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COLLEGE OF ENGINEERING

THE SPATIAL CULTURE OF TRADITIONAL AND CONTEMPORARY
HOUSING IN QATAR: A COMPARATIVE ANALYSIS BASED ON SPACE

SYNTAX

BY

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ABSTRACT

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Title: The Spatial Culture of Traditional and Contemporary Housing in Qatar. A Comparative Analysis based on Space Syntax

Supervisor of Thesis: Raffaello Furlan and Mark D. Major.

Residential architecture is the product of various influential factors that directly relate to the needs and wants of the occupants, subjecting residential architecture to transformation on an urban scale. In the context of the State of Qatar, the forces of globalization have affected socio-cultural factors, and this change is reflected in the spatial form of Qatari houses during rapid urbanization over the previous decades. The contemporary construction of housing tends to reflect the requirements of a global market instead of local architectural identity. Thus, a comparative assessment is established to contemplate the housing transformation in Qatar over the history of its urban development. A comparative investigation of spatial form in traditional and contemporary Qatari houses can provide useful insights into the embedded socio-cultural patterns influencing the development of housing in Qatar ever since the discovery of oil in the 1930s-50s. This research study uses space syntax analysis, supported by other simulation and visualization techniques, to examine these socio-cultural patterns in a selected sample of traditional and contemporary Qatari houses. Despite changes over time and across different eras, the study reveals that specific factors such as (1) privacy, (2) gender segregation and (3) hospitality tend to determine the spatial form of both vernacular and modern models of Qatari housing. The study concludes that these findings can help positively contribute towards the development of a distinctive architectural identity based on

social sustainability and tradition for the urban regeneration of the built environment. Such efforts are directed toward fulfilling the future urban strategies defined by Qatar National Vision 2030 and Qatar National Development Framework that seek to guide the development process of the country to a sustainable path for achieving a balanced growth model between locality and globalization.

نبذة مختصرة

العنوان: الآثار الاجتماعية والثقافية في تشكيل المسكن التقليدي والمعاصر في دولة قطر: دراسة مقارنة

وفق المنطق الاجتماعي للفراغات الحضرية (Space Syntax)

تُعد العمارة السكنية نتاجاً للعديد من العوامل المتأثرة باحتياجات السكان ورغباتهم، والتي تُسهم في تحوّل النطاق العمراني العام لارتباطها بالمكون الاجتماعي ذي التأثير الواضح في عملية التطوّر والتغيّر في البناء والعمارة. خلال العقود القليلة الماضية، طرأت على البيئة العمرانية لدولة قطر تغيّراتٌ كبيرة بسبب العولمة والانفتاح والنموّ المتسارع، مما أعاد تشكيل الهوية الاجتماعية والثقافية للأنماط السكنية في الدولة، وبالأخص هوية البيت القطري، ممثلاً الشكل الأكثر شيوعاً للسكن العائلي في قطر. يميل البناء المعاصر للإسكان في قطر إلى نقل متطلبات السوق العالمية بدلاً من استلهام المعاني من الهوية المعمارية المحلية، وذلك يستوجب تحليل الوضع الحالي استناداً إلى دراساتٍ مقارنةٍ تسمح بإعادة تقييم التحوّل الإسكاني في الدولة بين الماضي والحاضر، بالإضافة لتحليل الأنماط الثقافية وأنماط الحياة الاجتماعية في تشكيل هوية البيت القطري منذ فترة ما قبل اكتشاف النفط في ثلاثينات إلى خمسينات القرن الماضي، حتى المرحلة المعاصرة المتمثلة في غياب الهوية والاحتكام إلى معاييرٍ وطرق بناءٍ حديثةٍ استجابةً للتضخّم السكاني.

تستند هذه الدراسة المقارنة إلى نظرية المنطق الاجتماعي للفراغات الحضرية أو ما يعرف بتركيب جملة الفضاء (Space Syntax)، باستخدام برامج المحاكاة التقنية وتصورات جرافيكية أخرى لتحليل الأنماط الاجتماعية والثقافية في عينة مختارة من المنازل القطرية التقليدية والمعاصرة. تشير النتائج إلى الأثر الكبير لعوامل محددة مثل (1) الخصوصية، (2) الفصل بين الجنسين، (3) الضيافة في التركيب المكاني للبيوت القطرية بدرجاتٍ متفاوتة، والتي لازالت ترسخ للقيم الاجتماعية والثقافية في تكوين المسكن القطري بالرغم من كل عوامل التغيير الحديثة التي شكلت الوجه الجديد للتصميم الحضري في الدولة. تُسهم نتائج هذه الدراسة في تحديد توجّه الهوية العمرانية للمسكن القطري وفقاً لمبادئ الاستدامة الاجتماعية وتقييم مستقبل النمو الحضري للمدن والمناطق السكنية في ظل التوازن المنشود بين الإرث المحلي والانفتاح العالمي، مما يصبّ في توجيه الجهود نحو تحقيق استراتيجيات النمو العمراني للدولة كما تتطلّع إليه رؤية قطر الوطنية 2030.

STATEMENT

The following papers, which are derived from the author's master's thesis, were published and accepted for publication:

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A good journey never comes to an end. Like good design, it tends to re-evolve and re-evaluate itself with refinements and advancement. I hope that the ideas contained within this thesis can do the same, evolving and advancing within the field of urban design and architecture.

