressed by conducting an extensive literature review in Chapter 2. The chapter provided a comprehensive understanding and determination of the types of aspects and factors that affect social interaction among residents in communal spaces in similar contexts to the research context. It categorised the key aspects extracted from the critical analysis of relevant studies in developed, developing, and Middle East countries.

To achieve this question and the related objective, pertinent earlier studies that investigated the influence of different factors and aspects on social interaction among residents was analysed.



The literature review examined the relationship between social interaction and the urban form of the built environment (including the neighbourhood or shared communal spaces) and how to enhance social interaction. There is growing literature on the effect of the design of the built environment, such as the traditional city on social interaction among residents. At the same time, literature was found on the influence of the design of communal spaces on social interaction, such as the openness of courtyards, and climate responsive design that works with local weather conditions. Furthermore, it emphasised the impact of some of the indicators of social sustainability, such as density and urban form on social interaction alongside some demographic factors. Consequently, the current research categorised three aspects of factors that can affect social interaction among residents in residential environments, which were collected from earlier studies (see Tables 2-19, 2-20, 2-21). These aspects were:

- The impact of the SSI on social interaction, including the sense of community, privacy, safety and security, attachment to place, resident satisfaction with the built environment, and density.
- The impact of the PCBE: this involved accessibility, the provision and location of open green spaces, the provision and location of public infrastructure (social, educational, health...), climate responsive design, maintenance, and the site design (this includes the neighbourhood and its communal spaces).
- The impact of the DF, which includes ten factors. They are gender, age, marital status, education level, employment status, the types of tenure, number of children living in the house, the presence of relatives living in the same neighbourhood, the number of hours worked, and length of residency.

The study focused on these three independent variables, by investigating their influence on social interaction. These three aspects can directly or indirectly, subjectively or objectively affect social interaction. Moreover, the study investigated the influence of these three aspects on the level of neighbouring, social networks and social relationships among residents. Furthermore, Chapter 2 demonstrated eleven indicators that manifest social interaction (see section 2.6, page 50).

***RQ. 3: How do the critical factors that affect social interaction manifest in the communal spaces of residential neighbourhoods comprising single-family houses in Iraq?***

- ***Objective. 1:*** *To identify the typologies of communal space used in the neighbourhoods of single-family houses in an Iraqi context, especially in Basra.*

The first objective was achieved in two stages. Firstly, a desktop study was conducted to analyse both the limited literature on communal spaces in the Iraqi context, and the secondary data obtained from Basra Municipality (maps and schemes) alongside the findings of the fieldwork site survey. As a result, the intentional and unintentional types of communal space in the Iraqi residential context were identified and represented in Chapter 3. This determination embodies one of the criteria for selecting case studies to investigate the theoretical research framework. The communal spaces that are available in the Iraqi context, especially in Basra, are similar to those provided in every residential context, excepting the cultural background for some types. For example, it is common to use the space in front of the main entrance of the house to gather with a friend or neighbour.

The second step was to amalgamate the findings from users' urban and social sense questionnaire (Chapter 6) and the residents' socio-spatial practices (Chapter 7). This step presents the types of communal space most used for social contact by residents in SFHNs and is shown in Chapter 8. Chapter 6 discussed the most used communal spaces for regular and/or formal gatherings, the frequency of their use, residents' perceptions regarding the available communal spaces, and the suggestions they offer to encourage participation by adding or changing current spaces. Chapter 7 discussed the residents' socio-spatial practices, which involved observations and behavioural mapping. The findings in this chapter included the types of activities undertaken by residents across the surveyed neighbourhoods, the communal spaces used, the frequency with which these spaces are used, and their time of use during the day. Also, the number of users, their gender and age groups, broken down into males, females and children, were covered in the chapter. The chapter revealed five barriers and motives to use communal spaces within the neighbourhoods. They are the climatic conditions, the quality of physical attributes of the communal spaces, the proximity to dwellings, the cultural considerations in the design process, and the economic and political transformations.

Chapter 8 showed that the spaces in front of the main entrances of houses were the most frequently used communal space for regular contact by residents. This was followed by the mosque/church, local shops, and the local market or malls located within the neighbourhood. In contrast, worship facilities (mosque, church, and hussainya) were the most used communal

space for formal gatherings, such as weddings, condolence ceremonies, and religious ceremonies (Ramadan banquets, Eid breakfasts, and cooking on Muharram for the Martyr Imam Hussain's ceremony-Ashura ordinances). This was followed by "the space in front of the main entrance of the house", "streets and sidewalks" and "the shared garden of the neighbourhood". Moreover, 20% of the surveyed sample indicated other spaces for formal gatherings, namely "a house and halls for weddings".

- **Objective. 2:** *To extract the most influential factors from social sustainability indicators, physical characteristics of the built environment, and demographic factors on social interactions among residents use of communal spaces within residential neighbourhoods comprising single-family houses.*

The second objective was achieved by synthesising the findings of decision-makers' perceptions and users' urban and social sense questionnaire with the socio-spatial practices of residents (detailed observations and behavioural mapping). The final outcomes were synthesised and discussed in Chapter 8. The 17 Iraqi experts interviewed agreed on the effect of most of the examined factors on social interaction among residents within a range of degrees of influence, as shown in Chapter 5. The interviewed experts revealed their opinions regarding the impact of each factor according to their experiences. Furthermore, they agreed with the sub-variables that manifest the factors of both the SSI and PCBE, whilst adding new demographic factors to the DF list that needed consideration. Chapter 6 presented factors from the examined aspects (SSI, PCBE, and DF) that influenced the level of social interaction, neighbouring, social networks, and social relationships, overall and across the case studies according to users' perceptions.

The research findings in Chapter 8 suggested a list of factors related to the SSI, PCBE, and DF that affect social interaction, neighbouring, social networks, and social relationships. For the SSI, the sense of community, safety and security, privacy, density, and attachment to place, are found to have an impact on the level of social interaction. In contrast, the sense of community, density, safety and security, attachment to place, and satisfaction with the built environment are found to influence the neighbouring acts among residents. Moreover, the sense of community, safety and security, privacy, attachment to place, and density affect the level of social networks among residents, while safety and security, and resident satisfaction with the built environment affect the development of strong social relationships amongst residents.

For the PCBE, the provision of public utilities, open and green spaces, communal spaces designed to suit the area's climate, and their location within the neighbourhood affect social interaction. These physical characteristics would significantly improve the level of neighbouring acts among residents, thereby supporting the development of strong social relationships. At the same time, the individuals' social networks might evolve and grow when such elements exist within a neighbourhood since such places offer a chance for people to meet others. The findings also reveal that accessibility does not affect the level of social interaction; however, it can affect the use of communal space in terms of gender. Moreover, the maintenance of both the neighbourhood and its communal spaces affects social interaction, as it encourages and increases the number of users for social interaction. The neighbourhood and communal spaces' site design impact social interaction, neighbouring acts, social networks, and social relationships among residents.

In terms of the DF, the research findings suggest that gender, age, marital status, education level, employment status, length of residence in the neighbourhood, number of children aged ten years or less living in the house, and the presence of relatives living within the neighbourhood appear to influence social interaction. The number of working hours per day seems to have a minor effect on the level of social interaction among residents in communal spaces. In comparison, the first seven demographic factors that affect social interaction are found to influence the level of neighbouring acts among residents. The presence of relatives living within the neighbourhood seems to have a limited effect on the level of neighbouring acts among residents in communal spaces, as its influence was seen in one case study. Furthermore, gender significantly affects the level of social networks among residents in communal spaces in Basra's SFHNs. This is followed by education level, length of residence in the neighbourhood, the presence of relatives living within the neighbourhood, and the number of children aged ten years or less in the house. The age, marital status, employment status and the number of hours worked per day seem to have a less impact than the previously mentioned DF on social networks among residents. The findings also reveal that gender, employment status, and the presence of relatives living within the neighbourhood affect boosting strong relationships among residents who use communal spaces within SFHNs in Basra. In contrast, the education level has a minor impact.

- **Objective. 3:** *To investigate whether the current urban design of the built environment considers the socio-cultural values of a community with the changes in people's lifestyles and accommodates them in modern design trends in order to promote social sustainability, and thus, social life among residents.*

This objective was achieved by considering users' socio-spatial practices and decision-makers' perceptions; this has been shown in Chapter 8. The semi-structured interviews revealed that, despite the awareness of specific factors' impact on social interaction, the Iraqi experts interviewed do not consider these factors in work procedures due to several limitations. They reported minimal factors from SSI, PCBE, and DF aspects in work procedures to meet the general requirements for all residential developments. The findings of residents' socio-spatial practices and site survey indicate the deficiency of current built environment urban design, which was not updated practically. The urban design of the built environment of SFHNs seems to disregard the socio-cultural values of a community and the changes in people's lifestyles. This is obvious in the females' social and physical withdrawal and their low numbers observed when using the communal spaces. Besides, the design trends employed in the design of the housing sector in Iraq do not consider these factors to promote social sustainability and social life among residents. Chapter 8 revealed the need to improve social life by enhancing social interactions among residents in communal neighbourhood spaces. This is achieved by considering the impact of the factors examined in this research.

***R.Q. 4: What improvements can be made to the planning and urban design systems in Basra to achieve successful communal spaces in single-family house neighbourhoods?***

- *To develop a valid framework and lessons from Basra case studies, and recommend guiding principles for architects, urban professionals, and decision-makers by examining the views of decision-makers, residents, and spatial practices on improvements and enhancements to existing and future communal spaces within single-family house neighbourhoods.*

From the research findings, there are several key lessons to be learnt as the basis for recommendations to enhance the existing and future development of communal spaces in within single-family house neighbourhoods. Analysis across the empirical work leads to some key recommendations. The research addressed multilayer-based planning principles and design concepts, the implementation of which would help to ensure successful and efficient communal spaces in Basra. Primarily, the planning system has to be structured around authorities at different hierarchy levels, thus allowing for the formulation of policies to enhance communal spaces at an appropriate level. The planning system must introduce a strategy that guides the provision, diversity, and quality of communal spaces. When providing communal spaces within neighbourhoods, extra attention has to be given to the socio-cultural values of the community,

and the political and economic transformations that affected peoples' lifestyles after the war of 2003. Moreover, attention has to be given to the SSI, PCBE, and DF factors that affect social interaction among residents in developing and providing communal spaces. Authorities have to involve the community, other stakeholders, and educational institutions by publishing plans and strategies that implement such policies. To achieve sufficient public participation, this has to be undertaken in two directions: first, authorities have to involve the community in the planning decision-making process, and second, the community have to be educated to represent their rights and volunteer views about their built environment.

Policies developed at a high level must be shared with the lower, local level through the design concepts implemented in developments in the provision of successful communal spaces. There is an urgent need for a development plan within a comprehensive and flexible planning system that defines key objectives and strategies. Socio-cultural values are found to be relevant in enhancing social interaction among residents in Basra. These include encouraging neighbouring, increasing social networks and developing social relationships. This includes privacy, safety and security and containment. Moreover, factors from SSI, PCBE, and DF are also found related to improve the social life of communal spaces. The provision of family-friendly areas, user-oriented spaces, leisure facilities, food and drink provision, and activities for women, children, and elderly enhance active engagement to enhance satisfaction and spatial efficiency. Diverse, good quality communal spaces, such as coffee shops, stalls, gyms, libraries, playgrounds, and shops, are essential to improve social activities in any neighbourhood. Thus, place management, maintenance, privacy, and accessibility are essential to ensure long term sufficiency, and to encourage genders (mostly female) of different ages to use these facilities.

### **9.3. Contribution of the Research:**

The empirical investigation of social interaction patterns in this thesis was underpinned by a review of the theory on social sustainability, social interaction, factors/indicators that impact social interaction, and typologies of communal spaces in Iraq. The literature on the key concepts, indicators and main determinants that drive the understanding of social sustainability as it relates to the built environment of residential neighbourhoods in the Middle East context was analysed. Improving and encouraging social life in the communal spaces within neighbourhoods means exploring the factors that affect social interaction among residents in these spaces. Significant research on the aspects that influence social interaction was presented to identify the factors that affect social interaction among residents in communal spaces from



the perspective of a multi-layer approach. This considered the analysis of decision-makers and users' perceptions. Furthermore, observations of social interactions, the behavioural mapping of how and when users react in the communal spaces, and the barriers and motives for using these spaces were analysed.

This also examined specific locations in SFHNs, which are communal spaces. Some of these are not intentionally designed as communal spaces within neighbourhoods; yet they tend to possess unique elements that make them distinguished and used by residents. An analysis-based approach was used to gather secondary data from local government departments and pertinent literature (despite the limited literature in this regard) to recognise the intentional and unintentional communal spaces used in this study. The level of detail in the data collected in this research is significant in comparison with previous studies at the scale of residential neighbourhoods of single-family houses.

Factors from three aspects (SSI, PCBE, and DF) can be considered during the design process of residential neighbourhoods and communal spaces and their development process. This provides the opportunity to understand how each factor can affect and improve both social interaction among residents and the use of communal spaces within the neighbourhood. The research's main contributions to existing knowledge are:

1. Understanding the patterns of social interaction among users in communal spaces within SFHNs in Basra. This meant mapping the existing patterns of activities and social interactions within different types of communal spaces of three selected neighbourhoods in Basra. This study creates a detailed picture of if and how the available communal spaces of neighbourhoods of single-family houses facilitate and encourage social interaction among the residents of Basra and the individual activities of users. Photography of the current situation and residents' experiences of using these spaces contribute to a better comprehension of the current needs of users and offer a post-occupancy evaluation of these spaces in terms of their social sustainability.
2. Testing the existing assumptions regarding the impact of three aspects, namely the SSI, PCBE, and DF, on social interaction among residents in Iraq. This meant examining the influence of SSI, PCBE, and DF factors on the social interaction among residents within SFHNs in Basra. This has been considered from three different perspectives: experts' perceptions, residents' experiences and the researcher's observations. This research provides empirical evidence that will inform the design of future communal spaces within

residential neighbourhoods in Basra by considering these three aspects in addition to users' perceptions and needs.

3. Uncovering the role of physical characteristics of the built environment in neighbourhoods of single-family houses. This study tested a hypothesis concerning the impact of the physical characteristics of the built environment, including the design of the neighbourhood and communal spaces, on encouraging social interaction among residents and the people-based approaches of communal spaces within SFHNs. The findings reveal significant differences between the level of social interaction and the role of the physical characteristics from experts' perceptions and users' perceptions and their socio-spatial practices. This suggests the need for more research on this scope.

In addition to the aforementioned main contributions, other contributions to existing knowledge include the following:

- The study offers a contribution to international literature and knowledge on the planning and urban design practice of communal spaces in residential neighbourhoods in Middle East cities. With its focus on the communal spaces in Basra's neighbourhoods of single-family housing, it brings fresh evidence and new insights into developing these spaces by considering the impact of three aspects on social interaction. The experiences summarised from Basra offer contributions to planning and urban design theories for other developing Middle East countries and cities.
- This research demonstrates the effectiveness of a multi-layer methodology (i.e., mixed-methods approach) when studying the notion of social sustainability and the phenomenon of social interaction as a methodological structure for future researchers undertaking similar projects. As mentioned in the literature, social sustainability is a complex and vague notion; furthermore, it differs from context to context, and between social interactions. Social interaction amongst individuals in a specific built environment manifested in many scenes. Decision-makers' expertise, end-user's perceptions, and their socio-spatial practices are believed to be involved in creating these scenes. Therefore, it is better to examine the phenomenon of social interaction by considering all perspectives involved. As a result, this study used a multi-layer methodology, which was the best selection for the research subject and context.

The study used comprehensive research methods, including qualitative and quantitative data that provided different layers of results: decision-makers' and residents' views, and the views of residents in action (the socio-spatial practices of residents). These layers of results

offer a comprehensive understanding of both social sustainability and social interaction in the examined research context. This is attributed to the fact that a mixed-methods approach is useful in understanding contradictions between quantitative and qualitative findings. Moreover, the types of collected data - qualitative and quantitative - can help to validate each other and build a solid foundation from which to draw conclusions about interventions. This was achieved when the findings on decision-makers' perceptions and users' experiences were synthesised and validated by those of the socio-spatial practices of residents within the three selected neighbourhoods in Basra.

One of the advantages of the aforementioned approach is the identification of relevant contextual factors that affect the level of social interaction, neighbouring, social networks and social relationships among residents in the communal spaces of SFHNs. Besides, it helps to determine the typologies of communal spaces used in SFHNs. This determination contributes to the fragmented minimal literature. Correspondingly, the use of mixed research methods in future studies could be considered the most feasible way to comprehend the notion of social sustainability and the phenomenon of social interaction among residents in different contexts and environments. It is not sufficient to investigate the notion of social sustainability by using an isolated approach.

- The study develops practical policy recommendations (to architects, urban professionals, decision-makers as well as the educational realm) that would influence future planning and urban design practices in Basra and other cities. This influence will include developing the process of designing and managing communal spaces, which, in return, could promote social sustainability in Basra by enhancing the quality of its spaces. The recommendations of this research show the need for planning and implementation authorities in Iraq to consider social sustainability in residential environments in order to enhance social life in the city, and thereby the establishment of a sustainable environment. An initial step toward such application is to consider the examined factors of the SSI, PCBE, and DF that affect social interaction among residents in communal spaces of SFHNs, as well as the economic and political changes following the war of 2003 that affected people's lifestyles. The recommendations will also help to limit the adverse effects of the housing crisis that face the Iraqi government by considering the social aspect more seriously. Thus, the framework could add to theory by enabling the development of successful communal spaces within SFHNs through urban design and planning processes.
- The study identifies the typologies of communal spaces in neighborhoods of single-family houses, especially in Basra. This offers a review of the historical evolution of traditional

cities and Basra and analysed both the schemes of the area and the data of the fieldwork site survey. Furthermore, it identifies the existing typologies of communal spaces within Basra's neighbourhoods based on the structure and function of these spaces. In other words, the study identifies the communal spaces used for regular and formal gatherings. This research adds a further understanding of the communal spaces by indicating barriers and motives for the use of these spaces for social meetings in Basra, specifically and Middle East cities in general.

- The study develops new indices, and indicators by using existing and new indicators and measures. These specifically measure users' reactions to communal spaces, daily life activities, and some related data. Some of the measures widely used in research about collective information regarding social networks, neighbouring acts, and social relationships were adjusted in order to be suitable for use within the research context. This set of measures could be especially useful to other researchers investigating a similar project in comparable contexts.

#### **9.4. Research Limitations:**

There are a number of limitations and challenges in this research, which were encountered during the investigation, that need to be noted. Communal spaces within residential neighbourhoods are perceived and experienced differently by different groups based on their gender, age, and cultural backgrounds. However, the lack of previous empirical studies on communal spaces in Iraq, in general, and Basra, in particular, represents an important limitation. Additionally, writing the review of the urban development of Basra city and the social life within this context was challenging because of the limited resources or archives of historical documents and maps with text that the researcher could work from. Instead, the rather fragmented literature on the history of Basra and Iraq was used as a basis. The researcher sought to amalgamate photographic and textual evidence that tended to be separate in order to provide a coherent review.

Moreover, since some techniques in this research were based on a perceptual approach, there are limits to the results due to their basis in subjectivity. This was overcome by undertaking a questionnaire and socio-spatial practices of residents in addition to semi-structured interviews with 17 Iraqi experts who work within local (Basra) and central (Baghdad) government. The current study combined the findings of these tools and justified the final outcomes by using the observations and behavioural mapping. These tools are designed for professionals, as this gives a professional perspective, and for academics they could be useful for future research. Thus,

the tools could be adapted and used to illustrate the factors affecting social interaction in different residential contexts according to residents' experiences in contrast to those of professionals.

Some challenges influenced the primary data collection process. Obtaining security permissions for field trips in Basra from the local government was an issue that extended the task times. This has led to major methodological constraints, which impacted the conduct of the semi-structured interviews, the distribution of the questionnaire, and the application of residents' socio-spatial practices, including observations and behavioural mapping. During the interviews with professionals, the researcher encountered some difficulties, which meant they took longer to complete than expected. Some of these interviews took place in governmental departments, where some interviewees dealt with their daily work while answering the questions. Due to the short time frame of an already congested field visit, some of the interviews were conducted online as some of the Iraqi experts interviewed were in Baghdad.

In terms of the questionnaire, the researcher had to select some known people who could impact and reach residents within each case study to depend on them to distribute and receive the paper copy of the questionnaire. However, the researcher could not find any contributor in AlZahraa neighbourhood to take the position as contact with the residents there; therefore, the number of participants from this neighbourhood was low. Hence, as a support plan, the researcher distributed the survey online, and the questionnaire was distributed on WhatsApp groups alongside dissemination via a local NGO (My Right Organisation) that helped spread the link on their Facebook and WhatsApp platforms. Moreover, it is argued that the questionnaire can be a subjective tool and derived from self-report information, which can be viewed as a critical limitation that is time-consuming. People may not answer the questions truthfully. Therefore, it is essential to undertake further research that employs focus group interviews. This tool helps to discuss the responses in more detail.

Regarding behavioural observations, photographing people in communal spaces within residential neighbourhoods is challenging and not welcomed because of cultural and security considerations in Basra; this is particularly sensitive when there are females or families present. Also, as a female researcher, there was limited cooperation from people in the context. Therefore, wide shots were taken to illustrate the issues and to show some of the activities as part of a wider image rather than a detailed photograph of the activity. The researcher tended to use a camera phone while walking or taking a ride in a car with the responsible person who was selected for each case study to record the activities that occurred at the site, as it was

difficult for a female researcher to stand in a residential area to conduct observations and take photos. This was particularly the case in AlJunainah and AlKhalij Alarabi, while in AlZahraa, the researcher had to be accompanied by one of her family members to undertake the observations. Another reason to use a camera phone was the climatic condition of the area. The observations were conducted at specific times during the day to avoid the heat of the sun, although the seasons were winter and spring. This affected the data recording in the prepared sheets of tables, which lead to the video capture of activities and voice recorded notes (via the phone) to capture most actions. This enabled the researcher to fill the prepared sheet with the required information after completing each round of observations. For future research, it is crucial to use a video camera and hire a trained team to help the researcher collect intense data and avoid time consuming when conducting observations and behavioural mapping.

## **9.5. Recommendations for Improvement:**

The earlier chapter discussed the research findings, mainly determining the factors that affect social interaction in addition to those that affect the level of neighbouring acts, social networks, and social relationships among residents in communal spaces within SFHNs in Basra. This was achieved by investigating the impact of each of the SSI, PCBE, and DF on social life in communal spaces in the selected case studies in Basra. The main findings show a list of the factors that positively and negatively affect social interaction and social indexes in the communal spaces of SFHNs. In contrast, some factors did not match the findings of the literature review regarding their influence on the level of social interaction. The residents' perceptions and their socio-spatial practices revealed that in addition to the difference in the level of residents' social interaction across the case studies, some of the communal spaces used are unintentional spaces. This means that the quality of intentional communal spaces should be developed and enhanced. Besides, the current qualities must also be maintained, considering the factors that affect social interaction. The findings lead to some key recommendations.

### **9.5.1. Communal Space Level:**

This set of recommendations is proposed to enhance the social and spatial qualities of communal spaces in Basra's neighbourhoods, and to ensure physical and psychological comfort in these spaces. The recommendations of the research combined the outcomes of people's perceptions from the questionnaire and the researcher's suggestions from behavioural observations in order to enhance social interaction in the communal spaces. The



recommendations discussed are categorised into urban professionals and architects, decision-makers, and educational institutions.

#### **A. To Urban Professionals and Architects:**

- Ensure the provision of a diversity of communal spaces within neighbourhoods, such as a library, club, mall, takeaway shop, local shops, playgrounds for children, and parks, according to the suggestions of the majority of the surveyed sample. The provision of recreational and leisure activities in spaces enhances social interaction (Gehl, 2011).
- Ensure the provision of parks that are designed in response to the area's climate, and include hard and soft landscapes, such as suitably shaded seating places, fences, plants, fountains, and clean spaces. Moreover, design these communal spaces and places with a sense of privacy, safety and security. Create a natural environment to achieve attractive and visually pleasing spaces.
- Provide communal spaces within cohesive and accessible spaces in residential neighbourhoods that are walkable and easy to access and move around in. This can be achieved by establishing these amenities at central locations within close distances from the dwelling units that reflect the standards used.
- New communal spaces should endeavour to create as much mixed-uses as possible in the immediate surroundings, and for existing spaces, and when the opportunity arises, to introduce uses which support activity.
- Consider the requirements of users with special needs in communal spaces. The provision of inclusive spaces, which are welcoming to all users encourage engagement in public life (Carmona et al., 2010).
- Considering the local socio-cultural values within the communal spaces and their surroundings when designing communal areas within neighbourhoods in Middle East cities. In other words, respect the requirements of users regarding age groups and gender. It is essential to take into account privacy, containment, and safety and security when designing communal spaces to encourage females to use them for regular gatherings instead of houses.
- Enhance the identity and image of the spaces, which would help to create distinctive places with a distinguishable character (Lynch, 1960).

### **B. Decision-makers:**

- Ensure the sharing of the developed policies at a high level with the lower, local level through design concepts that consider the affective factors on social interaction in the provision of successful communal spaces. This means to ensure the development process is based on a comprehensive analysis that considers the influence of the SSI, PCBE, and DF aspects on social interaction.
- Ensure the activation of resident participation in decision-making related to neighbourhood affairs. This can be achieved by delivering workshops that explain, train, and educate residents on participation in decision-making. Enhance public participation will ensure residents' engagement in the process of redesign, regeneration, and maintaining the quality of existing communal spaces within SFHNs in Basra.
- Consider the socio-cultural values of the community, changes in people's lifestyles and in political and economic aspects (especially those following the war of 2003) when updating the current standards and laws of both urban design and planning. Additionally, consider these aspects in the development of current schemes and in the design new residential projects.
- Ensure regular and high-quality maintenance.
- Ensure activating the social sustainability role as one of the aims to achieve SDGs in institutional and operational governmental departments.
- Consider the social aspect when addressing the housing crisis that faces the Iraqi government. Decision-makers usually tend to provide as many dwelling units as possible without considering ways to enhance the level of social interaction among residents by providing of well-designed communal spaces when developing or designing new housing projects. This means that the housing crisis could lead to the neglect of social sustainability indicators, and social problems may emerge which result in the city becoming unsustainable socially.

### **C. Educational Institutions:**

Acknowledge the notion of social sustainability and the factors affecting social interaction from theoretical and practical viewpoints. Social sustainability is always ignored in the Iraqi governmental agenda. Therefore, there is a need to promote people's interest in this notion. In order to provide people with a comprehensive understanding of the concept of social

sustainability, it is important to start with education by including social sustainability in architectural academic curricula.

- Higher education institutions and universities in Basra and Iraq need to consider the introduction of designers' planning experiences in order to enable students to develop a coherent background and build reliable sources concerning the application of social sustainability in different built environments.
- Provide courses that reveal the differences between cultural, social, and environmental sustainability. Furthermore, explain that the three sustainability dimensions, social, environmental and economics, should be treated equally, which, in return, explicates the significance of maintaining the balance between these three dimensions.
- Support further investigations into the notion of social sustainability in the research context.

#### **9.6. Policy and Guideline Recommendations:**

Based on the findings of this research, the researcher has developed a set of recommendations that are directed to planning authorities. These aim to enhance the adequacy of communal spaces in Basra. There is a serious need to restructure and re-organise the planning system into a clear hierarchy, where all government agencies with relevant responsibility cooperate to produce better planning and urban design. The planning policy of communal spaces has to be set at the national level in Basra and Iraq because communal spaces can promote social behaviour between residents and encourage different community groups whereby people can meet, enjoy themselves, play and be festive (Buonfino & Hilder, 2006; Carmona et al., 2010; Farida, 2013; Francis et al., 2012; Gehl, 2011; Mahdavejad et al., 2012). From this national planning policy, a strategy for communal spaces should be provided to boost cross-departmental and partnership working and maximise the potential for success in existing and new communal spaces. Therefore, the strategy for public spaces should;

- Provide guidelines for the provision of communal spaces within SFHNs, including types, conditions, management plans and proportion per capita in developments.
- Provide design guidelines and codes for open communal spaces, which correspond to social, environmental and economic needs.
- Increase awareness of the importance of communal spaces within residential neighbourhoods of single-family houses among professionals.

- Involve stakeholders and the community within the system provided.
- Increase public awareness of the needs of users in communal spaces and their roles in the providing system.

### **9.7. Directions for Further Research:**

As well as responding to the research questions, this study raises new queries for further research concerning the effective factors on social interaction. This research determined that some factors did not affect the level of social interaction, although the opposite was found in the literature. Therefore, it would be useful to conduct an in-depth study investigating the influence of these factors in other residential developments in Iraq. Broader and more thorough research about the impact of accessibility, maintenance, and resident satisfaction with the built environment on social interactions amongst residents in the diverse topographic areas within Iraq is therefore needed. This would allow for detailed comparative studies on the factors that affect social interaction (and which not), including social ties, networks, and neighbouring.

This research identified the effective factors on social interaction in the communal spaces within SFHNs built since the 1960s as most of the residential neighbourhoods in Basra. Future research could, therefore, examine new residential areas that have been established in the last five years to investigate the effective factors on social interaction among residents. This research also highlighted weaknesses in the design and planning process when providing communal spaces within residential neighbourhoods. More in-depth research could be conducted on the organisational and legal aspects of providing different types of shared areas within residential neighbourhoods. It could also aim to determine ways to achieve stronger coordination and cooperation within Iraq's current institutional arrangements.

The current research was not explicitly designed to evaluate people's perceptions on why they do not use the available communal spaces within neighbourhoods, i.e., to find out why they do not use such places for everyday life. However, the research specifically examined the types of communal spaces within SFHNs with users of the selected areas and the factors that affect social interaction among residents. Therefore, it is essential to continue with further research to explore the wider society's perceptions and experiences of new spaces and why most are used. Nonetheless, this research still offers a better understanding of the current context of communal spaces within residential neighbourhoods in Basra.

Moreover, this study investigates the influence of three categories of factors on the social interactions among residents in communal spaces within Basra's neighbourhoods. These factors include the social sustainability indicators, physical characteristics of the built environment, and demographic factors. The current work also excluded some aspects from the investigation due to the difficulty in obtaining relevant data because of their sensitivity for residents, such as political, religious, health issues. Examples of this sensitive information, which proved difficult to obtain while conducting the current research, are political affiliations with a particular party, religious sects, or the presence of certain diseases. These issues have arisen following recent changes in Iraq after the 2003 war. Therefore, it is essential to carry out research to explore the influence of these extraneous factors on the social relationships among residents in communal spaces in the context of Iraq.

As well as answering the main research question, this thesis notes three directions for further research

- a) This work investigates the types of communal spaces in Basra's neighbourhoods of single-family houses that were built in the 1960s. Therefore, research could be carried out to explore the types of communal spaces in new residential districts, such as Alamal City and Al-Andalus, which are further away from Basra's city centre. This would allow for comparisons with the findings of this thesis.
- b) Due to similarities among residents' general religious and cultural orientations, and behaviours in cities and certain regions in Iraq, the recommendations for improving and rethinking the communal spaces SFHNs in Basra may also be appropriate for other SFHNs. Therefore, due to the applicability of the method used, the research could be carried out to examine the factors that affect social interaction among residents in other contexts in Iraq and different types of neighbourhoods.
- c) Due to the exclusion of a few aspects in the current work, further research needs to be carried out to examine the influence of some extraneous factors, such as political, health, and religious issues, on social interaction among Iraqi residents. Recently, a global public health crisis has been generated from the highly contagious coronavirus and the rapid spread of COVID-19 disease. This causes the appearance of the 'new normal' lifestyle that addresses this crisis by implementing social distancing measures and guidelines. This critical change could affect the level of social interactions among residents at the levels of neighbouring, social networks, and social relationships. Although there is no sufficient empirical research conducted to address the earlier areas of potential contributions both at the architectural and urban scales, a study by Salama

(2020) has raised debatable questions to address various scales and scopes. He stated that there are many social and spatial implications that architects, planners, and built environment professionals would be keen to examine. His compelling questions deal with the nature of transformations in urban dynamics post-pandemic, the key socio-spatial implications of distancing measures, the possibility of COVID-19 to alter the understanding of urban space and urban life dialectics, and whether engagement with nature would be favoured over human-human / human-built environment engagement. Also, he arises if the post-pandemic period would create new environments that support new living and working styles. To address such arguable issues, the current method tools used in this research are very relevant to examine human interaction with the environment, whether these tools are observation study, questionnaire, or interviews with decision-makers. All these tools combined will contribute to a better understanding of Covid implications on social interaction in communal spaces in residential environments. Consequently, further research would be essential to explore how this pandemic affects social interactions and how to overcome the challenges.

Communal spaces are substantial spatial elements of any city and residential structure; these basically shape social lives. Essentially, this research is one of the first studies to identify the factors that influence social interactions amongst residents inside communal spaces within SFHNs in Basra in order to improve the quality of these spaces, and, in return, improve the social sustainability of the city. The findings from this thesis highlight weaknesses and identify areas for improvement in order to enhance the experience of using communal spaces in Basra, and in other cities.

There is scope to reinstate some of the traditional forms of communal space; however, on its own, this would not be an appropriate solution as society has changed and affected users' lifestyles. Nonetheless, a deep understanding of the needs of the existing community and their national identity and values, which are represented in religious, social, and cultural traditions, are essential in developing successful communal spaces. Also, respect for the environment, economic, and social values, and the demographic factors, social sustainability indicators, and physical characteristics of the built environment are fundamental considerations when providing communal spaces in current Middle East cities. Such factors and values have to be carefully addressed at different levels of the planning system and supported by guidelines, policies, and plans.



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# Appendix A: Social Sustainability and Its Influential Indicators

## A.1. Introduction:

This appendix forms an expanded literature review in the areas of urban social sustainability. The appendix investigates different theoretical views on the notion of urban social sustainability, including definitions, studies from various countries (such as the UK, Australia, China, Amsterdam, India and some parts of the Middle East), and overlapping concepts in some of the indicators. This appendix also examines the commonly used indicators of social sustainability in the literature, which examine the notion in the housing context.

## A.2. Concepts and Theories of Urban Social Sustainability:

Sustainability tends to be considered more from the environmental and economic than social dimensions (Cuthill, 2009; Murphy, 2012; Vavik & Keitsch, 2010). Thus, the social dimension of sustainability has yet to be recognised in a broader context within academic literature, as it is a complicated and multifaceted concept that has often been examined through the lenses of separate disciplines and theoretical perspectives (Colantonio, 2007). Although some researchers indicated the importance of the social component of sustainability, “*there is little agreement as to what this consists of*” (Bramley & Power, 2009, p.31). Urban social sustainability relates to urban planning, architecture, psychology, sociology, policy and institutions. It is a dynamic concept and has changed with time, and a significant gap is identified through the current urban-related literature on social sustainability. Since most studies are also conducted in the context of developed countries, there has been little discussion on place related issues; thus, there is a gap in understanding concerning the emerging issues for developing or less developed countries. Furthermore, the social sustainability of urban areas is currently understudied within academic literature (Ghahramanpouri et al., 2013). Sustainability relates to society and individuals. As human behaviour is a complex phenomenon, it can only be viewed through social, psychological and personal aspects (Goel & Sivam, 2015).

Several scholars focused on defining the term social sustainability; therefore a growing body of literature has attempted to define this “nebulous” concept (Jenks & Jones, 2009). Moreover, several definitions have been proposed in the academic field of urban social sustainability (such as: Chiu, 2003; Littig & Griessler, 2005; Mckenzie, 2004; Partridge, 2005; Polèse & Stren, 2000; Yiftachel & Hedgcock, 1993). Urban social sustainability is an overarching idea, which incorporates the overall satisfaction of residents within communities. Polèse and Stren (2000, pp.15-16) define urban social sustainability as:

Development and growth compatible with the harmonious evolution of civil society; the fostering of an environment conducive to the compatible cohabitation of culturally and socially diverse groups, while at the same time encouraging social integration, with improvements in quality of life for all segments of the population.

Polèse and Stren (2000) interpret social sustainability as the collective functioning of society and issues relating to the quality of life. According to Serag El-Din et al. (2013), there is a relationship between sustainable urban development and quality of life. They suggest the latter is a multidisciplinary concept, and that the definition of urban quality of life is complex. Their study emphasises the role of urban planning and design, which contributes to principles of urban quality of life.

The sociologists, Littig and Griessler (2005, p.11), have proposed the following definition of social sustainability:

Social sustainability is a quality of societies. It signifies the nature-society relationships, mediated by work, as well as relationships within society. Social sustainability is given, if work within a society and the related institutional arrangements (1) satisfy an extended set of human needs and (2) are shaped in a way that nature and its reproductive capabilities are preserved over long period of time, and the normative claims of social justice, human dignity and participation are fulfilled.

This definition is similar to that found in Chiu (2003) who stated that social sustainability refers to the improvement and maintenance of current and future generations’ welfare, by focusing on actions that promote social sustainability, and enhance the quality of life by reducing social inequality (Enyedi, 2002). Both previous definitions highlight social justice. Similarly, Mckenzie (2004, p.25), in his working paper, proposed a definition, which is “*social sustainability is a life-enhancing condition within communities and a process within communities*



*that can achieve that condition.*”. According to McKenzie, future generations will not be disadvantaged by the activities of the current generation, when social sustainability incorporates equity of access to key services (including housing, health, education, transport, and recreation), as well as equity between generations. In this understanding, social sustainability is a system of cultural relations in which the positive aspects of disparate cultures are valued and promoted. Also, it is evidenced by the widespread political participation of citizens not only in electoral procedures but also in other areas of political activity, and particularly at a local level. Therefore, McKenzie (2004) argues that social sustainability is about accessibility, inter-generational equity and continuation of culture.

Through an extensive desk research methodology, Ghahramanpouri et al. (2013) identified social equity, the satisfaction of human needs, well-being, quality of life, social interaction, cohesion and inclusion, and a sense of community and place as important factors in urban social sustainability.

Social sustainability [is] about people’s quality of life, now and in the future. Social sustainability describes the extent to which a neighbourhood supports individual and collective well-being. It combines the design of the physical environment with a focus on how the people who live in and use a space relate to each other and function as a community. It is enhanced by development which provides the right infrastructure to support a strong social and cultural life, opportunities for people to get involved, and scope of the place and the community to evolve. (Dixon & Woodcraft, 2013, p. 475).

Moreover, the Brundtland Report (1987, p.33) for the United Nations World Commission on Environment and Development, states that “*sustainable development is a development that seeks to meet the needs and aspirations of the present without compromising the ability to meet those of the future*”. The two key concepts included in the report are the essential needs of the poor, to which overriding priority should be given; and the environment’s ability to meet present and future needs.

Yiftachel and Hedgcock (1993, p.140) defined urban social sustainability as the “*continuing ability of a city to function as a long-term, viable setting for human interaction, communication and cultural development*”. In their view, a socially sustainable city involves a viable urban social unit marked by vitality, solidarity, and a common sense of place among its residents. Figure A-1 illustrates an analytical framework to examine the level of urban social sustainability regarding social equity, community and urbanity.

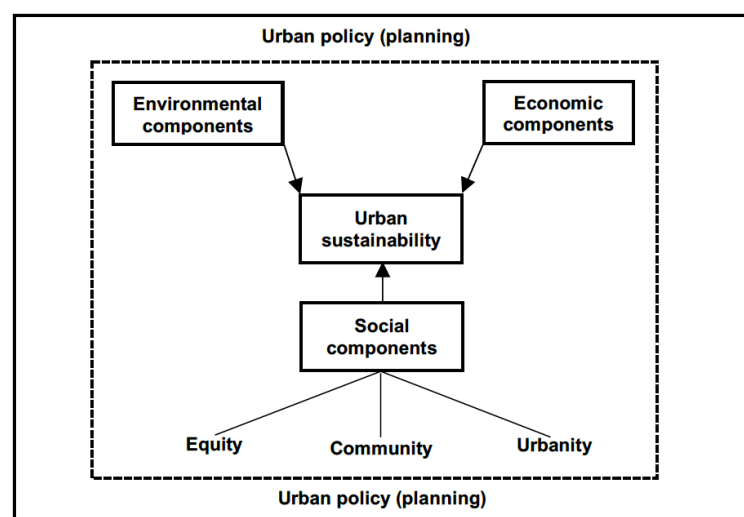


Figure A-1 Urban social sustainability: A conceptual framework. (Source: Yiftachel and Hedgcock (1993, p. 141), as cited by More (2017)).

Here, equity refers to social problems based on the equality of social groups, whilst community means developing a sense of community amongst social groups. The layout and design of the neighbourhood, character and dimensions of the neighbourhood unit impact social behaviour and relations. Urbanity refers to the movement of people from suburban areas to the city, who go on to embrace the diversity and intensity of city life. Yiftachel and Hedgcock (1993) analyse the role of urban planners and recognise the nexus between urbanity, community and

development, identified in Australian cities as ‘bringing back the city’. They conclude that urban planning can fail if a sense of community is not addressed. The layout and design can favour social relations which can develop community identity and avoid social isolation. The social dimension of sustainability refers to that of the community.

Cities are a locus of human diversity: people of varying wealth and status share an association with an urban boundary. Despite these common boundaries, sharp social divisions characterise many cities. Some cities are more successful than others in creating an environment conducive to the cohabitation of a diverse population (Polese and Stren, 2000). Cities today face the challenges of social, economic and ecological sustainability yet have the potential to cope with the issues and challenges. Figure A-2 illustrates the multidimensional complexity of sustainability policies (Finco & Nijkamp, 2010). Physical, Environmental, Social and Economic are the major sustainability principles and policies. These are adapted as sustainability strategies in order to enable greater resilience and increased urban efficiency. Sustainability policies are multi-dimensional and complex; the challenge for urban planners and designers is to ensure sustainability in all its forms.

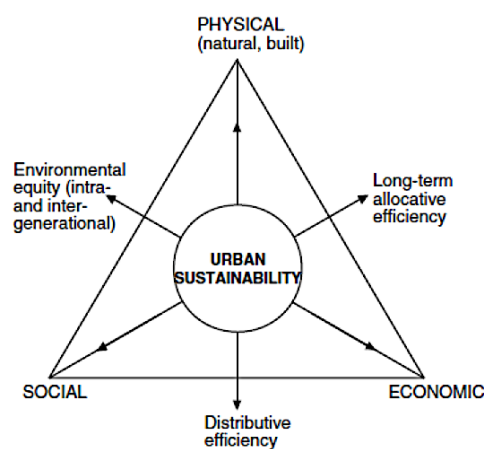


Figure A-2 Urban locus of sustainability principles and policies. (Source: Finco and Nijkamp (2010))

Urban social sustainability relates to the social fabric of cities and is an emerging area of research in urban planning, policy and practice at national, local and regional level. At the national level, research focuses on broader issues, such as migration and government policies, while at the local and regional level, it looks at building and thriving sustainable communities. A sustainable community is one in which people are not only able to live successfully, but want to live there (Vallance et al., 2011).

Social sustainability has three approaches to social capital for long-term sustainability in urban intervention areas. The first is social capital linked to individuals, the second is a feature of communities, and the third approach links capital between the civil society and public (Søholt et al., 2012). HACT (2015) studied the concept of social sustainability at the neighbourhood level and examined the concept of ‘community’ and interaction within the ‘space’ of communities. They concluded that a group of people who live together and share a sense of common beliefs, norms and well-being is conceived as a community, and that their common geographical location encourages a sense of shared identity.

The concept of urban social sustainability varies with time, culture and cities. Hilgers and Goldsmiths (2013) refer to three overlapping interpretations of urban social sustainability. The first is inspired by development studies and addresses social balance within an urban community, as guaranteed by equity and sustainability (Bramley, Dempsey, Power, Brown, & Watkins, 2009; Dempsey, Bramley, Power, & Brown, 2011). The second is that of “desired social change towards environmental sustainability in which people either actively embrace or resist those changes” (Vallance et al., 2011, pp. 342-343), and relates to sustainable behaviour. The third relates to cultural sustainability, and is based on the promotion and preservation of social and cultural stability. Soini and Birkeland (2014) describe cultural sustainability in terms of cultural heritage, constituting a source of identity of

the local sense of place, along with cultural vitality that provides a sense of belonging. They believe that economic viability, relating to place branding and marketing, is also part of cultural stability. Cultural diversity is a sense of community and local identity. The ‘locality’ of local ways of life and culture; the eco-cultural resilient balance between humans and nature, and eco-cultural civilisation are based on cultural norms and ideologies, and all contribute to cultural sustainability. The importance of diversity of cultures is also highlighted by Davidson & Wilson's (2009) definition, who stated that “*social sustainability is a system of cultural relations in which the positive aspects of disparate cultures are valued and promoted*”. Sachs (1999) similarly highlighted the significance of two types of sustainability; the first is *cultural* sustainability which requires a balance of externally imposed change with development and continuity from within, while the second type is *political* sustainability which is based on democracy, human rights, and effective institutional control.

Vallance et al., (2011) identify social sustainability as comprising three areas: ‘development sustainability’, addressing basic needs, social capital, justice and equity; ‘bridge sustainability’, which concerns biophysical environmental goals, and ‘maintenance sustainability’, meaning the preservation or sustaining of social-cultural characteristics. These influence how people embrace or resist change (see Figure A-3). Various researchers have published literature on urban social sustainability to interpret aspects of policy and practice.

Some scholars, such as Haqi (2016), intended to improve the understanding of current theories and practices when planning sustainable development and questioned whether a sustainable development approach would align with social sustainability objectives. This was achieved by applying content analysis to the literature review with a focus on planning sustainable development, the built environment, social sustainability, and urban planning fields. While Haqi (2016) aimed to enhance our understanding of current theories and practices of planning sustainable development, Mak and Peacock (2011) sought to disclose the level of focus a development has in meeting socially sustainable goals, making them success factors for development, and in planning a development now and into the future from a socially orientated viewpoint. They explored the characteristics of socially sustainable developments by comparing three case studies in London, UK, San Francisco, USA, and Sydney, Australia.

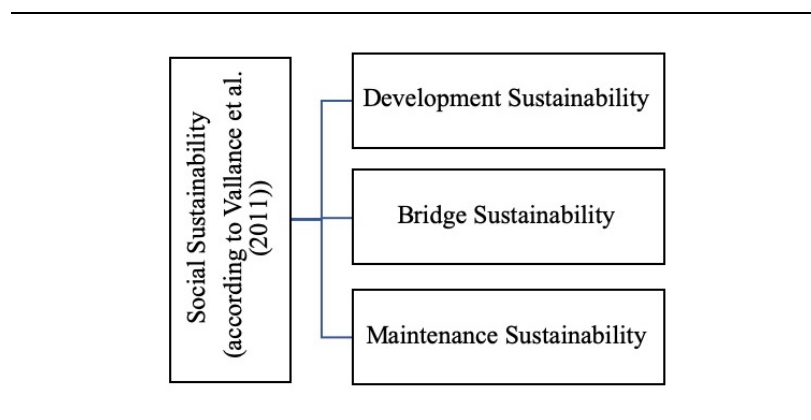


Figure A-3 Types of social sustainability compiled by the researcher from Vallance et al. (2011).

Stenberg (1999) and Colantonio (2007) discussed a way of achieving social sustainability by arguing that it could be addressed in anywhere by offering some essential requirements. These requirements are represented by affordable housing, which encompasses a comfortable, healthy and desirable house; maintenance and safety; good social relations among neighbours; health care; cultural advantages; offering convenient public transport; job opportunities with reliable income, and the opportunity for development and personal improvement, i.e., basic needs and equity (Colantonio, 2007). He (2007) argues that intangible and less measurable concepts are acquiring importance, such as identity, sense of place, quality of life, and the benefit of social networks.

Empirically, Chan and Lee (2008) examined certain design features that are significantly important to improve social sustainability that would enhance social sustainability. The results derived from their factor analysis indicated that certain design features should be incorporated to achieve social sustainability, which are: the satisfaction of welfare requirements; conservation of resources & the surroundings; creation of harmonious living environment; provisions facilitating daily life operations; form of development, and the availability of open spaces.

These were believed to be the most significant underlying factors for enhancing social sustainability of local urban renewal projects (2008) (see Figure A-4).

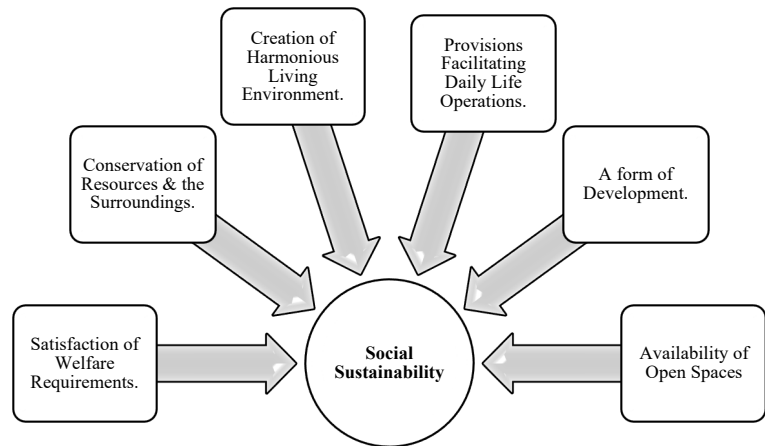


Figure A-4 The significant influential factors on the SS. Source: compiled by the researcher from Chan & Lee's research (2008).

Furthermore, a study of housing providers attempted to measure social sustainability. Dixon and Woodcraft (2013) developed a framework for social sustainability for housebuilders following a commission issued by the Berkeley Group to Social Life and the University of Reading. The aim was to create a practical and cost-effective way of measuring community strength and the quality of life across the Berkeley Group. The framework consisted of three dimensions: 'amenities and infrastructure', 'social and cultural life', and 'voice and influence'. They also identified 'change in the neighbourhood' as necessary; however, at the time, the 2011 census data was not available to enable comparisons. To develop the metrics, pre-existing national datasets or industry-standard assessment tools were used, and 45 questions were developed in total. A 'red, amber, green' scale was adopted to visualise whether the result for an indicator was worse, about the same, or better than expected in comparison to national datasets.

From the previous discussions, it can be said that social sustainability is a continuing positive process within communities. This process results from enhancing the quality of life by providing basic human needs and maintaining the welfare of current and future generations by reducing social inequality. This also takes into account the importance of culture and traditions in the built environment, and encourages social integration between socially and culturally diverse groups that live within a community. A review of earlier relevant studies revealed that scholars have sought to explore the notion of urban social sustainability by considering other aspects, such as examining the concepts of social justice, social exclusion, social capital, social cohesion, social inclusion, and cultural issues, while others have conducted empirical studies to identify factors to improve social sustainability. This offers evidence that social sustainability is a nebulous, complicated and multifaced concept. Table A-1 represents the reviewed earlier studies that discussed concepts and theories of social sustainability.

Table A-1 The most important studies deliberate the notion of social sustainability (compiled by the researcher).

