QATAR UNIVERSITY

COLLEGE OF ENGINEERING

ASSESSMENT OF NEIGHBORHOOD VITALITY IN DOHA

BY

REEM YOUSSEF AMIN AWWAAD

A Thesis Submitted to the Faculty of

the College of Engineering

in Partial Fulfillment

of the Requirements

for the Degree of

Masters of Science in Urban Planning and Design

January 2017

COMMITTEE PAGE

The members of the Committee approve the Thesis of Reem Youssef Amin Awwaad defended on 28/12/2016.

_____
Dr. Mohammed Mahbubur Rahman
Committee Member

_____
Dr. Anna Grichting
Committee Member

_____
Dr. M. Salim Ferwati
Committee Member

_____
Dr. Shaibu Bala Garba
Thesis Supervisor

_____
Dr. Djamel Boussaa
Thesis Co-Supervisor

Approved:

_____
Khalifa Al-Khalifa, Dean, College of Engineering

ABSTRACT

AWWAAD, REEM, YOUSSEF AMIN, Masters : January : 2017,

Masters of Science in Urban Planning and Design

Title: Assessment of Neighborhood Vitality in Doha

Supervisors of Thesis: Dr. Shaibu Garba, and Dr. Djamel Boussaa.

Well-functioning urban environments are good causes of societies living healthily and happily. The performance of the public realm plays an important role, in this regard, where societies are in direct contact with their physical environment. Urban environments should be created in which economic prosperity, social cohesion, and citizenship occur. The concept of urban vitality achieves this through being concerned with the socio-cultural, experiential, and spatial dimensions of the urban environment. On the scale of intimate communities, vitality plays a significant role in encouraging behaviors, social interactions, in the neighborhood. Three domains are studied to define urban vitality: the society, its activities, and its physical environment. Considering the local context of the thesis, the rapid growth of vehicle-oriented neighborhoods in Doha is leading to a decline in their degree of vitality. In many cases, this leads to a lower quality of urban life and a decline in the vitality of the city. Therefore, this thesis aims to assess the degree of neighborhood vitality in Doha in order to recommend actions for areas of improvements. Study neighborhoods are selected based on their geographical location within Doha and filtered by the average population density. Fereej Bin Mahmoud (downtown), Al-Thumama (suburban), and Al-Dafna (waterfront) neighborhoods were selected.

The assessment is approached through establishing a neighborhood vitality index which was aggregated from the individual scores of socio-cultural, experiential, and spatial

dimensions of neighborhood vitality. This approach is supported by three data collection tools: questionnaire survey, observations, and semi-structured interviews. A total of ninety questionnaires were collected from residents, along with six neighborhood observations, during morning and evening hours to study the functionality of the public realm. Results of the vitality index calculations showed that downtown and suburban neighborhoods were indexed as moderately vital, whereas waterfront neighborhoods were indexed as vital. Results of the analysis showed that three main factors should be considered to enhance the degree of vitality in neighborhoods: culture, climate, and context. Planning and design approaches should consider these factors to create well-functioning public realms through accessible streets and shaded, green public spaces.

DEDICATION

I dedicate my work to

Asmaa Ali Abdou,

Youssef Amin Awwaad, and

Abdou Ali Abdou

my parents and my uncle who have supported me throughout my life. Their affection, love, encouragement, and prayers enabled me to achieve such success.

Also, I dedicate my thesis to my beloved brother Mohammed, and beloved sisters Hend and Zahra for their sincere love and encouragement.

Thank you my beloved family.

ACKNOWLEDGMENTS

Firstly, I would like to express my sincere gratitude to my advisors Dr. Shaibu Garba and Dr. Djamel Boussaa for their continuous support throughout my academic years, for their patience, motivation, and immense knowledge. Their guidance helped me all the time of my research and writing of this thesis. Thank you.

Secondly, I would like to express my honest thankfulness to Seero Engineering Consulting. Since I started working with them in October 2014, I have found great support and encouragement throughout my Masters study. I truly thank Seero's management for supporting me to fulfil my degree requirements and for being flexible with my work hours by fitting them around my study hours. Also, I have immense appreciation for my work colleagues who have significantly supported me. Thank you Seero family.

On a more personal level, I am indebted to my parents, brother, and sisters whose value to me grows with age. I am thankful to my family who have blessed me with lots of encouragement and a happy life.

TABLE OF CONTENTS

LIST OF TABLES

LIST OF FIGURES

CHAPTER 1: INTRODUCTION

In the current age of global openness, it is significant how societies continue to shape and re-shape urban environments, from the active downtown areas in the city to its passive suburban areas. Strategies of urbanization, the necessity of growth, and the increasing demands for sustainable living bring about new landscapes. The quality of cities and their neighborhoods, however, is declining as new developments take over the ecology of the urban environment. Constant failures are witnessed to maintain vibrant and livable neighborhoods. Therefore, urban needs can be realized through a collection of vital neighborhoods that support the community structure. This is achievable through procedures to increase urban vitality using social and physical elements that realign the community through redefining the activity spaces.

In fact, the success of urban environments is usually judged by their ability to engage people together in a well-designed physical form. Both the physical and social environment of a place indicate the degree of its vitality. As a broad concept, urban vitality is concerned with the diversity and activity of the society in the physical environment. Intimate environments such as neighborhoods are seen to exhibit vitality at its best, where a community of people live, work, and interact in the public realm. The public realm refers to the domain that extends after the private realm of houses and their front gardens. Streets and public spaces in the neighborhood are the venues where “diverse and complex social groups are to be brought into ineluctable contact” (Schwaller, 2012). These are the places where residents encounter the company of strangers, where social and economic

transactions take place, and where residents are both actors and watchers. The public realm of the neighborhood is the domain where neighborhood vitality is present.

A number of factors are involved in order to improve the degree of vitality in neighborhoods: heterogeneity of the society, its behavior, its level of occupancy in the public realm, pedestrianization, diversity of activities, uniqueness of activities, their time of happening, place characteristics, and the morphology of the physical environment. All of these factors are grouped into three main categories of neighborhood vitality: the society, its activities, and the physical environment that encompasses them all.

Generally, vitality in neighborhoods refers to safe, favorable, and attractive streets and public spaces that offer more choices for social activities as well as being places for cultural exchanges. The complexity of such socio-cultural, experiential, and spatial transactions are the key to vital neighborhoods (Montgomery, 1998). Therefore, to be vital, neighborhoods must provide places for social and cultural transactions in a well-designed physical environment. In this regard, the notion of neighborhood vitality is largely about opening up the possibilities for transactions to take place in the public realm adding to its good performance in terms of safety, accessibility, and equity. Therefore, attempts to assess neighborhood vitality would add to the vitality of the whole city. The assessment would help identify areas of weakness in the neighborhood and, thus, suggest improvements to achieve higher degrees of vitality for healthy and happy societies in a well-functioning physical environment.

In this regard, the literature revealed that not all vital neighborhoods work in a similar way. A number of indicators were summarized with respect to the local context, climate, and culture as contributing to the different feelings in their public realm. Vital

neighborhoods can be achieved through higher sense of places inclusive of all qualities of urban life. Whether two places have similar or different reasons for vitality, it is clear, that vital neighborhoods are happier, healthier, and safer. They are areas where residents can be motivated to interact and occupy the public realm performing different activities. This attracts more and more people outdoors adding to the overall vitality of the neighborhood. In view of this, the relevant literature tackles this topic in two main fields:

• Urban morphology: generally understanding the spatial formation and organization of the urban context where the neighborhood exists. A thorough understanding of the public realm in which vitality is concerned. A major focus was given to the physical environment (streets and public spaces) to which people have physical and visual access.

• Environment-behavior studies: generally exploring the relationship between the social environment (in which the society and its activities are key players) and the physical environment (in which the neighborhood is the venue). Concepts such as the sense of neighborhood place and the quality of the neighborhood life were further explored in understanding of neighborhood vitality.

1.1 Research Significance

Neighborhoods with high degrees of vitality contribute to promoting a great sense of community that is reflected in social interactions, neighborhood life, activities, and place attachment. According to Krier et. al. (2009), sense of community is the experience of an individual with feelings tied to a place and people (neighborhood and neighbors). Therefore, designing public realms that promote for social occupancy and interactions is significant for the health of the society, neighborhoods, and for the city at large. Social

occupancy and interactions allow an equal distribution of resources and knowledge that enhances both the society's spatial experience and the neighborhood's physical environment (Javid et. al., 2005).

Neighborhoods are the primary urban blocks that make up the city. The grouping and organization of neighborhoods in relation to streets and public spaces constitutes the spatial structure of the city. In other words, the organization of the neighborhood's public realm constitutes the organization of the city's public realm. Therefore, the significance of this research lies in the need for a holistic planning process for neighborhoods that is committed to the local climate, culture, and context of Doha. Therefore, assessing and judging the degree of vitality (the society, its activities, and their physical environment) in neighborhoods would aid in recommending actions to guide future planning and current enhancement of neighborhood environments in Doha.

1.2 Research Statement

Doha evolved rapidly in the twentieth century due to oil and gas discovery. Its economy boomed resulting in a massive wave of urbanization (Furlan, 2016). Due to the rapid urbanization, the public realm of Doha was affected by the massive construction activities in the city towards preparing for mega sporting events (Adham, 2008). Some suggestions, studied in the literature, were that the public realm of Doha lacked proper accessibility and safety due to the vehicular dominance (Wiedmann et. al., 2012). As a result, and considering the intimate community where people live, neighborhoods of Doha were observed to significantly require suggestions to improve the performance of their public realm. Therefore, an assessment of the degree of vitality in the neighborhoods of

Doha was attempted to recommend actions towards improving the public realm through achieving a well-designed physical environment and a well-integrated social environment. In fact, it is the role and collaboration of both planning authorities and residents to establish vitality in the neighborhood (Kalinauskas, 2014). Hence, neighborhood vitality emerges from the society, its activities, and the physical environment that encompasses them all.

The morphological formation of Doha was based on the creation of agglomeration of housing units, which constituted the start of the traditional neighborhood system (*freej*) in Doha (Jaidah and Bourennane, 2009). The neighborhoods of Doha have been developed since the 1950s over the course of its urbanization. During that time, the urban fabric of Doha was planned based on vehicular accessibility, which had the largest impact on the development of zones and neighborhoods. Today, the development of neighborhoods in Doha is affected by a number of factors related to the society and the physical environment: lifestyle diversity of the multi-cultural population, income groups, social segregation, and planning regulations. It was clear that the dwellers of Doha, especially nationals, favor stand-alone villas that respect their cultural and privacy preferences (Qatar Statistics Authority, 2010). This housing preference has affected, in some cases, the type of activities in the neighborhoods, thus, affecting their vitality. Therefore, this research has attempted to assess neighborhoods and recommend actions towards enhancing their vitality.

1.3 Research Aim and Objectives

The central aim of this research is to assess the degree of vitality in the neighborhoods of Doha and to examine ways to improve it where needed. This is achieved

across three different levels: the society, its activities, and their physical environment. This aim is supported by a number of objectives:

• To understand the factors of neighborhood vitality specific to Doha.

• To assess the neighborhood characteristics that impact neighborhood vitality in Doha.

• To find out what factors affect the degree of neighborhood vitality in Doha, as related to the context, culture, and climate.

• To establish an objective method of measuring neighborhood vitality.

• To recommend actions to improve the degree of vitality in neighborhoods in contexts similar to Doha.

1.4 Research Outline

The research was broken down into chapters, with Chapters 1 and 2 discussing and exploring the concept, definitions, and examples of neighborhood vitality assessments as studied in the literature review. Chapter 3 identifies the methodology to execute the research through defining the study neighborhoods, assessment and vitality weighting method, and analysis system. Chapter 4, then, puts the research in context where the morphological formation of Doha and its neighborhoods are discussed. This has aided in the discussion of the current conditions of neighborhoods in Doha to assess their vitality and suggest improvements to increase its degree. The final Chapters of this thesis (5 and 6) include the assessment and discussion of the findings. The assessment has included calculation of the overall vitality index per neighborhood location. Recommendations were then developed, to suggest improvements towards an increased degree of vitality in Doha's neighborhoods.

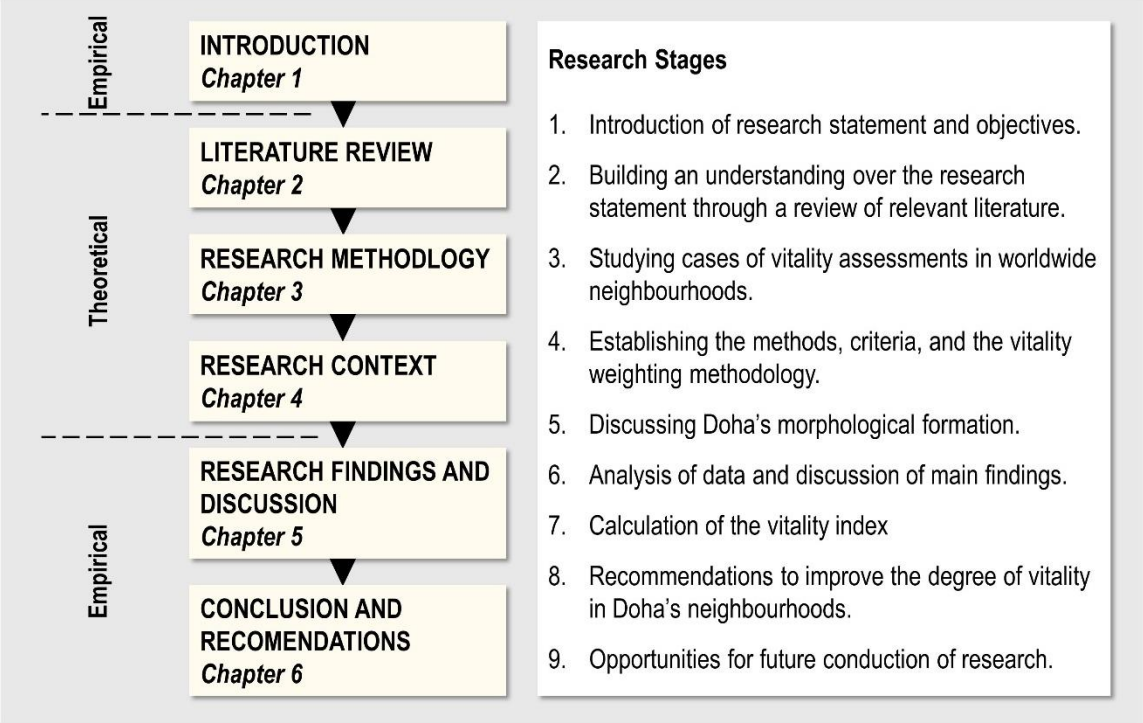

Figure 1. Outline of the thesis.

CHAPTER 2: LITERATURE REVIEW

2.1 Introduction

This chapter explores the definition of urban vitality and its associated indicators with a focus on the neighborhood scale. The chapter is based on a review of critical literature related to advances in the understanding of neighborhood vitality in the current century. Generally, this chapter ties the thesis into the present body of literature. Specifically, it draws from urban morphology and environment-behavior studies, highlighting the significant role of societies in creating active and well-functioning public realms. In this regard, two cases are studied to learn from best practices of vital neighborhoods which is concerned with the physical and spatial dimension of vitality. The case studies suggest that social occupancy and interactions in a well-designed public realm are the catalyst for vital neighborhoods. At the end, this chapter suggests a useful approach to assess neighborhood vitality in Doha considering the context, climate, and culture of Qatar.

2.2 The Urban Context

The socio-spatial organization of urban environments is made-up of different urban scales: cities, districts, and neighborhoods. As the largest scale, cities have long been a central concern in the discourse of researchers for decades. Their development has presented challenges for urban planners, local governments, and policy-makers around the world (Marans, 2012). The significant challenge is how can cities achieve the right degree of diversity to be self-sustaining and well-functioning (Mega, 2005). As pointed out by Sullivan et. al. (2004), a city must create an urban environment in which economic

prosperity, social cohesion, and citizenship occur. As the main center for human activities, the city has long been developed in an analogous urban structure which gives it unique morphologies across varied geographical locations (Hakim, 2008). According to Bianchini and Landry (1994), the city is a complex and multi-faceted entity that can be described as: an economic structure (an economy), a community of people (a society), a designed environment (an artefact), and a natural environment (an ecosystem).

The overall performance of the city is measured by the performance of its public realm (Selezneva, 2011). In fact, a good performance of the city's public realm is defined by the level of social occupancy and interactions (Brown e. al., 2014). People and their activities encourage safety and security within the public realm. In turn, this promotes for busy and active streets that are more pleasant to use (Jalaladdini and Oktay, 2012). As pointed out by Singh (2016), streets and public spaces provide the essential public life and social grounds for the city dwellers. Therefore, it should be noted that a more appropriate design of the city's public realm satisfies more needs of its dwellers leading to a happier living. Meeting the needs of people and adapting their activities in the city is then a key objective of a good public space (Lynch, 1961; Montgomery, 1998; Brown e. al., 2014; Belanche et. al., 2016). Likewise, the public realm of districts and neighborhoods within the city is greatly defined by the level of social occupancy and interactions taking place in it. Therefore, and at the lowest urban scale, it is noted that the good performance of the neighborhood's public realm will lead to the good performance of the city's overall public realm (Van den Berg et. al., 2016). The neighborhood scale is where the intimate community of people occur. The public realm at the neighborhood scale is the focal point

of social interactions that creates vitality. It has the most important function of bringing people together to create a community.

In recent urban design studies, attention to social values in urban environments has increased owing to the negative effects of the focus of recent planning processes on the requirements of vehicles rather than pedestrians (Kooshali et. al., 2015). As the venue of their activities, the public realm, in many cases, lacks to support the needs of societies especially at the spatial level (Dursun, 2012). This is where relationships between buildings, streets, and public spaces, create pedestrian destinations forming an active and well-functioning public realm: a vital urban environment. In this context, reviewing various studies in the design of public realm is seen important to expose the mutual relationships between the physical environment and the social environment. A key indicator of such relationships is agreed to be urban vitality (Maas, 1984; Bianchini and Landry, 1994; Drewes and Aswegen, 2010; Jalaladdini and Oktay, 2012; Gibson et. al., 2012; Hossini et. al., 2015). The key issue concerning vitality in an urban environment is the continuous presence of people at different times of the day performing different activities in streets and public spaces. Urban vitality highly relates to the social and spatial domains of the public realm. At the city scale, the public realm is inclusive of open plazas, community centers, city parks, and commercial streets. At the neighborhood scale, the public realm is inclusive of the streets and neighborhood parks, school area, mosque yard, and shop frontages. The following review is centered on vitality in neighborhoods as a means to achieve spatial qualities with happy residents who can mobilize for a cause with greater success in life.

The neighborhood represents the building block of the city giving it an undeniable impact on its general development (Wangel et. al., 2016). At the scale of the neighborhood,

there are two main spatial levels: the public realm, and the private realm. The public realm of the neighborhood includes the network of streets and public spaces where the residents are free to go, meet, and simply to watch one another. Montgomery (1998) defined the street as the most important element of a neighborhood's public realm. Though, Mass (1984) demonstrated that streets with high reliance on vehicles tend to evolve as weak spaces in the public realm since they are less conductive to pedestrian travel and social interactions. Hence, it is implied that the presence of people who perform different activities at different times of the day is the major factor towards a well-functioning public realm. In light of that, Azmi and Abdul-Karim (2012) demonstrated the significance of street life that is fostered by walkability in the neighborhoods. They concluded that vegetation and the variety of transportation modes encourage walkability in neighborhoods, and, thus, promote an active public realm (Azmi and Abdul-Karim, 2012). Residents of the neighborhood and their activities are known to directly affect the quality and performance of its public realm. Therefore, understanding what constitutes the public realm in its relevant urban context will aid in achieving high levels of vitality.

2.2.1 The Public Realm at the Scale of the Neighborhood

A number of researchers have agreed that the public realm can be analyzed in two major forms: streets and public spaces (Dursun, 2012; Elsheshtawy, 2013; Javid, 2005). In fact, several functions are recognized by the neighborhood's public realm: providing meeting places, offering spaces for local celebrations, and representing the neighborhood's image and identity (Montgomery, 1998). Jalaladdini and Oktay (2012) described the public realm as "all the parts of the urban fabric to which the public have physical and visual

access". Almost all definitions and views about public spaces include the primary indicators of accessibility and activity. In view of this, certain elements are stated by Selezneva (2011) as important elements of a well-functioning public realm: accessibility, safety, and equity (Figure 2).

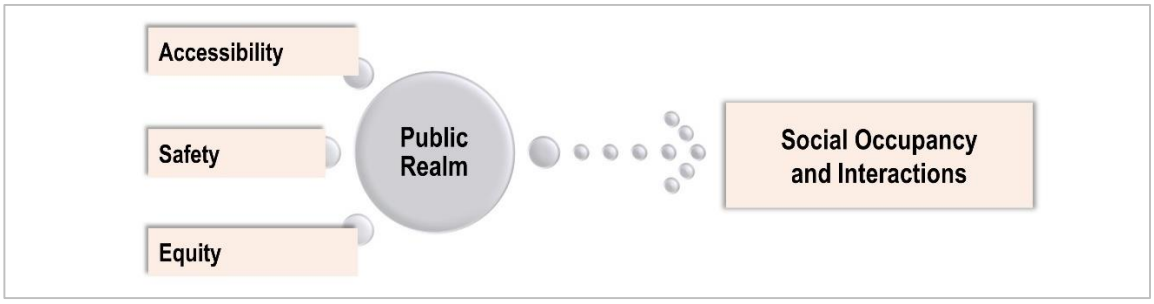

Figure 2. Primary elements of a well-functioning public realm (source: Selezneva, 2011).

At the most basic level, accessibility is the most essential one. It has two types: visual accessibility which allows people to see and be informed about the surroundings, and physical accessibility which allows people to enter the space and use its facilities (Jalaladdini and Oktay, 2012). Successful public spaces should invite all types of people to use their facilities. This leads to another significant social need which is equity. Equitable urban environments are those which can be shared equally by all types of people (Samvati et. al., 2013). They provide all of the qualities required to meet the needs of all types of people without diminishing the welfare of others. In this regard, streets and public spaces that are designed to allow access for people with special needs and with varied age groups are considered equitable and, thus, successful (Jalaladdini and Oktay, 2012). In fact, equitable public spaces at the scale of the neighborhood encompass some safety measures. Safe public spaces enhance the physical, mental, and social wellbeing of a community and, thus, encourage people to use them and achieve social occupancy and interactions (Eissa

et. al., 2015). According to Brown et. al. (2014), lighting and active street frontages can improve the perception of safety in neighborhoods, particularly at night time. Collectively, it can be comprehended that a well-functioning neighborhood is concerned with the creation of an accessible, equitable, and safe public realm, which, in turn, guarantees a more socially-balanced neighborhood that supports social occupancy and interactions.

2.2.2 Sense of Neighborhood Place

Sense of place, or place making, is a multi-layered concept that is neither consensually named nor defined. Much work has been done in the field of environmental psychology, but cultural geographers, anthropologists, sociologists and urban planners also study why certain places hold special meaning to people (Jean, 2015). Regardless of the disciplinary approach, sense of place at the scale of the neighborhood has been generally viewed as good for people and for places, providing a source of security and identity for the former, and cohesion and stability for the latter. To the residents, sense of neighborhood place translates into feelings of pride and security, a general sense of well-being, and higher life satisfaction (Jean, 2015). For places, it is associated with an increased social solidarity, local networks, and community participation (O'Sullivan, 2009). From an urban design perspective, the attachment of residents to places has been used to explain neighborhood stability and vitality (Schwaller, 2012). This is what makes sense of neighborhood places, which include tangible ties that are expressed when evoking atmospheres, smells, memories, images, representations, and feelings with the place (Cloutier et. al., 2014).

As learned from the literature, the key to successful neighborhood places is the diverse mix of activities. According to Montgomery (1998), “a good neighborhood design

is essentially about place-making, where places are not just a specific space, but all the activities and events which made it possible". Therefore, sense of neighborhood place can be defined as the combination of spatial characteristics that make a place unique, vital, and attractive (Jalaladdini and Oktay, 2012). These characteristics are: the physical space, the sensory experience, and the activities (Montgomery, 1998). Hence, the necessary urban qualities for a well-functioning neighborhood place include social interactions, diversity, commercial transactions, pedestrian destinations, landmarks, parks, accessible streets, etc. Therefore, it can be implied that successful neighborhood places have a structure and an underlying dynamic of activity, which creates their sense. This emphasizes a relation to urban vitality in neighborhoods, which increases, in part, when a sense of neighborhood place is promoted through spatial experiences. This relation is clearly manifested in the explanations of Mass (1984) who derived the concept of sense of place from the process of determining vitality in neighborhoods. According to him, the total effect of vitality is represented in the creation of genius loci or sense of place, which seems to characterize all vital urban environments, especially neighborhoods (Maas, 1984). In essence, sense of neighborhood places promotes urban vitality which is represented in the continuous presence of people in the public realm performing different activities (Figure 3).

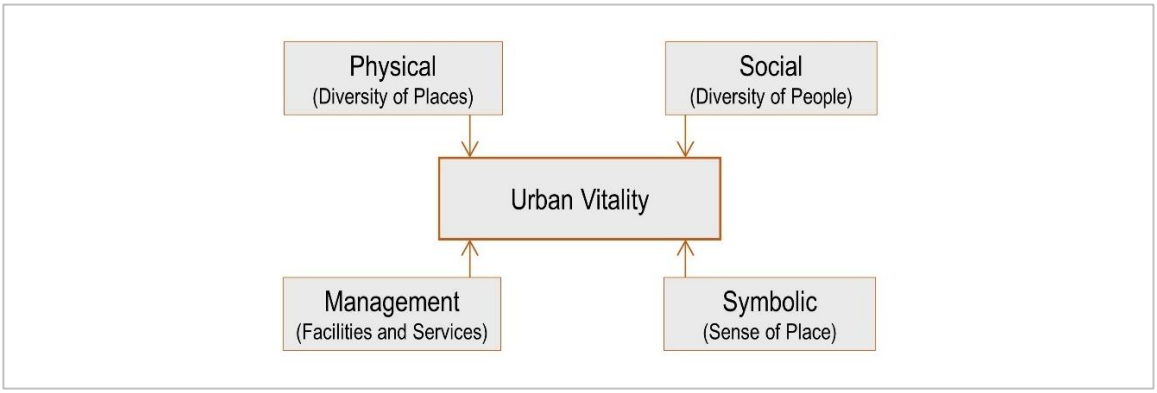

Figure 3. Sense of place and urban vitality (source: Maas, 1984).

In fact, the sense of neighborhood place is closely related to the availability of a wide range of spatial experiences. These arise from the presence of commercial activities and the interaction of a socially heterogeneous pedestrian population. As pointed out by Maas (1984), meaningless spaces become transformed by human activity into places with unique characteristics. In light of that, Lynch (1961) described a "good place" as being "responsive to all of the senses (sight, smell, sound, and touch) which collaborate to accentuate its identity". Similarly, Tan (2007) pointed out that well-functioning places constitute three components: physical setting (built form, landscape, furniture, etc.), meaning (legibility, attractions, place attachment, etc.), and activity (land use, pedestrian flow, vehicle flow, behavior, etc.). In support of that, Montgomery (1998) agreed that the principles of place-making are: activity (product of vitality and diversity), image, and form. He identified eight characteristics of good neighborhood places: an active street life, green public spaces, diverse patterns of movement (especially pedestrians), diversity of primary uses, presence of people attractors, fine-grained economy, variety in opening hours, and urban legibility (Figure 4). This reflects the defining factors that aid in achieving urban

vitality at the neighborhood scale. Such factors directly foster a strong sense of neighborhood place which makes residents satisfied about their neighborhood.

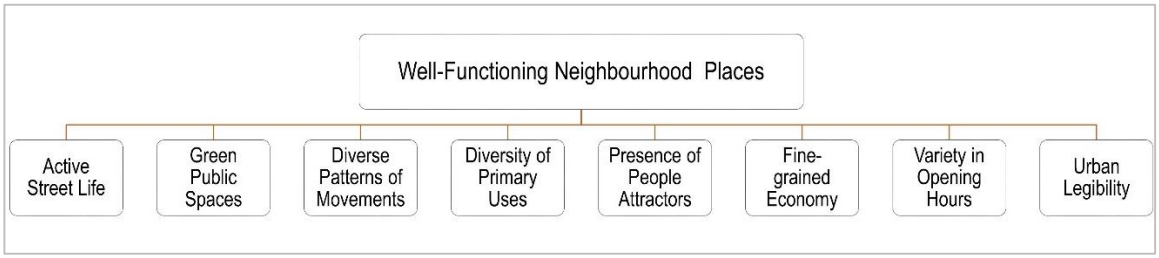

Figure 4. Characteristics of a well-functioning neighborhood place (source: Montgomery, 1998).

2.2.3 The Quality of Neighborhood Life

The quality of urban life is a notion that has been discussed profoundly in various studies in response to many urban problems. It is widely used in a wide range of fields, including healthcare, education, urban design, and sociology (Samvati et. al., 2013). Thus, the concept has different definitions according to the context it is used within. For the purpose of this thesis, it is interesting to place this concept in a particular context involving the neighborhood and the factors that define its vitality. In this case, it is referred to the concept as the quality of neighborhood life.

The quality of the neighborhood life is directly related to the daily life of its residents, which is associated with their cultural and intellectual backgrounds. It is the satisfaction in life that comes from having good health, comfort, happiness, and good relationships with the neighbors (Villerius, 2012). As Serag El Din et. al. (2013) pointed out, the quality of neighborhood life may be a measure of the personal motivation that a person has endowed enabling him/her to socialize and interact in the neighborhood. In fact, a good design of streets and public spaces in the neighborhood will nurture this motivation

of residents to go out and activate their neighborhood's public realm (Eriksson, 2013). In this regard, the quality of neighborhood life will be indicative of the degree of neighborhood vitality. To wit, vital neighborhoods include safer, accessible, more desirable, and more attractive places which have the capacity to offer more choices for social activities as well as being a place for cultural exchanges (Jalaladdini and Oktay, 2012). This relates back to the same concept of traditional neighborhoods where the presence of people outdoors at different times of the day had formed an active public realm, and thus increasing the degree of their vitality.

2.3 Neighborhood and Vitality

2.3.1 The Neighborhood

The idea of grouping housing units into a neighborhood unit was proposed in the 1920s after the industrial revolution. The neighborhood unit is enclosed by city roads and has a size of reasonable population sufficient enough to support the local facilities. At that time, the intention was to establish a community as a social unit in modern city planning, and to create safe and healthy living environments. Neighborhoods were meant to be secluded from car traffic and strangers. In the 1960s, Jacobs (1961) suggested a mixed-use planning of neighborhoods with shorter blocks to encourage pedestrian flows and active circulations. The roads of the neighborhood unit are linked to the adjacent neighborhoods. The shops and the community school are placed on the edge of the neighborhood for easier accessibility. Office buildings and open spaces flank the arterial roads, contributing to a mixed environment and acting as a sound barrier at the same time (Jacobs, 1961). It was theorized that if there is to be real freedom of choice, there must be freedom of movement.

Therefore, a grid pattern was adopted for the purpose of allowing easy movement and access. Today, several planning models attempt to produce vital neighborhoods based on social qualities. Some cities have succeeded in implementing vitality measures in selected neighborhoods in which community participation, planners, and decision-makers collaborated towards that.

The neighborhood is seen as the most important urban system that establishes the economic and social character of the district, providing the community ties which hold it together (Azmi and Abdul-Karim, 2012). The Neighborhood Concept was first introduced by Clarence Perry in 1910 to solve the problem of transportation in most of urban centers and housing areas (Cloutier et. al., 2014). His concept evolved from Ebenezer Howard Garden City theory and from the social reform aimed at adapting the growing urban population. The Neighborhood Concept also took into account the accessibility of residents from their homes to elementary schools and community centers. According to Cloutier et. al. (2014), Perry stated that the "neighborhood unit is described as a scheme of arrangement for the family life community", where it offers residents a convenient access to the neighborhood facilities such as elementary schools, parks, common playgrounds, shops, and public facilities.

There is a distinction between a neighborhood and a community. Neighborhoods exist for all, while communities may not (Barton et. al., 2010). The distinction is that a neighborhood is a physical place and a community is a social aspect of that place which is built upon the social relationships taking place in the neighborhood (Killian, 2013). The notion of sense of place can exist for the neighborhood residents without community

identity (Barton et. al., 2010). Although, sense of place is strengthened by the neighborhood residents who share common experiences, activities, and community identity.

In contemporary studies, the concept of neighborhood has occupied a central place. Urban sociologists have elaborated on themes concerning human behavior as being shaped by social factors and physical-environmental factors, rather than genetic and personal characteristics (O'Sullivan, 2009). It is also significant to urban planners crediting a well-functioning neighborhood. Among the prominent old works is that of Jane Jacobs (1961) who approached the neighborhood as a living organism, changing in response to how people interact within it. A positive social environment not only consists of social interactions with the neighbors but also the level of personal involvement in neighborhood life, which increases the perception of neighborhood quality and, in turn, creating residential satisfaction (Schoenberg and Rosenbaum, 1980). Based on their spatiotemporal properties, O'Sullivan (2009) defined two categories of contemporary neighborhoods: real estate neighborhoods, and policy neighborhoods. Real estate neighborhoods are ill-defined and are commonly subject to rapid change, especially during times of intense developmental activities. On the other hand, policy neighborhoods tend to be well-defined and change less frequently. These are developed by governments serving certain policies to address certain governmental aims or urban growth challenges (O'Sullivan, 2009). In both categories, factors of social interactions and activities play a major role in defining the degree of their vitality regardless of their planning initiatives.

Recent neighborhood-morphology studies can be grouped into three categories. First are those interested in the evolution of residential areas. These studies typically compare the spatial organization of neighborhoods (represented by land use and street

patterns) that were developed over different times (Eben Saleh, 2002). Second are those that focus on neighborhood planning after the emergence of automobiles, which considers pedestrianization and street patterning in the planning process. The most common view is that these neighborhoods involve superblocks with arterial roads bordering the residential areas, with fewer number of traffic intersections. The most tackled area of research investigates vehicular dominance and travel journeys on the physical design of the neighborhood (Filion and Hammond, 2003).

In contemporary neighborhoods, a prominent aspect concerning their good design through paying attention to their amenity value is walkability. Walkability is heavily discussed as one of the important factors in activating the public realm and fostering the neighborhood life, especially in streets (Singh, 2016). Walkable streets are vital corridors that help in identifying the most active places in the neighborhood where residents tend to locate themselves (Nagel, 2007). In view of its remarkable significance, Azmi and Abdul-Karim (2012) developed a set of recommendations to increase walkability in neighborhoods by providing: walkways with a minimum width of 3 meters, shady trees and shade structures, and neighborhood amenities to be placed at the center for better travel and accessibility. All of these design aspects aid in achieving pedestrian-oriented neighborhoods that increase individual and collective social occupancy and interactions (Singh, 2016). In fact, greater social occupancy and interactions in streets and public spaces are linked to healthier communities and increased economic gains (Azmi and Karim, 2012). Consequently, this degree of vitality at the neighborhood's public realm adds to the vitality of the city's overall public realm. The work of Kooshali et. al. (2015), Marquet and Miralles-Guasch (2015), Ravenscroft (2000), Montgomery (1998), and Maas (1984)

emphasized the importance of the pedestrianization and social occupancy in neighborhoods and criticized the attention to vehicular traffic. The neighborhood residents can interact with their surroundings more regularly while walking and thus feel more connected and more responsible for their physical environment. In turn, this will promote a greater sense of neighborhood place and, thus, vital neighborhood life.

Pedestrian-oriented neighborhoods provide opportunities for denser community networks which can increase individual peace of mind, community trust, and safety (Jalaladdini and Oktay, 2012). As Jane Jacobs (1961) outlined that more eyes on the street makes it safe in a secured neighborhood. Therefore, residents and their activities are the cause that promotes the qualities of public realm (accessibility, safety, and equity), and thus achieving a good quality of neighborhood life which gives it higher degrees of vitality. Through social occupancy and interactions, a neighborhood is meant to be vital with strong sense to its places. Bringing residents back to the streets and public spaces to perform different activities during different times of the day will promote neighborhood vitality (Gibson et. al., 2012; Hakim, 2012; Jean, 2015).

2.3.2 Neighborhood Vitality

Discussions of urban vitality started in the 1960s, moving towards the late 1980s with discussions focused on the vitality of downtown areas (Lynch, 1961; Schoenberg and Rosenbaum, 1980; Maas, 1984). Throughout the 1990s, there was fierce discussion to regenerate the cultural significance of urban areas through the promotion of higher degrees of vitality (Bianchini and Landry, 1994; Rofe, 1995; Montgomery, 1998). Today,

discussions about urban vitality focus on the creation of well-functioning public realms through investing in social, cultural, experiential, spatial, and economical transactions.

Several authors have studied urban vitality from different perspectives. However, almost all of them agree on a common meaning to the concept. A thesis was developed by Paul Mass in 1984 trying to define a theory for urban vitality. He presented core definitions that are all centered on three major aspects: the continuous presence of people in streets and public spaces, their activities and opportunities, and the environment within which these activities occur. These are considered the main domains of urban vitality (Maas, 1984). Since streets and public spaces are inanimate, it follows that only their users can manifest vitality. This implies the fact that the perception of neighborhood vitality must depend on the number of residents visible within a neighborhood considering their heterogeneity, behavior, and continuity (Gibson, 2012).

Bianchini and Landry (1994) supported this definition by describing the prevailing mood of vital neighborhoods as vibrant and positive. Similarly, they considered neighborhood vitality as the synergy that arises from a variety of unique commercial and entertainment opportunities, and a dense socially-heterogeneous pedestrian population (Bianchini and Landry, 1994). Zarin, Niroomand, and Heidari (2014) looked at urban vitality from a residential mobility perspective. They described it as the dynamic mobility and active individuality taking place at the central areas of the neighborhood. They established their description on the basis of Lynch (1960) and Jacobs (1961) definitions of vital urban environments. Lynch defined vitality as one of the eight factors of the quality of urban life (vitality, meaning, proportionality, access, supervision, authority, efficiency, and justice). He defined it as the extent to which the urban environment supports vital

operations, biological conditions, and human abilities (Lynch, 1960). Similarly, Jacobs described three principal terms for achieving urban vitality in the streets of the neighborhoods: compact mass of people, diversity of uses, and activities.