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LIST OF ABBREVIATIONS

| | |
|---------|--|
| GCC | Gulf Cooperation Council |
| GSDP | The General Secretariat for Development Planning |
| MDPS | Ministry of Development Planning and Statistics |
| MENA | Middle East and North Africa |
| MME | Ministry of Municipality and Environment |
| MSDP | Municipal Spatial Development Plans |
| OPEC | The Organization of the Petroleum Exporting Countries |
| PEO | Private Engineering Office |
| QNDF | Qatar National Development Framework |
| QNMP | Qatar National Master Plan |
| QNV2030 | Qatar National Vision 2030 |
| QPL | Qatar Planning Legislation |
| TOD | Transit-oriented Development |
| UN | United Nations |
| UNESCO | United Nations Educational, Scientific and Cultural Organization |
| VGA | Visibility Graph Analysis |

CHAPTER 1: INTRODUCTION

Residential architecture represents a wide spectrum of types and typologies designed and built in accordance to the direct needs of the occupants. The concept of the home usually goes beyond the physical limits of the built form assigned for human residence to include aspects of the psychological, spiritual and emotional needs of human beings (Mallett, 2004). The concept of home does not only address the independent needs of the individual, but it is also significant in addressing the social and cultural necessities of the entire community.

Scholars in urban planning and design agree that a house is a building type that fulfils the basic need for shelter in addition to higher-level behavioural, socio-cultural and environmental factors such as belonging, privacy, autonomy and comfort (Allan, 1989; Altman, 1975; Blunt, 2005; Campo, 1991; Hanson, 2003; Heathcote, 2012; Marcus, 1995; Rapoport, 1969, 2007; Rybczynski, 1986). In terms of human activities and basic human needs, houses everywhere serve “the same basic needs of living, cooking and eating, entertaining, bathing, sleeping, storage and the like” (Hanson, 2003, p. 2), yet the house is a pattern of space and an association between architectural form and culture beyond the superficiality of basic human needs.

Houses are buildings designed for human residence, ranging from single-family homes to apartments and group homes. Historically, the design of houses is an act of expressing the requirements of “the period and its conventions” (Neufert, 2000, p. 39). In the contemporary era, the house is an expression of the individual as well as the society’s way of life instead of a historical fortress for protection. In turn, housing is a crucial site in the everyday life of individuals especially in the process of social identity formation as well as the maintenance of social relationships (Dunn, 2000).

This research study explores the socio-cultural patterns changing residential architecture within the Islamic and Middle Eastern context of the State of Qatar. The interconnected and multifaceted socio-cultural factors influencing the architecture of Qatar shape and are shaped by the spatial form of residential units owned and inhabited by local Qatari families. This exploration has a comparative approach to signify aspects of urban transformation in houses covering a range of traditional and contemporary models in a specific socio-cultural context.

Based on the latest recorded social statistics on the Qatari society from the General Census of Population, Housing and Establishments 2015, the housing unit is defined as “a building or part of a building originally intended to accommodate one household” (MDPS, 2016, p. 25) maintaining its own accessibility to the public street through main doors and entry points. As defined by the statistics, a housing unit may be a villa, palace, apartment unit, independent room in a building, public house or what is referred to in Qatar as an Arabic or popular house (Table 1).

Table 1: Distribution (%) of Households by Type in Qatar. Source (MDPS, 2016)

| Census Year | Type of Housing Unit | | | | | | Number of Households |
|------------------------------------|----------------------|--------|-----------------|---------------------|--------|-------|-------------------------|
| | Palace/ Villa | Apart. | Arabic House | Part of Building | Others | Total | |
| 1986 | 20.5 | 24.1 | 37.6 | N/A | 17.8 | 100 | 49,783 |
| 1997 | 23.7 | 26.8 | 31.0 | N/A | 18.6 | 100 | 73,342 |
| 2004 | 24.4 | 29.2 | 26.3 | N/A | 20.1 | 100 | 102,184 |
| 2010 | 33.7 | 36.7 | 15.4 | 5.9 | 8.3 | 100 | 146,707 |
| 2015 | 40.5 | 42.9 | 7.2 | 4.7 | 4.7 | 100 | 201,432 |
| Growth Rate (%) (2010-2015) | | | | | | | |
| | 11 | 10 | -9 | 2 | -5 | N/A | |

According to Census 2015, the average household size in Qatar is 4.7 members. The number of households—defined as single residential units inhabited by one or more persons living together with no consanguinity or relatives by kinship or marriage—is 201 thousand units. More than half of the entire 2.5 million-member population is living in rented housing provided by the government or subsidized by private companies. For Qatari nationals, the average household size is 10 individuals including domestic labour while the most common housing type is the multi-storey villa (MDPS, 2015, 2017).

The current housing situation in Qatar reflects a rather limited tendency to represent cultural and social values either as direct architectural representations or in the internal configuration of the built units. The restrictive nature of the built forms

has been attributed to the predefined construction standards of the modern villa, which follow the global market trends while being supported by municipal building permits. Most of these trends aim for minimized cost and price values, providing an economical product with modern amenities and delivering a complete unit in the shortest possible timeframe. This mass production approach results in residential architectural forms that are detached from their local and socio-cultural context, especially in socially driven societies such as Qatar.

The current approach in architecture and urban design is not limited to housing, but also directs the entire urban development of Qatari cities including commercial, public, economical and other projects and establishment types. The trend of mega projects and large-scale residential and retail ventures also provides residential options based on ready-made Westernized styles, both in construction and marketability, which is seen as a supportive trend in generating residential options to fulfil the needs of the growing population (Al-Kubaisi, 1984; Al-Malki, 1994; Hutzell, Samahy, & Himes, 2015; Wiedmann, Salama, & Thierstein, 2012).