The Authors	General Focus	Underlying Issues	Social sustainability
Chiu (2003)	The attempt to explore the relationship between housing and the social dimension of sustainable development.	Empirically, applying the quantifiable components of the methodology to explore the social sustainability of housing development in Hong Kong, noting, in particular, the changes before and after the critical year of 1997.	Moderate
Colantonio (2007)	Measuring Social Sustainability by providing a comprehensive overview of the current understanding of social sustainability and identifies the main propositions of the concept from Urban Renewal in the EU	<ul style="list-style-type: none"> <li>• Reviewing the major assessment methods, metrics and tools of social sustainability.</li> <li>• Assesses the methodological and practical hurdles to their full implementation</li> </ul>	Heavily
Chan and Lee (2008)	Identifying critical factors for enhancing the social sustainability of urban renewal projects in Hong Kong	<ul style="list-style-type: none"> <li>• Examining the opinions of architects, planners, property development managers, and local citizens</li> <li>• The satisfaction of Welfare Requirements</li> <li>• Conservation of Resources &amp; the Surrounding</li> <li>• Creation of Harmonious Living Environment</li> <li>• Provisions Facilitating Daily Life Operations</li> <li>• Form of Development</li> <li>• Availability of Open Spaces"</li> </ul>	Heavily
Bramley & Power (2009)	The relationship between social sustainability and urban form	<ul style="list-style-type: none"> <li>• Urban form</li> <li>• Density</li> <li>• House types</li> <li>• Selected social sustainability outcomes</li> </ul>	Heavily
Bramley, Dempdey, Power, Brown & Watkins (2009).	The relationship between social sustainability and urban form: Evidence from five British cities.	Household surveys linked to: neighbourhood physical, map-based, and sociodemographic data for five British cities.	Heavily
Jenks & Jones (2009)	Considering Measuring and characterising urban form of five UK cities so it can be related to environmental, social and economic sustainability, and comparatively analysed different forms.	<p>The physical design of urban form regarding physical configuration and layout, including:</p> <ul style="list-style-type: none"> <li>• Links to the wider urban system;</li> <li>• Its land uses and functions;</li> <li>• The typology and density of built form and presence of open space.</li> </ul>	Moderate
Davidson & Wilson (2009)	Discussing the social dimensions of urban sustainability and measurement issues	<ul style="list-style-type: none"> <li>• A critical review of the literature on planning for sustainability.</li> <li>• The form of the built environment</li> <li>• How social scientists, policy makers and planners understand sustainability</li> <li>• The of diversity of cultures.</li> </ul>	Heavily
Finco & Nijkamp (2010)	Illustrating the multidimensional complexity of sustainability policies.	Consider adopting the major sustainability principles, Physical, Environmental, Social	Moderate

The Authors	General Focus	Underlying Issues	Social sustainability
		and Economic as sustainability strategies to be more resilient and increase urban efficiency.	
Dempsey, Bramley, Power, & Brown (2011)	Providing clarifying of the social sustainability concept.	<ul style="list-style-type: none"> <li>A detailed exploration and definition of the concept of social sustainability within the urban context.</li> <li>The relationship between urban form and social sustainability</li> <li>Two main dimensions of social sustainability are identified and discussed in detail: equitable access and the sustainability of the community itself</li> </ul>	Heavily
Vallance, Perkins, & Dixon (2011).	Identifying social sustainability as comprising three areas: 'development sustainability', 'bridge sustainability', and 'maintenance sustainability'.	<ul style="list-style-type: none"> <li>Addressing basic needs, social capital, justice and equity</li> <li>concerning biophysical and environmental goals</li> <li>the preservation or sustaining of social-cultural characteristics: how people embrace or resist changes.</li> </ul>	Heavily
Mak and Peacock (2011)	Sought to disclose the level of focusing a development has in meeting socially sustainable goals, success factors for development, and planning a development now and into the future from a socially orientated viewpoint. They explored by.	<ul style="list-style-type: none"> <li>Examineing the characteristics of social sustainable developments through the comparison of three case studies in London, UK; San Francisco, USA; and Sydney, Australia.</li> <li>Scholarly views on the subject of the principles of social sustainability, including characteristics and core issues of social sustainability in planning developments and future communities.</li> <li>Investigating the current practices in UK, USA and Australia sustainable developments</li> </ul>	Heavily
Søholt, Ruud, & Braathen (2012).	Exploring the aspects of targeted urban-area interventions that involve and appreciate local people during the intervention process to motivate them to continue keep-up and develop their area afterwards.	<ul style="list-style-type: none"> <li>Social sustainability and social capital</li> <li>Participation and governance</li> </ul>	Heavily
Ghahramanpo uri, Lamit, & Sedaghatnia (2013)	Reviewing the current literature and characterise definitions and trends related to social sustainability consideration of various urban units.	Selection documents of urban planning, urban design, urban sociology and urban policy published from 1993 to 2012.	Heavily
Dixon & Woodcraft (2013)	Look at the importance of social sustainability for housebuilders	<ul style="list-style-type: none"> <li>Present a framework for social sustainability measurement</li> <li>Report the results of applying the framework in practice</li> <li>Discuss the policy and practice implications of such an approach</li> </ul>	Heavily



The Authors	General Focus	Underlying Issues	Social sustainability
Hilgers and Goldsmiths (2013)	Overview of the concept of social sustainability	<ul style="list-style-type: none"> <li>Focusing on the social aspects of sustainability.</li> <li>Cities</li> </ul>	Heavily
Soini and Birkeland (2014)	Consider culture as an aspect of sustainable development, where some of the storylines of this aspect can be seen as instrumental, contributing to the achievement of social, economic, or ecological goals of sustainability.	<p>Investigating the scientific discourse on cultural sustainability, which is organised around seven storylines:</p> <ul style="list-style-type: none"> <li>Heritage,</li> <li>vitality,</li> <li>economic viability,</li> <li>diversity,</li> <li>locality,</li> <li>eco- cultural resilience,</li> <li>eco-cultural civilization.</li> </ul>	Moderate
Goel & Sivam (2015)	The impact of social behaviour in choosing sustainable practices in daily life.	The individual behaviour patterns: sustainable and unsustainable lifestyle patterns.	Moderate
(Chiu, 2003; Littig & Griessler, 2005; Mckenzie, 2004; Partridge, 2005; Polèse & Stren, 2000; Yiftachel & Hedgcock, 1993; Dempsey, Bramley, Power, & Brown, 2011)	Providing definitions of urban social sustainability		Heavily
HACT (2015)	Studying the concept of social sustainability at the neighbourhood level.	<p>Exploring:</p> <ul style="list-style-type: none"> <li>The ways that social sustainability is defined in different contexts</li> <li>The ways that it can be applied.</li> <li>The elements to consider when curating socially sustainable communities</li> <li>Potential metrics for measuring social sustainability.</li> </ul>	Heavily
Haqi (2016).	Considering the overlapping between the social dimensions of sustainability and the theories or notions by investigating whether the approach of sustainable development bring into line with social sustainability objectives.	<p>The literature has been reviewed with a focus on:</p> <ul style="list-style-type: none"> <li>planning sustainable development,</li> <li>built environment,</li> <li>social sustainability,</li> <li>and urban planning fields.</li> </ul>	Heavily

### A.3. Concepts Overlapping with Social Sustainability:

After reviewing relevant earlier studies, it was found that several concepts overlapped with the notion of social sustainability. It was previously observed that a broad range of studies attempted to discuss concepts related to social sustainability although there is limited literature that discusses social sustainability specifically (Bramley & Power, 2009). Bramley and Power pointed out that achieving social equity, social inclusion and social capital is associated with the concept of social sustainability in urban development. These three concepts overlap with social sustainability in some indicators. These concepts recognised the significance of people's participation, their interest in society, as well as equal access amongst individuals to social benefits (Bramley & Power, 2009).

Jenks and Jones (2009) stated that nine concepts are overlapping with the notion of social sustainability, including social equity, sustainability of community, social cohesion, social capital, social inclusion (exclusion), social networks, (norms, values, and culture), sense of belonging (to place), and safety and trust, as shown in Figure A-5 According to some scholars (Bramley et al., 2006; Bramley & Power, 2009; Burton, 2000a; Chiu, 2002; Dempsey, Bramley, Power, & Brown, 2009), most concepts (dimensions) that overlap with the notion of social sustainability are social equity and community sustainability. Basic social sustainability concerns the social balance within an urban community. It is guaranteed through these two main principles: equity and community sustainability (Bramley et al., 2009; Bramley & Power, 2009; Dempsey et al., 2011). In order to explore social sustainability at the neighbourhood scale, both concepts need to be incorporated (Dempsey et al., 2011; Jenks & Jones, 2009).

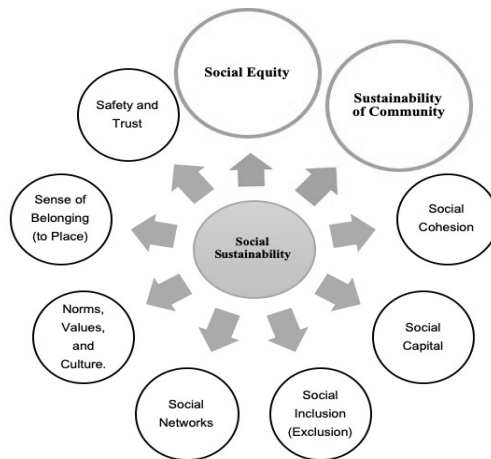


Figure A-5 The overlapping concepts with the notion of social sustainability. (Source: compiled by the researcher from Jenks & Jones (2009)).

These two main dimensions overlap with other concepts. According to Hemani et al. (2012), some concepts are associated with social equity and others with community sustainability, although both are considered overarching concepts at the core of the notion of social sustainability (Bramley et al., 2009, 2006; Bramley & Power, 2009; Burton, 2000; Chiu, 2002; Colantonio, 2008a-2008b; Dave, 2011; Dempsey et al., 2009, 2012; Karuppannan & Sivam, 2011; Sharifi & Murayama, 2013). This is shown in Figure A-6. The right side of the figure illustrates that the concepts of social capital and social cohesion relate to the concept of sustainability of community. The key measures for these two concepts are an attachment to the place/pride of place, social mixing/cultural unity, social interaction, safety/trust, and stability/demographic changes.

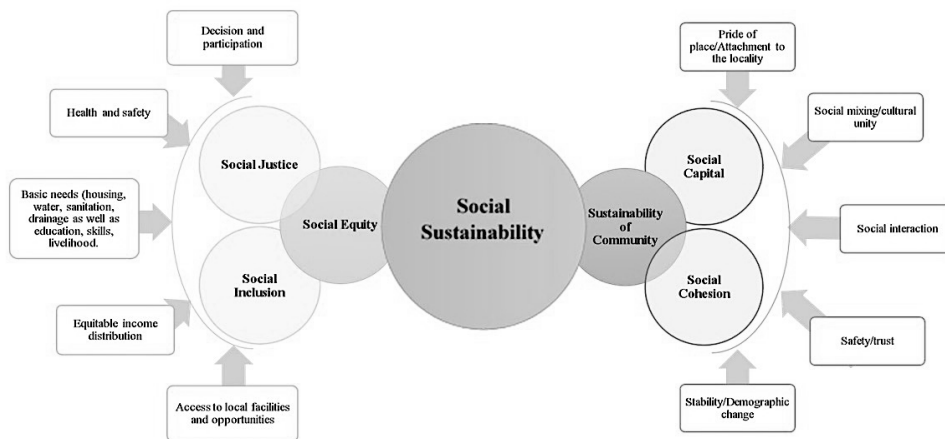


Figure A-6 The related concept to the notion of social sustainability. (Made by the researcher, source Hemani et al. (2012)).

The left side of the figure shows that the concepts of social justice and social inclusion relate to the concept of social equity. The key measures for these two concepts are decision and participation, health and safety, equitable income distribution, access to local facilities and opportunities, and basic needs (housing water, sanitation, drainage as well as education, skills and livelihood). The following sections explain the most two crucial related concepts to social sustainability.

#### ***A.3.1. Social Equity:***

Previous research provided clarification on the concept of social equity. According to Burton (2000a, p. 1970, as cited by Bramley & Power, 2009) stated that social equity subjects are powerful political and policy concerns, and focus on a distributive concept of social justice. Similarly, Pierson (2002) indicated that social equity refers to the proper delivery of resources and the prevention of exclusionary practices, which gives the right to all residents to participate fully in society, socially, economically and politically (Dempsey et al., 2012). Also, Bramley & Power (2009), Bramley et al. (2006), and Dempsey et al. (2009) stated that social equity involves services, jobs, and accessible opportunities.

According to Chiu (2003), the essential and crucial element of social sustainability is social equity. Also, Wolbring & Rybchinski (2013) highlighted the importance of this dimension in their research, which focused on assessing social sustainability for disabled people, and accessibility to services and facilities. Bramley and Power (2009) pointed out that the achievement of social equity, social inclusion and social capital are associated with the concept of social sustainability of urban development. As has been argued by Pincetl (2003), the consideration of the social, cultural and spiritual needs of a variety of social groups is a suggested characteristic of social equity, although equity does not mean that everyone can have the same amount of resources. Of more importance is the more efficient and equitable allocation of limited resources to ensure equity (Karuppannan & Sivam, 2011). With regard to the built environment, most of the literature highlighted that social equity means paying attention to the nature and extent of access to services and facilities in a given area.

In terms of services and facilities, it has been observed that there are daily services and aspects, which need equitable access by residents in a neighbourhood. In the literature (Aldous, 1992; Barton, 2000a, 2000b; Burton, 2000a, 2000b; Winter & Farthing, 1997), there seems to be a general agreement on the services and facilities that should be available to residents at the neighbourhood scale and should have good access. Bramley et al. (2009) pointed out that the services and facilities that are accessible in any neighbourhood are the essential local services, such as shops, schools, health centres (social structure); recreational opportunities, such as open and green spaces; public transport and services; opportunities for jobs, education and training, and affordable housing. Similarly, Dempsey et al. (2012) included education and training, housing, public services, social infrastructure, green space, culture and recreation. After reviewing the earlier literature, Dempsey et al. (2012) revealed the local services and facilities list, which is:

- Doctor/ GP surgery (key services)
- Post office
- Chemist
- Bank or building society
- Supermarket
- Primary school
- Pub
- Corner shop
- Café, restaurant, takeaway
- Community centre
- Library
- Sports and recreation facility
- Facility for children
- Public open/green space

In conclusion, social equity is an essential aspect of social sustainability that considers the ability of residents to participate fully in society, socially, economically and politically (Dempsey et al. 2012; Pierson, 2002). As mentioned at the beginning of this section, accessibility is commonly cited as a fundamental variable to measure social equity (Burton, 2000a; Karuppannan & Sivam, 2011). Accessibility comprises the means of reaching services and facilities, job opportunities, education and decent housing on offer within the neighbourhood via the public transport, walking and cycling networks within the neighbourhood and further afield (Barton, 2000;

Dempsey et al. 2012). The built environment can have an impact on social justice through the extent and nature of accessibility (Dempsey et al. 2012). For example, the essential services and facilities, the public transport routes, and the provision for walking and cycling.

#### ***A.3.2. Sustainability of Communities:***

The second concept, the sustainability of the community, is described as “*essentially concerned with the continued viability, health and functioning of ‘society’ itself as a collective entity*” (Bramley et al., 2006, p. 5). According to Hilgers and Goldsmiths (2013, p. 5), “*the sustainability of the community is the ability of this community to reproduce itself, to perpetuate its viability, and to guarantee integration and social cohesion within the community*”. This concept, the more collective ‘sustainability of community’ dimension, may be seen as more nebulous (Bramley et al., 2009; Jenks & Jones, 2009). In 2006, the Office of the Deputy Prime Minister (OPMD) defined this concept, as mentioned in a working paper for a series by Colantonio (2007):

“Sustainable communities are places where people want to live and work, now and in the future. They meet the diverse needs of existing and future residents, are sensitive to their environment, and contribute to a high quality of life. They are safe and inclusive, well planned, built and run, and offer equality of opportunity and good services for all” (2007, p. 11).

To identify the fundamental indicators and variables of this dimension, several studies will be reviewed. The determination and collection of indicators and sub-variables depend on possible relations that might influence social sustainability. Some of these relationships proved their effectiveness for social sustainability within empirical research in some contexts. Some of the published studies in the field of urban social sustainability have investigated some relevant concepts or indicators that have an impact on social sustainability. For example, ODPM (2006, as cited by Dempsey et al., 2009), the European policy interpretation of ‘sustainable communities’ comprises the social aspect of sustainability and describes them as active, safe, and inclusive. Other features of sustainable communities are argued to involve social interaction and a stable community of inhabitants who feel attached to where they live (Forrest & Kearns, 2001); a feeling of community in a healthy and safe environment (Burton & Mitchell, 2006), and the amount of living space and satisfaction with the neighbourhood (Dave, 2011). Concepts like identity, the sense of place and the welfare of social networks, which are intangible and less measurable, replaced traditional topics, such as equity, poverty reduction and livelihood (Colantonio, 2008a, 2008b; Mak & Peacock, 2011). In 2007, Colantonio mentioned that ODPM (2006) demonstrated eight key characteristics of sustainable communities:

- Active, inclusive and safe - fair, tolerant and cohesive with a strong local culture and other shared community activities.
- Well-run with efficient and inclusive participation, representation and leadership.
- Environmentally sensitive - providing places for people to live that are considerate of the environment.
- Well designed and built - featuring quality built and natural environment.
- Well connected - with good transport services and communication linking people to jobs, schools, health and other services.
- Thriving - with a flourishing and diverse local economy.
- Well served - with public, private, community and voluntary services that are appropriate to people's needs and accessible to all.
- Fair for everyone - including those in other communities, now and in the future.

In conclusion, the features that can represent the concept of sustainability of a community are social interaction, a stable community of inhabitants, attachment to the place/sense of place, a feeling/sense of community, satisfaction with the built environment, identity, and the welfare of social networks.

### **A.4. Social Sustainability Indicators:**

#### ***A.4.1. Residents’ Satisfaction:***

Residents’ satisfaction is a crucial, necessary step in the formation of a cumulative and overlapping relationship between users and the built environment, which, in turn, affects the sense of community, attachment to place, and subsequently, social interaction. According to Bonaiuto, Aiello, Perugini, Bonnes, and Ercolani (1999), residential satisfaction, which is made operational through components of perceived residential environmental quality, should act as a predictor of place attachment.

According to Hur and Morrow-Jones (2008), the neighbourhood is the basic environmental unit in which our social life occurs and which necessarily has an effect on the quality of life of its residents. The sense of belonging to a neighbourhood has an implicit emotional part according to which the satisfaction experienced develops following an evaluation of the physical and social elements of that environment (Mesch & Manor, 1998). Even in the conceptualisation of 'place', this evaluative emotional component appears, given that it is usually described as a 'space endowed with the meaning' (Altman & Low, 1992). Therefore, residential satisfaction can be understood as a dynamic process of interaction between residents and the physical and social factors of the environment (Galster, 1987). In this regard, residential satisfaction can be approached as a process that largely depends on the past evolution of the individual and their surroundings (Amérigo & Aragones, 1997). Thus, it is reasonable to assume that the number of interactions established with both the physical and social elements would be greater when someone lives in a neighbourhood longer (Speare, 1974).

One of the aspects that affect residents' satisfaction is the housing layout pattern. This could include circulation patterns, accessibility, the provision and location of a social infrastructure, the location and size of the open space, safety, aesthetics, and land use distribution (Karuppannan & Sivam, 2011). This study examines the satisfaction of residents with housing layouts, the provision and location of a social infrastructure, the types of communal spaces, the location and size of open spaces, the available visual attractions, and the maintenance level.

#### ***A.4.2. Safety and Security:***

It is said that a fundamental part of social sustainability is the perceived safety of a neighbourhood (Barton, 2000a). In its definition of social cohesion, the UK House of Commons Committee positioned perceived safety within Maslow's 'Hierarchy Of Needs', in which the fulfilment of basic needs is required before social cohesion can be achieved (House of Commons, 2004; Maslow, 1954). Thus, it is an antecedent for any positive social activity taking place in a neighbourhood (Barton et al., 2003). Providing security and, with it, feelings of safety in a neighbourhood are closely related to the other dimensions of community sustainability.

In a neighbourhood free from crime and disorder, residents can feel secure in their social interactions with other people and their participation in community activities. It is argued that people '*hate to feel unsafe or to live in an unsafe place*' (Shaftoe, 2000 p. 231) and that most simply want reassurance that they have nothing to fear from their neighbours. Such feelings of safety arguably enhance trust and reciprocity between residents and contribute to the sense of community and sense of place in a neighbourhood. Some of the claimed relations between safety and the built environment include the cited benefits of natural surveillance, i.e. active frontage such as windows directly overlooking streets, which is said to increase perceived comfort and safety when people interact with one another. The poor condition and maintenance of a built environment are claimed to have detrimental psychological effect on people's sense of safety (Worpole, 2003). The idea of nobody caring is closely linked to the 'broken window syndrome', where even "*cosmetic damage can invite more serious anti-social or even criminal behaviour*" (Wilson and Kelling, 1982, cited by Nash & Christie, 2003, p. 47). Thus, current government policy emphasises the importance of considering crime prevention as part of the urban design process (ACPO, undated; House of Commons, 2004, cited by Bramley et al., 2009).

The current research study will measure the indicator of safety and security by measuring the level of agreement of residents with some statements that related to this indicator. These statements ask about the safety of living in the neighbourhood, the safety of walking around the neighbourhood during the day; the safety of using open and closed communal spaces during the daytime and evenings; the safety from car accidents and planning for long residencies in the neighbourhood.

#### ***A.4.3. Sense of Community:***

Some scholars consider the sense of community as a theory to represent social interaction, whilst it is also a concept discussed in the area of urban planning and design. McMillan and Chavis (1986) explained the meaning of psychology in the sense of community, as it is a sense of belonging that the people have and share among each other, and a trustful sense between the individuals and groups. They discussed four factors that defined the sense of community.

1. Membership: a feeling of belonging or sharing a sense of personal relatedness.
2. Influence: making a difference to a group.

3. Reinforcement integration and fulfilment of needs: where members' needs are met by resources received through membership of the group.
4. Sharing an emotional connection: in other words, the commitment and belief that members have shared and will share history, common places, time together, and similar experiences.

According to Talen (1999), sense of community can be defined as a combination of shared emotional contact through the interaction with others, place attachment and a sense of membership in terms of the feeling of having a 'right to belong'. The sense of community is explained as a sociological tradition by urban planning and design. The sense of community represents human satisfaction (Brower, 1996). Although all communities are based on people sharing common interests and values, there are also communities of place (McMillan & Chavis, 1986). These are communities shaped by social relations between neighbours and other residents who live in an identifiable geographical area, supported by various environmental characteristics (Nasar & Julian, 1995a). Gehl (2011) considers that physical settings, activities and meanings are interrelated with physical environment regarding 'sense of place'. As stated by (Fukuyama, 1999, p.15), there is a direct and positive relationship between norms and values and the sense of community, as stated by *'the deeper and more strongly held these common values are, the stronger the sense of community is'*. Such a sense of community may manifest itself through the built environment, for example through common norms and codes of behaviour (Kearns & Forrest, 2000) such as an unwritten rule about keeping gardens tidy and lawns mown.

This is similar to some theories that have been explained in Islamic literature, such as "preventing the harming of public rights" (Ia Darar Wala Dirar), where caring and maintaining the residents' rights and duties are the principles. Many traditional religious scholars have discussed inhabitants' rights and duties according to Islamic values. For example, Ibn Taimiya, who lived between 1263 and 1328, clarified the rights and duties of residents in traditional Muslim cities, such as all the residents had opportunities to build many floors in their dwellings, but this should not have side effects for their neighbours, such as affecting the air ventilation, light, privacy, etc (Mortada, 2003). In contrast, no one has the right to build industrial facilities in the neighbourhood (e.g. leather-tanning factory or flour mill). This aims to keep the neighbourhood as convenient as possible to residents by minimising sources of pollution or noise (Mortada, 2003).

The sense of community in a neighbourhood varies based on miscellaneous components, such as the socio-cultural and environmental factors, and resident satisfaction (Rio et al., 2012). It is a social experience that can result in a sense of place and a spatial experience. It comprises both neighbouring interactions and a cognitive and emotional connection to the people and place. The benefits of neighbouring promote a sense of community and give residential satisfaction by encouraging community participation and a safe environment that nurtures social bonds. Plas and Lewis (1996) examined the relationships between the built environment and sense of community, by reviewing a new neighbourhood in seaside Florida. To do this, they used a qualitative research methodology, with a four-element sense of community index (Chavis & Newbrough, 1986; McMillan & Chavis, 1986) with sense of community variables that included loyalty, integration and satisfaction of demands, membership and feelings that are shared among the members.

In their study of neighbourhoods in New Zealand, Sengupta et al. (2013) identified 'feasible' and 'unfeasible' sense of community indicators. The former includes group activities in the local region, the use of public transport, and resolving local social issues such as noise pollution. The latter consists of household ownership, income, education, and the proportion of smokers in the region. Sengupta et al. (2013) argue that the sense of community contributes to social capital and is implied by policymakers for the benefit of the residents. McNeill, Kreuter, and Subramanian (2006, cited in Sengupta et al., 2013), identifies a sense of community as an important predictor of well-being, which differs among various types of people.

Participation in local and community activities, for example, attendance at a neighbourhood group, opposing the erection of a mobile phone mast, or regular participation in a sports team on the local green space (Dempsey, 2006) is claimed to relate closely to one's sense of community. Because participation in local and community activities is associated with the concept of civic society, measures of 'civic sociability' and civic culture often include participation in organised activities (Putnam et al., 1993). It is not, however, a certainty that, if participation in organised activities in a neighbourhood does not occur, such behaviour is necessarily described as socially unsustainable. People have many and different types of the social network, both within and outside a neighbourhood, which may mean that their particular interest is not shared by others in the neighbourhood, or that



they cannot regularly participate in localised activities. Furthermore, people may not have a tendency or desire to participate (Keller, 1968). However, despite claims to the contrary (Skidmore et al., 2006), it is clear that participation in organised activities is widely considered to contribute positively to community sustainability. Claims have been made that participation is associated with density and land use mix; thus, that mixing land uses and increasing density may provide residents with a greater variety of activities in which to participate.

Identity and social participation are nuclear and dynamic components of social cohesion strategies. The ideas of belonging to one shared community, shared values and goals contribute to social cohesion. The sense of belonging is conveyed in terms of identity; this identification can be between people and society, at a neighbourhood level. A sense of identity is therefore a social mechanism for social inclusion, (Zupi & Puertas, 2010).

In this study, the indicator 'the sense of community' will be examined by measuring the level of agreement amongst residents to a number of statements used in the previous relevant studies. These statements are '*participation in community affairs, social activities, and civic responsibility*'; '*knowing the neighbours*'; '*making new friends*'; '*the participation decision-making processes relevant to the neighbourhood*'.

#### ***A.4.4. Attachment to the Place - Pride/Sense of Place:***

It has long been claimed that physical settings, activities and meanings are interrelated (Gehl, 2011; Lynch, 1960). Relph (1976, p. 49) states that "*to be inside a place is to belong to it and to identify with it*", which can be as much about the physical environment as the people who inhabit it. Prescriptive theory calls achieving a 'sense of place' through carefully designing spaces and buildings and, for example, the retention of landmarks (Duany, 2003). According to Nash and Christie (2003), a positive sense of attachment to a place is considered a dimension of social sustainability because it is an integral component of people's enjoyment of the neighbourhood in which they live. While it is acknowledged that residents' sense of place attachment relates to the physical environment in which they live, the socio-spatial interpretation of neighbourhood and community adopted in this research also acknowledges the attachment that residents have to the people living there. This is often described as a 'sense of community' and is related not only to other residents, but to the social order, common norms and, to a lesser extent, civic culture in a neighbourhood (Kearns & Forrest, 2000).

It is claimed that pride/sense of place can be affected by the perceived quality of a place (Talen, 1999), consequently, such feeling is closely related to the built environment. For example, if a place has high levels of litter and vandalism, this is likely to affect people's sense of attachment to somewhere that does not feel looked after (Nash & Christie, 2003). This could then have adverse effects on feelings of safety, which might, in turn, decrease levels of social interaction and community participation. The sense of attachment to a place is also inextricably bound up with the concepts of belonging and territoriality; Forrest & Kearns (2001) argue that the importance of the urban form should not be undervalued concerning one's sense of identity and belonging. Residents of a particular neighbourhood share the built environment and the sense of attachment to a place that people have of that built environment, and together create 'the neighbourhood's own order, its special ensemble, which distinguishes it from the next place' (Relph, 1976, p. 2).

In the current research study, the sense of attachment to the place will be measured by evaluating the level of agreement with three statements. These statements are: *feeling attached to the neighbourhood strongly as being one of its members*; *when I arrive in the neighbourhood I feel if I have finally arrived at my home*, and *I feel proud of being living in this neighbourhood for good planning*.

#### ***A.4.5. Density:***

This section describes different dimensions of density used in this research, which are applicable to the neighbourhood scale and could claim to have an impact on sustainability. It is well known that there is variety and complexity in the definition and meaning of density. Density is used as a metric by decision-makers from many different disciplines and professions, such as anthropology, architecture, ecology, economics, environment-behaviour studies, planning, psychology, sociology, transportation and urban design (Churchman, 1999). Not surprisingly, there is no one accepted measure that is employed by everyone (Churchman, 1999; Forsyth, 2003). In the built environment, 'density' mostly means the ratio of population and/or of built space to a given area of land. The density of people and the density of buildings are combined; an increase of density in one generally leads to an increase of density in the other. Some scholars have provided descriptions about density that pertain to

dwelling units and populations at varying scales (from parcel to metropolitan areas), while others have concerned with built area intensity measures at the parcel or block scales, (Boyko & Cooper, 2011).

However, density is argued to have two dimensions, physical density and perceived density (Alexander et al., 1988; A. Rapoport, 1975). The presence of too many people or too much built up space in a given area is claimed to affect the perceptions of density. Higher density implies a higher ratio of buildings to a given land area; this saves the land, a scarce resource, but perceptions of this higher density affect social, economic and environmental conditions. Perceived density is also claimed to affect mental health, behaviour and social relationships. This study will consider the physical density to investigate whether the current distributions of population and dwelling density achieve sustainability. The inter-play of density and good design to achieve the right size of population or built up area (in a balanced way) is challenging but is claimed to be an effective way of achieving good quality of life and sustainability.

In calculations of density, for example, the numerator (the number of units) and/or denominator (usually the base land area) may differ; for example, the number of people per hectare vs. the number of dwellings in km<sup>2</sup>. Also, what is included and excluded in the calculation of some measures of density may vary; for example, the net density in one local authority may include a measure of pavements whereas another local authority may exclude it from their calculations (Churchman, 1999; DETR, 1998).

Policy-makers most often use parcel density, net neighbourhood residential dwelling/population density, city density, metropolitan density and, in London, habitable rooms per hectare (DETR, 1998) as density measures. Basically, these measures include dwelling density at different scales - the dwelling, the development site, the neighbourhood, the city and the larger city area - and can be found in policy and guidance (e.g., PPG3 in the UK, and SCH (2010) housing standards manual in Iraq). Density at each scale, though, will be appropriate for certain kinds of developments: parcel density (both gross and net density) for individual housing sites, neighbourhood density for a new residential community or urban quarter, and city and larger city area density is appropriate for new settlements or city extensions (DETR, 1998).

For local authority planners, the above measures will be used as well as front setbacks for kerbs and parcels, side-to-side distances between buildings, and floor area ratios and plot ratios (the latter often used in North America and continental Europe, DETR, 1998). Design and development briefs also will use floor areas and plot ratios in their calculation of total floor areas (e.g., in m<sup>2</sup>). Developers are most likely to use parcel density (Forsyth, 2003), floor area ratios, plot ratios and building site coverage. They also will converse with architects using terminology about total floor areas, which can be readily converted into dwelling density when designing for housing in mixed-use developments (Johnny Winter, Edward Cullinan Architects, personal communication, 6 June 2011). Finally, decision-makers in building services may use occupancy density, as undertaking this calculation helps to determine the spatial requirements for various services and infrastructure for buildings. Consequently, with some exceptions, there appears to be some overlap in the way density definitions are used by various decision-makers, such as policymakers, planners, developers and architects.

This research study examines the physical density impact on social interaction among residents. This will be achieved by investigating the percentage of housing units to the total area of the residential area; population and dwellings density; the number of people per house; the number of households per house, and comparing the rate of people using communal spaces with the total population that should utilise these spaces.

#### ***A.4.6. Privacy:***

The notion of privacy obtains various explanations in different contexts. Basically, privacy is defined as the mechanism of developing and maintaining process in the mutual relationship among individuals, within a small social group or in society at large (Al-Thahab et al., 2014). Irwin Altman (1975) indicated that the guidance of privacy through the creation of fundamental personal boundaries could achieve and maintain an individual's identity and personality (Al-Homoud, 2009). Westin (1967) argued that privacy works as the withdrawal of individual from society through the use of physical and behavioural boundaries. According to Al-Thahab et al. (2014), an individual's need to be included in the social interaction of everyday life is a significant determinant in the perception of the social space and boundaries of privacy. In this respect, privacy is never absolute as long as it refers to a changeable social and cultural sphere and interaction (Ramezani & Hamidi, 2010).

According to Altman (1975), privacy represents the interpersonal boundary-control process which organises our social interactions in manners similar to the shifting permeability of a cell membrane. Moreover, it is a dialectic mechanism and a system that stands between the restriction of interpersonal boundaries and being part of society through its dynamic ability to push towards an essential degree of openness-closeness, or accessibility-inaccessibility. This mechanism occurs with the presence of the relative reaction of various powers which change temporarily according to different circumstances. Altman presented the ‘desired’ and ‘achieved’ privacy where the subjectivity of the first is in the nobility of the sociocultural interactions between people at a specific period of time (Georgiou, 2006). For Rapoport (1977), privacy is the power and ability to manage social and cultural interactions between different social groups and being responsible for achieving the desired and acquired level of interaction (Ramezani & Hamidi, 2010). Striving for a degree of privacy does not mean the desire to achieve social isolation but is rather a communicative mechanism and guide for human social behaviour and shows, at the same time, the socio-physical boundary that isolates two different spaces (Georgiou, 2006). Consequently, privacy has to be conceptualised according to its relation to the different meanings of private and public realms.

The concept of privacy represents an important factor in the articulation of the built environment which has been largely interrogated in the analysis of the architecture of home and the spatial organisation of social spaces (Abdelmonem, 2010). The moral and behavioural system of Islam; as in the revelations of the holy Qur’an (4, 5 - 49), state *“Indeed, those who call you, [O Muhammad], from behind the chambers - most of them do not use reason, and if they had been patient until you [could] come out to them, it would have been better for them. But Allah is Forgiving and Merciful;”*. They prescribe a central criterion in determining privacy in the shaping of domestic social life of Iraqi society, yet they can equally be observed in non-Muslim communities in Iraq. Privacy, therefore, helps to improve the interrelationship between spaces within a living unit or between the unit and the outside context (Stewart, 2001).

The separation of public/private spaces summarizes the impact of the cultural and behavioural value systems on the sequence and hierarchy of spaces that largely defines the organic pattern of the traditional fabric at large. This context, in turn, introduces harmonious, integrated and controlled social relations within. Most cases dealing with privacy end up separating the public from the private through physical, behavioural and spatial codes which relate to *a consistent set of rules within a specific society* (Abu-Ghazze, 1993).

In this study, the privacy indicator will consider both perceived and physical privacy. From the perceived perspective, this will include reflecting the users’ feelings of comfort while using the communal spaces within their neighbourhood and the possibility of using these spaces with family, friends, and neighbours. From the physical perspective, this entails examining the hierarchy in the available communal spaces (from public to private) within the residential neighbourhood and the presence of physical or visual boundaries (trees and fences), and the possibility of surveillance by parents of children within open communal spaces.

### **A.5. Conclusion:**

The appendix discussed concepts, theories and research undertaken by various researchers in the area of urban social sustainability. Social sustainability is one of the three main dimensions of sustainable development. The other two dimensions are environmental and economic sustainability.

Through desk research methodology, the appendix reviewed relevant literature that examined the concept of social sustainability. A significant gap was identified through the current urban-related literature on social sustainability as it is a dynamic concept and has changed with time. Also, there is a growing body of literature that attempts to define this “nebulous” concept. The study of Yiftachel and Hedgcock (1993, p. 140) is an example that provided the first definition of urban social sustainability, which is defined as the *“continuing ability of a city to function as a long-term, viable setting for human interaction, communication and cultural development”*. The appendix also showed the common key issues that discussed in the earlier studies, as Table A-2 represented. It revealed that some studies were conducted at a neighbourhood scale in some developed and developing countries to examine the relationship between social sustainability and other social aspects.

Table A-2 Key issues in the literature review (compiled by the researcher).

The Key Issues	The region	Context	Authors
Providing definitions & explanation to the term of social sustainability	-	-	(N. Dempsey et al., 2011; Mckenzie, 2004; Vallance et al., 2011; Wolbring & Rybchinski, 2013; Yiftachel & Hedgcock, 1993).
The relationship between social interaction and the design of the built environment, such as the neighbourhoods and communal spaces.	Scotland , Taiwan Norway, Iraq, Algeria, Jordan	Multi-Rise Buildings	Farshidi (2016); Huang (2006); Skjaeveland, & Garling. (1997); Alahmed, et al (2014); Farida (2013); Abu-Ghazze (1999); Kennedy & Buys (2015).
evaluating the design of public neighbourhoods in terms of social sustainability.	UAE	Low-rise housing	Ahmed (2012), Ahmed (2011).
Using related concepts such as social equity, social justice, social capital, social exclusion, social cohesion to examine social sustainability.	Australia , Iran, UK	Multi-Rise Buildings	Baum & Gleeson (2010); Rastegar et al (2017); Hirschfield & Bowers (1997).
The relationship between neighbourhood density, perceived density and social sustainability.	New Zealand, Hong Kong India, UK,	Multi-Rise Buildings and residential landscapes	Ancell & Thompson-Fawcett (2008); Chan & Lee (2009); Dave (2011); Dempsey et al (2012); Bramley & Power (2009).
The relationship between inhabitants' satisfaction and: - Open spaces, their designing, aspects that impact open space provision. - The with the visual appearance of buildings and outdoor spaces, the physical characteristics of communal open spaces, types of outdoor appropriation, and their effects on community formation, level of maintenance and performance evaluation of housing schemes	Australia , Alegre, Brazil	Multi-Rise Residential Buildings	Lay & Reis, (2003).
The relationship between urban form and social sustainability aspects (mixed-used, compact, high-density forms) / related type of housing.	Mumbai, Delhi, UK, Iran, Amsterdam	Neighbourhood , Medium & high-density neighbourhoods	Bramley et al. (2009); Dempsey et al (2009); Bramley et al (2006); Karuppannan & Sivam (2011); Hemani et al. (2012); Sharifi & Murayama (2013); Hakim (1999); Arundel & Ronald (2017); Bramley & Power (2009).
The relationship between the sense of community with the public spaces	Western Australia	Multi-Rise Buildings	Francis, Giles-Corti, Wood, & Knuiman (2012).
Considering a new conceptual framework for social sustainability			Eizenberg & Jabareen. (2017).
Selecting indicators for sustainable development cities.	Iraq & Libya	City level	Alanbari et al. (2014); Elgadi at al. (2016), Al-Alwani (2014).
Highlighting factors that improve social sustainability	Hong Kong	urban renewal projects	Chan & Lee (2008).

The Key Issues	The region	Context	Authors
Evaluating the buildings' facades in order to achieve social sustainability by using the visual continuity of heritage architectural elements. Concerning the social and cultural sustainability in the typical design models of the public houses.	Iraq UAE	Proposed projects to develop the religious area Single-family houses	Al-Hinkawi & Hassan (2014) Ahmed (2011).

Since most of the studies are in the context of developed countries, there is a gap in relation to emerging issues in developing or less developed countries (Ghahramanpouri et al., 2013). *A socially sustainable* community concerns a society with high social capital, quality of life and well-being and communities with strong social bonds between them. The approach to the concept of social sustainability varies with the geographical location, alongside the influence of economic, political and environmental and social circumstances. The indicators of social sustainability are significant and thus need to be addressed in order to build communities with such qualities. However, in the context of the neighbourhood, urban planners and architects can play an important role in the successful building of communities; this also lies within the remits of authorities, key stakeholders and the residents themselves. Therefore, an integrated approach at a broader level can help to achieve social sustainability.

The appendix showed that the current study included the two main dimensions - social equity and sustainability of the communities, which comprise social sustainability (Bramley et al., 2009; Bramley & Power, 2009; Dempsey et al., 2011). Accessibility to the social services, facilities, and communal spaces will be considered in this research under the social equity dimension. The second dimension - sustainability of community - is strongly associated with notions of 'social capital' and 'social cohesion', which are the outcome of trust and social relations developed through interactions between residents, participation in community institutions, the relative stability of a community and the positive identification with a place (Bramley and Power, 2009; Dempsey et al., 2011; Forrest and Kearns, 2001). The appendix showed the collected indicators that determine social sustainability, where five key measurable aspects have been identified by Bramley et al. (2006) for use as indicators of community sustainability: social interaction and networks, participation in community groups and networks, community stability, pride or sense of place, and safety and security. The final collected list includes nine social sustainability indicators, including the previous five key measurable aspects of social life and density, urban form, residents' satisfaction, and privacy aspect.

## Appendix B: The Research Context Background

### **B.1. Geographic Location, Climate Conditions, and Population of Iraq:**

The Republic of Iraq is one of the Middle East countries, located in south-west Asia and forming the northeastern part of the Arab world. It is bordered by Turkey to the north, Iran to the east, Syria, Jordan, Saudi Arabia to the west, the Arabian Gulf, Kuwait and Saudi Arabia to the south; it extends between latitudes 29 and 27 north and longitudes 38 and 48 east. The capital is the Baghdad governorate, which is located at the centre of the country. According to the Central Statistical Organisation in Iraq (Central Statistical Organisation Iraq CSO, 2017), the annual statistical collection report states that Iraq covers 435,052 square kilometres, while, according to data obtained from “The World Factbook” (2017), the total area of Iraq is 438,317 square kilometres. Iraq’s topography is divided into four sections: the alluvial plain, the desert plateau, the mountainous region, and the terrain region. According to the administrative system of the country, which was inherited from the days of the Ottoman occupation of the country (1534-1917), Iraq is divided into 18 governorates (Al-Mas’audi & Al-Sa’adi, 2012).

In terms of the climate, Iraq is located within the northern temperate zone; however, its climate is subtropical with a rain-like system from the Mediterranean, as most of the rainfall occurs in winter, autumn and spring with zero rainfall in summer (Central Statistical Organisation Iraq CSO, 2017). Its climate can be categorised into three types. The first is Mediterranean climate, which covers the mountainous region in the north-east that is characterised by cold winters and moderate summers. The second type is the steppes climate, which is a transitional climate between the mountainous region in the north and the hot desert in the south. The hot desert is the third type of climate in Iraq, and this is where the case studies are located. The north-western winds prevail during all seasons of the year; it is cold and dry in winter and accompanied by a clear sky. In comparison, in summer the wind moderates the weather and decreases high temperatures. Eastern or north-eastern winds blow in winter, accompanied by severe cold and clear sky. South-Eastern winds are relatively warm and humid sometimes causing clouds and rains.

According to the annual statistical collection report (Central Statistical Organisation Iraq CSO, 2017), the population increased from 4.8 million in 1947 to nearly 6.3 million in 1957 with an annual growth rate 2.68%; moreover, it reached 12 million in 1977 with an annual growth rate of 3.2% for 1957-1977. The population reached 16.3 million in 1987 with an annual growth rate of 3.1% by the final population census results for 1977-1987. This was then raised to 22 million in 1997 according to the population census in 1997, with an annual growth rate of 3% for 1987-1997. Moreover, it was raised in 2009 to 31.6 million (by numbering and listing results), with an annual growth rate of 3.0% for 1997-2009, population; this increased to about 38.1 million as the projected population for 2018. As stated by CSO (2020), the total population of Iraq in 2018 is estimated to be 38,124,182, with a population growth rate of 2.58%. The urban and rural population proportions are 69.8% and 30.2%, respectively. As stated by The World Factbook (2017), it has been revealed that the concentration of population is in the north, centre, and eastern parts of the country, with many of the massive urban clusters found along large parts of the Tigris and Euphrates Rivers. Much of the western and southern areas are either lightly populated or uninhabited. Table B-1 represents the population in Iraq from 1987 to 2018. The population from 2010 to 2018 was calculated by numbering and listing the 2009 results, as reported in the annual statistical abstract (Central Statistical Organisation Iraq CSO, 2017).



Table B-1 The population in Iraq from 1985 to 2018 (source: CSO (2017)).

Year	Male	Female	Total
1985	8015	7570	15585
1986	8283	7828	16110
1987*	8396	7939	16335
1988	8675	8207	16882
1989	8953	8475	17428
1990	9190	8700	17890
1991	9460	8959	18419
1992	9731	9218	18949
1993	10001	9477	19478
1994	10271	9736	20007
1995	10541	9995	20536
1996	10843	10281	21124
1997**	10987	11059	22046
1998	11328	11347	22702
1999	11682	11700	23382
2000	12047	12039	24086
2001	12424	12389	24813
2002	12814	12751	25565
2003	13216	13124	26340
2004	13629	13510	27139
2005	14055	13908	27963
2006	14493	14317	28810
2007	14943	14739	29682
2008	16058	15837	31895
2009***	15910	15754	31664
2010****	16561	15929	32490
2011****	16985	16353	33338
2012****	17420	16788	34208
2013****	17864	17232	35096
2014****	18319	17686	36005
2015****	17790	17423	35213
2016****	18273	17896	36169
2017****	18764	18376	37140
2018****	19261	18863	38124

\* By population census results for the year 1987.  
\*\* By population census results for the year 1997.  
\*\*\* By numbering & listing results 2009  
\*\*\*\* (2010-2018) represent projections, noting that population projection for (2015-2018) calculated based on new population assumptions.

Iraq is characterised by the presence of diverse groups of ethnicities, including Arab 75-80%, Kurdish 15-20%, and other 5% (comprising Turkmen, Yezidi, Shabak, Kaka'i, Bedouin, Romani, Assyrian, Circassian, Sabaeen-Mandaeen, Persian) (*The World Factbook*, 2017). Thus, there is variety in spoken languages, which includes Arabic (official), Kurdish (official), Turkmen (a Turkish dialect), Syriac (Neo-Aramaic), and Armenian; these are official in areas where native speakers of these languages constitute a majority of the population.

The major (official) religion in Iraq is Islam, as 95-98% of the population are Muslim (Shia 64-69%, Sunni 29-34%). The second known religion is Christianity, which represents 1% of the population (including Catholic, Orthodox, Protestant, Assyrian Church of the East). While there has been the voluntary relocation of many Christian families to northern Iraq, the overall Christian population has decreased by at least 50%. However, the decrease is perhaps as high as 90% since the fall of the Saddam Hussain regime in 2003; according to US Embassy estimates, many fled to Syria, Jordan, and Lebanon. Other religions were estimated to comprise 1-4% of the Iraqi population (2015 estimation). Figure B-1 represents the distribution of religions in the Middle East and North Africa by country.

# Middle East and North Africa

## RELIGIOUS AFFILIATION BY COUNTRY

Data in graphics compiled in June 2014;  
updated September 2015.

Most self-identified religion  
per country

■ Muslim ■ Jewish ■ No reliable data

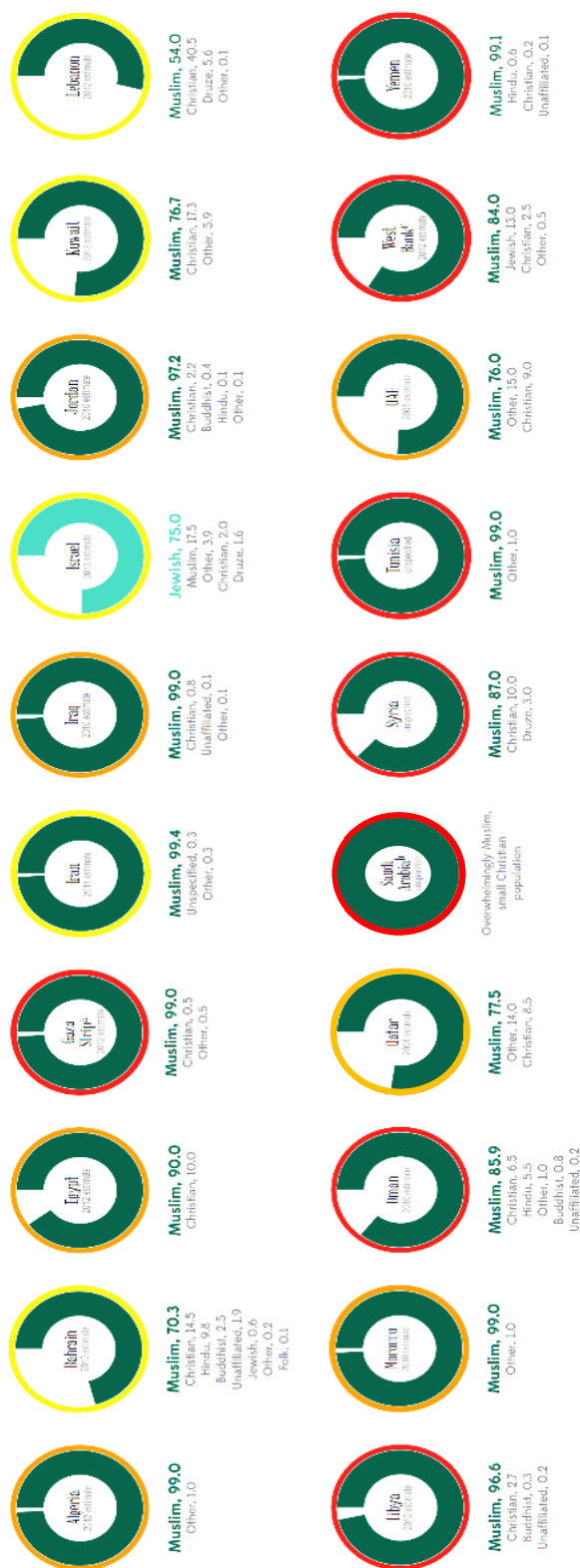
Unreliable level

High: Variety of data sources, including data from the country's national statistical agency and/or research consultancies; date of information is known and relatively recent.

Medium: Limited data sources; date of information is known but sometimes old.

Low: Few data sources; date of information sometimes is unspecified.

None: Data is unreliable.



\* The disenfranchisement of Israeli settlers was completed in September 2003. Gaza has had no Jewish population since then.

\* Officially, all Saudi Arabian citizens are considered Muslim. Conversion of a Muslim to another religion is considered apostasy and punishable by death. As of 2013, more than 30 percent of the population consists of immigrants, a significant share of them being Christian. Foreign workers are not allowed to practice Christianity openly but may register to attend church meetings in embassies or on the grounds of foreign communities.