In his study, Ravenscroft (2000) tackled the concept of urban vitality in neighborhoods from a socio-economic perspective. Considering Jacob's (1961) long-standing argument that well-functioning urban environments are able to sustain a diverse range of uses that attract significant number of users, urban vitality was placed as the first measure towards this success. Based on this, Ravenscroft (2000) discussed vitality in neighborhoods as linked to viability. The twin concept of vitality and viability is an important component of a healthy urban area, especially the neighborhood (Ravenscroft, 2000). Accordingly, in general he defined urban vitality as "how busy an urban area is at different times and locations". Whereas viability is defined as "the continuous ability of the urban area to attract commercial investments". Therefore, the two measures are interrelated. "The level of busyness (vitality) is seen as a significant component in new investment decisions (viability) and, concurrently, the continued development of new facilities (viability) generating an enhanced attraction for visitors (vitality)" (Ravenscroft, 2000). He investigated the twin concept of vitality and viability as related to the health of urban areas. In essence, vital and viable neighborhoods are considered healthy. This relationship is based on Montgomery's (1998) definition of urban vitality which "can only be achieved where there is a complex diversity of primary land uses (largely economic) and activity". Eight key indicators have been listed in his study providing a baseline for the urban health of neighborhoods (as in his study, healthy means vital and viable):

- Pedestrian flows
- Property yields

- Demand for shops
- Safety and security
- Diverse activities
- Vacancy rates
- Accessibility
- Varied modes of transportation

Generally, vitality in neighborhoods refers to safer, more desirable, and more attractive streets and public spaces which have the capacity for offering more choices for social activities as well as being places for cultural exchanges. According to Montgomery (1998), the key to successful urban environments is the transaction base, which must be as complex as possible. As pointed out by him, not all transactions are economic. Urban environments must provide spaces for social and cultural transactions. In this sense, the notion of urban vitality in neighborhoods is largely about opening up the possibilities for transactions to take place over time to develop a pattern of increasing complexity. Therefore, it can be comprehended from the review that Montgomery has tackled the concept of urban vitality from a socio-cultural perspective with some emphasis on the role of economy in creating vital neighborhoods. In his study, he referred to Lynch's definition of urban vitality as one of the five basic dimensions of city performance, along with sense, fit, access, and control. According to Lynch (1960), high degrees of vitality are found in cities which support the needs of their dwellers within a safe environment. These cities allow a maximum scope for social occupancy and interactions, and activities that take place in the public realm (Montgomery, 1998). At the scale of the neighborhood, this is likewise, applicable. Therefore, and in summary, neighborhood vitality is seen as important in bringing life into places through the continuous presence of people and their activities in a well-designed public realm to support healthy and happy living.

2.4 Indicators of Neighborhood Vitality

Typically, many studies have investigated urban vitality at the scale of the neighborhood based on objective indicators reflecting human conditions such as their employment data, social belongings, and personal living preferences. Mass (1984) established correlative indicators for neighborhood vitality considering the established definition of the major vitality domains: pedestrian population, their activities and opportunities, and the environment in which these activities occur. Zarin et. al. (2015) defined the factors that affect neighborhood vitality in a more specific way. They investigated vitality in two neighborhoods in Tehran through establishing comparison criteria to define it: contact and availability, variety of attractions, welfare, aesthetics, hygiene, public participation, hostel activity, and readability. These were considered as the preference index which should be placed in urban planning initiatives. Likewise, Landry (2016) focused on aspects of creativity in relation to vitality. He made the analysis explicate to what the urban environment wants to achieve through greater creativity. According to him, vitality is seen as the tool to achieve urban creativity. Therefore, he summarized a set of indicators for neighborhood vitality based on two categories: objective measures which can be quantified and measured, and subjective measures which can only be assessed and judged (Landry, 2016). Based on potential social scenarios, he looked at data concerning vitality from four different levels (Figure 5).

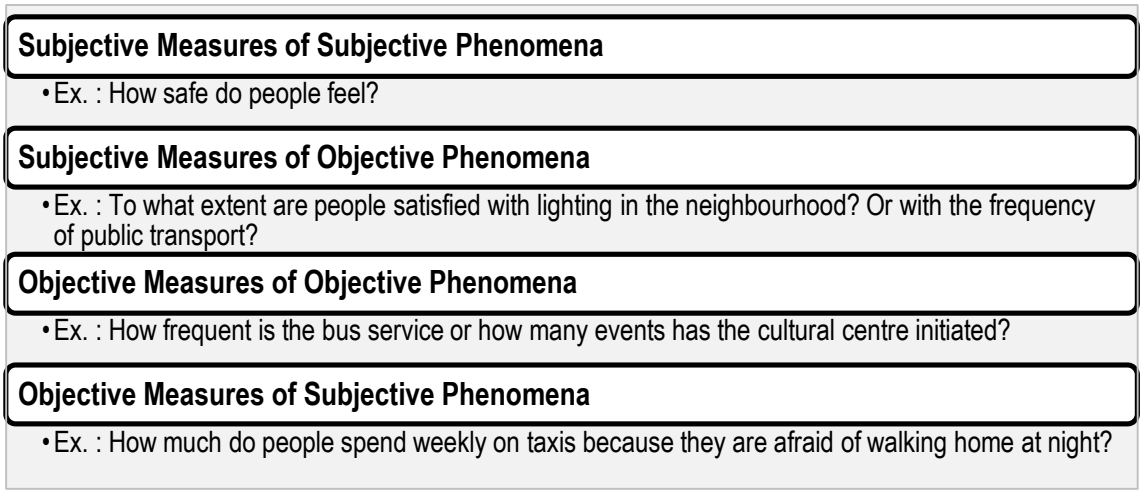

Figure 5. Landry's indicators of neighborhood vitality (source: Landry, 2016).

Accordingly, Landry (2016) has developed essential criteria to measure neighborhood vitality that involve:

• Levels of activity (things going on)

• Levels of use (participation)

• Levels of interaction (communication, transaction, and exchange)

• Levels of representation (how activity, use, and interaction are projected outside)

These are evolving around the three essential elements of the public realm: accessibility, safety, and equity. These criteria need to be looked at across the different dimensions: socio-cultural, experiential, and spatial. According to him, equity is represented in the critical mass and diversity which is concerned with the achievement of appropriate thresholds allowing activity to take place and cluster in the neighborhood (Landry, 2016). Safety and security are concerned with continuity, stability, comfort, and the lack of threat. Accessibility is concerned with physical and visual convenience, and the opportunity to be connected.

In his comprehensive study, Montgomery (1998) concluded an inclusive set of principles to achieve urban vitality in neighborhoods. The principles are categorized based on the three elements of achieving sense of place (Figure 6). Considering the cultural context of a place, these principles are possible to be adopted in the production of its built forms. Therefore, they are seen as highly related to the economical and spatial dimensions of neighborhood vitality.

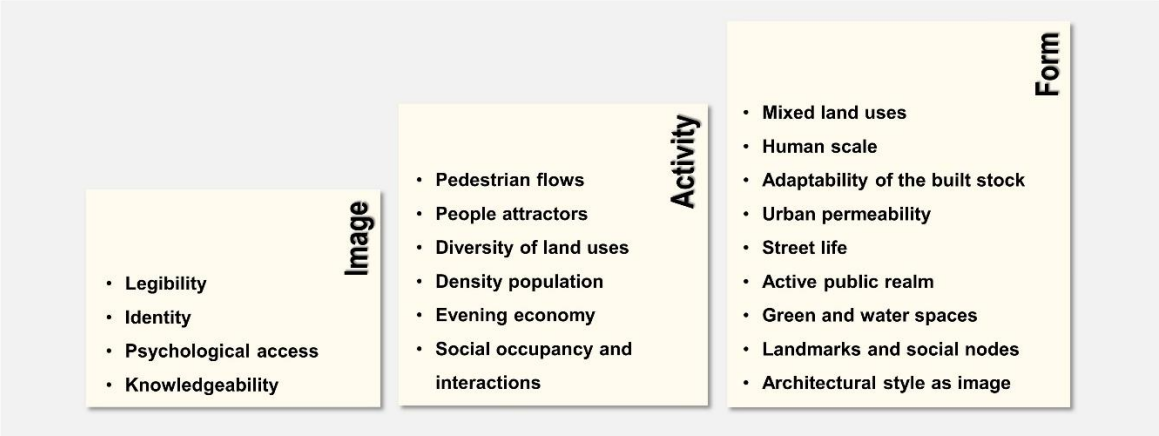

Figure 6. Summary of the principles to achieve urban vitality (source: Montgomery, 1998).

As comprehended from the review, researchers' identification of urban vitality criteria and indicators make it possible to comparatively count and conceive the indicators of neighborhood vitality. Five major studies have attempted to define the indicators which are all related to the three domains of neighborhood vitality: people, their activities, and the physical environment that accommodate them all. Mass (1998) tackled all of the domains by defining 10 major indicators of the vitality in an urban environment, including neighborhoods, all of which are also responsive to the three elements of the public realm: accessibility, safety, and equity. Likewise, Ravenscroft (2000), Zarin, et al. (2015), and Landry (2016) defined vitality indicators as relating to the three domains. However,

Kooshali et. al. (2015) tackled the concept of urban vitality from an environmental perspective. Their indicators are developed through responding to the environmental qualities that encourage social occupancy and interactions, without relating their study to the quantity and quality of the activities taking place (Figure 7).

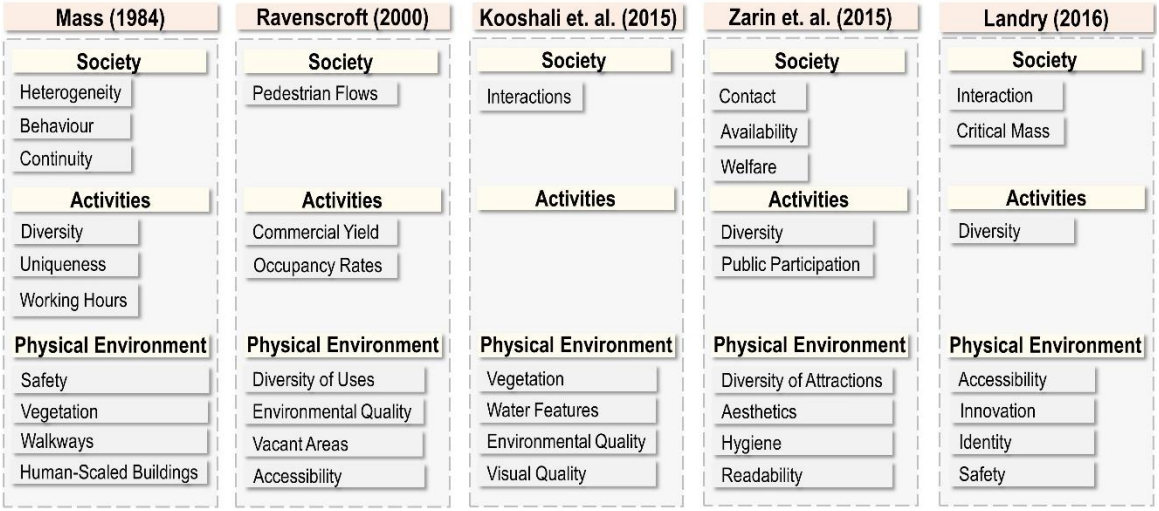

Figure 7. Collective comparison of urban vitality indicators.

2.5 Approaches to Assess Neighborhood Vitality

Most of the researchers have based their investigation of neighborhood vitality on qualitative methods using common tools to generate data about people in social settings, such as filed observations and interviews. However, their approach to data analysis was different. Filion and Hammond (2003) based their method on examining the physical features of the neighborhood. They observed the neighborhood's physical environment, how people use it, and to what extent it encourages their behavior. This involved examining street arrangements, retail patterns, in addition to housing typologies and distribution. Data from the observations aided in answering their central question of how the spatial organization of the neighborhood reflect the changes that have affected the society over

time. They found that grid network of streets provide better connectivity between the land uses in a neighborhood than curvilinear streets, crescents, and cul-de-sacs (Filion and Hammond, 2003). Their study presented an evaluation of four selected neighborhoods from the perspective of their pedestrian accessibility, infrastructure requirement, and traffic diversion from residential area connections. As relevant to this thesis, their tool of neighborhood observations is useful to assess one domain of neighborhood vitality: the physical environment. In this case, evaluation of the degree of neighborhood vitality will be limited to spatial vitality only, which requires the use of other tools to obtain comprehensive data about neighborhood vitality (including all domains: cultural, economic, and spatial).

The other approach to study neighborhood vitality is conducted through quantitative methods. Zarin et. al. (2015) collected their data through a questionnaire survey with random sampling method. Their data was analyzed using multivariate and backward regression method. This method supported their research objective to present theoretical framework for understanding the social values in achieving high quality of urban life. Azmi and Abdul-Karim (2012) used qualitative method in which their findings were based on semi-structured interviews with planning authorities and architectural firms including both academicians and practitioners. They analyzed the data using Computer Aided Qualitative Data Analysis software that is called Nvivo, which helped to identify study nodes through coding queries techniques. Sullivan et. al. (2004) investigated the social dimension of neighborhood vitality as being highly affected by amount of vegetation. They used interviews with residents, photographs of the neighborhood's green cover, and observations. The observations were recorded on coding sheets to prepare for analysis

through a statistical toll called Analysis of Variance (ANOVA) to test differences between the means of low green-cover spaces and high green-cover spaces in the study areas. This approach is useful to simulate the potential effects of physical environment on the social environment.

Additionally, in social researches such as that of Singh (2016), activity mapping technique is commonly used to outline the visible density and distribution of people and activities in the neighborhood. This technique facilitated the study of walking patterns in a pedestrian-oriented neighborhood. Observations and filed notes were used as well to test the neighborhood's social system and urban morphology. Studying neighborhood morphology as a factor affecting vitality has led to an understanding of how buildings present on both sides of a street make it active or dead (Singh, 2016). Similarly, Geographic Information Systems (GIS) technologies in social research are utilized, especially in studies concerning the quality of urban life (Marans, 2012). GIS data have been used and employed widely by researchers in examining issues of accessibility and transportation in urban environments to assess how proximity to diverse opportunities such as employment, education, health, and recreation might directly affect the quality of personal life; in turn, affecting the level of happiness and satisfaction. This approach is commonly used in environment-behavior studies, which directly help to inform policy and decision makers.

2.5.1 Local Assessment System for Neighborhood Planning: GSAS

In 2009, the Gulf Organization for Research and Development (GORD) in Qatar, in collaboration with reputed universities and research institutes, has developed the Global Sustainability Assessment System (GSAS), the first of its kind performance-based

sustainability rating system in the MENA region (Komeily and Srinivasan, 2015). In fact, GSAS aims at creating a sustainable urban environment to decrease the environmental impacts while addressing the specific socio-cultural needs of the place. It assesses sustainability measures in neighborhoods based on eight categories with respective weights: Energy (24%), Water (16%), Indoor Environment (14%), Cultural and Economic Value (13%), Site (9%), Urban Connectivity (8%), Material (8%), and Management and Operations (8%). It weighting methodology is based on the Analytical Hierarchy Process (AHP) for each individual category (GORD, 2016). The most important feature of GSAS is that it takes into account the region's social, economic, environmental and cultural aspects, which are different from other parts of the world (Komeily and Srinivasan, 2015). One of the schemes of GSAS is on neighborhoods. It is used to assess a neighborhood within a district. It may comprise different building typologies designed for a specific use.

The intent of GSAS Neighborhoods is to assess and rate the environmental performance neighborhoods (GROD, 2016). The criteria and measurements focus on verifying the performance of buildings and systems (i.e. transportation, water, information, etc.) within the neighborhood and ensuring the development adheres to sustainable principles such as smart growth and urban planning. Included for assessment under GSAS Neighborhoods are newly developing and existing neighborhoods.

This system is studied in light of utilizing its weighting methodology in the establishment of Neighborhood Vitality Index. GSAS stands as significantly relevant to the local context of Doha and, thus, would aid in achieving efficient scoring system for the purpose of this research. The next chapter (research methodology) would discuss the neighborhood vitality indexation process in details.

2.6 Case Studies

For the purpose of this thesis, and in order to develop a concrete approach to assess neighborhood vitality in Doha, two cases of neighborhood vitality assessment were examined. The study of cases was focused on understanding how vitality is defined, how it is studied, what kind of data has been used, and how it was analyzed to facilitate conclusions. This would directly feed into the study of neighborhood vitality in Doha. Additionally, the study of cases was intended to extract possible ways towards achieving high degrees of neighborhood vitality with respect to the local context. The selection of cases has followed a hierarchy of contextual relevance: an international case study and a regional case study. This was attempted to learn from best practices worldwide to foster neighborhood vitality. At the end, lessons learned from the examination of each case was summarized and adapted to suit the context of Doha.

2.6.1 International Case Study: Waterwijk Neighborhood in Almere City, Netherlands

2.6.1.1 Description

Almere is a newly-planned city in the Netherlands (Figure 8). Its planning process started in the late 1960s based on the Garden City model which promotes self-contained residential communities with abundant green public spaces (Zhou, 2012). The vision towards its development is national-driven to decentralize the overcrowded population away from the capital city Amsterdam. Today, Almere is considered a well-performing city because special focus was given to the design of its public realm at the early stages of the planning process (Zhou and Commandeur, 2009). In particular, its neighborhoods are designed to include the necessary urban amenities to guarantee a healthy living.

Figure 8. Location map of Waterwijk neighborhood in Almere city in the Netherlands.

Waterwijk neighborhood is located north-east of Almere, and was built in 1982 (Zhou, 2012). Its physical environment supports a sense of community and social bonding. It is designed with distinct centers in form of a public square or main street bordered by shops and houses. Home-based businesses were found to create economic vitality. Thus, an active street life exists where the presence of people and their activities is continuous throughout the day. As pointed out by Zhou (2012), it has a high degree of vitality where its public realm is actively used by residents supporting the idea of evening economies Abundant public facilities can be found in Waterwijk neighborhood, including primary school, supermarkets, a health center, sport centers, a community center, a church, and several kindergartens. A primary school full of children, combined with a supermarket with a flow of frequent buyers, is considered the main activity in Waterwijk. The logic of their locations is to be placed near bike paths. To support social interactions in the neighborhood, the streetscape is designed to be spacious and lined with public vegetation. In addition to street parking and collective parking squares, extra parking spaces are widely provided, at both ends of the streets, making streets complete and accessible to all types of transportation (Figure 9).

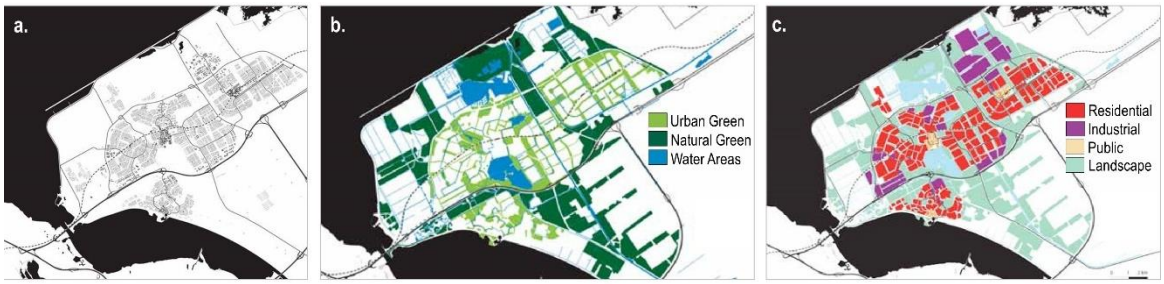

Figure 9. Urban morphology of Waterwijk neighborhood: a. Street network; b. Parks and public spaces; c. Land uses (source: Zhou, 2012).

Activities at Waterwijk are continuous. The most characteristic pattern is the dominant concentration of people and activities along streets. According to Zhou (2012), streets are part of the main loop connecting the four quarters of the neighborhood. The association of the dominant street with main neighborhood facilities and public green spaces has created a sense of clarity and centrality in the neighborhood's spatial environment. As a result, a concentrated movement of flows has facilitated the presence of people in streets and public spaces throughout the day (Figure 10).

Figure 10. The public realm of Waterwijk neighborhood (source: Zhou, 2012).

It is noted that supermarkets and schools in Waterwijk neighborhood are the most important activity centers. If they are located separately, then the distribution of people activities is scattered over the neighborhood area. If they are clustered, then a concentrated activity pattern can be observed. The later design clearly went back to the idea of centralization and locating supermarkets and schools in more visible locations from public transportation hubs. In Waterwijk neighborhood, main streets or dominant bike paths are

associated with public spaces and open landscape, which provides people with enjoyable walking and cycling environments, as well as opportunities for people watching. This relates to one of the major defining factors of vitality: social occupancy and interactions.

Besides the well-designed physical environment of Waterwijk, small businesses are playing an important role in increasing vitality in the neighborhood. Corner spaces in the neighborhood's public realm are designed to be multi-functional, so they are rarely unoccupied. These spaces are utilized and converted to diverse business uses. In this regard, home-based small businesses make greater contributions, fostering a strong neighborhood life. In turn, this adds to the overall vitality of Waterwijk neighborhood.

2.6.1.2 Study of Vitality

The vitality of Waterwijk neighborhood was studied as part of a comprehensive assessment of the vitality of Almere's urban life. Urban vitality was defined broadly as being concerned with the economy, culture, and society of an urban area. In general, economic, cultural, and social urban life constitutes urban vitality (Zhou, 2012). Therefore, the vitality of Waterwijk neighborhood was studied through an investigation of the spatial and non-spatial factors that have facilitated its presence. The spatial factors were based on the interrelationships between urban spaces and the society. The non-spatial factors were based on the level of retail activities and economic gains in the neighborhood. Data were collected based on the residents' preferences of outdoor activities and their perception of an active street life. Preferences of outdoor activities have included: shopping, cultural activities, cafés/restaurants, friends/family indoors, friends/family outdoors, walking/hanging out, city events, club/organization, outdoor sports, and indoor sports.

Perceptions of enhancement of the degree of vitality in the neighborhood have included: cozy center, quality public spaces, job opportunities, mixed population, organized events, self-organized activities, small businesses, high-income people, more density, more facilities, public participation, and tourists/visitors.

The survey of residents' opinion has guided the judgment of vitality in the neighborhood through suggesting the integration of traditional urban quality (cosines), more facilities and activities for the youth, and encouraging socio-cultural events and local businesses (Zhou and Commandeur, 2009). The study was based on a concise analysis of the main top-down planning strategies of the neighborhood as a newly-planned residential area. Interviews and questionnaires were utilized to evaluate the actual effects of social and cultural vitality through the angle of daily life of local residents. Finally, the assessment has facilitated the conclusion that residents were content with the combination of their suburban living environment with a certain degree of urban liveliness. The findings revealed that the spatial organization (hardware) provides conditions for the growth of the social cultural life (software) in the neighborhood (Zhou, 2012).

2.6.2 Regional Case Study: Narmak Neighborhood in Tehran City, Iran

2.6.2.1 Description

Narmak neighborhood is located in north-east Tehran, and was designed in 1951 based on Western planning processes (Kooshki et. al., 2015) (Figure 11). Five decades after its design, the original low residential density in the neighborhood has been transformed into a mixed-use, medium-density neighborhood with new migrants consisting of half of its population (Soleimani, 2014). Since then, the neighborhood has included multiple-family housing and some governmental buildings. Today, Narmak has a unique synthesis

between traditional and modern urbanity. This emphasizes the community ties in Narmak as having cultural sustainability supported by the strong attachment to the neighborhood (Zarin et. al., 2015).

Figure 11. Location map of Narmak neighborhood in Tehran city in Iran.

The center of the neighborhood is designed to be the physical domain of social interactions that used to naturally occur since its emergence. According to Karami et. al. (2014), Narmak neighborhood has a strong sense of place where residents feel satisfied about the physical environment. Further to Karami's statement, findings of several studies on the neighborhood's environment confirm that its physical and social environment are stable, safe, and legible which poses a balance in the quality of neighborhood life (Kooshki et. al., 2015; Karami et. al. 2014; and Soleimani et. al., 2014). In their study, Karami et. al. (2014) tested sustainability criteria in the neighborhood's social environment and found that Narmak is a sustainable neighborhood based on its stable population and their content use of the public realm. Additionally, the neighborhood has high amenity value where aesthetically-appealing landmarks and open spaces, vegetation, and landscaped pathways foster high degrees of vitality (Kooshki et. al., 2015) (Figure 12).

Figure 12. Urban morphology of Narmak neighborhood: Street network, public spaces, and land uses (source: Kooshki et. al., 2015).

It is noted from several studies on the neighborhood that residents have been satisfied about its open spaces and have expressed their sense of attachment to it (Karami et. al., 2014). Several aspects are confirmed by the surveyed residents which owe back to the neighborhood's high degrees of vitality: diversity of attractions in public spaces, good street lighting during the night, and shade trees along the pathways (Zarin et. al., 2015). All of these physical elements in the neighborhood support its social environment where a variety of activities take place during different times of the day. Additionally, people contact and availability provide natural surveillance in the neighborhood adding to its overall safety resulting in an active public realm during the night. In summary, aspects of a variety of activities, safety, and public hygiene are among the major aspects leading to high degrees of vitality in Narmak neighborhood (Figure 13).

Figure 13. The public realm of Narmak neighborhood (source: Kooshki et. al., 2015).

2.6.2.2 Study of Vitality

The vitality of Narmak neighborhood was studied from the perspective of environment-behavior relationships. The study was based on environmental qualities and social values. Therefore, vitality was mainly defined as being concerned with both the social and physical environments of the neighborhood. In general, neighborhood vitality in the study of Narmak was based on understanding the social values and the role of public spaces in the quality of urban life. Likewise, data were collected based on the evaluation of residents' perspective of their environments. The physical environment was studied through the spatial organization and physical aesthetics that promote community capacity and social development. This, in turn, informed about the social environment where the behavior of residents was studied. The physical environment was viewed as: urban planning characteristics (space and building; access and road networks; public and green spaces), spatial characteristics (social welfare; economic services; transportation services), and content characteristics (lifestyles; sense of belonging; environmental safety; social relationships) (Soleimani et. al., 2014).

The analysis of data was based on computer software to enable validation through the use of multivariate analysis method and standard multivariate regression. The assessment facilitated the conclusion that neighborhood vitality in Narmek can be enhanced

through: contact and availability, verity of attractions, welfare, aesthetics, hygiene, street watching activities, hostel activities, and legibility.

2.6.3 Lessons Learned from the Case Studies

The study of cases has presented some approaches to assess neighborhood vitality. Table 1 below illustrates the analysis of the selected cases through highlighting the significant lessons learned from vitality assessments in Waterwijk neighborhood in Almere and Narmak neighborhood in Tehran.

Table 1. Summary of the learned lessons from the case studies.

Aspects of Analysis	Waterwijk Neighborhood, Almere, Netherlands	Narmak Neighborhood, Tehran, Iran
Sense of Neighborhood Place	• Waterwijk is a source of security and identity for its residents. • Cohesion and stability in its physical environment to support community participation. • Cultural celebrations in public spaces. • Social solidarity and local networks are seen in the public realm.	• Narmak has a strong sense of community and social bonding. • Cultural ties to the history of the neighborhood. • Welfare and hygiene is promoted in most of places. • Legible physical environment.
Quality of Neighborhood Life	• Residents have general satisfaction which is reflected on their health, comfort, happiness, and good relationships with the neighbors. • Good design of public realm which nurtures residents' motivation to go out and socialize. • It has the capacity for offering more choices for social activities as well as being a place for cultural exchanges. • It supports home-based small businesses. • Active street life via the frequent flow of buyers.	• Residents are quite satisfied with the physical environment of their neighborhood. • Some parts of the public realm (especially public spaces) motivate residents to go out and socialize. • People contact and availability in the public realm provides natural surveillance and, thus, good levels of safety. • Green public spaces provide venues for a variety of activities. • Variety of attractions in the neighborhood supporting social occupancy and interactions.
Amenity Value	• Vegetation is provided throughout the public realm (planned following Garden City model).	• Vegetation is provided in major attraction spaces.

	• Pedestrian and cyclist pathways are provided. • Ponds are available. • Good spatial arrangement of street furniture in public spaces.	• Not all streets have pathways for Pedestrians and cyclists. Only in front of shops. • Good quality of street lighting during the night which fosters safety. • Landmarks signify most of the public spaces.
Overall Degree of Neighborhood Vitality	Vital neighborhood in terms of: • Economic vitality: home-based businesses. • Cultural vitality: community participation in cultural and social events. • Social vitality: 24/7 active public realm with continuous social occupancy. • Spatial vitality: high amenity value.	Vital neighborhood in terms of: • Cultural vitality: cultural ties to traditional places. • Social vitality: people contact and availability at different times of the day. • Spatial vitality: good amenity value.

2.7 Chapter Summary

As has been noted, several studies have depicted essential indicators for neighborhood vitality as being dependent on the society, its activities, and the physical environment that encompasses them all. Such criteria relate back to the basic elements of an active public realm: accessibility, safety, and equity. As a consequence of active public spaces, vital neighborhoods can be achieved through higher sense of places inclusive of all qualities of the urban life. It can be concluded that not all vital neighborhoods work in a similar way. It is important to realize that a neighborhood can be considered vital with different bases which occur as a result of different feelings in its public realm. Whether two places have similar or different bases and reasons for vitality, it is clear that vital neighborhoods are happier, healthier, and safer. They are areas where residents can be motivated to interact and occupy the public realm performing different activities. This attracts more and more people outdoors adding to the overall vitality of the neighborhood.

In other words, if a place is attractive, the people will come and if people are present, the place will become more attractive to more people.

It should be realized that the presence of people is not possible through economic transactions only, but it should be supported by pleasant pedestrian facilities with green shaded places enabling them to sit and spend the time without boredom. High amenity value in the neighborhood through the availability of vegetation, aesthetically-appealing buildings, and spatial organization of public spaces leads to spatial vitality (Zarin et. al., 2015). A sense of place will, thus, be achieved, adding to the overall vitality of the neighborhood. Likewise, a well-functioning public realm will motivate residents to get out and activate the neighborhood life through social occupancy and interactions. In turn, this will simultaneously foster various activities to take place. This is where high degrees of neighborhood vitality can be reached. Considering the local context of this thesis, the assessment of neighborhood vitality in Doha will be conducted utilizing the defining factors and criteria towards achieving high degrees of vitality. The studied cases of vital neighborhoods support the objectives of this thesis and suggest possible approaches to achieving them.

CHAPTER 3: RESEARCH METHEDOLOGY

3.1 Introduction

This chapter outlines the methodology of this thesis. A quantitative and qualitative approaches were used to assess issues of vitality and recommend actions towards higher degrees of vitality in the neighborhoods of Doha. The first part describes the methodological approach which includes establishing a definition for neighborhood vitality and its correlative dimensions based on the discussion of the literature review. The definition has helped to outline the methodology and to establish criteria for selection of the study neighborhoods. The second part, describes the study tools, data collection process, type of data needed, and the system of analysis for the collected data.

3.2 Research Approach

3.2.1 Established Definition for Neighborhood Vitality

In general, urban vitality is a compound concept. It is defined by various disciplines from different perspectives. However, all of them, with no exception, agree that urban vitality is about social occupancy and interaction (the continuous presence of people in the public realm performing diverse activities). At the scale of the neighborhood, vitality is not used to describe some physical features, but to describe all of the relationships and dynamics that exist between these physical features and the people who use them (the society). This is what makes the definition of neighborhood vitality, networked and complex rather than linear and elementary.

Almost all definitions and viewpoints about neighborhood vitality include primary lists of accessibility, diversity, and activity. Vital neighborhoods pay attention to

pedestrians more than vehicles. They are accessible to all groups of people, including people with special needs. To wit, the essence of neighborhood vitality is represented in the diversity of activities taking place in the neighborhood's public realm at different times of the day: talking, sitting, watching, walking, etc. It is a successive process: if the physical environment is well-designed, it becomes the catalyst for people presence (social occupancy). Consequently, their presence in different areas simulates different activities to take place at different times during the day and night (social interactions).

Generally, we find that neighborhood vitality deals, to a great extent, with performance. The functionality of the public realm in terms of streets and public spaces informs the socio-spatial success of the neighborhood. This imbeds three significant indicators: the society, its activities, and their physical environment. In Montgomery's definition (1998), neighborhood vitality refers to "the number of people in and around the street (pedestrian flows) across different times of the day and night, the uptake of facilities, the number of cultural events and celebrations over the year, the presence of an active street life, and generally the extent to which a place feels alive and upbeat". Therefore, neighborhood vitality increases safety, makes commercial transactions more viable, increases passive enjoyment of the streetscape (people watching), encourages social occupancy and interactions, and provides opportunities for cultural exchanges (Jalaladdini and Oktay, 2012). These factors are seen as necessary for neighborhood life as they add to the residents' physical and mental wellness, and support their happy living. In summary, a predominant definition for neighborhood vitality is arrived at that is established based on the reviewed literature. The society, its activities, and the physical environment that encompasses them are the three significant domains that define vitality (Figure 14).

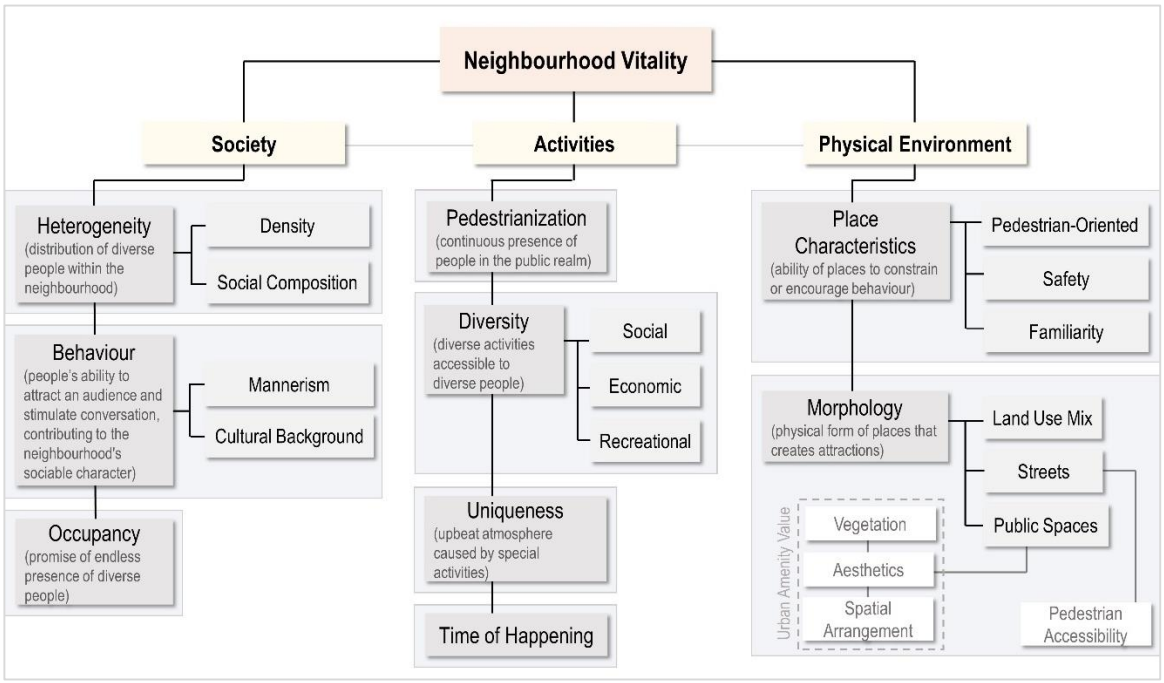

Figure 14. The established definition of neighborhood vitality (source: Barton et. al., 2010; Sullivan et. al., 2004; Montgomery, 1998; Maas, 1984).

Based on the established definition, neighborhood vitality is concerned with three main dimensions: socio-cultural, experiential, and spatial. The socio-cultural dimension characterizes a dense and heterogeneous society who are engaged in a variety of activities with continuity throughout the day and night. It is concerned with the cultural backgrounds of the society and their cultural identity and belonging. The experiential dimension is linked to the diversity of activities. It is concerned with revealing a sense of theatre and multiple atmospheric choices in the neighborhood (Mega, 2005). The spatial dimension characterizes accessibility to the neighborhood's public amenities, buildings that consider human scale, and the complexity of circulation patterns that encourage social occupancy and interaction (Maas, 1984). This signifies the different dimensions of the concept in view of the elements of a well-functioning public realm (Figure 15).

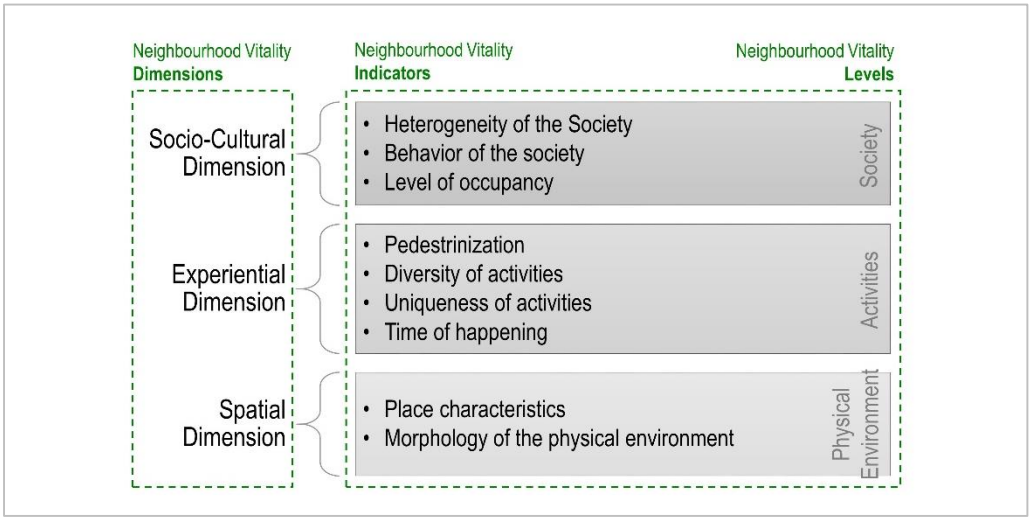

Figure 15. The established dimensions, indicators, and levels of neighborhood vitality.

3.2.2 Neighborhood Vitality Indexation

In many ways, the methodological issues associated with the measurement of neighborhood vitality can be linked to the assessment of performance as related to the society, activities, and the physical environment. A comprehensive assessment technique was established to combine vitality measures as learned from the literature (Maas, 1984; Ravenscroft, 2000; Kooshali et. al., 2015; Zarin et. al., 2015). A system of indexation was established, in light of the literature, to arrive at a solid score of vitality for neighborhoods. As illustrated in Figure 14, a total of nine indicators principally define neighborhood vitality: heterogeneity of the society, behavior of the society, level of occupancy in the public realm, pedestrianization, diversity of activities, uniqueness of activities, time of happening, place characteristics, and the morphology of the neighborhood's physical environment (Table 2).

Table 2. The indicators of neighborhood vitality based on the established definition.