In Qatar, housing for Qatari nationals is regulated through administrative programs such as National Housing Program and Public Housing Program (Hukoomi, 2018). The National Housing Program assures the provision of free land plots to all married male Qataris in order to establish a family home. The latter program targets nationals with special needs or fitting a certain social and economic status, in addition to women of particular social standing. Plot size varies depending on the availability of residential zones within vacant government land, which is currently challenging the supply of land in the country's most populated municipalities such as Doha and Al Rayyan. In addition to land supply issues, urban sprawl is continuously upsetting the role of planning in managing the urban growth of Qatar (QNDF, 2014).

In order to sustain Qatari residential architecture and conserve the cultural heritage of housing in the urban scale, active governance is essential to ensure that global trends in urban planning and design are regulated by locally intensive practices supported by a strong policy foundation. To this end, the State of Qatar proclaims its National Development Framework (QNDF) stemming from the strategic national plan of Qatar National Vision 2030 (QNV2030) which directly targets the challenge of the decline of Qatari identity, sense of belonging and cultural heritage due to globalization and rapid urbanization (Furlan & Alattar, 2017; GSDP, 2008; Salama & Wiedmann, 2013; Scharfenort, 2012; Sillitoe, 2014; Tok, Alkhater, & Pal, 2016; Wiedmann, Salama, & Mirincheva, 2014; Zaina, Zaina, & Furlan, 2016).

The QNV2030 defines “broad future trends and reflects the aspirations, objectives and culture of the Qatari people” (GSDP, 2008, p. 2). This national strategic plan was launched in 2008 by the General Secretariat of Development Planning with defined strategies and objectives aimed at sustaining the country’s development and improving the status of its people. By 2030, Qatar is expected to have a diversified economy, a productive society with highly educated human capital, and a sustainable environment and natural resources. QNV2030 envisages positive change in society in which the process of transformation comprehensively targets the human, economic, social and environmental pillars of sustainable development.

Sustainable development promotes an overall urban development process where the role of urban governance is important in coordinating and managing the growth of cities in the face of rapid population growth rates. In the case of Doha, the challenges of globalization result in planning issues that are addressed by the regulatory policy of the Qatar National Master Plan (QNMP). The master plan is expanded in two policy documents, namely the Qatar National Development

Framework (QNDF), and the Municipal Spatial Development Plans (MSDP) (Salama & Wiedmann, 2016). According to QNDF:

“Throughout Qatar a more sensitive understanding of the built environment and cultural heritage is required [...]. The use of best practice principles in new energy efficient building design whilst conserving the nation’s historic and cultural assets is also promoted” (QNDF, 2014, p. 50).

The QNDF defines the general principles for sustainable urban design that are responsive to the cultural heritage of Qatar (Figure 1). The focus of the spatial strategy is to deliver a balanced compact city growth model, including transit-oriented development (TOD), traditional neighbourhood development and liveable cities that celebrate local cultural heritage (AL-Mohannadi & Furlan, 2018c; QNDF, 2014).

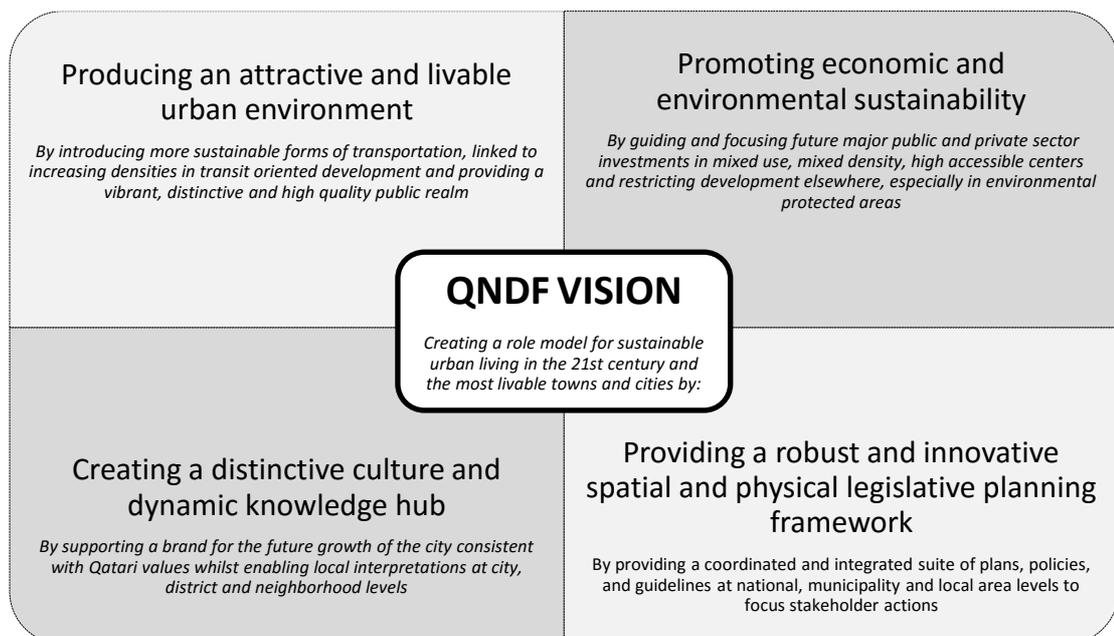


Figure 1: Generation of QNDF Vision. Source (QNDF, 2014) Author’s Summary

Amongst the strategic planning objectives of QNDF is the use of density and building typologies to provide choices in accommodation types, including adequate affordable housing for nationals. In addition, QNDF is strategized to create high quality residential neighbourhoods that are in harmony with the cultural identity and preferred lifestyles of Qataris.