\* The table does not include East Jerusalem.

Notes: Footnotings may not total 100 due to rounding.

15-17/2010 10-15

Figure B-1 MENA religious affiliation by country (source: The World Factbook (2017)).

## B.2. Basra Governorate:

The location of the case studies is in Basra Governorate, which, in April 2017, was recognised as Iraq's economic capital by the Iraqi Parliament (Walter, 2017). Basra city has played an important role in early Islamic history. It was built in 636 AD by the order of caliph, Umar Bin Al-Khattab, and became the first city built by Muslims outside the Arabian Peninsula, where it was of a military character. The governorate is the most southern of Iraq. In the south, the governorate is made up of a vast desert plain, intersected by the Shatt Al-Arab waterway, which is formed by the confluence of the Tigris and Euphrates rivers at Al-Qurnah and empties into the Arabic Gulf. Basra is located at 110 km by water above Al-Fāw on the Arabic Gulf. Accordingly, Basra is Iraq's main port, although it does not have deep water access, which is handled at the port of Umm Qasr and the port of Basra. The governorate is bordered with three governorates: Maysan and Dhi-Qar from the north, and Muthanna from the west, while the international borders with Kuwait and Iran border from the south and east, respectively. Table B-3 represents the area of the 18 Iraqi governorates, the number of districts, and sub-districts that were affiliated in 2017. As shown in Table B-3, the total area of the Basra governorate is 19,070 square kilometres, representing a percentage of 4.4% of the total area of Iraq (Central Statistical Organisation Iraq CSO, 2017; JAU, 2013). The governorate includes 16 administrative units that constitute seven districts (see Table B-3), which are Abu Al-Khaseeb, Al-Midaina, Al-Qurnah, Al-Zubair, Basra, Fao, and Shatt Al-Arab. The city of Basra, the governorate's capital, is Iraq's third-largest urban centre, and in terms of the total area, Basra is the sixth largest (see Table B-3).

Table B-3 The area of the governorates and the number of districts and sub-districts affiliated in 2017 (Central Statistical Organisation Iraq CSO, 2017)

Governorate	Number of sub-districts **	Number of districts **	%	Area (sq.km <sup>2</sup> )*
Ninevah	31	10	8.6	37323
Kirkuk	16	4	2.2	9679
Diala	23	6	4.1	17685
Al-Anbar	22	8	31.7	137808
Baghdad	32	10	1.0	4555
Babylon	18	6	1.2	5119
Kerbela	7	3	1.2	5034
Wasit	17	6	3.9	17153
Salah AL-Deen	17	9	5.6	24363
Al-Najaf	10	4	6.6	28824
Al-Qadlalya	15	4	1.9	8153
Al-Muthanna	12	5	11.9	51740
Thi-Qar	21	11	3.0	12900
Mayaan	15	6	3.7	16072
Al-Basrah	16	7	4.4	19070
Dohouk*	26	7	1.5	6553
Al-Sulaymaniyah*	61	16	3.9	17023
Erbil*	41	9	3.5	15074
Total	400	131	99.8	434128
Territorial			0.2	924
Total of Iraq	400	131	100	435052

\* Kurdistan Region

Source:

1. Areas obtained from the Ministry of Water Resources/General Authority.
2. Number of administrative breakdowns (district and sub-district) from CSO/Directorate of Population and Labour Force Statistics.

In terms of the climate, similar to the surrounding region, the governorate of Basra has a hot and arid climate, which has a wide range of thermal, low rain, and high humidity. The temperatures in summer are among the highest recorded in the world, regularly exceeding 50 °C (122 °F), and the average annual temperature is 24.3 °C (75.74 °F). Therefore, it is consistently one of the hottest cities in Iraq. Due to the vicinity of the Arabic Gulf, humidity and rainfall are relatively high. The governorate receives an average amount of 152mm of rainfall annually between the months of October and May (NCCI, 2015).

In 2018, the population of Basra's Governorate was estimated to be 2,908,491, which is Iraq's third largest and most populous city after Baghdad and Ninevah with a population growth rate of 2.1%. The proportions of the urban and rural population in the governorate are 81% and 19%, respectively (Central Statistical Organisation Iraq

CSO, 2017). Table B-4 shows the population projection for 2018 by the governorates and regions. The majority of the governorate's population is Shia Arabs; nevertheless, Basra also hosts a considerable Sunni minority, alongside small Chaldean and Assyrian Christian, Jewish, and Mandeans communities (NCCI, 2015); moreover, hundreds of Arab tribes and clans live throughout the governorate. The marshes in the northern areas of the governorate and along the border of Iran are the ancestral home of the Marsh Arabs (or Ma'dan). The Ma'dan have inhabited the marshlands of Southern Iraq for centuries, living in reed houses and practising traditional methods of agriculture, fishing and water buffalo breeding (NCCI, 2015).

Table B-4 The population projection by governorates and regions for 2018.

Governorate	Total مجموع	Rural ريف	Urban حضر	المحافظة
	مجموع Total	مجموع Total	مجموع Total	
Ninevah	3729998	1468069	2261929	نينوى
Kirkuk	1597876	416770	1181106	كركوك
Diala	1637226	831689	805537	ديالى
Al-Anbar	1771656	885541	886115	الانبار
Baghdad	8126755	1016521	7110234	بغداد
Babylon	2065042	1068157	996885	بابل
Kerbala	1218732	403860	814872	كربلاء
Wasit	1378723	548940	829783	واسط
Salah AL- Deen	1595235	875894	719341	صلاح الدين
Al-Najaf	1471592	420626	1050966	النجف
Al-Qadisiya	1291048	551447	739601	القادسية
Al-Muthanna	814371	444538	369833	المتن
Thi Qar	2095172	750362	1344810	ذي قار
Maysan	1112673	290820	821853	ميسان
Basrah	2908491	546368	2362123	البصرة
(15) Governorate Total	32814590	10519602	22294988	مجموع 15 محافظة
Kurdistan Region:				محافظة إقليم كردستان:
Erbil	1854778	310687	1544091	اربيل
Duhouk	1292535	335400	957135	دهوك
AL-Sulaimaniya	2162279	330160	1832119	السليمانية
Total of K.R	5309592	976247	4333345	مجموع محافظات الاقليم
Iraq Grand total	38124182	11495849	26628333	المجموع الكلي للعراق

Note :population projection calculated according to numbering & listing results 2009 .

ملاحظة : إسقاطات السكان محتسبة حسب نتائج الترقيم والحصر 2009

Basra was founded by Caliph Umar I in 638 c.e. It is the Bassorah of the *Arabian Nights* and Sinbad. In 1534, Basra was made part of the Ottoman Empire by Sultan Sulayman, who incorporated Iraq into his empire; along with Baghdad and Mosul, Basra was appointed one of the provinces of Ottoman Iraq. Although the Mamluks ruled Iraq for several centuries, the Ottomans re-established their authority in 1831, ousting the Mamluks and forcefully subjugating the tribal areas. British companies meanwhile established a sphere of influence, strengthening ties with tribal shaykhs and controlling the import-export market. The strategic position of Basra as a link in the overland route to Asia or the Mediterranean created a competition between the Ottomans, Germans, British, and Indians. The growth of the British and German presence in Basra during the eighteenth century awakened the Ottomans to its importance. They, therefore, attempted to re-establish their domination over Basra, Kuwait, and the surrounding region (Al-Khalaf, 2004).

During World War I, Basra was the first Ottoman city to fall to British–Indian occupation in 1914, and it was planned to keep Basra under permanent jurisdiction. However, although Britain was granted a mandate over Iraq by the League of Nations in 1920, they recognised Faisal I ibn Hussein as king in 1922 and dissolved the mandate in 1932, when Iraq was admitted to the League of Nations. One of the reasons that led to the Iran–Iraq War was control of the Shatt al-Arab, the major waterway connecting the Gulf with Iraq's port of Basra and Iran's ports of Khorramshahr and Abadan. This had been the very issue between the Ottomans and Persia (now Iran) before World War I. Because of its location, then, Basra became central to the struggle, and the surrounding countryside suffered ecological damage, which was made worse by the destruction wrought by the Coalition forces during the Gulf Crisis of 1990–1991.

Table B-5 Registered marriages and divorce contracts by governorate for 2014 – 2015 (source: CSO (2016)).

Governorate	2014		2015	
	Marriage contracts	Divorce contracts	Marriage contracts	Divorce contracts
Ninevah	..	..	..	..
Kirkuk	8565	1885	11157	2354
Diala	12494	2284	13766	2439
Al-Anbar	..	..	..	..
Baghdad	54661	23179	65818	28980
Babylon	17742	3986	19270	3361
Kerbela	9981	2697	11899	2419
Wasit	11432	2173	11450	3127
Salah Al-Deen	4134	574	7457	1094
Al-Najaf	11702	2100	11199	2287
Al-Qadisiya	10210	1985	12527	2522
Al-Muthanna	5704	912	6051	924
Thi-Qar	15486	3517	17648	3224
Maysan	8108	1167	9316	1479
Basra	19807	5569	23192	5589
Duhok*	..	..	..	..
Erbil*	..	..	..	..
Sulaimaniya*	..	..	..	..
Total	190026	52028	220750	59799

\*These governorates are in Kurdistan Region.

Table B-6 Number of drop - out students in primary schools by governorate and gender for the academic years 2011/2012 - 2014/2015 (source: CSO (2016)).

Governorate	2012/2011			2013/2012			2014/2013			2015/2014		
	No. Drop-out students			No. Drop-out students			No. Drop-out students			No. Drop-out students		
	Total	Female	Male	Total	Female	Male	Total	Female	Male	Total	Female	Male
Nineveh	15772	9149	6623	13957	7813	6144	17047	9991	7056	..	..	..
Kirkuk	2654	1694	960	2684	1654	1030	2831	1727	1104	..	..	..
Diala	1521	887	634	1607	934	673	2217	1137	1080	1470	694	776
Al-Anbar	7133	3753	3380	6864	3627	3237	6779	3578	3201	..	..	..
Baghdad	33430	13063	20367	24255	11799	12456	25757	12742	13015	24562	11960	12602
Babylon	7775	4510	3265	8597	5307	3290	8668	5320	3348	9441	5706	3735
Kerbela	4119	2565	1554	3966	2428	1538	3856	2237	1619	4403	2536	1867
Wasit	4472	2321	2151	4792	2442	2350	4876	2578	2298	5555	2449	3106
Salah Al-Deen	5259	2838	2421	4593	2581	2012	5153	2388	2765	..	..	..
Al-Najaf	4677	2060	2617	4524	1908	2616	3937	2113	1824	4276	2157	2119
Al-Qadisiya	3426	1432	1994	3993	2784	1209	2680	1474	1206	3105	1831	1274
Al-Muthanna	1880	1026	854	1815	1036	779	1940	1132	808	2268	1337	931
Thi-Qar	6095	3077	3018	5069	2588	2481	4357	2335	2022	6141	3320	2821
Maysan	2274	1108	1166	2588	1422	1166	2879	1483	1396	3153	1570	1583
Basrah	9039	4776	4263	9901	4668	5233	8066	3860	4206	7981	3663	4318
Duhok*	-	-	-	-	-	-	-	-	-	-	-	-
Erbil*	-	-	-	-	-	-	-	-	-	-	-	-
Sulaimaniya*	-	-	-	-	-	-	-	-	-	-	-	-
Total	109526	54259	55267	99205	52991	46214	101043	54095	46948	72355	37223	35132

\*These governorates are in Kurdistan Region.

Table B-7 Number of drop - out students in secondary schools by governorate and gender for the academic years 2011/2012 - 2014/2015 (Source: CSO (2016))

Governorate	2012/2011			2013/2012			2014/2013			2015/2014		
	No. Drop-out students			No. Drop-out students			No. Drop-out students			No. Drop-out students		
	Male	Female	Total	Male	Female	Total	Male	Female	Total	Male	Female	Total
Nineveh	2516	2782	5298	2514	3176	5690	2349	2870	5219	..	..	..
Kirkuk	766	767	1533	1107	880	1987	1041	967	2008	..	..	..
Diala	1128	945	2073	1250	906	2156	1659	808	2467	894	762	1656
Al-Anbar	1983	1455	3438	1978	744	2722	1517	679	2196	..	..	..
Baghdad	7448	10868	18316	8687	12188	20875	9993	10855	20848	9383	12727	22110
Babylon	2798	1568	4366	1513	1884	3397	1887	1634	3521	2167	2364	4531
Kerbela	1018	1237	2255	783	1095	1878	1001	1071	2072	1489	1341	2830
Wasit	800	677	1477	863	957	1820	1278	777	2055	1908	779	2687
Salah Al-Deen	1044	722	1766	874	663	1537	1263	715	1978	..	..	..
Al-Najaf	1251	1393	2644	1127	1475	2602	1289	1640	2929	1893	2541	4434
Al-Qadisiya	856	1131	1987	1231	1663	2894	1515	1310	2825	1253	1537	2790
Al-Muthanna	786	605	1391	506	752	1258	664	587	1251	1528	959	2487
Thi-Qar	995	970	1965	1479	1578	3057	1664	1098	2762	2252	1581	3833
Maysan	783	1442	2225	468	253	721	500	431	931	505	455	960
Basrah	2314	1762	4076	2899	3101	6000	2408	2284	4692	2993	2975	5968
Duhok*	-	-	-	-	-	-	-	-	-	-	-	-
Erbil*	-	-	-	-	-	-	-	-	-	-	-	-
Sulaimaniya*	-	-	-	-	-	-	-	-	-	-	-	-
Total	26486	28324	54810	27279	31315	58594	30028	27726	57754	26265	28021	54286

\*These governorates are in Kurdistan Region.



## Appendix C: Ethics Approval

<p>Please answer all questions</p> <p><b>1. Title of the investigation</b></p> <p>Social Sustainability of Residential Environments in Iraq: Factors Impacting Social Interaction in Communal Spaces in Selected Neighbourhoods in Al-Basra City.</p> <p>Please state the title on the PLS and Consent Form, if different:</p> <ul style="list-style-type: none"> <li>• Social Sustainability of Residential Environments in Iraq: Factors Impacting Social Interaction in Communal Spaces in Selected Neighbourhoods in Al-Basra City</li> <li>• The residents' questionnaire</li> <li>• Interviews</li> </ul> <p><b>2. Chief Investigator (must be at least a Grade 7 member of staff or equivalent)</b></p> <p>Name: Prof Ashraf Salama</p> <p><input checked="" type="checkbox"/> Professor  <input type="checkbox"/> Reader  <input type="checkbox"/> Senior Lecturer  <input type="checkbox"/> Lecturer  <input type="checkbox"/> Senior Teaching Fellow  <input type="checkbox"/> Teaching Fellow</p> <p>Department: Department of Architecture          Telephone: +44 (0)141 548 3995          E-mail: <a href="mailto:ashraf.salama@strath.ac.uk">ashraf.salama@strath.ac.uk</a></p> <p><b>3. Other Strathclyde investigator(s)</b></p> <p>Name: Noor Almansor          Status (e.g. lecturer, post-graduate): Post-graduate          Department: Department of Architecture          Telephone: 07427076541          E-mail: <a href="mailto:noor.almansor@strath.ac.uk">noor.almansor@strath.ac.uk</a></p> <p><b>4. Non-Strathclyde collaborating investigator(s) (where applicable)</b></p> <p>Name:          Status (e.g. lecturer, post-graduate):          Department/Institution:          If student(s), name of supervisor:          Telephone:          E-mail:          Please provide details for all investigators involved in the study:</p> <p>The place of useful learning          The University of Strathclyde is a charitable body, registered in Scotland, number SC015263</p>	<p><b>5. Overseas Supervisor(s) (where applicable)</b></p> <p>Name(s):          Status:          Department/Institution:          Telephone:          Email:  <input type="checkbox"/> I can confirm that the local supervisor has obtained a copy of the Code of Practice: Yes <input type="checkbox"/> No          Please provide details for all supervisors involved in the study:</p> <p><b>6. Location of the investigation</b></p> <p>At what place(s) will the investigation be conducted</p> <p>The investigation will be conducted in the centre of Basra city, the southern province of Iraq. It will take place in the available communal spaces of three single-family housing neighbourhoods a) AlJumainah neighbourhood 1960s, b) AlKhalij Alarabi neighbourhood 1970s, and c) AlZahraa neighbourhood 1960s, where people from the high-middle class have inhabited these neighbourhoods. The layout of the neighbourhoods is considered the most common in Basrah, in particular, and in Iraq, in general.</p> <p>If this is not on University of Strathclyde premises, how have you satisfied yourself that adequate Health and Safety arrangements are in place to prevent injury or harm?</p> <p>The area that the investigation will be conducted in is a safe place which is my hometown in my country (Iraq) in the southern province. The place is clear of any health and safety risks.</p> <p><b>7. Duration of the investigation</b></p> <p>Duration(years/months): 2-3 months per year</p> <p>Start date (expected): 20 / 12 / 2017- 2018 Completion date (expected): 20 / 03 / 2018 - 2019</p> <p><b>8. Sponsor</b></p> <p>Please note that this is not the funder; refer to Section C and Annexes 1 and 3 of the Code of Practice for a definition and the key responsibilities of the sponsor.</p> <p>Will the sponsor be the University of Strathclyde: Yes <input type="checkbox"/> No <input type="checkbox"/>          If not, please specify who is the sponsor:</p> <p><b>9. Funding body or proposed funding body (if applicable)</b></p> <p>Name of funding body:          Status of proposal – if seeking funding (please click appropriate box):  <input type="checkbox"/> In preparation  <input type="checkbox"/> Submitted  <input type="checkbox"/> Accepted          Date of submission of proposal: / / Date of start of funding: / /</p>
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<p><b>10. Ethical issues</b></p> <p>Describe the main ethical issues and how you propose to address them:</p> <p>The investigation will include a questionnaire (which will be anonymised), semi-structured interviews (the audio recorded data will be pseudo-anonymised), behavioural observation, and fieldwork site survey.</p>	<p><b>13. Nature of the participants</b></p> <p>Please note that investigations governed by the Code of Practice that involve any of the types of participants listed in B1(b) must be submitted to the University Ethics Committee (UEC) rather than DEC/SEC for approval.</p>
<p><b>11. Objectives of investigation (including the academic rationale and justification for the investigation). Please use plain English.</b></p> <p>This study aims to investigate the social sustainability in the Iraqi context, especially in the residential developments. This investigation will be done through focusing on the social interaction as the main determinant of the social sustainability. The main aim of the study is the identification of the main indicators and factors that affect the social interaction among residents in the communal spaces in the single-family houses neighbourhoods. Such type of investigations did not take part widely in the Middle East countries, especially in Iraq.</p> <p>Moreover, to identify the types of the communal spaces that are located in single-family houses neighbourhoods in the Iraqi contexts and the attempt to develop the types of these spaces to enhance the social life in the area. Furthermore, to know the level of the social interaction among residents in the current situation, and whether the current design of the built environment of the neighbourhoods, the layout of houses and the communal spaces have an impact on the social interaction level among the residents.</p> <p>Such investigation will contribute to the knowledge to fill the gap of examining the social sustainability in the Iraqi residential context and its significance would be returned to the decision makers, architects, and urban designers with recommendations that would help in developing the social aspect in the current single-family residential buildings and considering the main indicators and factors that affect the social interaction among residents in designing and developing the residential sector in Iraq.</p>	<p>Do any of the participants fall into a category listed in Section B1(b) (participant considerations) applicable in this investigation?: Yes <input type="checkbox"/> No <input checked="" type="checkbox"/></p> <p>If yes, please detail which category (and submit this application to the UEC):</p>
<p><b>12. Participants</b></p> <p>Please detail the nature of the participants:</p> <ol style="list-style-type: none"> <li>The participants for the questionnaire can generally be described as the residents who live in Basrah in the selected neighbourhoods with different demographic backgrounds and spending time in the communal spaces that are provided in these two neighbourhoods in Basrah, Iraq.</li> </ol> <p>Summarise the number and age (range) of each group of participants: Number: 275    Age (range) 18-50 and over</p> <ol style="list-style-type: none"> <li>Professional participants for the interviews can generally be described as experts from Iraq, including decision-makers, urban designers, and architects.</li> </ol> <p>Summarise the number and age (range) of each group of participants: Number: 20    Age (range) 35-60 and over</p>	<p><b>14. Method of recruitment</b></p> <p>Describe the method of recruitment (see section B4 of the Code of Practice), providing information on any payments, expenses or other incentives.</p> <p>Before any activity in the field and after identifying the participants, who will be involved in the questionnaires, based on basic requirements stated above, local administrators of the selected neighbourhoods and mosques' imams will be informed of the research process. They, in addition to the researcher, will inform the residents of the neighbourhoods orally about the research process and about asking them their participation in conducting the questionnaire. Moreover, the local administrators will assist in facilitating the spreading and collecting process of the questionnaires from residents.</p> <p><b>The recruitment</b> of the residents After this process, each of the PIS, Consent Form, and the questionnaire will be delivered to residents by person, by online, which will be done via social media wherever it available.</p> <p>For the interviews with the Iraqi experts, the recruitment of participants will be by social media, email, and phone.</p> <p>There will be no payments, expenses or other incentives to persuade the participants to take part in the investigation (questionnaire and interviews).</p>
<p>Please detail any inclusion/exclusion criteria and any further screening procedures to be used:</p> <p>There are two main criteria for the participants for the questionnaire. The first is the participants' residential location and length of residence in the neighbourhood. The residential location should be within the boundaries of the three selected case studies: AlJumainah neighbourhood, AlKhaliq Alarabi neighbourhood, and AlZahraa neighbourhood. Length of residence should be at least two years.</p> <p>A second selection criteria is based on their age. Participants should be 18 and above, so they can admit to their own legal consent. There will be no additional distinction based on gender, social status or occupation, education status.</p> <p>For the interviewees, they should be experts working in the field of architecture, urban planning or academic such as academic from the University of Basrah, and in the governmental directorates such as Directorate of Urban Planning and the Urban Design department in Basrah Municipality.</p>	<p><b>15. Participant consent</b></p> <p>Please state the groups from whom consent/assent will be sought (please refer to the Guidance Document). The PIS and Consent Form(s) to be used should be attached to this application form.</p> <p>Full informed consent is sought from the participants by using the participant information sheet and consent form included with the application. Participants will have their informed consent to take part in the research; they will have an information section at the beginning of the questionnaires or interview which provides full relevant details of the nature, object and duration of the proposed investigation in a form that is readily understood and they will be aware that they can withdraw from the research at any time; without giving an explanation.</p>

<p><b>16. Methodology</b> Investigations governed by the Code of Practice which involve any of the types of projects listed in B1(a) must be submitted to the University Ethics Committee rather than DEC/SEC for approval.</p> <p>Are any of the categories mentioned in the Code of Practice Section B1(a) (project considerations) applicable in this investigation? <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No</p> <p>If 'yes', please detail:</p>	<p>Describe the research methodology and procedure, providing a timeline of activities where possible. Please use plain English.</p> <p>To look into the everyday experience in the communal spaces in single-family houses neighbourhoods in Iraq, the researcher will use mixed methods. A combination of qualitative and quantitative approaches has thus been utilised to drive the empirical work. The combination of qualitative and quantitative approaches expanded the variety of methods used to gather data in order to answer the research questions.</p> <p>1. <b>Semi-structured interviews:</b></p> <p>The researcher will conduct semi-structured interviews with Iraqi experts, including decision makers, urban designers, and architects to obtain quantitative and qualitative data. The purpose of these interviews is to capture more detailed information about the preferences and opinions of the experts' views and perspectives regarding the pre-prepared list by the researcher. The list includes a number of indicators and factors that could affect the social interaction among residents in residential developments and might be related to Iraqi context. Each interview would take around 45 to 60 minutes. The interview includes two types of questions, multi-choice questions (quantitative) and text entry questions (qualitative). The answers to the questions will be written by hand by interviewees. Also, the interviews will be audio recorded after obtaining official consent from the interviewees. From each category, decision-makers, urban designers, and architects the researcher will send a request for conducting interviews by phone, email, and social media, and when the responses come back the final number of interviewees will be known. The results of the interviews will be used to build the residents' questionnaire.</p> <p>2. <b>Questionnaire:</b></p> <p>The initial intention was to carry out structured interviews with residents to obtain the information about the social interaction, the social aspects, the physical design characteristics, and the demographic factors; however, due to difficulties with residents' privacy, traditional and cultural issues, this could be not possible. An alternative method for collecting data from a large sample population is a self-completion questionnaire, which is also efficient regarding cost and time (Bryman, 2012). The research has attempted to focus on designing the questionnaire to minimise this limitation by designing a comprehensive questionnaire, which can provide the maximum reliable information regarding the four parts that the research attempted to focus on. The questionnaire includes four parts, each covering different types of information, namely demographic factors, physical design characteristics of the built environment, social interaction and the social aspect. Although the research the approach is both inductive and deductive, the questionnaire included closed-ended questions in order to obtain quantitative data regarding the four parts. The designed questionnaire will be tested in two stages before the main study. First, experts from the university (the supervisor of the researcher) will be asked to assess the draft of the questionnaire and to make comments both about the questionnaire and the proposed methods of delivery and collection. Second, after translating the draft of the questionnaire to Arabic language, it will be given to non-experts from the Iraqi residents to examine the clarity of the questions and the time needed for completion. In order to increase the response rate, the researcher will inform the responsible person of the neighbourhood about the questionnaire to inform the residents before the delivery of the questionnaire. The questionnaire will be distributed in the workshops houses which located in the selected neighbourhoods by person in addition to an option to complete the survey online.</p> <p>3. <b>Behavioural observation:</b></p> <p>The behavioural observation will be used to provide an evidence of the information that will be acquired from the questionnaire for participants (the residents). The observation of people in the communal spaces of the neighbourhoods will be conducted during different hours on weekdays and weekends. The observation</p>
<p>will be for the type of use of the communal spaces by residents whether they use them for transit, socialising with others or accompanying children, resting, going for a walk, or practising a sport. Identifying the commonly used types of the communal spaces that are located in single-family houses neighbourhoods. Also, the researcher will record the total number of the communal spaces' users, the number of users of male, female, and children who use the communal spaces, and what age groups that use the communal spaces usually. Moreover, observing for how long the residents stay in these the communal spaces, and the opportunities for formal and informal social gathering, and stop and chat with neighbours or say hello.</p> <p>4. <b>Fieldwork site survey:</b></p> <p>The researcher intends to organise a fieldwork, which includes a designed checklist to collect information regarding the physical attributes of the built environment. Obtaining the schemes and plans for each of the selected neighbourhoods, the blocks layout for the housing buildings, and the layout of the communal spaces, and matching them between the official maps and schemes that obtained from Basrah Municipality and the current situation acquired from the Google Maps. Also, the researcher tends to have photographs for the current communal spaces in the selected neighbourhoods for the study. Moreover, the identification of the physical characteristics design for the communal spaces whether these spaces have physical or visual boundaries, providing the hierarchy in spaces, and whether the design of the communal spaces are a climate responsive designed. The fieldwork site survey will help in knowing the provision of the social services in the neighbourhoods, such as schools, local market, shops, workshops (church or masjid) as well as knowing the level of provision pedestrian routes in the neighbourhoods.</p> <p>The timeline of the investigation will start with the first stage in December 2017 with the semi-structured interviews. When the interviews ended, the questions of the questionnaire will be revised according to the results of the interviews for the list of indicators and factors that may affect social interaction among residents. After that, the second stage of the investigation will begin including the questionnaire, behavioural observation, and fieldwork site survey. However, part of fieldwork site survey can be done before the second stage of the investigation started. The end of the investigation is expected to be finished at the beginning of March 2019.</p> <p><b>What specific techniques will be employed and what exactly is asked of the participants? Please identify any non-validated scale or measure and include any scale and measures charts as an Appendix to this application. Please include questionnaires, interview schedules or any other non-standardised method of data collection as appendices to this application.</b></p> <p>For the interviews, the materials that the researcher will need:</p> <p>Notepad for taking notes.</p> <p>A recorder.</p> <p>A separate sheet for the interview questions and the questionnaire is included in the annex of this application.</p> <p><b>Where an independent reviewer is not used, then the UEC, DEC or SEC reserves the right to scrutinise the methodology. Has this methodology been subject to independent scrutiny? Yes <input type="checkbox"/> No <input checked="" type="checkbox"/></b></p> <p><b>If yes, please provide the name and contact details of the independent reviewer:</b></p>	



<p><b>17. Previous experience of the investigator(s) with the procedures involved. Experience should demonstrate an ability to carry out the proposed research in accordance with the written methodology.</b></p> <p>Previous experience of the chief investigator (Prof Ashraf Salama) includes long and extensive experience in urban research cities of the Global South. His experience spans six countries in four continents, including academic and professional experience in Egypt, the United States, The United Kingdom, and the Middle East. He established the Cluster for Research in Architecture and Urbanism of Cities in the Global South (CRAUCGS) at the University of Strathclyde in 2014. This research is part of this ongoing to produce new knowledge on cities outside of the Western world. He currently supervises a range of urban research in various cities across the Global South, among which several investigations in the African Continent.</p> <p>His experience also includes intimate involvement in the participatory design and community participation, demonstrated by his longtime professional association with Henry Samoff, often considered as the founder of participation in architecture.</p> <p>Previous experience of the field investigator (Noor Almansor) include a certain familiarity with the region (Iraq), and with the city of investigation (Basrah) as being her country and she lives in the city for 33 years. The field investigator lives in Basrah, Iraq for 33 years and she obtained her academic study in architecture from the University of Basrah in 2007. Relevant research experience includes a recording of commercial, residential, and educational spaces, use of survey, unstructured interviews. During this period that the field investigator spent it in the region, she was able to establish a relevant network in Basrah of local expertise and academics.</p>	<p><b>19. Potential risks or hazards</b></p> <p>Briefly describe the potential Occupational Health and Safety (OHS) hazards and risks associated with the investigation:</p> <p>Please attach a completed OHS Risk Assessment (S20) for the research. Further Guidance on Risk Assessment and Form can be obtained on <a href="#">Occupational Health, Safety and Wellbeing's webpages</a></p> <p><b>20. What method will you use to communicate the outcomes and any additional relevant details of the study to the participants?</b></p> <p>The outcomes of questionnaire and interviews will not be shared with participants.</p>																								
<p><b>18. Data collection, storage and security</b></p> <p>How and where are data handled? Please specify whether it will be fully anonymous (i.e. the identity unknown even to the researchers) or pseudo-anonymised (i.e. the raw data is anonymised and given a code name, with the key for code names being stored in a separate location from the raw data) - if neither please justify.</p> <p>The data from the questionnaire and behavioural observation will be fully anonymous (i.e. the identity unknown even to the researchers). Interviews will include answering the questions in writing by the interviewees in addition to audio recording. The identity of the interviewees will be known just for the field investigator and anonymous to the chief investigator. Later, the audio recorded interviews will be transcribed by the researcher, with the consent of the participant. People's identity in visual data will be anonymised if used in the publication. No data will be disseminated without the written consent of the participant.</p> <p>Explain how and where it will be stored, who has access to it, how long it will be stored and whether it will be securely destroyed after use:</p> <p>All research data will be stored and backed-up on secure central university servers. The questionnaire data will be stored on Qualtrics account: <a href="https://stratheng.eu.qualtrics.com/ControlPanel/">https://stratheng.eu.qualtrics.com/ControlPanel/</a>, and hard copy with the field investigator. For the duration of the research, the data will be stored on the H: drive only, which is covered by central back-up. The benefits of storing data on institutional servers are several: data is secured and protected; it can be shared with others when needed; it can be accessed off-campus; it has none of the recognised vulnerabilities of external memory drives or hard disks.</p> <p>However, to access the central university servers, internet access is required. During the fieldwork phase when access to the internet can be limited, storage of data on external memory drive will be inevitable. Great care will be taken to keep a back-up always separate from the main data source. Data will frequently be uploaded to the servers when possible. After the research is completed, all data should be stored in the institutional research data repository Pure.</p> <p>Will anyone other than the named investigators have access to the data? Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> If 'yes', please explain:</p>	<p><b>21. How will the outcomes of the study be disseminated (e.g. will you seek to publish the results and, if relevant, how will you protect the identities of your participants in said dissemination)?</b></p> <p>The outcome, results and findings of the study will regularly be shared with the chief investigator and will be significant for potential dissemination through publication after completing the investigation. The identity of the participant will be fully anonymous. The people's identity in visual data will be anonymised if used in the publication. No data will be disseminated without the written consent of the participant.</p> <table border="1"> <thead> <tr> <th>Checklist</th> <th>Enclosed</th> <th>N/A</th> </tr> </thead> <tbody> <tr> <td>Participant Information Sheet(s)</td> <td><input checked="" type="checkbox"/></td> <td><input type="checkbox"/></td> </tr> <tr> <td>Consent Form(s)</td> <td><input checked="" type="checkbox"/></td> <td><input type="checkbox"/></td> </tr> <tr> <td>Sample questionnaire(s)</td> <td><input checked="" type="checkbox"/></td> <td><input type="checkbox"/></td> </tr> <tr> <td>Sample interview format(s)</td> <td><input checked="" type="checkbox"/></td> <td><input type="checkbox"/></td> </tr> <tr> <td>Sample advertisement(s)</td> <td><input type="checkbox"/></td> <td><input type="checkbox"/></td> </tr> <tr> <td>OHS Risk Assessment (S20)</td> <td><input type="checkbox"/></td> <td><input type="checkbox"/></td> </tr> <tr> <td>Any other documents (please specify below)</td> <td></td> <td></td> </tr> </tbody> </table>	Checklist	Enclosed	N/A	Participant Information Sheet(s)	<input checked="" type="checkbox"/>	<input type="checkbox"/>	Consent Form(s)	<input checked="" type="checkbox"/>	<input type="checkbox"/>	Sample questionnaire(s)	<input checked="" type="checkbox"/>	<input type="checkbox"/>	Sample interview format(s)	<input checked="" type="checkbox"/>	<input type="checkbox"/>	Sample advertisement(s)	<input type="checkbox"/>	<input type="checkbox"/>	OHS Risk Assessment (S20)	<input type="checkbox"/>	<input type="checkbox"/>	Any other documents (please specify below)		
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Any other documents (please specify below)																									

<p><b>22. Chief Investigator and Head of Department Declaration</b> Please note that unsigned applications will not be accepted and both signatures are required</p> <p>I have read the University's Code of Practice on Investigations involving Human Beings and have completed this application accordingly. By signing below, I acknowledge that I am aware of and accept my responsibilities as Chief Investigator under Clauses 3.11 – 3.13 of the <a href="#">Research Governance Framework</a> and that this investigation cannot proceed before all approvals required have been obtained.</p> <div style="display: flex; justify-content: space-between;"> <div style="width: 45%;"> <p>Signature of Chief Investigator</p> <div style="border: 1px solid black; height: 40px; margin-top: 10px;"></div> </div> <div style="width: 45%;"> <p>2/8/2018</p> <p>I confirm I have read this application. I am happy that the study is consistent with the departmental strategy, that the staff and/or students involved have the appropriate expertise to undertake the study and that adequate arrangements are in place to supervise any students that might be acting as investigators, that the study has access to the resources needed to conduct the proposed research successfully, and that there are no other departmental-specific issues relating to the study of which I am aware.</p> <p>Signature of Head of Department</p> <div style="border: 1px solid black; height: 40px; margin-top: 10px;"></div> </div> </div> <p>Please also type name here</p> <div style="display: flex; justify-content: space-between;"> <div style="width: 45%;"> <p>Dr Andrew Agapiou, Director of Research</p> </div> <div style="width: 45%;"> <p>Date: 2/8/2018 Please note the original form was signed by Dr Andrew Agapiou as Director of Research since the Head of Department is listed as the Chief Investigator – The original form was not available during the production of the thesis due to lack of access to offices (Covid-19 restrictions and working from home)</p> </div> </div>	<p style="text-align: center;"><b>Participant Information Sheet for Residents.</b></p> <p><b>Name of department: Architecture</b> <b>Title of the study:</b> Social Sustainability of Residential Environments in Iraq: Factors Impacting Social Interaction in Communal Spaces in Selected Neighbourhoods in Al-Basra City.</p> <p><b>Introduction</b> This survey is part of a PhD research project investigating and identifying the influential factors on social interaction among residents in the communal spaces in single-family houses neighbourhoods in Iraq. It will be carried out as a questionnaire in English and Arabic and conducting semi-structured interviews with experts, by Noor Almansor, PhD researcher at University of Strathclyde with the following contact details: <a href="mailto:Noor.almansor@strath.ac.uk">Noor.almansor@strath.ac.uk</a></p> <p><b>What is the purpose of this investigation?</b> The purpose of this investigation is to identify the influential factors and indicators on the social interaction among inhabitants in the communal spaces of their single-family neighbourhoods. The research aims to help urban designers, architects, and decision makers understand the social needs of the residents of urban housing developments. Also, the research aims to highlight the notion of social sustainability in the Iraqi context, and enhance the concept through identifying the impacting factors on social interaction among residents.</p> <p><b>Do you have to take part?</b> The nature of the investigation is a PhD research project. Would like you to answer the questions only if you feel comfortable and in as much depth as you decide. All the information you provide will remain confidential and will be used only as anonymous data for statistical analysis for the purpose of this research. You are under no obligation to participate in this study and supply information, although would really appreciate the participation and every single person that participates will be very helpful. Participation is voluntary and not participating will not affect any other aspects of your day to day life. And the participants can withdraw without explanation at any stage of the study if they wish to do so. Please be assured that the survey is completely anonymous.</p> <p><b>What will you do in the project?</b> The data collection will be completing a questionnaire that includes questions related to the participants, their neighbourhood physical design characteristics, demographic factors, social interaction among residents, and some questions relevant to social aspect indicators. This questionnaire will take around 10 minutes to complete it. Please be sure you answered all the questions and complete the questionnaire within two weeks from the date you receive it. Moreover, there will be semi-structured interviews with experts, including architects, urban designers, and decision makers. The interview will take around 30 to 45 minutes to finish the questions.</p> <p><b>Why have you been invited to take part?</b> As the research project being investigation the influential factors and indicators on social interaction among residents in communal spaces in single family-houses neighbourhoods, this has been sent out to the residents who live there to take part in the study.</p> <p><b>What are the potential risks to you in taking part?</b> There is no potential risk in taking part in this study and it will solely focus on the built environment.</p> <p><b>What happens to the information in the project?</b> All the data collected, and the information of the participants will be confidential and will be stated as anonymous, unless you wish not to.</p> <p>The University of Strathclyde is registered with the Information Commissioner's Office who implements the Data Protection Act 1998. All personal data on participants will be processed in accordance with the provisions of the Data Protection Act 1998.</p> <p>Thank you for reading this information – please ask any questions if you are unsure about what is written here.</p> <p><b>What happens next?</b> Thank you for taking time to read this information. If you are happy to be involved in the project, you will be asked to sign a consent form to confirm this. The information from this study will be published as a PhD thesis and may be disseminated by other means, such as academic papers, conferences or lectures, after the completion of the project.</p>
<p><b>23. Only for University sponsored projects under the remit of the DEC/SEC, with no external funding and no NHS involvement</b></p> <p><b>Head of Department statement on Sponsorship</b> This application requires the University to sponsor the investigation. This is done by the Head of Department for all DEC applications with the exception of those that are externally funded and those which are connected to the NHS (those exceptions should be submitted to R&amp;KES). I am aware of the implications of University sponsorship of the investigation and have assessed this investigation with respect to sponsorship and management risk. As this particular investigation is within the remit of the DEC and has no external funding and no NHS involvement, I agree on behalf of the University that the University is the appropriate sponsor of the investigation and there are no management risks posed by the investigation.</p> <p>If not applicable, tick here <input type="checkbox"/></p> <div style="display: flex; justify-content: space-between;"> <div style="width: 45%;"> <p>Signature of Head of Department</p> <div style="border: 1px solid black; height: 40px; margin-top: 10px;"></div> </div> <div style="width: 45%;"> <p>Date: / /</p> </div> </div> <p>Please also type name here</p>	

Consent Form					
<p><b>Chief Investigator details:</b></p> <div style="border: 1px solid black; padding: 10px; margin: 10px 0;"> <p>Name: Dr Ashraf Salama  Status: Professor  Department: Architecture  Contact details: Telephone: +44 (0)141 548 3995  E-mail: <a href="mailto:ashraf.salama@strath.ac.uk">ashraf.salama@strath.ac.uk</a></p> </div> <p><b>Researcher contact details:</b></p> <p>Noor Almansor  PHD researcher  Department of Architecture  University of Strathclyde  <a href="mailto:noor.almansor@strath.ac.uk">noor.almansor@strath.ac.uk</a></p> <p>Address: Level 3, James Weir building  75 Montrose Street  Glasgow  G1 1XJ</p> <p>This investigation was granted ethical approval by the University of Strathclyde Ethics Committee.</p> <p>If you have any questions/concerns, during or after the investigation, or wish to contact an independent person to whom any questions may be directed or further information may be sought from, please contact:</p> <p>Secretary to the University Ethics Committee  Research &amp; Knowledge Exchange Services  University of Strathclyde  Graham Hills Building  50 George Street  Glasgow  G1 1QE</p> <p>Telephone: 0141 548 3707  Email: <a href="mailto:ethics@strath.ac.uk">ethics@strath.ac.uk</a></p>	<p><b>Name of department:</b> Architecture Department  <b>Title of the study:</b> Social Sustainability of Residential Environments in Iraq: Factors Impacting Social Interaction in Communal Spaces in Selected Neighbourhoods in Al-Basra City.</p> <ul style="list-style-type: none"> <li>▪ I confirm that I have read and understood the information sheet for the above project and the researcher has answered any queries to my satisfaction.</li> <li>▪ I understand that my participation is voluntary and that I am free to withdraw from the project at any time, up to the point of completion, without having to give a reason and without any consequences. If I exercise my right to withdraw and I don't want my data to be used, any data which have been collected from me will be destroyed.</li> <li>▪ I understand that I can withdraw from the study any personal data (i.e. data which identify me personally) at any time.</li> <li>▪ I understand that anonymised data (i.e. data which do not identify me personally) cannot be withdrawn once they have been included in the study.</li> <li>▪ I understand that any information recorded in the investigation will remain confidential and no information that identifies me will be made publicly available.</li> <li>▪ I consent to being a participant in the project</li> <li>▪ I consent to being audio and/or video recorded as part of the project</li> </ul> <p>For investigations where it has been decided that "no fault compensation" cover will be provided the following wording needs to be included: In agreeing to participate in this investigation I am aware that I may be entitled to compensation for accidental bodily injury, including death or disease, arising out of the investigation without the need to prove fault. However, such compensation is subject to acceptance of the Conditions of Compensation, a copy of which is available on request.</p> <table border="1" style="width: 100%;"> <tr> <td style="width: 50%; height: 40px; vertical-align: bottom;">(PRINT NAME)</td> <td style="width: 50%; height: 40px; vertical-align: bottom;">Date:</td> </tr> <tr> <td style="height: 40px; vertical-align: bottom;">Signature of Participant:</td> <td style="height: 40px; vertical-align: bottom;"></td> </tr> </table>	(PRINT NAME)	Date:	Signature of Participant:	
(PRINT NAME)	Date:				
Signature of Participant:					



## Appendix D: The Analysis Data of The Questionnaire

### D.1. The Scale Reliability (Questionnaire):

Reliability means that a measure (or in this case questionnaire) should consistently reflect the construct that it is measuring (Field, 2009). Reliability is a measure of the stability or consistency of test scores. It can also be defined as the ability of a test or research findings to be repeatable. A reliability test was conducted to ensure that the questionnaire was reliable to measure the same latent variables. In other words, according to Field (2009), in statistical terms, reliability is usually based on the idea that individual items (or sets of items) should produce results consistent with the overall questionnaire; this typically considers the value of the Cronbach's alpha. Cronbach's alpha is a measure of internal consistency, namely, how closely related a set of items are as a group. It is considered a measure of scale reliability. The Cronbach's alpha reliability coefficient normally ranges between 0 and 1, and the closer the coefficient is to 1.0, the greater is the internal consistency of the items (variables) in the scale. The rule of George and Mallery (2003), as follows, can be followed to interpret the output: > 0.9 (*Excellent*), > 0.8 (*Good*), > 0.7 (*Acceptable*), > 0.6 (*Questionable*), > 0.5 (*Poor*), and < 0.5 (*Unacceptable*).

Table D-1 Cronbach's Alpha value for the reliability test.

Reliability Statistics		
Cronbach's Alpha	Cronbach's Alpha Based on Standardized Items	N of Items
<b>0.722</b>	.738	147

Table D-1 demonstrates the alpha coefficient for this questionnaire's items was **.726**, suggesting that the items had a relatively high internal consistency (a reliability coefficient of .70 or higher is considered "*acceptable*" in most social science research). This meant that the questionnaire was a reliable scale to measure the factors forming this study. In Table D-2, the **Item-Total Statistics** presents the results for "**Cronbach's Alpha if Item Deleted**", as shown in the final column. It is the measure of reliability to determine the "Item" which, when deleted, would enhance the overall reliability of the measuring instrument.

Table D-2 Item total statistics of the tested questions from the questionnaire.