Key Indicators of Neighborhood Vitality
Heterogeneity of the society
Behavior of the society
Level of occupancy in the public realm
Pedestrianization
Diversity of activities
Uniqueness of activities
Time of happening
Place characteristics
Morphology of the neighborhood's physical environment

Considering the three dimensions of neighborhood vitality, socio-cultural vitality is established to be the sum of individual scores of the society indicators: heterogeneity, behavior, and occupancy. Likewise, experiential vitality is scored based on the activities indicators: pedestrinization, diversity, uniqueness, and time of happening. Finally, spatial vitality is based on the physical environment indicators: place characteristics, and neighborhood morphology. Each indicator was treated with equal importance. The level of achievement of each individual score is established based on the level of presence of each indicator. A scale of 1 to 3 was used to indicate the absence, moderate presence, and presence of the indicator, respectively. The meaning of each score is defined to each indicator in Table 3.

Table 3. Definition of scale value for each indicator.

Indicator / Scale	1 (Not Present)	2 (Moderately Present)	3 (Present)
Heterogeneity of the society	Not dense and not balanced social composition	Presence of one aspect and lack of others	Dense society and balanced social composition
Behaviour of the society	Not attracting or stimulating conversations; culturally conservative	Presence of one aspect and lack of others	Able to attract and stimulate conversations; culturally open
Level of occupancy	Lack of people presence in streets and public spaces across different times	Presence in streets and public spaces at specific times	Presence in streets and public spaces across different times
Pedestrinization	Lack of continuous presence of people; vehicular dominance	Moderate presence of people	Continuous presence of people
Diversity of activities	Single type of activities	Two types of activities	Diverse activities (social, economic, recreational)
Uniqueness of activities	Less common activities	Common activities	Unique activities
Time of happening	Once per day	Specific times per day	Varied times per day
Place characteristics	Pedestrian inaccessibility, unsafe, and illegible	Presence of one aspect and lack of rest	Pedestrian-oriented, safe, and legible
Morphology of the physical environment	Single land uses, inaccessible streets, lack of shaded walkways, lack of beautiful and green public spaces	Presence of one aspect and lack of others	Mixed land uses, accessible streets, shaded walkways, beautiful and green public spaces

The measurement method was adapted from GSAS system weighting methodology (GORD, 2016). In refining this methodology, and relating it to the definition of neighborhood vitality, all GSAS criteria for each category were converted to a relevant form of scoring that is based on percentage weight for neighborhood vitality domains and the statistical results of the questionnaire survey. The percentage weight was assigned to each domain based on its respective number of indicators. The domain of the society was assigned 33% (3 indicators / 9 indicators), activities 45% (4 indicators / 9 indicators), and the physical environment 22% (2 indicators / 9 indicators). The weights were meant to

reflect the most influential domains of vitality, which is significantly concerned with the pedestrian populations and their level of activeness in the neighborhood.

The neighborhood vitality index is established to be based on a linear scoring process. Firstly, the statistical results of the questionnaire decide on the scale value for each indicator, which are summed afterwards to a single score for each vitality dimension. Each indicator was worth 3 points. The socio-cultural dimension was based on 9 points (3 x 3 indicators), the experiential dimension was based on 12 points (3 x 4 indicators), and lastly the spatial dimension was based on 6 points (3 x 2 indicators). The score of each dimension is multiplied, then, by the weight percentage of each domain. Finally, the neighborhood vitality index is obtained in the form of percentage value. The indexation approach was equally divided to indicate not vital (1% to 35%), moderately vital (36% to 70%), and vital neighborhood (71% to 100%) (Figure 16).

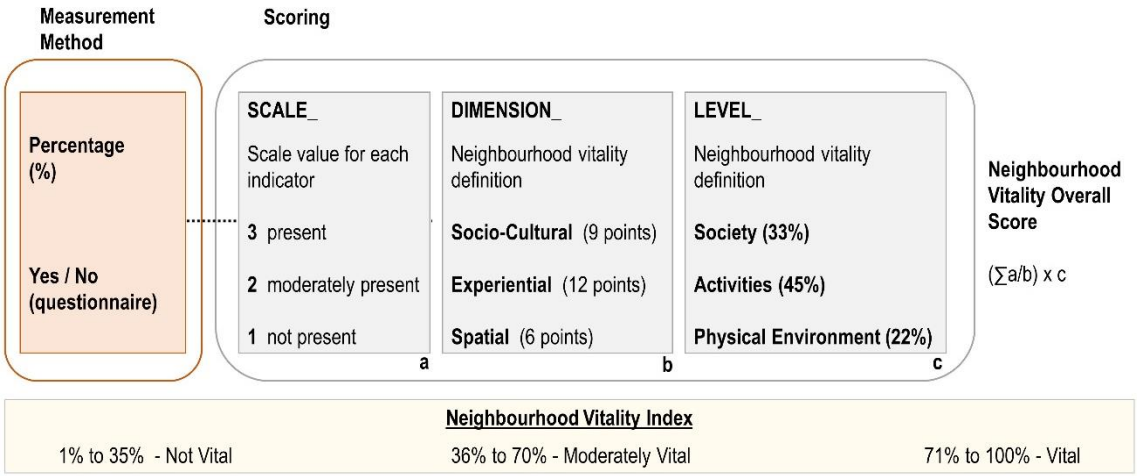

Figure 16. Neighborhood vitality scoring methodology (source: Gulf Organization for Research and Development, 2016).

The scoring methodology was viewed in light of the vitality dimensions in order to allow for an objective assessment. Recommendations will then be focused on areas of

improvements, and actions will be scoped towards increasing the degree of vitality in the neighborhoods.

3.3 Data Definition

The required data for the assessment were outlined from the established definition of neighborhood vitality. The three indicators of vitality define the target group from which data were to be collected. Therefore, data were defined as related to the society, its activities, and their physical environment. According to the established definition (Figure 13), the required data for assessment are listed in Table 4.

Table 4. Required data for the assessment based on the established definition of neighborhood vitality.

Dimension	Indicator	Data Collection Questions	Required Data
Socio-Cultural	Heterogeneity of the Society	• Who are the people living in the neighborhood in terms of nationality, age, gender, and social and economic status? • What is the population density in the neighborhood?	• Gender • Social status • Nationality • Age • Educational level • Professional expertise • Years living in Doha and in the neighborhood • Knowledgeability of neighbors
	Behavior of the society	• What is the cultural background and lifestyle of the people? • What behaviors and attitudes are displayed in the neighborhood's public realm?	
	Level of occupancy	• Are people present in the neighborhood's public realm throughout different times of the day? • What does their presence and occupancy say about accessibility, safety, and equity of the public realm?	
Experiential	Pedestrinization	• Are the streets used for pedestrian activities such as walking, watching, and sitting? • Are the people willing to pedestrianize?	• Type and frequency of activities taking place • Time of activities taking place • Unique activities taking place
	Diversity of activities	• What types of activities are taking place in the neighborhood's public realm?	

	Uniqueness of activities	• Are there special activities taking place in the neighborhood?	• Frequency of neighborhood park usage • Activities performed in streets and public spaces
	Time of happening	• What times are activities taking place in the neighborhood? • Are the activities continuous throughout different times of the day?	
`Spatial	Place characteristics	• Dose the physical design of the neighborhood's public realm encourages behavior? • Are the streets and public spaces pedestrian-oriented? • How safe is the public realm?	• Design of streets and public spaces • Level of maintenance of streets and public spaces • Pedestrian accessibility to streets and public spaces • Aesthetics of buildings and general neighborhood environment • Amount of vegetation • Spatial arrangement of streets and shops • Mix and type of land uses
	Morphology of the physical environment	• How land uses are distributed and mixed in the neighborhood? • How are streets and public spaces organized structurally to form the neighborhood's public realm? • What are the significant places in the neighborhood? • How well maintained are the streets and public spaces of the neighborhood? • How pleasant is the public realm of the neighborhood?	

The data defined in Table 4 are required to inform the indicators of vitality (the neighborhood, its residents, and their activities) and, thus, give conclusions about the social and physical environments of the neighborhood. Moreover, this data is meant to be comprehensive enough to include all dimensions of neighborhood vitality: social, cultural, experiential, and spatial. Being based on the established definition of vitality, the procedure of analysis of such data would be straight forward to arrive at results for the degree of vitality in the neighborhood. All in all, the method to assess neighborhood vitality in this thesis is based on the definition that summarizes the indicators and dimensions of neighborhood vitality (Figure 14).

3.4 Selection of the Study Neighborhoods

3.4.1 Current Conditions of Neighborhood Vitality in Doha

Since the start of the twenty-first century, Doha has been facing a period of rapid growth of vehicle-orientated neighborhoods, especially in suburban locations and fringes. This has led to a lower quality of urban life and a decline in neighborhood vitality measures. This is because the public realm is designed with a greater focus on vehicles rather than people (Al-Shawish, 2015; Wiedmann et. al., 2014). Today, the challenge for local planning authorities is to control this urban growth without reducing the social value. The focus on the scale of neighborhoods where intimate communities are created, guarantees successful retrofitting for the social capital of Doha.

In Doha, expatriates were portrayed mainly as detached from the neighborhood life (Qawasmeh, 2013). Therefore, it is important to understand the social composition of Doha's population. This aids in answering the important questions that inform the strategies to achieve higher degrees of vitality in Doha's neighborhoods: How do nationals engage in their neighborhoods in Doha, and how do they live with changes in the social composition of their neighborhoods? Does living in the downtown, suburban, or waterfront neighborhoods of Doha have an impact on neighborhood vitality? In order to address these questions, it is important to understand the urban structure of Doha and the locational distribution of its neighborhoods.

3.4.2 Selection Process

Two criteria were used in the selection of study neighborhoods in Doha. First is the locational distribution of neighborhoods in Doha with reference to its historic center (Souq Waqif area). Second is the average population density in neighborhoods based on the

census 2015 results (Ministry of Development Planning and Statistics, 2016; Qatar Atlas, 2010; Qatar Statistics Authority, 2010). These criteria were used to guarantee a rational selection of a representative sample of Doha's neighborhoods where judgments of vitality issues are valid (Figure 17).

Figure 17. Population density as per the 2015 census in which the neighborhoods with the average population density are outlined (Source: Ministry of Development Planning and Statistics, 2016).

The location of neighborhoods within Doha is found to affect its urban development since significant numbers of large-scale residential projects are directed towards the waterfront and suburban locations in the city. Therefore, Doha was divided into three locations: downtown, suburban, and waterfront (Figure 18). A neighborhood was selected from each location, to have a credible representation of Doha's neighborhoods. In each location, neighborhoods were sorted based on population density and the average is selected. In the downtown location, Fereej Bin Mahmoud neighborhood is selected. In the

suburban location, Al-Thumama neighborhood is selected. Finally, in the waterfront location, Al-Dafna neighborhood is selected. All having the average population density among their ilk (Figure 17 and Figure 18).

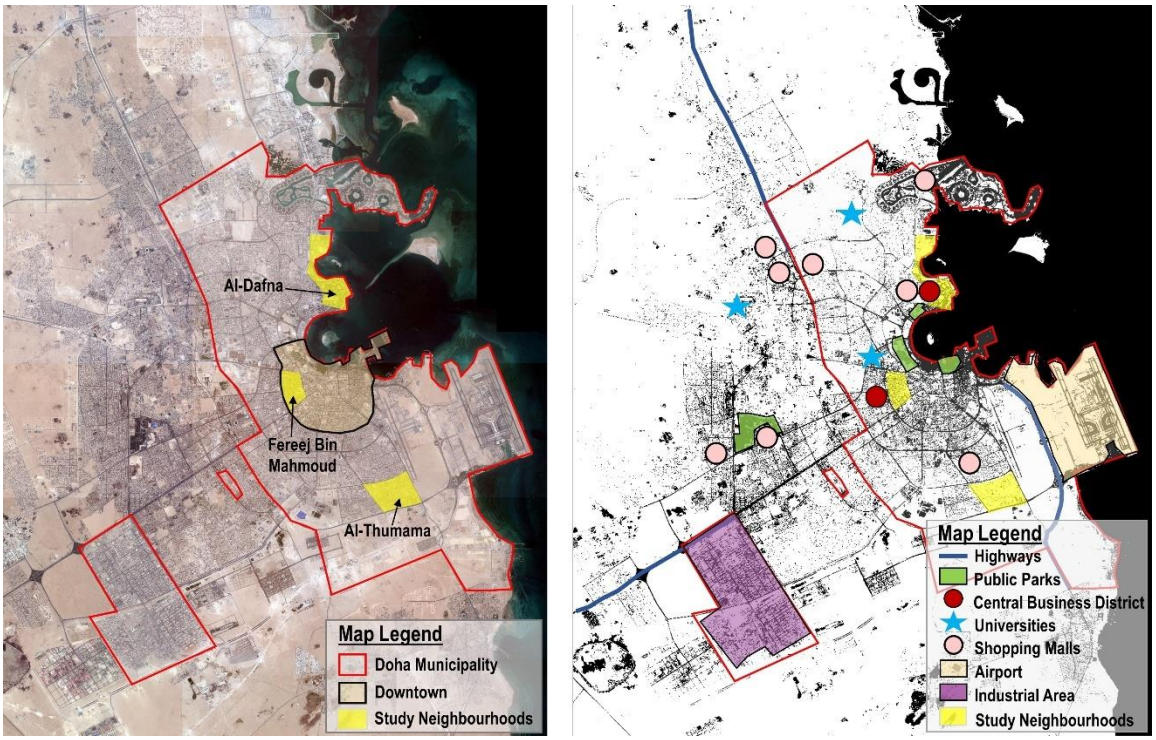

Figure 18. Location of the study neighborhoods at the scale of Doha municipality.

Traditionally, Doha's center (downtown area) was the most pursued-after location for housing (Jaidah and Bourennane, 2009). It was the magnet of people, houses, and trade activities around Souq Waqif (historic core of Doha's community). Assessing the degree of neighborhood vitality in the downtown area is seen as significant where it preserves the identity that makes the community memorable. Also, it can be noticed that the current level of community interest and civic pride are reflected in the development of high amenity value in areas around the souq to attract people. The suburban areas of Doha are newly planned to accommodate new generations of the expanding population (Wiedmann et. al.,

2013). Assessing the degree of neighborhood vitality in the suburban areas is seen as significant to recommend actions towards mitigating the negative effects of sprawling developments. The waterfront areas in Doha are developed mainly for commercial and recreational uses. However, northern areas such as the West Bay Lagoon and Al-Dafna neighborhoods are sought-after for high-end residential accommodation in Doha (Colliers, 2013). Therefore, three neighborhoods based on the three morphological locations of Doha: downtown, suburban, and waterfront areas (Table 5 and Figure 19).

Table 5. Summary of the criteria for selection of the study neighborhoods.

The Selected Neighborhood	Criteria for Selection
Fereej Bin Mahmoud	• Downtown location. • Average population density among downtown neighborhoods (17,712 persons/km^2). • Old neighborhood adjacent to the historic core. • Inhabited mostly by expatriates (especially Asians and Arabs).
Al-Thumama	• Suburban location. • Average population density among suburban neighborhoods (3,933 persons/km^2). • Modern planned district. • Grid-like planning pattern. • High vehicular dominance. • Inhabited mostly by nationals and some expatriates (especially Arabs).
Al-Dafna	• Waterfront location. • Average population density among waterfront neighborhoods (1,005 persons/km^2). • Lies within a mixed-use district where office towers, governmental buildings, hotels, showrooms, and shopping malls are located. • Inhabited mostly by high-income residents. • Inhabited mostly by expatriates (especially Europeans, Americans, or Australians).

Figure 19. GIS imageries of the three study neighborhoods and their immediate surroundings (source: GIS, 2016).

3.5 Data Collection Tools

The data were collected using three main tools: questionnaire survey, systematic neighborhood observations, and interviews with local planning authorities. These have been defined based on the established definition of neighborhood vitality which requires quantitative data and qualitative data. Quantitative data were obtained through the questionnaire survey that was directed to the neighborhoods' residents. Qualitative data were gathered from the observations for the neighborhoods' environment and from the interviews with local planning authorities. Each method was selected to answer the research questions (Table 6).

Table 6. Summary of the data collection tools.

Method 1	**Quantitative**
Tool	Questionnaires
Target	Neighborhoods' residents

Relation to Neighborhood Vitality Definition	• The society
	  ○ Social composition
	  ○ Cultural background
	  ○ Social occupancy
	• Its activities
	  ○ Pedestrianization
	  ○ Diversity
	  ○ Uniqueness
	  ○ Time of happening
	• Physical environment

	○ Place characteristics ○ Morphology (including neighborhood amenity value)
Addressment of Research Objectives	• To understand the factors of neighborhood vitality specific to Doha. • To assess the neighborhood characteristics that impact neighborhood vitality in Doha. • To find out what factors affect the degree of neighborhood vitality in Doha, as related to the context, culture, and climate. • To recommend actions to improve the degree of vitality in neighborhoods in contexts similar to Doha.
Method 2	**Qualitative**
Tool	Systematic observations
Target	Neighborhoods' physical and social environments
Relation to Neighborhood Vitality Definition	• The society ○ Residents' behavior ○ Social occupancy • Its activities ○ Pedestrianization ○ Diversity ○ Uniqueness ○ Time of happening • Physical environment ○ Morphology (including neighborhood amenity value)
Addressment of Research Objectives	• To understand the factors of neighborhood vitality specific to Doha. • To assess the neighborhood characteristics that impact neighborhood vitality in Doha. • To find out what factors affect the degree of neighborhood vitality in Doha, as related to the context, culture, and climate. • To recommend actions to improve the degree of vitality in neighborhoods in contexts similar to Doha.
Method 3	**Qualitative**
Tool	Semi-structured Interviews
Target	Local Planning Authorities
Relation to Neighborhood Vitality Definition	• Physical environment ○ Place characteristics ○ Morphology (including neighborhood amenity value)
Addressment of Research Objectives	• To understand the factors of neighborhood vitality specific to Doha. • To assess the neighborhood characteristics that impact neighborhood vitality in Doha. • To find out what factors affect the degree of neighborhood vitality in Doha, as related to the context, culture, and climate. • To establish an objective method of measuring neighborhood vitality. • To recommend actions to improve the degree of vitality in neighborhoods in contexts similar to Doha.

3.5.1 Questionnaire Survey

A questionnaire survey was conducted to examine how neighborhoods are perceived by their residents, their level of satisfaction, and what they need in a vital neighborhood. Research on neighborhood vitality and residential satisfaction has often been based on the perceived neighborhood environment by its residents (Schwaller, 2012; Eriksson, 2013; Cloutier et. al., 2014). The questionnaires were developed based on the defining factors of neighborhood vitality (Figure 14). The questions were developed to explore and investigate opinions and perceptions regarding personal use of the neighborhood's physical environment, preferences of living, and rating of the neighborhood's overall physical and social environment. Thirty questionnaires were targeted for each neighborhood for residents who were willing to participate. Random sampling was used to grant equal chances for participation and opining surveying. A total of ninety questionnaires were collected form residents of study neighborhoods.

3.5.1.1 Pilot Study

A pilot study was conducted to test the effectiveness and validity of the questionnaires in obtaining the needed data. Ten questionnaires were distributed in the study neighborhood and the results were initially analyzed to establish grounds for assessment. Some questions related to personal preferences of the neighborhood environment were included to reflect safety measures and neighborhood familiarity. On the other hand, some questions were excluded as were found not to be contributing to the assessment of neighborhood vitality. The questionnaires were reorganized to include two main sections: personal information and neighborhood information. The pilot study has helped to create and restructure the spread sheet of data analysis. Lastly, the final modified

versions of the questionnaire and the spread sheet were approved for distribution and collection.

3.5.2 Systematic Observations

Systematic neighborhood observations were conducted during the day and night to observe the behavior of residents in their neighborhood environment. Each neighborhood was observed for a period of two days. Three hours during the morning and three hours during the evening. The target places of observations were selected randomly based on the density of residents present in public realm. Namely, areas in front of shops and supermarkets, areas in front of houses that overlook the main street, and areas along local streets and *sikkas* (narrow streets). During the observations, a checklist of neighborhood vitality criteria was used to verify and confirm the absence or presence of vitality sub-indicators: density of people, their social composition, behavior, time of presence in streets and public spaces, activities, amenity value of the physical environment, and the overall neighborhood design.

3.5.3 Semi-Structured Interviews

Local planning authorities were interviewed to understand the planning process of the neighborhoods in Doha. Vitality-related aspects such as land use planning, zoning of residential areas within Doha, the public realm, and amenity value of neighborhoods were the focus of discussions. Two local authorities were targeted as being responsible on the urban planning and public realm design of the neighborhoods of Doha: Authority of Urban Planning in the Ministry of Municipality and Environment, and Public Works Authority (Ashghal). Two semi-structured interviews were conducted with the Public Works

Authority, and another two with the Urban Planning Authority. The main topics of discussions were centered on the physical design of neighborhoods and how it addresses the needs of local society and their potential activities (Table 7).

Table 7. List of interviewees, their organizations, and discussion topic.

Interviewee	Local Authority	Date of Interview	Topics
Expert in Master Planning and Research – Qatar National Master Plan Team	Ministry of Municipality and Environment	March 1, 2016	• Future of Doha in relation to existing governmental initiatives to sustain the urban growth. Rail project is one of the core projects to recreate a well-functioning public realm. • Governmental attempt to consider socially-creative places that encourage social cohesion in neighborhoods and in the larger scale of the city's public domain.
Expert in Building Project Management	Ashghal – Public Works Authority	May 23, 2016	• Governmental initiatives to enhance the physical and social environments in Doha. A currently-discussed project is the Public realm of Doha. • Qatar National Vision 2030 towards vital public places.
Expert in Public Realm of Doha and Roads Design	Ashghal – Public Works Authority	June 4, 2016	• Public realm of Doha project that aims to establish a set of Public Domain Design Guidelines for several areas in Doha. Part of this is the public realm of neighborhoods. • Urban challenges and opportunities in the enhancement of Doha's streetscape design, consider the rapid growth of the city. • The design concept is based on comfort across all levels: cultural, social, spatial, and physical. • Two design mock-ups of "complete streets" are implemented in Al-Dafna neighborhood and Old Al-Rayan neighborhood to test their impact on the societies and their social environment.
Expert in GIS and Land Use Surveying – Qatar National Master Plan Team	Ministry of Municipality and Environment	October 16, 2016	• Land uses and zoning of neighborhoods. • Adaptations of Rail project requirements in existing and future neighborhood developments.

3.6 Data Description

The collected data were particularly original as preference and perception data were collected directly from the residents through questionnaires. Also, systematic observations of the neighborhoods' physical and social environments revealed more data that supports the questionnaire answers. All the collected data were translated into various charts and maps to illustrate the neighborhoods' profile across the three different levels of vitality: society, activities, and the physical environment. Each of these factors was comprehensively analyzed to conclude fair judgments of the degree of neighborhood vitality in Fereej Bin Mahmoud neighborhood (downtown), Al-Thumama neighborhood (Suburban), and Al-Dafna neighborhood (waterfront).

3.6.1 Description of the Surveyed Residents

3.6.1.1 The Total Sample

A total of ninety residents participated in the questionnaire survey. Thirty questionnaires were distributed in each of the study neighborhoods. The surveyed sample was based on residents who were willing to participate in the survey. In total, the participants were 53% males and 47% females. Arabs constitute 35% of the total participants which is the highest nationality, followed by Asians who constitute 25%. Qataris constitute 21% whereas Europeans/ Americans/ Australians constitute 18%. This reflects the population structure of Doha where expatriates make-up more than 60% of the total population (Qatar Atlas, 2010). The majority of participants are adults in which 28% of them are aged between 26 to 35 years old, and 24% of them aged between 36 to 45 years old. 23% of them are 18 to 25 years old, 20% are 46 to 55 years old, and 5% age more than 55 years old (Figure 20).

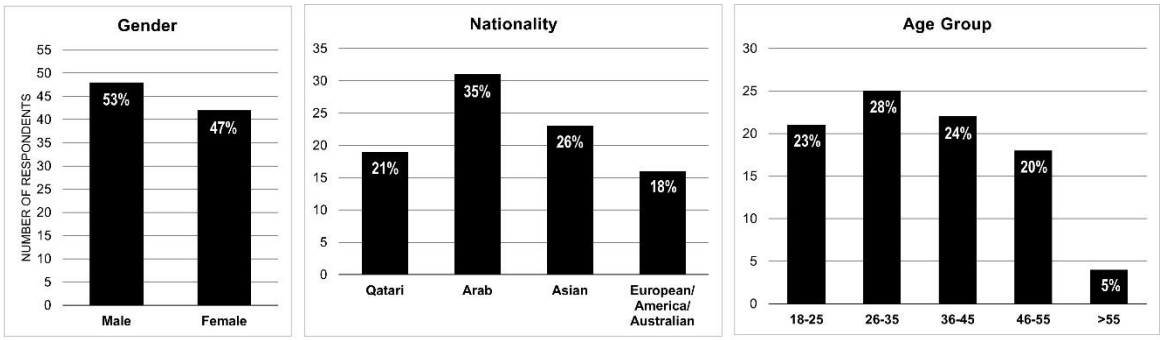

Figure 20. Gender, nationality, and age group of the total surveyed residents.

Personal data of participants were gathered to inform about the social composition of the society in each neighborhood. Data related to social status, length of time living in Doha, educational level, and professional expertise would give a general picture of the heterogeneity and cultural background of the society. 46% of the total participants are married, 37% are single and 7% are divorced. More than half of the participants (55%) have been living in Doha for more than a decade. This reflects their familiarity and knowledgeability of the city and its neighborhoods. This percentage is followed by 19% of them who have lived in Doha for 3 to 6 years, 18% have lived there from 7 to 10 years, and 8% who are new and have lived there from 1 to 2 years in Doha. 67% of the participants were bachelor/ diploma degree holders constituting a majority, where almost equal percentages of 16% and 17% were secondary degree or master's degree holders respectively. 52% were working in operational and technical related professions, and 38% were working in managerial and supervisory related professions (Figure 21).

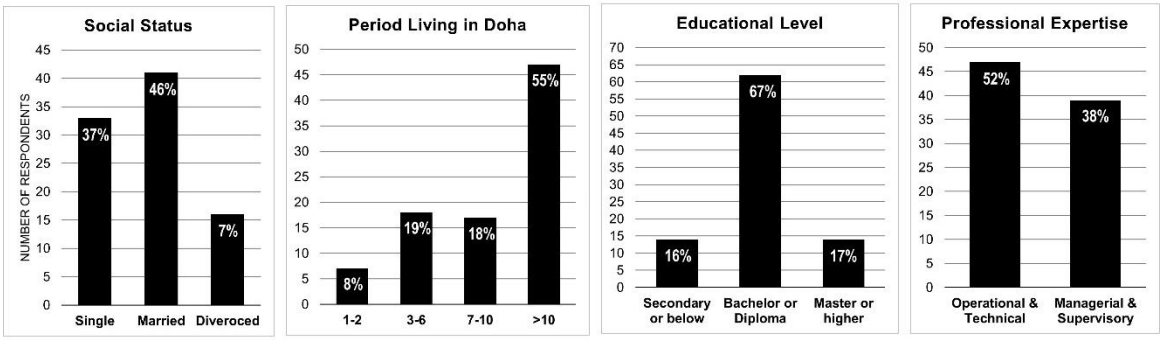

Figure 21. Social status, period living in Doha, educational level, and professional expertise of the total surveyed residents.

3.6.1.2 Downtown Neighborhood Sample: Fereej Bin Mahmoud

According to the survey results, male dominance was seen as a significant feature of downtown neighborhoods. Male participants were higher in number where they constituted 60% of the sample. Results for the social status show that 47% of the sample are single, and 33% are married, and 20% are divorced. This reflects the significant fact about downtown neighborhoods in Doha where male bachelors are dominant. The whole of Fereej Bin Mahmoud society is made up of expatriates, in which 57% of them are Asians, 37% Arabs, and 6% westerners. Most of the sample group is youths and adults who are aged between 18 to 45 years old (Figure 22).

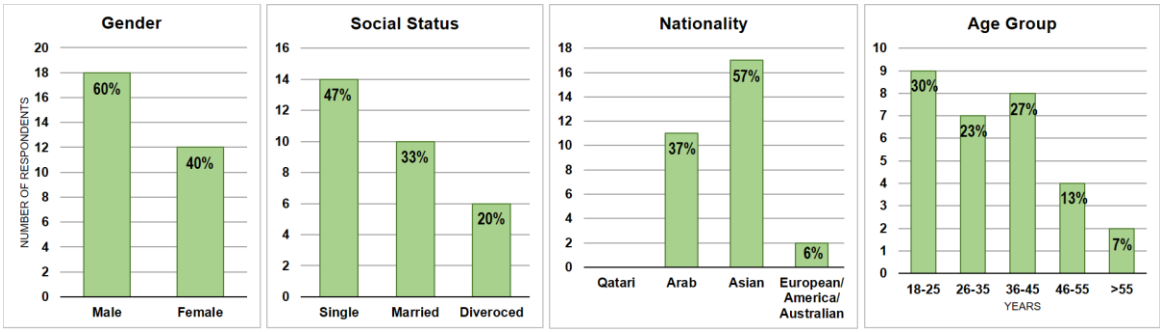

Figure 22. Statistics of gender, social status, nationality, and age group of the surveyed residents of Fereej Bin Mahmoud.

The majority of the surveyed residents are Bachelor degree holders accounting for

56% of the sample. 57% have lived in Fereej Bin Mahmoud for 3 to 6 years, followed by 30% who have lived in it from 7 to 10 years. 58% know a few of their neighbors while 27% know most of their neighbors. These general questions were asked to reveal issues related to the level of cultural mix and social bonding in Fereej Bin Mahmoud. In fact, the majority didn't choose to live in the neighborhood. They had their residence offered by the employer as work accommodation (47%). This is followed by housing affordability as the second main reason for living in Fereej Bin Mahmoud (41%). Only a few of the participants live in the neighborhood for personal preferences (12%). The concept of family neighborhood in Doha is applicable mainly to nationals who live as groups of one family together in one neighborhood. This confirms the result of Fereej Bin Mahmoud as not being a family neighborhood (Figure 23).

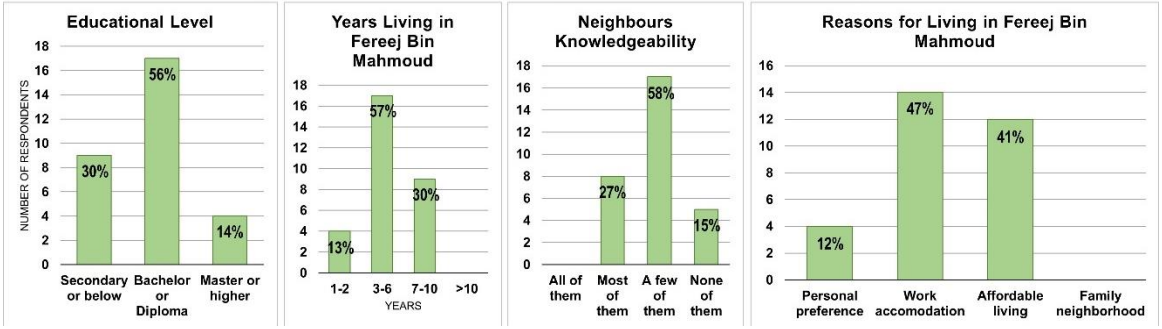

Figure 23. Statistics of the educational level of the surveyed residents, years living in the neighborhood, neighbors knowledgeability, and reasons for living in Fereej Bin Mahmoud.

According to the survey answers, driving is the main activity that is performed by the residents of Fereej Bin Mahmoud during all times of the day. This is followed by shopping as the second recurrent activity during the different times of the day. Walking stands as another dominant activity for the residents during the morning and evening times (Figure 24).

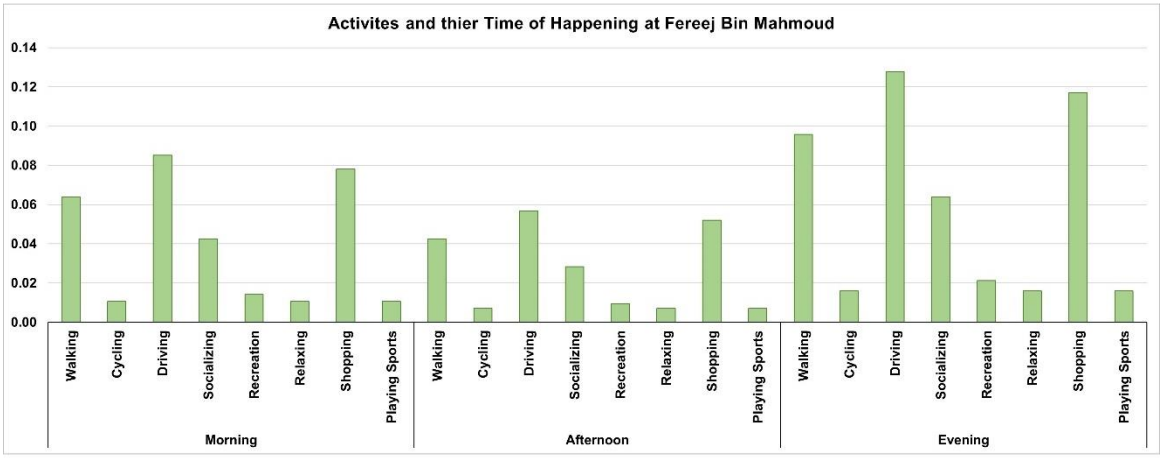

Figure 24. Activities taking place in Fereej Bin Mahmoud during the morning, afternoon, and evening times.

The level of social occupancy at Fereej Bin Mahmoud was assessed through answers to how encouraging the public realm is for use and presence. 54% of the surveyed residents are not encouraged to go outside and spend hours in the public realm due to two main reasons: lack of green spaces in the neighborhood (25%), and its physical environment that is not adapted to the hot weather (28%). Also, some residents experience lack of safety in the neighborhood (23%) and, thus, are not encouraged to use the streets and public spaces of Fereej Bin Mahmoud. On the other hand, some of the participants are encouraged to go outside (46%) and spend hours for socializing and performing fitness-related activities, accounting for a total of 33% and 29% respectively (Figure 25).

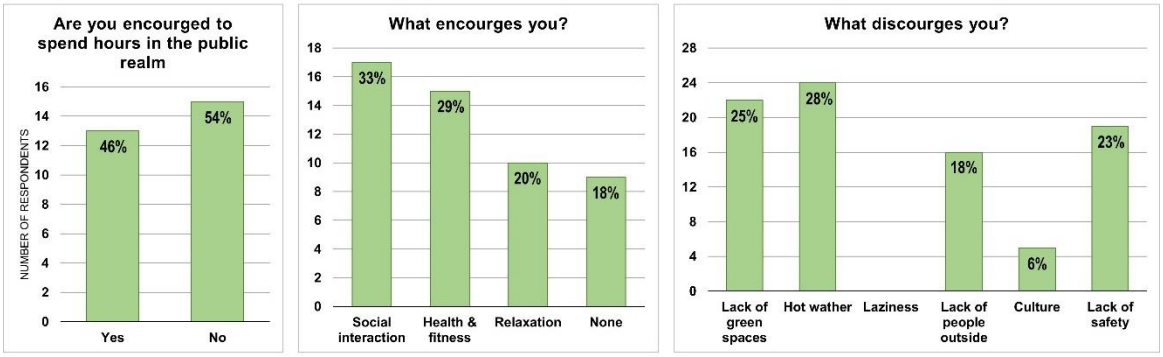

Figure 25. Level of social occupancy in Fereej Bin Mahmoud.

Perceptions of the public realm were gathered to assess how functional the physical environment and the social environment are in Fereej Bin Mahmoud. Most of the participants find that public spaces (89%) and streets (50%) are not well designed and maintained in the neighborhood. Public spaces appear to be highly lacking in the good design and functionality in the neighborhood with 67% of the surveyed residents agreeing with that. Streets lack the good design and maintenance as well where 41% of the surveyed residents are not able to use them for walking. However, 36% of them are sometimes able to use the streets for walking (Figure 26).

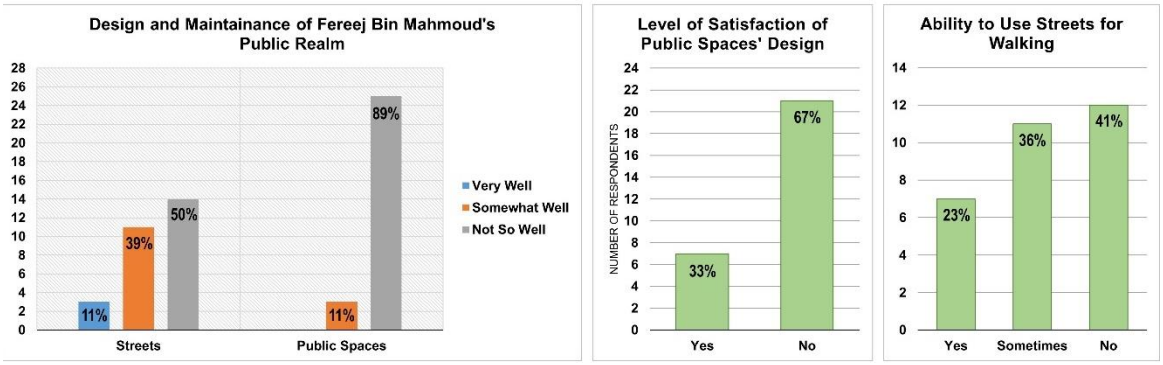

Figure 26. Design of the public realm of Fereej Bin Mahmoud.

Perceptions of the neighborhood life were gathered though assessments of the residents' level of satisfaction and preference towards the physical and social environments

of Fereej Bin Mahmoud. 52% of the surveyed residents find the neighborhood not safe and not beautiful. Sense of pride for the neighborhood is low with 46% not feeling proud of living in the neighborhood, while 37% feel somewhat proud about their neighborhood. Similarly, 40% are not happy living in the neighborhood. Suggestions to improve the public realm were mainly to support the physical environment with shaded walkways (25%) and vegetation (20%). Also, the addition of public spaces (17%) and water features (15%) were other suggested additions to enhance the public realm of Fereej Bin Mahmoud (Figure 27).

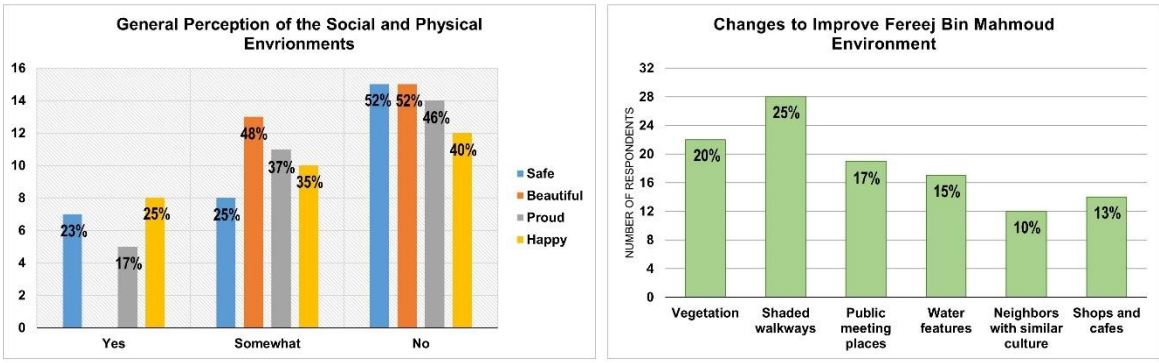

Figure 27. General perceptions of the public realm of Fereej Bin Mahmoud with suggestions to enhance it.