Based on the directives of QNV2030 and QNDF, there is a need to create a housing identity that relates to the environmental and the socio-cultural context of the country, responding to the rapidity of real estate and economic development and fulfilling the demands of the growing population (Furlan & Sipe, 2017; QNDF, 2014). The effects of globalization, market demand and the evolution process of specific socio-cultural parameters of the Qatari society are becoming major trends contributing to the transformation of the spatial form of housing in Qatar (Nagy, 2004b; Salama, 2007).

As Qatari society embraces global change and accessibility to a wider spectrum of market choices, the socially responsive characteristics of the Qatari house seem upended by the transformative parameters of the society. According to Nagy, “in societies where renovation and rebuilding are common, such as Qatar, the development cycle of the family is an important factor influencing changes in house form” (Nagy, 2004a, p. 47).

The Qatari house represents a unit of analysis to investigate residential architecture within a transformative social framework. The analysis supports social sustainability in housing interpreted in terms of the social constraints limiting development, the social preconditions necessary to support environmental sustainability and the maintenance of the wellbeing of current and future people generations (Ahmed, 2017; Chiu, 2004). The social sustainability of architecture is

presumably linked to socio-cultural nature of housing, which in turn references theories of urban design and regeneration. The aim of relinking social sustainability to housing and its architecture is to maintain a distinctive Qatari and Middle Eastern urban identity capable of providing future generations with sustainable dwelling options.

Among the most sustainable housing typologies or archetypes is the courtyard house, known as a responsive typology to “low rise high-density urban housing” and “is an appropriate form of housing within contemporary mixed use sustainable urban developments” (Edwards, Sibly, Hakim, & Land, 2006, p. xvii). The common formative scheme of the courtyard house includes a one-storey angle-shaped built block with a central open space contained within boundary walls or adjoining buildings (Figure 2).

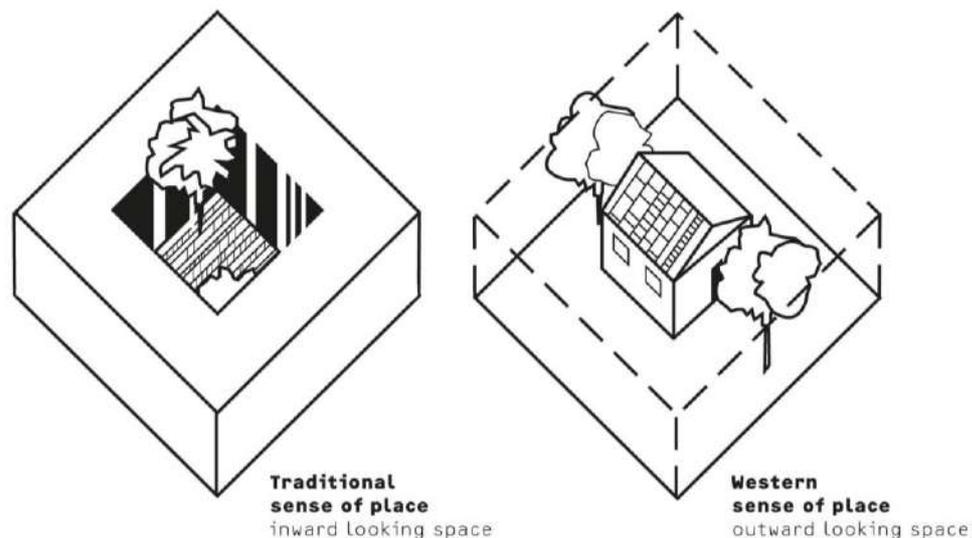


Figure 2: Traditional vs. Western Sense of Place in Houses. Source (Pahl-Weber, Seelig, Ohlenburg, & Bergmann, 2013, p. 67)

The courtyard house is a widely spreading domestic typology across different climates and cultures in the world from China to Morocco. Its form supports family and community life and proves its usefulness and popularity as a socially sustainable facet of architecture in traditional and historical settlements, especially in the Mediterranean and the Middle East regions (Petruccioli, 2008; Ragette, 2006; Salama, 2006; Salama, 2003; Zhang, 2016). On that account, “the courtyard house requires attention because it is the residential type which responds simultaneously to cosmic, cultural and climatic forces. As such it is the main residential type of the Arab region, although it enjoyed a form of parallel evolution beyond the Middle East” (Petruccioli, 2008, p. 874).

In the context of the Middle East and North Africa region (MENA) and the Arabian Gulf region, the typical vernacular house is characterized by design parameters shaped by the socio-cultural structure (AL-Rostomani, 1997; Lewcock & Freeth, 1978; Majida, Shuichib, & Takagi, 2012). Traditional houses are primarily organized on the basis of culture and belief. Social networks based in Islamic principles used to govern most of the societies in the region, including the Qatari society, promoting the socio-cultural and behavioural patterns of privacy, gender segregation and hospitality as major determinants of the human-environment interaction (Campo, 1991; Fathy, 1986; Furlan & Alattar, 2017; Remali, Salama, Wiedmann, & Ibrahim, 2016; Salama, 2013a; Sobh & Belk, 2011).