	Scale Mean if Item Deleted	Scale Variance if Item Deleted	Corrected Item-Total Correlation	Cronbach's Alpha if Item Deleted
Q1: The name of the neighbourhood.	260.52	5806.535	0.092	0.721
Q2: The gender.	260.97	5849.437	-0.415	0.723
Q3: The age group.	259.55	5800.953	0.063	0.721
Q4: The marital status.	259.86	5795.384	0.234	0.721
Q5: The education level.	258.38	5811.011	0.030	0.722
Q6: The employment status.	258.31	5729.446	0.316	0.718
Q8: Number of working hours per day.	256.95	5505.839	0.369	0.710
Q8: Number of working days per month.	248.66	5566.826	0.085	0.730
Q9 The preferred place - At home.	261.52	5837.201	-0.361	0.723
Q9 The preferred place - At the closed communal spaces such as cafés.	262.31	5815.656	0.062	0.722
Q9 The preferred place - At the open communal spaces .	262.33	5811.242	0.201	0.721
Q9 The preferred place of spending free and rest time within the neighbourhood – Other.	262.36	5808.691	0.471	0.721
Q10 The number of families living in the house.	260.59	5784.457	0.254	0.720
Q10 The number of total people living in the house.	254.57	5742.846	0.113	0.720

	Scale Mean if Item Deleted	Scale Variance if Item Deleted	Corrected Item-Total Correlation	Cronbach's Alpha if Item Deleted
Q11 The number of children aged ten years or less in the house.	260.43	5683.092	0.509	0.715
Q12 The type of ownership.	258.79	5790.448	0.230	0.720
Q14 The length of residency in the neighbourhood.	258.17	5727.829	0.326	0.718
Q16 The total area of the house.	259.84	5752.344	0.395	0.719
Q17 The presence of relatives living within the neighbourhood.	262.02	5809.421	0.115	0.721
Q19 Safety & security: How safe do you feel when using the space in front of your home entrance?	259.34	5806.826	0.073	0.721
Q19 Safety & security: How safe do you feel when using the spaces between houses?	259.76	5779.871	0.244	0.720
Q19 Safety & security: How safe do you feel when using the streets and sidewalk.	259.62	5794.029	0.173	0.721
Q19 Safety & security: How safe do you feel when using the children playground.	260.02	5809.000	0.056	0.721
Q19 Safety & security: How safe do you feel when using the public garden between houses.	259.91	5804.431	0.092	0.721
Q19 Safety & security: How safe do you feel when using the mosques, churches and hussainya.	259.22	5828.212	-0.111	0.722
Q19 Safety & security: How safe do you feel when using the local shops.	259.26	5819.599	-0.020	0.722
Q19 Safety & security: How safe do you feel when using the local market or malls.	259.40	5795.577	0.174	0.721
Q19 Safety & security: How safe do you feel when using the local restaurant.	259.50	5807.202	0.091	0.721
Q19 Safety & security: How safe do you feel when using the local cafes.	260.00	5808.877	0.052	0.721
Q19 Safety & security: How safe do you feel when using the gym.	259.79	5801.535	0.105	0.721
Q20 The neighbourhood is safe to live in.	259.21	5772.272	0.337	0.720
Q20 Feeling safe walking around the neighbourhood during the day.	259.47	5772.429	0.280	0.720
Q20 Feeling safe when using the available closed and open communal spaces during the daytime.	259.45	5781.936	0.222	0.720
Q20 Feeling safe when using the available closed and open communal spaces during the evening.	259.90	5752.551	0.320	0.719
Q20 Feeling safe from car accidents when being in the street in front of my house.	260.09	5771.203	0.227	0.720
Q20 Planning to stay in the neighbourhood as long as possible.	259.69	5791.060	0.128	0.721
Q21 Place Attachment - Feeling attached to the neighbourhood strongly as being one of its members.	259.41	5760.668	0.334	0.719
Q21 Place Attachment - Feeling proud of being living in this neighbourhood.	259.60	5771.542	0.261	0.720
Q21 Place Attachment - Feeling at home when arriving at the neighbourhood.	259.43	5777.127	0.264	0.720
Q22 Sense of community - The friendships and relationships I have with neighbours in the neighbourhood mean a lot to me.	259.67	5753.312	0.336	0.719
Q22 Sense of community - I have made new friends while living here.	259.72	5749.326	0.373	0.719
Q22 Sense of community - If I need a little company, I can stop by a neighbour I know.	260.28	5752.870	0.304	0.719
Q22 Sense of community - Attending most of the social gatherings organised in the neighbourhood.	259.43	5773.443	0.305	0.720
Q22 Sense of community - Participating in decision-making processes relevant to the neighbourhood.	260.24	5748.748	0.328	0.719
Q23 Privacy - The possibility of watching the kids easily when they are playing in the provided communal spaces near the house.	259.90	5806.094	0.065	0.721
Q23 Privacy - The possibility of using the open communal spaces in the neighbourhood with the family.	260.36	5787.182	0.167	0.720

	Scale Mean if Item Deleted	Scale Variance if Item Deleted	Corrected Item-Total Correlation	Cronbach's Alpha if Item Deleted
Q23 Privacy - The possibility of using the open communal spaces in the neighbourhood with friends and neighbours.	260.14	5773.840	0.231	0.720
Q26 Accessibility - It is easy to access the public services and the communal spaces of the neighbourhood.	259.57	5812.881	0.029	0.722
Q26 Accessibility - The proximity of public services and communal spaces in the neighbourhood.	259.62	5823.889	-0.041	0.722
Q26 Accessibility for both genders at any time during the day.	260.53	5813.376	0.013	0.722
Q27 Satisfaction with site design - The diversity of communal spaces in the neighbourhood.	259.74	5826.932	-0.064	0.722
Q27 Satisfaction with site design - The area of the open communal spaces within the neighbourhood.	259.86	5833.665	-0.114	0.723
Q27 Satisfaction with site design - The availability of visual attractions in the public garden between houses, e.g., shaded seats, trees, water figures.	259.52	5820.044	-0.020	0.722
Q27 Feeling satisfied with the distribution of both houses and the location of public services within the neighbourhood.	260.00	5838.842	-0.168	0.723
Q27 Satisfaction with site design - The width of the internal neighbourhood's streets.	259.95	5814.260	0.020	0.722
Q27 Satisfaction with site design - The presence of sidewalks with a suitable width of neighbourhood's streets.	260.03	5809.227	0.057	0.721
Q27 Satisfaction with site design - The shape of the internal streets of the neighbourhood.	260.03	5820.876	-0.025	0.722
Q29 The level of maintenance and renovation of the services of the neighbourhood.	261.02	5810.263	0.030	0.722
Q29 Maintenance - The furnishing and maintenance of the streets and sidewalks of the neighbourhood are well established.	261.31	5804.358	0.066	0.721
Q32 Effectiveness - The presence of a gathering space inside the house, e.g. garden.	260.69	5811.516	0.043	0.722
Q32 Effectiveness - Availability and diversity of public social services within the neighbourhood.	260.03	5836.104	-0.159	0.723
Q32 Effectiveness - Distribution of public social services in the neighbourhood.	260.33	5831.417	-0.111	0.722
Q32 Effectiveness - Providing shared green and open spaces in the residential area.	259.98	5827.737	-0.089	0.722
Q32 Effectiveness - Suitable distribution of green and open spaces within the residential area.	260.05	5829.278	-0.099	0.722
Q32 Effectiveness - The accessibility and possibility of using communal spaces.	260.21	5824.167	-0.056	0.722
Q32 Effectiveness - Designing and supplying the open communal spaces within the neighbourhood with trees, lighting, shaded seats, visual and physical boundaries of the garden that give a sense of containment and privacy.	259.97	5822.841	-0.050	0.722
Q32 Effectiveness - Designing the enclosed communal spaces of the neighbourhood.	260.14	5830.191	-0.104	0.722
Q32 Effectiveness - The area of the open and enclosed communal spaces located in the neighbourhood.	260.55	5822.778	-0.037	0.722
Q32 Effectiveness - Maintaining social services and the communal spaces provided in the neighbourhood.	259.81	5826.227	-0.080	0.722
Q33 The number of neighbours you know by name in your area.	247.50	3249.588	0.795	0.655
Q33 The number of neighbours you say hello to when you meet.	245.24	2947.239	0.713	0.700
Q33 The number of neighbours usually stop and chat with them when you meet them on the street.	257.07	4901.399	0.803	0.680
Q33 The number of neighbours you visit from time to time.	259.36	5540.621	0.574	0.709
Q33 The number of neighbours you consider as friends.	258.31	5163.937	0.608	0.695
Q33 If I have a personal crisis, I have a neighbour can talk to.	261.52	5809.237	0.166	0.721

	Scale Mean if Item Deleted	Scale Variance if Item Deleted	Corrected Item-Total Correlation	Cronbach's Alpha if Item Deleted
Q33 The number of households in your neighbourhood that you can turn to in an emergency.	259.28	5485.080	0.528	0.707
Q34 The frequency of visits with neighbours.	259.88	5780.880	0.201	0.720
Q35 Usual place for a meeting - The main entrance of the house.	261.79	5811.956	0.078	0.721
Q35 Usual place for meeting - Spaces between houses.	262.34	5818.335	-0.008	0.722
Q35 Usual place for meeting - Streets and sidewalks.	261.98	5809.947	0.106	0.721
Q35 Usual place for meeting - Children's playground.	262.34	5818.721	-0.022	0.722
Q35 Usual place for a meeting - Garden of the neighbourhood.	262.26	5820.792	-0.055	0.722
Q35 Usual place for meeting - Masjid/church.	262.02	5793.315	0.333	0.721
Q35 Usual place for meeting - Local shops.	262.02	5799.386	0.251	0.721
Q35 Usual place for meeting - Local market or malls.	262.17	5805.584	0.199	0.721
Q35 Usual place for meeting - Local restaurants.	262.33	5807.031	0.325	0.721
Q35 Usual place for meeting - Local café.	262.33	5805.487	0.370	0.721
Q35 Usual place for meeting – Gym.	262.36	5819.112	-0.050	0.722
Q35 Usual place for meeting – Others.	262.31	5824.148	-0.156	0.722
Q36 Existing Problems - Replicate conflicts and problems and transform them into tribal ones.	262.12	5824.459	-0.097	0.722
Q36 Existing Problems - Negative behaviours, e.g., domestic violence, child abuse, and verbal harassment by youngers	262.02	5815.877	0.027	0.722
Q36 Existing Problems - Frequency of property and street crime, e.g., burglary and theft.	262.28	5829.045	-0.235	0.722
Q36 Existing Problems - Lack of traffic security due to the frequent car accidents.	262.03	5806.350	0.158	0.721
Q36 Existing Problems - Lack of social, cultural and sport services in the neighbourhood.	261.57	5822.144	-0.069	0.722
Q36 Existing Problems - The spread of negative phenomena, such as littering and garbage.	261.64	5819.393	-0.022	0.722
Q36 Existing Problems - Too many stray dogs in the neighbourhood.	261.88	5816.704	0.015	0.722
Q36 Existing Problems – Others.	262.26	5811.423	0.132	0.721
Q37 The frequency of asking for help, borrowing or exchanging things with neighbours.	261.24	5776.327	0.304	0.720
Q38 Participating in formal and informal gatherings.	261.52	5801.728	0.307	0.721
Q39 The usual gathering place - The main entrance of the house.	262.02	5812.684	0.071	0.721
Q39 The usual gathering place - Spaces between houses.	262.16	5819.011	-0.016	0.722
Q39 The usual gathering place - Streets and sidewalks.	262.03	5808.315	0.131	0.721
Q39 The usual gathering place - Children's playground.	262.36	5818.761	-0.032	0.722
Q39 The usual gathering place - Garden of the neighbourhood.	262.26	5819.879	-0.037	0.722
Q39 The usual gathering place - Masjid/church.	261.74	5797.318	0.279	0.721
Q39 The usual gathering place - Local shops.	262.31	5820.007	-0.050	0.722
Q39 The usual gathering place - Local market or malls.	262.29	5821.649	-0.083	0.722
Q39 The usual gathering place - Local restaurants.	262.36	5820.025	-0.095	0.722
Q39 The usual gathering place - Local café.	262.36	5820.025	-0.095	0.722
Q39 The usual gathering place – Gym.	262.36	5820.025	-0.095	0.722
Q39 The usual gathering place – Others.	262.24	5826.678	-0.163	0.722
Q40 Frequency of using the main entrance of the house.	260.34	5819.247	-0.015	0.722
Q40 Frequency of using Spaces between houses.	261.91	5816.677	0.003	0.722
Q40 Frequency of using Streets and sidewalks.	260.62	5772.941	0.199	0.720

	Scale Mean if Item Deleted	Scale Variance if Item Deleted	Corrected Item-Total Correlation	Cronbach's Alpha if Item Deleted
Q40 Frequency of using Children's playgrounds.	262.02	5816.719	0.005	0.722
Q40 Frequency of using the neighbourhood garden.	261.93	5798.662	0.133	0.721
Q40 Frequency of using the masjid/church.	261.10	5799.954	0.083	0.721
Q40 Frequency of using local shops.	260.22	5804.107	0.057	0.721
Q40 Frequency of using local market or malls.	260.48	5811.447	0.021	0.722
Q40 Frequency of using local restaurants.	261.50	5806.570	0.059	0.721
Q40 Frequency of using the local café.	261.79	5803.641	0.079	0.721
Q40 Frequency of using the gym.	261.93	5839.855	-0.143	0.723
Q41 Closest Gathering Place - The main entrance of the house.	261.98	5821.912	-0.053	0.722
Q41 Closest Gathering Place - Spaces between houses.	262.26	5821.704	-0.073	0.722
Q41 Closest Gathering Place - Streets and sidewalks.	262.10	5809.989	0.116	0.721
Q41 Closest Gathering Place – Children's playground.	262.34	5809.914	0.292	0.721
Q41 Closest Gathering Place – Others.	262.22	5817.686	0.006	0.722
Q41 Closest Gathering Place - None/do not use any.	262.29	5826.000	-0.184	0.722
Q42 To sit and chat with others.	261.84	5796.554	0.278	0.721
Q42 For passing.	262.19	5818.683	-0.012	0.722
Q42 Used to observe the pedestrians.	262.33	5821.487	-0.100	0.722
Q42 Used to the cultivation of some plants.	262.29	5818.421	-0.009	0.722
Q42 Used for parking.	262.19	5822.823	-0.080	0.722
Q42 Used for children to play.	262.22	5812.738	0.094	0.721
Q42 Used – Others.	262.16	5815.677	0.036	0.722
Q43 The usual time of using the adjacent place–Morning.	262.05	5814.225	0.051	0.722
Q43 The usual time of using the adjacent place – Afternoon.	261.78	5812.738	0.068	0.721
Q43 The usual time of using the adjacent place–Evening.	262.00	5798.105	0.265	0.721
Q44 The use of the public garden located in your neighbourhood.	260.66	5827.598	-0.140	0.722
Q45 Using the public garden to sit and chat with others.	262.16	5814.379	0.056	0.722
Q45 Using the public garden for passing.	262.36	5818.551	-0.022	0.722
Q45 Using the public garden to observe pedestrians.	262.36	5817.674	0.022	0.722
Q45 Using the public garden for children to play.	262.24	5802.432	0.294	0.721
Q45 Using public garden – Others.	262.36	5820.761	-0.132	0.722
Q46 The usual time of using the shared garden-Morning.	262.34	5811.318	0.242	0.721
Q46 The usual time of using the shared garden – Afternoon.	262.12	5818.529	-0.009	0.722
Q46 The usual time of using the shared garden-Evening.	262.31	5807.762	0.265	0.721

## D.2. The Sets' Validity:

This section represents the validity of the items collected. These items were divided into the three groups on which the questionnaire aims to collect data. The groups are: the physical characteristics of the built environment (PCBE); the social sustainability indicators (SSI), and the social interaction (SI) set. This was achieved by running the reliability analysis, which included testing the items (questions) that belong to each group. According to Table D-3, Table D-4, and Table D-5, the items of the PCBE, SSI, and SI have good internal consistency, with Cronbach's alpha coefficients of 0.652, 0.761, and 0.731, respectively. In other words, the items or the questions of each group measure the aspects that are built for them.



*Table D-3 Cronbach's Alpha to test the validity of the physical characteristics of the built environment.*

Reliability Statistics		
Cronbach's Alpha	Cronbach's Alpha Based on Standardized Items	N of Items
.652	.725	23

*Table D-4 Cronbach's Alpha to test the validity of the social sustainability indicators set.*

Reliability Statistics		
Cronbach's Alpha	Cronbach's Alpha Based on Standardized Items	N of Items
.761	.786	37

*Table D-5 Cronbach's Alpha value of the social interaction questions.*

Reliability Statistics		
Cronbach's Alpha	Cronbach's Alpha Based on Standardized Items	N of Items
0.731	0.792	11

Tables D-6, D-7, and D-8 represent the item-total statistics for the tested questions that belong to each of the PCBE, SSI, and SI sets, respectively. A close inspection of these tables illustrates that the values of 'Cronbach's Alpha if Item Deleted' for each item in the three groups are greater than .70, suggesting that these items have relatively high internal consistency in each group (a reliability coefficient of 0.70 or higher is considered "acceptable").

*Table D-6 The item-total statistics of the physical characteristics of the built environment.*

Item-Total Statistics					
	Scale Mean if Item Deleted	Scale Variance if Item Deleted	Corrected Item-Total Correlation	Squared Multiple Correlation	Cronbach's Alpha if Item Deleted
Q16 The total area of the house.	49.63	53.545	.049	.078	.660
Q26 Accessibility – It is easy to access the public services and the communal spaces of the neighbourhood.	49.12	54.155	-.010	.502	.669
Q26 Accessibility - The proximity of public services and communal spaces in the neighbourhood.	49.09	54.148	-.005	.416	.668
Q26 Accessibility for both genders at any time during the day.	49.94	53.336	.005	.316	.674
Q27 Satisfaction with the site design - The diversity of communal spaces.	49.08	54.249	.019	.583	.660
Q27 Satisfaction with the site design - The area of the open communal spaces.	49.09	52.317	.184	.712	.645
Q27 Satisfaction with the site design - The availability of visual attractions in the public garden.	48.87	52.860	.139	.569	.649
Q27 Satisfaction with the site design - The distribution of houses and public services.	49.33	53.410	.084	.654	.654
Q27 Satisfaction with the site design - The width of the internal neighbourhood's streets.	49.44	53.012	.107	.765	.653
Q27 Satisfaction with the site design- The presence of sidewalks with a suitable width.	49.43	52.530	.140	.767	.649
Q27 Satisfaction with site design - the design of the neighbourhood's internal streets.	49.55	53.541	.076	.719	.655
Q29 The level of maintenance and renovation of the services of the neighbourhood.	50.52	55.232	-.089	.674	.686



#### Item-Total Statistics

	Scale Mean if Item Deleted	Scale Variance if Item Deleted	Corrected Item-Total Correlation	Squared Multiple Correlation	Cronbach's Alpha if Item Deleted
Q29 Maintenance - The furnishing and maintenance of the streets and sidewalks of the neighbourhood are well established.	50.67	55.695	-.110	.646	.687
Q32 Effectiveness - The presence of a garden.	50.02	49.160	.400	.424	.623
Q32 Effectiveness - Availability and diversity of public social services.	49.58	48.131	.552	.620	.610
Q32 Effectiveness - Distribution of public social services.	49.66	48.121	.544	.635	.610
Q32 Effectiveness - Providing shared green and open spaces.	49.47	47.741	.610	.751	.606
Q32 Suitable distribution of green and open spaces within the residential area.	49.56	46.880	.642	.664	.600
Q32 Effectiveness – Accessibility and possibility of using the communal spaces.	49.69	48.147	.571	.629	.609
Q32 Effectiveness - Designing and providing open communal spaces.	49.54	47.486	.637	.671	.603
Q32 Effectiveness - Designing the enclosed communal spaces.	49.70	48.879	.480	.550	.617
Q32 Effectiveness - The area of the open and enclosed communal spaces.	49.89	48.436	.507	.511	.614
Q32 Effectiveness - Maintenance of social services and the communal spaces.	49.40	49.534	.465	.511	.621

Table D-7 The item-total statistics of the social sustainability indicators.

	Scale Mean if Item Deleted	Scale Variance if Item Deleted	Corrected Item-Total Correlation	Cronbach's Alpha if Item Deleted
Q10 The number of families living in the house.	100.53	183.265	0.222	0.758
Q10 The number of total people living in the house.	94.81	168.230	0.103	0.800
Q19 Safety and security: How safe when using the space in front of your home entrance.	99.20	182.213	0.243	0.757
Q19 Safety and security: How safe when using the spaces between houses.	99.58	175.488	0.478	0.747
Q19 Safety and security: How safe when using the streets and sidewalk.	99.59	183.056	0.200	0.758
Q19 Safety and security: How safe when using the children playground.	99.95	181.365	0.240	0.757
Q19 Safety and security: How safe when using the public garden between houses.	99.86	183.816	0.158	0.760
Q19 Safety and security: How safe when using the mosques, churches and hussainya.	99.04	185.783	0.180	0.759
Q19 Safety and security: How safe when using the local shops.	99.11	186.709	0.136	0.760
Q19 Safety and security: How safe when using the local market or malls.	99.29	182.207	0.266	0.756
Q19 Safety and security: How safe when using the local restaurant.	99.40	183.357	0.245	0.757
Q19 Safety and security: How safe when using the local cafes.	99.96	179.277	0.288	0.754
Q19 Safety and security: How safe when using the gym.	99.68	178.298	0.380	0.751
Q20 Safety & security - The neighbourhood is safe to live in.	99.06	178.743	0.433	0.751
Q20 Safety & security - feeling safe walking around the neighbourhood during the day.	99.29	177.499	0.395	0.750
Q20 Safety & security - Feeling safe when using the closed & open communal spaces during the daytime	99.23	178.151	0.367	0.751
Q20 Safety & security - Feeling safe using the closed & open communal spaces during the evening.	99.69	174.294	0.387	0.749
Q20 Safety & security - Feeling safe from car accidents when in the street.	99.86	176.044	0.313	0.753
Q20 Safety & Security - Planning to stay in the neighbourhood as long as possible.	99.39	177.253	0.313	0.753

	Scale Mean if Item Deleted	Scale Variance if Item Deleted	Corrected Item-Total Correlation	Cronbach's Alpha if Item Deleted
Q21 Place Attachment - Feeling strongly attached to the neighbourhood as one of its members.	99.20	172.922	0.541	0.744
Q21 Place Attachment - Feeling proud of living in this neighbourhood.	99.38	174.845	0.443	0.748
Q21 Place Attachment - Feeling at home when arriving in the neighbourhood.	99.31	176.901	0.385	0.750
Q22 Sense of community - The friendships and relationships I have with neighbours in the neighbourhood mean a lot to me.	99.54	171.264	0.503	0.743
Q22 Sense of community - I have made new friends while living here.	99.56	172.426	0.498	0.744
Q22 Sense of community - If I need a little company, I can stop by a neighbour I know.	100.08	175.893	0.322	0.752
Q22 Sense of community - Attending most of the social gatherings.	99.29	174.562	0.517	0.746
Q22 Sense of community - Participating in decision-making processes relevant to the neighbourhood.	99.94	170.059	0.501	0.743
Q23 Privacy - The possibility of easily watching the kids when they are playing in the communal spaces provided near the house.	99.81	181.192	0.230	0.757
Q23 Privacy - The possibility of using open communal spaces with the family.	100.18	179.665	0.262	0.756
Q23 Privacy - The possibility of using open communal spaces with friends and neighbours.	99.93	178.830	0.276	0.755
Q27 Satisfaction with site design - The diversity of communal spaces.	99.59	190.043	-0.073	0.768
Q27 Satisfaction with site design - Feeling satisfied with the size of the open communal spaces within the neighbourhood.	99.68	188.349	-0.003	0.765
Q27 Satisfaction with site design - The availability of visual attractions in the public garden	99.35	185.952	0.107	0.761
Q27 Satisfaction with site design - The distribution of houses and public services.	99.88	190.035	-0.075	0.767
Q27 Satisfaction with site design - The width of the internal neighbourhood's streets.	99.86	188.930	-0.030	0.766
Q27 Satisfaction with site design - The presence of sidewalks with a suitable width.	99.95	187.922	0.014	0.765
Q27 Satisfaction with site design - The design of the neighbourhood's internal streets.	100.00	190.051	-0.074	0.768

Table D-8 The item-total statistics of the social interaction questions.

	Scale Mean if Item Deleted	Scale Variance if Item Deleted	Corrected Item-Total Correlation	Squared Multiple Correlation	Cronbach's Alpha if Item Deleted
Q17 The presence of relatives living within the neighbourhood	51.63	3704.289	.269	.138	.737
Q33 No. of neighbours you know by name in your area.	37.70	1781.601	.827	.805	.615
Q33 No. of neighbours you say hello to when you meet.	36.94	1574.047	.821	.806	.638
Q33 No. of neighbours you usually stop and chat with.	46.34	2952.299	.743	.632	.669
Q33 No. of neighbours you visit from time to time.	48.69	3348.250	.512	.600	.708
Q33 No. of neighbours you consider as friends.	47.71	3142.961	.484	.320	.699
Q33 If I have a personal crisis, I have a neighbour can talk to.	51.21	3712.223	.191	.181	.737
Q33 No. of households you can turn to in an emergency.	48.65	3429.501	.463	.568	.714
Q34 The frequency of visiting	49.57	3680.638	.275	.218	.735
Q37 The frequency of asking for help, borrowing or exchanging things with neighbours	50.92	3699.439	.192	.093	.736
Q38 Participating in formal and informal gatherings.	51.22	3710.292	.230	.115	.737

### D.3. Kolmogorov–Smirnov Test (K-S):

After conducting the reliability and stability tests to examine the tool of the questionnaire, the Kolmogorov-Smirnov test was run to test the normality distribution of the data of the dependent variable, which is social interaction (SI). The dependent variable (SI) has also manifested within three indices; the N\_Index, the SN\_Index, and the SR\_Index. According to the Kolmogorov-Smirnov test represented in Table D-9, all dependent variables have a non-normal distribution because the  $p$ -value is less than 0.05. In order to ensure these data are normally distributed, the  $p$ -value should be greater than 0.05 (Field, 2009). The table shows that the individual neighbouring index,  $D(218) = 0.084$ ,  $p < .05$ , the mean of neighbouring index,  $D(218) = 0.144$ ,  $p < .001$ , the social network index,  $D(218) = 0.274$ ,  $p < .001$ , and the social relationships index,  $D(218) = 0.064$ ,  $p < .05$  are all significantly non-normal (see Figure D-1, Figure D-2, and Figure D-3, respectively).

Table D-9 Kolmogorov-Smirnov test tests of normality for the dependent variable.

	Kolmogorov-Smirnov <sup>a</sup>			Shapiro-Wilk		
	Statistic	df	Sig.	Statistic	df	Sig.
N_Index	0.084	218	0.001	0.922	218	0.000
SN_Index	0.274	218	0.000	0.574	218	0.000
SR_Index	0.064	218	0.032	0.974	218	0.000

a. Lilliefors Significance Correction

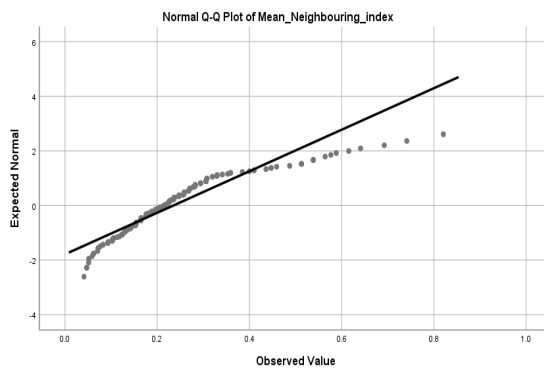


Figure D-1 Normal Q-Q Plot of Mean Neighbouring Index.

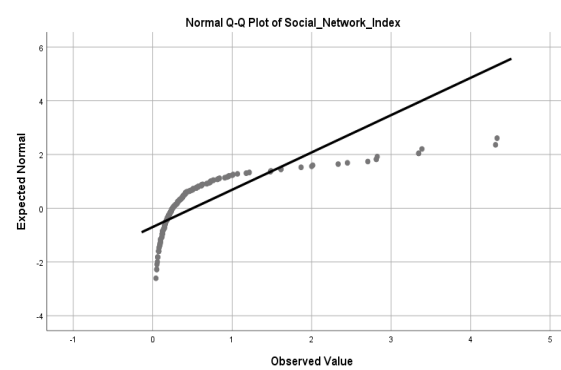


Figure D-2 Normal Q-Q Plot of Social Relationships Index.

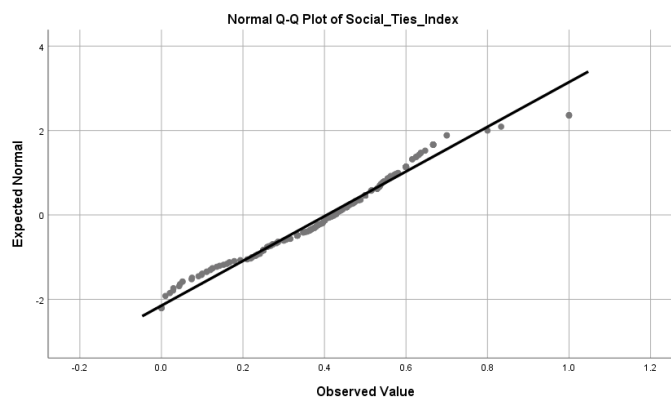


Figure D-3 Normal Q-Q Plot of Social Network Index.

### D.4. The Demographic Factors of the Respondents:

In this study, the demographic factors comprise 11 factors, including age, gender, marital status, number of children, education status, employment status, number of working hours and days, the presence of relatives, the length of residency in the house and neighbourhood, and the type of ownership. Also, it includes indicating the number of families and the total number of members living in the house. The following sub-sections describe the statistics.

#### D.4.1. Gender:

The first demographic factor is gender. Because the questionnaire was distributed randomly, Table D-10 and Figure D-4 demonstrate that the overall proportion of male respondents is slightly more than female respondents, i.e., 50.4% males and 49.6% females. This distribution is approximately the same for AlJunainah neighbourhood, where the proportion of male respondents was significantly higher than female respondents, while for AlKhalij Alarabi and AlZahraa, the proportion of female respondents was higher than male, i.e., 52.6% and 59% females, respectively. In other words, both genders had the opportunity to participate in this survey, which enabled the consideration of perceptions from different perspectives.

Table D-10 Respondents' gender in the case studies.

Gender	AlJunainah		AlKhalij Alarabi		AlZahraa		Overall	
	n	Percent	n	Percent	n	Percent	n	Percent
Male	50	58.8%	46	47.4%	16	41.0%	112	50.7%
Female	35	41.2%	51	52.6%	23	59.0%	109	49.3%
Total	85	100.0%	97	100.0%	39	100.0%	221	100.0%

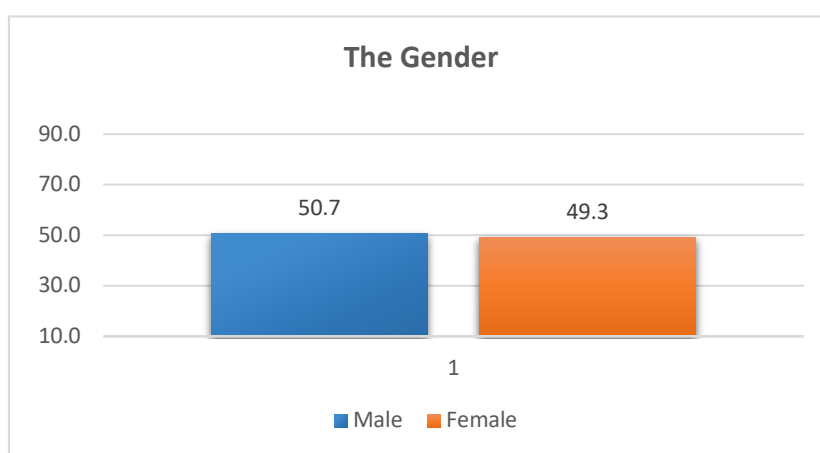


Figure D-4 Overall percentage of respondents to the third question regarding gender.

#### D.4.2. Age Group:

The second factor was the age group, which represented the breakdown of respondents between six age groups. Overall, it is apparent from Table D-11 and Figure D-5 that the majority of respondents were relatively young, aging between 18 and 44 years of age, whereas 37.1% of the respondents were aged between 25 and 34, 21.7% were aged between 35 and 44, and 19.5% aged between 18 and 24. The data also demonstrated that around 19% of the respondents were aged between 45 and 64 years, while only 3.2% of the respondents belonged to 65-74 years age group. The breakdown in the table represents approximately similar patterns across the surveyed neighbourhoods.

Table D-11 Counts and valid percent of the age groups.

Age groups	AlJunainah		AlKhalij Alarabi		AlZahraa		Overall	
	N	%	N	%	N	%	N	Valid %
18 - 24	10	11.8%	28	28.9%	5	12.8%	43	19.5%
25 - 34	37	43.5%	25	25.8%	20	51.3%	82	37.1%
35 - 44	16	18.8%	24	24.7%	8	20.5%	48	21.7%
45 - 54	9	10.6%	9	9.3%	2	5.1%	20	9.0%
55 - 64	12	14.1%	8	8.2%	1	2.6%	21	9.5%
65 - 74	1	1.2%	3	3.1%	3	7.7%	7	3.2%
Total	85	100.0%	97	100.0%	39	100.0%	221	100.0%

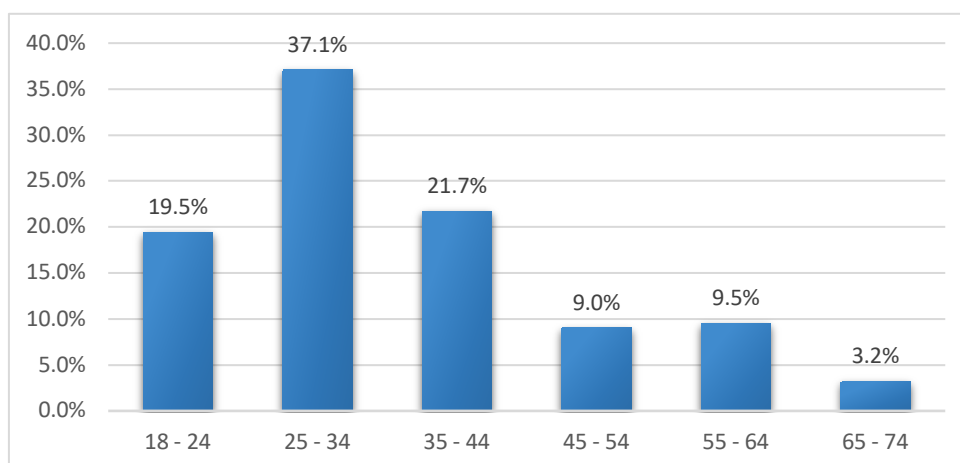


Figure D-5 Age groups of respondents.

#### D.4.3. Marital Status:

Table D-12 and Figure D-6 demonstrate the marital status of the respondents in the three case studies. It is apparent from the table that slightly more than two-thirds of the total respondents were married, slightly less than 30% were single, while only 5.4% were divorced or widowed. A closer inspection of the breakdown in the table shows that the majority of respondents in each neighbourhood were married, followed by single respondents, and a small proportion of the respondents were either divorced or widowed.

Table D-12 Valid percentages of marital status.

Marital status	AlJunainah		AlKhalij Alarabi		AlZahraa		Total	
	N	%	N	%	N	%	N	Valid %
Married	67	78.8%	52	53.6%	24	61.5%	143	64.7%
Divorced / Widow	2	2.4%	9	9.3%	1	2.6%	12	5.4%
Single	16	18.8%	36	37.1%	14	35.9%	66	29.9%
Total	85	100.0%	97	100.0%	39	100.0%	221	100.0%

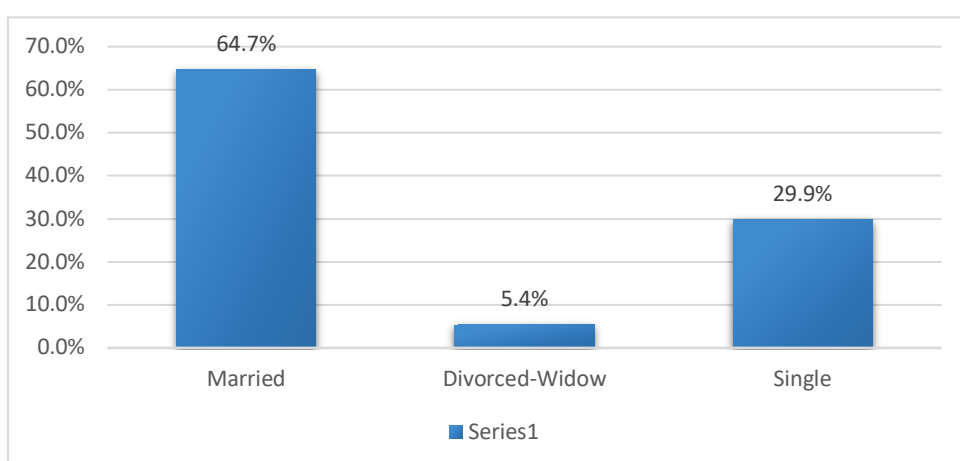


Figure D-6 Breakdown of the overall valid percentages of the marital status of respondents.

#### D.4.4. Education Level:

Table D-13 and Figure D-7 represent the breakdown of the education level of respondents overall and for each case study. Overall, it is apparent from the data in the table that more than half of the respondents have a bachelor's degree or above, while 15.4% of the respondents were undergraduate students. The proportion of respondents who held an institute certificate was 14.9%, and 13% of respondents had a secondary school degree or less, while around less than 2% of respondents had no education background. A closer inspection of the table shows similar

patterns across the neighbourhoods. The higher proportion of respondents in AlJunainah, AlKhalij Alarabi, and AlZahraa neighbourhoods with bachelor's degrees or above were 58.8%, 39.2%, and 87.2%, respectively, while the less proportion of respondents with no education background were 3.5%, and 0.0% respectively.

Table D-13 The education level of the respondents.

Education status	AlJunainah		AlKhalij Alarabi		AlZahraa		Total	
	n	%	n	%	n	%	n	Valid %
Secondary school or less	12	14.1%	17	17.5%	0	0.0%	29	13.1%
Institute degree	14	16.5%	18	18.6%	1	2.6%	33	14.9%
University degree and above	50	58.8%	38	39.2%	34	87.2%	122	55.2%
No degree	3	3.5%	0	0.0%	0	0.0%	3	1.4%
Undergraduate student	6	7.1%	24	24.7%	4	10.3%	34	15.4%
Total	85	100.0%	97	100.0%	39	100.0%	221	100.0%

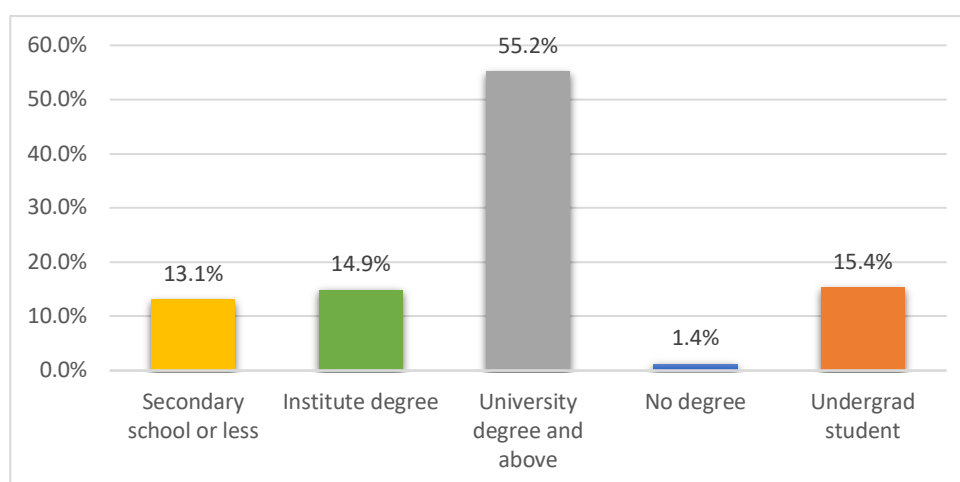


Figure D-7 The overall valid per cents of education background.

#### D.4.5. Employment Status:

Table D-14 and Figure D-8 represent the breakdown of employment status of residents in the surveyed neighbourhoods. Overall, the data in the table shows that around one-third of the respondents worked in the public sector (governmental departments), 19.4% worked in the private sector (e.g., foreign companies like oil companies and organisations or self-employed), 15.9% were university students, around 13% were either unemployed or housewives, and around 7% of the respondents were retirees. The data in Table 6-6 also demonstrates that around one-third of the sample population, namely those who are unemployed, housewives, and retirees, seem to spend more time at home (in comparison with those who work or study). It is argued that the social interaction level is higher among these three categories of people because they have more time to interact with neighbours or to use communal spaces (Buonfino & Hilder, 2006).

Further inspection of the table shows a breakdown that demonstrates approximately similar patterns across AlJunainah and AlZahraa neighbourhoods. However, in AlKhalij Alarabi neighbourhood, the proportion of respondents who are employees in the public sector and university students are similar at 24.2%. It can also be seen that the proportion of respondents who work in the public sector in the surveyed districts is significantly higher in AlZahraa neighbourhood at 43.9%, while in AlJunainah neighbourhood, it is 35.9% and in AlKhalij Alarabi neighbourhood it is 24.2%.



Table D-14 Employment status.

Employment status	AlJunainah		AlKhalij Alarabi		AlZahraa		Overall	
	n	%	n	%	n	%	n	Valid %
Public sector employee	29	34.1%	23	23.7%	18	46.2%	70	31.7%
Private sector employee	19	22.4%	18	18.6%	7	17.9%	44	19.9%
Student	6	7.1%	24	24.7%	5	12.8%	35	15.8%
Retired	7	8.2%	4	4.1%	3	7.7%	14	6.3%
Unemployed	16	18.8%	10	10.3%	3	7.7%	29	13.1%
Housewife	8	9.4%	18	18.6%	3	7.7%	29	13.1%
Total		100.0%		100.0%	39	100.0%	221	100.0%

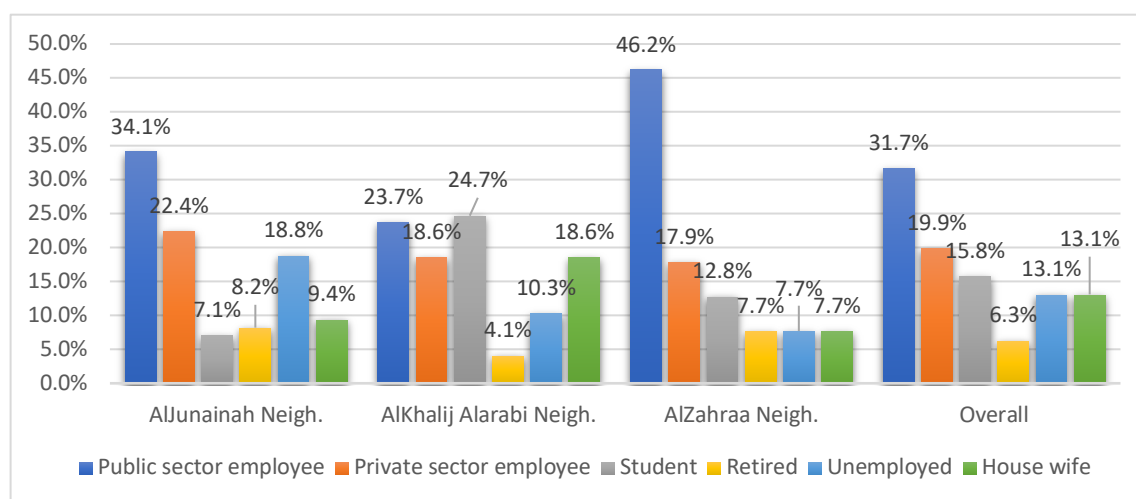


Figure D-8 Employment status.

#### D.4.6. The Number of Working Hours per Day and Working Days per Month:

Table D-15 shows the descriptive statistics of the eighth question of the questionnaire. This question includes two sections related to the number of working hours per day and working days per month. The minimum statistics (0) refer to the lowest number of working hours per day and working days per month for respondents who do not work (retirees, unemployed and housewives), while the maximum statistics (24 and 30) represent the higher number of working hours and working days, respectively.

Table D-15 Descriptive statistics for question eight of the questionnaire.

Descriptive Statistics								
	N Statistic	Minimum Statistic	Maximum Statistic	Std. Deviation Statistic	Skewness		Kurtosis	
					Statistic	Std. Error	Statistic	Std. Error
Number of working hours per day.	221	0	24	4.540	1.013	.164	2.939	.326
Number of working days per months.	221	0	30	10.889	-.465	.164	-1.478	.326
Valid N (listwise)	221							

Table D-16 represents the summaries of questions six and eight of the questionnaire across the surveyed neighbourhoods. It shows the mean total working hours per day and working days per month for respondents who are public and private sector employees and university students. Overall, for those who work in the public sector, the mean number of working hours per day is eight. The breakdown of the data shows a similar pattern in AlKhalij Alarabi neighbourhood, while in AlJunainah and AlZahraa, the working hours are nine and seven hours per day, respectively. Regarding the mean number of working days per month, the data demonstrates that, overall, the mean number of working days per month is 21, which is similar in AlJunainah and AlZahraa neighbourhoods, while in AlKhalij Alarabi neighbourhood, it is 20 days per month.

For those who are employees in the private sector, the table shows that the mean number of working hours per day is eight, which is similar to AlJunainah neighbourhood, although it is nine and seven hours in AlKhalij Alarabi and AlZahraa neighbourhoods respectively. According to the data, 24 days is the mean number of working days per a month for private sector employees; this is similar in AlKhalij Alarabi neighbourhood, while it is 25 days in AlJunainah and 23 days in AlZahraa.

The data also represents the mean number of working hours per day for those who are university students, which is six, whilst the mean number of working days per month for students is 22. The breakdown of the data shows a similar pattern across most case studies regarding the number of working hours per day, except in AlJunainah neighbourhood, which is seven. Regarding the mean number of working days per month, the data breakdown shows that there is a similar pattern across the surveyed neighbourhoods, except for AlZahraa neighbourhood, which is 20 days.

Regarding the mean for question eight, the average working hours per day for all three categories is eight. This pattern is similar across most neighbourhoods, except for AlZahraa neighbourhood, which is seven hours. The average working days per month for the same three categories are 22. This pattern is similar across AlKhalij Alarabi neighbourhood, while for AlJunainah neighbourhood, it is 23 and in AlZahraa neighbourhood, it is 21, as shown in Table D-16.

*Table D-16 The mean value for questions six and eight of the questionnaire across the surveyed neighbourhoods.*

			AlJunainah	AlKhalij Alarabi	AlZahraa	Overall (mean)
Q6: Employment status	Public sector employee	Number of working hours per day.	9	8	7	8
		Number of working days per month.	21	20	21	21
	Private sector employee	Number of working hours per day.	8	9	7	8
		Number of working days per month.	25	24	23	24
	Student	Number of working hours per day.	7	6	6	6
		Number of working days per month.	22	22	20	22
Total	Number of working hours per day.		8	8	7	8
	Number of working days per month.		23	22	21	22

Table D-17 demonstrates the counts and percentages of the total number of working hours per day and working days per month for respondents who work or study across the surveyed neighbourhoods. Overall, it can be seen that the higher proportions are for respondents who spend six (17.3%) or eight (17.7%) hours working or studying. The breakdown in the table shows a similar pattern in AlJunainah neighbourhood. For AlZahraa neighbourhood, 30.8% of respondents spend six hours per day working or studying, 20.5% spend eight hours. In comparison, in AlKhalij Alarabi neighbourhood, 52.1% of respondents spend between four to eight hours per day working or studying, whilst 17.7% spend eight hours in work.

Regarding the number of working days per month, the higher proportion is for the population sample who work or study for 22 days per month, i.e., 30%. The breakdown in the same table shows a similar pattern for AlKhalij Alarabi neighbourhood (36.5%). For AlJunainah and AlZahraa neighbourhoods, 23.5% and 27.8% of the respondents, respectively, spend 22 days per month for working or studying outside their areas; however, these percentages are still the highest proportion for the number of working days per month in these neighbourhoods.

Table D-17 Percentage of working hours per day across the surveyed neighbourhoods.

No. working hours/day	AlJunainah		AlKhalij Alarabi		AlZahraa		Overall	
	N	%	N	%	N	%	N	%
0	31	36.5%	32	33.3%	9	23.1%	72	32.7%
1	0	0.0%	1	1.0%	0	0.0%	1	0.5%
4	3	3.5%	1	1.0%	3	7.7%	7	3.2%
5	3	3.5%	12	12.5%	1	2.6%	16	7.3%
6	15	17.6%	11	11.5%	12	30.8%	38	17.3%
7	4	4.7%	10	10.4%	3	7.7%	17	7.7%
8	14	16.5%	17	17.7%	8	20.5%	39	17.7%
9	4	4.7%	4	4.2%	1	2.6%	9	4.1%
10	4	4.7%	3	3.1%	0	0.0%	7	3.2%
12	3	3.5%	4	4.2%	2	5.1%	9	4.1%
14	1	1.2%	0	0.0%	0	0.0%	1	0.5%
22	1	1.2%	0	0.0%	0	0.0%	1	0.5%
24	2	2.4%	1	1.0%	0	0.0%	3	1.4%
Total	85	100.0%	96	100.0%	39	100.0%	220	100.0%

No. working days/month	AlJunainah		AlKhalij Alarabi		AlZahraa		Overall	
	N	%	N	%	N	%	%	N
0	31	36.5%	32	33.3%	9	25.0%	72	33.2%
8	2	2.4%	0	0.0%	0	0.0%	2	0.9%
12	0	0.0%	1	1.0%	0	0.0%	1	0.5%
14	2	2.4%	4	4.2%	3	8.3%	9	4.1%
15	3	3.5%	1	1.0%	1	2.8%	5	2.3%
16	0	0.0%	0	0.0%	1	2.8%	1	0.5%
20	8	9.4%	7	7.3%	4	11.1%	19	8.8%
21	0	0.0%	1	1.0%	2	5.6%	3	1.4%
22	20	23.5%	35	36.5%	10	27.8%	65	30.0%
24	2	2.4%	4	4.2%	1	2.8%	7	3.2%
25	1	1.2%	2	2.1%	1	2.8%	4	1.8%
26	7	8.2%	5	5.2%	2	5.6%	14	6.5%
28	4	4.7%	0	0.0%	0	0.0%	4	1.8%
30	5	5.9%	4	4.2%	2	5.6%	11	5.1%
Total	85	100.0%	96	100.0%	36	100.0%	217	100.0%

#### D.4.7. Number of Households per House:

Table D-18 represents the counts and percentages of answers to question ten of the questionnaire, which relates to the number of families living in the house within each of the three neighbourhoods. Overall, the data shows that slightly more than half of the respondents indicated that they live in houses consisting of one family, while the remaining respondents (i.e., 49.3%) live in homes of more than one family, 29.9% occupy houses of two families, 17.2% live in houses of three families, and only 2.3% live in houses of four families or more.

This pattern is approximately similar across AlKhalij Alarabi neighbourhood, where more than half of the respondents (62.9%) live in households of one family, and 37.1% live in houses of more than one family. However, the pattern in AlJunainah and AlZahraa neighbourhoods is quite the opposite, where less than half of respondents live in houses of one family, i.e., 41.2% and 41.0%, respectively, and more than half (around 59%) occupy houses of more than one family (see Figure D-9). Table D-19 shows the descriptive statistics of the total number of households per house, where the minimum statistic (1) refers to the lowest number of families and people per house, and the maximum statistics (5 and 21) represent the highest number of families and people in the house, respectively. The average (mean statistic = 1.71) total number of families in the house across the surveyed neighbourhoods is two households, while the mean number of people living in the house is seven. Table D-20 demonstrates the breakdown of the average total number of families and people who live per house across the three case studies.

Table D-18 Household size per house.

No. of households per house	AlJunainah		AlKhalij Alarabi		AlZahraa		Total	
	n	%	n	%	n	%	n	Valid %
1	35	41.2%	61	62.9%	16	41.0%	112	50.7%
2	37	43.5%	21	21.6%	8	20.5%	66	29.9%
3	10	11.8%	14	14.4%	14	35.9%	38	17.2%
4	2	2.4%	1	1.0%	1	2.6%	4	1.8%
5	1	1.2%	0	0.0%	0	0.0%	1	0.5%
Total	85	100.0%	97	100.0%	39	100.0%	221	100.0%

Table D-19 Descriptive statistics of the number of households per house

Descriptive Statistics									
	N Statistic	Minimum Statistic	Maximum Statistic	Mean Statistic	Std. Deviation Statistic	Skewness		Kurtosis	
						Statistic	Std. Error	Statistic	Std. Error
No. of families in the house.	221	1	5	1.71	0.845	0.946	0.164	0.248	0.326
No. of total people in the house.	221	1	21	7.36	3.248	0.608	0.164	0.788	0.326
Valid N (listwise)	221								

Table D-20 The mean of question ten of the questionnaire.

Q10	AlJunainah	AlKhalij Alarabi	AlZahraa	Overall
	Mean	Mean	Mean	Mean
The number of families living in the house.	2	2	2	2
The number of total people living in the house.	7	7	8	7

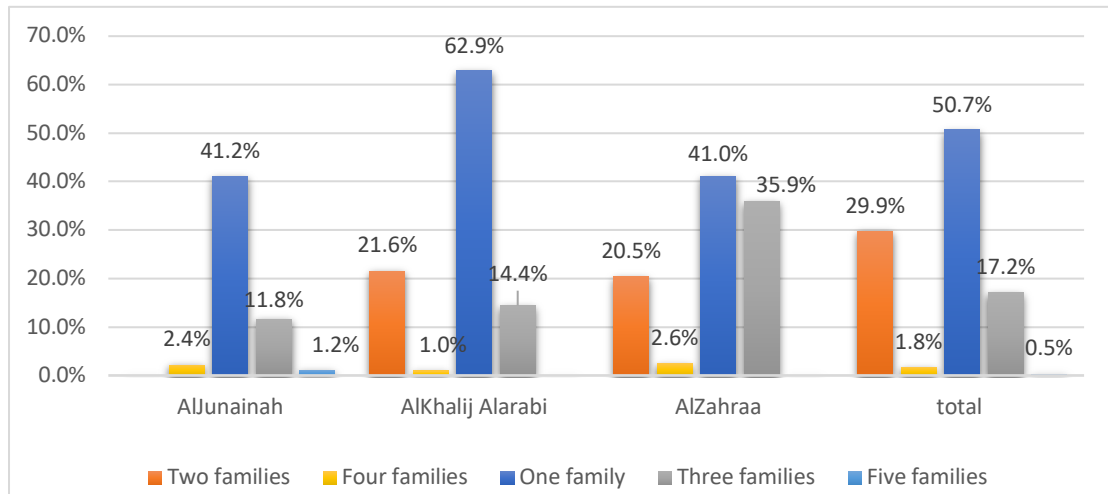


Figure D-9 Number of families per house in the three neighbourhoods.

#### D.4.8. Household size:

According to Table D-21, the mean number of members living in a house is seven persons. The table represents the total number of people per house across the case studies. Moreover, a closer inspection of the table shows the higher proportion (30.8%) of respondents belong to households of five and six people; this is followed by 21.3% of respondents whose households consist of eight or nine people. This pattern is slightly different across the three neighbourhoods, where in AlJunainah neighbourhood, around one-third of the respondents' households consist of six and nine people, whilst 10.6% of respondents' families comprise five people. For AlKhalij Alarabi neighbourhood, 19.6% of respondents' households include five people, 14.4% comprise respondents whose families consist of six people, and this is the same for respondents who belong to families of eight people.

Regarding AlZahraa neighbourhood, 20.5% of respondents' families consist of 12 people, as these households consist of three families, according to the breakdown in Table D-22. In comparison, 15.4% of respondents belong to households of five persons, and 12.2% consist of six people. Figure D-10 represents the overall total number of people who live in the house. Table D-22 represents the breakdown of household size with the total number of families per house in each neighbourhood. According to the table, it can be seen that the typical number of families per house across the case studies is one, two, or three.

Table D-21 Household Size.