Generally, 78% of the surveyed residents agree that the location of the neighborhood is the most preferred characteristic of living in it. On the other hand, 49% of them agree that the neighborhood life is the least preferred for them to live in. This is followed by 39% who dislike the physical design of the neighborhood (Figure 28).

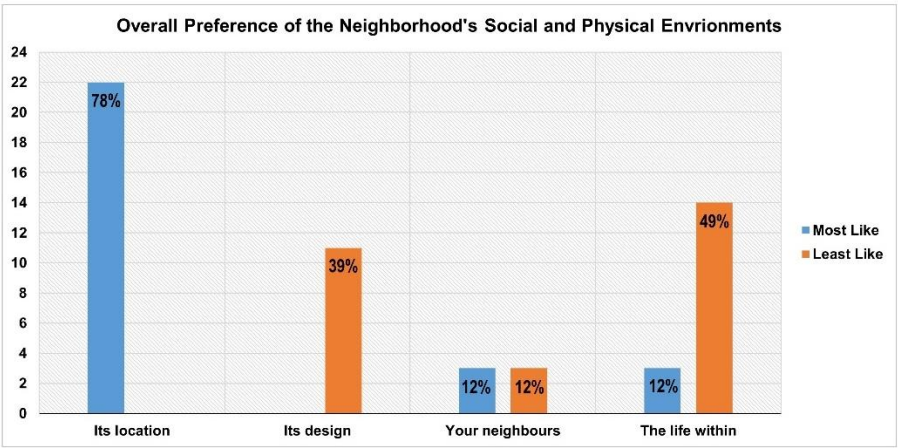

Figure 28. Overall preference of Fereej Bin Mahmoud's environment.

Particular preferences of the residents were gathered to reflect their heterogeneity and behavior in regards to their interaction in the neighborhood's environment. The most important preference of all participants is the ability to use the streets to perform diverse activities. They give the highest importance to the neighborhood streets that are well-designed to support a diverse range of activities. This is followed by r three other major preferences: the inclusion of neighborhood shops, the provision of a well-designed neighborhood park, and the familiarity with the neighborhood's facilities and surroundings. According to the neighborhood vitality definition, these preferences are related to the neighborhood's physical environment. The availability of a neighborhood school has less importance. The least importance is given to the preference of their children growing up and living in the neighborhood (Figure 29).

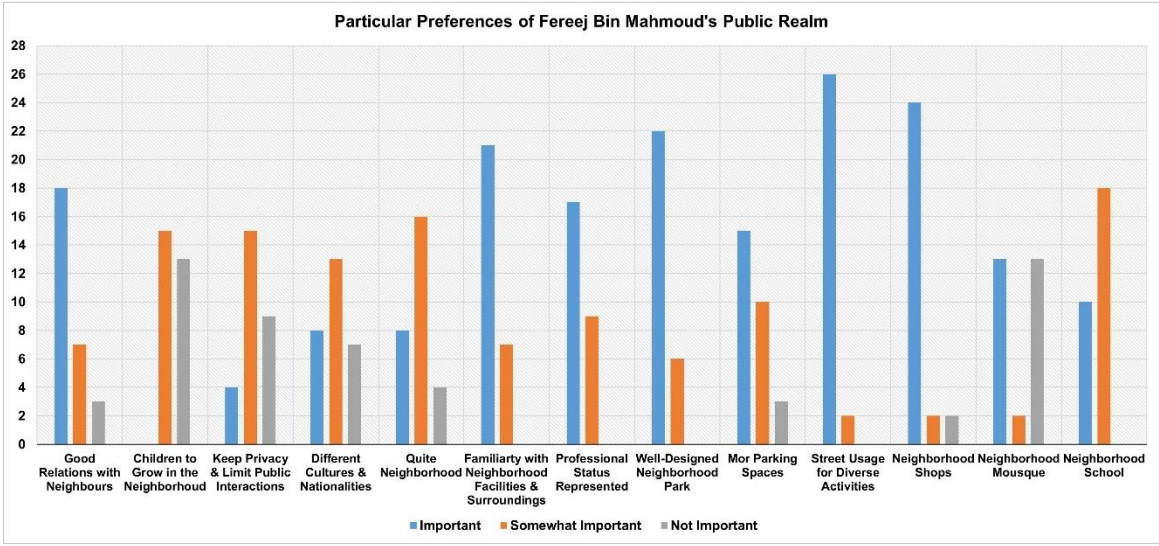

Figure 29. Particular preferences by the residents of Fereej Bin Mahmoud.

3.6.1.3 Suburban Neighborhood Sample: Al-Thumama

According to the survey results, male and female participants are equal in number where they constitute 50%-50% equally. Results for the social status show that 58% of the sample are married, and 33% are single, and 9% are divorced. This reflects the significant fact about suburban neighborhoods in Doha being family neighborhoods. The majority of Al-Thumama society is made up of nationals and some expatriates with a similar culture, in which 45% of them are Qataris, 35% Arabs, 12% Asians, and 8% westerners. Most of the sample are adults aged between 26 and 35 years old (Figure 30).

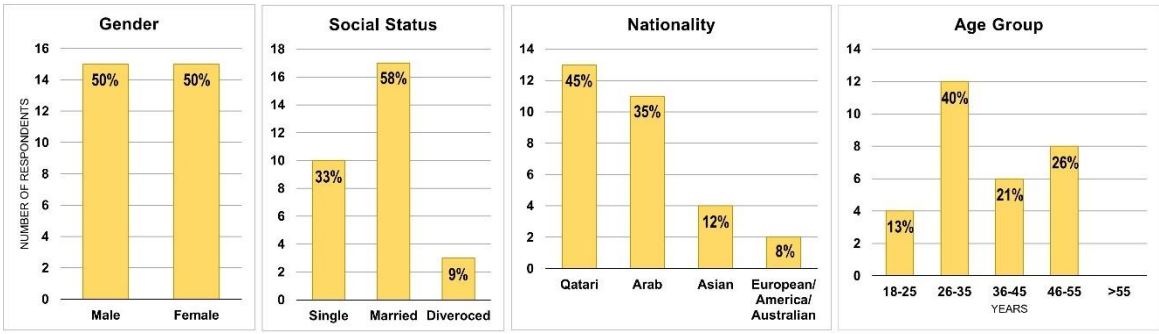

Figure 30. Statistics of gender, social status, nationality, and age group of the surveyed residents of Al-Thumama.

The majority of the surveyed residents are Bachelor degree holders accounting for 77% of the sample. 40% have lived in Al-Thumama for 3 to 6 years, followed by 30% who have lived in it for 1 to 2 years, and 20% who have lived for 7 to 10 years in Al-Thumama. 53% know few of their neighbors while 33% know most of their neighbors. These general questions were asked to reveal issues related to the level of cultural mix and social bonding in Al-Thumama. According to the results, 41% of the surveyed residents have chosen to live in Al-Thumama because it is their family neighborhood while 36% have chosen it according to their personal preferences. Housing affordability is the third reason for living in the neighborhood, accounting for 20% of the sample. This is confirmed by the major nationalities in the neighborhood where Qataris (nationals) and Arabs (expatriates) are dominant (Figure 31).

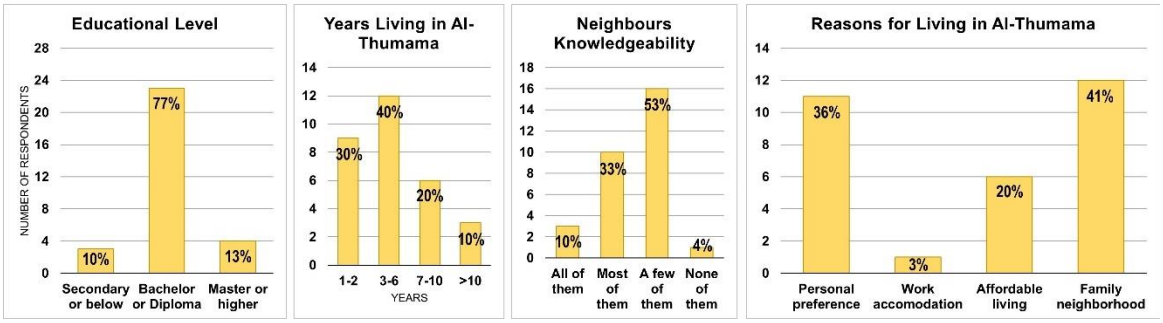

Figure 31. Statistics of the educational level of the surveyed residents, years living in the neighborhood, neighbors knowledgeability, and reasons for living in Al-Thumama.

According to the survey answers, driving is the main activity that is performed by the surveyed residents of Al-Thumama during the evening. This is followed by walking as the second recurrent activity during the evening. Similarly, driving and walking are the main activities performed by the residents during the morning and afternoon times, but with lower concentrations as compared to the evening times (Figure 32).

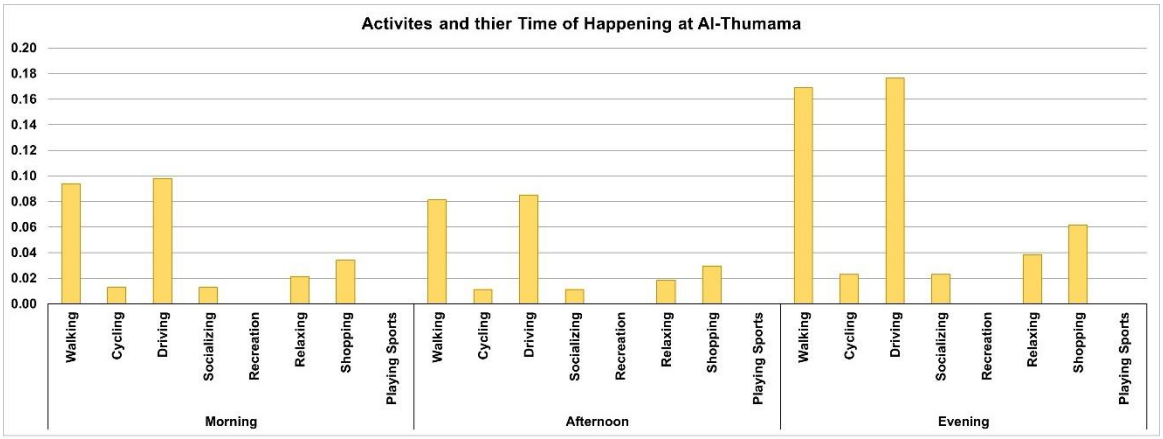

Figure 32. Activities taking place in Al-Thumama during the morning, afternoon, and evening times.

The level of social occupancy at Al-Thumama is assessed through answers to how encouraging the physical design of the public realm is for use and occupancy. 56% of the surveyed residents are encouraged to go without mentioning a solid reason that encourages them (34%). However, this is followed by 26% who were encouraged to use the public realm to perform fitness and health-related activities. Reasons for social interactions and relaxation were found to have equal percentages (20%). On the other hand, 44% are not encouraged to use and occupy the public realm mainly due to the neighborhood's physical environment that is not adapted to the hot weather (39%). This is followed by the lack of green spaces in the neighborhood accounting for 26% (Figure 33).

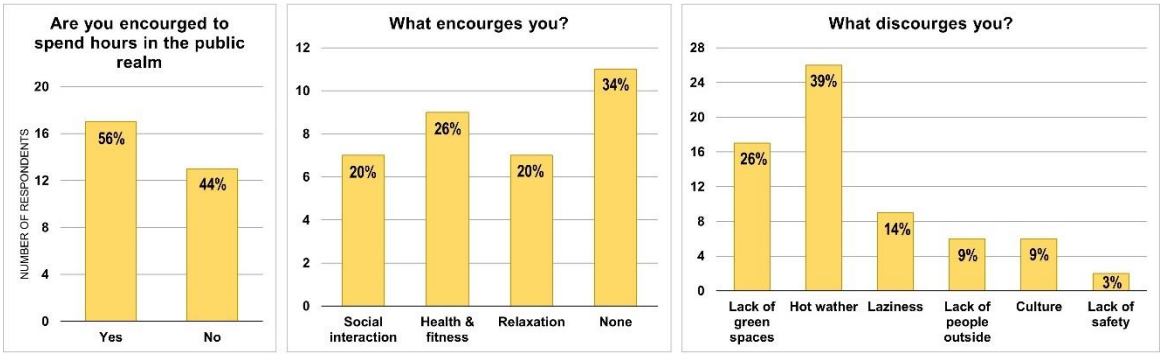

Figure 33. Levels of social occupancy at Al-Thumama neighborhood.

Most of the participants find that public spaces (63%) and streets (50%) are somewhat well designed and maintained in the neighborhood. However, streets are seen to be well designed and maintained by 40% of the surveyed residents. Public spaces appear to lack the good design and functionality in the neighborhood more than streets, with 52% of the surveyed residents not being satisfied with their design. The percentage difference is not significantly varied since 48% of the sample are satisfied with the design of public spaces in Al-Thumama. 43% of the surveyed residents have found the streets accessible for walking, while 34% of them are not able to walk in streets (Figure 34).

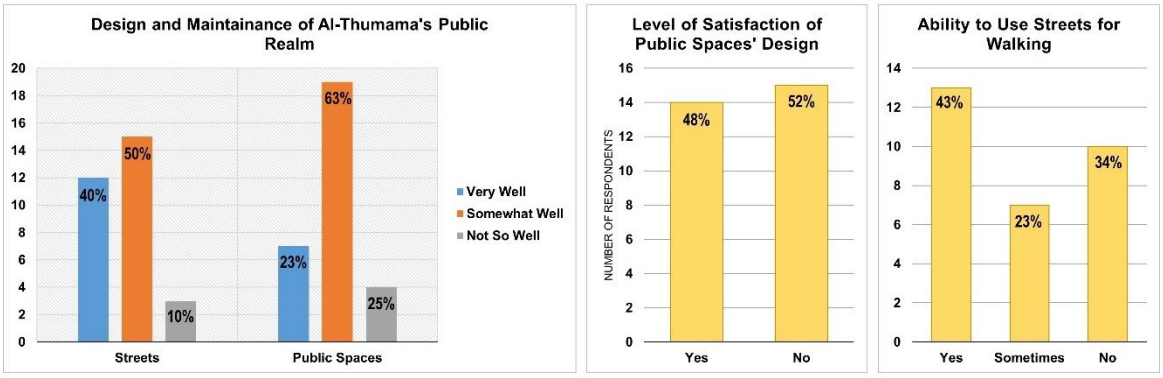

Figure 34. Design of the public realm of Al-Thumama neighborhood.

Perceptions of the neighborhood life were gathered though assessments of the residents' level of satisfaction and preference towards the physical and social environment of Al-Thumama. 73% of the surveyed residents find the neighborhood very safe. Opinions about the aesthetics of the public realm and feel of happiness using the public realm are equal. 50% of them find the neighborhood's environment somewhat beautiful, and 50% of them feel happy living in the neighborhood and occupying its public realm. Opinions on sense of pride living in the neighborhood are moderate in which 46% feel somewhat proud

living in Al-Thumama. As the case with Fereej Bin Mahmoud, suggestions to improve the public realm are mainly to support the physical environment with shaded walkways (26%) and vegetation (18%). Also, the provision of shops and cafes is another suggestion to enhance the public realm of Al-Thumama, accounting for 17% of the sample (Figure 35).

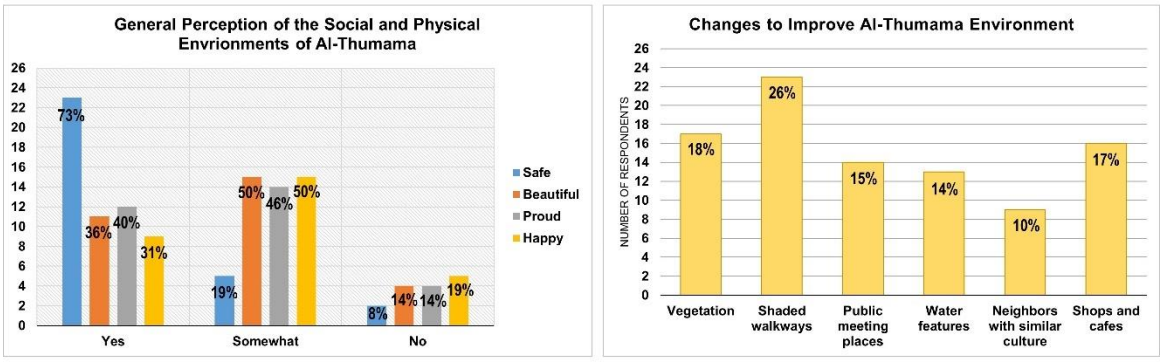

Figure 35. General perceptions of the public realm of Al-Thumama with suggestions to enhance it.

Generally, 33% of the surveyed residents agree that the location of the neighborhood is the most preferred characteristic of it. Followed by 31%who agree that the neighborhood life is the most preferred characteristic. On the other hand, 36% of the surveyed residents agree that the physical design of the neighborhood is the least preferred for them to live in it. Followed by 26% of them least preferring their neighbors in the Al-Thumama. This implies less preferences towards the physical environment of Al-Thumama that does not support the social environment (Figure 36).

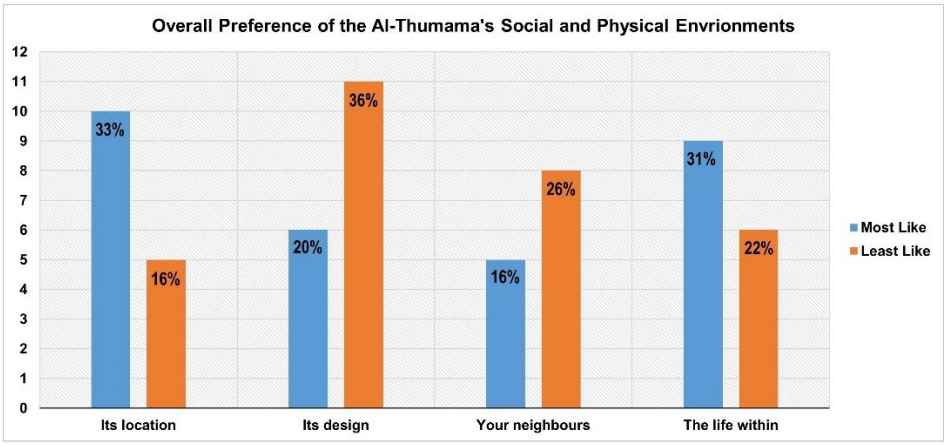

Figure 36. Overall preference of Al-Thumama's environment.

Particular preferences by the residents were gathered to reflect their heterogeneity and behavior in regards to their interaction in the neighborhood's environment. The most important preference by all of the surveyed residents is the need for more mosques in Al-Thumama. This is followed directly by the need for being familiar with the neighborhood's facilities and surroundings, and equally the need for more parking spaces. The preference towards their children growing up in the neighborhood has less importance. The least importance is given to the preference of the neighborhood having different cultures and nationalities (Figure 37).

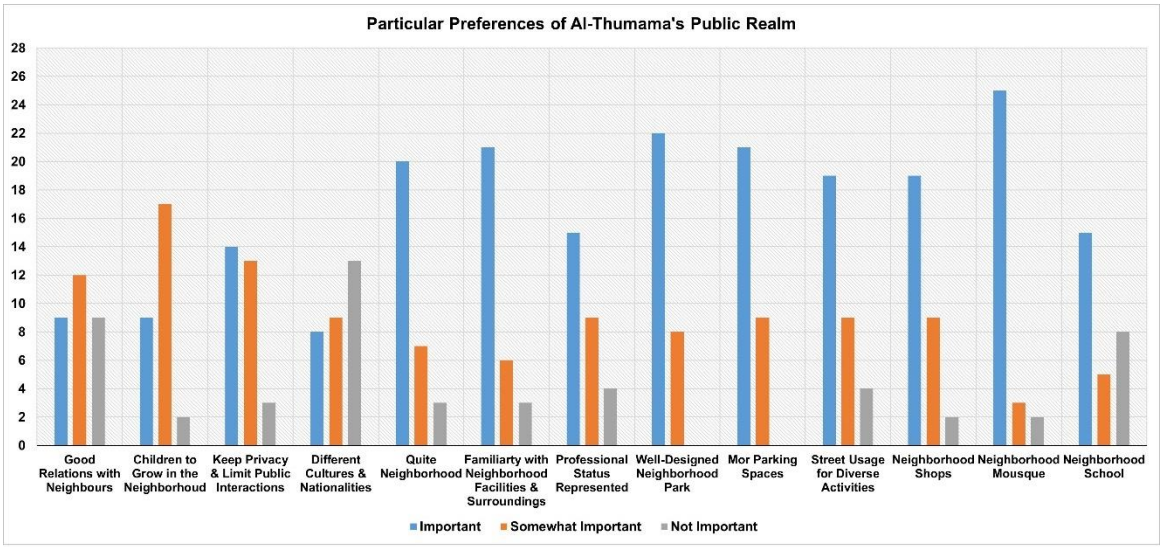

Figure 37. Particular preferences by the residents of Al-Thumama neighborhood.

3.6.1.4 Waterfront Neighborhood Sample: Al-Dafna

According to the survey results, male and female participants are equal in number where they constitute 50%-50% equally. Results for the social status show that 47% of the sample are single, and 30% are married, and 13% are divorced. Al-Dafna neighborhood seems to have a unique and diverse society which is made up of 42% westerners, 32% Arabs, 21% Qataris, and 5% Asians. The age group of the surveyed residents indicate balance and stability of the society. 26% is the figure for each age group of 18 to 25 years old and 36 to 45 years old. Similarly, the age groups of 26 to 35 years old and 46 to 55 years old are both 20%. This reflects the varied heterogeneity of the society as compared to Al-Thumama and Fereej Bin Mahmoud sample (Figure 38).

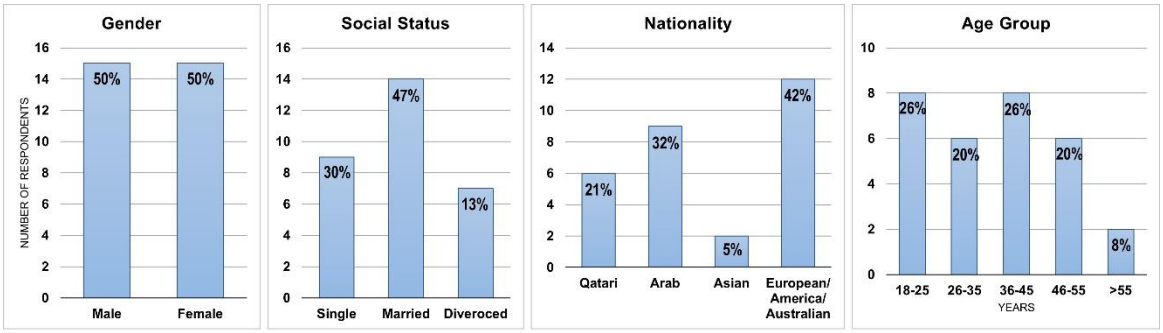

Figure 38. Statistics of gender, social status, nationality, and age group of the surveyed residents of Al-Dafna.

The majority of the surveyed residents are Bachelor degree holders accounting for 73% of the sample. 44% have lived in Al-Dafna for more than 10 years, followed by 33% who have lived in it from 3 to 6 years, and 20% who have lived from 7 to 10 years. 47% know most of their neighbors while 33% know few of their neighbors. These general questions were asked to reveal issues related to the level of cultural mix and social bonding in Al-Dafna. According to the results, 53% of the surveyed residents have chosen to live in Al-Dafna according to their personal preferences. Work accommodation is the second recurrent reason for living in Al-Dafna according to the surveyed residents, which accounts for 44% of the sample (Figure 39).

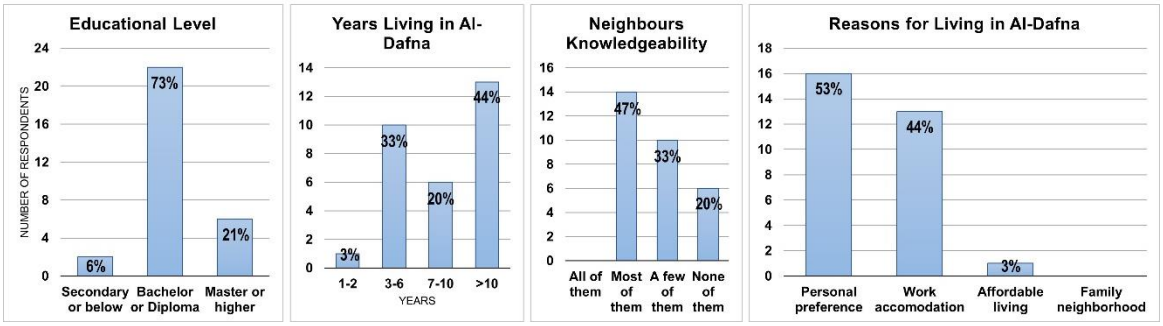

Figure 39. Statistics of the educational level of the surveyed residents, years living in the neighborhood, neighbors knowledgeability, and reasons for living in Al-Dafna.

According to the survey results, driving is the main activity that is performed by the residents of Al-Dafna during the evening. This is followed by walking and shopping equally as the second recurrent activities during the evening. Similarly, driving and shopping are the main activities performed by the residents during the morning and afternoon times, but with lower concentrations as compared to evening times (Figure 40).

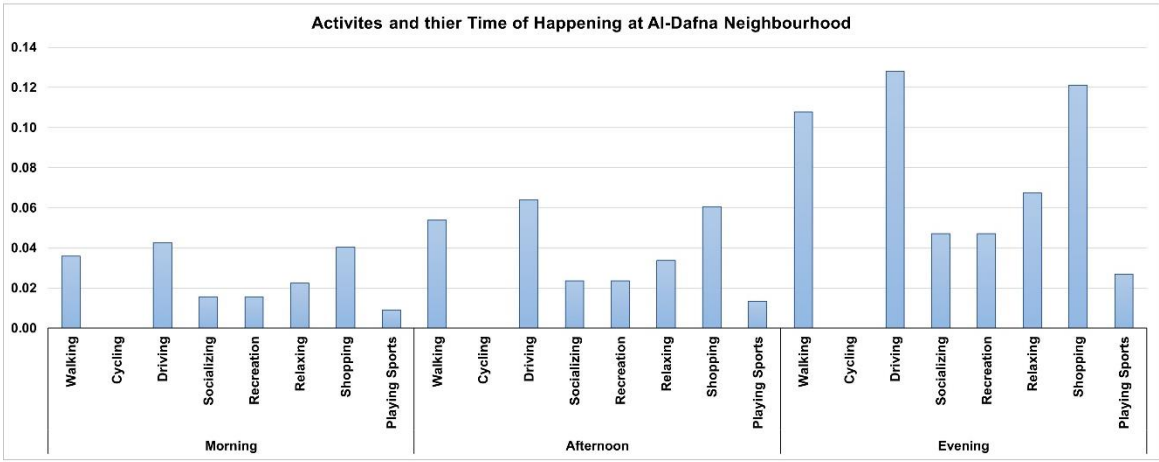

Figure 40. Activities taking place in Al-Dafna during the morning, afternoon, and evening times.

Al-Dafna is the only neighborhood that has a park among the selected study neighborhoods. Al-Sheraton park is newly renovated adding to the quality of the network of green parks in Doha. Perceptions of the park design in terms of frequency of usage, accessibility, and types of activities it supports were asked to the surveyed residents. Surprisingly, 65% of the surveyed residents do not use the park, and only 7% of them use it. This informs about issues of accessibility as its location away from the residential towers makes it less accessible for frequent usage. However, walking was the most frequent activity in the park accounting for 34%. 21% of the surveyed residents also use the park for relaxation purposes, whereas 18% use it frequently for their kids to play. 12% of them use

for socializing purposes and 10% for recreation (Figure 41).

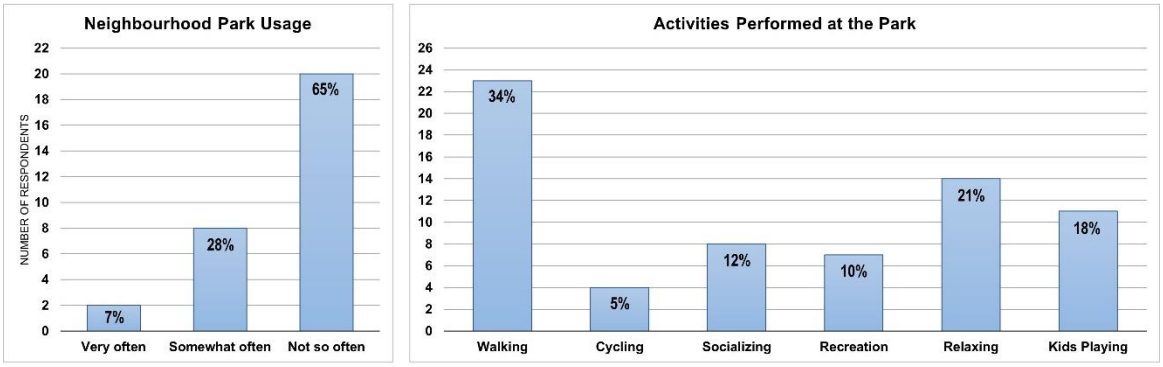

Figure 41. Perceptions of the neighborhood park in Al-Dafna.

The level of social occupancy at Al-Dafna is assessed through answers to how encouraging the public realm is for use and occupancy. 54% of the surveyed residents are not encouraged to go outside and occupy the public realm mainly due to the hot weather (44%). This informs about the physical design of the public realm that is not adapted to the local climate of Doha. On the other hand, almost an equal percentage of 46% were encouraged to use the public realm and spend hours outside, mainly to perform health and fitness related activities (42%). This is followed by relaxation (31%) as an encouraging activity to occupy the public realm of Al-Dafna (Figure 42).

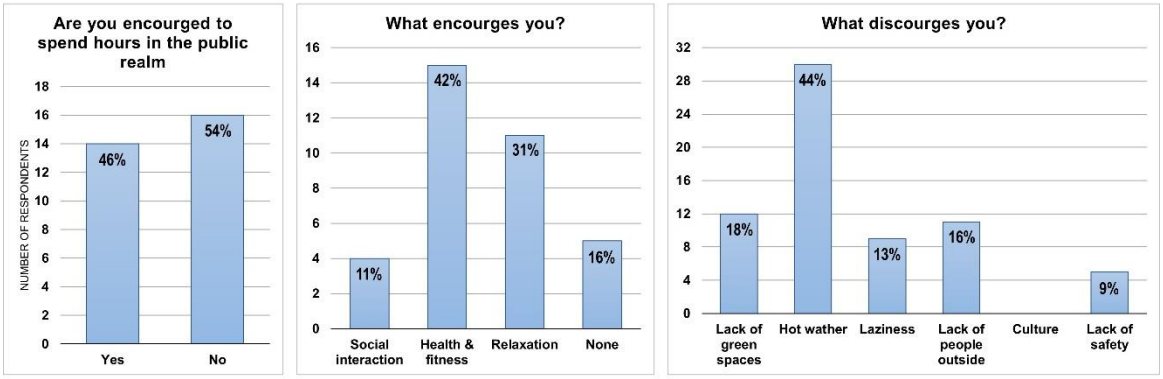

Figure 42. Level of social occupancy at Al-Dafna neighborhood.

Perceptions of the public realm were gathered to assess the performance of the physical environment and the social environment in Al-Dafna neighborhood. 50% of the surveyed residents find the streets somewhat well designed and maintained. Similarly, 56% of them find the public spaces somewhat well designed and maintained. These percentages are followed by percentages of lack of proper design and maintenance of streets and public spaces (30% and 28% respectively). However, 71% were satisfied with the design of public spaces, but not streets. Equal percentages of 36% are shown for ability and inability to use the streets for walking. This informs about issues of pedestrian accessibility of streets in Al-Dafna (Figure 43).

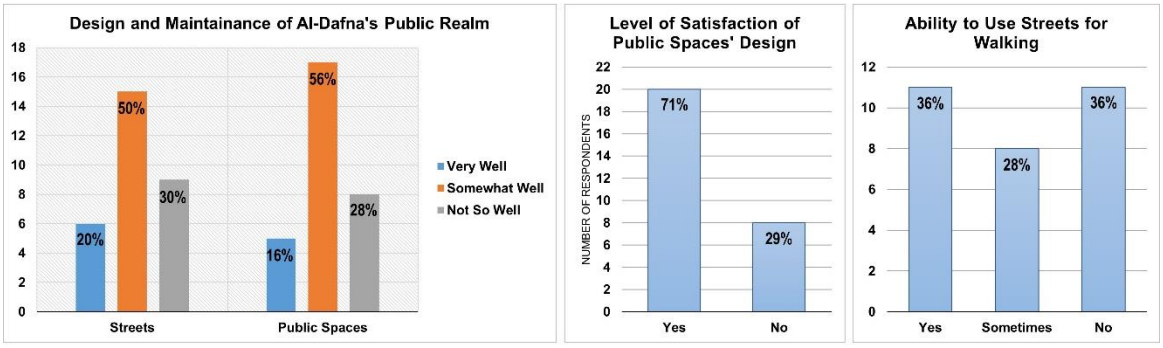

Figure 43. Design of the public realm of Al-Dafna neighborhood.

Perceptions of the neighborhood life were gathered though assessments of the residents' level of satisfaction and preference towards the physical and social environment of Al-Dafna. Generally, 60% of the surveyed residents find the neighborhood very safe, and 50% find it very beautiful. 73% of them feel very proud and 56% feel happy living in the neighborhood. However, and as the case with Fereej Bin Mahmoud and Al-Thumama neighborhoods, suggestions to improve the public realm of Al-Dafna are mainly to provide the physical environment with shaded walkways (31%) and vegetation (19%). This is

followed by the provision of well-design public spaces (16%) (Figure 44).

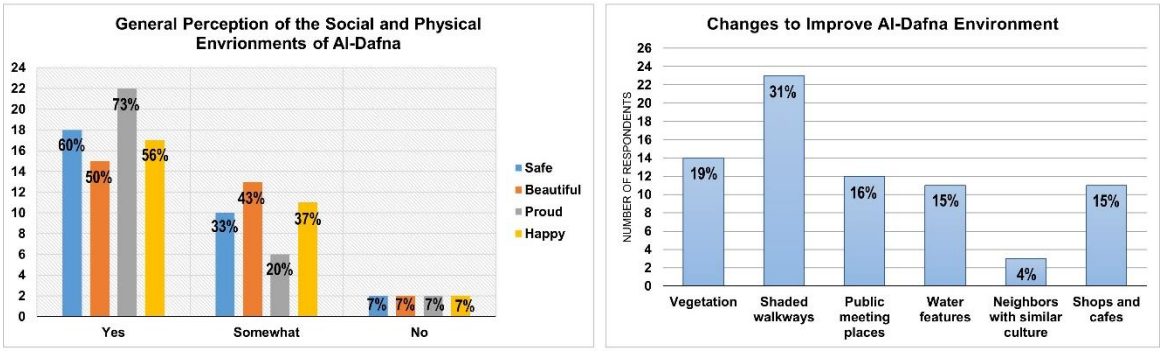

Figure 44. General perceptions of the public realm of Al-Dafna with suggestions to enhance it.

Generally, 63% of the surveyed residents agree that the location of the neighborhood is the most preferred characteristic of living in it. On the other hand, 50% of them agree that the physical design of the neighborhood is the least preferred. This implies less preferences towards the physical environment of Al-Dafna that does not support the social environment (Figure 45).

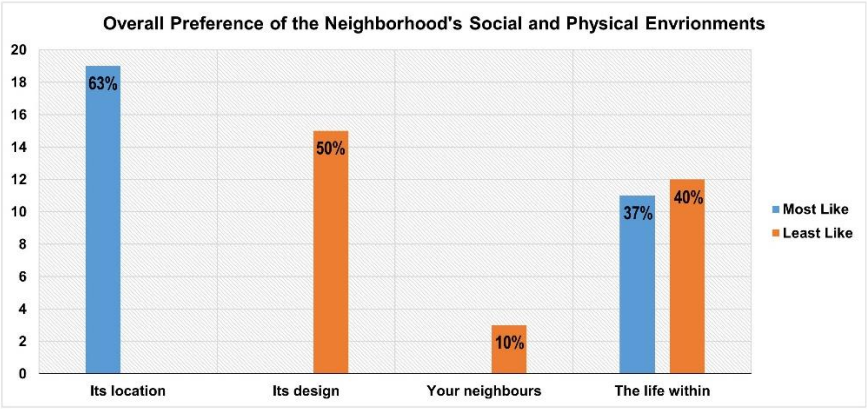

Figure 45. Overall preference of Al-Dafna's environment.

Particular preferences of the residents were gathered to reflect their heterogeneity and behavior in regards to their interaction in the neighborhood's environment. The most important preference of all the surveyed residents is the provision of a well-deigned

neighborhood park in terms of accessibility. This is followed directly by the preference of street design to support diverse uses and activities, which also reflects issues of accessibility. The preference to have a neighborhood school has less importance. The least importance is given to the preference of keeping privacy and limiting public interactions (Figure 46).

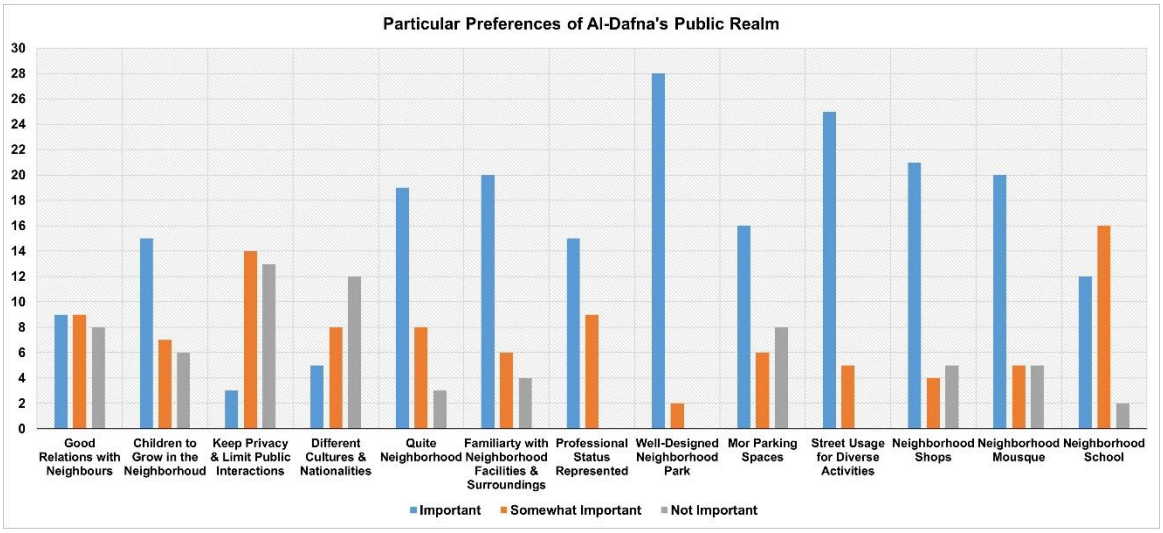

Figure 46. Particular preferences by the residents of Al-Dafna neighborhood.