In domestic architecture, privacy is one of the most predominant factors in determining the internal configuration of houses. In fact, the development of the house is based on the idea of separating the public and private domains where privacy of the family or household is preserved by architectural interventions such as gates, walls, doors and windows (Evans, 1997; Heathcote, 2012). Within the household,

spaces are distributed based on functionality, hierarchy of activity, accessibility, level of privacy and, in some cases, the gender of occupants. Thus, the issue of gendered spaces in housing presents an interesting human-behaviour phenomenon considering the influence of socio-cultural factors in the built environment. This discussion leads to contemplation on the roles of males and females in domestic spaces, which is subject to the societal limits of relationships and segregation.

Within the private domain of the house, specific socio-cultural attributes are directed toward fulfilling the needs of the society as a unifying system. The rise of hospitality as a determinant pattern of the socio-cultural development of housing in Qatar and the entire MENA region signifies the important relationship between the individual and the communal—the private and the public.

In addition to religious and socio-cultural norms, the region's climate historically influenced the way rural communities used to interact with the built environment, leading to the creation of historical built solutions to foster the human-environment interaction (Fathy, 1986; Weber & Yannas, 2014). Today the static variable of the climate continues to dominate the relationship between people and the built environment as compared to the dynamism of socio-cultural trends, which tend to evolve over time. Within the framework of social transformation in Qatar:

“Qatar is deliberately engaged in a rapid process of societal transformation. That process has its contradictions and tensions, particularly with regards to achieving a balance between Islam, social traditions, and modernity. But it also has a specific policy dynamic of generating ideas and institutions” (Tok et al., 2016, p. 3).

The contemporary challenge of Qatari society may be represented by the need to keep up with the fast-moving wheel of change while maintaining a strong attachment to cultural and urban identity. Accordingly, “a real cultural sustainability will be achieved through the integration of the local identity into urban development” (Ibrahim, 2016, p. 802). Despite changes in building materials, technological advancement and other modern considerations, this study assumes the relatively steady influence of socio-cultural patterns on the spatial form of housing units in Qatar over time. In theory, traditional houses reproduced exclusive architectural and design parameters following the requirements of the era; however, today’s Qatari houses still demonstrate common socio-cultural patterns that directly shape their spatial form and architectural configuration.

Through analytical contemplation and graphical simulation of selected cases of traditional and contemporary houses, the methodology of space syntax is utilized for its ability to investigate the relationship between socio-cultural phenomena and the spatial layout of houses. Further analysis of socio-cultural patterns is supported by other analytical and visualization techniques. The findings reveal that despite changes in time and across eras, there is a direct effect of socio-cultural patterns on the spatial form of houses in Qatar. The effects of (1) privacy, (2) gender segregation and (3) hospitality clearly manipulate the built form of both vernacular and contemporary models. Knowledge obtained from this research study is expected to contribute to the construction of architectural identity based on social sustainability for the urban regeneration of the built environment in the State of Qatar as well as the wider region.

The Research Problem

The effects of globalization, market demand and the evolution process of the socio-cultural characteristics of Qatari society are major trends contributing to the transformation of the spatial form of housing in Qatar. In 2019, as Qatari society becomes open to global change and more accessible to a wide spectrum of market choices, the architectural configuration and form of the house remains in conflict with transformative parameters that reshape its socially responsive characteristics. Thus, the Qatari house represents a unit of analysis to investigate residential architecture within a transformative social framework, referring to the tangible and intangible changes brought to society over time along with other transformative influences.

This research study is a theoretical attempt to investigate the social sustainability of residential architecture by relinking the socio-cultural sustainability of housing to theories of urban design and regeneration with the aim of maintaining the urban identity. It attempts to resolve the contemporary challenge in housing represented by the lack of a collective development process, which reflects the socio-cultural parameters of the society especially in the inner configuration and the spatial organization of the contemporary house—or the equivalent modern villa, the most widespread unit of dwelling in Qatar. Put simply, notwithstanding their architectural identity as an evolving built form, contemporary houses in Qatar seem to lack cultural essence and social linkage. The natural progress of housing has been interrupted by modernization and globalization, in which the sudden wealth induced by oil production instigated a quick upgrade from primitive open-air mud houses to air-conditioned multi-storey villas. The contemporary challenge is represented by the need to rethink housing transformation beyond the current oil-based economy, contemplating sustainability as the future of development in all scales.

The Disciplinary Context

Housing studies is a multidisciplinary field of research incorporating different disciplines including urban studies, architecture, sociology, economics and other basic and integrated human sciences. However, this research is specific in its disciplinary context as it deals with issues related to architectural sociology, limiting the scope of analysis to the housing unit and the socio-cultural patterns affecting its spatial form.

Considering its integrated approach, the role of architectural sociology in academia is to scale architectural studies within the human-behaviour schemes that emphasize the role of social science in the design of spatial environments (Hutchison, Gottdiener, & Ryan, 2014; Özüğurlu & Köksal, 2012; Salama, 2013b; Smith, 2002; Smith & Bugni, 2002). Sociology and architecture are interrelated through the understanding of collective identities that shape built form and contribute to the preservation of social characteristics in buildings.

Another disciplinary context that aligns this research with its proper theoretical framework is urban morphology, which is defined as “the study of urban forms, and of the agents and processes responsible for their transformation” (Oliveira, 2016, p. 2). It focuses on the transformative aspects of the urban space in cities and the integration of socio-spatial forces in the transformation process.

Three principles define the theoretical basis of urban morphology: (1) form, (2) resolution and (3) time. Any city or town is readable through its physical form, which is marked by the elements of buildings, open spaces and streets. In contrast, the resolution of urban form is related to the understanding of buildings, streets, the city and the wider region. In addition, the principle of time is critical to urban morphology analysis as it refers to the transformative aspect of urban form and the process of continuous growth and replacement (Bianca, 2015; Moudon, 1997).