No. people in the house	AlJunainah		AlKhalij Alarabi		AlZahraa		Total	
	N	%	N	%	N	%	N	Valid %
1	2	2.4%	1	1.0%	1	2.6%	4	1.8%
2	3	3.5%	2	2.1%	3	7.7%	8	3.6%
3	5	5.9%	3	3.1%	3	7.7%	11	5.0%
4	3	3.5%	6	6.2%	2	5.1%	11	5.0%
5	9	10.6%	19	19.6%	6	15.4%	34	15.4%
6	15	17.6%	14	14.4%	5	12.8%	34	15.4%
7	7	8.2%	13	13.4%	1	2.6%	21	9.5%
8	8	9.4%	14	14.4%	0	0.0%	22	10.0%
9	15	17.6%	8	8.2%	2	5.1%	25	11.3%
10	5	5.9%	7	7.2%	3	7.7%	15	6.8%
11	4	4.7%	1	1.0%	3	7.7%	8	3.6%
12	4	4.7%	4	4.1%	8	20.5%	16	7.2%
13	0	0.0%	3	3.1%	1	2.6%	4	1.8%
14	1	1.2%	0	0.0%	1	2.6%	2	0.9%
15	4	4.7%	0	0.0%	0	0.0%	4	1.8%
16	0	0.0%	1	1.0%	0	0.0%	1	0.5%
21	0	0.0%	1	1.0%	0	0.0%	1	0.5%
Total	85	100.0%	97	100.0%	39	100.0%	221	100.0%

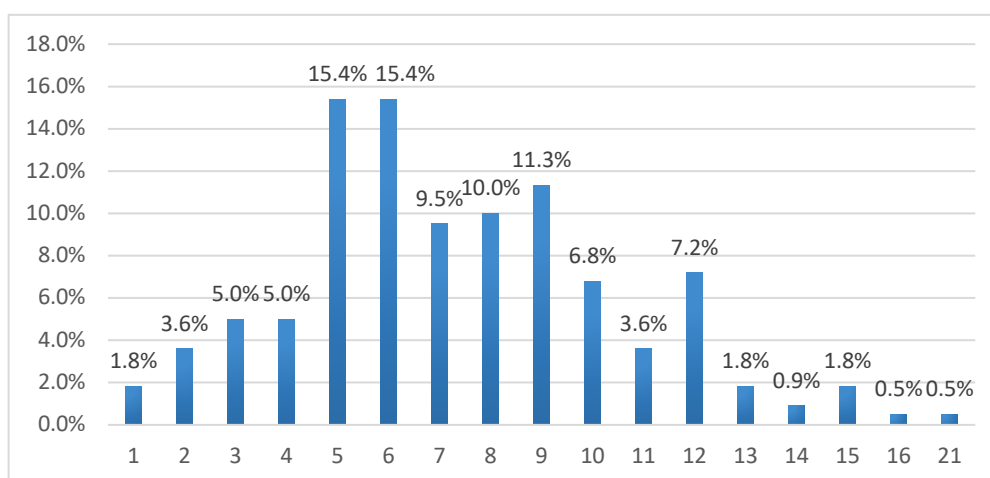


Figure D-10 The number of people living in the house.

Table D-22 The number of both households and people per house in each neighbourhood and overall.

No. of pple per house		One family	Two families	Three families	Four families	Five families	Total
AlJunainah neighbourhood	1	2.2%	-	-	-	-	2.2%
	2	2.2%	-	1.1%	-	-	3.3%
	3	5.6%	-	-	-	-	5.6%
	4	3.3%	-	-	-	-	3.3%
	5	10.0%	-	-	-	-	10%
	6	7.8%	7.8%	1.1%	-	-	16.7%
	7	3.3%	3.3%	1.1%	-	-	7.8%
	8	1.1%	11.1%	-	-	-	12.2%
	9	3.3%	14.4%	-	-	-	17.8%
	10	1.1%	4.4%	-	-	-	5.6%
	11	-	2.2%	1.1%	1.1%	-	4.4%
	12	-	1.1%	2.2%	-	1.1%	4.4%
	13	-	1.1%	-	-	-	1.1%
	14	-	-	1.1%	-	-	1.1%
	15	-	-	3.3%	1.1%	-	4.4%
Total		40%	45.6%	11.1%	2.2%	1.1%	100%
AlKhali Alarabi Neighbourhood	1	1%	-	-	-	-	1%
	2	3%	-	-	-	-	3%
	3	2%	-	1%	-	-	3%
	4	5%	1%	-	-	-	6.1%
	5	17%	2%	-	-	-	19.2%
	6	13%	2%	-	-	-	15.2%
	7	11%	2%	-	-	-	13.1%
	8	5%	5%	4%	-	-	14.1%
	9	3%	2%	3%	-	-	8.1%
	10	2%	4%	1%	-	-	7.1%
	11	-	-	1%	-	-	1%
	12	-	2%	2%	-	-	4%
	13	1%	1%	1%	-	-	3%
	16	-	-	1%	-	-	1%
	21	-	-	-	1%	-	1%
Total		64%	21%	14%	1%	-	100%
AlZahraa Neighbourhood	1	-	2%	-	-	-	2.4%
	2	7%	2%	-	-	-	9.8%
	3	7%	-	-	-	-	7.3%
	4	7%	-	-	-	-	7.3%
	5	12%	2%	-	-	-	14.6%
	6	10%	2%	-	-	-	12.2%
	7	-	-	2.4%	-	-	2.4%
	9	-	2%	2.4%	-	-	4.9%
	10	-	7%	-	-	-	7.3%
	11	-	-	7.3%	-	-	7.3%
	12	-	-	19.5%	-	-	19.5%
	13	-	-	2.4%	-	-	2.4%
	14	-	-	-	2%	-	2.4%
Total		44%	20%	34.1%	2%	-	100%

#### D.4.9. Number of Children and Teenagers Under 18 Years Old in the House:

This section addresses question 11 in the survey, which was divided into sub-questions. The first sub-question concerned the number of children aged ten years old or less living in the house. Table D-23 illustrates the descriptive statistics of the total number of children and teenagers aged under 18 years old in the house. The minimum statistics (0) represent respondents with no children or teens living in the house, while the maximum statistics (7 and 8) refer to the highest number of children and teens, respectively. Table D-23 represents the mean number of children and teens who live in houses across the case studies, i.e., two and one, respectively.



Table D-23 Descriptive statistics of the number of children and teenagers under 18 years of age in the house.

	Descriptive Statistics					Skewness		Kurtosis	
	N Statistic	Minimum Statistic	Maximum Statistic	Mean Statistic	Std. Deviation Statistic	Statistic	Std. Error	Statistic	Std. Error
No. of children aged <10 years.	221	0	7	1.85	1.546	.669	.164	-.128	.326
No. of teens aged between 11 to 17 years in the house.	221	0	8	1.04	1.394	1.864	.164	4.939	.326
Valid N (listwise)	221								

Table D-24 The mean of question eleven of the questionnaire.

Q11	AlJunainah	AlKhalij Alarabi	AlZahraa
The number of children aged ten years or less in the house.	2	2	2
The number of teens aged between 11 to 17 years in the house.	1	1	1

Starting with the number of children per house, Table D-25 demonstrates the breakdown of the number of children aged ten years old or less per respondents' house in the surveyed neighbourhoods. Overall, 22.6% of respondents have no children, while slightly more than three-quarters of respondents (77.4%) have children aged ten years old or less; 52.2% of respondents' have more than one child (see Figure D-11). The breakdown in Table D-25 and Figure D-11 shows an approximately similar pattern across the examined neighbourhoods. For AlZahraa neighbourhood, the total proportion of respondents with children is 74.4%, while 25.6% of respondents have no children. As shown in Figure D-11, the proportion of respondents with more than one child in their households is a striking across the three neighbourhoods, as it reaches around more than half of respondents in AlJunainah and AlZahraa neighbourhoods. Closer inspection of the table shows that AlKhalij Alarabi neighbourhood has the highest proportion of respondents with children.

Table D-25 The number of children aged ten years old or less who live in the house.

Number of children aged ≤10 Y	AlJunainah		AlKhalij Alarabi		AlZahraa		Overall	
	n	%	n	%	n	%	n	Valid %
0	20	23.5%	20	20.6%	10	25.6%	50	22.6%
1	20	23.5%	29	29.9%	7	17.9%	56	25.3%
2	17	20%	21	21.6%	7	17.9%	45	20.4%
3	18	21.2%	16	16.5%	0	0%	34	15.4%
4	6	7.1%	6	6.2%	12	30.8%	24	10.9%
5	3	3.5%	3	3.1%	2	5.1%	8	3.6%
6	1	1.2%	1	1.0%	1	2.6%	3	1.4%
7	0	0.0%	1	1.0%	0	0%	1	0.5%
<b>Total</b>	<b>85</b>	<b>100.0%</b>	<b>97</b>	<b>100.0%</b>	<b>39</b>	<b>100%</b>	<b>221</b>	<b>100.0%</b>

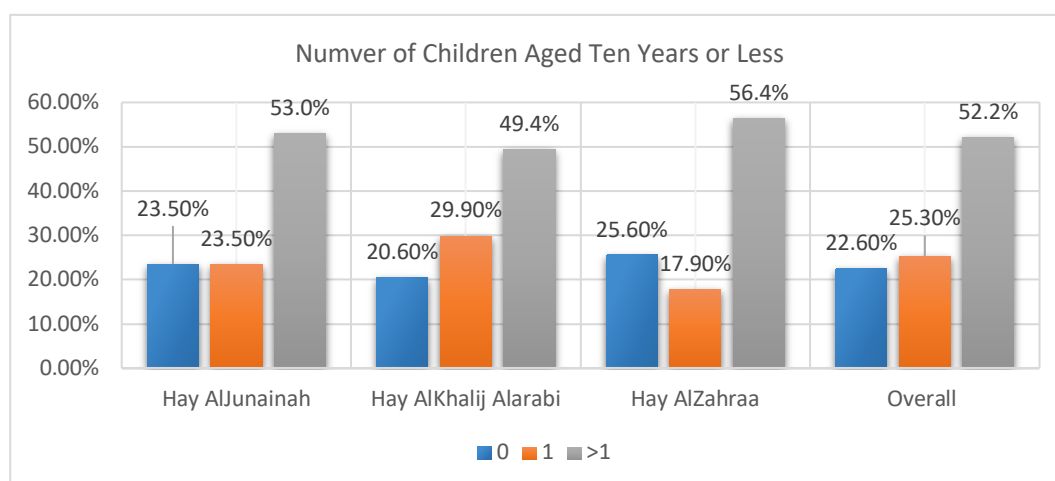


Figure D-11 Proportion of children aged ten years or less categorised in three groups in the examined neighbourhoods and overall.

The second sub-question of question 11 concerned the number of teens aged between 11- and 17-years old living in the house. Overall, according to the data represented in Table D-26 and Figure D-12, 49.8% of the sample population have no teens living with them, while slightly more than half of respondents (50.2%) indicated that their households include teenagers aged between 11 and 17 years; 20.8% of respondents have one teen in their families, and 29.4% have more than one teen. This pattern is approximately similar in AlKhalij Alarabi neighbourhood, while in AlJunainah and AlZahraa neighbourhoods, less than half of respondents have teens living in the house, i.e., 43.5% and 25.6%, respectively.

Table D-26 The number of teens aged between 11 and 17 years of age living in respondents' houses in the examined neighbourhoods and overall.

Number of teens aged (11-17) Y in the house	AlJunainah		AlKhalij Alarabi		AlZahraa		Overall	
	Count	Percent	Count	Percent	Count	Percent	Count	Valid Percent
0	48	56.5%	33	34%	29	74.4%	110	49.8%
1	15	17.6%	26	26.8%	5	12.8%	46	20.8%
2	15	17.6%	20	20.6%	1	2.4%	36	16.3%
3	2	2.4%	11	11.3%	3	7.7%	16	7.2%
4	3	3.5%	5	5.2%	0	0.0%	8	3.6%
5	2	2.4%	0	0.0%	1	2.6%	3	1.4%
8	0	0.0%	2	2.1%	0	0.0%	2	0.9%
<b>Total</b>	<b>85</b>	<b>100.0%</b>	<b>97</b>	<b>100.0%</b>	<b>39</b>	<b>100.0%</b>	<b>221</b>	<b>100.0%</b>

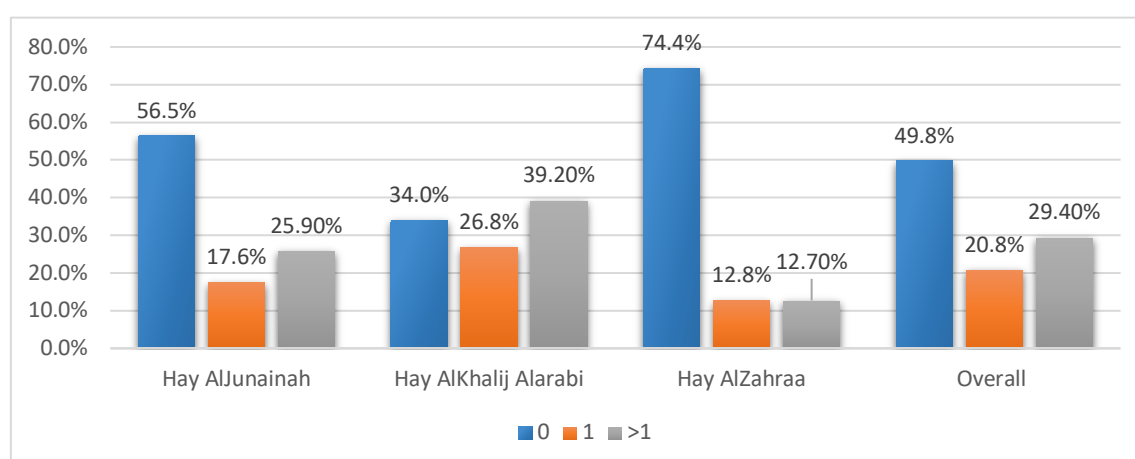


Figure D-12 Number of teens aged 11 to 17 years living in respondents' houses in the surveyed case studies and overall.

#### D.4.10. The length of residence.

Table D-27 shows the length of residency for respondents in their present residence. Overall, the data shows that the length of residence of 30.8% of the respondents is between six to ten years, more than one-quarter of respondents have occupied their dwellings for more than twenty years; slightly more than one-quarter of respondents have occupied their present residence for five years or less, and 16.2% of respondents have lived in their current home between 11 to 20 years. The breakdown across the three neighbourhoods shows approximately similar patterns in AlJunainah neighbourhood, whilst in AlKhalij Alarabi and AlZahraa neighbourhoods the higher proportion of residency is amongst those who have occupied their present residence for more than 20 years (see Figure D-13).

Table D-27 Total length of residency in the examined neighbourhoods.

Length of residence in the neighbourhood	AlJunainah		AlKhalij Alarabi		AlZahraa		Overall	
	n	%	n	%	n	%	n	Valid %
Less than two years	9	10.6%	9	9.3%	4	10.3%	22	10.0%
2-5 years	16	18.8%	15	15.5%	3	7.7%	34	15.38%
6-10 years	30	35.3%	25	25.8%	13	33.3%	68	30.8%
11-15 years	5	5.9%	9	9.3%	4	10.3%	18	8.1%
16-20 years	5	5.9%	13	13.4%	0	0.0%	18	8.1%
More than 20 years	20	23.5%	26	26.8%	15	38.5%	61	27.6%
<b>Total</b>	<b>85</b>	<b>100.0%</b>	<b>97</b>	<b>100.0%</b>	<b>39</b>	<b>100.0%</b>	<b>221</b>	<b>100.0%</b>

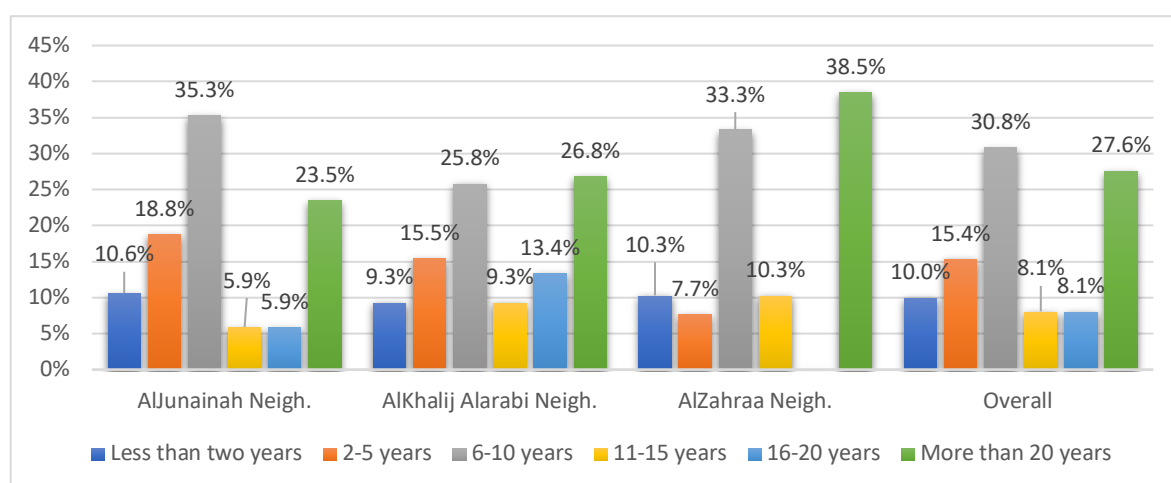


Figure D-13 Length of residence in the surveyed neighbourhoods.

#### D.4.11. Types of Ownership:

Table D-28 demonstrates the breakdown of the types of ownership of respondents' residential properties. This section addresses question 12 in the survey and 221 participants answered the question. Overall, 70.1% of residential properties are owned by respondents, 13.6% are rented residential properties, 14.5% are multi-owned properties, while around 2% of dwellings are government housing. The data in Table D-28 and Figure D-14 shows approximately similar patterns in AlJunainah and AlZahraa neighbourhoods. In AlKhalij Alarabi, the results regarding property ownership are: 69.1% owned, 17.5% rented, 12.4% multi-owned, and 1.0% government housing.

Table D-28 Property ownership.

Type of ownership	AlJunainah		AlKhalij Alarabi		AlZahraa		Overall	
	n	%	n	%	n	%	n	Valid %
Owned	61	71.8%	67	69.1%	27	69.2%	155	70.1%
Rent	10	11.8%	17	17.5%	3	7.7%	30	13.6%
Multi-ownership	13	15.3%	12	12.4%	7	17.9%	32	14.5%
Government Housing	1	1.2%	1	1.0%	2	5.1%	4	1.8%
<b>Total</b>	<b>85</b>	<b>100.0%</b>	<b>97</b>	<b>100.0%</b>	<b>39</b>	<b>100.0%</b>	<b>221</b>	<b>100.0%</b>

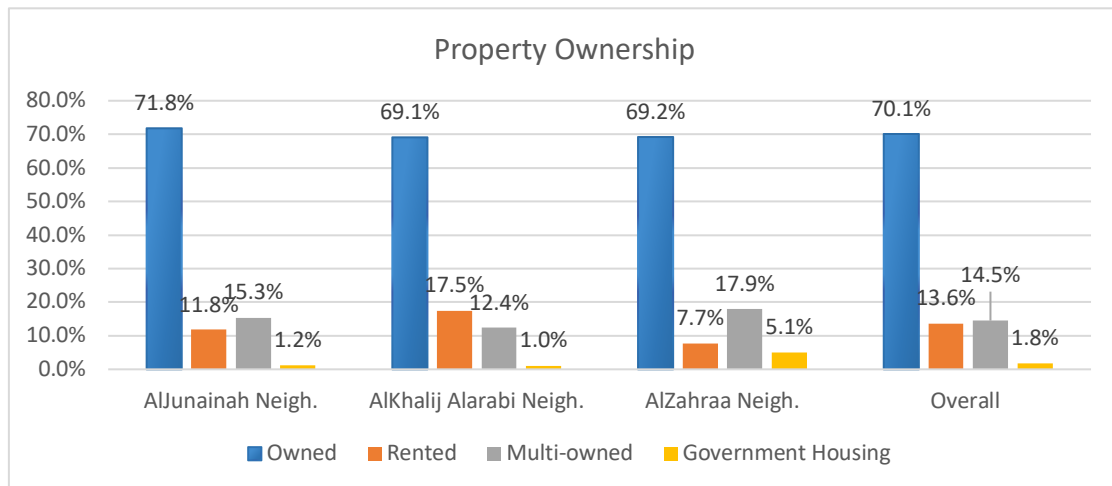


Figure D-14 The type of ownership of residential properties.

#### D.4.12. The Presence of Relatives Living in the Same Neighbourhood:

This section concerns question 17 of the questionnaire, which asks respondents whether they have relatives living in the same neighbourhood. Table D-29 represents the breakdown of responses to this question within the surveyed case studies. Overall, the data shows that more than half of respondents (57%) indicated the presence of relatives living in the same neighbourhood, while 43% of the respondents reported that they have no relatives living in the same area. This pattern is approximately similar across most surveyed neighbourhoods, except AlJunainah neighbourhood, where 50.6% of respondents reported that they have no relatives living in the same area.

Table D-29 Presence of relatives living in the same neighbourhood.

		AlJunainah		AlKhalij Alarabi		AlZahraa		Overall	
		N	%	N	%	N	%	N	%
Q17 The presence of relatives live within the neighbourhood.	No	42	49.4%	62	63.9%	22	56.4%	126	57%
	Yes	43	50.6%	35	36.1%	17	43.6%	95	43%
Total		85	100%	97	100%	39	100%	221	100%

### D.5. Social Interaction and the Physical Characteristics of the Built Environment (PCBE):

The data in Table D-30 shows the examined physical characteristics of the built environment. The data shows that there is a difference between the mean of social interaction and the intercept and the mean of satisfaction with the communal spaces. In other words, the covariates of the intercept and mean of satisfaction with the communal spaces (estimated coefficients of 1.734 and -0.305, respectively) are statistically significant ( $p=.000$ ,  $.010$  and  $.010$ , respectively) within a 95% confidence interval (0.907, 2.560), (-0.535, -0.074), respectively. Most surprisingly, according to data on residents' perceptions, the accessibility to communal spaces and their maintenance were not related to the level of social interaction among residents in the surveyed neighbourhoods in Iraq, where  $p$ -value >

.05, (i.e., .876 and .622, respectively). Table D-30 also demonstrates the parameter estimates of social interaction and the physical characteristics of the built environment across the surveyed neighbourhoods. Closer inspection of the data shows that, in all the surveyed neighbourhoods, only the intercept (estimated coefficient of 1.641, 0.753, and 4.363, respectively) is statistically significant ( $p$ -value  $>.05$ ), within a 95% confidence interval (0.486, 2.797), (0.042, 1.465), and (0.476, 8.251), respectively. In the meantime, the data shows no difference in the means for social interaction and the examined physical characteristics of the built environment, as none of the covariates are statistically significant ( $p$ -value  $>.05$ ).

Table D-30 Parameter estimates of social interaction and the physical characteristics of the built environment.

	Parameter	B	Std. Error	95% Wald Confidence Interval		Hypothesis Test		
				Lower	Upper	Wald Chi-Square	df	Sig.
Overall	(Intercept)	1.734	0.4217	0.907	2.560	16.900	1	.000
	Accessibility Q23	-0.001	0.0792	-0.157	0.154	0.000	1	.876
	Maintenance Q25	-0.011	0.0604	-0.129	0.107	0.034	1	.622
	Satisfaction with communal spaces.	-0.305	0.1174	-0.535	-0.074	6.725	1	.010
	Satisfaction with the neighbourhood. (Scale)	0.000	0.1116	-0.219	0.218	0.000	1	.492
AlJunainah	(Intercept)	1.641	0.5896	0.486	2.797	7.747	1	.005
	Accessibility Q23	-0.002	0.1225	-0.242	0.238	0	1	.986
	Maintenance Q25	-0.029	0.0855	-0.197	0.138	0.117	1	.732
	Satisfaction with communal spaces	-0.247	0.1821	-0.604	0.110	1.837	1	.175
	Satisfaction with the neighbourhood (Scale)	0.004	0.1886	-0.366	0.373	0	1	.985
AlKhalij Alarabi	(Intercept)	0.753	0.3632	0.042	1.465	4.304	1	.038
	Accessibility Q23	-0.022	0.0623	-0.144	0.100	0.123	1	.726
	Maintenance Q25	-0.034	0.0548	-0.142	0.073	0.392	1	.531
	Satisfaction with communal spaces.	-0.086	0.1003	-0.283	0.110	0.738	1	.390
	Satisfaction with the neighbourhood. (Scale)	0.078	0.0789	-0.076	0.233	0.985	1	.321
AlZahraa	(Intercept)	4.363	1.9834	0.476	8.251	4.84	1	.028
	Accessibility Q23	-0.037	0.3503	-0.723	0.650	0.011	1	.917
	Maintenance Q25	0.031	0.2189	-0.398	0.460	0.02	1	.888
	Satisfaction with communal spaces.	-0.854	0.4444	-1.725	0.017	3.697	1	.055
	Satisfaction with the neighbourhood. (Scale)	-0.234	0.6357	-1.48	1.012	0.136	1	.712

Dependent Variable: Mean Social Interaction

Model: (Intercept), Mean of Accessibility Q23, Mean of maintenance Q25, Satisfaction with communal spaces, Satisfaction with the neighbourhood

a. Maximum likelihood estimate

With regard to the factor for the total area of the house, a Kruskal-Wallis H test showed that there is no statistically significant difference in the level of social interaction between the different areas of the houses in the surveyed neighbourhoods,  $\chi^2(4) = 5.469$ ,  $p = .242$ , with a mean rank social interaction of 105.80 for less than 200 sqm, 114.63 for 200—250 sqm, 111.30 for 300-350 sqm, 96.09 for 400-450 sqm, and 174.38 for 500+ sqm. (see the data under the “Overall” column in Table D-31 and Table D-32). Regarding the factor for the total area of the house across the case studies, a Kruskal-Wallis H test showed that there is no statistically significant difference in the level of social interaction between the different areas of houses across the surveyed neighbourhoods, where in AlJunainah,  $\chi^2(4) = 3.581$ ,  $p = .466$ ; in AlKhalij Alarabi,  $\chi^2(3) = 0.195$ ,  $p = .978$ , and in AlZahraa,  $\chi^2(4) = 7.704$ ,  $p = .103$ , (see Table D-31 and Table D-32).

Table D-31 Ranks of the mean of the total area of the house (question 16th of the questionnaire), overall and across the surveyed neighbourhoods.

Ranks									
Q16 The total area of the house		AlJunainah		AlKhalij Alarabi		AlZahraa		Overall	
		N	Mean Rank	N	Mean Rank	N	Mean Rank	N	Mean Rank
Mean of Social Interaction	less than 200 sqm	28	40.70	26	49.31	8	19.00	62	105.80
	200—250 sqm	37	46.55	30	50.23	13	14.46	80	114.63
	300-350 sqm	14	34.96	30	48.62	15	23.90	59	111.30
	400-450 sqm	3	43.33	11	45.95	2	21.25	16	96.09
	500+ sqm	3	57.83	97		1	39.00	4	174.38
	Total	85				39		221	

Table D-32 Kruskal-Wallis Test - Grouping variable: Q16 the total area of the house, overall and across the surveyed neighbourhoods.

Test Statistics				
	Mean of Social Interaction			
	AlJunainah	AlKhalij Alarabi	AlZahraa	Overall
Kruskal-Wallis H	3.581	.195	7.704	5.469
df	4	3	4	4
Asymp. Sig.	.466	.978	.103	.242

## D.6. Social Interaction and the Social Sustainability Indicators (SSI):

Table D-33 shows the indicators of social sustainability and social interaction in general. The data in the table shows that there are differences between the means of social interaction and the number of families living in the house, the attachment to place, the sense of community, and privacy (estimated coefficients of 0.221, -0.210, 0.564, and -0.251 respectively). They are statistically significant ( $p$ -value  $< .05$ ) within a 95% confidence interval (0.035, 0.408), (-0.382, -0.038), (0.287, 0.841), and (-0.476, -0.027), respectively. Table D-33 also shows the indicators of social sustainability that affect social interaction across the examined case studies. Closer inspection of the data demonstrates that the covariates for the safety and security of the neighbourhood and its communal spaces and the sense of community in AlJunainah neighbourhood (estimated coefficients of 0.247 and 0.565, respectively) are statistically significant ( $p$ -value  $< .05$ ) within a 95% confidence interval (0.048, 0.445) and (0.123, 1.008), respectively. In AlKhalij Alarabi neighbourhood, the covariates for the number of people living in the house, the sense of community and privacy (estimated coefficients of 0.053, 0.436 and -0.205, respectively) are statistically significant ( $p$ -value  $< .05$ ) within a 95% confidence interval (0.018, 0.088) and (0.208, 0.664), and (-0.381, -0.030), respectively. The table also shows that the only covariate in AlZahraa neighbourhood that is statistically significant is the sense of community (estimated coefficient of 1.139), where the  $p$ -value  $< .05$  within a 95% confidence interval (0.320, 1.959).

Table D-33 Parameter estimates of social interaction and physical characteristics of the built environment in the surveyed neighbourhoods.

Parameter		B	Std. Error	95% Wald Confidence Interval		Hypothesis Test		
				Lower	Upper	Wald Chi-Square	df	Sig.
Overall	(Intercept)	0.247	0.4406	-0.616	1.111	0.315	1	.575
	<b>The number of families living in the house.</b>	<b>0.221</b>	<b>0.095</b>	<b>0.035</b>	<b>0.408</b>	<b>5.429</b>	<b>1</b>	<b>.020</b>
	The number of people living in the house	0.005	0.0246	-0.043	0.054	0.045	1	.832
	Mean of Safety and security	0.138	0.0786	-0.016	0.292	3.093	1	.079
	<b>Mean of attachment to the Place</b>	<b>-0.210</b>	<b>0.0879</b>	<b>-0.382</b>	<b>-0.038</b>	<b>5.705</b>	<b>1</b>	<b>.017</b>
	<b>Mean of sense of community</b>	<b>0.564</b>	<b>0.1412</b>	<b>0.287</b>	<b>0.841</b>	<b>15.953</b>	<b>1</b>	<b>.000</b>
	Mean of residents' satisfaction	-0.135	0.1006	-0.332	0.062	1.796	1	.180
	<b>Mean of privacy</b>	<b>-0.251</b>	<b>0.1144</b>	<b>-0.476</b>	<b>-0.027</b>	<b>4.823</b>	<b>1</b>	<b>.028</b>
	(Scale)	0.746a	0.071	0.619	0.899			



Parameter		B	Std. Error	95% Wald Confidence Interval		Hypothesis Test		
				Lower	Upper	Wald Chi-Square	df	Sig.
AlJunainah Neigh.	(Intercept)	-0.392	0.5856	-1.540	0.756	0.449	1	.503
	The number of families living in the house.	0.257	0.1393	-0.017	0.530	3.39	1	.066
	The number of people living in the house	-0.035	0.0359	-0.106	0.035	0.962	1	.327
	<b>Mean of safety and security</b>	<b>0.247</b>	<b>0.1013</b>	<b>0.048</b>	<b>0.445</b>	<b>5.936</b>	<b>1</b>	<b>.015</b>
	Mean of attachment to the Place	-0.167	0.1183	-0.399	0.065	1.987	1	.159
	<b>Mean of sense of community</b>	<b>0.565</b>	<b>0.2256</b>	<b>0.123</b>	<b>1.008</b>	<b>6.284</b>	<b>1</b>	<b>.012</b>
	Mean of residents' satisfaction	0.014	0.1302	-0.241	0.269	0.012	1	.913
	Mean of privacy	-0.192	0.1761	-0.537	0.153	1.184	1	.276
	(Scale)	0.578a	0.0887	0.428	0.781			
AlKhalij Alarabi Neigh.	(Intercept)	-0.443	0.3395	-1.109	0.222	1.705	1	.192
	The number of families living in the house.	0.080	0.0695	-0.056	0.217	1.341	1	.247
	<b>The number of people living in the house</b>	<b>0.053</b>	<b>0.0178</b>	<b>0.018</b>	<b>0.088</b>	<b>8.828</b>	<b>1</b>	<b>.003</b>
	Mean of safety and security	0.028	0.0674	-0.105	0.160	0.167	1	.683
	Mean of attachment to the Place	-0.112	0.0687	-0.247	0.022	2.673	1	.102
	<b>Mean of sense of community</b>	<b>0.436</b>	<b>0.1164</b>	<b>0.208</b>	<b>0.664</b>	<b>14.015</b>	<b>1</b>	<b>.000</b>
	Mean of residents' satisfaction	0.082	0.078	-0.071	0.235	1.106	1	.293
	<b>Mean of privacy</b>	<b>-0.205</b>	<b>0.0895</b>	<b>-0.381</b>	<b>-0.030</b>	<b>5.245</b>	<b>1</b>	<b>.022</b>
	(Scale)	0.167a	0.0239	0.126	0.221			
AlZahraa Neigh.	(Intercept)	0.954	2.1563	-3.272	5.18	0.196	1	.658
	The number of families living in the house.	-0.047	0.436	-0.901	0.808	0.012	1	.914
	The number of people living in the house	0.039	0.1063	-0.170	0.247	0.133	1	.716
	Mean of safety and security	0.393	0.3398	-0.273	1.059	1.339	1	.247
	Mean of attachment to the Place	-0.454	0.3506	-1.141	0.233	1.676	1	.195
	<b>Mean of sense of community</b>	<b>1.139</b>	<b>0.4181</b>	<b>0.320</b>	<b>1.959</b>	<b>7.421</b>	<b>1</b>	<b>.006</b>
	Mean of residents' satisfaction	-0.458	0.4993	-1.437	0.521	0.841	1	.359
	Mean of privacy	-0.310	0.3655	-1.026	0.406	0.720	1	.396
	(Scale)	1.494a	0.3384	0.959	2.329			

Dependent Variable: Mean of Social Interaction

Model: (Intercept), The number of families lives in the house, The number of total people lives in the house, Mean of safety and security of the neighbourhood and communal spaces Q20, Mean of attachment to the place (Q21), Mean of sense of community, Mean of residents' satisfaction, Mean of privacy.

a Maximum likelihood estimate.

### D.7. Social Interaction and Demographic Factors (DF):

The analysis was conducted by running two tests, GLM and Kruskal-Wallis H test, which both suit non-parametric data. Table D-34 represents the parameter estimates of the mean of social interaction and the number of working days per month, working hours per day, and children aged less than ten years in the house as overall and across the case studies. As overall, the estimated coefficients of each of the intercept (0.396) and the covariate of the number of children aged ten years or less living in the house (0.193) are statistically significant ( $p$ -value<.05) within a 95% confidence interval (0.160, 0.633) and (0.116, 0.270), respectively.

Table D-34 Parameter estimates of the mean of social interaction and the number of each of working days per month, working hours per day, and children aged less than ten years in the house.

Parameter		B	Std. Error	95% Wald Confidence Interval		Hypothesis Test		
				Lower	Upper	Wald Chi-Square	df	Sig.
Overall	(Intercept)	0.396	0.1207	0.160	0.633	10.783	1	.001
	Number of working hours per day	0.031	0.0185	-0.005	0.067	2.807	1	.094
	Number of working days per month	-0.003	0.0076	-0.018	0.011	0.212	1	.645
	<b>Number of children aged &lt;10 Y in the house</b>	<b>0.193</b>	<b>0.0394</b>	<b>0.116</b>	<b>0.270</b>	<b>23.93</b>	<b>1</b>	<b>.000</b>
	(Scale)	0.790 <sup>a</sup>	0.0752	0.656	0.952			

Parameter		B	Std. Error	95% Wald Confidence Interval		Hypothesis Test		
				Lower	Upper	Wald Chi-Square	df	Sig.
AlJunainah	(Intercept)	0.312	0.1599	-0.001	0.626	3.819	1	.051
	Number of working hours per day	0.042	0.0202	0.003	0.082	4.377	1	<b>.036</b>
	Number of working days per month	-0.002	0.0091	-0.019	0.016	0.031	1	.861
	Number of children <10 Y in the house	0.241	0.0575	0.129	0.354	17.624	1	<b>.000</b>
	(Scale)	0.570 <sup>a</sup>	0.0874	0.422	0.770			
AlKhalij Alarabi	(Intercept)	0.321	0.0924	0.140	0.502	12.05	1	.001
	Number of working hours per day	0.026	0.0164	-0.006	0.058	2.52	1	.112
	Number of working days per month	-0.006	0.0065	-0.019	0.006	1	1	.317
	Number of children <10 Y in the house	0.136	0.0306	0.076	0.196	19.633	1	<b>.000</b>
	(Scale)	0.196 <sup>a</sup>	0.0281	0.148	0.260			
AlZahraa	(Intercept)	1.043	0.5382	-0.012	2.097	3.753	1	.053
	Number of working hours per day	-0.057	0.1209	-0.294	0.180	0.221	1	.638
	Number of working days per month	0.011	0.0404	-0.068	0.090	0.075	1	.785
	Number of children <10 Y in the house	0.189	0.1422	-0.090	0.468	1.767	1	.184
	(Scale)	2.317 <sup>a</sup>	0.5248	1.487	3.612			

Dependent Variable: Mean of Social Interaction  
Model: (Intercept), Q8: Number of working hours per day, Q8: Number of working days per months, Q11 The number of children aged ten years or less in the house  
a. Maximum likelihood estimate.

Table D-34 shows that, in AlJunainah neighbourhood, there are differences between the means of social interaction and the number of working hours per day and the number of children aged ten years or less living in the house. This means the level of social interaction is influenced by the estimated coefficients of each covariate of the number of working hours per day (0.042), and the covariate of the number of children aged ten years or less living in the house (0.241), where they are statistically significant ( $p$ -value<.05) within a 95% confidence interval (0.003, 0.082) and (0.129, 0.354), respectively. Closer inspection of the data shows that the level of social interaction in AlKhalij Alarabi neighbourhood is influenced by the estimated coefficients of the covariate for the number of children aged ten years or less in the house (0.136), where it is statistically significant ( $p$ -value<.05) within a 95% confidence interval (0.076, 0.196), while in AlZahraa, none of these factors influence the level of social interaction.

The Kruskal-Wallis H test was run to examine the impact of eight categorical independent variables (demographic factors) on the level of social interaction (see Table D-35 and Table D-36). The data shows that there are statistically significant differences in the level of social interaction between gender, age groups, marital status, education level, employment status, length of residency in the neighbourhood, and the presence of relatives living within the neighbourhood ( $p$ -value <.05). Tables D-35 and D-36 show that the previously mentioned demographic factors generated a significant difference in the mean score of the following:

- Gender,  $\chi^2(1) = 43.595$ ,  $p = .000$ , with a mean rank social interaction of 139.01 for Male and 82.22 for Female.
- Age group,  $\chi^2(5) = 25.769$ ,  $p = .000$ , with a mean rank social interaction of 70.17 for (18-24), 112.76 for (25-34), 125.52 for (35-44), 126.70 for (45-54), 124.33 for (55-64), and 156.71 for (65-74).
- Marital status,  $\chi^2(2) = 21.120$ ,  $p = .000$ , with a mean rank social interaction of 104.29, for Divorced or widow, 81.57 for Single, and 125.15 126.80 for Married.
- Education level,  $\chi^2(4) = 22.426$ ,  $p = .000$ , with a mean rank social interaction of 174.17 for No degree, 103.62 for Secondary degree, 130.88 for Institute degree, 69.03 72.71 for Undergrad student, and 117.52 for University degree and above.
- Employment status,  $\chi^2(5) = 31.695$ ,  $p = .000$ , with a mean rank social interaction of 97.05 for Unemployed, 91.33 for Housewife, 145.14 for Retired, 69.01 for Student, 131.49 for Private sector employee, and 126.21 for Public sector employee.

- Length of residency in the neighbourhood,  $\chi^2(5) = 24.128, p = .001$ , with a mean rank social interaction of 73.94 for Less than two years, 77.28 for 2-5 years, 126.42 for 6-10 years, 110.06 for 11-15 years, 85.61 for 16-20 years, and 125.45 for more than 20 years.
- The presence of relatives living within the neighbourhood,  $\chi^2(1) = 10.346, p = .001$ , with a mean rank social interaction of 98.99 for No, 126.93 for Yes.

The results of the Kruskal-Wallis H test in Table D-35 and Table D-36 show that there were statistically significant differences in the level of social interaction between the gender and the presence of relatives living within AlJunainah neighbourhood ( $p$ -value  $< .05$ ). Tables D-35 and D-36 show that the previously mentioned demographic factors generate a significant difference in the mean score of the following:

- The gender,  $X^2(1) = 16.123, p = .000$ , with a mean rank social interaction of 51.99 for Male and 30.16 for Female.
- The presence of relatives who live within the neighbourhood,  $X^2(1) = 8.677, p = .003$ , with a mean rank social interaction of 35.02 for No and 50.79 for Yes.

Closer inspection of the data in the same table under AlKhalij Alarabi neighbourhood shows that there are statistically significant differences in the level of social interaction between gender, age group, marital status, education level, and employment status ( $p$ -value  $< .05$ ). Table D-35 and table D-36 show that the previously mentioned demographic factors generate a significant difference in the mean score of the following:

- Gender,  $X^2(1) = 22.931, p = .000$ , with a mean rank social interaction of 63.40 for Male and 36.01 for Female.
- Age group,  $X^2(5) = 30.385, p = .000$ , with a mean rank social interaction of 25.80 for (18-24), 56.34 for (25-34), 60.69 for (35-44), 51.11 for (45-54), 56.31 for (55-64), and 85.00 for (65-74).
- Marital status,  $X^2(2) = 22.990, p = .000$ , with a mean rank social interaction of 54.11 for Divorced or widow, 31.32 for Single, and 60.36 for Married.
- Education level,  $X^2(3) = 20.838, p = .000$ , with a mean rank social interaction of 53.24 for Secondary school or less, 59.53 for Institute degree, 26.50 for Undergrad student, and 56.33 for University degree and above.
- Employment status,  $X^2(5) = 33.086, p = .000$ , with a mean rank social interaction of 37.95 for Unemployed, 45.67 for Housewife, 82.25 for Retired, 26.50 for Student, 64.42 for Private sector employee, and 62.04 for Public sector employee.

Regarding AlZahraa neighbourhood, the data shows that there are statistically significant differences in the level of social interaction between the gender and the length of residence in the neighbourhood ( $p$ -value  $< .05$ ). Tables D-35 and D-36 demonstrates that the previously mentioned demographic factors generate a significant difference in the mean score of the following:

- Gender,  $X^2(1) = 11.172, p = .001$ , with a mean rank social interaction of 27.31 for Male and 14.91 for Female.
- Length of residency in the neighbourhood,  $X^2(5) = 15.636, p = .008$ , with a mean rank social interaction of 9.00 for less than two years, 9.33 for 2-5 years, 22.12 for 6-10 years, 9.38 for 11-15 years, 14.50 for 16-20 years, and 26.89 for more than 20 years.

Table D-35 Ranks of the mean of demographic factors and the mean of social interaction.

		Ranks							
		Social Interaction							
		AlJunainah		AlKhalij Alarabi		AlZahraa		Overall	
		N	Mean Rank	N	Mean Rank	N	Mean Rank	N	Mean Rank
Gender	Male	50	51.99	46	63.40	16	27.31	112	139.01
	Female	35	30.16	51	36.01	23	14.91	109	82.22
	Total	85		97		39		221	
Age group	18 - 24	10	35.35	28	25.80	5	19.40	43	70.17
	25 - 34	37	41.41	25	56.34	20	15.38	82	112.76
	35 - 44	16	48.56	24	60.69	8	24.75	48	125.52
	45 - 54	9	50.44	9	51.11	2	32.50	20	126.70
	55 - 64	12	43.04	8	56.31	1	34.00	21	124.33
	65 - 74	1	22.00	3	85.00	3	26.17	7	156.71
	Total	85		97		39		221	
Marital status	Divorced-Widow	2	15.00	9	54.11	1	30.00	12	104.29
	Single	16	35.44	36	31.32	14	16.93	66	81.57
	Married	67	45.64	52	60.36	24	21.38	143	125.15
	Total	85		97		39		221	
Education level	No degree.	3	59.33					3	174.17
	Secondary school or less.	12	31.71	17	53.24			29	103.62
	Institute degree.	14	55.68	18	59.53	1	35.00	33	130.88
	Undergrad student.	6	35.92	24	26.50	4	23.50	34	69.03
	University degree and above.	50	42.03	38	56.33	34	19.15	122	117.52
	Total	85		97		39		221	
Employment status	Unemployed.	16	37.56	10	37.95	3	14.17	29	97.05
	Housewife.	8	33.75	18	45.67	3	12.17	29	91.33
	Retired.	7	43.64	4	82.25	3	26.17	14	145.14
	Student.	6	35.92	24	26.50	5	19.50	35	69.01
	Private sector employee.	19	48.18	18	64.42	7	22.36	44	131.49
	Public sector employee.	29	46.47	23	62.04	18	20.47	70	126.21
	Total	85		97		39		221	
Type of ownership	Governmental housing.	1	30.00	1	34.50	2	28.25	4	122.63
	Rent.	10	36.65	17	43.21	3	10.83	30	88.95
	Multi-ownership.	13	44.65	12	56.75	7	21.21	32	124.92
	Owned.	61	43.90	67	49.30	27	20.09	155	112.09
	Total.	85		97		39		221	
Length of residency in the neighbourhood	Less than two years.	9	24.61	5	45.60	4	9.00	18	73.94
	2 - 5 years.	10	30.65	12	33.75	3	9.33	25	77.28
	6 - 10 years.	35	46.60	30	59.25	13	22.12	78	126.42
	11 - 15 years.	5	59.10	8	52.88	4	9.38	17	110.06
	16 - 20 years.	6	42.75	15	38.53	1	14.50	22	85.61
	More than 20 years.	20	47.20	27	49.69	14	26.89	61	125.45
	Total	85		97		39		221	
The presence of relatives living within the neighbourhood	No	42	35.02	62	45.57	22	19.59	126	98.99
	Yes	43	50.79	35	55.07	17	20.53	95	126.93
	Total	85		97		39		221	

Table D-36 Kruskal-Wallis H Test for the demographic factors and social interaction, overall and across the surveyed neighbourhoods.

		Test Statistics			
		Social Interaction			
		AlJunainah	AlKhalij Alarabi	AlZahraa	Overall
Gender	Kruskal-Wallis H	16.123	22.931	11.172	43.595
	df	1	1	1	1
	Asymp. Sig.	.000	.000	.001	.000
Age group	Kruskal-Wallis H	3.473	30.385	9.493	25.769
	df	5	5	5	5
	Asymp. Sig.	.627	.000	.091	.000
Marital status	Kruskal-Wallis H	4.847	22.990	2.137	21.120
	df	2	2	2	2
	Asymp. Sig.	.089	.000	.344	.000
Education level	Kruskal-Wallis H	8.097	20.838	2.301	22.426
	df	4	3	2	4
	Asymp. Sig.	.088	.000	.317	.000
Employment status	Kruskal-Wallis H	3.812	33.086	3.422	31.695
	df	5	5	5	5
	Asymp. Sig.	.577	.000	.635	.000
Type of ownership	Kruskal-Wallis H	1.080	1.905	3.071	5.263
	df	3	3	3	3
	Asymp. Sig.	.782	.592	.381	.154
Length of residence in the neighbourhood	Kruskal-Wallis H	10.960	9.826	15.636	24.128
	df	5	5	5	5
	Asymp. Sig.	.052	.080	.008	.000
The presence of relatives living within the neighbourhood	Kruskal-Wallis H	8.677	2.551	0.065	10.346
	df	1	1	1	1
	Asymp. Sig.	.003	.110	.799	.001

## D.8. Neighbouring Index and Physical Characteristics of the Built Environment (PCBE):

From the data in Table D-37, it can be seen that the level of neighbouring among the residents is significantly influenced by the intercept, the mean of accessibility, and the mean of satisfaction with the communal spaces ( $p$ -value  $< .005$ ) (estimated coefficients of 22.138, 1.441, and -2.538) within a 95% confidence interval (0.271, 2.61) and (-4.271, -0.805), respectively. The breakdown of the data across the surveyed neighbourhoods (see Table D-37) shows that, in AlJunainah neighbourhood, only the intercept (estimated coefficient of 0.375) is statistically significant ( $p$ -value  $< .05$ ) within a 95% confidence interval (0.229, 0.520). In the meantime, the data show that the level of neighbouring among residents in AlKhalij Alarabi is significantly influenced by satisfaction with the physical attributes of the neighbourhood and the level of the accessibility to communal spaces within the area, where their estimated coefficients (-0.020 and 0.020, respectively) are statistically significant ( $p$ -value  $< .05$ ) within a 95% confidence interval (-0.038, -0.003) and (0.006, 0.034), respectively. Moreover, the level of neighbouring among residents in AlZahraa is significantly influenced by satisfaction with the physical attributes of the communal spaces within the area, where its covariate (estimated coefficient of -0.099) is statistically significant ( $p = .017$ ) within a 95% confidence interval (-0.181, -0.018).

Table D-37 Parameter estimates for the Neighbouring Index and the PCBE.

	Parameter	B	Std. Error	95% Wald Confidence Interval		Hypothesis Test		
				Lower	Upper	Wald Chi-Square	df	Sig.
Overall	(Intercept)	22.138	3.1751	15.915	28.361	48.614	1	.000
	Accessibility Q23.	1.441	0.5965	0.271	2.610	5.833	1	.016
	Maintenance Q24.	-0.264	0.4545	-1.155	0.627	0.337	1	.561
	Satisfaction with communal spaces.	-2.538	0.8841	-4.271	-0.805	8.24	1	.004
	Satisfaction with the neighbourhood. (Scale)	-1.222	0.8406	-2.870	0.425	2.114	1	.146
AlJunainah	(Intercept)	48.640 <sup>a</sup>	4.6271	40.366	58.609			
	Accessibility Q23.	0.375	0.0744	0.229	0.520	25.37	1	.000
	Maintenance Q25.	0.003	0.0155	-0.028	0.033	0.030	1	.862
	Satisfaction with communal spaces.	-0.003	0.0108	-0.024	0.018	0.068	1	.795
	Satisfaction with the neighbourhood. (Scale)	-0.032	0.0230	-0.077	0.013	1.965		.161
AlKhalij Alarabi	(Intercept)	-0.022	0.0238	-0.069	0.025	0.858	1	.354
	Accessibility Q23.	0.012 <sup>a</sup>	0.0018	0.009	0.016			
	Maintenance Q25.	0.178	0.0408	0.098	0.258	19.022	1	.000
	Satisfaction with communal spaces.	0.020	0.0070	0.006	0.034	8.036	1	.005
	Satisfaction with the neighbourhood. (Scale)	0.001	0.0062	-0.011	0.013	0.029	1	.864
AlZahraa	(Intercept)	-0.002	0.0113	-0.024	0.021	0.020		.888
	Accessibility Q23.	-0.020	0.0089	-0.038	-0.003	5.222	1	.022
	Maintenance Q25.	0.003 <sup>a</sup>	0.0004	0.002	0.004			
	Satisfaction with communal spaces.	0.830	0.1855	0.466	1.193	20.001	1	.000
	Satisfaction with the neighbourhood. (Scale)	0.017	0.0328	-0.047	0.081	0.274	1	.600
AlZahraa	(Intercept)	-0.016	0.0205	-0.057	0.024	0.646	1	.422
	Accessibility Q23.	-0.099	0.0416	-0.181	-0.018	5.687		.017
	Maintenance Q25.	-0.086	0.0595	-0.203	0.030	2.115	1	.146
	Satisfaction with communal spaces.	0.016 <sup>a</sup>	0.0037	0.011	0.026			
	Satisfaction with the neighbourhood. (Scale)							

Dependent Variable: Neighbouring Index  
Model: (Intercept), Mean of Accessibility Q23, Mean of maintenance Q25, Satisfaction with communal spaces, Satisfaction with the neighbourhood  
a. Maximum likelihood estimate

Closer inspection of the data in Table D-38 and Table D-39, which details the results of the Kruskal-Wallis test, show that, overall, there is no statistically significant difference in the level of neighbouring acts (N\_Index) between the different total area of the house,  $\chi^2(4) = 5.852, p = 0.211$ , with the mean rank N\_Index score of 111.98 for less than 200sq, 113.53 for 200-250 sq., 104.96 for 300-350 sq., 99.56 for 400-450 sq, and 180.00 for 500 sq and more. The Kruskal-Wallis test was also run to determine the influence of the total area of the house on the level of neighbouring acts among residents in each of the surveyed neighbourhoods, and it shows no statistically significant difference in the level of neighbouring acts (N\_Index) between the different total areas of house across the surveyed neighbourhoods, where  $p\text{-value} > .05$  (see Table D-38 and Table D-39).