3.6.2 Description of the Surveyed Spaces

Neighborhood observations were conducted for a period of two weeks. Observations were conducted in each neighborhood during two weekdays considering morning, afternoon, and evening times. In Fereej Bin Mahmoud, a total of three hours of observation during each time were conducted and repeated for two days. Likewise, the same system of observations was conducted in Al-Thumama and Al-Dafna. Based on the three factors of neighborhood vitality, the observations targeted the following:

• Heterogeneity (density and social composition), behavior (mannerism and cultural background), and occupancy of the society.

• Pedestrianization, diversity (social, economic, and recreational), time of happening, and uniqueness of activities.

• Place characteristics (pedestrian-oriented, safe, and familiar), and morphology (building conditions, land use mix, streets, public spaces, spatial arrangement, and amount of vegetation) of the physical environment.

A checklist was used during the observation to mark the presence and/or absence of the above-stated factors. In general, each neighborhood had special environments with special cultural mix of the society. The tables below summaries the observation results for each neighborhood (Table 8, 9, and 10).

Table 8. Summary of the observation results from Fereej Bin Mahmoud neighborhood.

Observed Indicators of Fereej Bin Mahmoud Neighborhood Vitality			
Society	Dominant Nationality		Asians and Arabs
	Dominant Gender		Males
	People Density		High
Social Environment	Activities	Economic	Trading; Shopping; Working
		Recreational	Relaxing; Sports playing
		Social	Socializing; Dining
	Pedestrinization		Not supported by the physical environment
	Diversity		Yes
	Uniqueness		No
	Social Segregation		Yes. Only expatriates were observed
	Social Occupancy		Yes
	Social Interactions		Sometimes
Physical Environment	Land Use	Planned Uses	• Multi-family residential • Commercial frontage (mixed-use) • Commercial office • Public institutions: Schools • Mosque
		Building Types	Apartment buildings; Shops/ Showrooms; Office buildings/ Banks; School; Mosque; Hotels; Restaurants; Gymnasium; Hypermarkets; Health centre

	Amenity Value	Vegetation and Shade	No
		Aesthetic Buildings	No. Only some of commercial frontages are aesthetically-appealing
	Housing Typologies	Villas	No
		Apartments	Yes
	Park	Pedestrian-Oriented	No park
		Safe	
		Famous	
		Parking Availability	
	Shops	Pedestrian-Oriented	No
		Safe	Yes
		Famous	Yes
		Parking Availability	Sometimes
	Mosque	Pedestrian-Oriented	Yes
		Safe	Yes
		Famous	Yes
		Parking Availability	Yes
	School	Pedestrian-Oriented	No
		Safe	Yes
		Famous	No
		Parking Availability	Sometimes

Table 9. Summary of the observation results from Al-Thumama neighborhood.

Observed Indicators of Al-Thumama Neighborhood Vitality			
Society	Dominant Nationality		Nationals and Arabs
	Dominant Gender		Males
	People Density		Medium
Social Environment	Activities	Economic	Trading; Shopping
		Recreational	Relaxing; Sports playing; Kids' playing
		Social	Socializing; Dining
	Pedestrinization		Yes, but not supported by the physical environment
	Diversity		Yes
	Uniqueness		No
	Social Segregation		No
	Social Occupancy		Sometimes
	Social Interactions		Sometimes
Physical Environment	Land Use	Planned Uses	• Single-family residential • Commercial frontage (mixed-use) • Commercial office • Commercial shopping center • Parks

			• Public institutions: Schools • Public institutions: Government • Mosque • Utility
		Building Types	Villas; Apartment buildings; Shops/ Showrooms; Offices; Schools; Driving School; Mosque; Hypermarket; Café; Health center
	Amenity Value	Vegetation and Shade	No
		Aesthetic Buildings	Yes
	Housing Typologies	Villas	Yes
		Apartments	Yes
	Park	Pedestrian-Oriented	No
		Safe	Yes
		Famous	No
		Parking Availability	Yes
	Shops	Pedestrian-Oriented	Yes
		Safe	Yes
		Famous	Yes
		Parking Availability	Yes
	Mosque	Pedestrian-Oriented	Yes
		Safe	Yes
		Famous	No
		Parking Availability	Yes
	School	Pedestrian-Oriented	No
		Safe	Yes
		Famous	Yes
		Parking Availability	Sometimes

Table 10. Summary of the observation results of Al-Dafna neighborhood.

Indicators of Al-Dafna Neighborhood Vitality			
Society	Dominant Nationality		Arabs, Europeans/ Americans/ Australians, and Nationals
	Dominant Gender		Males
	People Density		Medium
Social Environment	Activities	Economic	Commercial; Shopping; Trading
		Recreational	Relaxing; Sports playing
		Social	Socializing; Dining; Entertainment
	Pedestrinization		Yes, but not supported by the physical environment
	Diversity		No
	Uniqueness		Yes

	Social Segregation		Yes
	Social Occupancy		Yes
	Social Interactions		Sometimes
Physical Environment	Land Use	Planned Uses	• Multi-family residential • Commercial mixed-use • Commercial office • Commercial shopping centre • Parks • Parking • Special use district • Utility
		Building Types	Apartment towers; Office towers; Ministries; Hotels; Shopping malls; Park
	Amenity Value	Vegetation and Shade	No
		Aesthetic Buildings	Yes
	Housing Typologies	Villas	No
		Apartments	Yes
	Park	Pedestrian-Oriented	Yes
		Safe	Yes
		Famous	Yes
		Parking Availability	Yes
	Shops	Pedestrian-Oriented	No
		Safe	Yes
		Famous	Yes
		Parking Availability	Yes
	Mosque	Pedestrian-Oriented	No mosque
		Safe	
		Famous	
		Parking Availability	
	School	Pedestrian-Oriented	No school
		Safe	
		Famous	
		Parking Availability	

3.7 Chapter Summary

The methodology chapter outlined the research approach to assess neighborhood vitality in the three selected neighborhoods based on their location within Doha: Fereej Bin Mahmoud neighborhood in the downtown area, Al-Thumama neighborhood in the

suburban area, and Al-Dafna neighborhood in the waterfront area. These were selected based on two main criteria: locational distribution within Doha, and the average population density in each location. The data collection tools were identified to answer the questions about neighborhood vitality as related to the definition. A questionnaire survey for the residents, and systematic observations for the neighborhoods were used, supported by interviews with local planning authorities. Choosing the sample for participating in the survey was not restricted to any criteria, such as nationality or age. Residents who were willing to participate were considered, ensuring a fair and equal data collection. The effectiveness and applicability of the questionnaire was validated through a pilot study of ten respondents. A total of ninety questionnaires were collected from the three neighborhoods. Observations were conducted in parallel to the survey.

Data were described and analyzed to reveal initial information about the neighborhood, its society, and the daily activities. Considering the different cultural mix of the society in each neighborhood, Fereej Bin Mahmoud displayed a high level of social occupancy in streets due to the behavior of Asian bachelors who tend to spend long periods outdoors. The society has low levels of attachment to their neighborhood due, mainly, to the cultural and lifestyle differences which, in many cases, limit social interactions. Generally, the public realm lacks functionality due to the physical environment. Public spaces are not provided and streets are inaccessible. This led to a decreased sense of neighborhood place and lack of neighborhood life due to the society's behavior that is constrained by the physical environment. Suggestions to improve Freej Bin Mahmoud's public realm are centered on the provision of shaded walkways, accessible streets for diverse uses (Sitting, watching, walking, biking, etc.), park, and wayfinding signs.

On the contrary, results from Al-Thumama displayed a low level of social occupancy in streets due to the behavior of nationals and Arab families who are conservative and preservative to privacy. Unlike Fereej Bin Mahmoud, the society has high levels of attachment to their neighborhood due mainly to the cultural similarities, lifestyle compatibility, and the neighborhood's appropriateness for family residence. Generally, the public realm lacks functionality due to the society, its activities, and the physical environment. Public spaces are not provided and streets are inaccessible. This led to a decreased sense of neighborhood place and lack of neighborhood life due to the society's conservative behavior that is constrained, in many cases, by the physical environment. Suggestions to improve Al-Thumama's public realm are centered on the provision of shaded walkways, landscaped buffers along streets, accessible streets for diverse people, street furniture, neighborhood park, shops and cafes, and mosques.

Finally, analysis of Al-Dafna displayed unique results. The society is diverse and global, where the physical environment is the most unique in Doha with towers and high-rise buildings. It has moderate level of social occupancy in streets due to the presence of famous shopping malls, hotels, ministries, and office headquarters. Like Al-Thumama, the society has high levels of attachment to their neighborhood due mainly to the uniqueness of the physical environment, societies diverse lifestyles, and the excellent urban showcase. However, the public realm of Al-Dafna still lacks functionality due to the inaccessible physical environment. Public spaces are not provided and streets are inaccessible to different modes of mobility. This led to a decreased sense of neighborhood place and lack of neighborhood life in which the physical environment constrains the behavior. Suggestions to improve Al-Dafna's public realm are centered on the provision of shaded

walkways, landscaped buffers along streets, accessible streets for diverse people, street furniture, neighborhood park, and mosques.

CHAPTER 4: RESEARCH CONTEXT

4.1 Introduction

This chapter places the research in the context of Doha and concisely describes the urban profile of the study neighborhoods. First, it presents a historical overview of the urban evolution of Doha and the early formation of its *ferjan* or early neighborhoods. Discussion of the present urban conditions of the neighborhoods is attempted to emphasize the research problem where the public realm is lacking functionality. Second, it presents a focused description of each of the study neighborhoods. This includes location, urban evolution, planning approach, size, land use mix, and the society structure.

4.2 Overview of the Morphological Formation of Doha

4.2.1 Historical Overview

The city of Doha was formed during the eighteenth century under the name of Al-Bidaa, when the Al-Thani tribe moved from central Arabia to settle on the eastern coast of Qatar peninsula in 1847 (Elsheshtawy, 2011). They founded the first urban settlement along the sea shore at the location of an old fishing village (Adham, 2008). According to Wiedmann et. al. (2012), the choice of location was based on the privileged shape of the sea shore, which was believed to protect the settlement from sea attacks. Also it is noted that the presence of the water source of *Wadi Musherieb* (Musherieb Valley) has helped Doha's center to evolve linearly along the *Wadi*, being based mainly on trading activities (Qawasmeh, 2013) (Figure 47). This has resulted in the development of Souq Waqif

(market), which is considered today as a historical value to Qatar's heritage (Jaidah and Bourennane, 2009).

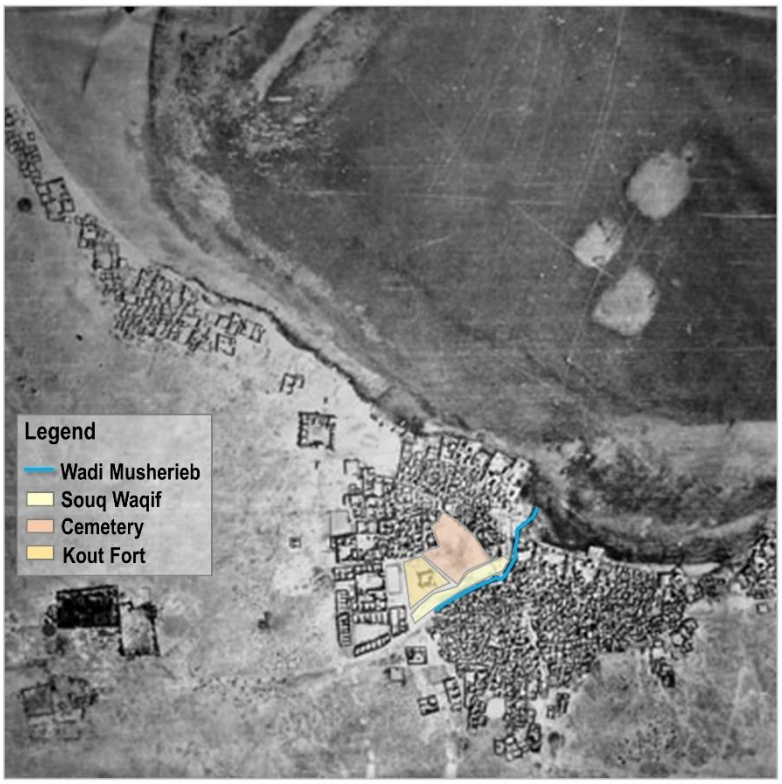

Figure 47. Agglomeration of housing units along Wadi Musherieb and Souq Waqif in Al-Bidaa forming the first urban settlements (source: Lockerbie, 2016).

During the first decades of the twentieth century, Al-Bidaa witnessed a notable increase in the number of its population due to the flourishing pearl trade at that time. Before oil discovery in 1939, Doha was a fishing village where houses were built based on the inherited knowledge of the local population using local building materials (Wiedmann et. al., 2014). Houses of one family were grouped together forming residential neighborhoods. In these neighborhoods, houses were built in close proximity to each other, usually wall on wall, due to their strong social affiliation (Wiedmann et. al., 2012). Housing agglomerations were created organically around Wadi Musherieb and the Souq Waqif area.

According to Adham (2008), Al-Bidaa was developed into eight urban settlements along the sea shore responding to the need for land distribution among tribes and the allocation of water sources. This is considered the first phase of neighborhood development in Doha, which is called *fereej* (plural: *ferjan*) in the local language (Jaidah and Bourennane, 2009). Later, after World War I, Al-Bidaa was renamed Doha and announced as the capital city of the state of Qatar shortly after independence through an agreement between Sheikh Mohamed Bin Thani, the ruler, and the British generals at that time (Wiedmann et. al., 2012).

During the first half of the twentieth century, the population of Doha consisted mainly of Al-Thani tribe in addition to groups of Persian immigrants, who were mainly engaged in boat construction and pearl trading. As pointed out by Adham (2008), each social group was segregated in specific areas in which the harbor, souq, and mosque used to be the main gathering places of all Doha's population. These were the main urban elements that neighborhoods (*ferjan*) in Doha developed around. Namely, it can be comprehended from the review that neighborhoods in Doha have developed essentially from the agglomeration of housing units around core areas including the mosque and the souq (Jaidah and Bourennane, 2009). That said, commercial and socio-religious traditions have controlled the development of the physical environment of Doha giving it a unique urban character (Eissa et. al., 2015). Unlike the case of other cities all over the world, the development of Doha's neighborhoods during the oil urbanization stage was a direct reflection of rigid public control and planning based on imported urban development concepts from the West (Wiedmann et. al., 2014).

During the second half of the twentieth century, Doha underwent a great wave of

urbanization that resulted from the economic flourishing of oil discovery (Elsheshtawy, 2011). In 1974, the first master plan of Doha was developed by foreign urban planners who transformed its dense, organic urban fabric into a ring-planned pattern (Salama and Wiedmann, 2012). Doha was developed into several zones that are defined by a network of linear roads and ring roads (Figure 47). According to Lockerbie (2016), the physical planning of Doha was based on the traditional system of *majlis al-shura* (consultative council) in which western-style ministries were established to control the urban development of the city. The planning process of Doha was the province of the Ministry of Public Works at that time (Lockerbie, 2016). In light of this, the morphological formation of Doha can be envisaged as follows: street network, zones, and neighborhoods. According to Qatar Atlas (2010), the municipality of Doha has 58 zones (Figure 48). Each zone has a number of neighborhoods that are not solidly defined in the administrative setup of Doha (Qatar Atlas, 2010).

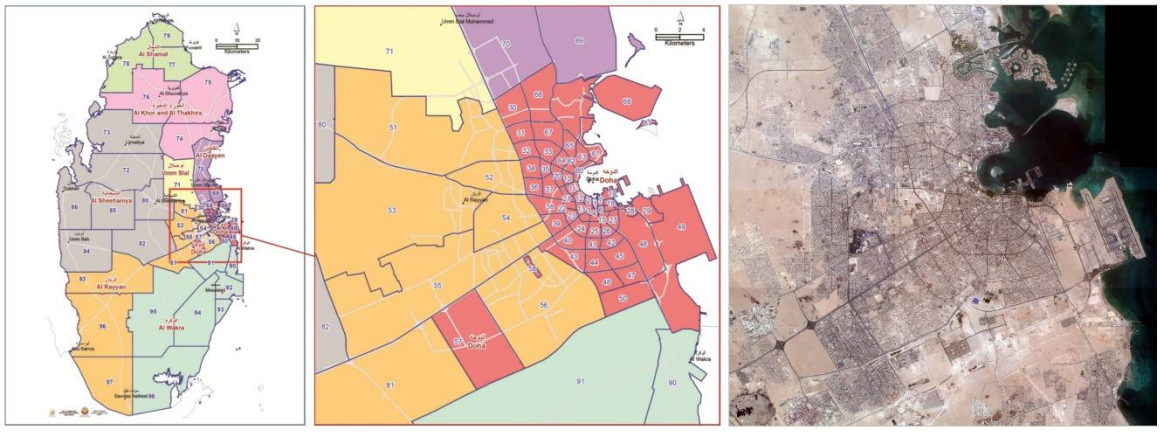

Figure 48. Administrative set-up map of Doha's zones (source: Qatar Atlas, 2010).

4.2.2 Current Urban Conditions of Doha City

In the present time, Doha is being restructured from internally-integrated wholes to

a collection of units which operate as nodes on regional economic networks (Elsheshtawy, 2011). Doha's traditional core (the downtown area) is being blended into a network of centers forming a multi-tier system with complex relationships that keeps the city from disintegrating (Wiedmann et. al., 2014). It is noted that forces of globalization have major impacts on Doha's urban environment, affecting both the socio-cultural and physical aspects of the city (Furlan, 2016). With the emergence of a global culture, the spatial experiences and feelings within the urban environment in Doha are being radically altered (Elsheshtawy, 2011). This is also affecting the social construction of local identities in Doha which poses a challenge to the general quality of the public realm. Therefore, it was suggested that aspects of urban vitality could be assessed and fostered in order to guarantee a well-functioning public realm, leading to a high quality of urban life (Figure 49).

Figure 49. Satellite imageries of Doha illustrating the major urban transformations and expansion in the twenty-first century (source: Qatar Urban Planning Authority, 2015).

Since the start of the twenty-first century, Doha has tried to develop urban vitality around its historical core (the downtown neighborhoods), yet the city has serious traffic and transportation problems and could certainly not be described as vital in its current form (Wiedmann et. al., 2014). Such problems have affected many neighborhoods and have transformed them into inhuman spaces which reduce the quality of neighborhood life and

social cohesion. Many newly introduced streets in Doha are being utilized as movement channels for vehicles rather than a capable space for social life. In general, it was concluded that the physical environment of Doha has low concerns for social needs.

Assessing vitality at the scale of the neighborhood gave insights into how to foster high degrees of neighborhood vitality in Doha. However, the challenge was that higher degrees of vitality become concentrated in the downtown and waterfront neighborhoods in Doha, while suburban and fringe neighborhoods were left with lower degrees of neighborhood vitality. Therefore, the assessment was based on the locational distribution of neighborhoods in Doha.

4.3 Neighborhoods of Doha

The old neighborhoods of Doha (*ferjan*) were created based on the social and religious values with higher degrees of vitality as compared to the neighborhoods of today (Jaidah and Bourennane, 2009). According to Wiedmann et. al. (2012), neighborhoods in Doha evolved in an organic fashion based on the principle of a cell, namely the courtyard house, multiplied into clusters (Figure 50). These residential clusters were connected to the central backbone of the settlement –the harbor, souq, and mosque. During the 1970s, all of the old neighborhoods in Doha were replaced by new planned neighborhoods, and the local population (nationals) were moved to new suburban areas such as Medinat Khalifa, Al-Gharrafa, and Al-Rayyan zones to the north-west of the city (Wiedmann et. al., 2012). At that time, these modern suburban neighborhoods stood on equally sized rectangular plots accessed by an orthogonal grid of roads, which represents a western style of neighborhood planning.

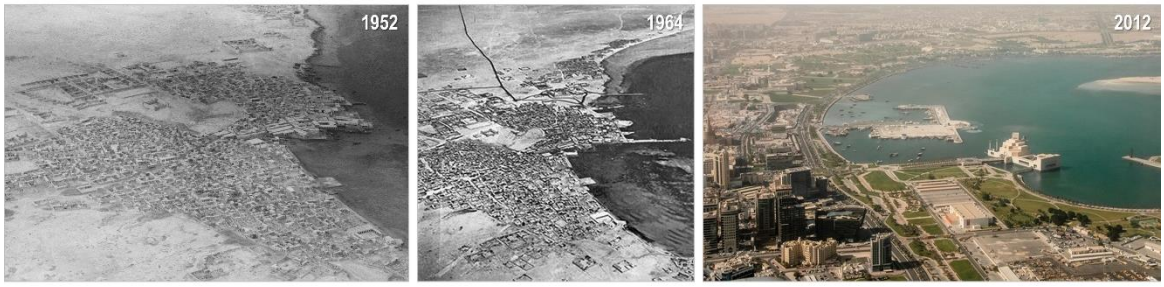

Figure 50. Aerial views of the changing urban morphology of Doha throughout decades.

The existing neighborhoods of Doha are affected by the rapid wave of urbanization as a result of Qatar's participation in mega sporting events. This impact is seen in the current lack of neighborhood life that is represented in the lack of vitality: a fact that seriously touches the public realm of the whole of Doha. As pointed out by Wiedmann et. al. (2012), the existing neighborhoods of Doha are nothing but a "monotonous suburban residential areas that are characterized by gated houses and streets, resulting in a severe lack of a sense of community and the deserted urban environment". It is implied that targeting higher degrees of neighborhood vitality will maximize the possibility of Doha's neighborhoods to become vital areas with an active public realm that serves the community, and at the same time adds to the overall vitality of the city. As pointed out by Barton et. al. (2010), introducing urban vitality in neighborhoods is the foundation for communities to thrive.

As discussed in the literature review chapter, and according to Montgomery (1998), successful neighborhoods must combine three essential elements: the physical space, the unique sensory experience, and activities of the residents. This is what constitutes the desired sense of neighborhood place and an active neighborhood life. Therefore, assessment of neighborhood vitality in Doha is the purpose of this thesis. However, to do this, it is required first to establish a concrete definition of the core concepts, in relevance

to the local context of Doha, in order to identify their defining factors. This is where the identified factors of neighborhood vitality will be operationalized to collect data and start the assessment.

The selected neighborhoods for the study were assessed based on the following aspects: neighborhood profile, society profile, daily activities performed at the neighborhood (social environment), and amenity value of the neighborhood's physical environment.

4.3.1 Downtown Neighborhood: Fereej Bin Mahmoud

Fereej Bin Mahmoud is located in the downtown of Doha, adjacent to Mushiereb area in which Souq Waqif is located (Figure 51). It is one of the highly-populated residential districts in Doha. According to the satellite imageries of Doha's urban evolution, the boundaries of Fereej Bin Mahmoud started to appear in the 1970s (Figure 52). The name of the neighborhood is related back to the old settlement of the first Qatari family who occupied the land: Al-Mahmoud (Atlas, 2010). Fereej Bin Mahmoud means, therefore, the neighborhood of Al-Mahmoud family as the case of many of the downtown neighborhoods such as Al-Asmakh, Al-Ghanim, Al-Jufairi, Al-Hitmi, Al-Derham etc.

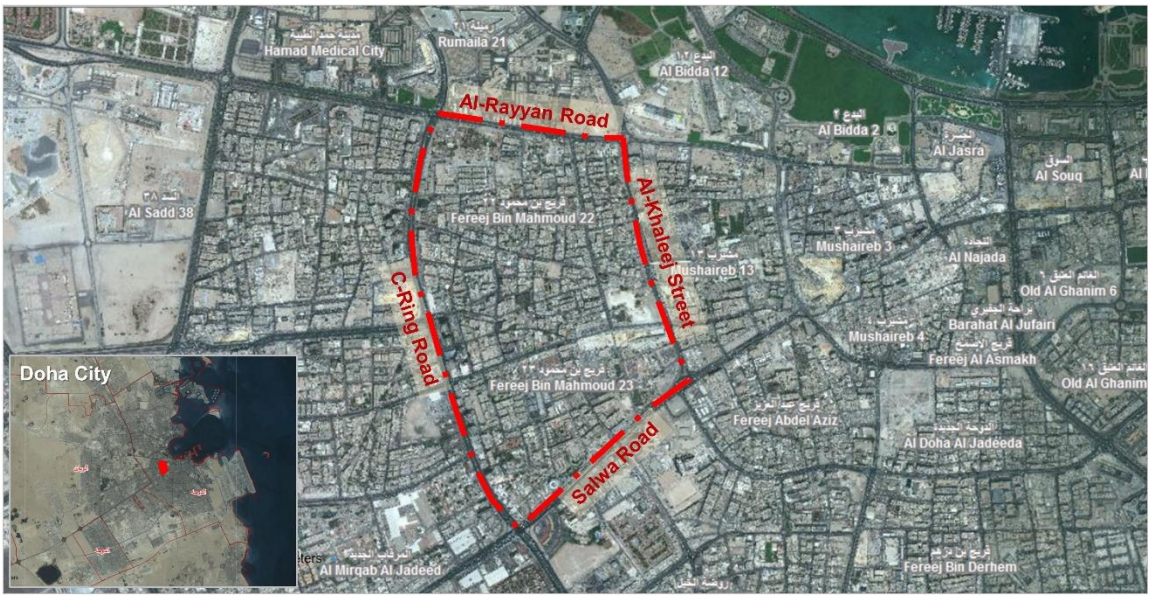

Figure 51. Location map of Fereej Bin Mahmoud in Doha (source: Qatar Geo-Portal Map, 2016).

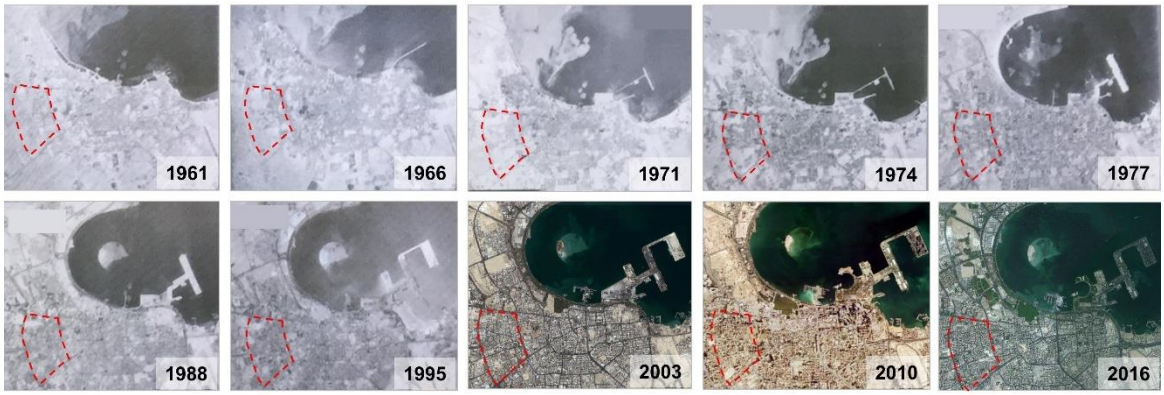

Figure 52. Urban evolution of Fereej Bin Mahmoud throughout years (source: Qatar Atlas, 2010).

As compared to other neighborhoods in the downtown area, Fereej Bin Mahmoud has a large area accounting to almost 1.8 square kilometers (Qatar Atlas, 2010). In fact, the large size of the neighborhood increases its potential for more activities to take place keeping the downtown area active as it is. This was clear during the observations where the vital commercial places encourage diverse activities to take place. This is also supported by the direct link of Fereej Bin Mahmoud to arterial roads such as the C-Ring Road and

Salwa Road. Particularly, it is bounded by the C-Ring Road from the west, Al-Khaleej Street from the east, Salwa Road from the south, and Al-Rayyan Road from the north. The neighborhood's location within arterial roads makes one of the well-known and significant neighborhoods in Doha. According to the observations, a number of significant commercial and lodging destinations are located in Fereej Bin Mahmoud adding to its touristic value. This justifies the dominance of foreigners in the neighborhood who greatly activate its public realm (Figure 53).

Figure 53. Streets' condition in Fereej Bin Mahmoud (a. Signage and residential frontages; b. Retail and commercial footages; c. Parking accommodation and building facades in a local road; d. Enhanced street conditions along the C-Ring road).

As per the land use map of Doha 2008, Fereej Bin Mahmoud is planned to have mix of uses. Its major land use is multi-family residential that is bounded by commercial uses.

The neighborhood has one type of housing represented in apartment buildings only. Therefore, housing diversity is not a prominent feature of the neighborhood. Also, as per the land use map, Fereej Bin Mahmoud stands as a commerce-oriented neighborhood where public open spaces are not present. Lack of green parks and public sitting areas decreases the functionality of the neighborhood's public realm. Considering the large area of the neighborhood, the planned public services (such as mosque, school, and hypermarkets) are few as compared to the dominant residential land use (Figure 54).

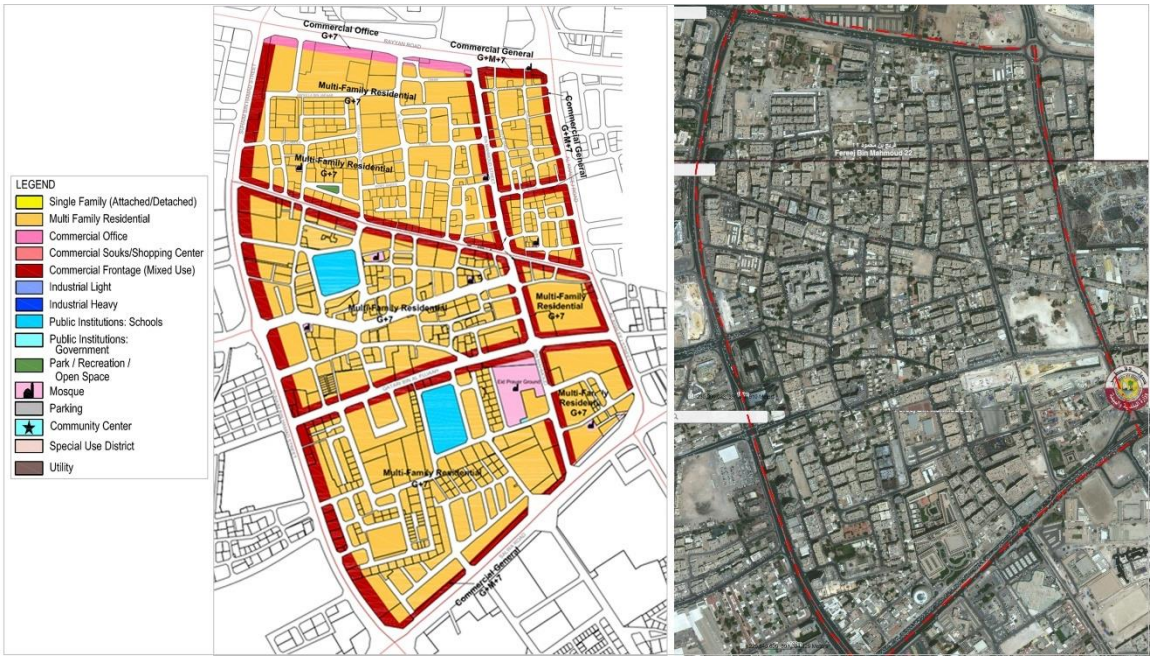

Figure 54. Land use map of Fereej Bin Mahmoud as per the 2008 survey (source: Qatar Urban Planning Authority, 2015).

4.3.2 Suburban Neighborhood: Al-Thumama

Al-Thumama neighborhood is a relatively new and fast-emerging neighborhood. It is located in the south of Doha, adjacent to the old airport and is bounded by arterial roads such as the E-Ring Road and the F-Ring Road. It has a strategic location that provides easy and quick access to Hamad International Airport. In particular, Al-Thumama neighborhood

is bounded by the E-Ring Road from the north, the F-Ring Road from the south, Al-Matar street from the east, and Najma street from the west (Figure 55). Its planning started in the 1990s where modern grid-like physical organization was followed (Figure 56).

Figure 55. Location map of Al-Thumama neighborhood in Doha (source: Qatar Geo-Portal Map, 2016).

Figure 56. Urban evolution of Al-Thumama throughout years (source: Qatar Atlas, 2010).

Al-Thumama neighborhood is a medium-populated neighborhood that is occupied by a considerable number of nationals. The neighborhood has a landscaped walkway along its boundary with the E-Ring Road. This walkway is used by some of the neighborhood's residents for walking, cycling, sitting, and socializing. However, the planned park is not physically present in the neighborhood leaving it as vacant land.

As per the land use map of Doha 2008, Al-Thumama is planned as a modern residential area where public services are in the center surrounded by residential land uses. Single-family houses are the dominant housing typology. However, the existing residential fabric of the neighborhood includes diversity of housing for both villas and apartments. The eastern boundary of Al-Thumama is a commercial mixed use frontage where significant shops and showrooms are located. The neighborhood has a diversity of schools: governmental secondary school, governmental primary school, private international school, private Indian school, and a driving school. Also, a number of mosques are centrally distributed in the neighborhood. A neighborhood park is planned but is not implemented leaving the site empty and currently used as a parking space (Figure 57).

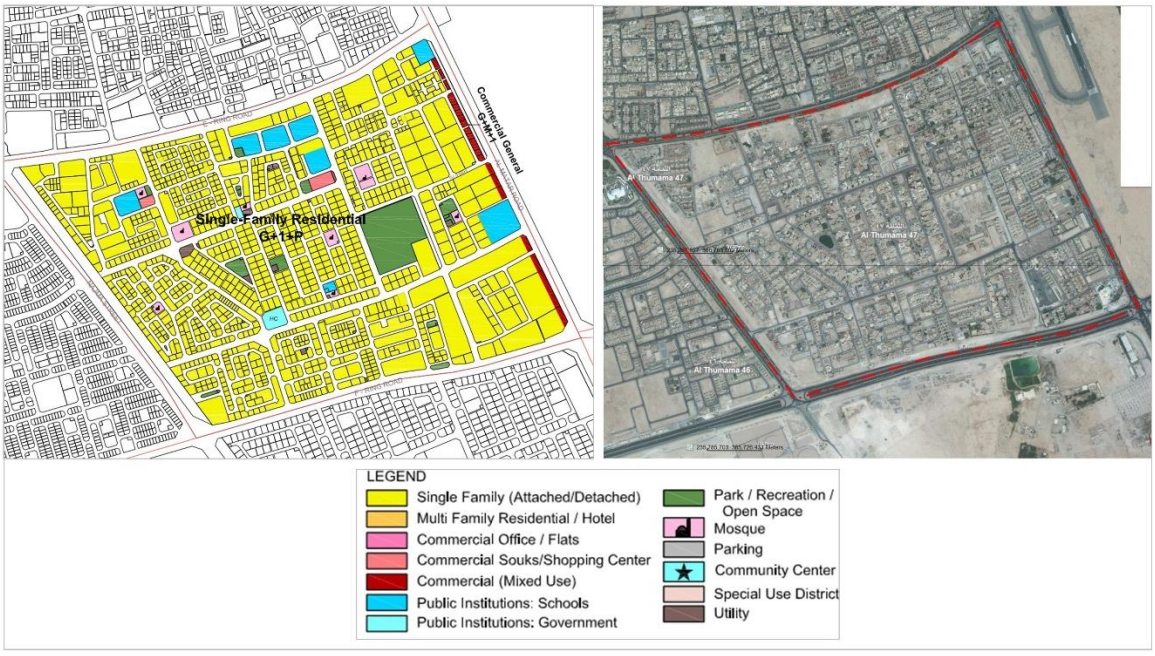

Figure 57. Land use map of Al-Thumama neighborhood as per the 2008 survey (source: Qatar Urban Planning Authority, 2015).

4.3.3 Waterfront Neighborhood: Al-Dafna

Al-Dafna neighborhood has a special location and character in Doha. It is located

along the sea coast of north Doha hosting high-rise buildings and towers that give Doha its unique skyline (Figure 58). The site of Al-Dafna is reclaimed utilizing the shallow waters to develop the land boundaries. This is what gives it its name, Al-Dafna, meaning the dredged land.

Figure 58. Location map of Al-Dafna in Doha (source: Qatar Geo-Portal Map, 2016).

As the first high-rise neighborhood in Doha, Al-Dafna has gone through massive urban transformation which was significantly recognized from 2003 to 2006 and continues until the present time (Abdelbaset, 2015) (Figure 59). It was planned to be the new business district that would include most of the ministries and governmental buildings. It enjoys a waterfront of 1.5 kilometers length which used to host embassies and diplomatic organizations (Abdelbaset, 2015). However, recently the government has reallocated the embassies in an attempt to utilize the strategic waterfront of Al-Dafna for beach-based activities. It is noteworthy that the future Sharq Crossing will connect Al-Dafna neighborhood to The Pearl in the north and to Hamad International Airport in the south.

Generally, the past, present, and future of Al-Dafna neighborhood place it among the most significant areas in Doha that give it the image and urban character.

Figure 59. Urban evolution of Al-Dafna throughout years (source: Qatar Atlas, 2010).

As per the land use map of Doha 2008, Al-Dafna neighborhood has special planning since its use has been changed from single-family residential to high-rise multi-family residential (Abdelbaset, 2015). The government has reallocated the area to serve as the new business district with mixed-use towers. Therefore, Al-Dafna has one type of housing typologies represented in high-end apartment towers targeting high income groups. As per the land use map, commercial uses are more dominant than residential uses in Al-Dafna. Offices, shopping malls, mixed-use commercial centers, and hotels are more prominent than residential towers in the area. Special use areas are present in Al-Dafna making it subject to future planning and zoning attempts by the government. A number of pocket parks are planned but are not implemented leaving the site empty and currently used for parking. A considerable number of areas are planned for parking uses, distributed mainly around the commercial uses (Figure 60).