The Focus of the Research

This research study explores the socio-cultural patterns reshaping housing within the context of the State of Qatar as an Arab and Islamic country in the Middle East and North African region (MENA). The interconnected and multifaceted socio-cultural factors influencing the architecture of Qatar are reflected in the spatial form of housing units owned and inhabited by local Qatari families. This regionally and socially focused scope of analysis is justified by the urge to investigate housing transformation in the context of Qatar, bearing in mind the current global challenges in urbanism including (1) the fragmentation of urban areas as a result of sprawl, (2) privatization, and (3) migration and immigration of the world's population from the rural areas to the cities, putting the latter in a state of urban pressure.

Other local imperatives accounting for housing transformation in Qatar include (1) the role of active governance in managing the housing industry, (2) the involvement of the private sector with its predefined international marketable trends, and (3) the evolution of certain demographic, economic and socio-cultural parameters of the Qatari society as a result of global openness and rapid population growth, bearing in mind the current approach toward reviving Qatar's national identity through sustaining its culture and traditional way of life (Buainain, 1999; GSDP, 2008; QNDF, 2014). By focusing on housing in Qatar as the physical unit of investigation and Qatari nationals as the social actors, the evolution of housing in Qatar is analysed with reference to a set of predefined socio-cultural attributes, refining the process of analysis and leading to clear-cut conclusions regarding architectural sociology. The intended outcome is the creation of contemporary housing in Qatar that is rooted in its local traditions and heritage, reviving the link between urban form and socio-cultural patterns of the society.

The Research Question/s

The research is directed toward answering the following questions that are primarily targeting socio-cultural factors reshaping residential architecture in Qatar:

- What are the socio-cultural factors that influenced, and are influencing, the transformation of the spatial form of Qatari houses? The question is based on the hypothesis that assumes a direct influence of socio-cultural factors in the spatial form of houses in Qatar both in the past and the present. The influence might vary based on certain historical and socio-economical contexts that are further investigated in the research study.
- How can such socio-cultural factors in the contemporary context be investigated and approved? The question of investigative potential is linked to the adaptability of the methodology, which would provide sufficient results and therefore approve the influence of socio-cultural factors in reshaping house form in the context of the research study.
- How the influence of socio-cultural factors, local spatial practices and values in reshaping the spatial configuration of houses, can be tested and validated, utilizing the theoretical tool of space syntax? Space syntax is both a theory and a tool that could provide adequate analysis to measure qualitative human-behaviour phenomena such as the effect of socio-cultural patterns on the internal configuration of houses.
- What would such conclusions articulate about the architectural sociology of housing in Qatar and its sustainability in the future? The social and cultural patterns could either support or restrict the process of housing transformation in Qatar by affecting the built form of houses negatively or positively.

Objectives

This research study has three major objectives:

- (1) There is a need to create an urban identity of residential architecture in Qatar that is perceptively responsive to the environmental and socio-cultural context of the country. The emphasis on urban identity is envisaged through the Qatar National Vision 2030 and Qatar National Development Framework. The development plans and policies aim to transform Qatar into an advanced country capable of achieving sustainable development and strengthening its national identity. A balanced growth model between traditional aspirations and modernity is key to constructing the anticipated urban identity particularly in housing.
- (2) Analysing the direct relationship between socio-cultural patterns and the spatial form of houses in any region of the world, including the most culturally driven regions such as the MENA region and the Arabian Gulf supports social sustainability of architecture. Furthermore, analysis of the socio-cultural influence in urban forms shows that architecture and urban design are advocacy disciplines in sustaining society. This objective is imperative for future housing policies and development visions as it emphasizes the social unit rather than the individual approach in creating desirable, resilient built environments.
- (3) Initiating comparative assessments between traditional and contemporary houses provides important conclusions on the influence of time over the course of housing progress, which is either supported or restricted by the socio-cultural pattern that governs societal systems, and in turn has direct reflections on construction and architecture. By assuming traditional architecture to be the result of pure socio-cultural aspirations, comparison to contemporary housing would

scale the current practices both socially and architecturally within the socio-cultural framework.

Chapter's Summary

To summarize, there is common agreement on the importance of socio-cultural and behavioural human practices in redefining the built environment and transforming its process of evolution. Thus, the hypothesis of the study assumes a relatively steady influence of socio-cultural patterns on the spatial form of contemporary housing units in Qatar, verifying that local spatial practice is well sustained from generation to generation. A graphical summary of the chapter is presented below in Figure 3.