Table D-38 Ranks of the Neighbouring Index and the total area of the house, overall and across the surveyed neighbourhoods.

		Ranks							
Q16 The total area of the house		AlJunainah		AlKhalij Alarabi		AlZahraa		Overall	
		N	Mean Rank	N	Mean Rank	N	Mean Rank	N	Mean Rank
Neighbouring Index	less than 200 sqm.	28	42.20	26	49.98	8	19.94	62	111.98
	200—250 sqm.	37	48.22	30	45.82	13	16.62	80	113.53
	300-350 sqm.	14	27.82	30	53.13	15	21.80	59	104.96
	400-450 sqm.	3	40.00	11	44.09	2	19.25	16	99.56
	500+ sqm.	3	60.00			1	39.00	4	180.00
Total		85		97		39		221	



Table D-39 Kruskal-Wallis test of the Neighbouring Index and the grouping Variable: Q16 the total area of the house.

Test Statistics				
	Neighbouring Index			
	AlJunainah	AlKhalij Alarabi	AlZahraa	Overall
Kruskal-Wallis H	8.465	1.402	4.333	5.852
df	4	3	4	4
Asymp. Sig.	.076	.705	.363	.211

### D.9. Neighbouring Index and Social Sustainability Indicators (SSI):

The data in Table D-40 shows that the neighbouring level is significantly influenced by the indicators of the number of both families and people living in the house, the sense of community and resident satisfaction (estimated coefficient of 0.049, -0.008, 0.073, and -0.034, respectively) ( $p$ -value < .05) within a 95% confidence interval (0.026, 0.072), (-0.014, -0.002), (0.039, 0.108), and (-0.058, -0.009), respectively. Closer inspection of the table shows that, in AlJunainah neighbourhood, the number of both families and people living in the house and the sense of community (estimated coefficient of 0.043, -0.011, and 0.100, respectively) are statistically significant ( $p$ -value < .05) within a 95% confidence interval (0.013, 0.072), (-0.019, -0.004), and (0.052, 0.148), respectively. According to the data regarding AlKhalij Alarabi neighbourhood, the covariates of safety and security and the sense of community (estimated coefficients of -0.017 and 0.075, respectively) are statistically significant ( $p$ -value < .05) within a 95% confidence interval (-0.027, -0.007) and (0.058, 0.093), respectively. In AlZahraa neighbourhood, data in the last part of the table shows that the covariates of the number of families living in the house, the total number of people living in the house, safety and security, attachment to place, and the sense of community (estimated coefficients of 0.073, -0.015, 0.063, -0.057, and 0.184, respectively) are statistically significant ( $p$ -value < .05) within a 95% confidence interval (0.027, 0.119), (-0.026, -0.004), (0.028, 0.099), (-0.094, -0.020), and (0.140, 0.227), respectively.

Table D-40 Parameter estimates of the Neighbouring index and social sustainability indicators.

Parameter		B	Std. Error	95% Wald Confidence Interval		Hypothesis Test		
				Lower	Upper	Wald Chi-Square	df	Sig.
Overall	(Intercept)	0.192	0.0547	0.084	0.299	12.274	1	.000
	<b>The number of families living in the house.</b>	0.049	0.0118	0.026	0.072	17.461	1	<b>.000</b>
	<b>The number of people living in the house.</b>	-0.008	0.0031	-0.014	-0.002	6.044	1	<b>.014</b>
	Safety and security.	-0.004	0.0098	-0.023	0.015	0.19	1	.663
	Attachment to Place.	-0.012	0.0109	-0.033	0.010	1.163	1	.281
	<b>Sense of community.</b>	0.073	0.0175	0.039	0.108	17.485	1	<b>.000</b>
	<b>Residents' satisfaction.</b>	-0.034	0.0125	-0.058	-0.009	7.352	1	<b>.007</b>
	Privacy.	-0.010	0.0142	-0.038	0.018	0.504	1	.478
AlJunainah	(Scale)	0.011 <sup>a</sup>	0.0011	0.010	0.014			
	(Intercept)	0.047	0.0638	-0.078	0.173	0.553	1	.457
	<b>The number of families living in the house.</b>	0.043	0.0152	0.013	0.072	7.892	1	<b>.005</b>
	<b>The number of people living in the house.</b>	-0.011	0.0039	-0.019	-0.004	8.241	1	<b>.004</b>
	Safety and security.	0.006	0.0110	-0.015	0.028	0.344	1	.557
	Attachment to Place.	-0.005	0.0129	-0.030	0.020	0.144	1	.705
	<b>Sense of community.</b>	0.100	0.0246	0.052	0.148	16.481	1	<b>.000</b>
	Residents' satisfaction.	-0.004	0.0142	-0.031	0.024	0.065	1	.799
AlKhalij Alarabi	Privacy.	-0.017	0.0192	-0.055	0.020	0.818	1	.366
	(Scale)	-.007 <sup>a</sup>	0.0011	0.005	0.009			
	(Intercept)	0.052	0.0261	0.001	0.103	3.972	1	.046
	The number of families living in the house.	0.002	0.0053	-0.008	0.013	0.145	1	.703
	The number of people living in the house.	0.002	0.0014	0.000	0.005	2.745	1	.098
	<b>Safety and security.</b>	-0.017	0.0052	-0.027	-0.007	10.576	1	<b>.001</b>
AlZahraa	Attachment to Place.	-0.001	0.0053	-0.011	0.01	0.011	1	.915
	<b>Sense of community.</b>	0.075	0.0090	0.058	0.093	70.328	1	<b>.000</b>

Parameter		B	Std. Error	95% Wald Confidence Interval		Hypothesis Test		
				Lower	Upper	Wald Chi-Square	df	Sig.
AlZahraa	Residents' satisfaction.	0.000	0.0060	-0.011	0.012	0.004	1	.948
	Privacy (Scale)	-0.007	0.0069	-0.021	0.006	1.156	1	.282
	(Intercept)	0.001 <sup>a</sup>	0.0001	0.001	0.001			
		-0.027	0.1154	-0.253	0.199	0.054	1	.816
	<b>The number of families living in the house.</b>	0.073	0.0233	0.027	0.119	9.786	1	<b>.002</b>
	<b>The number of people living in the house.</b>	-0.015	0.0057	-0.026	-0.004	6.803	1	<b>.009</b>
	<b>Safety and security.</b>	0.063	0.0182	0.028	0.099	12.119	1	<b>.000</b>
	<b>Attachment to the Place.</b>	-0.057	0.0188	-0.094	-0.020	9.175	1	<b>.002</b>
	<b>Sense of community.</b>	0.184	0.0224	0.140	0.227	67.299	1	<b>.000</b>
	Residents' satisfaction.	-0.001	0.0267	-0.054	0.051	0.002	1	.965
AlJunainah	Privacy (Scale)	0.013	0.0196	-0.025	0.051	0.434	1	.510
	(Scale)	0.004 <sup>a</sup>	0.0010	0.003	0.007			

Dependent Variable: Neighbouring Index

Model: (Intercept), The number of families living in the house, The number of people living in the house, Mean of safety and security of the neighbourhood and communal spaces Q20, Mean of attachment to the place (Q21), Mean of sense of community, Mean of residents' satisfaction, Mean of privacy<sup>a</sup>

<sup>a</sup> a Maximum likelihood estimate.

#### D.10. Neighbouring Index and Demographic Factors (DF):

The results, after running the GLM, showed that the intercept and number of children living in the house aged ten years or less were significantly related to the level of neighbouring (N\_Index) among residents in the investigated context, where  $p$ -value < .05, (see Table D-41). The estimated coefficients of the previously mentioned covariates (0.206 and 0.014, respectively) are statistically significant ( $p$ -value < .05) within a 95% confidence interval (0.171, 0.240) and (0.003, 0.025), respectively. The sign of the covariate for "the number of children" is positive, which means there is a positive relationship between the number of children living in the house and the level of neighbouring acts among residents. This indicates that the more children aged ten years or less living in the house, the higher the level of neighbouring acts among residents. Table D-41 also demonstrates the effective demographic factors on the level of neighbouring acts among residents across the surveyed neighbourhoods. It can be seen that the level of neighbouring acts among residents across AlJunainah was influenced by the intercept and the number of children living in the house aged ten years or less ( $p$ -value < .05), while in AlKhalij Alarabi and AlZahraa, only the intercept (estimated coefficients of 16.948, and 12.409, respectively) was statistically significant ( $p$  = .000) within a 95% confidence interval (14.521, 19.375) and (7.561, 17.257), respectively.

Table D-41 Parameter estimates of the neighbouring index and demographic factors.

Parameter		B	Std. Error	95% Wald Confidence Interval		Hypothesis Test		
				Lower	Upper	Wald Chi-Square	df	Sig.
Overall	(Intercept)	0.206	0.0175	0.171	0.240	137.548	1	<b>.000</b>
	Number of working hours per day.	-0.001	0.0027	-0.006	0.005	0.044	1	.833
	Number of working days per month	0.000	0.0011	-0.002	0.002	0.088	1	.767
	<b>Number of children aged &lt;10 Y in the house.</b>	0.014	0.0057	0.003	0.025	6.053	1	<b>.014</b>
	(Scale)	0.017 <sup>a</sup>	0.0016	0.014	0.020			
AlJunainah	(Intercept)	17.924	2.0073	13.990	21.858	79.740	1	<b>.000</b>
	Number of working hours per day.	0.012	0.2537	-0.486	0.509	0.002	1	.963
	Number of working days per month	-0.059	0.1138	-0.282	0.164	0.267	1	.606
	<b>Number of children &lt;10 Y in the house.</b>	1.778	0.7216	0.364	3.192	6.070	1	<b>.014</b>
	(Scale)	89.810 <sup>a</sup>	13.7762	66.490	121.309			
AlKhalij Alarabi	(Intercept)	16.948	1.2381	14.521	19.375	187.381	1	<b>.000</b>
	Number of working hours per day.	-0.078	0.2202	-0.509	0.354	0.124	1	.725
	Number of working days per month	-0.016	0.0870	-0.187	0.155	0.033	1	.855
	Number of children <10 Y in the house.	0.401	0.4107	-0.404	1.206	0.954	1	.329
	(Scale)	35.208 <sup>a</sup>	5.0555	26.571	46.651			

	Parameter	B	Std. Error	95% Wald Confidence Interval		Hypothesis Test		
				Lower	Upper	Wald Chi-Square	df	Sig.
AlZahraa	(Intercept)	12.409	2.4733	7.561	17.257	25.171	1	.000
	Number of working hours per day.	0.029	0.5556	-1.060	1.118	0.003	1	.958
	Number of working days per month	0.086	0.1858	-0.278	0.450	0.213	1	.645
	Number of children <10 Y in the house.	0.117	0.6535	-1.163	1.398	0.032	1	.858
	(Scale)	48.944 <sup>a</sup>	11.0837	31.401	76.289			

Dependent Variable: Neighbouring Index

Model: (Intercept), Q8: Number of working hours per day, Q8: Number of working days per months, Q11 The number of children aged ten years or less in the house

a. Maximum likelihood estimate.

The results of the Kruskal-Wallis H test indicate that, overall, there are statistically significant differences in the level of neighbouring (N\_Index) between six demographic factors including gender, age, marital status, education background, employment status, and length of residency in the neighbourhood ( $p$ -value<.05). Table D-42 and Table D-43 show that the aforementioned demographic factors generate a significant difference in the mean score of the following:

- Gender,  $\chi^2(1)=16.974$ ,  $p = .000$ , with a mean rank N\_Index score of 128.48 for Male and 93.04 for Female.
- Age group,  $\chi^2(5)=14.878$ ,  $p = .011$ , with a mean rank N\_Index score of 82.58 for (18-24), 199.46 for (25-34), 105.15 for (35-44), 122.93 for (45-54), 124.43 for (55-64), and 152.29 for (65-74).
- Marital status,  $\chi^2(2)=10.121$ ,  $p = .006$ , with a mean rank N\_Index score of 113.75 for Divorced or widow, 90.16 for Single, and 120.39 for Married.
- Educational background,  $\chi^2(4) =13.273$ ,  $p=.010$ , with a mean rank N\_Index score of 190.50 for No degree, 114.29 for Secondary school or less, 121.20 for Institute degree, 81.03 for Undergrad student, and 113.86 for University degree and above.
- Employment status,  $\chi^2(5) =15.319$ ,  $p=.009$ , with a mean rank social interaction of 109.97 for Unemployed, 100.36 for Housewife, 144.24 for Retired, 79.33 for Student, 1221.49 for Private sector employee, and 118.43 for Public sector employee.
- Length of residency in the neighbourhood,  $\chi^2(5)=14.511$ ,  $p=.013$ , with a mean rank social interaction of 84.31 for Less than two years, 93.04 for 2-5 years, 114.71 for 6-10 years, 118.38 for 11-15 years, 83.89 for 10-20 years, and 129.21 for more than 20 years.

A Kruskal-Wallis H test was also run to determine the demographic factors related to the level of neighbouring acts across the case studies, see Table D-42 and Table D-43. The data shows that there are statistically significant differences in the Neighbouring Index between gender, education status, and the presence of relatives living within AlJunainah neighbourhood ( $p$ -value <.05). Table D-43 shows that the previously mentioned demographic factors generate a significant difference in the mean score of the following:

- Gender,  $X^2(1)=15.020$ ,  $p=.000$ , with a mean rank N\_Index score of 51.67 for Male and 30.61 for Female.
- Education status,  $X^2(4) =9.990$ ,  $p=.041$ , with a mean rank N\_Index score of 74.50 for No degree, 48.83 for Secondary school or less, 51.43 for Institute degree, 31.67 for Undergrad student, and 38.71 for University degree and above.
- The presence of relatives living within the neighbourhood,  $X^2(1) =5.076$ ,  $p=.024$ , with a mean rank N\_Index score of 36.90 for No and 48.95 for Yes.

Table D-42 Ranks of the means of the demographic factors and the Neighbouring Index, as overall and across the surveyed neighbourhoods.

		Ranks							
		Neighbouring Index							
		AlJunainah		AlKhalij Alarabi		AlZahraa		Overall	
		N	Mean Rank	N	Mean Rank	N	Mean Rank	N	Mean Rank
Gender	Male	50	51.67	46	54.54	16	26.13	112	128.48
	Female	35	30.61	51	44.00	23	15.74	109	93.04
	Total	85		97		39		221	
Age group	18 - 24	10	38.25	28	33.93	5	18.70	43	82.58
	25 - 34	37	44.74	25	51.12	20	18.65	82	119.46
	35 - 44	16	39.47	24	50.81	8	19.75	48	105.15
	45 - 54	9	45.17	9	59.11	2	28.50	20	122.93
	55 - 64	12	47.21	8	65.69	1	29.00	21	124.43
	65 - 74	1	12.50	3	82.67	3	23.17	7	152.29
	Total	85		97		39		221	
Marital status	Divorced-Widow	2	30.25	9	66.33	1	24.50	12	113.75
	Single	16	33.47	36	35.54	14	17.25	66	90.16
	Married	67	45.66	52	55.32	24	21.42	143	120.39
	Total	85		97		39		221	
Education level	No degree	3	74.50	-	-	-	-	3	190.50
	Secondary school or less	12	48.83	17	59.79	-	-	29	114.29
	Institute degree	14	51.43	18	59.00	1	32.50	33	121.20
	Undergrad student	6	31.67	24	36.50	4	22.25	34	81.03
	University degree and above	50	38.71	38	47.33	34	19.37	122	113.86
	Total	85		97		39		221	
Employment status	Unemployed	16	49.38	10	39.90	3	10.67	29	109.97
	Housewife	8	33.94	18	55.47	3	20.17	29	100.36
	Retired	7	45.43	4	79.00	3	23.17	14	144.25
	Student	6	31.67	24	36.50	5	18.50	35	79.33
	Private sector employee	19	44.79	18	61.17	7	20.79	44	121.49
	Public sector employee	29	42.57	23	46.20	18	21.11	70	118.43
	Total	85		97		39		221	
Type of ownership	Governmental housing	1	33.00	1	18.50	2	21.50	4	111.63
	Rent	10	35.25	17	46.65	3	14.50	30	90.77
	Multi-ownership	13	41.96	12	48.13	7	23.64	32	119.89
	owned	61	44.66	67	50.21	27	19.56	155	113.06
	Total	85		97		39		221	
Length of residency in the neighbourhood	Less than two years	9	34.28	5	28.50	4	13.63	18	84.31
	2 - 5 years	10	38.40	12	37.33	3	15.00	25	93.04
	6 - 10 years	35	42.09	30	51.68	13	21.77	78	114.71
	11 - 15 years	5	67.50	8	57.56	4	7.63	17	118.38
	16 - 20 years	6	49.50	15	34.87	1	21.50	22	83.89
	More than 20 years	20	42.75	27	60.31	14	24.68	61	129.21
	Total	85		97		39		221	
The presence of relatives living within the neighbourhood	No	42	36.90	62	50.88	22	20.80	126	106.56
	Yes	43	48.95	35	45.67	17	18.97	95	116.88
	Total	85		97		39		221	

Table D-43 Kruskal-Wallis H Test for the demographic factors and Neighbouring Index, as overall and across the surveyed neighbourhoods.

		Test Statistics			
		Neighbouring Index			Overall
		AlJunainah	AlKhalij Alarabi	AlZahraa	
Gender	Kruskal-Wallis H	15.020	3.406	7.880	16.974
	df	1	1	1	1
	Asymp. Sig.	.000	.065	.005	.000
Age group	Kruskal-Wallis H	2.835	16.595	2.330	14.878
	df	5	5	5	5
	Asymp. Sig.	.725	.005	.802	.011
Marital status	Kruskal-Wallis H	3.705	14.315	1.349	10.121
	df	2	2	2	2
	Asymp. Sig.	.157	.001	.509	.006
Education level	Kruskal-Wallis H	9.990	9.675	1.472	13.273
	df	4	3	2	4
	Asymp. Sig.	.041	.022	.479	.010
Employment status	Kruskal-Wallis H	3.596	14.920	2.549	15.319
	df	5	5	5	5
	Asymp. Sig.	.609	.011	.769	.009
Type of ownership	Kruskal-Wallis H	1.451	1.433	1.498	3.786
	df	3	3	3	3
	Asymp. Sig.	.694	.698	.683	.285
Length of residence in the neighbourhood	Kruskal-Wallis H	6.881	13.923	9.286	14.511
	df	5	5	5	5
	Asymp. Sig.	.230	.016	.098	.013
The presence of relatives living within the neighbourhood	Kruskal-Wallis H	5.076	0.769	0.247	1.412
	df	1	1	1	1
	Asymp. Sig.	.024	.381	.619	.235

A closer inspection of the data, in AlKhalij Alarabi neighbourhood, shows that there are statistically significant differences in the N\_Index between the age group, marital status, education level, employment status, and length of residence in the neighbourhood ( $p$ -value  $<.05$ ). Table D-42 and Table D-43 shows that the aforementioned demographic factors generate a significant difference in the mean score of the following:

- Age group,  $\chi^2(5) = 16.595$ ,  $p = .005$ , with a mean rank N\_Index score of 33.93 for (18-24), 51.12 for (25-34), 50.81 for (35-44), 59.11 for (45-54), 65.69 for (55-64), and 82.67 for (65-74).
- Marital status,  $\chi^2(2) = 14.315$ ,  $p = .001$ , with a mean rank N\_Index score of 66.33 for Divorced or widow, 35.54 for Single, and 55.32 for Married.
- Education level,  $\chi^2(3) = 9.675$ ,  $p = .022$ , with a mean rank N\_Index score of 59.79 for Secondary school or less, 59.00 for Institute degree, 36.50 for Undergrad student, and 47.33 for University degree and above.
- Employment status,  $\chi^2(5) = 14.920$ ,  $p = .011$ , with a mean rank N\_Index score of 39.90 for Unemployed, 55.47 for Housewife, 79.00 for Retired, 36.50 for Student, 61.17 for Private sector employee, and 46.20 for Public sector employee.
- Length of residence in the neighbourhood,  $\chi^2(5) = 13.923$ ,  $p = .016$ , with a mean rank N\_Index score of 28.50 for Less than two years, 37.33 for 2 - 5 years, 51.68 for 6-10 years, 57.56 for 11-15 years, 34.87 for 16-20 years, and 60.31 for More than 20 years.

Regarding AlZahraa neighbourhood, the data shows that there is a statistically significant difference in the N\_Index between the gender,  $\chi^2(1) = 7.880$ ,  $p = .005$ , with a mean rank N\_Index score of 26.13 for Male and 15.74 for Female (see Table D-42 and Table D-43).

### D.11. Social Network Index and Physical Characteristics of the Built Environment (PCBE):

The data in Table D-44 shows that only the intercept and the mean of satisfaction with communal spaces (estimated coefficient of 0.928 and -0.211) are statistically significant ( $p$ -value<.05) within a 95% confidence interval (0.297, 1.559) and (-0.387, -0.035), respectively. A Kruskal-Wallis test was run to determine the influence of the total area of the house on the social network level among respondents overall and in each of the surveyed neighbourhoods. The test shows no statistically significant difference in the SN\_Index between the total areas of the house,  $X^2(4) = 4.128, p=0.389$  (see Table D-46). Data in Table D-45 and Table D-46 show a statistically significant difference in the SN\_Index between the different total areas of the houses in AlZahraa neighbourhood,  $x^2(4) = 11.358, p=.023$ , with a mean rank SN\_Index score of 18.94 for less than 200 sqm, 12.96 for 200—250 sqm, 25.53 for 300-350 sqm, 19.00 for 400-450 sqm, and 39.00 for 500sqm and more. In the meantime, there is no statistically significant difference in the SN\_Index between the different total areas of the houses in the other two neighbourhoods.

Table D-44 Parameter estimates for the mean of the Social Network Index and the PCBE, as overall and in the surveyed neighbourhoods.

				95% Wald Confidence Interval		Hypothesis Test		
Parameter		B	Std. Error	Lower	Upper	Wald Chi-Square	df	Sig.
Overall	(Intercept)	0.928	0.3221	0.297	1.559	8.305	1	.004
	Accessibility Q23.	-0.013	0.0605	-0.131	0.106	0.044	1	.835
	Maintenance Q25.	-0.023	0.0461	-0.113	0.067	0.249	1	.618
	<b>Satisfaction with communal spaces.</b>	-0.211	0.0897	-0.387	-0.035	5.53	1	.019
	Satisfaction with the neighbourhood.	0.092	0.0853	-0.075	0.259	1.167	1	.280
AlJunainah	(Scale)	0.500 <sup>a</sup>	0.0476	0.415	0.603			
	(Intercept)	1.014	0.519	-0.003	2.032	3.821	1	.051
	Accessibility Q23.	-0.004	0.1078	-0.215	0.208	0.001	1	.972
	Maintenance Q25.	-0.05	0.0753	-0.198	0.097	0.449	1	.503
	Satisfaction with communal spaces.	-0.168	0.1603	-0.482	0.146	1.103	1	.294
AlKhalij Alarabi	Satisfaction with the neighbourhood.	0.045	0.166	-0.280	0.370	0.074	1	.786
	(Scale)	0.573 <sup>a</sup>	0.0878	0.424	0.773			
	(Intercept)	0.489	0.3874	-0.270	1.248	1.593	1	.207
	Accessibility Q23.	-0.066	0.0665	-0.196	0.064	0.985	1	.321
	Maintenance Q25.	-0.035	0.0585	-0.15	0.08	0.357	1	.550
AlZahraa	Satisfaction with communal spaces.	-0.093	0.107	-0.303	0.117	0.751	1	.386
	Satisfaction with the neighbourhood.	0.151	0.0842	-0.014	0.316	3.216	1	.073
	(Scale)	0.274 <sup>a</sup>	0.0393	0.207	0.363			
	(Intercept)	2.025	1.2319	-0.389	4.440	2.702	1	.100
	Accessibility Q23.	-0.014	0.2176	-0.44	0.413	0.004	1	.950
	Maintenance Q25.	0.009	0.136	-0.258	0.275	0.004	1	.948
	Satisfaction with communal spaces.	-0.431	0.276	-0.972	0.110	2.437	1	.119
	Satisfaction with the neighbourhood.	-0.086	0.3949	-0.86	0.688	0.047	1	.828
	(Scale)	0.724 <sup>a</sup>	0.1638	0.464	1.128			

Dependent Variable: Social Network Index

Model: (Intercept), Mean of Accessibility Q23, Mean of maintenance Q25, Satisfaction with communal spaces, Satisfaction with the neighbourhood

a. Maximum likelihood estimate



Table D-45 Ranks of the Social Network Index and the total area of the house, overall and across the surveyed neighbourhoods.

Ranks								
Q16 The total area of the house		AlJunainah		AlKhalij Alarabi		AlZahraa		Overall
		N	Mean Rank	N	Mean Rank	N	Mean Rank	N Mean Rank
Social Networks Index	less than 200 sqm	28	40.80	26	51.10	8	18.94	62 109.48
	200—250 sqm	37	44.28	30	52.57	13	12.96	80 111.15
	300-350 sqm	14	40.46	30	44.43	15	25.53	59 110.99
	400-450 sqm	3	45.00	11	46.77	2	19.00	16 100.81
	500+ sqm	3	57.50	97		1	39.00	4 172.38
	Total	85		26	51.10	39		221

Table D-46 Kruskal-Wallis test of the Social Network Index and the grouping Variable: Q16 The total area of the house, overall and across the surveyed neighbourhoods.

Test Statistics				
	Social Networks Index			
	AlJunainah	AlKhalij Alarabi	AlZahraa	Overall
Kruskal-Wallis H	1.527	1.487	11.358	4.128
df	4	3	4	4
Asymp. Sig.	0.822	.685	.023	.389

## D.12. Social Network Index and Social Sustainability Indicators (SSI):

According to Table D-47, the most effective indicators of social sustainability on the level of social networks amongst respondents in this study are the safety and security of the neighbourhood and its communal spaces, the attachment to place, the sense of community, and privacy. The data shows that the estimated coefficients of the previously mentioned covariates (0.145, -0.185, 0.402, and -0.199, respectively) are statistically significant ( $p$ -value < .05) within a 95% confidence interval (0.028, 0.263), (-0.316, -0.053), (0.191, 0.613), and (-0.370, -0.028), respectively. The breakdown of the data in Table D-47 show different patterns across the surveyed neighbourhoods. The safety and security indicator (estimated coefficient of 0.260) significantly affects the level of social network amongst respondents in AlJunainah neighbourhood ( $p=.004$ ), within a 95% confidence interval (0.081, 0.439). The sense of community, privacy, and the number of total people living in the house (estimated coefficients of 0.346, -0.210, and 0.056, respectively) significantly relate to the level of social network amongst respondents in AlKhalij Alarabi neighbourhood ( $p$ -value<.005), within a 95% confidence interval (0.081, 0.439) (-0.410, -0.011), and (0.016, 0.095), respectively. In AlZahraa, the level of social networks amongst respondents is influenced by the sense of community, where the estimated coefficient of 0.557 is statistically significant ( $p=.038$ ), within a 95% confidence interval (0.030, 1.083).

Table D-47 Parameter estimates of the Social Network Index and social sustainability indicators in the surveyed neighbourhoods.

Parameter		B	Std. Error	95% Wald Confidence Interval		Hypothesis Test		
				Lower	Upper	Wald Chi-Square	df	Sig.
Overall	(Intercept)	-0.289	0.3361	-0.948	0.37	0.74	1	.390
	The number of families living in the house.	0.138	0.0725	-0.004	0.28	3.65	1	.056
	The number of people living in the house.	0.022	0.0188	-0.015	0.059	1.358	1	.244
	<b>Safety and security.</b>	0.145	0.060	0.028	0.263	5.886	1	<b>.015</b>
	<b>Attachment to Place.</b>	-0.185	0.0671	-0.316	-0.053	7.568	1	<b>.006</b>
	<b>Sense of community.</b>	0.402	0.1077	0.191	0.613	13.919	1	<b>.000</b>
	Residents' satisfaction.	0.004	0.0767	-0.146	0.155	0.003	1	.955
	<b>Privacy.</b>	-0.199	0.0873	-0.370	-0.028	5.185	1	<b>.023</b>
	(Scale)	0.434 <sup>a</sup>	0.0413	0.360	0.523			
AlJunainah	(Intercept)	-0.557	0.5285	-1.593	0.478	1.112	1	.292
	The number of families living in the house.	0.195	0.1257	-0.051	0.442	2.412	1	.120
	The number of people living in the house.	-0.013	0.0324	-0.076	0.051	0.160	1	.690
	<b>Safety and security.</b>	0.260	0.0914	0.081	0.439	8.081	1	<b>.004</b>
	Attachment to Place.	-0.173	0.1068	-0.382	0.037	2.613	1	.106

Parameter		B	Std. Error	95% Wald Confidence Interval		Hypothesis Test		
				Lower	Upper	Wald Chi-Square	df	Sig.
AlKhalij Alarabi	Sense of community.	0.382	0.2036	-0.017	0.781	3.525	1	.060
	Residents' satisfaction.	0.064	0.1175	-0.166	0.295	0.299	1	.585
	Privacy.	-0.162	0.1589	-0.473	0.150	1.036	1	.309
	(Scale)	0.471 <sup>a</sup>	0.0722	0.349	0.636			
	(Intercept)	-0.523	0.386	-1.279	0.234	1.833	1	.176
	The number of families living in the house.	0.083	0.079	-0.072	0.238	1.108	1	.293
	<b>The number of people living in the house.</b>	0.056	0.0202	0.016	0.095	7.599	1	<b>.006</b>
	Safety and security.	0.042	0.0766	-0.108	0.193	0.307	1	.579
	Attachment to Place.	-0.134	0.0781	-0.287	0.019	2.936	1	.087
	<b>Sense of community.</b>	0.346	0.1323	0.086	0.605	6.815	1	<b>.009</b>
AlZahraa	Residents' satisfaction.	0.108	0.0887	-0.066	0.282	1.483	1	.223
	<b>Privacy.</b>	-0.210	0.1018	-0.410	-0.011	4.259	1	<b>.039</b>
	(Scale)	0.215 <sup>a</sup>	0.0309	0.163	0.285			
	(Intercept)	0.470	1.3857	-2.246	3.186	0.115	1	.735
	The number of families living in the house.	-0.018	0.2802	-0.568	0.531	0.004	1	.948
	The number of people living in the house.	0.029	0.0683	-0.105	0.163	0.178	1	.673
	Safety and security.	0.260	0.2184	-0.168	0.688	1.417	1	.234
	Attachment to Place.	-0.285	0.2253	-0.726	0.157	1.596	1	.207
	<b>Sense of community.</b>	0.557	0.2687	0.030	1.083	4.293	1	<b>.038</b>
	Residents' satisfaction.	-0.269	0.3208	-0.898	0.359	0.705	1	.401
	Privacy.	-0.190	0.2349	-0.651	0.270	0.657	1	.418
	(Scale)	0.617 <sup>a</sup>	0.1398	0.396	0.962			

Dependent Variable: **Social Network Index**

Model: (Intercept), The number of families living in the house, The number of people living in the house, Mean of safety and security of the neighbourhood and communal spaces, Mean of attachment to the place, Mean of sense of community, Mean of residents' satisfaction, Mean of privacy<sup>a</sup>

a. Maximum likelihood estimate.

### D.13. Social Network Index and Demographic Factors (DF):

Table D-48 shows that the number of working hours per day and the number of children living in the house aged ten years or less significantly influence the SN\_Index. The data shows that the estimated coefficients of the previously mentioned covariates (0.041 and 0.166, respectively) are statistically significant ( $p$ -value<.05) within a 95% confidence interval (0.014, 0.067) and (0.110, 0.222), respectively. Table D-48 also demonstrates the patterns of the effective demographic factors on the level of social networks across the surveyed neighbourhoods. It can be seen from the data that, in AlJunainah neighbourhood, the covariates of the number of working hours per day and the number of children living the house aged ten years or less (estimated coefficients of 0.049 and 0.231, respectively) are statistically significant ( $p$ -value<.05) within a 95% confidence interval (0.016, 0.081) and (0.139, 0.322), respectively. A closer inspection of the data illustrates that the level of social networks in AlKhalij Alarabi is influenced by the number of children aged ten years or less living the house, where the estimated coefficient of 0.147 is statistically significant ( $p$ =.000), within a 95% confidence interval (0.082, 0.212).

Table D-48 Parameter estimates of the Social Network Index and demographic factors.

Parameter Estimates								
Parameter		B	Std. Error	95% Wald Confidence Interval		Hypothesis Test		
				Lower	Upper	Wald Chi-Square	df	Sig.
Overall	(Intercept)	0.076	0.0873	-0.095	0.247	0.758	1	.384
	<b>Number of working hours per day.</b>	0.041	0.0133	0.014	0.067	9.263	1	<b>.002</b>
	Number of working days per months.	-0.007	0.0055	-0.017	0.004	1.431	1	.232
	<b>The number of children aged ten years or less in the house.</b>	0.166	0.0285	0.110	0.222	33.931	1	<b>.000</b>
	(Scale)	0.413 <sup>a</sup>	0.0393	0.343	0.498			
AlJunainah	(Intercept)	-0.040	0.1301	-0.295	0.215	0.093	1	.761
	<b>Number of working hours per day.</b>	0.049	0.0164	0.016	0.081	8.707	1	<b>.003</b>
	Number of working days per months.	-0.002	0.0074	-0.017	0.012	0.107	1	.743

Parameter Estimates								
Parameter		B	Std. Error	95% Wald Confidence Interval		Hypothesis Test		
				Lower	Upper	Wald Chi-Square	df	Sig.
AlKhalij Alarabi	<b>The number of children aged ten years or less in the house.</b>	0.231	0.0468	0.139	0.322	24.289	1	<b>.000</b>
	(Scale)	0.377 <sup>a</sup>	0.0579	0.279	0.510			
	(Intercept)	0.058	0.0997	-0.137	0.254	0.343	1	.558
	Number of working hours per day.	0.034	0.0177	0.000	0.069	3.780	1	.052
	Number of working days per months.	-0.008	0.0070	-0.022	0.006	1.274	1	.259
	<b>The number of children aged ten years or less in the house.</b>	0.147	0.0331	0.082	0.212	19.813	1	<b>.000</b>
	(Scale)	0.229 <sup>a</sup>	0.0328	0.172	0.303			
	(Intercept)	0.432	0.3163	-0.188	1.052	1.862	1	.172
	Number of working hours per day.	-0.044	0.0711	-0.184	0.095	0.391	1	.532
	Number of working days per months.	0.006	0.0238	-0.040	0.053	0.074	1	.785
AlZahraa	The number of children aged ten years or less in the house.	0.125	0.0836	-0.039	0.289	2.247	1	.134
	(Scale)	0.801 <sup>a</sup>	0.1813	0.514	1.248			
	(Intercept)	0.432	0.3163	-0.188	1.052	1.862	1	.172

Dependent Variable: Social Network Index  
Model: (Intercept), Q8: Number of working hours per day, Q8: Number of working days per months, Q11 The number of children aged ten years or less in the house  
<sup>a</sup> Maximum likelihood estimates.

The results of Kruskal-Wallis H test indicate statistically significant differences in the SN\_Index between the seven demographic factors, including gender, age, marital status, education background, employment status, length of residence in the neighbourhood, and the presence of relatives living in the same neighbourhood ( $p$ -value <.05). Table D-49 and Table D-50 show that the previously mentioned demographic factors generate a significant difference in the mean of the following:

- Gender,  $\chi^2(1) = 50.281$ ,  $p = .000$ , with a mean rank SN\_Index score of 141.08 for Male and 80.09 for Female
- Age group,  $\chi^2(5) = 24.496$ ,  $p = .000$ , with a mean rank SN\_Index score of 74.27 for (18-24), 108.45 for (25-34), 134.77 for (35-44), 123.55 for (45-54), 116.93 for (55-64), and 149.86 for (65-74).
- Marital status,  $\chi^2(2) = 19.165$ ,  $p = .000$ , with a mean rank SN\_Index score of 95.54 for Divorced or widow, 83.95 for Single, and 124.78 for Married.
- Education background,  $\chi^2(4) = 21.545$ ,  $p = .000$ , with a mean rank SN\_Index score of 164.17 for No degree, 89.48 for Secondary school or less, 132.39 for Institute degree, 75.31 for Undergrad student, and 118.97 for University degree and above.
- Employment status,  $\chi^2(5) = 31.961$ ,  $p = .000$ , with a mean rank SN\_Index score of 96.53 for Unemployed, 82.48 for Housewife, 139.39 for Retired, 73.67 for Student, 131.49 for Private sector employee, and 128.91 for Public sector employee.
- Length of residence in the neighbourhood,  $\chi^2(5) = 23.915$ ,  $p = .000$ , with a mean rank SN\_Index score of 72.58 for Less than two years, 76.74 for 2 - 5 years, 129.87 for 6 - 10 years, 105.21 for 11 - 15 years, 92.16 for 16 - 20 years, and 120.66 for More than 20 years.
- The presence of relatives living within the neighbourhood,  $\chi^2(1) = 20.023$ ,  $p = .000$ , with a mean rank SN\_Index score of 94.29 for No and 133.16 for Yes.

Table D-49 Ranks of the means of the demographic factors and the Social Network Index across the case studies.

		Ranks							
		Social Network Index							
		AlJunainah		AlKhalij Alarabi		AlZahraa		Overall	
		N	Mean Rank	N	Mean Rank	N	Mean Rank	N	Mean Rank
Gender	Male	50	51.11	46	64.70	16	27.00	112	141.08
	Female	35	31.41	51	34.84	23	15.13	109	80.09
	Total	85		97		39		221	
Age group	18 - 24	10	35.80	28	27.86	5	20.60	43	74.27
	25 - 34	37	40.59	25	56.74	20	14.88	82	108.45
	35 - 44	16	50.19	24	61.54	8	25.63	48	134.77
	45 - 54	9	50.33	9	46.67	2	33.50	20	123.55
	55 - 64	12	42.38	8	51.50	1	34.00	21	116.93
	65 - 74	1	30.50	3	81.83	3	24.50	7	149.86
	Total	85		97		39		221	
Marital status	Divorced-Widow	2	18.00	9	48.94	1	30.00	12	95.54
	Single	16	37.50	36	33.60	14	16.93	66	83.95
	Married	67	45.06	52	59.67	24	21.38	143	124.78
	Total	85		97		39		221	
Education level	No degree	3	58.17	-	-	-	-	3	164.17
	Secondary school or less	12	25.88	17	49.03	-	-	29	89.48
	Institute degree	14	54.43	18	56.69	1	37.00	33	132.39
	Undergrad student	6	39.75	24	27.85	4	24.13	34	75.31
	University degree and above	50	43.39	38	58.70	34	19.01	122	118.97
	Total	85		97		39		221	
Employment status	Unemployed	16	36.13	10	41.00	3	16.00	29	96.53
	Housewife	8	32.31	18	42.06	3	10.17	29	82.48
	Retired	7	42.36	4	79.25	3	24.50	14	139.39
	Student	6	39.75	24	27.85	5	19.90	35	73.67
	Private sector employee	19	49.45	18	62.36	7	21.93	44	131.49
	Public sector employee	29	46.34	23	64.26	18	20.83	70	128.91
	Total	85		97		39		221	
Type of ownership	Governmental housing	1	30.50	1	44.00	2	30.00	4	131.13
	Rent	10	37.30	17	42.32	3	13.00	30	91.87
	Multi-ownership	13	46.42	12	59.42	7	20.21	32	125.13
	owned	61	43.41	67	48.90	27	19.98	155	111.27
	Total	85		97		39		221	
Length of residency in the neighbourhood	Less than two years	9	23.22	5	49.60	4	8.13	18	72.58
	2 - 5 years	10	30.15	12	34.83	3	11.00	25	76.74
	6 - 10 years	35	46.77	30	61.28	13	22.81	78	129.87
	11 - 15 years	5	58.00	8	48.50	4	9.50	17	105.21
	16 - 20 years	6	43.75	15	39.23	1	13.50	22	92.16
	More than 20 years	20	47.75	27	47.11	14	26.18	61	120.66
	Total	85		97		39		221	
The presence of relatives living within the neighbourhood	No	42	34.08	62	43.64	22	18.91	126	94.29
	Yes	43	51.71	35	58.50	17	21.41	95	133.16
	Total	85		97		39		221	

Table D-50 Kruskal-Wallis H Test for the demographic factors and Social Network Index across the case studies.

		Test Statistics			
		Social Network Index			
		AlJunainah	AlKhalij Alarabi	AlZahraa	Overall
Gender	Kruskal-Wallis H	13.126	27.253	10.234	50.281
	df	1	1	1	1
	Asymp. Sig.	.000	.000	.001	.000
Age group	Kruskal-Wallis H	3.622	26.708	10.789	24.496
	df	5	5	5	5
	Asymp. Sig.	.605	.000	.056	.000
Marital status	Kruskal-Wallis H	3.317	18.290	2.136	19.165
	df	2	2	2	2
	Asymp. Sig.	.190	.000	.344	.000
Education level	Kruskal-Wallis H	10.040	19.435	3.003	21.545
	df	4	3	2	4
	Asymp. Sig.	.040	.000	.223	.000
Employment status	Kruskal-Wallis H	4.685	30.941	3.367	31.961
	df	5	5	5	5
	Asymp. Sig.	.456	.000	.644	.000
Type of ownership	Kruskal-Wallis H	1.058	2.637	2.674	4.648
	df	3	3	3	3
	Asymp. Sig.	.787	.451	.445	.199
Length of residence in the neighbourhood	Kruskal-Wallis H	11.914	10.704	14.837	23.915
	df	5	5	5	5
	Asymp. Sig.	.036	.058	.011	.000
The presence of relatives living within the neighbourhood	Kruskal-Wallis H	10.849	6.249	0.462	20.023
	df	1	1	1	1
	Asymp. Sig.	.001	.012	.497	.000

To determine the demographic factors related to the social network level across the case studies, a Kruskal-Wallis H test was conducted and showed statistically significant differences in the SN\_Index between gender, education status, the length of residence in the neighbourhood, and the presence of relatives living within AlJunainah neighbourhood ( $p$ -value  $<.05$ ). Table D-49 and Table D-50 show that the previously mentioned demographic factors generate a significant difference in the mean score of the following:

- Gender,  $X^2(1) = 13.126$ ,  $p = .000$ , with a mean rank SN\_Index score of 51.11 for Male and 31.41 for Female.
- Education status,  $X^2(4) = 10.040$ ,  $p = .040$ , with a mean rank SN\_Index score of 58.17 for No degree, 25.88 for Secondary school or less, 54.43 for Institute degree, 39.75 for Undergrad student, and 43.39 for University degree and above.
- Length of residence in the neighbourhood,  $X^2(5) = 11.914$ ,  $p = .036$ , with a mean rank SN\_Index score of 23.22 for less than two years, 30.15 for 2-5 years, 46.77 for 6-10 years, 58.00 for 11-15 years, 43.75 for 16-20 years, and 47.75 for more than 20 years.
- The presence of relatives living within the neighbourhood,  $X^2(1) = 10.849$ ,  $p = .001$ , with a mean rank SN\_Index score of 34.08 for No and 51.71 for Yes.

A closer inspection of the data in the same table under AlKhalij Alarabi neighbourhood demonstrations statistically significant differences in the SN\_Index between gender, age group, marital status, education level, employment status, and the presence of relatives living in the same neighbourhood ( $p$ -value  $<.05$ ). The data in Table D-49 and Table D-50 shows that the previously mentioned demographic factors generate a significant difference in the mean score of the following:

- Gender,  $X^2(1) = 27.253$ ,  $p = .000$ , with a mean rank SN\_Index score of 64.70 for Male and 38.84 for Female.
- Age group,  $X^2(5) = 26.708$ ,  $p = .000$ , with a mean rank SN\_Index score of 27.86 for (18-24), 56.74 for (25-34), 61.54 for (35-44), 46.67 for (45-54), 51.50 for (55-64), and 81.83 for (65-74).
- Marital status,  $X^2(2) = 18.290$ ,  $p = .000$ , with a mean rank SN\_Index score of 48.94 for Divorced or widow, 33.60 for Single, and 59.67 for Married.

- Education level,  $\chi^2(3)=19.435, p=.000$ , with a mean rank SN\_Index score of 49.03 for Secondary school or less, 56.69 for Institute degree, 27.85 for Undergrad student, and 58.70 for University degree and above.
- Employment status,  $\chi^2(5)=30.941, p=.000$ , with a mean rank SN\_Index score of 41.00 for Unemployed, 42.06 for Housewife, 79.25 for Retired, 27.85 for Student, 62.36 for Private sector employee, and 64.26 for Public sector employee.
- The presence of relatives living in the same neighbourhood,  $\chi^2(1)=6.249, p=.012$ , with a mean rank SN\_Index score of 43.64 for No and 58.50 for Yes.

Regarding AlZahraa neighbourhood, the data shows statistically significant differences in the SN\_Index between gender and length of residence in the neighbourhood ( $p$ -value  $<.05$ ). Table D-49 and Table D-50 show that the aforementioned demographic factors generate a significant difference in the mean score of the following:

- Gender,  $\chi^2(1)=10.234, p=.001$ , with a mean rank SN\_Index score of 27.00 for Male and 15.13 for Female.
- Length of residence in the neighbourhood,  $\chi^2(5)=14.837, p=.011$ , with a mean rank SN\_Index score of 8.13 for Less than two years, 11.00 for 2-5 years, 22.81 for 6-10 years, 9.50 for 11-15 years, 13.50 for 16-20 years, and 26.18 for more than 20 years.

#### D.14. Social Relationships Index and Physical Characteristics of the Built Environment (PCBE):

The GLM was run to identify the influence of three physical characteristics factors on the SR\_Index. The data in Table D-51 shows that, as overall, only the intercept (estimated coefficient of 0.582) is statistically significant ( $p=.000$ ) within a 95% confidence interval (0.414, 0.750). The breakdown of the data in the same table shows similar pattern in AlJunainah neighbourhood, where the estimated coefficient of 0.597 is statistically significant ( $p=.000$ ), within a 95% confidence interval (0.362, 0.832). However, in AlKhalij Alarabi, the covariates of the intercept and the mean of satisfaction with the neighbourhood (estimated coefficients of 0.630 and -0.073, respectively) are statistically significant ( $p$ -value $<.05$ ) within a 95% confidence interval (0.365, 0.894) and (-0.131, -0.015), respectively. In comparison, in AlZahraa, the covariate of the mean for maintenance (estimated coefficient of 0.060) is statistically significant ( $p=.044$ ) within a 95% confidence interval (0.002, 0.119).

Table D-51 Parameter estimates for the mean of the Social Relationship Index and the PCBE.

	Parameter	B	Std. Error	95% Wald Confidence Interval		Hypothesis Test		
				Lower	Upper	Wald Chi-Square	df	Sig.
Overall	<b>(Intercept)</b>	<b>0.582</b>	<b>0.0857</b>	<b>0.414</b>	<b>0.750</b>	<b>46.172</b>	<b>1</b>	<b>.000</b>
	Accessibility Q23.	-0.013	0.0159	-0.044	0.018	0.674	1	.412
	Maintenance Q25.	-0.004	0.0122	-0.027	0.020	0.085	1	.771
	Satisfaction with communal spaces	-0.022	0.0236	-0.068	0.024	0.860	1	.354
	Satisfaction with the neighbourhood.	-0.033	0.0224	-0.077	0.011	2.160	1	.142
	(Scale)	0.034 <sup>a</sup>	0.0033	0.029	0.042			
AlJunainah.	<b>(Intercept)</b>	<b>0.597</b>	<b>0.1199</b>	<b>0.362</b>	<b>0.832</b>	<b>24.77</b>	<b>1</b>	<b>.000</b>
	Accessibility Q23.	-0.018	0.0246	-0.066	0.030	0.542	1	.462
	Maintenance Q25.	-0.006	0.0172	-0.040	0.028	0.129	1	.719
	Satisfaction with communal spaces	-0.063	0.0365	-0.134	0.009	2.937	1	.087
	Satisfaction with the neighbourhood.	0.011	0.0376	-0.062	0.085	0.091	1	.763
	(Scale)	0.029 <sup>a</sup>	0.0045	0.022	0.040			
AlKhalij Alarabi	<b>(Intercept)</b>	<b>0.630</b>	<b>0.1351</b>	<b>0.365</b>	<b>0.894</b>	<b>21.734</b>	<b>1</b>	<b>.000</b>
	Accessibility Q23.	0.010	0.0232	-0.035	0.056	0.200	1	.655
	Maintenance Q25.	-0.011	0.0204	-0.051	0.029	0.281	1	.596
	Satisfaction with communal spaces	-0.017	0.0373	-0.090	0.056	0.212	1	.645
	<b>Satisfaction with the neighbourhood.</b>	<b>-0.073</b>	<b>0.0293</b>	<b>-0.131</b>	<b>-0.015</b>	<b>6.188</b>	<b>1</b>	<b>.013</b>
	(Scale)	0.033 <sup>a</sup>	0.0048	0.025	0.044			



	Parameter	B	Std. Error	95% Wald Confidence Interval		Hypothesis Test		
				Lower	Upper	Wald Chi-Square	df	Sig.
AlZahraa	(Intercept)	0.293	0.2830	-0.262	0.848	1.071	1	.301
	Accessibility Q23.	-0.042	0.0490	-0.138	0.054	0.725	1	.395
	<b>Maintenance Q25.</b>	0.060	0.0300	0.002	0.119	4.060	1	<b>.044</b>
	Satisfaction with communal spaces	-0.024	0.0606	-0.143	0.095	0.156	1	.692
	Satisfaction with the neighbourhood.	0.075	0.0890	-0.099	0.250	0.713	1	.399
	(Scale)	0.035 <sup>a</sup>	0.0080	0.022	0.055			

Dependent Variable: Social Relationship Index  
Model: (Intercept), Mean of Accessibility Q23, Mean of maintenance Q25, Satisfaction with communal spaces, Satisfaction with the neighbourhood  
a. Maximum likelihood estimate

A closer inspection of the data in Table D-52 and Table D-53 demonstrates the result of Kruskal-Wallis test that was run to determine the influence of the house's area on the SR\_Index. It showed that there is no statistically significant difference in the level of social relationships (SR\_Index) between the surveyed sample between the five different areas of houses,  $\chi^2(4) = 3.501$ ,  $p = .478$ . Similarly, the data in Table D-52 and Table D-53 shows no statistically significant difference in the SR\_Index between the different total areas of houses across the surveyed neighbourhoods.