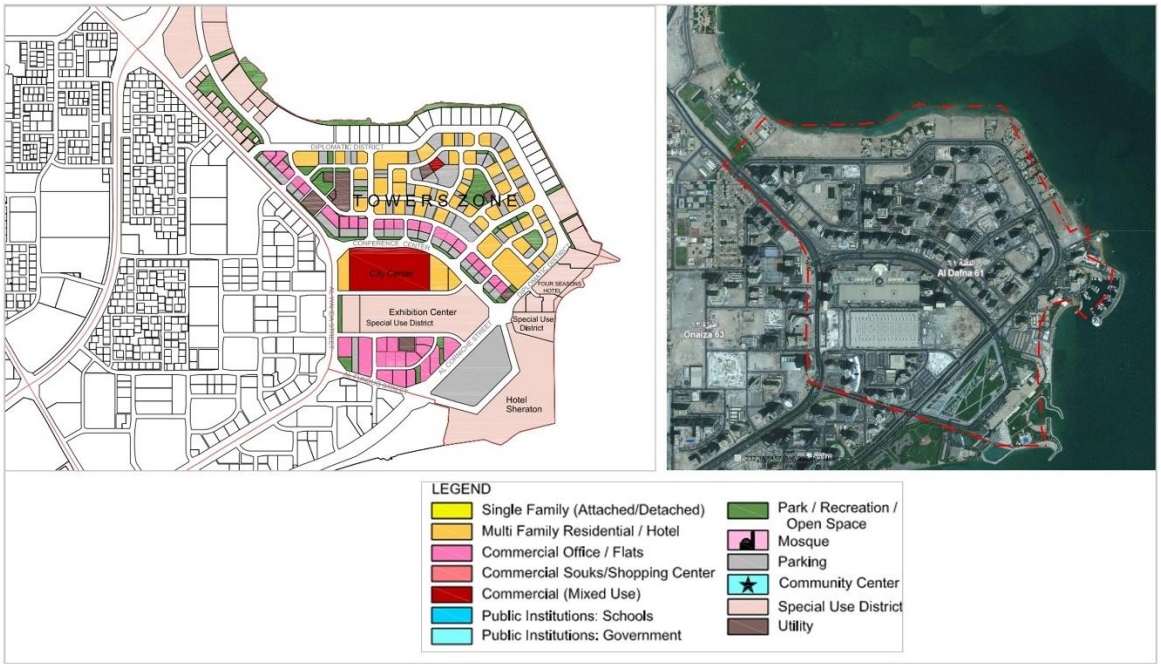

Figure 60. Land use map of Al-Dafna neighborhood as per the 2008 survey (source: Qatar Urban Planning Authority, 2015).

4.4 Chapter Summary

Doha has evolved from the agglomeration of small housing settlements which have grown with time forming *ferjan* (traditional neighborhoods). Commercial and socio-cultural, and religious traditions have controlled the development of Doha's physical environment. After the discovery of oil and gas in the 1939, Doha has grown in size responding to the migration flows to begin its massive urbanization. The development of the neighborhoods of Doha during the oil urbanization stage were a direct reflection of rigid public control and planning based on imported urban development concepts from the West. During the second half of the twentieth century, Doha has undergone a great wave of urbanization that has resulted from the economic flourishing. Doha was developed into several zones that are defined by a network of linear roads and ring roads. In summary, the

morphological formation of Doha was based on: street network, zones, and neighborhoods.

The traditional neighborhoods of Doha (*ferjan*) were created based on social and religious values, giving them higher degrees of vitality as compared to the contemporary neighborhoods. They grew around the central backbone of Doha at that time (the harbour, souq, and mosque). During the 1970s, all the old neighborhoods in Doha were replaced by new planned neighborhoods, and the local population (nationals) were moved to suburban areas. The rapid wave of urbanization due to participation in mega sporting events and aspiration towards urban excellence has significantly affected the existing neighborhoods of Doha. The impact is seen in the current lack of neighborhood life that is represented in the lack of vitality. Lack of neighborhood vitality reflects the lack of functionality of the city's public realm. The three selected neighborhoods for study (Fereej Bin Mahmoud, Al-Thumama, and Al-Dafna) were selected based on location in ord0er to tackle all of the urban layers of Doha's development (downtown, suburban, and waterfront).

Fereej Bin Mahmoud emerged in the 1970s where it is one of the highly-populated neighborhoods in Doha. It is dominated by multi-family residences of affordable apartment buildings. It is occupied by expatriates only (mainly Asians and a few Arabs). It is a busy neighborhood in which diverse activities take place. On the other hand, Al-Thumama is a newly-planned neighborhood. It is dominated by single-family residences of stand-alone villas and compound villas. It emerged in the 1990s. It has low population density and is mainly occupied by nationals and some Arabs. Similarly, Al-Dafna is a unique and significant neighborhood in Doha where it represents its image and famous skyline. It is dominated by luxurious multi-family residences of towers and high-rise buildings. It is occupied mainly by Europeans/ Americans/ Australians and some high-income Arabs. The

description of each neighborhood reflects the influential factors on the location: lifestyle, income groups, social segregation, and the local planning regulations.

CHAPTER 5: RESEARCH FINDINGS AND DISCUSSION

5.1 Introduction

This chapter presents the findings of the thesis in which judgments of the degree of vitality of neighborhoods in three locations is presented. The assessment was based on discussing the obtained results with respect to the local climate, culture, and context of Doha. These considerations were concluded from the analysis as significantly influencing the vitality of neighborhoods in Doha. Factors such as multi-cultural societies, lifestyle, income groups, social segregation, and local planning regulations, can be accommodated in commitment and consideration to the local climate, culture, and context. Discussions and findings of the neighborhood vitality with respect to location is, therefore, judged through the specified considerations along with the qualities of the public realm (accessibility, safety, and equity). Concepts of the sense of neighborhood place and neighborhood life were judged in view of the obtained results. At the end, an overall assessment of all neighborhoods was concluded to address the research aim and state the degree of neighborhood vitality in Doha.

5.2 Data Analysis

5.2.1 Discussion of the Results: Fereej Bin Mahmoud Neighborhood

The survey results reflect that Fereej Bin Mahmoud neighborhood is occupied only by expatriates who have low levels of attachment to it. Due to the cultural differences (Asians and Arabs) of its society, opportunities for social interactions are very low. Also, considering the absence of nationals (Qataris) from the neighborhood, this cultural inconsistency has resulted in social segregation and, thus, lack of social interactions. To

wit, the neighborhood's social environment has low levels of vitality where knowledgeability of neighbors is also low leading to fewer interactions and social bonding. According to the survey results, Fereej Bin Mahmoud lacks the neighborhood life which makes its public realm less active and, thus, not vital in terms of the society and its activities (Figure 61).

Figure 61. Social environment of Fereej Bin Mahmoud neighborhood (source: author).

Similarly, the physical environment of Fereej Bin Mahmoud is not supportive to social occupancy, interactions, and bonding. As implied from the survey results, the physical environment is not attractive for people to perform activities outside. In general, the majority of opinions agree that it is not beautiful and not safe. Streets are designed only for vehicles which makes driving the most performed activity and walking the least performed activity. Pedestrianization is not considered and, thus, the society lacks feeling

safe in terms of traffic and the general use of streets (Figure 62). Also, Fereej Bin Mahmoud lacks green spaces and a neighborhood park. This greatly discourages people to go outside and socialize. In total, the public realm of Fereej Bin Mahmoud is not well-designed where streets are not complete and public spaces are not provided. However, its location in the center of the city makes it highly preferred and desired (Figure 63).

Figure 62. Existing streets in Fereej Bin Mahmoud neighborhood (source: author).

Figure 63. Physical environment of Fereej Bin Mahmoud neighborhood (source: author).

Some changes and/or additions are suggested by the respondents to enhance the public realm of Fereej Bin Mahmoud and, thus to create a unique life within. The majority need the provision of shaded walkways with landscaped buffers along the streets. This will guarantee social occupancy and safety for both pedestrians and vehicles. The physical environment is seen as not properly adapted to the hot weather of Doha. Vegetation is greatly needed in the neighborhood where it enhances the overall environment and also encourages social occupancy and interactions. A common agreement was the need to use the streets for diverse activities: walking, sitting, watching, shopping, etc. However, requirements of wayfinding were highly important. According to the respondents, almost all of them want to be familiar with the neighborhood's facilities and surroundings. This informs the need to equip the streets with a proper signage system and directive walkways.

Additionally, a green park with water features needs to be provided for recreation and family-oriented activities. This will fulfil the society's needs for a neighborhood park where diverse activities take place.

5.2.2 Discussion of the Results: Al-Thumama Neighborhood

The survey results reflect that Al-Thumama neighborhood is occupied by both nationals and expatriates. Due to some cultural and social differences (Qataris and Arabs) of its society, opportunities for social interactions are low. Considering the conservative nature of the Qatari society, social interactions are less dominant in the neighborhood where a dedicated place for each family is used for socializing and interactions (the *majlis*) (Jaidah and Bourennane, 2009). According to the results, living at Al-Thumama was either because of a personal preference or because it is the family neighborhood (*fereej*). This reflects the higher levels of neighborhood attachment as compared to the downtown neighborhood: Fereej Bin Mahmoud. However, the social environment of Al-Thumama lacks vitality where knowledgeability of the neighbors is low leading to less interactions and social bonding. According to the survey results, Al-Thumama somehow lacks the neighborhood life which makes its public realm less active and, thus, not vital in terms of the society and its activities.

Similarly, the physical environment of Al-Thumama needs some enhancements in regards to its amenity value. The absence of a neighborhood park and green spaces discourages, in many cases, social occupancy and interactions. As implied from the survey results, the physical environment lacks social nodes such as cafes, shops, and parks which are needed to activate the public realm. Al-Thumama's physical environment is very safe

and somewhat beautiful as agreed by most respondents. The provision of vegetation and shaded walkways and places for pedestrians will add to its safety and beauty. Streets are somewhat well-designed and maintained but still lack the needed support for pedestrianization (Figure 64). Public spaces are not provided, but the available pockets are somewhat well-design and maintained. This justifies the major activity in the neighborhood as driving and sometimes walking during evening times. In total, the public realm of Al-Thumama is not well-designed. Streets are not complete in many places, and public spaces are not provided. However, its location near the airport makes it highly preferred and desired. Unlike its physical design that requires diversity of land uses, public spaces and green areas.

Figure 64. Existing streets in Al-Thumama neighborhood (source: author).

Some changes and/or additions are suggested by the respondents to enhance the public realm of Al-Thumama and, thus to create a unique life within. The majority need the provision of shaded walkways with landscaped buffers along the streets. This will

guarantee social occupancy and add to the beauty of its physical environment which is currently not adapted to the hot weather of Doha. Vegetation is greatly needed in the neighborhood where it enhances the overall environment and also encourages social occupancy and interactions. A common agreement was the need for more mosques in the neighborhood, considering its dominant Muslim society. An adverse agreement was there being less preference for Al-Thumama as a neighborhood with different cultures and nationalities. This implies the need for social segregation where lifestyles are different. In fact, the local society of Doha has a special lifestyle and traditions which are less conducive to being open to multi-cultures. Additionally, a green park needs to be provided for recreation and family-oriented activities. This will fulfil the society's needs for a neighborhood park where diverse activities take place, especially for their children (Figure 65).

Figure 65. Physical environment of Al-Thumama neighborhood (source: author).

5.2.3 Discussion of the Results: Al-Dafna Neighborhood

The survey results reflect that Al-Dafna neighborhood is occupied by expatriates, mainly Arabs and Europeans/ Americans/ Australians. According to the results, living in Al-Dafna was either because of personal preferences or because residence was provided as work accommodation. Like the AL-Thumama, this reflects the higher levels of neighborhood attachment as compared to Fereej Bin Mahmoud. Knowledgeability of neighbors among the society of Al-Dafna is high where most of the respondents know most of their neighbors. This shows a higher level of social bonding as compared to Al-Thumama and Fereej Bin Mahmoud societies. However, and according to the results, Al-Dafna somehow lacks the neighborhood life which makes its public realm less active and, thus, not vital in terms of the society and its activities. Prominently, this is because of the physical environment. Social interactions among the society are limited due to the physical design of Al-Dafna. This is confirmed by the survey results where streets and public spaces are less supportive to pedestrianization. Vehicular dominance causes less traffic safety and, thus, decreases social occupancy in many cases. Public spaces are sparse, a fact that discourages social interactions in the neighborhood. However, the existing streets and public spaces were said to be well designed and maintained in Al-Dafna neighborhood.

The unique towers of Al-Dafna place it in a unique position among other waterfront neighborhoods in Doha. All of the respondents feel proud and happy living in Al-Dafna neighborhood in which they see it beautiful and impressive. This gives special considerations in assessing the physical environment of Al-Dafna where issues of streets-buildings relationship, human scale, and urban intimacy change the behavior of the society

(Figure 66). According to the results, and despite the less supportive design to pedestrian accessibility, the society feel happier and more satisfied with living in their neighborhood. This can be explained by its uniqueness in defining the image of Doha city and in being very rich in services and facilities.

Figure 66. Existing streets of Al-Dafna neighborhood (source: author).

However, some enhancements to the physical environment of Al-Dafna are suggested in regards to its amenity value. The absence of a nearby park and green spaces discourages, in many cases, social occupancy and interactions. The provision of vegetation and shaded walkways for pedestrians and cyclists are placed among the significant enhancements to Al-Dafna. The notion of 'complete streets' needs to be adapted towards better mobility patterns. Public spaces are not provided, but the available pockets are somewhat well-designed and maintained. This justifies the major activity at the

neighborhood as driving which reflects the low levels of social occupancy during different times of the day. In total, the public realm of Al-Dafna is not well-designed where streets and public places should be accessible to pedestrians and cyclists, as they are to vehicles. Like Fereej Bin Mahmoud and Al-Thumama, the location of Al-Dafna is the most preferred characteristic, whereas its physical design is the least preferred (Figure 67).

Figure 67. Physical environment of Al-Thumama neighborhood (source: author).

Some changes and/or additions are suggested by the respondents to enhance the public realm of Al-Dafna and, thus, create the quality life within. The majority need the provision of shaded walkways with landscaped buffers along the streets. This would guarantee social occupancy and would add to the beauty of its physical environment, which is currently not adapted to the hot weather of Doha. Issues of urban heat islands are among the major problems in Al-Dafna's public realm. Vegetation is greatly needed in the neighborhood where it enhances the overall environment and also encourages social

occupancy and interactions. A common agreement was the need for a well-designed nearby park and accessible streets. An adverse agreement was there being less preference for keeping personal privacy and limiting public interactions. This mirrors the unique lifestyles of the society which are more conductive to socializing and multi-cultural openness.

5.3 Calculation of Neighborhood Vitality Index

The calculation of the neighborhood vitality index was approached through determining the neighborhood vitality index that is based on the individual score of socio-cultural, experiential, and spatial dimensions. The aggregated score would relate to the neighborhood life that is supported by a well-designed public realm. The detailed calculation sheets are included in Appendix C.

5.3.1 Vitality Index of Downtown Neighborhoods

Table 11. Downtown neighborhood vitality indexation.

Indicators	Level of Achievement	Dimension Score	Neighborhood Vitality (NV) Index
Heterogeneity of the society	1 - ***2*** - 3	Socio-Cultural Vitality score **7/9** (7/9) x 33% = **26%**	**67%** Moderately Vital
Behavior of the society	1 - 2 - ***3***		
Level of occupancy	1 - ***2*** - 3		
Pedestrinaization	1 - ***2*** - 3	Experiential Vitality score **8/12** (8/12) x 45% = **30%**	
Diversity of activities	1 - ***2*** - 3		
Uniqueness of activities	***1*** - 2 - 3		
Time of happening	1 - 2 - ***3***		
Place characteristics	***1*** - 2 - 3	Spatial Vitality score **3/6** (3/6) x 22% = **11%**	**Neighborhood Vitality Index Scale** **1% to 35%** Not Vital **36% to 70%** Moderately Vital **71% to 100%** Vital
Morphology of the physical environment	1 - ***2*** - 3		

5.3.2 Vitality Index of Suburban Neighborhoods

Table 12. Suburban neighborhood vitality indexation.

Indicators	Level of Achievement	Dimension Score	Neighborhood Vitality (NV) Index
Heterogeneity of the society	1 - ***2*** - 3	Socio-Cultural Vitality score **4/9** (4/9) x 33% = **15%**	**57%** Moderately Vital
Behavior of the society	***1*** - 2 - 3		
Level of occupancy	***1*** - 2 - 3		
Pedestrinaization	1 - ***2*** - 3	Experiential Vitality score **6/12** (6/12) x 45% = **23%**	
Diversity of activities	***1*** - 2 - 3		
Uniqueness of activities	***1*** - 2 - 3		
Time of happening	1 - ***2*** - 3		
Place characteristics	1 - 2 - ***3***	Spatial Vitality score **5/6** (5/6) x 22% = **19%**	**Neighborhood Vitality Index Scale** **1% to 35%** Not Vital **36% to 70%** Moderately Vital **71% to 100%** Vital
Morphology of the physical environment	1 - ***2*** - 3		

5.3.3 Vitality Index of Waterfront Neighborhoods

Table 13. Waterfront neighborhood vitality indexation.

Indicators	Level of Achievement	Dimension Score	Neighborhood Vitality (NV) Index
Heterogeneity of the society	1 - 2 - ***3***	Socio-Cultural Vitality score **8/9** (8/9) x 33% = **29%**	**82%** Vital
Behavior of the society	1 - 2 - ***3***		
Level of occupancy	1 - ***2*** - 3		
Pedestrinaization	1 - ***2*** - 3	Experiential Vitality score **10/12** (10/12) x 45% = **38%**	
Diversity of activities	1 - 2 - ***3***		
Uniqueness of activities	1 - ***2*** - 3		
Time of happening	1 - 2 - ***3***		
Place characteristics	1 - ***2*** - 3	Spatial Vitality score **4/6** (4/6) x 22% = **15%**	**Neighborhood Vitality Index Scale** **1% to 35%** Not Vital **36% to 70%** Moderately Vital **71% to 100%** Vital
Morphology of the physical environment	1 - ***2*** - 3		

5.3.4 Cross Tabulation Analysis

Table 14. Cross tabulation table of neighbourhood vitality indexations.

	Indicators	Fereej Bin Mahmoud (Downtown Neighborhood)			Al-Thumama (Suburban Neighborhood)			Al-Dafna (Waterfront Neighborhood)		
		Level of Achievement	Dimension Score	NV Index	Level of Achievement	Dimension Score	NV Index	Level of Achievement	Dimension Score	NV Index
Socio-Cultural	**Heterogeneity of the society**	2	26%		2	15%		3	29%	
	Behavior of the society	3			1			3		
	Level of occupancy	2			1			2		
Experiential	**Pedestrinaization**	2	30%		2	23%		2	38%	
	Diversity of activities	2			1			3		
	Uniqueness of activities	1			1			2		
	Time of happening	3			2			3		
Spatial	**Place characteristics**	1	11%		3	19%		2	15%	
	Morphology of the physical environment	2			2			2		
				67%			**57%**			**82%**

5.4 Assessment of Neighborhood Vitality

In the three studied neighborhoods, the design of the public realm was more oriented towards vehicles, a fact that significantly affected their degree of vitality. This relates back to the public realm of the whole of Doha which lacks pedestrian accessibility in many cases (Al-Shawish, 2015). The vehicular dominance in Doha as the main transportation mean decreases the potential of pedestrian occupancy and interactions on all scales.

In general, the neighborhoods of Doha were found to be socially segregated according to their location in the city. Downtown neighborhoods are occupied by expatriates only, mainly Asians and Arabs, whereas nationals and some Arabs occupy the suburban neighborhoods. Waterfront neighborhoods are more luxury-oriented where the amenity value is the highest as compared to the downtown and suburban neighborhoods. These are mainly occupied by Europeans/ Americans/ Australians and high-income Arabs. Therefore, it was implied that a number of factors were found to affect the degree of neighborhood vitality in Doha as related to the society and the physical environment: lifestyle, income groups, social segregation, and planning regulations. The multi-cultural society of neighborhoods in Doha has different lifestyles and income groups. This make neighborhoods subject to social segregation that is enforced by the planning regulations.

5.4.1 Vitality of Downtown Neighborhoods of Doha

Based on the survey and observation results, the downtown neighborhoods of Doha have special characteristics in terms of their society and the physical environment. The society is made up of Asians and low to middle income Arabs who constitute the working class of Doha's population (Qatar Statistics Authority, 2010). They have different lifestyles

and cultural backgrounds which need to be supported by the neighborhood's physical environment. In general, in many cases the lifestyle of Arabs is compatible with the local culture and lifestyle – linguistic, cultural and religious compatibility with nationals (Kapiszewski, 2006). However, the culture of Asians is notably different from the local culture. A prominent behavior of Asians was observed during the study: they prefer sitting outdoors and watching people on the street. This behavior of natural surveillance of streets requires responsiveness to such a different lifestyle. In fact, a common preference between most Arabs and Asians is the preference for multi-family living. The local planning authorities address this need through providing housing typologies that support multi-family living (Qatar Atlas, 2010). As illustrated in the analysis, the downtown neighborhoods are planned to have one housing typology (apartment buildings) owing to their location, population density, and proximity to retail markets. This makes living in the downtown neighborhoods affordable to many expatriates in Doha, especially the middle to low income groups.

In this regard, the social environment of downtown neighborhoods is not supported. On the one hand, the diverse lifestyles and cultural backgrounds of the society decreases the opportunities for social interactions. Which, in turn, affects the community bonding. Facts related to social incoherence lead to a reserved behavior for residents where chances of interacting and stimulating conversations are very low. According to the survey results, most of the residents' knowledgeability of their neighbors is low leading to less interactions. Also, with the absence of nationals from the neighborhoods, this cultural inconsistency has resulted in social segregation and, thus, lack of social interactions. On the other hand, the inaccessible streets and the absence of public spaces limit social

occupancy in the neighborhood. All in all, the social environment of downtown neighborhoods in Doha is not supported nor considered in the design of the physical environment. As concluded from the observations, random behaviors of few people at commercial frontages at specific times of the day result in low degrees of social interactions and occupancy.

As discussed in previous sections, the downtown neighborhoods in Doha are the oldest. They emerged in the late 1960s around Souq Waqif forming an economic center for Doha (Lockerbie, 2016). Their physical environment is unique in which it has both an organic and modern form. In fact, today the physical environment of downtown neighborhoods constrains the society's behavior. As discussed in the analysis section, pedestrian accessibility is limited to road markings of crossings at traffic signal intersections. Walkways are not integral to the physical design which decreases the safety of pedestrians. This limits social occupancy at the public realm where streets are not accessible to pedestrians and cyclists. Additionally, most of the downtown neighborhoods lack public spaces and neighborhood parks. Therefore, the public realm is incomplete.

Despite the fact that housing diversity is not present in downtown neighborhoods in Doha, but their physical form has succeeded somehow in creating attractions. As per the survey results, the land use mix at downtown neighborhoods is more diverse as compared to suburban and waterfront neighborhoods. The presence of basic land uses: residential, retail, and commercial, places all basic needs in one neighborhood – residence, work, and shops. This adds to the well-planned morphology of the downtown neighborhoods (Figure 68). All in all, the physical environment of downtown neighborhoods in Doha have good land use mix, but lacks accessible streets and public spaces which encourage behavior. This

lack of functionality of their public realm constrains the society and its activities, thus, decreasing the degree of neighborhood vitality.

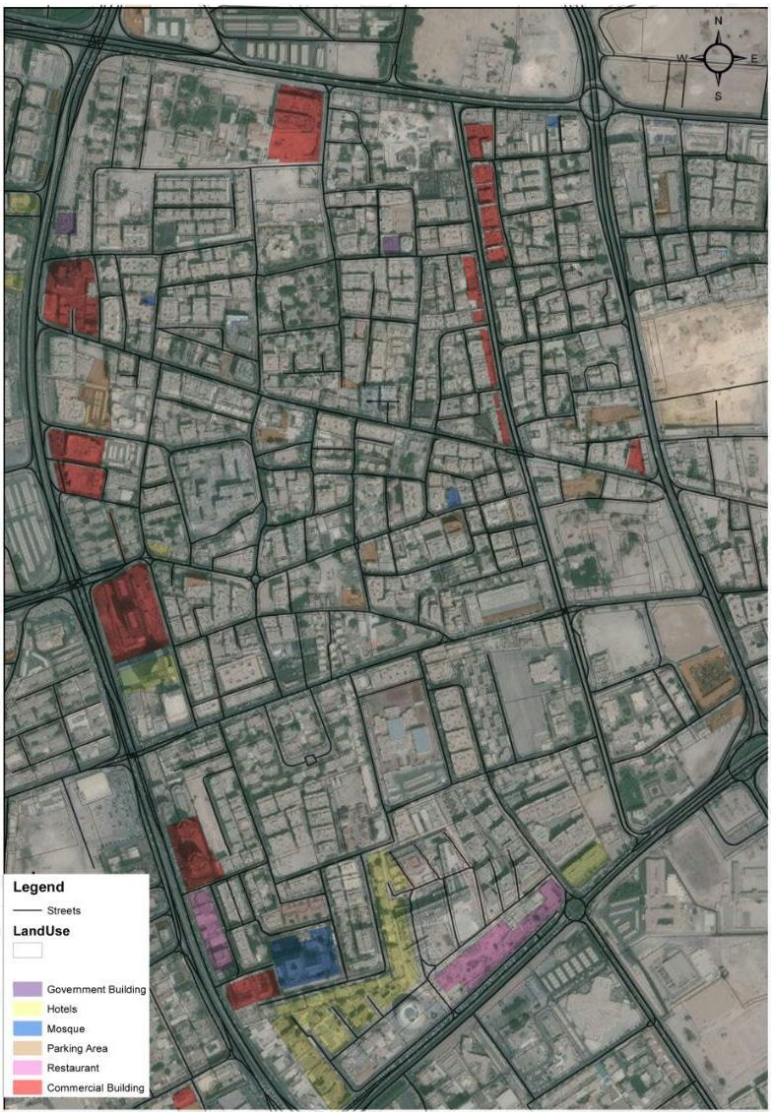

Figure 68. Existing land uses in Fereej Bin Mahmoud neighborhood.

5.4.1.1 The Public Realm

As concluded from the analysis of the survey results, the public realm of downtown neighborhoods is not well-designed with streets – not being complete and public spaces – not being provided. Therefore, the urban amenity value in downtown neighborhoods is

lacking. Vegetation, aesthetically-appealing buildings, and the overall spatial arrangement of the public realm are inadequate. As per the survey results, some changes and/or additions are suggested to enhance the public realm and, thus to create a neighborhood life within. All suggestions call for a climate responsive physical environment. The provision of shaded walkways with landscaped buffers along the streets was a top suggestion. It will guarantee social occupancy and safety for both pedestrians and vehicles. Shade trees and landscaped buffers are commonly suggested to adapt to the hot climate of Doha. Another common suggestion was the need for complete streets. Streets that could be used for diverse activities equipped with proper signage system and directive walkways. All in all, the public realm of downtown neighborhoods addresses diversity, but not accessibility nor safety. Therefore, attention should be given to accessible and safe streets and public spaces.

5.4.1.2 Sense of Neighborhood Place

As learned in the literature, the total effect of vitality is represented in the creation of genius loci or sense of place, which seems to characterize all vital urban environments, especially neighborhoods. The characteristics of a good neighborhood place are: the physical space, the sensory experience, and the activities. It is a place that has the necessary urban qualities: neighborhood park, accessible streets, green spaces, pedestrian attractions, social interactions, diversity, and commercial transactions. As discussed above, the downtown neighborhoods lack most of these qualities which poses serious questions to their physical environment. Therefore, actions could be recommended towards enhancing their physical structure and an underlying dynamic of activity, which would create their sense. The end result is a unique spatial experience for residents who, in turn, will be

encouraged by the places' physical characteristics to activate the public realm contributing to the neighborhoods' sociable character.

5.4.1.3 Neighborhood Life

Likewise, the life in downtown neighborhoods need to be restored since it is directly related to the daily life of residents, which is associated with their cultural and intellectual backgrounds. According to the survey results, most of the residents are not satisfied with the life within their neighborhood. An agreement was concluded on the least preferred neighborhood quality as being the life within the neighborhood. This reflects the dissatisfaction that comes from lack of comfort, safety, happiness, and relationships with neighbors. Therefore, it can be implied that the quality of the downtown neighborhood life could be assessed from the personal motivation that the residents are endowed with enabling them to socialize and interact in the neighborhood, which was not found to be present. In fact, the incompetence of the design of the public realm (accessible streets and public spaces) nurture this demotivation of neighbors to go out. In this regard, the quality of downtown neighborhoods' life indicates a low degree of neighborhood vitality.

5.4.1.4 Neighborhood Vitality

Table 15. Summary results of the study of vitality of downtown neighborhoods in Doha.

The Vitality of Downtown Neighborhoods in Doha		
Society		
Heterogeneity	Density	The highest population densities in Doha are found at the downtown areas (Qatar Atlas, 2010). Therefore, and as surveyed, the society is dense where multi-family residence is the dominant housing typology in the downtown neighborhoods.
	Social Composition	The social composition of the society of downtown neighborhoods was assessed through looking at the

		dominant nationality, gender, and age group. They are occupied only by expatriates (Asians and Arabs). This has created a social segregation among the neighborhoods of Doha where different lifestyles are accommodated. According to the 2010 census, male percentage is higher than female in Doha which confirms the male dominance in downtown neighborhoods where the working class live.
Behavior	Mannerism	The manners reflect social norms and the demands of the social context. According to the observation results, the society is conservative and, thus, displays a formal behavior during public interactions. The manners of the society of downtown neighborhoods are socially acceptable.
	Cultural Background	The society of downtown neighborhoods is multi-cultural. As stated earlier, the society has different lifestyles and cultural backgrounds where Arab and Asian cultures coexist in one neighborhood.
Occupancy		Downton neighborhoods don't promise an endless presence of diverse people at the public realm. Social occupancy is limited to retail and commercial frontages only. This is due to the lack of pedestrian accessibility to streets and public spaces.
		Activities
Pedestrianization		According to the survey and observation results, pedestrians are not considered in the physical design of downtown neighborhoods in Doha. Vehicular dominance has constrained the continuous presence of pedestrians in the public realm.
Diversity	Social	Social activities that are accessible to diverse people, such as: cafes, restaurants, and shops frontages. In some instances, street watching is a common behavior of Asians. This passive behavior contributes, in many cases, to the neighborhood's sociable character.
	Economic	Diverse economic activities that are accessible to diverse people, such as: commercial and retail centers.
	Recreational	Recreational and lodging activities that are accessible to diverse people, such as: hotels, restaurants, and cafes.
Uniqueness		Retail activities at the downtown neighborhoods are unique where variety of options are provided.
Time of Happening		Activities are not taking place throughout the day, except for lodging and some retail activities. Shops open at

		certain times and encourages buyers' presence during opening times only.
	Physical Environment	
Place Characteristics	Pedestrian-Oriented	Places at the downtown neighborhoods are not pedestrian-oriented, rather they are vehicles-oriented. According to the survey and observation results, pedestrians lack accessibility to public spaces.
	Safety	Safety measures are not wholly considered in the physical design of places. In general, the public realm is not safe in terms of traffic and pedestrian accessibility to neighborhood's services and facilities.
	Legibility and Familiarity	In general, boundaries are legible. Well-known retail and commercial frontages act as landmarks in Doha. Residents and the public in general are familiar with the commercial places in the neighborhood.
Morphology	Land Use Mix	The land uses are well-mixed in downtown neighborhoods. Residential, commercial, retail, dining, and lodging uses are all grouped and fairly organized in the downtown neighborhoods.
	Streets	Streets are lacking accessibility. They are only accessible to vehicles which decreases their design qualities making them incomplete. Complete streets are accessible to pedestrians, people with special needs, cyclists, vehicles, and public transportation. Also, complete streets are adapted to the local climate where shade structures, vegetation, landscaped buffers, directive signs, and street furniture are integral to their design. These significant qualities encourage social occupancy and interactions.
	Public Spaces	Almost all of the downtown neighborhoods in Doha lack public spaces. These can be in the form of parks or green plazas. Therefore, the urban amenity value of the public realm is affected. Lack of vegetation, aesthetically-appealing edges, and spatial arrangements of the neighborhood's physical form, all significantly decrease the functionality of the public realm. Vegetation is needed to enhance the society's appreciation of a particular place in the neighborhood. It adds greater values to the physical environment in support for social occupancy and interactions. These values are derived from the pleasantness, aesthetic coherence, and cultural and recreational attributes of a neighborhood place.

In general, a comprehensive assessment of the vitality of downtown neighborhoods in Doha reveals two major conclusions:

- Downtown neighborhoods in Doha are partially vital in terms of their society and its activities. The multi-cultural, dense society contributes to the vitality of the public realm where (only if the physical design supports them) their observed behavior stimulates interactions through good manners and willingness to exchange cultural conservations. However, in terms of their continuous occupancy in the public realm, the society is not continuously present outdoors, mainly due to the hot weather. This is because of the lack of a climate-responsive physical environment. Likewise, the diverse activities performed by the society and the uniqueness of some of them contributes to the neighborhood's vitality. Commercial, retail, and passive social activities have made the downtown neighborhoods of Doha unique.
- Downtown neighborhoods in Doha are not vital in terms of their physical environment. the physical design of their public realm lacks a number of elements: accessible streets, green spaces, neighborhood parks, neighborhood mosque, aesthetically-appealing edges, shaded walkways, wayfinding signs, and street furniture. As observed, the existing neighborhood places constrain behavior. All of this contribute to the lack of neighborhood life and a decreased sense of neighborhood places where residents are constrained from activating their public realm.

5.4.2 Vitality of Suburban Neighborhoods of Doha

Based on the survey and observation results, the suburban neighborhoods of Doha are the targeted living environments for nationals. The society is largely made up of

nationals (Qataris) and a considerable number of Arabs and a few Asians (Qatar Statistics Authority, 2010). Generally, the society of suburban neighborhoods has an almost similar culture and lifestyle. The lifestyle of Arabs is compatible with the local culture and lifestyle in terms of language, religion, and societal traditions (Kapiszewski, 2006). Therefore, local planning authorities have provided villas with building height regulations not exceeding G+2 floors in suburban locations where large family living is supported. As illustrated in the analysis, the suburban neighborhoods are planned to have a dominant housing typology of stand-alone villas targeting single-family living of nationals and middle to high income expatriates. Considering the similar lifestyle, Arab families target suburban neighborhoods to live in, and with, culturally-familiar surroundings and neighbors.

The society of suburban neighborhoods is less dense as compared to downtown neighborhoods. This is mainly due to the land use type and mix. Unlike downtown neighborhoods, single-family residential use is the dominant land use in suburban neighborhoods with few supporting land uses such as public institutions (schools) and mosques. Some retail and commercial uses maybe planned at the boundaries. This makes the society less heterogeneous, in which it is less dense and less diverse.

In this regard, the social environment of suburban neighborhoods has special considerations. Nationals tend to maintain their privacy and limit public interactions in the neighborhood. They tend to socialize with their family members in the exterior *majlis* (sitting area) that is attached to the house. Their conservative behavior in maintaining their privacy decreases the opportunities for social interactions in the public realm. However, unlike the case of downtown neighborhoods, community bonding was still observed in suburban neighborhoods where good neighbor relations were observed, but not daily

interactions. Therefore, the manners of the society reflect the social norms of limited public interactions, which is socially acceptable with respect to the context. However, some signs of socio-cultural segregation can be noticed where tendency to exchange cultural conversations is lacking in suburban neighborhoods.

In fact, and in many cases, the physical design of suburban neighborhoods contributes to the lack of social occupancy and interactions. As per the survey and observation results, not all streets are accessible, and public spaces are not provided. Some of the main streets are accessible to pedestrians, but not the local ones. Other modes of transportation are not supported in the neighborhoods' physical design. Therefore, streets should be completed with cycling tracks, pedestrian walkways, and public bus stops. Some shared walkways are provided along main streets with no buffer, which decreases pedestrian safety in the neighborhood. This limits social occupancy in the public realm where streets are not accessible to pedestrians and cyclists. However, in general, the physical environment, of suburban neighborhoods is agreed to be safe. Characteristics of neighborhood places were partially satisfied in suburban neighborhoods but do not encourage social activities because of inconsistency in the physical design.

The physical environment of suburban neighborhoods follows modern planning of grid-like arrangements of streets and land parcels. In fact, the amenity value of the public realm in suburban neighborhoods is lacking. Neighborhood parks and green public spaces are lacking in most suburban neighborhoods, which discourages, in many cases, social occupancy and interactions in the public realm. The lack of vegetation in many neighborhood places was seen to constrain social occupancy. This is mainly due to the hot weather. As implied from the survey and observation results, residents had a common

agreement towards their need for shade trees and landscaped buffers along the main walkways. Also, a prominent requirement was the need for social nodes. Cafes and shops are minimal in suburban neighborhoods and, thus greatly needed for an active public realm (Figure 69).

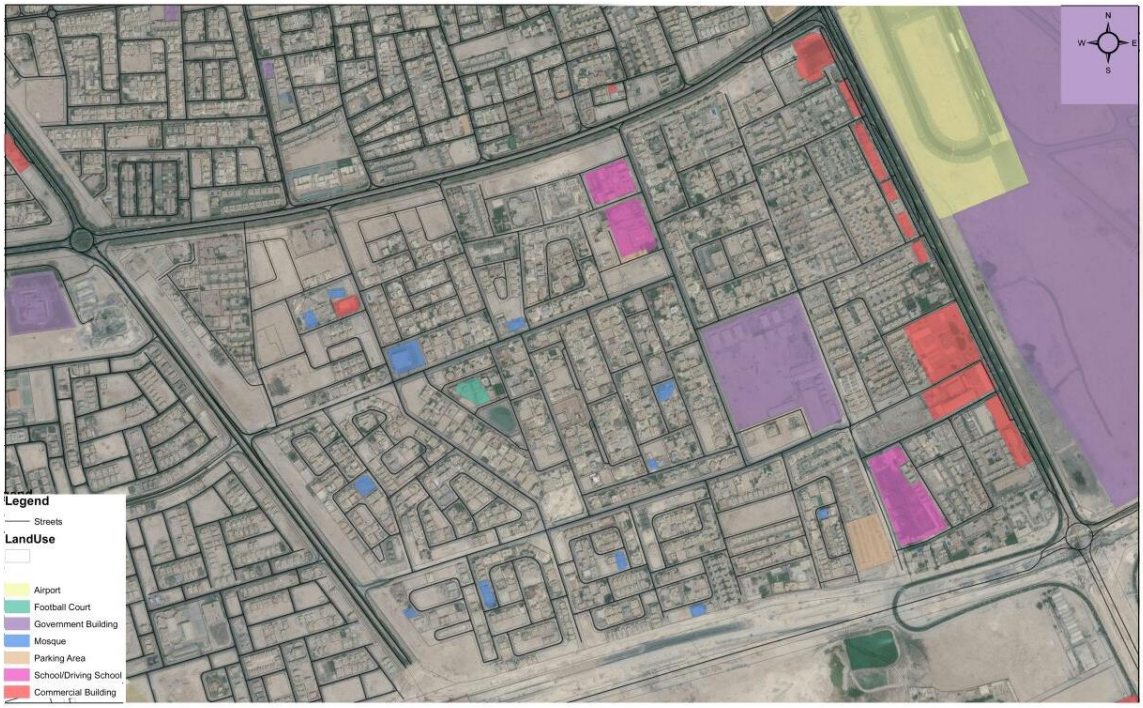

Figure 69. Existing land uses in Al-Thumama neighborhood.