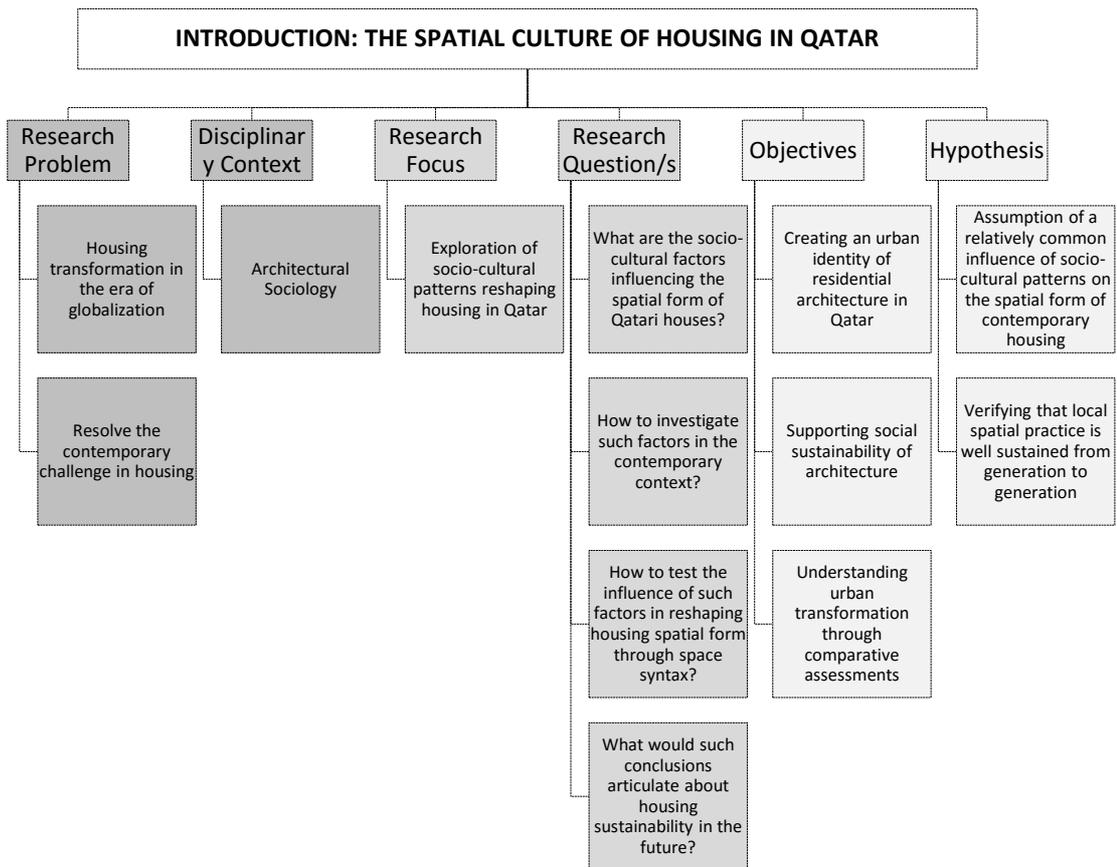


Figure 3: Summary of Chapter 1 – Introduction

CHAPTER 2: LITERATURE REVIEW

The literature review chapter presents an intensive analytical overview of issues concerning the topic of the thesis. It is structured based on a logical flow of conceptual terms and theories that are essential to review in order to fully comprehend the topic of socio-cultural patterns reshaping housing in Qatar. Facts and arguments are presented as critically as possible, supported by evidence and citations from the literature in addition to the author's arguments and research outcomes.

The first section outlines major insights on urbanism in the regional context as well as the context of the research; namely, the State of Qatar with a major focus on its urban and socio-cultural profile. The second section targets the concept of architectural sociology as the primary disciplinary context of the research, merging the gap between architecture and social science. The third section offers a review of the basic terminologies of the house and culture, as well as an examination of the socio-cultural patterns affecting the spatial form of housing. It also sheds light on the comparative potential of traditional and contemporary housing in terms of socio-cultural attributes influencing the housing transformation over time.

The fourth section explores the development of housing in Qatar and reviews characteristics of Qatari architecture and urban design in the past and the present. This section highlights important facets of traditional architecture and the transformation of residential architecture since the 1930s–50s as a result of oil discovery and the changes brought to the society by modernity. In addition, this section contemplates the effect of privacy and gendered spaces in contemporary Qatari houses. The final fifth section is dedicated to the theoretical assessment of space syntax as the applicable methodology of the research study, which is then explained in the following research design chapter.

Overview of Urbanism in the Regional Context and Qatar

This part of the literature review outlines major trends in urban development in the Middle East and MENA region as a macro analysis of the regional context, approaching the Arabian Gulf region and settling in the State of Qatar as the targeted research context.

The review includes aspects of urban transformation in the selected MENA region, in addition to an outline of demographic, socio-cultural and urban profiles to put the study in its proper contextual perspective. Major emphasis is given to globalization, which as a comprehensive process, contributed to the massive urban transformation of the mostly-Nomadic, once-deserted MENA region into a series of active global hubs and urban centres.

Similarly, the Arabian Gulf region is explored demographically, historically and socio-culturally. The history of urbanism in the region is also highlighted, recording major shifts in the urban development process and summarizing phases of urban growth. In addition, the planning typology of the Gulf cities is investigated theoretically to relate current urban growth scenarios to theories of urban planning and design. The last part covers a futuristic outlook of the region while considering the challenges of globalization and sustainable development.

The review of urbanism in the State of Qatar begins with an overview of the country's current socio-cultural and urban profile, relating contemporary statistics to historical sources of transformation. Considering that this research study targets architectural sociology as a disciplinary context with housing as the unit of analysis, the historical exploration of the tent as a past unit of dwelling is presented thoroughly. The purpose is to relink urban transformation to major shifts in Qatari urban history, where the portable tent has been replaced entirely by built structures and houses in the

modern time, which range from primitive mud houses to the more recent multi-storey villas. The tent is explored in terms of behavioural, spatial and socio-cultural aspects and then compared to its recent symbolic function. Meanwhile, a reference to socio-cultural trends and human-behavioural phenomena is established to contemplate the effect of urban transformation on the social aspect of life in Qatar, both now and then.

The concluding part of the contextual overview targets urbanism in the current era of globalization and signifies the urge to consider sustainable development in the urban scale, demarcating sustainable urbanism as a goal and a desired outcome for the creation of better cities and societies.