Table D-52 Ranks of the Social Relationship Index and the total area of the house, overall and across the case studies.

		Ranks							
Q16 The total area of the house		AlJunainah		AlKhalij Alarabi		AlZahraa		Overall	
		N	Mean Rank	N	Mean Rank	N	Mean Rank	N	Mean Rank
Social Relationships Index	less than 200 sqm	27	46.57	26	45.29	8	18.63	61	110.98
	200—250 sqm	36	43.43	30	44.30	12	24.21	78	111.12
	300-350 sqm	14	33.57	30	55.10	15	14.70	59	103.66
	400-450 sqm	3	39.67	11	53.95	2	31.00	16	127.47
	500+ sqm	3	25.33			1	19.00	4	69.50
	Total	83		97		38		218	

Table D-53 Kruskal-Wallis test of the Social Relationship Index and the grouping Variable: Q16 The total area of the house, overall and across the case studies.

Test Statistics				
	Social Relationships Index			
	AlJunainah	AlKhalij Alarabi	AlZahraa	Overall
Kruskal-Wallis H	4.285	3.043	7.156	3.501
df	4	3	4	4
Asymp. Sig.	.369	.385	.128	.478

### D.15. Social Relationships Index and Social Sustainability Indicators (SSI):

The GLM was run to identify which of the tested social sustainability indicators influence the SR\_Index. It is clear from the data in Table D-54 that, as overall, the intercept (estimated coefficient of 0.465) was the only covariate that is statistically significant ( $p = .000$ ) within a 95% confidence interval (0.276, 0.653). The breakdown of the data in Table D-54 across the surveyed neighbourhoods shows that the covariates of the intercept and the safety and security in AlJunainah neighbourhood (estimated coefficients of 0.509 and -0.047, respectively) and the covariates of the intercept and the resident's satisfaction in AlKhalij Alarabi (estimated coefficients of 0.507 and -0.072, respectively) are statistically significant ( $p < .005$ ), within a 95% confidence interval (0.256, 0.762), (-0.089, -0.005), (0.215, 0.799), and (-0.140, -0.005), respectively.

Table D-54 Parameter estimates of the Social Relationship Index and the social sustainability indicators in the case studies.

		B	Std. Error	95% Wald Confidence Interval		Hypothesis Test		
				Lower	Upper	Wald Chi-Square	df	Sig.
Overall	(Intercept)	0.465	0.0961	0.276	0.653	23.384	1	.000
	The number of families living in the house.	-0.013	0.0202	-0.053	0.026	0.432	1	.511
	The number of people living in the house.	-0.003	0.0052	-0.014	0.007	0.402	1	.526
	Safety and security.	-0.018	0.0169	-0.051	0.015	1.126	1	.289
	Attachment to place.	0.029	0.0187	-0.007	0.066	2.439	1	.118
	Sense of community.	-0.007	0.0302	-0.066	0.053	0.047	1	.829
	Resident satisfaction.	-0.025	0.0217	-0.067	0.018	1.280	1	.258
	Privacy.	0.016	0.0245	-0.032	0.064	0.423	1	.516
	(Scale)	0.034 <sup>a</sup>	0.0032	0.028	0.040			
AlJunainah	(Intercept)	0.509	0.1291	0.256	0.762	15.567	1	.000
	The number of families living in the house.	0.002	0.0292	-0.056	0.059	0.003	1	.956
	The number of people living in the house.	-0.013	0.0076	-0.028	0.002	3.088	1	.079
	Safety and security.	-0.047	0.0215	-0.089	-0.005	4.826	1	.028
	Attachment to place.	0.013	0.0249	-0.036	0.062	0.269	1	.604
	Sense of community.	0.005	0.0476	-0.088	0.099	0.013	1	.909
	Resident satisfaction.	-0.013	0.0281	-0.068	0.042	0.202	1	.653
	Privacy.	0.042	0.0377	-0.032	0.116	1.237	1	.266
	(Scale)	0.025 <sup>a</sup>	0.0039	0.019	0.034			
AlKhalij Alarabi	(Intercept)	0.507	0.1490	0.215	0.799	11.559	1	.001
	The number of families living in the house.	-0.006	0.0305	-0.066	0.054	0.038	1	.845
	The number of people living in the house.	0.001	0.0078	-0.014	0.016	0.01	1	.919
	Safety and security.	0.006	0.0296	-0.052	0.064	0.037	1	.847
	Attachment to place.	0.052	0.0302	-0.008	0.111	2.926	1	.087
	Sense of community.	-0.034	0.0511	-0.135	0.066	0.453	1	.501
	Resident satisfaction.	-0.072	0.0342	-0.140	-0.005	4.479	1	.034
	Privacy.	0.007	0.0393	-0.070	0.084	0.028	1	.867
	(Scale)	0.032 <sup>a</sup>	0.0046	0.024	0.043			
AlZahraa	(Intercept)	0.062	0.3849	-0.692	0.817	0.026	1	.871
	The number of families living in the house.	-0.003	0.0716	-0.143	0.138	0.001	1	.970
	The number of people living in the house.	0.001	0.0178	-0.034	0.036	0.002	1	.963
	Safety and security.	0.032	0.0585	-0.082	0.147	0.306	1	.580
	Attachment to place.	0.001	0.0569	-0.110	0.112	0	1	.986
	Sense of community.	0.010	0.0690	-0.125	0.145	0.022	1	.882
	Resident satisfaction.	0.077	0.0882	-0.096	0.250	0.757	1	.384
	Privacy.	0.010	0.0593	-0.106	0.126	0.029	1	.865
	(Scale)	0.039 <sup>a</sup>	0.0088	0.025	0.060			

Dependent Variable: **Social Relationship Index**

Model: (Intercept), The number of families lives in the house, The number of total people lives in the house, Mean of safety and security of the neighbourhood and communal spaces, Mean of attachment to the place, Mean of sense of community, Mean residents' satisfaction, Mean of privacy.

a. Maximum likelihood estimate.

## D.16. Social Relationships Index and Demographic Factors (DF):

This section describes the demographic factors that influence social relationships (SR\_Index). Table D-55 shows that the covariates of the intercept and the number of working hours per day (estimated coefficients of 0.475 and -0.013, respectively) that are statistically significant ( $p$ -value<.05) within a 95% confidence interval (0.426, 0.523) and (-0.020, -0.006), respectively. The breakdown of data in the same table represents a similar pattern in AlJunainah neighbourhood, where the intercept and number of working hours per day ( $B$ = 0.490 and -0.014, respectively) are statistically significant ( $p$ -value<.05) within a 95% confidence interval (0.422, 0.558) and (-0.022, -0.006), respectively. For AlKhalij Alarabi and AlZahraa neighbourhoods, only the intercept (estimated coefficients of 0.492 and 0.403, respectively) is statistically significant ( $p$ =.000) within a 95% confidence interval

(0.417, 0.568) and (0.264, 0.542), respectively. The covariate of the number of working hours per day ( $B=-0.014$ ) also has a negative relationship with the SR\_Index.

Table D-55 Parameter estimates of the Social Relationships Index and demographic factors.

Parameter		B	Std. Error	95% Wald Confidence Interval		Hypothesis Test		
				Lower	Upper	Wald Chi-Square	df	Sig.
Overall	(Intercept)	0.475	0.0248	0.426	0.523	367.736	1	.000
	Number of working hours per day	-0.013	0.0037	-0.020	-0.006	11.828	1	.001
	Number of working days per month.	0.001	0.0015	-0.002	0.004	0.472	1	.492
	Number of children aged ten years or less in the house.	-0.009	0.0081	-0.025	0.006	1.352	1	.245
	(Scale)	0.032 <sup>a</sup>	0.0031	0.027	0.039			
AlJunainah	(Intercept)	0.490	0.0348	0.422	0.558	198.486	1	.000
	Number of working hours per day	-0.014	0.0043	-0.022	-0.006	10.845	1	.001
	Number of working days per month.	0.001	0.0019	-0.003	0.005	0.211	1	.646
	Number of children aged ten years or less in the house.	-0.012	0.0121	-0.036	0.012	0.959	1	.327
	(Scale)	0.025a	0.0039	0.019	0.034	0.000		
AlKhalij Alarabi	(Intercept)	0.492	0.0387	0.417	0.568	161.839	1	.000
	Number of working hours per day.	-0.013	0.0069	-0.027	0.000	3.724	1	.054
	Number of working days per month	0.002	0.0027	-0.004	0.007	0.405	1	.524
	Number of children aged ten years or less in the house.	-0.019	0.0128	-0.044	0.006	2.191	1	.139
	(Scale)	0.034a	0.0049	0.026	0.046			
AlZahraa	(Intercept)	0.403	0.0710	0.264	0.542	32.202	1	.000
	Number of working hours per day.	-0.005	0.0159	-0.036	0.026	0.097	1	.755
	Number of working days per month	-0.001	0.0053	-0.012	0.009	0.072	1	.789
	Number of children aged ten years or less in the house.	0.013	0.0196	-0.026	0.051	0.425	1	.515
	(Scale)	0.039a	0.0089	0.025	0.061			

Dependent Variable: **Social Relationship Index**

Model: (Intercept), Q8: Number of working hours per day, Q8: Number of working days per months, Q11

The number of children aged ten years or less in the house.

a. Maximum likelihood estimate.

The Kruskal-Wallis H test indicates that there are statistically significant differences in the SR\_Index between four demographic factors including gender, education background, employment status, and the presence of relatives living in the same neighbourhood ( $p$ -value  $<.05$ ). The data in the 'Overall' column in Table D-56 and Table D-57 shows that the aforementioned demographic factors generate a significant difference in the mean score of the following:

- Gender,  $\chi^2(1) = 17.349$ ,  $p = .000$ , with a mean rank SR\_Index score of 91.88 for Male and 127.45 for Female
- Education background,  $\chi^2(4) = 12.932$ ,  $p = .012$ , with a mean rank SR\_Index score of 148.50 for No degree, 136.59 for Secondary school or less, 118.94 for Institute degree, 120.15 for Undergrad student, and 96.78 for University degree and above.
- Employment status,  $\chi^2(5) = 21.091$ ,  $p = .001$ , with a mean rank SR\_Index score of 131.63 for Unemployed, 140.52 for Housewife, 111.27 for Retired, 122.86 for Student, 98.13 for Private sector employee, and 88.39 for Public sector employee.
- The presence of relatives living within the neighbourhood,  $\chi^2(1) = 6.469$ ,  $p = .011$ , with a mean rank SR\_Index score of 119.04 for No and 97.14 for Yes.

The breakdown of the data in Table D-56 and Table D-57 suggests that, in AlKhalij Alarabi neighbourhood, three demographic factors influence the level of strong social relationships between the residents of AlKhalij Alarabi. The Kruskal-Wallis H test shows statistically significant differences in the SR\_Index between gender, employment status, and the presence of relatives living in AlKhalij Alarabi neighbourhood ( $p$ -value  $<.05$ ). The data for AlKhalij Alarabi in Tables D-56 and D-57 illustrates that the previously mentioned demographic factors generate a significant difference in the mean scores of the following:

- Gender,  $\chi^2(1) = 19.385$ ,  $p = .000$ , with a mean rank SR\_Index score of 35.76 for Male and 60.94 for Female

- Employment status,  $\chi^2(5) = 13.609$ ,  $p = .018$ , with a mean rank SR\_Index score of 50.05 for Unemployed, 61.94 for Housewife, 52.38 for Retired, 54.73 for Student, 49.22 for Private sector employee, and 31.67 for Public sector employee.
- The presence of relatives living within the neighbourhood,  $\chi^2(1) = 5.430$ ,  $p = .020$ , with a mean rank SR\_Index score of 54.00 for No and 40.14 for Yes.

Table D-56 Ranks of the means for the demographic factors and the Social Relationship Index in the surveyed case studies.

		Ranks							
		Social Ties Index							
		AlJunainah		AlKhalij Alarabi		AlZahraa		Overall	
		N	Mean Rank	N	Mean Rank	N	Mean Rank	N	Mean Rank
Gender	Male	48	39.64	46	35.76	16	16.31	110	91.88
	Female	35	45.24	51	60.94	22	21.82	108	127.45
	Total	83		97		38		218	
Age group	18 - 24	10	49.85	28	55.93	5	15.90	43	124.49
	25 - 34	37	42.65	25	45.32	19	21.32	81	109.23
	35 - 44	15	35.80	24	37.85	8	17.31	47	88.61
	45 - 54	9	36.50	9	52.67	2	26.25	20	110.25
	55 - 64	11	48.77	8	61.19	1	11.00	20	130.40
	65 - 74	1	7.50	3	60.67	3	18.17	7	98.93
	Total	83		97		38		218	
Q4: The Marital status	Divorced-Widow	2	39.00	9	60.72	1	30.50	12	135.46
	Single	16	41.03	36	50.18	14	19.68	66	112.16
	Married	65	42.33	52	46.15	23	18.91	140	106.02
	Total	83		97		38		218	
Q5: Education level	No degree	3	54.67					3	148.50
	Secondary school or less	11	58.41	17	54.06			28	136.59
	Institute degree	13	42.54	18	53.44	1	22.00	32	118.94
	Undergrad student	6	46.75	24	54.73	4	16.38	34	120.15
	University degree and above	50	36.92	38	41.01	33	19.80	121	96.78
	Total	83		97		38		218	
Employment status	Unemployed	15	56.67	10	50.05	3	18.00	28	131.63
	Housewife	8	48.69	18	61.94	2	31.75	28	140.52
	Retired	6	43.17	4	52.38	3	18.17	13	111.27
	Student	6	46.75	24	54.73	5	20.50	35	122.86
	Private sector employee	19	33.16	18	49.22	7	17.64	44	98.13
	Public sector employee	29	37.14	23	31.67	18	19.06	70	88.39
	Total	83		97		38		218	
Type of ownership	Governmental housing	1	50.00	1	65.00	2	15.50	4	98.38
	Rent	9	36.44	17	51.65	3	8.17	29	104.21
	Multi-ownership	13	38.19	12	41.17	7	23.50	32	102.75
	owned	60	43.53	67	49.49	26	20.04	153	112.21
	Total	83		97		38		218	
Length of residency in the neighbourhood	Less than two years	9	44.78	5	38.80	4	20.38	18	107.64
	2 - 5 years	9	50.11	12	47.54	3	16.67	24	115.98
	6 - 10 years	34	39.29	30	44.57	13	17.08	77	99.68
	11 - 15 years	5	40.60	8	61.50	3	25.33	16	128.53
	16 - 20 years	6	54.33	15	43.80	1	27.50	22	114.75
	More than 20 years	20	38.35	27	55.65	14	20.29	61	113.01
	Total	83		97		38		218	
The presence of relatives living within the neighbourhood	No	40	45.63	62	54.00	21	20.00	123	119.04
	Yes	43	38.63	35	40.14	17	18.88	95	97.14
	Total	83		97		38		218	

Table D-57 Kruskal-Wallis H Test for the demographic factors and Social Relationship Index in the surveyed case studies.

		Test Statistics			
		Social Relationship Index			
		AlJunainah	AlKhalij Alarabi	AlZahraa	Overall
Gender	Kruskal-Wallis H	1.098	19.385	2.277	17.349
	df	1	1	1	1
	Asymp. Sig.	.295	.000	.131	.000
Age group	Kruskal-Wallis H	5.481	8.067	2.712	9.992
	df	5	5	5	5
	Asymp. Sig.	.360	.153	.744	.075
Marital status	Kruskal-Wallis H	0.069	2.159	1.049	2.578
	df	2	2	2	2
	Asymp. Sig.	.966	.340	.592	.276
Education level	Kruskal-Wallis H	8.410	5.059	0.392	12.932
	df	4	3	2	4
	Asymp. Sig.	.078	.167	.822	.012
Employment status	Kruskal-Wallis H	10.181	13.609	2.797	21.091
	df	5	5	5	5
	Asymp. Sig.	.070	.018	.731	.001
Type of ownership	Kruskal-Wallis H	1.156	1.426	4.353	0.978
	df	3	3	3	3
	Asymp. Sig.	.764	.700	.226	.807
Length of residence in the neighbourhood	Kruskal-Wallis H	3.623	5.037	2.256	3.936
	df	5	5	5	5
	Asymp. Sig.	.605	.411	.813	.559
The presence of relatives living within the neighbourhood	Kruskal-Wallis H	1.751	5.430	0.095	6.469
	df	1	1	1	1
	Asymp. Sig.	.186	.020	.758	.011

### D.17. Communal Space for Regular Gatherings:

Table D-58 shows the frequency of responses amongst the surveyed sample on selecting the communal space used by residents for **regular gatherings** within the neighbourhood. Overall, the communal space selected for regular contact by over half of the respondents (64.2%) is the space in front of the main entrance of the house. The data shows that over than one-third of the respondents selected streets and sidewalks, masjid/church, and local shops for regular meetings (i.e., 40.7%, 38.7%, and 36.8%, respectively), while 29.9% of the respondents selected the local market or malls located within the neighbourhood as spaces for regular interaction. Moreover, 17.6% of respondents used the shared garden of the neighbourhood, while 10.8% of the surveyed sample indicated the house as another space for regular contact, whilst remaining respondents selected other types of communal spaces (i.e., local restaurants, local café, and gym). The dominant gender that selects these choices was males, see Table D-59. The breakdown of the data presents different patterns of communal space use across the case studies.

Table D-58 Frequencies for question 30 of the questionnaire (communal space for regular contacts).

Q30: Where do you usually meet your neighbours?	AlJunainah		AlKhalij Alarabi		AlZahraa		Overall	
	N	N %	N	N %	N	N %	N	N %
The space in front of the main entrance of the house.	44	54.3%	60	69.8%	27	73.0%	131	64.2%
Streets and sidewalks.	34	42.0%	32	37.2%	17	45.9%	83	40.7%
Masjid/church.	22	27.2%	48	55.8%	9	24.3%	79	38.7%
Local shops.	27	33.3%	32	37.2%	16	43.2%	75	36.8%
Local market or malls.	20	24.7%	36	41.9%	5	13.5%	61	29.9%
The garden of the neighbourhood.	21	25.9%	14	16.3%	1	2.7%	36	17.6%
Other.	12	14.8%	6	7.0%	4	10.8%	22	10.8%
Local restaurants.	9	11.1%	7	8.1%	0	0.0%	16	7.8%
Local café.	6	7.4%	7	8.1%	2	5.4%	15	7.4%
Gym.	6	7.4%	3	3.5%	2	5.4%	11	5.4%
Children's playground	4	4.9%	0	0.0%	2	5.4%	6	2.9%
N%=	N/81		N/86		N/37		N/204	

Table D-59 Frequencies for question 30 of the questionnaire (communal space for regular contacts) in regard of gender.

Gender	The communal space for regular gatherings	Responses		
		N	Percent	Percent of Cases
Male	The main entrance of the house.	71	22.5%	68.3%
	Spaces between houses.	10	3.2%	9.6%
	Streets and sidewalks.	55	17.5%	52.9%
	Children playground.	3	1.0%	2.9%
	Garden of the neighbourhood.	19	6.0%	18.3%
	Masjid/church.	42	13.3%	40.4%
	Local shops.	45	14.3%	43.3%
	Local market or malls.	30	9.5%	28.8%
	Local Restaurants.	12	3.8%	11.5%
	Local Café.	14	4.4%	13.5%
	Gym.	10	3.2%	9.6%
	Others.	4	1.3%	3.8%
	Total	315	100.0%	302.9%
Female	The main entrance of the house.	60	27.3%	60.0%
	Spaces between houses.	3	1.4%	3.0%
	Streets and sidewalks.	28	12.7%	28.0%
	Children playground.	3	1.4%	3.0%
	Garden of the neighbourhood.	4	1.8%	4.0%
	Masjid/church.	37	16.8%	37.0%
	Local shops.	30	13.6%	30.0%
	Local market or malls.	31	14.1%	31.0%
	Local Restaurants.	4	1.8%	4.0%
	Local Café.	1	0.5%	1.0%
	Gym.	1	0.5%	1.0%
	Others.	18	8.2%	18.0%
	Total	220	100.0%	220.0%

a Dichotomy group tabulated at value 1.

### D.18. Communal Space for Formal Gatherings:

Table D-60 shows the frequency of responses amongst the surveyed sample when selecting the communal space used by residents for *formal gatherings* within the neighbourhood. Overall, the communal space selected for formal contact by over half of the respondents (68.1%) is the worship facility (masjid/church). The data shows that 40% of respondents selected the space in front of the main entrance of the house, 35.1% selected streets and sidewalks, and 27% selected the shared garden of the neighbourhood. Moreover, 20% of the surveyed sample indicated other spaces for formal contact, namely the house and halls for weddings, while the remaining respondents selected the other types of communal space (i.e., local shops, mall, local restaurants, local café, and gym). The data breakdown presents different patterns across the case studies. In AlJunainah neighbourhood, the most selected communal spaces were the masjid/church (68.4%), streets, sidewalks and the shared garden of the neighbourhood (39.5% each), and the space in front of the main entrance of the house (32.9%). Moreover, 26.3% of the respondents indicated other spaces for formal gatherings. For AlKhalij Alarabi neighbourhood, the most selected communal spaces for formal interactions were the masjid/church (70.5%), the space in front of the main entrance of the house (47.4%), the shared garden of the neighbourhood (37.2%), and the streets and sidewalks (28.2%). Finally, in AlZahraa neighbourhood, the masjid/church was selected for formal gatherings by 61.3%, followed by streets and sidewalks 41.9, and the space in front of the main entrance of the house (38.7%), whilst 25.8% of respondents indicated other options for formal gatherings (see Table D-60).

Table D-60 The frequency of using the communal space for formal contact: Q33 of the questionnaire.

Q33: Where do you usually meet your neighbours for scheduled gatherings?	AlJunainah		AlKhalij Alarabi		AlZahraa		Overall	
	N	N %	N	N %	N	N %	N	N %
Masjid/church	52	68.4%	55	70.5%	19	61.3%	126	68.1%
The space in front of the main entrance of the house.	25	32.9%	37	47.4%	12	38.7%	74	40.0%
Streets and sidewalks.	30	39.5%	22	28.2%	13	41.9%	65	35.1%
The shared garden of the neighbourhood.	31	39.5%	29	37.2%	-	-	50	27.0%
Other.	20	26.3%	9	11.5%	8	25.8%	37	20.0%



Q33: Where do you usually meet your neighbours for scheduled gatherings?	AlJunainah		AlKhalij Alarabi		AlZahraa		Overall	
	N	N %	N	N %	N	N %	N	N %
Local market or malls.	1	1.3%	8	10.3%	2	6.5%	11	5.9%
Local shops.	1	1.3%	7	9.0%	2	6.5%	10	5.4%
Local restaurants.	2	2.6%	3	3.8%	1	3.2%	6	3.2%
Children's playground.			3	3.8%	2	6.5%	5	2.7%
Local café.	3	3.9%	1	1.3%	1	3.2%	5	2.7%
Gym.	1	1.3%	1	1.3%	1	3.2%	3	1.6%
N%=	N/76		N/78		N/31		N/185	

Table D-61 shows the communal spaces used for both formal and regular contact overall and across the case studies. From the data in the column “overall”, two communal spaces have obtained an IS\_Index score of 0.46, namely the space in front of the main entrance of the house and the masjid/church/hussainya. This score indicates that, after rounding to the nearest integer, these two spaces have been often used by residents for regular and formal contact. The breakdown of the data shows similar patterns in AlKhalij Alarabi neighbourhood. In AlZahraa neighbourhood, the respondents indicated the use of the space in front of the main entrance of the house for regular and formal contact, the IS\_Index=0.50. In AlJunainah neighbourhood, the data shows that no specific communal space was selected by the respondents for using for both regular and formal gatherings, where the higher scores are 0.44 for worship facilities and 0.41 for the space in front of the main entrance of the house.

*Table D-61 Communal spaces for formal and regular contact across the case studies.*

Communal Space for Regular and Formal Contacts	AlJunainah	AlKhalij Alarabi	AlZahraa	Overall
<b>The space in front of the main entrance of the house.</b>	<b>0.41</b>	<b>0.50</b>	<b>0.50</b>	<b>0.46</b>
Streets and sidewalks.	0.38	0.28	0.38	0.33
Children's playground.	0.02	0.02	0.05	0.02
The garden of the neighbourhood.	0.31	0.22	0.08	0.23
<b>Masjid/church/hussainya.</b>	<b>0.44</b>	<b>0.53</b>	0.36	<b>0.46</b>
Local shops.	0.16	0.20	0.23	0.19
Local market or malls.	0.12	0.23	0.09	0.16
Local restaurants.	0.06	0.05	0.01	0.05
Local café.	0.05	0.04	0.04	0.05
Gym.	0.04	0.02	0.04	0.03
Other.	0.19	0.08	0.15	0.13

### D.19. The Frequency of Using Communal Spaces:

Table D-62 reveals the count and percentage of the answers regarding the frequency of use of each communal space both overall and across the case studies. Overall, 26.7% of respondents indicated that they use the space in front of the main entrance of the house daily for social contact. The breakdown of the data shows a similar pattern in AlKhalij Alarabi neighbourhood, while in AlJunainah and AlZahraa neighbourhood, around 31% of the respondents indicated never using it before as a place for social contact. More than one-third of the respondents (36.2%) indicated that they never used the streets and sidewalks for social contact, while 29.9% indicated using these spaces weekly. The breakdown of the data shows similar patterns across AlJunainah and AlZahraa neighbourhoods, although in AlKhalij Alarabi neighbourhood, 35.1% of the respondents indicated using these spaces weekly for social contact. Moreover, respondents revealed that they never used the following communal spaces before for social interaction with neighbours: the children's playground, shared garden in the neighbourhood, worship facilities (masjid, church or hussainya), local restaurants, local cafes, and gyms, scored high percentages (i.e., 83.3%, 63.8%, 43%, 65.6%, 78.7%, and 86.9%, respectively). The breakdown of the data represents similar patterns across the surveyed neighbourhoods. One-third of respondents (35.3%) indicated using local shops weekly for social contact with others. The breakdown of the data demonstrates a similar pattern across the case studies, except in AlJunainah neighbourhood, where 29.4% of respondents indicated never using these spaces for social contact. In addition, 35.3% of respondents indicated using the local market or mall weekly for

social contact. The breakdown of the data demonstrates a similar pattern across the case studies, except in AlZahraa neighbourhood, where 35.9% of respondents revealed that they do not use these areas for social contact.

Table D-62 The frequency of use for each communal space overall and across the case studies: Question 34.

Q34		AlJuninah		AlKhalij Alarabi		AlZahraa		Overall	
		N	N %	N	N %	N	N %	N	N %
The space in front of the main entrance of the house	Never used before	26	30.6%	20	20.6%	12	30.8%	58	26.2%
	Once or twice a year	6	7.1%	3	3.1%	3	7.7%	12	5.4%
	Monthly	17	20.0%	13	13.4%	7	17.9%	37	16.7%
	Weekly	18	21.2%	28	28.9%	9	23.1%	55	24.9%
	Daily	18	21.2%	33	34.0%	8	20.5%	59	26.7%
Streets and sidewalks	Never used before	31	36.5%	33	34.0%	16	41.0%	80	36.2%
	Once or twice a year	3	3.5%	5	5.2%	2	5.1%	10	4.5%
	Monthly	15	17.6%	10	10.3%	5	12.8%	30	13.6%
	Weekly	25	29.4%	34	35.1%	7	17.9%	66	29.9%
	Daily	11	12.9%	15	15.5%	9	23.1%	35	15.8%
Children's playground	Never used before	71	83.5%	77	79.4%	36	92.3%	184	83.3%
	Once or twice a year	3	3.5%	8	8.2%	2	5.1%	13	5.9%
	Monthly	6	7.1%	6	6.2%	1	2.6%	13	5.9%
	Weekly	3	3.5%	6	6.2%	0	0.0%	9	4.1%
	Daily	2	2.4%	0	0.0%	0	0.0%	2	0.9%
The garden of the neighbourhood.	Never used before	48	56.5%	62	63.9%	31	79.5%	165	63.8%
	Once or twice a year	8	9.4%	6	6.2%	3	7.7%	17	7.7%
	Monthly	21	24.7%	20	20.6%	5	12.8%	46	20.8%
	Weekly	6	7.1%	6	6.2%	0	0.0%	12	5.4%
	Daily	2	2.4%	3	3.1%	0	0.0%	5	2.3%
Masjid/church/hussainya	Never used before	39	45.9%	33	34.0%	23	59.0%	95	43.0%
	Once or twice a year	11	12.9%	16	16.5%	11	28.2%	38	17.2%
	Monthly	16	18.8%	15	15.5%	2	5.1%	33	14.9%
	Weekly	18	21.2%	27	27.8%	0	0.0%	45	20.4%
	Daily	1	1.2%	6	6.2%	3	7.7%	10	4.5%
Local shops	Never used before	25	29.4%	25	25.8%	9	23.1%	59	26.7%
	Once or twice a year	3	3.5%	3	3.1%	4	10.3%	10	4.5%
	Monthly	14	16.5%	13	13.4%	9	23.1%	36	16.3%
	Weekly	24	28.2%	42	43.3%	12	30.8%	78	35.3%
	Daily	19	22.4%	14	14.4%	5	12.8%	38	17.2%
Local market or malls	Never used before	26	30.6%	28	28.9%	14	35.9%	68	30.8%
	Once or twice a year	3	3.5%	3	3.1%	2	5.1%	8	3.6%
	Monthly	22	25.9%	19	19.6%	13	33.3%	54	24.4%
	Weekly	29	34.1%	40	41.2%	9	23.1%	78	35.3%
	Daily	5	5.9%	7	7.2%	1	2.6%	13	5.9%
Local restaurants	Never used before	51	60.0%	65	67.0%	29	74.4%	145	65.6%
	Once or twice a year	3	3.5%	5	5.2%	3	7.7%	11	5.0%
	Monthly	21	24.7%	20	20.6%	6	15.4%	47	21.3%
	Weekly	8	9.4%	7	7.2%	1	2.6%	16	7.2%
	Daily	2	2.4%	0	0.0%	0	0.0%	2	0.9%
Local cafes	Never used before	62	72.9%	82	84.5%	30	76.9%	174	78.7%
	Once or twice a year	2	2.4%	4	4.1%	2	5.1%	8	3.6%
	Monthly	5	5.9%	4	4.1%	7	17.9%	16	7.2%
	Weekly	12	14.1%	6	6.2%	0	0.0%	18	8.1%
	Daily	4	4.7%	1	1.0%	0	0.0%	5	2.3%
Gym	Never used before	70	82.4%	88	90.7%	34	87.2%	192	86.9%
	Once or twice a year	4	4.7%	3	3.1%	3	7.7%	10	4.5%
	Monthly	2	2.4%	2	2.1%	1	2.6%	5	2.3%
	Weekly	7	8.2%	1	1.0%	1	2.6%	9	4.1%
	Daily	2	2.4%	3	3.1%	0	0.0%	5	2.3%

## D.20. The Nearest Communal Space to the Residents' Houses:

Table D-63 Options provided by 10.4% of the residents.

Others	AlJunainah		AlKhalij Alarabi		AlZahraa		Overall	
	N	N %	N	N %	N	N %	N	N %
-	75	88.2%	91	93.8%	34	87.2%	200	90.5%
Other:	10		7		5		21	
1. Hussainya	2	2.4%	1	1.0%	2	5.1%	5	2.3%
2. The shops that located within the neighbourhood.	0	0.0%	0	0.0%	1	2.6%	1	0.5%
3. The house	8	9.4%	4	4.1%	1	2.6%	13	5.9%
4. There are no gathering places.	0	0.0%	0	0.0%	1	2.6%	1	0.5%
5. I do not use any of the previously mentioned options because I am a married woman, have domestic responsibilities, and our customs and traditions that necessitate being considered.	0	0.0%	1	1.0%	0	0.0%	1	0.5%

## D.21. The Preferred Time for Using the Closest Communal Space for Social Interaction:

Table D-64 represents the responses of question 37 of the questionnaire, which asked respondents to select the preferred time for using communal spaces - morning, afternoon, and evening. According to the data concerning the area in front of the main entrance of the house, 54.9% of respondents used this frequently in the morning, 54.4% in the afternoon, and 48.4% in the evening. Closer inspection of the data indicates that around one-third of respondents (33.8%) used streets and sidewalks in the morning. In comparison, almost one-quarter of respondents used these spaces during the afternoon and evening (25.7% and 27.5%, respectively). Regarding the garden of the neighbourhood, slightly more than one-quarter (26.4%) of respondents employed this communal space as the closest to their house during the evenings, 16.9% used it during the afternoon, while only 8.5% used it during the morning. The other spaces that were indicated as the closest communal space to respondents' houses were used more during the evenings.

Table D-64 The time of using the closest communal space to the house (Q37).

	Morning				Afternoon				Evening			
	unselected		selected		unselected		selected		unselected		selected	
	N	N %	N	N %	N	N %	N	N %	N	N %	N	N %
The space in front of the main entrance of the house	60	40.0%	39	54.9%	25	29.4%	74	54.4%	55	42.3%	44	48.4%
Streets and sidewalks.	29	19.3%	24	33.8%	18	21.2%	35	25.7%	28	21.5%	25	27.5%
The garden of the neighbourhood.	30	4.0%	6	8.5%	13	15.3%	23	16.9%	12	9.2%	24	26.4%
Other.	18	12.0%	5	7.0%	7	8.2%	16	11.8%	12	9.2%	11	12.1%
Children's playground.	1	0.7%	1	1.4%	0	0.0%	2	1.5%	2	1.5%	0	0.0%

## D.22. Activities Undertaken in The Closest Communal Space to The House:

Important to mention that 87.3% of respondents (193) answered the question "what is the activity that performed in the closest communal space?" Table D-65 shows types of activities that conducted by residents within the nearest communal space to their houses. A closer inspection of Table D-65 shows that more than a quarter of the respondents (27.5%) indicated that they use the space in front of the main entrance of the house for sitting and chatting, and 19.7% use these spaces for passing through, and 14.5% for parking their cars. The space in front of the main entrance of the house was also used for observing pedestrians, children's play, and cultivating some plants (7.8%, 7.3%, and 4.7%, respectively). It can be seen from the data in Table D-65 that the streets and sidewalks were mostly used for sitting, chatting and passing through with a similar percentage of 13.5 % of respondents. In comparison, 10.9% of respondents indicated the use of streets and sidewalks for parking their cars. Around 16% of the remaining respondents were closely divided between using streets and sidewalks to observe pedestrians (4.7%), cultivate some plants (4.7%), and for children's play (5.7%). However, the children's playground was rarely used for play by children. For the shared garden in the neighbourhood, 15.5% of respondents

frequently used it for sitting and chatting, which was the highest proportion. Meanwhile, the other activities obtained very low percentages. Also, it was used for studying, as stated by one of the respondents, as shown in Table D-66.

Table D-65 The types of activities performed in the nearest communal space to the house by residents.

Q36 What is the activity that performed in the nearest communal space?									
		To sit and chat with others.	For passing	To observe the pedestrians	To the cultivation	For Parking	To play children	Others	Overall
Spaces in front of main entrances of houses.	Count	53	38	15	9	28	14	16	99
	% Total	27.5%	19.7%	7.8%	4.7%	14.5%	7.3%	8.3%	51.3%
Streets and sidewalks.	Count	26	26	9	9	21	11	10	53
	% Total	13.5%	13.5%	4.7%	4.7%	10.9%	5.7%	5.2%	27.5%
Children's playground.	Count	1	0	0	0	0	2	0	2
	% Total	0.5%	0.0%	0.0%	0.0%	0.0%	1.0%	0.0%	1.0%
Garden of the neighbourhood.	Count	30	15	8	4	5	9	5	10
	% Total	15.5%	7.8%	4.1%	2.1%	2.3%	4.7%	2.3%	18.7%
Other.	Count	13	1	1	1	1	1	11	22
	% Total	6.7%	0.5%	0.5%	0.5%	0.5%	0.5%	5.7%	11.4%
Total	Count	108	68	25	20	49	32	38	193
	% Total	56.0%	35.2%	13.0%	10.4%	25.4%	16.6%	19.7%	100.0%

Percentages and totals are based on respondents.

The “Others” option revealed that respondents use this space for, greeting neighbours, greeting neighbours and observing the kids while they are playing, or studying (see Table D-66). Some of the respondents mentioned that they use these spaces for greeting and meeting friends and neighbours, observing the kids while they are playing, or overriding the sidewalk to enlarge their house. Some residents indicated that the closest communal space that they used for their social interaction is their houses. Residents typically use houses for meeting and discussing life and family matters, and sometimes for holding social events, which could be weddings or condolences.

Table D-66 Other activities that take place in the closest communal space to residents' houses: Responses of Q36 “Others”.

Other Activities		N
The space in front of the main entrance of the house.	Greeting neighbours.	5
	Do not use them for any activity.	6
	Studying.	1
	Greeting neighbours and observing the kids while they are playing.	3
	Total	15
Streets and sidewalks.	Greeting neighbours and observing the kids while they are playing.	1
	Taking the sidewalk to complete the house.	1
	Do not use for any activity.	6
	Greeting and meeting friends and neighbours	.3
	Total	11
The shared garden of the neighbourhood.	Studying.	1
Hussainya.	Praying.	3
	Do not use for any activity.	1
	Total	5
House.	Meeting neighbours and discussing the life and family matters.	5
	Social events.	1
	Do not use for any activity.	1
	Total	7
Total		38

### D.23. The Preferred Place for Spending Free or Rest Time:

Table D-67 shows the counts and percentages of respondents according to the gender who indicated the preferred place to spend free and entertaining time within the neighbourhood. From Table D-67, it can be seen that a higher rate of females selected spending free time in the house than males; both genders preferred to spend their free time in the house over other choices. The patterns are similar across the three case studies. Males mainly selected enclosed and open communal spaces within the three neighbourhoods, although the proportions of males who chose these spaces were lower than those who chose the house.

Table D-67 Cross tabulation between the preferred place and gender within the surveyed neighbourhoods.

The preferred place within the neighbourhood to spend free and rest time		Male		Female	
		Count	Column N %	Count	Column N %
Overall	At home	84	75.0 <sup>a</sup> %	101	92.7 <sup>b</sup> %
	At enclosed communal spaces such as cafés.	17	15.2%	7	6.4%
	At open communal spaces such as the neighbourhood garden, or street.	14	12.5%	1	0.9%
	Other	2	1.8%	4	3.7%
AlJunainah	At home	41	82.0 <sup>c</sup> %	30	85.7 <sup>d</sup> %
	At the enclosed communal spaces such as cafés.	7	14.0%	5	14.3%
	At the open communal spaces such as the neighbourhood garden or street.	4	8.0%	1	2.9%
	Other	1	2.0%	2	5.7%
AlKhali Alarabi	At home	32	69.6 <sup>e</sup> %	51	100.0 <sup>f</sup> %
	At the enclosed communal spaces such as cafés.	8	17.4%	1	2.0%
	At the open communal spaces such as the neighbourhood garden or street.	8	17.4%	0	0.0%
	Other	0	0.0%	0	0.0%
AlZahraa	At home	11	68.8 <sup>g</sup> %	20	87.0 <sup>h</sup> %
	At the enclosed communal spaces such as cafés.	2	12.5%	1	4.3%
	At the open communal spaces such as the neighbourhood garden or street.	2	12.5%	0	0.0%
	Other	1	6.3%	2	8.7%
% of Total					
a.	% = Count / 112	b.	% = Count /	c.	% = Count / 50
e.	% = Count / 46	f.	% = Count / 51	d.	% = Count / 35
		g.	% = Count / 16	h.	% = Count / 23

Table D-68 shows the preferred places according to the age groups for both genders. The percentages are calculated depending on the total of males and females who answered this question. For males, the age groups who prefer the house in which to spend free time were 25-34, 35-44, and 18-24, with the following respective percentages 21.4%, 19.6%, and 12.5. For females, similar age groups selected the house in which to spend free time with the following respective percentages: 40.4%, 21.1%, and 15.6%. To conclude, the results showed, overall and in each case study, that “the house” is more preferred place to spend free time amongst females than males for the 18 to 44 age groups.

Table D-68 The preferred place within the neighbourhood in which to spend free time by age group.

		At Home	At the enclosed communal spaces	At the open communal spaces	Other	Total
Male	18 - 24	Count	14	4	2	0
		% of Total <sup>a</sup>	12.5%	3.6%	1.8%	0.0%
	25 - 34	Count	24	5	2	0
		% of Total <sup>a</sup>	21.4%	4.5%	1.8%	0.0%
	35 - 44	Count	22	5	5	1
		% of Total <sup>a</sup>	19.6%	4.5%	4.5%	0.9%
	45 - 54	Count	10	2	1	1
		% of Total <sup>a</sup>	8.9%	1.8%	0.9%	0.9%
	55 - 64	Count	11	1	1	0
		% of Total <sup>a</sup>	9.8%	0.9%	0.9%	0.0%
	65 - 74	Count	3	0	3	0
		% of Total <sup>a</sup>	2.7%	0.0%	2.7%	0.0%
	Total	Count	84	17	14	2
		% of Total <sup>a</sup>	75.0%	15.2%	12.5%	1.8%

			At Home	At the enclosed communal spaces	At the open communal spaces	Other	Total
Female	18 - 24	Count	23	1	0	0	23
		% of Total <sup>b</sup>	21.1%	0.9%	0.0%	0.0%	21.1%
	25 - 34	Count	44	5	0	3	51
		% of Total <sup>b</sup>	40.4%	4.6%	0.0%	2.8%	46.8%
	35 - 44	Count	17	0	1	1	18
		% of Total <sup>b</sup>	15.6%	0.0%	0.9%	0.9%	16.5%
	45 - 54	Count	8	0	0	0	8
		% of Total <sup>b</sup>	7.3%	0.0%	0.0%	0.0%	7.3%
	55 - 64	Count	8	1	0	0	8
		% of Total <sup>b</sup>	7.3%	0.9%	0.0%	0.0%	7.3%
	65 - 74	Count	1	0	0	0	1
		% of Total <sup>b</sup>	0.9%	0.0%	0.0%	0.0%	0.9%
Total	Count	101	7	1	4	109 <sup>b</sup>	
	% of Total <sup>b</sup>	92.7%	6.4%	0.9%	3.7%	100.0%	
% of Total <sup>a</sup> = Count /112			% of Total <sup>b</sup> = Count/109				



## Appendix E: The Questionnaire

### E.1. Users' Urban and Social Sense Questionnaire (English Copy):

#### Users' Urban and Social Sense Questionnaire

##### **Introduction**

This survey is part of a PhD research project investigating which of the social sustainability indicators, physical characteristics of the built environment, and demographic factors have an impact on social interaction between residents in communal spaces of single-family houses neighbourhoods. The research aims to improve housing conditions by studying the social life in the Iraqi residential neighbourhoods, focusing particularly on communal and public spaces, and understanding the preferences of the residents of urban housing developments. The outcomes will contribute towards increasing wellbeing and the quality of life of the occupants of future urban housing developments in Iraq. Please be assured that the survey is completely anonymous. All the information you provide will remain confidential and will be used only as anonymous data for statistical analysis for the purpose of this research. I will be so grateful if you contribute in answering the questions.

##### **Who should complete the questionnaire?**

Any interested person aged 18 or above, in your household, are welcome to participate in this study by completing this questionnaire. Please note that as for each copy of the questionnaire, only one person must answer all the questions at a time. Participation is voluntary and will not affect any other aspects of your day-to-day life. The participants can withdraw from answering the questionnaire if they would like to do so.

##### **How to complete the questionnaire?**

In order to answer the questions, participants should tick a suitable box. In a few questions, the participants are asked to write in their answers in words or numbers. No special knowledge is needed. For each question, instructions are given on how to indicate your response. This questionnaire might take between 15-20 minutes to complete it. Please be sure you answered all the questions and completed the questionnaire within one week from the date of receiving.

##### **How to return the completed questionnaire?**

In order to return the completed questionnaire to the researcher, an envelope will be attached to each questionnaire. As mentioned before, the questionnaire should be completed and be ready to collect within one week starting from the first day of receiving. The participant can either deliver the completed questionnaire to a nominated person from the neighbourhood who his identity will be confirmed to them later or keep it to be collected in person by the researcher or one of her team who delivers it. If for any reason the completed questionnaire has not been collected in the selected period, the person will call again on another day.

**Thank you very much for your assistance.**

**It is very much appreciated.**

If you have any question regarding this questionnaire, please do not hesitate to contact the researcher through this email [noor.almansor@strath.ac.uk](mailto:noor.almansor@strath.ac.uk), or by phone on this number 009647801009542

##### **Note:**

In this questionnaire, the focus will be on the term "communal spaces" located in residential neighbourhoods. These spaces include the space in front of the main entrance of the house (the doorstep of the outside door of the house), the sidewalk, the street, the shared garden of the neighbourhood that is overlooked by a group of homes, the children's playground (if any inside the neighbourhood), a café, a restaurant, a religious building such as a mosque, a hussainya, or a church, local shops (and the space in front of their main entrances), gyms, local market or mall.

This section deals with general personal information: Housing, Age, Gender, Marital Status, and Education:

**Q1. Where do you live?**

- ☐ Hay Al-Andalus/ AlJunainah
- ☐ Hay Al-Khaleej Alarabi
- ☐ Hay AL-Zahraa

**Q2. Please indicate your gender from the following choices by ticking (✓) one box only.**

- ☐ Male
- ☐ Female

**Q3. Please indicate your age group. Please tick (✓) one box.**

- ☐ 18 - 24
- ☐ 25 - 34
- ☐ 35 - 44
- ☐ 45 - 54
- ☐ 55 - 64
- ☐ 65 - 74
- ☐ 75 or older

**Q4. Please indicate your marital status. Please tick (✓) one box.**

- ☐ Married
- ☐ Widowed/Divorced
- ☐ Single

**Q5. Please indicate your education level. Please tick (✓) one box.**

- ☐ No degree
- ☐ Secondary school (general / vocational) or less
- ☐ Institute degree (e.g. technical medical institute)
- ☐ Undergraduate student
- ☐ University degree and above

**Q6. Please indicate the best description of your employment status from the following choices by ticking (✓) one box only.**

- ☐ Employed within the public sector
- ☐ Employed within the private sector
- ☐ Student
- ☐ Retired
- ☐ Unemployed
- ☐ Housewife

*Skip To: Q8 If you are Unemployed, Retired, Housewife.*

**Q7. Work Location: Please indicate your workplace.**

- ☐ My workplace outside the neighborhood (such as school, hospital or university)
- ☐ My workplace within the neighborhood.
- ☐ Other (please specify)

**Q8. Time Spent at Work: Please indicate the relevant answers to the following two questions.**

	State in Numbers
How many hours do you spend at work daily?	
How many days do you work per month?	

**Q9. Where you usually spend your free time in your neighbourhood?**

- ☐ In one of the closed communal places within the neighborhood, such as cafes, restaurants, the mosque or hussainya.
- ☐ In one of the open communal spaces within the neighborhood, such as the street, sidewalk, or the shared public garden within the neighborhood.
- ☐ Other (please specify)

**Information about your family and house:**

**Q10. Number of Families (if any): Please indicate the relevant answers to the following questions relating to your household. Please write your answers using numbers.**

	State in numbers
How many families currently live in your house?	
How many people currently live in your household including yourself?	

**Q11. Number of Children and Teenagers**

**According to Age Group:** Please indicate how many children are living in your household according to the age categories listed below. Please insert 0 if none.

	State in numbers
Children aged ten years or less	
Teens aged between 11-17	

**Q12. Please indicate the type of your dwelling ownership. Please tick (✓) one box.**

- ☐ Owned
- ☐ Rented
- ☐ Multi-Ownership.
- ☐ Owned by the Government.

**Q13. How long have you lived in the same house? Please tick (✓) one box.**

- ☐ Less than two years
- ☐ 2 - 5 years
- ☐ 6 - 10 years
- ☐ 11 - 15 years
- ☐ 16 - 20 years
- ☐ More than 20 years.

**Q14. Please indicate how long have you lived in your neighbourhood? Please tick (✓) one box.**

- ☐ Less than two years
- ☐ 2 - 5 years
- ☐ 6 - 10 years
- ☐ 11 - 15 years
- ☐ 16 - 20 years
- ☐ More than 20 years.

**Q15. The house contains: (tick all that apply)**

- ☐ Garden.
- ☐ Central courtyard.
- ☐ Rooms are spacious.
- ☐ All of the above.
- ☐ None of the above.

**Q16. What is the area your home?**

- ☐ Less than 200 square meters.
- ☐ 200-250 square meters.
- ☐ 300-350 square meters.
- ☐ 400-450 square meters.
- ☐ 500 square meters and above.

**Q17. Do you have relatives living in the same neighbourhood where you live? Please tick (✓) one box.**

- ☐ Yes
- ☐ No

#### Social Aspects

Tick (✓) to choose the appropriate response

**Q18. Safety and Security Aspects:** Please indicate how safe you feel when using the following communal?

	Very safe	Safe	Unsafe	Very unsafe	Don't know	Not available
Space in front of the main entrance of the house.						
Streets and sidewalks.						
Children's playground (located in the neighbourhood).						
Garden of the neighbourhood (located between some houses).						
Mosque/hussainya/c hurch (located in the neighbourhood).						
Local shops (located in the neighbourhood).						
Local market or malls (located in the neighbourhood).						
Restaurants (located in the neighbourhood).						
Cafe (located in the neighbourhood).						
Gym (located in the neighbourhood).						

**Q19. The neighbourhood you live in;** Please indicate your level of agreement or disagreement with the following statements listed below.

Statement	Strongly agree	Somewhat agree	Somewhat disagree	Strongly disagree	Neither agree nor disagree
The neighbourhood is safe to live in.					
I feel safe walking around our neighbourhood during the evening.					
I feel safe and secure when using existing open communal spaces in the neighbourhood for gatherings during the daytime.					
I feel safe and secure when using existing open communal spaces in the neighbourhood for gatherings during the evening.					
I feel safe when in the street in front of my house.					
I plan to stay in the neighbourhood as long as possible.					

**Q20. Impressions about the attachment to place:** According to the neighbourhood you live in, please indicate your degree of agreement or disagreement with the following statements listed below.