5.4.2.1 The Public Realm

In general, the public realm of suburban neighborhoods in Doha lacks accessibility and diversity. Some streets are accessible while the majority are not. Also, as the case with downtown neighborhoods, streets are incomplete lacking shaded walkways with landscaped buffers, cycling tracks, wayfinding signs, and street furniture. Therefore, the urban amenity value in suburban neighborhoods is lacking. Vegetation, aesthetically-appealing buildings, and the overall spatial arrangement of the public realm are lacking.

The approach towards enhancing the public realm of suburban neighborhoods is climate and culture responsiveness. Social occupancy and interactions will be encouraged when climate-responsive places and streets are provided throughout the neighborhood. Also, consideration of the society's culture and social norms will add to the functionality of the public realm.

Moreover, and as per the survey and observation results, a common agreement was the need for more mosques in the neighborhood considering its dominant Muslim society. The society has a special lifestyle and traditions which are less conducive to being open to multi-cultures. Therefore, the physical design of the public realm should support the society's norms and culture. All in all, the public realm of suburban neighborhoods addresses safety, but not accessibility nor diversity. Therefore, attention should be given to accessible and diverse streets and public spaces with commitment to climate and culture.

5.4.2.2 Sense of Neighborhood Place

Sense of place in suburban neighborhoods is lacking. Despite some places in suburban neighborhoods encouraging behavior, the overall physical environment has low amenity value which decreases the sensory experience, and activities. Also, the absence of neighborhood park and public spaces, causes the neighborhoods to lack the necessary urban qualities. These are significantly represented in: neighborhood parks, accessible streets, green spaces, pedestrian attractions, social interactions, diversity, and commercial transactions. Therefore, places of suburban neighborhoods should be enhanced to encourage behavior, which creates their sense. The end result is a unique spatial experience for residents who, in turn, will be encouraged by the places' physical characteristics to

activate the public realm contributing to the neighborhoods' sociable character.

Attraction places are usually located at the boundaries of suburban neighborhoods. These add to the diversity aspect of the public realm, but still are few or sometimes not present. Therefore, the neighborhoods' physical environment should evoke diversity, accessibility to encourage behavior with respect to climate and culture. Consequently, this increases the sense of neighborhood place adding to the overall degree of vitality.

5.4.2.3 Neighborhood Life

Taking into consideration the culture and traditions of the society, suburban neighborhoods have special neighborhood life that is based on privacy and limited public interactions. However, the creation of a neighborhood life requires first the presence of all physical qualities. A well-functioning physical environment supports a heterogeneous society that is encouraged to pedestrianize and perform diverse activities in the neighborhood. According to the survey and observation results, suburban neighborhoods somehow lack the neighborhood life where their public realm is not active nor displays diversity and accessibility.

5.4.2.4 Neighborhood Vitality

Table 16. Summary results of the study of vitality of suburban neighborhoods in Doha.

The Vitality of Suburban Neighborhoods in Doha		
Society		
Heterogeneity	Density	In suburban neighborhoods, the society is not dense where single-family residence is the dominant housing typology.
	Social Composition	By looking at the nationality, gender, and age group of the society, it is concluded that suburban neighborhoods in Doha are occupied mainly by nationals (Qataris) and a number of expatriates (Arabs and a few Asians). Suburban

		neighborhoods are more family-oriented where different ages are present.
Behavior	Mannerism	According to the observation, the society preserves its privacy and, thus, displays a conservative behavior in public interactions, if any. In general, the manners of the society are socially acceptable.
	Cultural Background	The society of suburban neighborhoods is Arab and Muslim. This implies the Arab-Islamic identity that is dominant in the neighborhood's social environment. As stated earlier, the society has almost similar lifestyles and cultural backgrounds where Arabs have compatible culture to that of nationals.
Occupancy		Suburban neighborhoods do not promise an endless presence of diverse people in the public realm. Social occupancy is limited to the few retail and commercial frontages only. This is due to the lack of diversity and accessibility in the public realm.
		Activities
Pedestrianization		According to the survey and observation results, pedestrians are not considered in the physical design of suburban neighborhoods in Doha. Vehicular dominance has constrained the continuous presence of pedestrians in the public realm. Also, the lack of public spaces discourages pedestrianization.
Diversity	Social	Places of social activities do not exist in suburban neighborhoods. Shops, cafes, and restaurants are greatly needed in the neighborhood.
	Economic	Places of economic activities do not significantly exist in suburban neighborhoods. A few retail and commercial frontages exist, but are not distributed nor diverse.
	Recreational	Places of recreational activities do not exist in suburban neighborhoods. Neighborhood parks, green public spaces, cafes, and playgrounds are greatly needed in the neighborhood.
Uniqueness		No unique activities are present in suburban neighborhoods. However, different types of educational centers or schools can be found which can be considered special activities as compared to other neighborhoods in Doha.
Time of Happening		Activities do not take place throughout the day. The neighborhood becomes quite during the evening.

Physical Environment		
Place Characteristics	Pedestrian-Oriented	Some places at the suburban neighborhoods are pedestrian-oriented. However, they are mainly reached by car. In general, pedestrians are not wholly considered in the physical design of the neighborhoods.
	Safety	Safety measures are considered in the physical design of places in suburban areas. In general, the public realm is safe.
	Legibility and Familiarity	In general, boundaries of the suburban neighborhoods are somewhat legible. However, a significant part of the physical environment is not legible and lacks landmarks or well-known destinations.
Morphology	Land Use Mix	The land uses are not diverse. The dominant land use is single-family residential use. Therefore, the mix of land use is not a feature of suburban neighborhoods.
	Streets	Streets of the suburban neighborhoods lack accessibility and amenity value. They are only accessible to vehicles which decreases their design qualities making them incomplete. Complete streets are accessible to pedestrians, people with special needs, cyclists, vehicles, and public transportation. Also, complete streets are adapted to the local climate and culture where shade structures, vegetation, landscaped buffers, directive signs, and street furniture are integral to the street design. These significant qualities add to the proper functionality of the public realm where behavior is encouraged (social occupancy and interactions).
	Public Spaces	Most of the suburban neighborhoods in Doha lack public spaces. These can be found in form of neighborhood parks or green plazas. Therefore, the urban amenity value of the public realm is affected. Lack of vegetation, aesthetically-appealing edges, and spatial arrangements of the neighborhood's physical form, all significantly decrease the functionality of the public realm. Vegetation is needed to enhance the society's appreciation of a particular place in the neighborhood. It adds greater values to the physical environment in support of social occupancy and interactions. These values are derived from the pleasantness, aesthetic coherence, and cultural and recreational attributes of a neighborhood place.

In general, a comprehensive assessment of the vitality of suburban neighborhoods in Doha reveals one main conclusion:

- Suburban neighborhoods in Doha have low degree of vitality. They are not vital in terms of their society, its activities, and the physical environment.
    - The society of suburban neighborhoods is not heterogeneous. It is conservative and scattered, where public interactions are limited. In terms of their continuous occupancy in the public realm, the society is not continuously present outdoors due to the cultural and societal traditions that call for privacy. Additionally, the lack of a climate-responsive physical environment contributes to the lack of vital society.
    - Likewise, activities are rarely performed by the society in the public realm. if present, these activities lack continuity, diversity, and uniqueness.
    - The physical environment of suburban neighborhoods in Doha lacks a number of necessary elements: accessible streets, green spaces, neighborhood parks, neighborhood mosques, aesthetically-appealing edges, shaded walkways, wayfinding signs, and street furniture. As observed, the existing neighborhood places are not climate-responsive. All of this contribute to the lack of neighborhood life and a decreased sense of neighborhood places where the physical environment is not committed to the climate and culture. As a result, the public realm of suburban neighborhoods is not functioning.

5.4.3 Vitality of Waterfront Neighborhoods of Doha

As in the case of downtown and suburban neighborhoods, waterfront

neighborhoods in Doha have special characteristics in terms of their society and the physical environment. The society is mainly made up of expatriates where Europeans/ Americans/ Australians form a majority. In addition, high-income Arabs and Asians constitute a portion of the society. This reflects the diverse lifestyles and cultural backgrounds as being global to accommodate all of the society's needs. In fact, waterfront neighborhoods are the most favored among all locations in which access to leisure activities and urban facilities is guaranteed. Additionally, almost all of the waterfront neighborhoods play a major role in representing the image of Doha. The skyline, level of technological advancement, and urban excellence are all reflected through the physical environment of waterfront neighborhoods. Therefore, the society is global enough to live in an open, advanced, and busy environment like this. Interestingly, and as per the survey and observation results, the degree of neighborhood attachment is high in waterfront neighborhoods. Residents have expressed their pride, happiness, and desire towards their neighborhoods. They are socially active where the majority of them know most of their neighbors. Therefore, community bonding is observed in waterfront neighborhoods.

The social environment of waterfront neighborhoods is partially supported through social occupancy during extended times of the day. However, social interactions are not supported by the physical environment. The characteristics of neighborhood places do not stimulate conversations and pedestrianization. Lack of traffic safety and lack of legibility, in some cases, constrains behavior. Additionally, streets are inaccessible to pedestrians, cyclists, and public buses. In general, lack of pedestrian accessibility, safety, and legibility in the physical design of the public realm contributes to the decreased sociable character of waterfront neighborhoods. However, since most waterfront neighborhoods are famous for

luxurious retail and dining destinations, random behaviors of buyers at retail frontages at specific times of the day result in some social interactions and occupancy.

As is the case with suburban neighborhoods, the physical environment of waterfront neighborhoods is newly-planned. High-rise construction and housing diversity are prominent characteristics of waterfront neighborhoods which add to the value of physical environment. A good mix of land uses exist where attractions are created acting as landmarks to Doha's urban environment. Beach facilities are utilized sometimes in the neighborhoods which add to their amenity value. However, vegetation is still lacking. As is the case with other neighborhoods, shade trees, landscaped buffers, and green public spaces are significantly needed to activate the public realm of waterfront neighborhoods. Being famous for leisure facilities and services, the physical environment needs to be equitable to accommodate all modes of transportation and, thus, have a well-functioning public realm. All in all, the physical environment of waterfront neighborhoods in Doha s good land use mix and unique activities, but lacks accessible streets and public spaces, which do not encourage behavior (Figure 70).

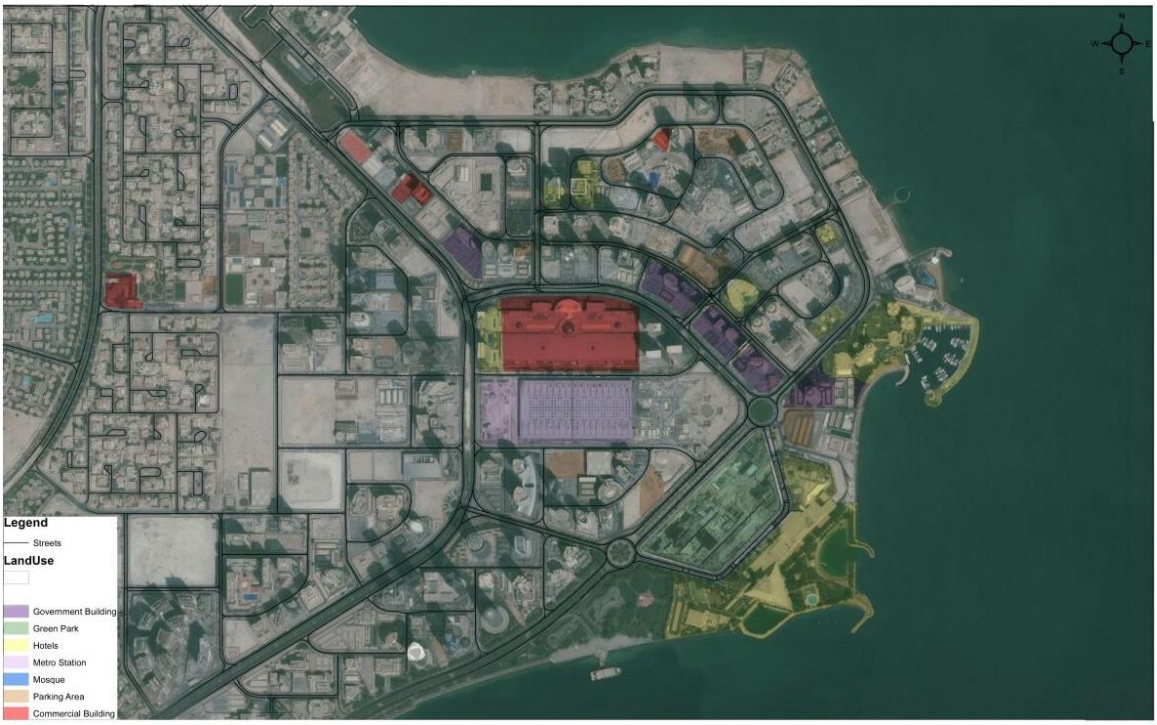

Figure 70. Existing land use in Al-Dafna neighborhood.

5.4.3.1 The Public Realm

In general, the public realm of waterfront neighborhoods is active and busy as compared to the downtown and suburban neighborhoods. The presence of famous public destinations, institutions, 5-star hotels, luxurious dining facilities, commercial headquarters, and big shopping malls results in higher degrees of social occupancy during extended times of the day. However, social interactions are rare due to the design of the physical environment that doesn't encourage interactions. Streets don't support pedestrian accessibility and public spaces are scarce. Therefore, the public realm needs enhancement with focus on its amenity value to adapt the design to the local climate.

Waterfront neighborhoods in Doha act as landmarks in the city. They are the hub of cultural, economic, touristic, and urban development. In fact, large investments in Doha

are directed towards the waterfront locations and, thus, are promising towards the creation of a vital public realm that starts with the good design of the physical environment. Major projects such as the Metro system and the Sharq Bay Crossing are positive moves towards a more accessible public realm (Rizzo, 2013). Therefore, and as per the interview with local planning authorities, the public realm of waterfront neighborhoods will be the first to witness enhancement and upgrade to the physical environment. Mock-ups of accessible streets are implemented in Al-Dafna neighborhood as part of the Doha Public Realm project which is still in the analysis stages (Table 4).

5.4.3.2 Sense of Neighborhood Place

Sense of place in waterfront neighborhoods is partially experienced. As per the survey and observation results, the majority of residents feel attached and satisfied towards their neighborhood places. However, the lack of amenity value decreases their sensory experience, and limits their activities. Unlike the case with downtown and suburban neighborhoods, the focus here is on streets. Streets are a potential source of achieving stronger sense of place at the ground level of famous public attractions. The notion of 'complete streets' needs to be adapted to encourage diverse activities to take place, while they are accessible to pedestrians and cyclists, as they are to vehicles. The end result is a unique spatial experience for residents who, in turn, will be encouraged by the places' physical characteristics to activate the public realm contributing to the neighborhoods' sociable character.

5.4.3.3 Neighborhood Life

According to the survey and observation results, waterfront neighborhoods partially

lack neighborhood life. The lack of a well-functioning public realm, in many cases, results in the lack of a neighborhood life. Prominently, this is because of the physical environment. Social interactions among the society are limited due to the physical design where streets and public spaces are less supportive to pedestrianization. Vehicular dominance causes less traffic safety and, thus, decreases social occupancy in many cases. Public spaces are sparse, a fact that discourages social interactions in the neighborhood. All in all, the public realm of waterfront neighborhoods supports diversity and safety but not accessibility. Therefore, accessible streets and public spaces are the way towards a vital neighborhood life.

5.4.3.4 Neighborhood Vitality

Table 17. Summary results of the study of vitality of waterfront neighborhoods in Doha.

The Vitality of Waterfront Neighborhoods in Doha		
	Society	
Heterogeneity	Density	The society is dense where housing diversity exist. Both multi-family residences and single-family residences are provided in waterfront neighborhoods.
	Social Composition	The social composition of the society of waterfront neighborhoods was assessed through looking at the dominant nationality, gender, and age group. The waterfront neighborhoods in Doha are global. A diversity of nationalities and age groups live in them, where different lifestyles are accommodated in one location. However, a dominant factor for the society's social composition is its income. High income groups constitute the majority of the society.
Behavior	Mannerism	The manners reflect social norms and the demands of the social context. According to the observation results, the society is open and, thus, displays a motivating and welcoming behavior during public interactions. The manners of the society of waterfront neighborhoods are socially attractive.
	Cultural Background	The society is culturally diverse. As stated earlier, the society has diverse lifestyles and cultural backgrounds.

Occupancy		Due to their special position and strategic location within Doha, waterfront neighborhoods promise a continuous presence of diverse people at the public realm during extended times of the day. Social occupancy is concentrated around public destinations.
	Activities	
Pedestrianization		According to the survey and observation results, pedestrians are not considered in the physical design of waterfront neighborhoods in Doha. Vehicular dominance has constrained the continuous presence of pedestrians in the public realm.
Diversity	Social	Social activities that are accessible to diverse people, such as: cafes, restaurants, shopping malls, hotels, and public buildings.
	Economic	Diverse economic activities that are accessible to diverse people, such as: commercial and retail centers.
	Recreational	Recreational and lodging activities that are accessible to diverse people, such as: hotels, restaurants, and cafes.
Uniqueness		The mix of residential, retail, lodging, dining, and recreational activities in the waterfront neighborhoods is unique where a variety of options are provided.
Time of Happening		The public realm of waterfront neighborhoods is active and busy throughout the day due to the presence of diverse uses. The opening hours of shopping malls and hotels add to the continuity of activities in the public realm at different times of the day.
	Physical Environment	
Place Characteristics	Pedestrian-Oriented	Places in the waterfront neighborhoods are not pedestrian-oriented, rather they are vehicles-oriented. According to the survey and observation results, pedestrians lack accessibility to streets and public spaces in the neighborhood.
	Safety	Safety measures are not wholly considered in the physical design of places. In general, the public realm is not safe in terms of traffic and pedestrian accessibility to the neighborhood's services and facilities.
	Legibility and Familiarity	In general, waterfront neighborhoods are quite legible. Famous retail and commercial centers, and landmark buildings make residents and the general public familiar with the neighborhood

Morphology	Land Use Mix	The land uses are diverse and well-mixed in waterfront neighborhoods. Residential, commercial, retail, dining, lodging, and recreational uses exist and are fairly organized in the waterfront neighborhoods.
	Streets	The streets lack accessibility. They are only accessible to vehicles which decreases their design qualities making them incomplete. Complete streets are accessible to pedestrians, people with special needs, cyclists, vehicles, and public transportation. They are adapted to the local climate where shade structures, vegetation, landscaped buffers, wayfinding signs, and street furniture are integral to their design. These significant qualities add to the proper functionality of the public realm where behavior is encouraged (social occupancy and interactions).
	Public Spaces	Public spaces are scarce in waterfront neighborhoods. These can be in the form of neighborhood parks or green plazas. Therefore, the urban amenity value of the public realm is affected. Lack of vegetation and pleasant, climate-responsive walkways decreases the functionality of the public realm. Vegetation is needed to enhance the society's appreciation of a particular place in the neighborhood. It adds greater values to the physical environment in support for social occupancy and interactions. These values are derived from the pleasantness, aesthetic coherence, and cultural and recreational attributes of a neighborhood place.

In general, a comprehensive assessment of the vitality of waterfront neighborhoods in Doha reveals three major conclusions:

- Waterfront neighborhoods in Doha are vital in terms of their society. The culturally diverse, dense society contributes to the vitality of the public realm where (only if the physical design supports them) their observed behavior and cultural background simulates interactions through good manners and willingness to exchange cultural conservations. In terms of their continuous occupancy of the public realm, the society

is mostly present outdoors. However, the lack of a climate-responsive physical environment sometimes does not encourage their occupancy.

- Waterfront neighborhoods are partially vital in terms of their performed activities. The diversity and uniqueness of their activities contribute to the neighborhood's vitality. Residential, commercial, retail, dining, lodging, and recreational activities have made the waterfront neighborhoods of Doha unique and diverse. These activities are performed during extended times of the day which, in many cases, result in an upbeat atmosphere in the neighborhood.
- Waterfront neighborhoods in Doha are not vital in terms of their physical environment. the physical design of the public realm lacks a number of elements: accessible streets, green spaces, neighborhood park, neighborhood mosque, shaded walkways, wayfinding signs, and street furniture. As observed, the existing neighborhood places constrain behavior due to lack of accessibility and traffic safety. All of these contribute to the lack of neighborhood life and a decreased sense of neighborhood places where, in many cases, residents are constrained from activating their public realm.

5.4.4 Overall Assessment

Table 18. The overall assessment of neighborhood vitality in Doha.

	Downtown Neighborhoods	**Suburban Neighborhoods**	**Waterfront Neighborhoods**
The Public Realm	Not functional due to the physical environment.	Not functional due to the physical environment and society.	Not functional due to the physical environment.
Sense of Neighborhood Place	Not strong due to the physical environment.	Not strong due to the physical environment and activities.	Partially strong due to the society.
The Neighborhood Life	Not present due to the physical environment and the society.	Not present due to the physical environment and the society.	Not present due to the physical environment.
Degree of Neighborhood Vitality	Partially vital in terms of the society and its activities, but not vital in terms of the physical environment.	Not vital in terms of the society, its activities, and their physical environment.	Vital in terms of the society and its activities, but not vital in terms of the physical environment.
Overall judgment of neighborhood vitality in Doha	In general, waterfront neighborhoods have the highest degree of vitality, followed by downtown neighborhoods. The lowest degree of neighborhood vitality is associated with suburban neighborhoods in Doha. All in all, neighborhoods of Doha are partially vital in terms of the society and its activities, but are not vital in terms of the physical environment.		

CHAPTER 6: CONCLUSION AND RECOMMENDATIONS

This chapter summarizes the thesis and its findings, and presents a discussion of possible actions towards increasing the degree of vitality in the neighborhoods of Doha. Neighborhood vitality was approached through reviewing the literature on urban vitality and its significant impact on the functionality of the public realm of urban environments. The scale of the neighborhood was studied where an intimate community of people exist. The underlying concepts of sense of neighborhood place, and the neighborhood life were investigated to picturize the significant impact of neighborhood vitality on the health and happiness of residents. Despite the different literature scopes, indicators of vitality at the scale of the neighborhood were summarized as all being inclusive and related to the society, its activities, and their physical environment. The study of cases has aided the understanding of neighborhood vitality and its defining factors. A number of lessons were extracted from the study, in which neighborhood vitality was achieved across the cultural, social, economic, and spatial levels. In summary, the physical design of the neighborhood was concluded to be the major determinant of vitality. If the neighborhood's public realm is well designed in terms of accessibility, safety, and equity then vitality has high degrees.

As per the review of literature, a number of approaches were concluded to investigate and determine the degree of vitality in urban environments. These were heavily dependent on opinion survey of residents' needs and perception of their neighborhood environment. Accordingly, three tools were selected to collect the data: questionnaire survey, systematic observations, and semi-structured interviews; targeting the residents and their activities, the social and physical environments of the neighborhood, and the local

planning authorities respectively. These were selected based on the established definition of neighborhood vitality (the society, its activities, and their physical environment). The selection of study neighborhoods was based on two main criteria: location within Doha, and the average population density. These have aided in answering the research question where location had an impact on the vitality of the neighborhood.

An established definition of neighborhood vitality was concluded where three main factors were agreed to define vitality: the society (considering its heterogeneity, behavior, and level of occupancy), its activities (pedestrianization, diversity, uniqueness, and time of happening), and the physical environment (characteristics of places, and morphology and the amenity value) that encompasses them all. This definition is the outcome of other definitions of vitality focusing on several aspects as related to people and their environment. Moreover, four dimensions for neighborhood vitality were defined: cultural, social, economic, and spatial. The comprehensive definition of neighborhood vitality has aided in operationalizing the assessment and reaching the findings.

The main objective of the thesis was to assess the vitality of neighborhoods in Doha across three different levels: the society, its activities, and the physical environment that encompasses them all. To be archived, this has included a number of sub-objectives: to establish a definition for neighborhood vitality; to assess neighborhood life in Doha which reflects the physical and social environments of the neighborhood; to investigate if location has an impact on the degree of vitality in neighborhoods; to judge the overall degree of neighborhood vitality in Doha; and to recommend actions towards higher degrees of neighborhood vitality in Doha. The assessment was approached through investigating the perception of residents of their neighborhood's physical and social environments, and

observing their behavior and heterogeneity in the neighborhood's public realm, and interviewing neighborhood planners in local planning authorities to learn about local planning regulations. This has guided the assessment where a number of influential factors have been implied to affect neighborhood vitality in Doha: lifestyle, income groups, social segregation, and planning regulations (Figure 71).

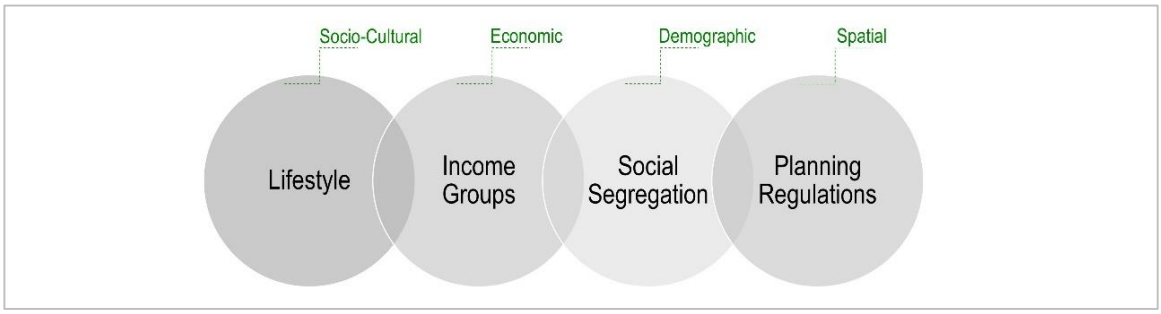

Figure 71. Influential factors that affect the development of neighborhoods in Doha.

Being the oldest, downtown neighborhoods had the greatest population density where multi-family residential land use was dominant. Downtown neighborhoods were occupied only by expatriates, especially the working class of them. This has added to the heterogeneity of the society where density and social composition were diverse and prominent. Their behavior was socially acceptable to attract an audience and simulate interactions contributing to the neighborhood's sociable character. Being culturally diverse, the society of downtown neighborhoods performed diverse activities at different times of the day. However, the physical environment lacked a well-functioning public realm, in which streets were inaccessible and public spaces were lacked. Due to this, the amenity value was very low is the physical environment of downtown neighborhoods. Problems to the design of their public realm were summarized: inaccessible, unsafe (in terms of traffic), and not equitable. Namely, the public realm was assessed to be vehicle-oriented, climate

irresponsive, lacking vegetation and neighborhood park, lacking housing diversity, and lacking aesthetically-appealing edges. Therefore, judgment of vitality in downtown neighborhoods was concluded to be partially vital in terms of the society and its activities, but not vital in terms of the physical environment.

On the other hand, suburban neighborhoods had special characteristics in terms of their society. As the neighborhoods of nationals and a few Arab expatriates, the society of suburban neighborhoods had similar cultures and lifestyles, but significantly lacked social interactions. In fact, the lifestyle of Arabs is compatible with the local culture in terms of language, religion, and societal traditions. Unlike downtown neighborhoods, the society of suburban neighborhoods was less diverse and dense where single-family living was supported. The planning regulations, social segregation, and the conservative lifestyle of nationals, all has decreased the vitality of the society and its activities in suburban neighborhoods. Lacking in heterogeneity and behavior, the society was preserving their privacy and limiting public interactions. Therefore, activities were lacking in the public realm, which had further decreased the degree of vitality. Additionally, as the case with downtown neighborhoods, suburban neighborhoods had a lack of functionality in the public realm: inaccessible, unsafe (in terms of traffic), and not equitable. Namely, the public realm was assessed to be vehicle-oriented, culture and climate irresponsive, lacking vegetation and neighborhood park, lacking housing diversity, and lacking mix of land uses. Therefore, judgment of vitality in suburban neighborhoods was concluded to be not vital in terms of the society and its activities, and the physical environment.

Waterfront neighborhoods also had unique characteristics in terms of their society as well as the physical environment. Almost all waterfront neighborhoods play a major role

in representing the image of Doha. The skyline, level of technological advancement, and urban excellence are all reflected through the physical environment. Diverse lifestyles and cultures were accommodated by the physical environment for the global society. However, this was only implemented through planning regulations but not the physical design of the public realm. Housing diversity, mix of land use, and access to high-end leisure facilities were all regulated by the government in waterfront locations. However, the physical environment still lacked the needed accessibility, safety, and equity. Namely, the public realm was assessed to be vehicle-oriented, culture and climate irresponsive, lacking vegetation and neighborhood park, and lacking a neighborhood mosque. Therefore, judgment of vitality in waterfront neighborhoods was concluded to be vital in terms of the society and its activities, but not vital in terms of the physical environment.

As it was implied, the neighborhoods of Doha had different characteristics with respect to their locational distribution within the city. It was found that location significantly impacted the degree of neighborhood vitality in Doha. However, all were found to significantly lack vitality in the design of their physical environment. This is generally because of the lack of a holistic thinking in the planning process of Doha's public realm. Accessibility, safety, and equity are major urban qualities lacking in the physical environment of Doha. At the scale where an intimate community of people live, neighborhoods should be planned and designed to be accessible, safe, and equitable. Accessibility is reflected in every element in the neighborhood including, access to diverse modes of transportation, work, recreational facilities, and diverse housing typologies. This is to target all types of people, including, but not limited to, pedestrians, cyclists, and commuters; children, adults, and the elderly; people with or without physical inabilities;

etc. This is where equity is considered in the design through giving equal chances and benefits to all users. Where accessibility and equity are implemented, safety should be complemented, all of which being integral elements to a well-functioning public realm, and, thus, vital neighborhood environment with vital residents.

In summary, a number of problems were concluded to affect the design of the physical environment of neighborhoods in Doha. All were being centered on the adaptation to the local climate, context, and culture. If wholly considered in the planning process, the 3Cs guarantee a direct achievement of an accessible, safe, and equitable public realm (Figure 72). However, the concluded problems to the existing neighborhoods' public realm in Doha were:

- Lack of safe and well-integrated circulation routes for pedestrians, cyclists, and vehicles.
- Lack of vegetation (shade trees, landscaped buffers, green visual barriers, etc.).
- Lack of land use mix, where the residential land use should be supported by retail, commercial, religious, educational, and recreational uses.
- Lack of housing diversity where at least two housing typologies should be present in a neighborhood.
- Lack of the neighborhood's basic family-oriented facilities such as; a green park, hypermarket, cafes and restaurants, and mosques.

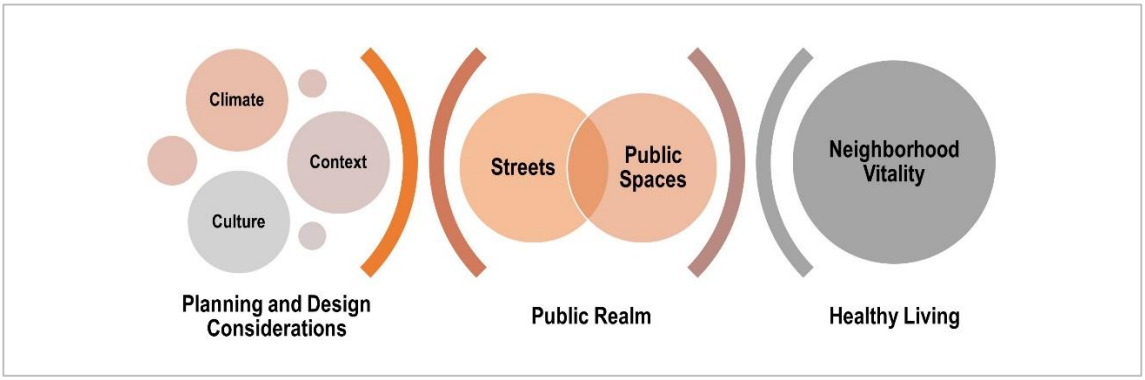

Figure 72. Thinking paradigm towards planning for neighborhood vitality.

The responsiveness of the neighborhood's physical design to the local climate is an important consideration towards a healthy, happy, and sustainable living. A well-designed outdoor environment encourages physical activity which, in turn, results in a healthy lifestyle for residents (Azmi and Karim, 2012; Eriksson, 2013). The climate of Doha is mostly hot and dusty throughout the year. However, with the integration of shade, vegetation, and water features, a unique microclimate can be created in the neighborhood which will encourage residents to use the public realm, adding to their health and to the neighborhood's overall degree of vitality. Therefore, it can be stated that the local climate of Doha is not an obstacle to vitality, but rather i the planning approach is. Therefore, consideration and commitment to the local climate of Doha is greatly needed towards an increased degree of neighborhood vitality in Doha.

Likely, the responsiveness of the neighborhood's physical design to the local context is an important consideration along with climate and culture. In fact, urban planning and design starts with an assessment of the area and its context (Krier et. al., 2009). Understanding the local context is important for planners to address the needs and produce vital environments. Special attention to several factors: the multi-cultural society, current

economic conditions, current trends in the residential market, and urban development drivers is also required to understand the local context of Doha. Since vitality is significantly defined by the society and its activities, the context where diverse cultures, lifestyles, and perceptions of the neighborhood environments should be understood in order to recommend actions towards an increased degree of vitality. Therefore, significant commitment and consideration should be given to the local context of Doha during the planning and post-planning stages.

Finally, the responsiveness of the neighborhood's physical design to the local culture is a very important consideration. Qatar is an Arab-Islamic country where its culture and societal traditions are greatly inspired by *Shari'ah* laws (Islam). As presented in the findings chapter, irresponsiveness to the local culture has significantly resulted in decreased degrees of vitality, especially in suburban neighborhoods where nationals live. Communities develop and cities flourish when the local culture is routinely considered and respected (Gibson et. al., 2012). Therefore, a neighborhood with high amenity value reflects the consideration of the local climate, context, and culture. This, in turn, informs about the good functionality of its public realm, which indicates an increased degree of vitality (Figure 73).

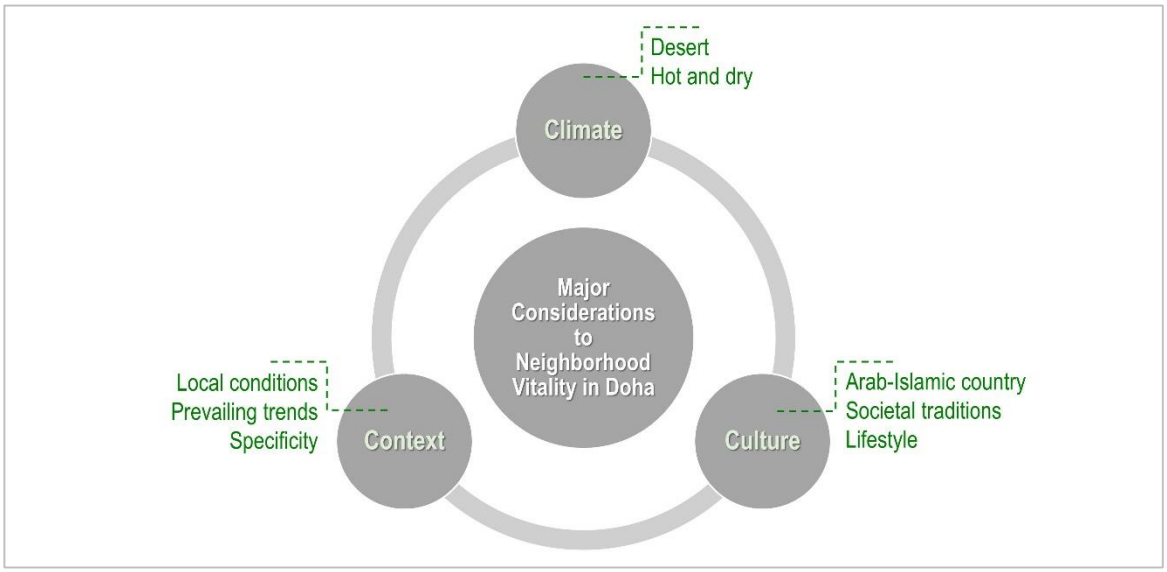

Figure 73. Major considerations to neighborhood vitality in Doha.

6.1 Recommendations

It is imperative that neighborhoods across Doha meet the needs of their societies. Like the traditional Qatari neighborhood systems (*ferjan*), contemporary neighborhoods in Doha should serve the major function of bringing houses together where the society is encouraged to use the outdoor environment, while ensuring family privacy and climate responsiveness. Weaving houses together with a mix of public amenities such as shops, mosques, schools, clinics, parks, and public spaces through accessible streets that encourage walking and cycling, will create a vital neighborhood. Since the neighborhoods of Doha are concluded to lack vitality in terms of their physical environment, a set of recommendations is developed to guide actions towards an increased degree of neighborhood vitality in Doha.

The physical environment is inclusive of streets and public spaces which together create the public realm. Below are the recommended actions towards enhancing and/or creating vital public realm at the scale of the neighborhood (Figure 74):

6.1.1 Streets

1. With consideration to the local context, existing street curbs should be redesigned to accommodate designated paths for pedestrians, cyclists, and people with special needs, with a landscaped buffer to the driveway side. Thus, achieving the qualities of the public realm: accessibility, safety, and equity.
2. With consideration to the local climate and context, bus stops should have designated drop-off/pick-up space with shaded waiting area. Thus, achieving accessibility and safety.
3. With consideration to the local climate, street edges should be lined with shade trees to enhance the microclimate and encourage social occupancy and interactions. Water canals can be integrated, as well, to cool the air and, thus achieve a more enhanced microclimate in the public realm which encourages physical activity. The provision of green spaces where residents are able to live with healthier lifestyles with green spaces providing them with somewhere to meet, exercise or just relax. According to Samvati et. al. (2013), those with good access to green space are more likely to be physically active, thus reducing the risk of health problems.
4. With consideration to the local context, the government should create accessibility systems where maps for walking and biking are developed to educate the society on how to use the public realm safely, especially in traffic junctions of main roads.

6.1.2 Public Spaces

1. With consideration to the local context and culture, designing public spaces that treat residents equally, and consider the needs of different groups: elderly people, children, mothers, and people with special needs.

2. With consideration to the local climate and context, vegetation should be an integral part of the design of public spaces.

6.1.3 Neighborhood Planning

The planning approach should be flexible, needs-based, and holistic.

1. With consideration to the local context and culture, neighborhoods should incorporate a range of green open spaces and an array of housing choices. Land uses should be diverse and mixed (residences, shopping, services, recreation, and workplaces) to create vital and convenient places that promote variety of community values. This integration of employment, housing, retail, cultural, religious, recreational, educational and community facilities in close proximity will add vitality and character throughout the neighborhood. This is a needs-based approach towards designing and/or enhancing the neighborhood's physical environment.
2. With consideration to the local context and culture, the government should incorporate entertainment and fun in the neighborhood's land use planning to ensure the involvement of children. Engaging children is significant to the continued vitality of the neighborhood. As implied from the survey and observation results, residents require a safe and healthy living environment for their children.
3. Residents living in the neighborhood see its physical environment every day and know what would best improve it. Therefore, community participation should be encouraged through establishing a system for residents to express their needs and raise their voices towards a vital living. Community participation will help in monitoring the successfulness in fulfilling the needs; in responding to the local climate, culture, and

context; in enhancing the provision of future urban services, and in maintaining existing services. Thus, guaranteeing a high quality of amenity value.