Q20	Strongly agree	Somewhat agree	Somewhat disagree	Strongly disagree	Neither agree nor disagree
I feel strongly attached to the neighbourhood as one of its members.					
I feel proud to live in this neighbourhood.					
I feel at home when arrived at the neighbourhood.					

**Q21. Impressions about the sense of community:** According to the neighbourhood you live in, please indicate your degree of agreement or disagreement with the following statements listed below, by ticking (✓) one box for each statement.

Q21	Strongly agree	Somewhat agree	Somewhat disagree	Strongly disagree	Neither agree nor disagree
The friendships and relationships I have with other people in the neighbourhood mean a lot to me.					
I have made new friends while living here.					
If I need a little company, I can stop by a neighbour I know.					
I attend most of the social gatherings organized in the neighbourhood (e.g., religious events, weddings, funeral receptions).					
I participate in decision-making processes relevant to the neighbourhood (such as solving problems, involvement in voluntary work.).					

Q22. Impressions **about privacy**: According to the neighbourhood you live in, please indicate the degree of your agreement or disagreement with the following statements listed below.

Q22	Strongly agree	Somewhat agree	Somewhat disagree	Strongly disagree	Neither agree nor disagree
I can watch the kids easily when they play in the available communal spaces near the house.					
I can use open communal spaces like the street, sidewalk, or garden near my house with neighbours or friends.					
I can use the open communal spaces like the street, sidewalk, or the garden near my house with neighbours or friends.					

Physical characteristics of the built environment  
Tick (✓) to choose the appropriate response.

Q23. Impressions **about Accessibility**:

According to the neighbourhood you currently live in, please indicate your level of agreement or disagreement with the following statements to describe the reality of your neighbourhood.

Q23	Strongly agree	Somewhat agree	Somewhat disagree	Strongly disagree	Neither agree nor disagree
It is easy to access the available communal spaces.					
Communal spaces located in the neighbourhood close to my house (about ten minutes walking distance).					
The communal spaces in my neighbourhood are accessible to both genders and all age groups.					

Q24. Impressions **about site design**:

According to your neighbourhood you currently live in, please indicate your level of agreement or disagreement with the following statements describing the reality of your neighbourhood.

Q24	Strongly agree	Somewhat agree	Somewhat disagree	Strongly disagree	Neither agree nor disagree
I am satisfied with the variety of communal spaces in the neighbourhood, for example, gardens between houses, cafés, a playground for children, large sidewalks, etc.					
I am satisfied with the total area of the existing open communal spaces in the neighbourhood.					
I am satisfied with the availability of visual attractions in					

Q24	Strongly agree	Somewhat agree	Somewhat disagree	Strongly disagree	Neither agree nor disagree
the shared garden between the houses in the neighborhood, such as water fountains, trees and plants, shaded seats and good ground.					
I am satisfied with both the houses and public services (educational, religious, commercial and social) that have been distributed within the neighbourhood in their current form.					
I am satisfied with the width of the streets in my neighbourhood.					
I am satisfied with the existence of sidewalks of a suitable width to the streets of the neighbourhood.					
I am satisfied with the shape of the inner streets of the neighbourhood and their direct connection to the main streets outside off.					

**Q25. Impressions about maintenance:**

According to the neighbourhood you currently live in, please indicate your level of agreement or disagreement with the following statements describing the reality of your neighbourhood.

Q25	Strongly agree	Somewhat agree	Somewhat disagree	Strongly disagree	Neither agree nor disagree
I am satisfied with the level of the maintenance and cleanliness of the neighbourhood and its public services.					
The furnishing and maintenance of the streets and sidewalks of the neighborhood, such as the presence of traffic signs, lighting, paving of sidewalks and streets are well established.					

**Q26. If you could choose to add/change any of the communal spaces within your neighbourhood, what would you suggest? Please state your main reasons.**

**Q27. What is the ideal communal space that you would like to have in your neighbourhood? What would you like to see in it? Please state your main reasons.**



### Social Interaction with Neighbours

**Q28. The social interaction between you and your neighbours: Thinking about the people living in your neighbourhood, please state your answers in numbers to the following questions.**

Questions	State in numbers
How many neighbours do you know by name in your neighbourhood?	
How many neighbours do you typically stop and chat with when you run into them?	
How many neighbours do you say hello to when you meet?	
How many neighbours do you consider as friends?	
How many of your neighbours do you visit every now and then?	
How many households in your neighbourhood can you turn to in an emergency?	

**Q29. Thinking about the neighbours you know by name; please indicate how often you meet them by ticking (✓) one box.**

- ☐ Daily
- ☐ Weekly
- ☐ Monthly
- ☐ Once or twice a year
- ☐ Never

*Skip To: Q31, If you choose Never.*

**Q30. Thinking about the people you know in your neighbourhood, please indicate where you usually meet them, by ticking (✓) all that apply.**

- ☐ Space in front of the main entrance of the house.
- ☐ Streets and sidewalks.
- ☐ Children's playground (located in the neighbourhood).
- ☐ The shared neighbourhood garden (located between some houses).
- ☐ Mosque/Hussainya/church (located in the neighbourhood).
- ☐ Local shops (located in the neighbourhood).
- ☐ Local market or malls (located in the neighbourhood).
- ☐ Restaurants (located in the neighbourhood).
- ☐ Cafe (located in the neighbourhood).
- ☐ Gym (located in the neighbourhood).
- ☐ Other (please specify).

**Q31. Regarding the borrow and exchange of things and favours asked/received (e.g., If I do not have something I need for my cooking, I can borrow it from a neighbour), please indicate how often such occasions have happened? Please tick (✓) one box.**

- ☐ Never
- ☐ Rarely
- ☐ Sometimes
- ☐ Quite often
- ☐ Always

**Q32. Formal gatherings:** Have you ever participated in scheduled gatherings and social activities with your neighbours? Please tick (✓) one box only.

- ☐ Yes
- ☐ No

*Skip To: Q34 If you choose NO*

**Q33. Please indicate where the scheduled gatherings and social events with your neighbours usually occur, by ticking (✓) all that apply.**

- ☐ Main entrance of the plot.
- ☐ Streets and sidewalks.
- ☐ Children's playground (located in the neighbourhood).
- ☐ Garden of the neighbourhood.
- ☐ Outdoor sports facilities (e.g. basketball field, football field).
- ☐ Masjid/church (located in the neighbourhood).
- ☐ Local shops (located in the neighbourhood).
- ☐ Local market or malls (located in the neighbourhood).
- ☐ Restaurants (located in the neighbourhood).
- ☐ Cafe (located in the neighbourhood).
- ☐ Gym (located in the neighbourhood).
- ☐ Other, please specify.

**Q34. The usage of communal spaces:** Please indicate how often you use each space of the following in your neighbourhood, by ticking (✓) one box for each space.

Q34	Daily	Weekly	Monthly	Once or twice a year	Never	Not available
Space in front of the main entrance of the house.						
Streets and sidewalks.						
Children's playground (located in the neighbourhood).						
The shared neighbourhood garden (located between some houses).						
Mosque/hussainya/church (located in the neighbourhood).						
Local shops (located in the neighbourhood).						
Local market or malls (located in the neighbourhood).						
Restaurants (located in the neighbourhood).						
Cafe (located in the neighbourhood).						
Gym (located in the neighbourhood).						

**Q35. What is the nearest communal space to your house that you usually use in your social interaction with neighbours?**

- ☐ Main entrance of the plot.  
☐ Streets and sidewalks.  
☐ Children's playground (located in the neighbourhood).  
☐ Garden of the neighbourhood.  
☐ None  
☐ Other \_\_\_\_\_

Skip to the end of the survey if you choose "None"

**Q36. What is the activity that performed in the nearest communal space to your house that selected in Question 35, and why? Please tick all that apply.**

- ☐ To sit and chat with others.  
☐ To transit  
☐ To watch pedestrians  
☐ For agriculture.  
☐ For parking.  
☐ For children's play.  
☐ Other (please specify) \_\_\_\_\_

**Q37. When do you usually use the nearest communal space to your house you chose in question 35?**

- ☐ Morning  
☐ Afternoon  
☐ Evening

**Would you like to add any comment?**

Thank you for your participation in this survey

## E.2. Users' Urban and Social Sense Questionnaire (Arabic Copy):

### استبيان الحس الحضري والاجتماعي للمستخدمين في البصرة

#### مقدمة:

هذا الاستبيان هو جزء من مشروع بحث لنيل درجة الدكتوراه في الهندسة المعمارية للباحثة نور عبدالامير في جامعة سترانكلايد في بريطانيا. ستساعد مشاركتك في هذا الاستبيان على تحديد العوامل المؤثرة في تطوير الاحياء السكنية في العراق من خلال دراسة الحياة الاجتماعية في الحي السكني العراقي والتي تعتبر الاولى من نوعها، بالتركيز على استخدام أماكن التجمع العامة داخل الحي وفهم ما هي تفضيلات سكان المساكن الحضرية. تأكد من أن جميع المعلومات التي ستقدمها في هذا الاستبيان ستبقى في سرية تامة ولن يتم استخدامها إلا كبيانات مجهولة للتحليل الإحصائي لغرض انجاز هذا البحث. اجابتك على هذا الاستبيان يعتبر مهم جدا لاتمام البحث وستكون الباحثة ممتنة جدا لمساهمتك في الإجابة عليه.

#### من يجب أن يكمل الاستبيان؟

أي شخص مهتم بعمر 18 سنة أو أكثر مرحب به للمشاركة في استكمال هذا الاستبيان. يرجى ملاحظة أنه يجب على كل فرد إكمال نسخة واحدة منه. نرجو علمكم بأن المشاركة طوعية ولن تؤثر على أي جانب من جوانب حياتك اليومية.

#### كيف يتم ملئ الاستبيان؟

للإجابة على أسئلة الاستبيان، يجب على المشاركين وضع علامة صح (✓) في مربع الإجابة المناسبة. في بعض الأسئلة، سيطلب من المشاركين كتابة إجاباتهم أو ان يستخدموا الأرقام حيث ان في كل سؤال سيتم إعطاء تعليمات حول كيفية الإجابة عليه. لا توجد حاجة إلى معرفه أو خبرة خاصة للإجابة على الأسئلة. قد يستغرق اكمال الاستبيان ما بين ١٥ إلى ٢٠ دقيقة. يرجى التأكد من الإجابة على جميع الأسئلة وإكمال الاستبيان في غضون أسبوع واحد من تاريخ استلامه.

#### كيفية إرجاع الاستبيان المكتمل؟

بعد الانتهاء من الإجابة على جميع اسئلة الاستبيان وخلال اسبوع واحد بدأ من اليوم الأول من استلامه، سيتم استلام الاستمارة عن طريق اخذها شخصياً من قبل الباحثة أو أحد أعضاء فريق البحث الذين قاموا بتسليمها. لكم. إذا لم يتم جمع استمارات الاستبيان المكتمل في الموعد المحدد انفا لأي سبب من الأسباب، فسوف يتم التواصل معكم مرة أخرى في يوم آخر.

#### ملاحظة هامة:

في هذا الاستبيان سيتم التركيز على مفردة امكان التجمع العامة الموجودة في الحي السكني وتشمل المساحة مقابل مدخل المنزل (عتبة باب البيت الخارجي)، الرصيف، الشارع، الحديقة العامة المشتركة التي تطل عليها مجموعة من البيوت، الساحة المخصصة للعب الاطفال (ان وجدت داخل الحي حيث تتوفر فيها المراحيج والزحليقات، مقهى، مطعم، مبنى ديني كالمسجد او الحسينية او الكنيسة، المحلات التجارية والمساحة المقابلة لها، صالات الرياضة، والسوق او المول.

شكرا جزيلا لمشاركتك في الإجابة على هذا الاستبيان

مساعدتك لي تعد محل تقدير كبير جدا.

إذا كان لديك أي استفسار، يرجى ألا تتردد في التواصل مع الباحثة من خلال البريد الإلكتروني التالي: [noor.almansor@strath.ac.uk](mailto:noor.almansor@strath.ac.uk)

يشكل هذا القسم مجموعة شخصية عامة: المكان، العمر والجنس والحالة الزوجية والتعليم.

يرجى الإجابة إلى الأسئلة المناسبة للأسئلة التالية وذلك بوضع علامة (✓) لاختيار إجابة واحدة

س1. في أي حي تسكن؟

- حي الحبيبة
- حي الخليل العربي
- حي الزهراء

س2. الجنس؟

- ذكر
- أنثى

س3. ماهي فنتك العربية؟

- 18- 24
- 25- 34
- 35 - 44
- 45 - 54
- 55 - 64
- 65 - 74
- 75+

س4. ما هي حائلتك الاجتماعية؟

- متزوج متزوجة
- متطلق بارأى مثلية أو زمة
- غير متزوج غير متزوجة

س5. ما هو تحصيلك الدراسي؟

- حاصل على شهادة الإعدادية أو أقل
- حاصل على شهادة معبد
- حاصل على شهادة جامعية بكالوريوس أو أعلى.
- غيرها (اكتب): .....

س6. ماهي طبيعة عملك حاليا؟

- موظف (موظفة) في القطاع الحكومي
- موظف (موظفة) في القطاع الخاص
- طالب/طالبة
- مقاعد/مقعدة
- عاطل/عاطلة عن العمل.
- ربانية بيت.

إذا كانت إجابتك "عاطل/عاطلة عن العمل"، "مقاعد/مقعدة" أو "ربانية أسرة"، انتقل إلى السؤال 8 مباشرة.

س7. أين مكان عملك؟

- مكان عمل خارج الحي (كالجامعة أو الدائرة).
- مكان عمل داخل الحي.
- أخرى (الرجاء التحديد) .....

س8. الوقت الذي تعيش فيه العمل:

يرجى الإجابة على الأسئلة التالية باستخدام الأرقام.

السؤال	الإجابة بالأرقام
كم ساعة تقضينا في العمل يوميا؟	
كم يوم تعمل في الشهر؟	

س9. عدة، أين تقضي معظم وقت فراغك أو راحتك داخل الحي؟

- في المنزل
- في إحدى أماكن التجمع العامة المقفلة داخل الحي كالمقاهي، المطاعم، المسجد أو الحسنية.
- في إحدى أماكن التجمع العامة المقفلة داخل الحي كالشارع، الرصيف، أو الحديقة العامة المشتركة داخل الحي.

معلومات عن منزلك وأسرتك

س10. عدد الأبناء (إن وجدت):

يرجى الإجابة بالأرقام عن الأسئلة التالية المتعلقة بالعوائل التي تعيش في منزلك والعائلة الواحدة تشمل الزوج والزوجة وأطفالها):

السؤال	اجب بالأرقام
كم عدد العوائل التي تعيش في منزلك حاليا، من ضمنهم عائلتك؟	
كم عدد الأشخاص الذين يعيشون في منزلك، بما فيهم أنت والأطفال؟	

س11. عدد الأطفال حسب الفئة العمرية:

كم عدد الأطفال في منزلك وفقا للفئات المذكورة في الجدول أدناه؟ يرجى وضع 0 إذا لم يكن هناك إجابة.

السؤال	اجب بالأرقام
الأطفال الذين تتراوح أعمارهم بين عشر سنوات أو أقل	
المراهقين الذين تتراوح أعمارهم بين 17-11	

س12. نوع ملكية السكن:

ما هو نوع ملكيتك السكنية؟

- ملك
- إيجار
- متعدد الملكية (مستأجر)
- سكن حكومي

س13. من أي سنة وانت تشغل نفس المنزل؟

- أقل من عامين
- 2-5 سنوات
- 6-10 سنوات
- 11 - 15 سنة
- 16 - 20 سنة
- أكثر من 20 سنة

س14. من أي سنة وانت مقم في حيك السكني؟

- أقل من عامين
- 2-5 سنوات
- 6-10 سنوات
- 11 - 15 سنة
- 16 - 20 سنة
- أكثر من 20 سنة

س15. يحتوي المنزل على: (يمكنك اختيار أكثر من إجابة)

- حديقة
- فناء وسطي (حوش)
- غرف واسعة
- مكان ما تترك أعلاء

س16. ما هي مساحة منزلك؟

- أقل من 200 متر مربع
- 200—250 متر مربع
- 300-350 متر مربع
- 400-450 متر مربع
- 500 متر مربع فما فوق

س17. هل لديك أقارب يعيشون في نفس الحي الذي تعيش فيه؟

- نعم
- لا

أسئلة عن الجوانب الاجتماعية العامة التي ينطوي عليها مستوى الجوار (الجيرة).

س18. جوانب السلامة والأمان ضح علامة (✓) لاختيار الإجابة المناسبة:

ما مستوى شعورك بالسلامة والأمان عند استخدام الأماكن التالية في الحي الذي نقيم فيه؟

الامكان	أبداً	بعض الأحيان	أغلب الأحيان	دائماً
المساحة مقابل المدخل (غرفة الباب الخارجي).				
شوارع وأروسة الحي الداخلية				
مساحة لعب الأطفال الموجودة في الحي السكني.				
الحديقة العامة المشتركة الموجودة بين المنازل في الحي.				
مسجد/حسنية/كتيبة موجودة داخل الحي.				
المحلات الموجودة داخل الحي.				
السوق أو مركز التسوق (التي تقع في الحي).				
المساحة التي تقع ضمن حدود الحي.				
القاهي الموجودة داخل الحي.				
مساحات رياضية موجودة داخل الحي.				

س19. فيها ينطق بالحي السكني الذي تعيش فيه، ما مدى موافقتك أو عدم موافقتك مع العبارات التالية؟

العبارة	أبداً	بعض الأحيان	أغلب الأحيان	دائماً
الحي آمن للعيش فيه.				
أشعر بالأمان بالنسبة داخل الحي وحوله خلال اليوم.				
أشعر بالأمان والأمان عند استخدام أماكن التجمع العامة المقفلة كالشارع، الرصيف، الحديقة العامة بين المنازل والأماكن الموجودة في الحي السكني خلال فترة النهار.				
أشعر بالأمان والأمان عند استخدام أماكن التجمع العامة المقفلة كالشارع، الرصيف، الحديقة العامة بين المنازل والأماكن الموجودة في الحي السكني خلال فترة المساء.				
لا أشعر بالخوف من حوادث السيارات عندما أكون في الشوارع الموجودة أمام منزلي أكون في الشارع الحي قصيرة وتقاطعها بغير مما تقلل من إمكانية اختراق السيارات من خارج الحي الشوارع الداخلية.				
أشعر بالبقاء في الحي لأطول فترة ممكنة.				

س20. فيها ينطق في الحي السكني الذي تعيش فيه حالياً، ما مدى موافقتك أو عدم موافقتك مع العبارات التالية؟

انطباعتك حول التنقل بالمكان

العبارة	أبداً	بعض الأحيان	أغلب الأحيان	دائماً
أشعر بالارتباط بالحي الذي أعيش فيه بقوة كوني واحد من أبناء الحي.				
أشعر بالفخر لكوني أعيش في هذه الحي.				
أشعر كائني في منزلي عند وصولي للحي.				



س35. مكان التجمع الأقرب إلى منزلك:

أي أماكن التجمع العامة التالية هي الأقرب إلى منزلك وتستخدمها للتواصل مع الآخرين؟ اختر أجابة واحدة.

- ☐ المساحة مقابل مدخل المنزل.
- ☐ شوارع وأرصفة الحي الداخلية.
- ☐ ساحة لعب الأطفال الموجودة في الحي (إن وجدت).
- ☐ الحديقة العامة المشتركة الموجودة بين المنازل في الحي.
- ☐ لا يوجد.
- ☐ أخرى (الرجاء ذكرها): -----

إذا كانت إجابتك "لا يوجد"، انتقل إلى نهاية الاستبيان

س36. لأي فحيلة تستخدم المكان الذي اخترته في السؤال 35 ولماذا؟ يمكنك اختيار أكثر من أجابة مع ذكر السبب رجاء.

- ☐ للجلوس والردشة مع الآخرين. (انكر السبب) -----
- ☐ للعبور. (انكر السبب) -----
- ☐ لمراقبة المارة. (انكر السبب) -----
- ☐ للزراعة. (انكر السبب) -----
- ☐ كراج للسيارة. (انكر السبب) -----
- ☐ اللعب الأطفال. (انكر السبب) -----
- غيرها (الرجاء ذكرها مع ذكر السبب): -----

س37. متى عدة تستخدم المكان الذي اخترته في السؤال 35 لتفاعلات التي اخترتها في السؤال 36؟ يمكنك اختيار أكثر من أجابة.

- ☐ صباحا
- ☐ عصرا
- ☐ مساء

هل تود إضافة أي تعليق؟ يرجى الكتابة في الحقل ان شاء

س34. استخدام أماكن التجمع العامة في الحي: الرجاء

الأجوبة بوضع علامة (✓).  
كم مرة تستخدم كل من الأماكن التالية للتواصل مع الآخرين في الحي؟

المكان	أبداً	بداً	بعض الأحيان	غالباً	دائماً
المساحة مقابل مدخل منزلك (عقب الباب الخارجي).					
شوارع وأرصفة الحي الداخلية.					
ساحة لعب الأطفال الموجودة في الحي السكني.					
الحديقة العامة المشتركة الموجودة بين المنازل في الحي.					
مسجد أو حسيبة أو كنيسة موجودة داخل الحي.					
السوق أو مراكز التسوق التي تقع في الحي.					
المطاعم التي تقع ضمن حدود الحي.					
المقاهي الموجودة داخل الحي.					
المحلات الموجودة داخل الحي.					
المساحات مقابل مدخل المنزل (عقب باب البيت الخارجي).					
شوارع وأرصفة الحي الداخلية.					
ساحة لعب الأطفال الموجودة في الحي (إن وجدت).					
الحديقة العامة المشتركة الموجودة بين المنازل في الحي.					
مسجد أو حسيبة أو كنيسة موجودة داخل الحي.					
المحلات الموجودة داخل الحي.					
السوق أو مراكز التسوق التي تقع في الحي.					
المطاعم التي تقع ضمن حدود الحي.					
المقاهي الموجودة داخل الحي.					
المحلات الموجودة داخل الحي.					
المساحات مقابل مدخل المنزل (عقب باب البيت الخارجي).					

شكر جزيلا لمشاركتك في هذه الدراسة وإجابتك على هذا الاستبيان

س31. اقترأ الأشياء:

ما مدى تكرار اقترأ وتبادل الأشياء أو طلب مساعدة بيتك وبين جيرانك (على سبيل المثال، إذا لم يكن لدى شيء أحفاجه تطهى الطعام، يمكنك استعارته من أحد الجيران بناءً

- ☐ نادراً.
- ☐ في بعض الأحيان.
- ☐ في أحيان كثيرة.
- ☐ دائماً.

س32. التجمعات والمناسبات الاجتماعية:

هل تشارك في التجمعات والمناسبات الاجتماعية المنظمة (مثل مناسبات دينية، أعراس، مجالس عزاء) مع جيرانك؟

- ☐ نعم
- ☐ لا

إذا كانت إجابتك "لا"، انتقل إلى سؤال 34.

س33. أين عدة تقام هذه التجمعات والمناسبات الاجتماعية المنظمة مع جيرانك؟ يمكنك اختيار أكثر من أجابة واحدة.

- ☐ المساحة مقابل مدخل المنزل (عقب باب البيت الخارجي).
- ☐ شوارع وأرصفة الحي الداخلية.
- ☐ ساحة لعب الأطفال الموجودة في الحي (إن وجدت).
- ☐ الحديقة العامة المشتركة الموجودة بين المنازل في الحي.
- ☐ مسجد أو حسيبة أو كنيسة موجودة داخل الحي.
- ☐ المحلات الموجودة داخل الحي.
- ☐ السوق أو مراكز التسوق التي تقع في الحي.
- ☐ المطاعم التي تقع ضمن حدود الحي.
- ☐ المقاهي الموجودة داخل الحي.
- ☐ صالات رياضية موجودة داخل الحي (إن وجدت).
- ☐ أخرى (الرجاء ذكرها): -----

التواصل الاجتماعي بينك وبين جيرانك

س28. الناس الذين يعيشون في منطقتك: يرجى بيان إجابتك بالأرقام على الأسئلة التالية:

السؤال	الأجابه
كم عدد الجيران الذين تعرفهم بالاسم في منطقتك؟	
كم عدد الجيران الذين تلقى عليهم التحية عند رؤيتك لهم؟	
كم عدد الجيران الذين عادة ما تتوقف وتحدث معهم عندما تصادفهم في الشارع؟	
كم عدد الجيران الذين تزرعهم بين الحين والآخر؟	
كم عدد الجيران الذين تعتبرهم أصدقاء؟	
كم عدد الأسر في منطقتك التي يمكنك الجوه إليها في حالة الطوارئ؟	

س29. بالنسبة إلى جيرانك الذين تعرفهم، ما طبيعة تكرار لقاءاتكم معهم؟ اختر أجابة واحدة.

- ☐ يومياً
- ☐ أسبوعياً
- ☐ شهرياً
- ☐ مرة أو مرتين سنوياً
- ☐ أبداً

إذا كانت إجابتك "أبداً"، انتقل إلى سؤال 31.

س30. أين عدة تكون لقاءاتك مع جيرانك الذين تعرفهم في الحي؟ يمكنك اختيار أكثر من أجابة واحدة.

- ☐ المساحة مقابل مدخل المنزل (عقب باب البيت الخارجي).
- ☐ شوارع وأرصفة الحي الداخلية.
- ☐ ساحة لعب الأطفال الموجودة في الحي السكني (إن وجدت).
- ☐ الحديقة العامة المشتركة الموجودة بين المنازل في الحي.
- ☐ مسجد أو حسيبة أو كنيسة موجودة داخل الحي.
- ☐ المحلات الموجودة داخل الحي.
- ☐ السوق أو مراكز التسوق التي تقع في الحي.
- ☐ المطاعم التي تقع ضمن حدود الحي.
- ☐ المقاهي الموجودة داخل الحي.
- ☐ صالات رياضية موجودة داخل الحي (إن وجدت).
- ☐ أخرى (الرجاء ذكرها): -----



## Appendix F: The Semi-structured Interviews

### F.1. The English Copy of the Semi-structured Interviews' Questions:

#### Semi-structured Interviews with Iraqi Experts

##### **Introduction:**

The researcher, Noor Almansor, a PhD student at the University of Strathclyde in Architecture Department, is conducting research about the urban social sustainability in Iraq, in general, and in Basra, in particular.

The research significance lays in the fact that it concentrates on improving housing conditions by studying the social life in the Iraqi residential neighbourhoods and focuses particularly on communal and public spaces. The main aim of her research is to identify the factors that affect social interaction among residents within the communal spaces in the Iraqi residential environment. The results of this research contribute greatly to bridging the knowledge gap related to the study of social life in Iraq. Second, the study provides recommendations to architects, urban planners and designers, and decision-makers to take into consideration the factors that affect the quantity and quality of social interaction between the residents in order to develop, design and implement housing projects in Iraq, especially neighbourhoods with single-family housing.

In this study, conducting semi-structured interviews with the Iraqi experts is to find out their opinions on any demographic factors, indicators of social sustainability, and the physical characteristics of the built environment that affect the social interaction among residents—in addition, knowing whether the set of sub-variables collected in this study represent the social interaction activities among Iraqi residents. The interview will take around 45 to 60 minutes to complete the interview. All provided information will remain confidential and will be used only as anonymous data for statistical analysis to carry out this research.

You are not obliged to participate in this study and supply information; however, your participation will be beneficial and most appreciated. If you would like to contact the Principal Investigator in the study to discuss this research, please e-mail Noor Almansor at the email address [noor.almansor@strath.ac.uk](mailto:noor.almansor@strath.ac.uk).

##### **Q.1. Please indicate your position. Please tick (✓) one box.**

- ☐ Architect (works with the government/ public authority, e.g., municipality).
- ☐ Architect (works in private practice, e.g., as a consultant in office).
- ☐ Architect (works in academia, e.g., as academic).
- ☐ Urban Planner/ Designer (works with the government/ public authority, e.g., municipality).
- ☐ Urban Planner/ Designer (works in private practice, e.g., as a consultant in office).
- ☐ Urban Planner/ Designer (works in academia, e.g. as academic).

**The Social Sustainability Indicators:**

**Q.2. Please indicate the degree of agreement or disagreement with the following list of social sustainability indicators and which may have an impact on the social interaction among residents in the Iraqi context. Please tick (✓) one box in the table below.**

	Strongly agree	Somewhat agree	Neither agree nor disagree	Somewhat disagree	Strongly disagree
Sense of community					
Attachment to the place					
Residents Satisfaction					
Safety and security					
Privacy					
Density					

**Q.3. Please indicate the degree of agreement or disagreement with the following list of sub-variables of the social sustainability indicators and which may represent the social interaction indicators. Please tick (✓) one box in the table below.**

Indicators	Sub-variables	Strongly agree	Somewhat agree	Neither agree nor disagree	Somewhat disagree	Strongly disagree
Sense of community	Knowing the neighbours/sense of community.					
	Participation in community affairs, social activities and civic responsibilities.					
	Participatory decision-making processes relevant to the neighbourhood.					
	Making new friends.					
Attachment to the place	Feeling attached to the neighbourhood strongly as one of its members.					
	When I arrive in the neighbourhood, I feel as if I have finally arrived at my home.					
	I feel proud of living in this neighbourhood for its good design and planning.					
Residents Satisfaction	Resident satisfaction with the planning and design of both the neighbourhood and communal spaces in the neighbourhood.					
	Resident satisfaction with the housing area.					
	Satisfaction with the aesthetic appearance of the built environment, providing attractive elements like water fountains and plants.					
	Aesthetics of the facades of buildings surrounding the communal spaces.					
Safety and security	The crime rate (criminal code, violent, property crimes) or frequency of conflict.					
	Percentage of residents who feel safe in their neighbourhood during daytime and night.					
	The incidence of crimes committed by youth.					
	Percentage of residents who feel safe in the communal spaces within residential neighbourhoods during the daytime and night.					
	The incidence of racism and hatred crime.					
Privacy	Perceived privacy and comfort when using communal spaces within the residential neighbourhood.					
	Hierarchy in spaces within the residential neighbourhood (open spaces and street network).					
	Physical or visual boundaries (trees and fences).					
	Surveillance for the users of the communal spaces (e.g., parents and children).					
Density	The number of communal space users.					
	The number of people per house.					
	The number of households per house.					
	The number of people living in the neighbourhood to the total area of the residential neighbourhood.					
	Percentage of housing units to the total area of the residential area (comparing the current situation to the standard).					

- Q.4. Do you take into account in your work the list indicators of social sustainability that is mentioned in the second question? If not all, which of them? Please indicate the reasons.**
- Q.5. Please indicate if there are additional social sustainability indicators that you consider important and should be added to the second question. Kindly clarify why you think these additional indicators are important.**
- Q.6. Do you think there are any influential relationships between the social sustainability indicators listed in the second question? Please use a scale from 1 to 6 to describe the strength of the relationship from the weak to strong and use 0 if there is no relationship.**

	Sense of community	Attachment to the place	Residents Satisfaction	Safety and security	Privacy	Density
Sense of community						
Attachment to the place						
Residents Satisfaction						
Safety and security						
Privacy						
Density						

**The Physical Characteristics of the Built Environment:**

- Q.7. Please indicate your degree of agreement or disagreement with the following list of physical characteristics of the built environment that can influence the social interaction among residents in residential neighbourhoods and can be applied in the Iraqi urban context. Please tick (✓) one box.**

Physical Characteristics	Strongly agree	Somewhat agree	Neither agree nor disagree	Somewhat disagree	Strongly disagree
Accessibility.					
Climate responsive design.					
Site design (the neighbourhood and communal spaces).					
Maintenance.					
Provision and location of social infrastructure.					
Provision and location of open and green spaces.					

- Q.8. Please indicate your degree of agreement or disagreement with the following list of sub-variables shown in the table below for each of the physical characteristics of the built environment mentioned in the previous question. Please tick (✓) one box in front of each index in the table below.**

Sub-variables		Strongly agree	Somewhat agree	Neither agree nor disagree	Somewhat disagree	Strongly disagree
Accessibility	The accessibility to communal spaces.					
	The proximity of the communal spaces to users in the neighbourhood.					
	The number of females who have access to communal spaces in the neighbourhood.					
	The number of males who have access to communal spaces in the neighbourhood.					
	The number of children who have access to communal spaces in the neighbourhood.					
Climate responsive design	A proper design for the environmental climate of the region.					
	The selection of building materials that fit the place and region.					
	The use of appropriate architectural treatments to the local environment.					
The site design	The area of communal spaces within the residential neighbourhood.					

Sub-variables		Strongly agree	Somewhat agree	Neither agree nor disagree	Somewhat disagree	Strongly disagree
Maintenance	The layout of communal spaces within the residential neighbourhood.					
	The area of the dwelling.					
	The layout of the residential neighbourhood.					
	The maintenance of communal spaces.					
	The maintenance of the residential neighbourhood.					
The provision and location of social infrastructure	The provision of infrastructure within the residential neighbourhood (social, educational, etc.)					
	The location of infrastructure according to the needs of the residential neighbourhood.					
The provision and location of green and open spaces	The number of green and open spaces within the residential neighbourhood.					
	Appropriate distribution of green and open spaces within the residential neighbourhood.					

**Q.9. Do you take into account in your work the list of the physical characteristics of the built environment mentioned in the seventh question? If not all, which of them? Please indicate the reasons.**

**Q.10. Please indicate if there are additional physical characteristics that you consider important and should be added to the list mentioned previously. Kindly clarify why you think these additional characteristics are important.**

**Q.11. Do you think there are any influential relationships between the physical characteristics of the built environment and social sustainability indicators that listed in the second question? Please use a scale from 1 to 6 to describe the relationship from the weak to the strong and use 0 if there is no relationship**

	Sense of community	Attachment to the place	Residents Satisfaction	Safety and security	Privacy	Density	Social interaction
Accessibility.							
Climate responsive design.							
Site design (the neighbourhood and communal spaces).							
Maintenance.							
Provision and location of social infrastructure.							
Provision and location of open and green spaces.							

#### **The Demographic Characteristics:**

**Q.12. Please indicate your degree of agreement or disagreement with the following list of demographic factors that can influence the social interaction among residents within residential neighbourhoods and can be applied in the Iraqi urban context. Please tick (✓) one box.**

Demographic Factors	Strongly agree	Somewhat agree	Neither agree nor disagree	Somewhat disagree	Strongly disagree
Age.					
Gender.					
Education status.					
Income of level.					
A number of children under 18 years old at home.					
Employment status.					
Number of hours worked.					

Demographic Factors	Strongly agree	Somewhat agree	Neither agree nor disagree	Somewhat disagree	Strongly disagree
Marital status.					
Type of ownership.					
Length of residence (house/neighbourhood).					

**Q.13. Do you take into account in your work the list of the demographic factors mentioned in the seventh question? If not all, which of them? Please indicate the reasons.**

**Q.14. Please indicate if there are additional demographic factors that you consider important and should be added to the list mentioned previously. Kindly clarify why you think these additional characteristics are important.**

**Q.15. Do you think there are any influential relationships between the demographic factors and social sustainability indicators that listed in the second question? Please use a scale from 1 to 6 to describe the relationship from the weaker to stronger and use 0 if there is no relationship.**

	Sense of community	Attachment to the place	Residents Satisfaction	Safety and security	Privacy	Density	Social interaction
Age.							
Gender.							
Education status.							
Income of level.							
A number of children under 18 years old at home.							
Employment status.							
Number of hours worked							
Marital status.							
Type of ownership.							
Length of residence (house/neighbourhood).							

### **Social Interaction:**

**Q.16. Please indicate your degree of agreement or disagreement with the following list of sub-variables that can be used to manifest the social interaction in the Iraqi urban context. Please tick (✓) one box for each sub-variable listed in the table below.**

Sub-Variables of Social Interaction	Strongly agree	Somewhat agree	Neither agree nor disagree	Somewhat disagree	Strongly disagree
The frequency of meeting their neighbours.					
Knowing each other by name.					
A number of neighbours they visit.					
The number of neighbours an individual considers as friends.					
The number of neighbours whom an individual can ask them for help.					
Stop and chat with neighbours or say hello.					
Exchange small things between neighbours.					
The possibility of using open communal spaces with neighbours and friends.					
Opportunities for formal and informal social gathering.					
visual interaction (passive communication).					

**Q.17. According to your experience, are there any other important sub-variables that contribute to clarifying and measuring the social interaction among residents in Iraqi single-family housing neighbourhoods that have not been mentioned previously? Please include them in the following space, with the reasons, if possible.**

## F.2. The Arabic Copy of the Semi-structured Interviews' Questions:

### مقابلة شبه منظمة مع المختصين العراقيين :

المقدمة:

تقوم الباحثة نور عبد الامير بأعداد بحث حول الاستدامة الاجتماعية الحضرية في العراق بصورة عامة وفي البصرة بصورة خاصة كجزء من متطلبات نيل شهادة الدكتوراه في التصميم الحضري في جامعة ستراثكلايد.

يهدف البحث الى تحسين ظروف السكن في العراق من خلال تطبيق مفهوم البيئة المستدامة و ذلك بالتركيز على احدى دعائم هذا المفهوم وهي الاستدامة الاجتماعية. حيث يقوم البحث بدراسة مدى توافق البيئة المبنية للأحياء السكنية العراقية مع الحياة الاجتماعية للسكان وكيفية ادامتها بالتركيز بشكل خاص على المساحات المجتمعية المشتركة داخل الحي السكني. الهدف الرئيسي للبحث هو تحديد العوامل التي تؤثر على التواصل الاجتماعي بين سكان داخل المساحات المجتمعية المشتركة في البيئة السكنية العراقية. نتاج هذه الدراسة تسهم، أولاً، بشكل كبير في سد الفجوة المعرفية والمتعلقة بدراسة الحياة الاجتماعية في العراق. ثانياً، توجيه توصيات الى المماريين والمخططين والمصممين الحضريين و أصحاب القرار بالاخذ بنظر الاعتبار العوامل التي تؤثر على كمية ونوعية التفاعل الاجتماعي بين السكان من اجل تطوير، تصميم، وتنفيذ المشاريع السكنية في العراق، خاصة الأحياء ذات السكن المنفرد (البناء الافقي).

اجراء المقابلات شبه المنظمة مع الخبراء العراقيين في هذه الدراسة هو لمعرفة ارائهم حول أي العوامل الديموغرافية للسكان، مؤشرات الاستدامة الاجتماعية، والخصائص الفيزيائية للبيئة المبنية تؤثر على التفاعل الاجتماعي بين السكان. إضافة الى ذلك، معرفة فيما اذا كانت المتغيرات الفرعية التي تم جمعها في هذه الدراسة تمثل التفاعل الاجتماعي و تتوافق مع البيئة الحضرية العراقية من اجل قياسها. سيستغرق اجراء المقابلة ما بين 45 الى 60 دقيقة لإتمامها. ستظل جميع المعلومات المقدمة من قبلك في سرية تامة ولن تستخدم إلا كبيانات مجهولة الهوية لأغراض التحليل الإحصائي لغرض انجاز هذا البحث.

يرجى ملاحظة أن المشاركة طوعية ويمكنك الانسحاب دون اعطاء اي سبب في أي مرحلة من مراحل المقابلة إذا كنت ترغب في ذلك. للتأكيد، فانت لست ملزماً بالمشاركة في هذه الدراسة، الا ان مشاركتكم في هذه المقابلات يعتبر دعماً كبيراً للباحثة ومكسباً ثميناً لخبرتكم في المجال، كما ان مشاركتكم ستكون محط تقدير وامتنان لدى الباحثة.

إذا كنت ترغب في الاتصال بالباحثة لمناقشة هذا البحث، يرجى التواصل على البريد الإلكتروني للباحثة نور عبد الامير

[noon.almansor@strath.ac.uk](mailto:noon.almansor@strath.ac.uk)

### مع الشكر والتقدير

س.1. يرجى بيان عنوانك الوظيفي. الرجاء اختيار الاجابة المناسبة.

- مهندس معماري يعمل في القطاع الحكومي الخدمي على سبيل المثال في البلدية.
- مهندس معماري يعمل في القطاع الخاص على سبيل المثال مكتب استشاري او مكتب تصميم او شركة.
- مهندس معماري يعمل في الوسط الأكاديمي، مثل الجامعة.
- مهندس تخطيط معماري يعمل في القطاع الحكومي.
- مهندس تخطيط معماري يعمل في القطاع الخاص على سبيل المثال في مكتب او شركة استشارية.
- مهندس تخطيط معماري يعمل في الوسط الأكاديمي كجامعة.



مؤشرات الاستدامة الاجتماعية:

2. حسب خبرك، أي المؤشرات المدرجة في الجدول أدناه يمكن أن تؤثر على التفاعل الاجتماعي بين السكان في الأحياء السكنية ويمكن قياسها في السياق الحضري العراقي؟ الرجاء بيان درجة الاتفاق أو الاختلاف بوضع علامة (✓) في مربع واحد أمام كل مؤشر في الجدول أدناه مع بيان السبب.

3. من الرجاء الإشارة إلى درجة الانطلاق أو المتغيرات على المتغيرات الفرعية لكل مؤشر من مؤشرات الاستدامة الاجتماعية المذكورة أعلاه والموضحة في الجدول أدناه. الرجاء وضع علامة (✓) في مربع واحد أمام كل مؤشر في الجدول أدناه.

المؤشرات	مؤاقل	مؤاقل	مؤاقل	مؤاقل	مؤاقل
الإحصاء بالإنتماء للمجتمع					
التعلق بالمكان					
رضا السكان					
السلامة والأمان					
الخصوصية					
الكفاءة					

المؤشرات	موافق بشدة	موافق	محايد	غير موافق	غير بشدة
المشاركة في شؤون المجتمع المحلي، الأنشطة والمبادرات الاجتماعية.					
المشاركة الفعلية في عمليات صنع القرار التشاركية ذات الصلة بالحي					
تكوين صداقات جديدة					
معرفة الجيران					
الشعور بالانتماء القوي للحي كونه فرد من أفراد المجتمع.					
عند وصولي للحي، أشعر وكأنني وصلت المنزل أخيراً.					
أشعر بالفخر بكوني أكن هذا الحي لحسن تخطيطه.					
رضا السكان عن مساحة السكن وعن مساحة قصائدات التجمع العامة في الحي					
التجمع العامة في الحي					
الرضا على					
المظهر					
الجمالي للبيئة					
جذابة وأجواء الإيجابية المحيطة بأماكن التجمع العامة في الحي السكن					
المنطقة					
رضا السكان عن تخطيط وتصميم كل من الحي و مساحات التجمع العامة في الحي السكني					
معدل نسبة الجريمة في الحي (الاعتق، جرائم الملكية) أو تكرار النزاعات					
حدوث الجرائم المرتكبة من قبل الشباب					
وجود جرائم التعصير والكراهية أو التآثرات في المنطقة					
نسبة التماس الذين يشعرون بالأمان في أثناء تواجدهم في الحي خلال النهار والليل					
نسبة الناس الذين يشعرون بالأمان في أثناء تواجدهم في أماكن التجمع العامة في الحي خلال النهار والليل					
وجود التآثر في تصميم الفضاءات العامة للحي السكني من الخاص إلى العام.					
وجود حدود فيزيائية أو بصرية تعدد أماكن التجمع العامة					
تعطي احساس الخصوصية					
سهولة المراقبة والإنشراق للوالدين من داخل وخارج أماكن التجمع العامة.					
الشعور بالخصوصية والأمان عند استخدام أماكن التجمع العامة في الحي السكني					
نسبة عدد الوحدات السكنية إلى المساحة الكلية للحي.					
نسبة عدد الأشخاص الذين يعيشون في الحي إلى المساحة الإجمالية للمنطقة السكنية.					
عدد الأسر في كل منزل.					
عدد الأشخاص في المنزل.					
عدد الأشخاص الذين يستخدمون أماكن التجمع العامة في الحي.					

هل المؤشرات المذكورة سابقا يتم استخدامها فعليا في واقع حال عملكم؟ أي منها؟ يرجى بيان الاسباب.

5. حسب خبرتك في مجال عملك، هل هناك مؤشرات استدامة إيجابية إضافية مهمة تؤثر على التفاعل الاجتماعي بين السكان في الأحياء العشوائية ذات السكن المنفرد غير التي ذكرت سابقاً؟ وما الأسباب؟

توجد هناك علاقة. الثاني: الرءاء نكر هذه العلاقات في الحل اءاءه. استءءم الأرقام من (6) للعلاقة القوية إلى (1) للعلاقة الضعيفة، ضء (0) اذا م برأء كل هءاك اى علاقات معءمة ومؤثرة بءن مؤشرات الاستءامة الءءماعية المءكورة في القائمة المءرءة في السوال 6.س.

الكلية	الخصوصية	السلامة والأمان	رضا السكان	التعلق بالمكان	الإلتصاف بالاتجاه للمجتمع
					الإحساس بالاتناء للمجتمع
					التعلق بالمكان
					رضا السكان
					السلامة والأمان
					الخصوصية
					الكفاية

**الخصائص الفيزيائية للبيئة المبنية:**

7. حسب خبرتك في مجال عملك، أي الخصائص الفيزيائية للبيئة المبنية المدرجة في الجدول أدناه تؤثر على التفاعل الاجتماعي بين السكان ويمكن قياسها في السياق الحضري العراقي؟ الرجاء بيان درجة الاتفاق أو الاختلاف بوضع علامة (✓) في مربع واحد أمام كل مؤثر في الجدول أدناه مع بيان السبب.

مؤلف	مؤلف	مؤلف	مؤلف
الخصائص الفيزيائية	المكانية الوصول	ملامحة التصميم للمناخ البيئي للمنطقة	توفير الموقع (الحض)
			توفير خدمة الصيانة لخدمات الحي
			توفير توفير النسي الاجتماعية
			توفير و توفير المساحات المفتوحة في الحي

8. الرجاء الإشارة إلى درجة الانقطاع أو الاختلاف على المتغيرات أو المحددات الفرعية لكل من الخصائص الفيزيائية للبيئة المبنية المذكورة أعلاه والموضحة في الجدول أدناه. (✓) في مربع واحد أمام كل مؤشر في الجدول أدناه.

الموقع	الخصائص الفيزيائية	موافق شدة	موافق	مخاطر	عدد موافق	عدد موافق شدة
تصميم الموقع (الحي)	المساحة					
	المساحات المتاحة					
	المساحات المخصصة					
	المساحات المخصصة					
	المساحات المخصصة					
البنية التحتية	البنية التحتية					
	البنية التحتية					
	البنية التحتية					
	البنية التحتية					
	البنية التحتية					
البنية التحتية	البنية التحتية					
	البنية التحتية					
	البنية التحتية					
	البنية التحتية					
	البنية التحتية					

غير موافق بشدة	غير موافق	محايد	موافق	موافق بشدة
الخصائص الفيزيائية				
توفير خدمة المصداقية				مصدرة اماكن التجمع العامة في الحي السكني
الخدمات التي توفر وتوقيع التقييم الإجتماعية				مصدرة الحي السكني بصورة عامة
الإجتماعية				توقيع الخدمات الإجتماعية في الحي السكني
توفير وتوقيع الخدمات الإجتماعية				توقيع الخدمات الإجتماعية حسب حاجة الحي السكني
توفير وتوقيع الخدمات المساحات المفتوحة				عدد المساحات المفتوحة والخضراء داخل الحي السكني
المرافحة في الحي السكني				مطابقة توقيع المساحات المفتوحة والخضراء داخل الحي السكني

هل الخصائص الفيزيائية السابق ذكرها تؤخذ بنظر الاعتبار فعلياً في واقع حال عملكم؟ أي منها؟ يرجى بيان الاسباب.

10. حسب خبرك في مجال عمالك، هل هناك خصائص فيزيائية إضافية مهمة تؤثر على التفاعل الاجتماعي بين السكان في الإحياء العرقية ذات السكان المنفرد غير التي تم ذكرها سابقاً؟ وما الأسباب إن وجدت؟

11. م. العلاقة بين الخصائص الفيزيائية للبيئة المبنية و مؤشرات الاستدامة الاجتماعية الذناه؟ استخدم الأرقام من (6) للعلاقة القوية الى (1) للعلاقة الضعيفة، وضع (0) اذا لم توجد هناك علاقة.

	التفاعل الاجتماعي	الخصوصية	السلامة والأمان	رضا السكان	العنق بأكملها	الأشخاص بالإنشاء للجمعية
الكثافة						
المحورية						
السلامة والأمان						
رضا السكان						
العنق بأكملها						
الأشخاص بالإنشاء للجمعية						

## العوامل الديموغرافية:

12. حسب خبرك في مجال عدك، أي الخصائص الديموغرافية أدناه لها تأثير على التفاعل الاجتماعي بين السكان ويمكن قياسها في السياق الحضري المعاصر؟ الرجاء بيان درجة الانطلاق أو الاختلاف بوضع علامة (✓) في مربع واحد أمام كل مؤشر في الجدول أدناه مع بيان السبب إن أمكن.

ملاحظات	مواقي	مواقي	مواقي
عدد الأطفال تحت سن 18			
الحالة الزوجية			
عدد ساعات العمل			
نوع السكن			
مدى الإقامة في المنزل			
الجنس			
المستوى التعليمي			
الصحة			
التخصص الدموغرافية			

هل العوامل الديموغرافية المذكورة الفاتيم استخدمها فعلياً في واقع حال عملكم أي منها؟ يرجى بيان الاسباب.

هل هناك خصائص ديموغرافية إضافية مهمة تؤثر على التفاعل الاجتماعي بين السكان في الأحياء العراقية ذات السكان المنفرد غير التي تم ذكرها سابقاً؟ ما الأسباب؟

الم (1) للعلاقة الضعيفة، ضع (II) إذا لم توجد هناك علاقة.  
م.س.15. ملاقة العلاقة بين الخصائص الديموغرافية و مؤشرات الاستدامة الاجتماعية انهاء؛ استخدم الأرقام من (6) للعلاقة القوية

القطاع	الكثافة	الخصومية	السلامة والأمان	رضا السكان	التنقل بالمكان	الانتماء للمجتمع	الاحتياجات
الإجمالي							
التنقل الاجتماعي							
الثقافة							
الخصوصية							
الأمان والسلامة							
السكان							
رضا							
التنقل							
بالمكان							
الانتماء للمجتمع							
الاحتياجات							

### المتغيرات الفرعية للتفاعل الاجتماعي:

16. من. يرجى الإشارة إلى درجة الاتفاق أو الاختلاف مع القائمة التالية المتغيرات الفرعية التي يمكن استخدامها لتمثيل وقياس التفاعل الاجتماعي في السياق الحضري المعرفي. الرجاء وضع علامة (✓) في مربع واحد لكل متغير فرعي مذكور في الجدول أدناه.

[illegible]

س. 17. هل هناك متغيرات فرعية أخرى مهمة تسهم في توضيح وقّاس التفاعل الاجتماعي بين الأفراد العراقية ذات السكان المنقرض غير التـم، ذكرت سابقاً؟