4. With consideration to the local context, neighborhoods' planning and design should be holistic. While improving the physical environment may be the main goal, the effects can be far wider through enhancing social cohesion, and neighborliness in issues like social segregation of societies and neighborhoods is mitigated.

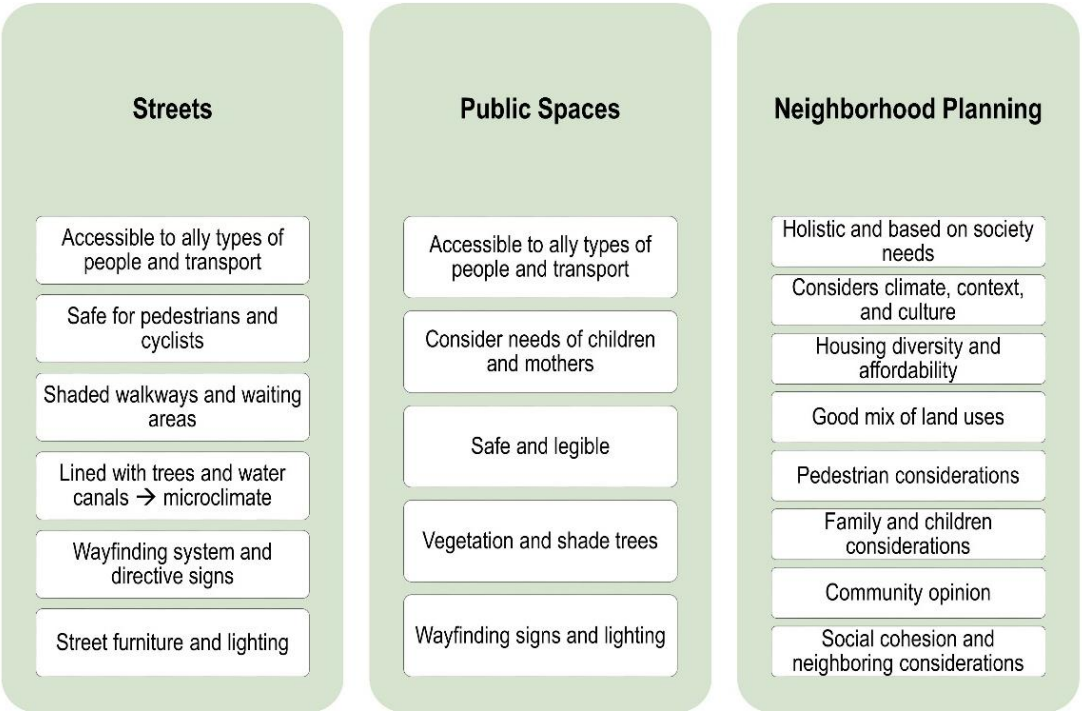

Figure 74. Summary of the recommendations towards neighborhood vitality in Doha.

6.2 Limitations of the Research

This research could have been more comprehensive and accurate if more data were available. Data from the local planning authority were treated with high confidentiality as current projects and planning processes are at the early stages, especially data related to Doha Public Realm project. In fact, the absence of design plans and guideline documents has affected the discussion of the results where knowledgeability of future planning

attempts could have guided the recommendations. Also, another challenge was at the early stages of the research. Published work on urban vitality at the scope of neighborhoods was limited, where urban vitality was mainly discussed at the city scale.

Some challenges were faced during the collection of data. The questionnaire survey was targeted towards the residents of the three selected study neighborhoods. This had reduced the chances of participation and, thus, consumed more time to obtain the targeted number of questionnaires.

6.3 Opportunities for Future Research

This research can be further developed in a number of ways. Neighborhood vitality in Doha can be assessed quantitatively, in which weight points can be assigned to each factor of the defined vitality (society, activities, and the physical environment). The weight point could be assigned based on the presence/absence of each sub-factor. The conclusion is a comparable measure of vitality in different neighborhoods which can solidly guide the recommendations and actions.

Another possibility of conducting the research, is expanding the findings further to a neighborhood prototype that is applicable to Doha. An illustrative design manual, therefore, could be developed in support of the Vital Neighborhood prototype. This can suggest a shift from targeting livable neighborhoods to targeting vital neighborhoods which are holistic to all parties involved (the society, its activities, and the physical environment that encompasses them all). Being a broader concept, neighborhood vitality promises the integration of all qualities as related to the society, culture, sensory experience, economy, and the physical environment.

REFERENCES

Abdelbaset, M. (2015). Liveability of High-Rise Districts: Case Study of West Bay in Doha. Qatar University. Doha, Qatar.

Abu Dhabi Urban Planning Council (2010). Abu Dhabi Economic Vision 2030 and Abu Dhabi Urban Planning Vision 2030. Retrieved 26 March 2016 from http://www.upc.gov.ae/template/upc/pdf/abu-dhabi-vision-2030-revised-en.pdf

Adham, K. (2008) Rediscovering the Island: Doha`s Urbanity from Pearls to Spectacle, in Elsheshtawy, Y., ed., *The Evolving Arab City*, Routledge, New York, NY.

Alnsour, J. (2016). Managing Urban Growth in the City of Amman, Jordan. *Cities*, 50, 93-99. http://dx.doi.org/10.1016/j.cities.2015.08.011

Al-Shawish, A. (2015). Evaluating the Impact of Gated Communities on the Physical and Social Fabric of Doha City. Qatar University.

Azmi, D., & Karim, H. (2012). Implications of Walkability towards Promoting Sustainable Urban Neighborhood. *Procedia - Social and Behavioral Sciences*, 50, 204-213. http://dx.doi.org/10.1016/j.sbspro.2012.08.028

Barton, H., Grant, M., & Guise, R. (2010). Shaping Neighborhoods: For Local Health and Global Sustainability. London: Routledge.

Belanche, D., Casaló, L., & Orús, C. (2016). City Attachment and Use of Urban Services: Benefits for Smart Cities. *Cities*, 50, 75-81. http://dx.doi.org/10.1016/j.cities.2015.08.016

Bianchini, F. & Landry, C (1994). *The Creative City: A Methodology for Assessing Urban Viability and Vitality*. Southend-on-Sea, UK: CoMedia.

Brown, L., Dixon, D., & Gillham, O. (2014). Urban design for an urban century: Shaping more liveable, equitable, and resilient cities. New Jersey: Wiely, second edition.

Cloutier, S., Jambeck, J., & Scott, N. (2014). The Sustainable Neighborhoods for Happiness Index (SNHI): A Metric for Assessing a Community's Sustainability and Potential Influence on Happiness. *Ecological Indicators*, 40, 147-152. http://dx.doi.org/10.1016/j.ecolind.2014.01.012

Drewes, J. & Aswegen, M. (2010). Determining the vitality of urban centres. *The Sustainable World*, WIT Transactions on Ecology and the Environment, 142, 15-25. doi:10.2495/SW100021

Dursun, P. (2012). Dialogue on Space: Spatial Codes and Language of Space. *Istanbul Technical University (ITU)*, 9 (1), 104-119, 2012-1

Eben Saleh, M. (2002). The transformation of residential neighborhood: the emergence of new urbanism in Saudi Arabian culture. Building and Environment, 37(5), 515-529. http://dx.doi.org/10.1016/s0360-1323(01)00041-5

Eissa, B., Awwad, R., Awwaad, R., & Furlan, R. (2015). Neighborhoods and Social Interactions: The Case of Al-Najada Area in Doha. American Journal of Sociological Research, 5(4), 119-133. doi:10.5923/j.sociology.20150504.03

Elsheshtawy, Y. (2011). *The Evolving Arab City: Tradition, Modernity, and Urban Development*. London: Routledge.

Elsheshtawy, Y. (2013). Where the Sidewalk Ends: Informal Street Corner Encounters in Dubai. *Cities*, 31, 382-393. http://dx.doi.org/10.1016/j.cities.2012.12.001

Erickson, T. (2010). The Value of a Neighborhood School: The Story of Paxson Elementary, Missoula, Montana. University of Montana. Montana, USA.

Eriksson, U. (2013). Neighborhood Environment and Physical Activity. Lund University. Lund, Sweden.

Filion, P., & Hammond, K. (2003). Neighborhood Land Use and Performance: The Evolution of Neighborhood Morphology over the 20th Century. *Environment And Planning B: Planning And Design*, 30(2), 271-296. http://dx.doi.org/10.1068/b12844

Furlan, R. (2016). Modern and Vernacular Settlements in Doha: An Urban Planning Strategy to Pursue Modernity and Consolidate Cultural Identity. Arts & Social Sciences Journal, 07(02). http://dx.doi.org/10.4172/2151-6200.1000171

Gibson, C., Brennan-Horley, C., Laurenson, B., Riggs, N., Warren, A., Gallan, B., & Brown, H. (2012). Cool places, creative places? Community perceptions of cultural vitality in the suburbs. *International Journal of Cultural Studies*, 15(3), 287-302. http://dx.doi.org/10.1177/1367877911433750

Gulf Organization for Research and Development – GORD (2016). Global Sustainability Assessment System – GSAS. Retrieved 10 November 2016 from http://www.gord.qa/admin/Content/Link245201663038.pdf

Hakim, B. (2008). *Arabic-Islamic Cities: Building and Planning Principles*. London: New York.

Hakim, B. (2012). Neighborhood Test Design based on Historic Precedents. ArchNet-IJAR, International Journal of Architectural Research, 6(2), 135-148.

Hopkins, D., & Williamson, T. (2010). Inactive by Design? Neighborhood Design and Political Participation. Political Behaviour, 34(1), 79-101. http://dx.doi.org/10.1007/s11109-010-9149-2

Hossini, S., Azemati, S., Elyasi, N., & Mozaffar, F. (2015). The Effect of the Vitality Level of University Campuses on Increasing Social Interactions and Makin. *Procedia - Social and Behavioural Sciences*, 170, 225-233. http://dx.doi.org/10.1016/j.sbspro.2015.01.032

Hutzell, K. & El-Samahy, R. (2013). Carnegie Mellon University in Qatar. Retrieved 12 March 2016, from http://4ddoha.com/

Jaidah, I., & Bourennane, M. (2009). A Brief History of Qatar. In The History of Qatari Architecture 1800-1950 (1st ed., p. 336). Doha: Skira Editore.

Jalaladdini, S., & Oktay, D. (2012). Urban Public Spaces and Vitality: A Socio-Spatial Analysis in the Streets of Cypriot Towns. *Procedia - Social and Behavioral Sciences*, 35, 664-674. http://dx.doi.org/10.1016/j.sbspro.2012.02.135

Javid, D., Krasnove, K., del Rio, V., & Levi, D. (2005). Sense of Community and Travel Behavior: Investigating New Urbanism and Smart Growth Principles in Two Residential

Neighborhoods in San Luis Obispo County. *Focus*, 2(1). http://dx.doi.org/10.15368/focus.2005v2n1.7

Jean, S. (2015). Neighborhood attachment revisited: Middle-class families in the Montreal metropolitan region. *Urban Studies*. http://dx.doi.org/10.1177/0042098015594089

Kalinauskas, T. (2014). Designing a Mess Contributing to Vitality and Functional Diversity in Post-Soviet City. Delft University of Technology. Delft, Netherlands.

Kapiszewski, A. (2006). Arab versus Asian Migrant Workers in the GCC Countries. *United Nations Expert Group Meeting on International Migration and Development in the Arab Region*. Population Division, Department of Economic and Social Affairs, United Nations Secretariat. http://www.un.org/esa/population/meetings/EGM_Ittmig_Arab/P02_Kapiszewski.pdf

Karami, S., Ghafary, M., & Fakhrayee, A. (2014). Analyzing the correlation between urban spaces and place attachment, Evidence from: Narmak neighborhood in Tehran. *European Online Journal of Natural and Social Sciences*, 3(4), 129-39. http://www.european-science.com

Killian, M. (2013). Everything in Common: The Strength and Vitality of Two Christian Intentional Communities. University of Cincinnati. Ohio, USA.

Komeily, A. & Srinivasan, R. (2015). A need for balanced approach to neighborhood sustainability assessments: A critical review and analysis. *Sustainable Cities and Society*, 18, 32-43. http://dx.doi.org/10.1016/j.scs.2015.05.004

Kooshali, A., Azeri, A., Parvizi, R., & Hosseini, S. (2015). Effect of Environmental Physical Elements in Creating Residential Complex's Vitality for the Enhancement of Social Interactions. *Procedia – Social and Behavioral Sciences*, 201, 255-264. http://dx.doi.org/10.1016/j.sbspro.2015.08.174

Kooshki, F., Mollatabar, A., & Masumi, L. (2015). The Local Community Planning (Case Study: Narmak Neighborhood of Tehran). *International journal of Academic Research in business and Social Sciences*, 5(7), 171-178. http://hrmars.com/hrmars_papers/The_Local_Community_Planning.pdf

Krier, L., Thadani, D., & Hetzel, P. (2009). *The Architecture of Community*. Washington, DC: Island Press.

Landry, C. (2016). Urban Vitality: A New Source of Urban Competitiveness. Prourb.fau.ufrj.br. Retrieved 6 March 2016, from http://www.prourb.fau.ufrj.br/cidades/uheroes/abert/texto3.htm

Lockerbie, J. (2016). Planning in Qatar 01. *Catnaps.org*. Retrieved 2 April 2016, from http://www.catnaps.org/islamic/planning.html

Lynch, K. (1961). *Good City Form*. Cambridge, Mass.: MIT Press.

Maas, P. (1984). Towards a Theory of Urban Vitality. The University of British Colombia. Vancouver, Canada.

Marans, R. (2012). Quality of Urban Life Studies: An Overview and Implications for Environment-Behavior Research. *Procedia - Social and Behavioral Sciences*, 35, 9-22.

http://dx.doi.org/10.1016/j.sbspro.2012.02.058

Marquet, O., & Miralles-Guasch, C. (2015). Neighborhood Vitality and Physical Activity among the Elderly: The Role of Walkable Environments on Active Ageing in Barcelona, Spain. *Social Science and Medicine*, 135, 24-30. http://dx.doi.org/10.1016/j.socscimed.2015.04.016

Mega, V. (2005). *Sustainable development, energy, and the city*. Chapter 6: Socio-Economic Vitality of Cities. New York: Springer.

Ministry of Development Planning and Statistics (2016). GIS Qatar. Accessed 27September 2016. Online map: http://www.arcgis.com/apps/MapSeries/index.html?appid=a286d77d29c14421abb6df62ccd316c9

Montgomery, J. (1998). Making a city: Urbanity, vitality and urban design. *Journal of Urban Design*, 3(1), 93-116. http://dx.doi.org/10.1080/13574809808724418

Nagel, P. (2007). Redeveloping Urban Brownfields: Integrating "Creative Class" Neighborhoods Near City Centers. University of Cincinnati. Ohio, USA.

O'Sullivan, D. (2009). Changing Neighborhoods-Neighborhoods Changing: A Framework for Spatially Explicit Agent-Based Models of Social Systems. *Sociological Methods & Research*, 37(4), 498-530. http://dx.doi.org/10.1177/0049124109334793

Qatar Atlas (2010). Qatar Statistics Authority (3rd ed., Vol. 1). Doha: Al-Rayyan Printing Press.

Qatar General Secretariat for Development Planning (2008). Qatar National Vision 2030. Retrieved 2 August 2016 from http://www.mdps.gov.qa/en/qnv/Documents/QNV2030_English_v2.pdf

Qatar Geo-Portal Map (2016). GIS Qatar. Accessed 22 September 2016. Online map: http://geoportal.gisqatar.org.qa/qmap/index.html

Qatar Statistics Authority (2010). Census of Population, Housing, and Establishments. Retrieved 20 June 2016, from http://www.qsa.gov.qa/qatarcensus/Populations.aspx

Qatar Urban Planning Authority (2015). Archive Section: Urban Growth Maps.

Qawasmeh, R. (2013). Investigating Quality of Urban Life in Residential Neighborhoods in Doha. Qatar University. Doha, Qatar.

Ravenscroft, N. (2000). The Vitality and Viability of Town Centers. *Urban Studies*, 37(13), 2533-2549. http://dx.doi.org/10.1080/00420980020080681

Rizzo, A. (2013). Metro Doha. Cities, 31, 533-543. doi: 10.1016/j.cities.2011.11.011

Rofe, Y. (1995). Space and Community - The Spatial Foundations of Urban Neighborhoods: An Evaluation of Three Theories of Urban Form and Social Structure and Their Relevance to the Issue of Neighborhoods. *Berkeley Planning Journal*, 10(1), 107-125. http://escholarship.org/uc/item/8691z2bp

Rybarczyk, G., & Wu, C. (2014). Examining the Impact of Urban Morphology on Bicycle Mode Choice. *Environment and Planning B: Planning and Design*, 41(2), 272-288. http://dx.doi.org/10.1068/b37133

Salama, A., & Wiedmann, F. (2013). *Demystifying Doha: On Architecture and Urbanism in an Emerging City*. Ashgate: Farnham and Burlington.

Samvati, S., Nikookhoy, M., & Izadi, M. (2013). The Role of Vitality and Viability of Urban Streets in Enhancement the Quality of Pedestrian –Oriented Urban Venues (Case Study: Buali Sina Street, Hamedan, Iran). *Journal of Basic and Applied Scientific Research*, 3(7), 554-561. ISSN 2090-4304

Schoenberg, S. & Rosenbaum, P. (1980). *Neighborhoods that Work*. New Brunswick, N.J.: Rutgers University Press.

Schwaller, E. (2012). Effects of Neighborhood Design on Residential Habits and Sense of Community: Testing the Claims of New Urbanism. Arizona State University. Arizona, USA.

Selezneva, E. (2011). Urban Vitality: Exploring the Centrality Conditions. Delft University of Technology. Delft, Netherlands.

Serag El Din, H., Shalaby, A., Farouh, H., & Elariane, S. (2013). Principles of Urban Quality of Life for a Neighborhood. *HBRC Journal*, 9(1), 86-92. http://dx.doi.org/10.1016/j.hbrcj.2013.02.007

Singh, R. (2016). Factors Affecting Walkability of Neighborhoods. *Procedia - Social and Behavioural Sciences*, 216, 643-654. http://dx.doi.org/10.1016/j.sbspro.2015.12.048

Soleimani, M., Mahmoudi, S., Zanganeh, A., & Behruzinia, T. (2014). Urban Environmental Quality: Environmental Perception Case Study: Narmak Neighborhood in District No 4 of Tehran Municipality. *Regional Studies and Research Journal*, 6(2) 2252-0848. http://uijs.ui.ac.ir/urs

Sullivan, W., Kuo, F., & DePooter, S. (2004). The Fruit of Urban Nature: Vital Neighborhood Spaces. Environment and Behavior, 36(5), 678-700. http://dx.doi.org/10.1177/0193841x04264945

Sung, H., & Lee, S. (2015). Residential Built Environment and Walking Activity: Empirical Evidence of Jane Jacobs' Urban Vitality. *Transportation Research Part D: Transport and Environment*, 41, 318-329. http://dx.doi.org/10.1016/j.trd.2015.09.009

Tan, W. (2007). Urban Vitality: Exploring spatial conditions of 24/7 environments for Netherlands. Delft University of Technology. Delft, Netherlands.

Van den Berg, M., Van Poppel, M., Van Kamp, I., Andrusaityte, S., Balseviciene, B., & Cirach, M. et al. (2016). Visiting Green Space is associated with Mental Health and Vitality: A Cross-Sectional Study in Four European Cities. *Health and Place*, 38, 8-15. http://dx.doi.org/10.1016/j.healthplace.2016.01.003

Venetie, S. (2015). The Spine: Researching Spatial Interventions to Strengthen the Vitality of Zoetermeer as a Residential City on the Long Term. Delft University of Technology. Delft, Netherlands.

Villerius, W. (2012). Light plan - Space for People a Public Space Strategy towards a 24 Hour Vitality and Socio-Spatial Integrated Inner City for Brussels. Delft University of Technology. Delft, Netherlands.

Wang, Y., Chau, C., Ng, W., & Leung, T. (2016). A Review on the Effects of Physical Built

Environment Attributes on Enhancing Walking and Cycling Activity Levels within Residential Neighborhoods. *Cities*, 50, 1-15. http://dx.doi.org/10.1016/j.cities.2015.08.004

Wangel, J., Wallhagen, M., Malmqvist, T., & Finnveden, G. (2016). Certification Systems for Sustainable Neighborhoods: What do They Really Certify?. Environmental Impact Assessment Review, 56, 200-213. http://dx.doi.org/10.1016/j.eiar.2015.10.003

Wiedmann, F., Salama, A., & Mirincheva, V. (2014). Sustainable Urban Qualities in the Emerging City of Doha. Journal of Urbanism. 7(1), 62-84. http://dx.doi.org/10.1080/17549175.2013.870088

Wiedmann, F., Salama, A., & Thierstein, a. (2012). Urban Evolution of the City of Doha: An Investigation into the Impact of Economic Transformations on Urban Structures. METU JFA 29(2), 35-61. doi:10.4305/METU.JFA.2012.2.2

Yang, T. (2010). From Nodes to Centralities Creating New Pedestrian Urban Vitality Under the Background of Upcoming Public Transportation Systems. Delft University of Technology. Delft, Netherlands.

Zarin, S., Niroomand, M., & Heidari, A. (2015). Physical and Social Aspects of Vitality Case Study: Traditional Street and Modern Street in Tehran. *Procedia - Social and Behavioral Sciences*, 170, 659-668. http://dx.doi.org/10.1016/j.sbspro.2015.01.068

Zhou, J. (2012). Urban Vitality in Dutch and Chinses Towns. Architecture and Built Environment.

Zhou, J., & Commandeur, S. (2009). Urban Culture in New Town Almere. *The 4th International Conference of the International Forum on Urbanism (IFoU)*. Amsterdam, The Netherlands.

APPENDIX A – QUESTIONNAIRE SURVEY SAMPLE

Neighbourhood Vitality Questionnaire Survey – Doha 2016

Thesis Focus on Urban Design | MUPD 760

Master Degree in Urban Planning and Design

كلية الهندسة
College of Engineering
QATAR UNIVERSITY جامعة قطر

Dear Sir/ Madam,

I would like to invite you to participate in this research questionnaire and highly appreciate your support. This is my **Thesis Project** that is about ***Assessment of Neighborhood Vitality in Doha***. The participation is voluntary, and you can skip any question or withdraw at any time.

The aim of my thesis is to assess issues of urban vitality in Doha's neighborhoods. This questionnaire will help to understand the complex dynamics between the current realities of neighborhood life in Doha in order to recommend actions towards a well-functioning public realm.

This questionnaire is therefore based on two distinctive sections:

1. Personal Information: Who are you? Your activities in the neighborhood?
2. Neighborhood Information: How do you experience your neighborhood?

For further information: Please contact Reem Youssef Awwaad. Email: ra084283@qu.edu.qa
Mobile: +974 3029 3985

PERSONAL INFORMATION: WHO ARE YOU?

1.1) Gender:
Male ☐ Female ☐

1.2) Social Status:
Single ☐ Married ☐ Divorced ☐

1.3) Nationality:
Qatari ☐ Arab ☐ Asian ☐ European/ American/ Australian ☐

1.4) In the case you are an expatriate, how many years have you been in Doha?
1 – 2 ☐ 3 – 6 ☐ 7 – 10 ☐ >10 ☐

1.5) Age:
18 – 25 ☐ 26 – 35 ☐ 36 – 45 ☐ 46 – 55 ☐ >55 ☐

1.6) What is your educational level?
Secondary and below ☐
Bachelor / Diploma ☐
Master's or higher ☐

1.7) What is your professional expertise?
Operational & Technical ☐
Managerial & Supervisory ☐

1.8) How long have you been living in your neighborhood?
1 – 2 ☐ 3 – 6 ☐ 7 – 10 ☐ >10 ☐

1.9) How many of your neighbors do you know?
All of them ☐ Most of them ☐
A few of them ☐ None of them ☐

1.10) Reason for living in your neighborhood?
Personal preference ☐
Work accommodation ☐
Affordable living ☐
Family neighbourhood – *Fereej* ☐

PERSONAL INFORMATION: YOUR ACTIVITIES IN THE NEIGHBORHOOD?

1.11) In a usual week, what activities do you perform in your neighbourhood? (pick all applicable)
Walking ☐ Cycling ☐ Driving ☐
Socializing ☐ Recreation ☐ Relaxing ☐
Shopping ☐ Playing sports ☐

1.12) In general, at what time do you perform these activities? (pick all applicable)
Morning ☐ Afternoon ☐ Evening ☐

1.13) How often do you use the public park in your neighborhood?
Very often ☐ Somewhat often ☐ Not so often ☐

If you use the park, what activities you perform there? (pick all applicable)
Walking ☐ Cycling ☐ Socializing ☐
Recreation ☐ Relaxing ☐ Kids' playing ☐

Are you satisfied with the park's design and facilities?
Yes ☐ No ☐

1.14) What unique activities is your neighborhood famous with? If any

_____

NEIGHBORHOOD INFORMATION: HOW DO YOU EXPERIENCE YOUR NEIGHBORHOOD?

2.1) Are you encouraged to go out of your house to spend hours in the neighbourhood performing different activities?
Yes ☐ No ☐

What encourages you? (pick all applicable)
Social Interaction ☐ Health & Fitness ☐ Relaxation ☐
None ☐

What discourages you? (pick all applicable)
Lack of green spaces ☐ Hot Weather ☐ Laziness ☐
Lack of people outside ☐ Culture ☐
Lack of traffic safety ☐

2.2) How well are the streets maintained in your neighbourhood?
Very well ☐ Somewhat well ☐ Not so well ☐

2.3) How well are the public spaces maintained in your neighbourhood?
Very well ☐ Somewhat well ☐ Not so well ☐

Neighbourhood Vitality Questionnaire Survey – Doha 2016

Thesis Focus on Urban Design | MUPD 760

Master Degree in Urban Planning and Design

كلية الهندسة
College of Engineering
QATAR UNIVERSITY جامعة قطر

2.4) Can you use your neighborhood's streets to walk safely?
Yes ☐ Sometimes ☐ No ☐

2.5) In general, how safe do you feel in your neighborhood?
Very safe ☐ Somewhat safe ☐ Not so safe ☐

2.6) In your opinion, how beautiful is your neighborhood?
Very beautiful ☐ Somewhat beautiful ☐ Not so beautiful ☐

2.7) In your opinion, what is the ideal neighborhood environment in Doha that you wish to live in?
_____

2.8) How proud are you to live in your neighborhood?
Very proud ☐ Somewhat proud ☐ Not so proud ☐

2.9) How happy are you to live in your neighborhood?
Very happy ☐ Somewhat happy ☐ Not so happy ☐

2.10) What do you like most about your neighborhood?
Its location ☐ Its design ☐ Your neighbors ☐
The life within (quite, safe, etc.) ☐

2.11) What do you like least about your neighborhood?
Its location ☐ Its design ☐ Your neighbors ☐
The life within (noise, unsafe, dull, etc.) ☐

2.12) What changes would most improve your neighborhood's life? (pick all applicable)
Vegetation ☐ Shaded walkways ☐
Public meeting places ☐ Water features ☐
Neighbors with similar culture ☐ Shops & Cafes ☐

2.8) What are your particular preferences?	Important	Somehow Important	Not important
I want to have good relations with my neighbors			
I want to keep my privacy and limit interactions with my neighbors			
I want to have different cultures and nationalities in my neighborhood			
I want to live in a quit neighborhood			
I want to be familiar of my neighborhood's facilities and surroundings			
I want my children to grow in this neighborhood			
I want to have a well-designed park in my neighbourhood			
I want to have more parking spaces in my neighborhood			
I want to use the streets of my neighborhood for walking, cycling, and sitting			
I want to have shops in proximity to my house			
I want to have a mosque in proximity to my house			
I want to have a school in proximity to my house			

Thank you!

APPENDIX B – QU-IRB APPROVAL FORM

جامعة قطر
QATAR UNIVERSITY

Qatar University Institutional Review Board
QU-IRB

October 9, 2016

Ms. Reem Youssef Amin Awwaad
Graduate Student Project
College of Engineering
Qatar University
Tel.: 30293985
Email: ra084283@qu.edu.qa, reem.y.awwaad@gmail.com

Dear Ms. Reem Awwaad,

Sub.: **Research Ethics Review Exemption / Graduate Student Project**
Ref.: **Project titled, "Assessment of Neighborhood Vitality in Doha"**

We would like to inform you that your application along with the supporting documents provided for the above proposal, is reviewed and having met all the requirements, has been exempted from the full ethics review.

Please note that any changes/modification or additions to the original submitted protocol should be reported to the committee to seek approval prior to continuation.

Your Research Ethics Approval No. is: **QU-IRB 657-E/16**

Kindly refer to this number in all your future correspondence pertaining to this project.

Best wishes,

K. Alali

Dr. Khalid Al-Ali
Chairperson, QU-IRB

جامعة قطر
QATAR UNIVERSITY
Institutional Review Board
(IRB)
Office Of Academic Research

Qatar University-Institutional Review Board (QU-IRB), P.O. Box 2713 Doha, Qatar
Tel +974 4403-5307 (GMT +3hrs) email: QU-IRB@qu.edu.qa

APPENDIX C – NEIGHBOURHOOD VITALITY INDEX

CALCULATIONS

Calculation of Neighbourhood Vitality Index for Fereej Bin Mahmoud

	Indicators	Survey Questions	Result	Achievement Level	Dimensions	Neighbourhood Vitality Index
Society	Heterigenity of the society	1.1) Gender/ 1.2) Social Status/ 1.3) Nationality/ 1.5) Age	Mainly single/ 57% Asians and no Qataris/ Mainly youth	1 - **2** - 3	Socio-Cultural Vitality score (7/9)*33% = 26%	67% Moderately Vital
	Behaviour of the society	1.6) What is your educational level?/ 1.7)/ 1.8) How long have you been living in your neighborhood?/ 1.9) How many of your neighbors do you know?/ 1.10) Reason for living in your neighborhood?/ Particular preferences	56% Bachelor degree holders/ 57% live in neighbourhood for 3-6 years/ 58% know few of their neighbours/ work accomodation/ well-designed neighbourhood envrionment is prefered	1 - 2 - **3**		
	Level of occupancy	2.4) Can you use your neighborhood's streets to walk safely?	41% are not encourged to use streets due to hot weather and lack of green spaces, while 36% are sometimes encourged	1 - **2** - 3		
Activities	Pedestrinization	2.1) Are you encouraged to go out of your house to spend hours in the neighbourhood performing different activities? What encourages you? What	54% not encourged due to hot wather and lack of green spaces/ 46% are encourged due to social interactions	1 - **2** - 3	Experiential Vitality score (8/12)*45% = 30%	
	Diversity of activities	1.11) In a usual week, what activities do you perform in your neighbourhood?/ If you use the park, what activities you perform there?	Driving is the predominant activity/ no neighbourhood park/ economic activities are dominant	1 - **2** - 3		
	Uniquness of activities	1.14) What unique activities is your neighborhood famous with? If any	common activities	**1** - 2 - 3		
	Time of happening	1.12) In general, at what time do you perform these activities?	equal distribution of activities across the day	1 - 2 - **3**		
Physcial Environment	Place characteristics	2.5) In general, how safe do you feel in your neighborhood?/ 2.7) In your opinion, what is the ideal neighborhood environment in Doha that you wish to live in?/ 2.8) How proud are you to live in your neighborhood?/ 2.9) How happy are you to live in your neighborhood?/ 2.10) What do you	50% and above find the neighbourhood places unsafe and not beautiful, and they don't feel proud and happy about them/ lack of shade	**1** - 2 - 3	Spatial Vitality score (3/6)*22% = 11%	
	Morphology of the physcial envrionment	Are you satisfied with the park's design and facilities?/ 2.2) How well are the streets maintained in your neighbourhood?/ 2.3) How well are the public spaces maintained in your neighbourhood?/ 2.6) In your opinion, how beautiful is your neighborhood?/ 2.12) What changes would most improve your neighborhood's life?	mixed land uses/ 50% find the streets not well designed and mainananced, and 89% find the public spaces not well designed and maintained	1 - **2** - 3		

Neighbourhood Vitality Index		Level of Achievment	
1% to 35%	Not Vital	1	Not Present
36% to 70%	Moderately Vital	2	Moderately Present
71% to 100%	Vital	3	Present

Calculation of Neighbourhood Vitality Index for Al-Thumama

	Indicators	Survey Questions	Result	Achievement Level	Dimensions	Neighbourhood Vitality score
Society	Heterigenity of the society	1.1) Gender/ 1.2) Social Status/ 1.3) Nationality/ 1.5) Age	distribution/ 58% married/ 45% Qataris and 35% Arabs/ Mainly youth	1 - **2** - 3	Socio-Cultural Vitality score (4/9)*33% = 15%	57% Moderately Vital
Society	Behaviour of the society	1.6) What is your educational level?/ 1.7)/ 1.8) How long have you been living in your neighborhood?/ 1.9) How many of your neighbors do you know?/ 1.10) Reason for living in your neighborhood?/ Particular preferences	77% Bachelor degree holders/ 40% live in neighbourhood for 3-6 years/ 53% know few of their neighbours/ family neighbourhood/ neighbourhood mousque and park are prefered	**1** - 2 - 3		
Society	Level of occupancy	2.4) Can you use your neighborhood's streets to walk safely?	43% are encourged to use streets, while 34% are not	**1** - 2 - 3		
Activities	Pedestrinization	2.1) Are you encouraged to go out of your house to spend hours in the neighbourhood performing different activities? What encourages you? What discourages you?	56% encourged to exersise for health and fitness, and 44% are not encourged due to hot weather	1 - **2** - 3	Experiential Vitality score (6/12)*45% = 23%	
Activities	Diversity of activities	1.11) In a usual week, what activities do you perform in your neighbourhood?/ If you use the park, what activities you perform there?	Driving is the predominant activity/ no neighbourhood park	**1** - 2 - 3		
Activities	Uniquness of activities	1.14) What unique activities is your neighborhood famous with? If any	common activities	**1** - 2 - 3		
Activities	Time of happening	1.12) In general, at what time do you perform these activities?	only morning and evening	1 - **2** - 3		
Physcial Environment	Place characteristics	2.5) In general, how safe do you feel in your neighborhood?/ 2.7) In your opinion, what is the ideal neighborhood environment in Doha that you wish to live in?/ 2.8) How proud are you to live in your neighborhood?/ 2.9) How happy are you to live in your neighborhood?/ 2.10) What do you like most about your neighborhood?/ 2.11) What do you like least about your neighborhood?	50% and above find the neighbourhood places safe, and somewhate beautiful, and they feel somewhat proud and happy about them/ lack of shade	1 - 2 - **3**	Spatial Vitality score (5/6)*22% = 19%	
Physcial Environment	Morphology of the physcial envrionment	Are you satisfied with the park's design and facilities?/ 2.2) How well are the streets maintained in your neighbourhood?/ 2.3) How well are the public spaces maintained in your neighbourhood?/ 2.6) In your opinion, how beautiful is your neighborhood?/ 2.12) What changes would most improve your neighborhood's life?	dominant residential land use/ 50% find the streets somewhat well designed and maintananced, and 63% find the public spaces somewhat well designed and maintained	1 - **2** - 3		

Neighbourhood Vitality Index	
1% to 35%	Not Vital
36% to 70%	Moderately Vital
71% to 100%	Vital

Level of Achievment	
1	Not Present
2	Moderately Present
3	Present

Calculation of Neighbourhood Vitality Index for Al-Dafna

	Indicators	Survey Questions	Result	Achievement Level	Dimensions	Neighbourhood Vitality score
Society	Heterigenity of the society	1.1) Gender/ 1.2) Social Status/ 1.3) Nationality/ 1.5) Age	gender distribution/ 47% married/ 42% Westerners and	1 - 2 - **3**	Socio-Cultural Vitality score (8/9)*33% = 29%	82% Vital
	Behaviour of the society	1.6) What is your educational level?/ 1.7)/ 1.8) How long have you been living in your neighborhood?/ 1.9) How many of your neighbors do you know?/ 1.10) Reason for living in your neighborhood?/ Particular preferences	73% Bachelor degree holders/ 44% live in neighbourhood for more than 10 years/ 47% know most of their neighbours/ personal preference and work accomodation/ well-designed neighbourhood park and street usage for different activities are prefered	1 - 2 - **3**		
	Level of occupancy	2.4) Can you use your neighborhood's streets to walk safely?	equal percentage of ability to use the streets	1 - **2** - 3		
Activities	Pedestrinization	2.1) Are you encouraged to go out of your house to spend hours in the neighbourhood performing different activities? What encourages you? What	54% not encourged due to hot wather and lack of green spaces/ 46% are encourged	1 - **2** - 3	Experiential Vitality score (10/12)*45% = 38%	
	Diversity of activities	1.11) In a usual week, what activities do you perform in your neighbourhood?/ If you use the park, what activities you perform there?	Driving and shopping are the predominant activities/ economic and recreational	1 - 2 - **3**		
	Uniquness of activities	1.14) What unique activities is your neighborhood famous with? If any	some unique activities	1 - **2** - 3		
	Time of happening	1.12) In general, at what time do you perform these activities?	distribution of activities across the day	1 - 2 - **3**		
Physcial Environment	Place characteristics	2.5) In general, how safe do you feel in your neighborhood?/ 2.7) In your opinion, what is the ideal neighborhood environment in Doha that you wish to live in?/ 2.8) How proud are you to live in your neighborhood?/ 2.9) How happy are you to live in your neighborhood?/ 2.10) What do you like most about your neighborhood?/ 2.11) What do you like least about your neighborhood?	50% and above find the neighbourhood places safe and beautiful, and they feel proud and happy about them/ lack of shade	1 - **2** - 3	Spatial Vitality score (4/6)*22% = 15%	
	Morphology of the physcial envrionment	Are you satisfied with the park's design and facilities?/ 2.2) How well are the streets maintained in your neighbourhood?/ 2.3) How well are the public spaces maintained in your neighbourhood?/ 2.6) In your opinion, how beautiful is your neighborhood?/ 2.12) What changes would most improve your neighborhood's life?	mixed land uses/ 50% find the streets not well designed and mainananced, and 89% find the public spaces not well designed and maintained	1 - **2** - 3		

Neighbourhood Vitality Index		Level of Achievment	
1% to 35%	Not Vital	1	Not Present
36% to 70%	Moderately Vital	2	Moderately Present
71% to 100%	Vital	3	Present

تَـمّ بـحَـــمـد الله