The focused, detailed and comprehensive approach of the literature review is essential to place the study into its proper theoretical framework, where every aspect of the analysis of the spatial culture of housing in Qatar is related to the larger picture, both theoretically and geographically. During the last two years of the master's program of urban planning and design in the Department of Architecture and Urban Planning at Qatar University, the author developed a systematic overview of major issues concerning urban transformation, globalization and other urban design topics. The sub-headings of the upcoming literature review are the result of this research endeavour, carried out through regular academic courses including class reading assignments, term papers and formal presentations as well as personal research activities and reading enrichments.

The MENA Region

The MENA region extends over the vast area of nineteen countries including North Africa and Egypt, Levant countries, the Arabian Peninsula and Iran (Figure 4). The region is defined by numerous characteristics including geography, culture, history and economic integration (Fischer & El-Erian, 1996; Pahl-Weber *et al.*, 2013). Usually, countries within a region seek unification for the sake of economic advantages and increased collective powers.

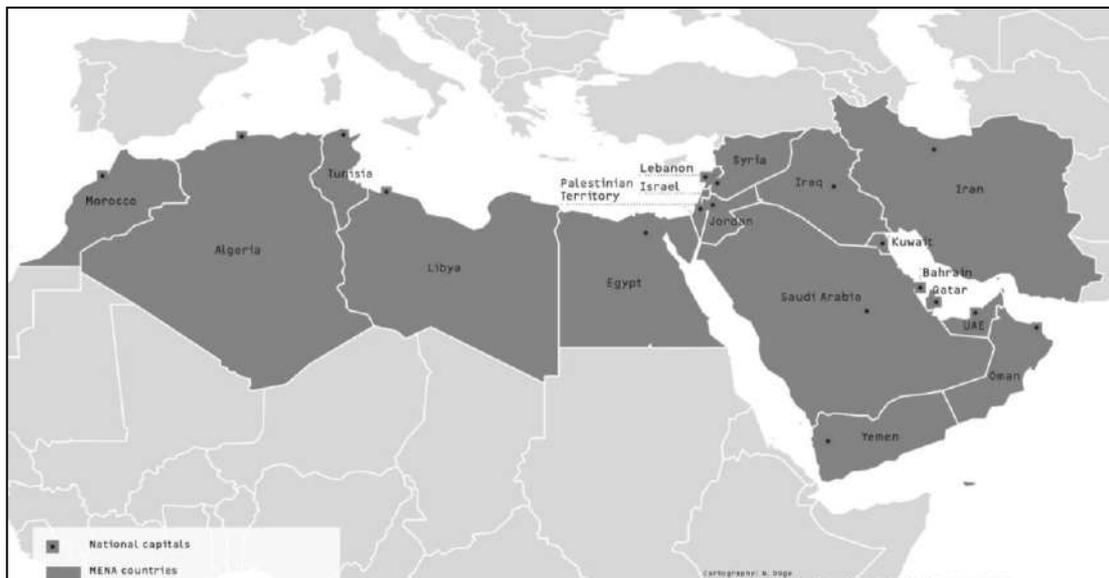


Figure 4: Profile of the MENA Region. Source (Pahl-Weber *et al.*, 2013, p. 12)

International organizations such as the United Nations and the World Bank currently classify MENA as an urban setting under pressure (Pahl-Weber *et al.*, 2013, p. 14). This statement draws attention to the challenges facing the region including urbanization, infrastructure development and sustainability. Based on census and

historical analysis, the region has experienced rapid urbanization as a result of population growth and migration since the 1950s. Formerly, traditional urban settlements were the common hubs of the region, which were majorly influenced by the Roman Empire followed by Islamic dominance (Blake & Lawless, 1980; UN-Habitat, 2012).

Western influence on the region was initiated by foreign occupation, which reshaped urban development by introducing modern planning projects that contradicted with the existing traditional morphology. After 1950, most MENA countries were declared independent, and the planning process controlled by governmental authorities failed to manage the vast population growth, leading to idle urban development (Pahl-Weber *et al.*, 2013; UN, 2015).

Considering the socio-economic profile of the MENA region, an external reviewer can easily categorize countries based on their economic status, which eventually reflects on the expansion of cities and willingness to initiate serious urban planning and sustainable development visions. This argument is the major theme of the book titled *The Evolving Arab City: Tradition, Modernity and Urban Development*, (Elsheshtawy, 2011) in which cities within the MENA region are generally classified as either struggling cities or emerging cities.

According to the book, “this distinction is geographical but it also reflects a growing reality in the region pertaining to the extent of engagement with globalization” (Elsheshtawy, 2011, p. 10). Struggling cities are traditional cores with global aspirations, yet they tend to be controlled by political authorities, which slows down the wheel of progress. Such cities include Amman, Beirut, Rabat and possibly other non-OPEC cities. Emerging cities, however, are active modern metropolises, ruled by monarchies that are willing to utilize their wealth for inclusive recognition as

globalized centres. It is interesting to note that cities within most of the Gulf states, including cities in Qatar, fall into the category of emerging cities considering their urban evolution from deprived to fast-growing economies.

Globalization and Urban Transformation in MENA: From the Desert to the City

Transformation is a natural process that triggers systems to evolve and continuously adapt to new changes. On the urban scale, transformation is triggered by different variables including time, resources and innovation in technology, which tend to reshape human perceptions of the built environment. Therefore, urban transformation is linked to changes brought over time to the urban scape, as well as the integration of new resources and technology into the city-making process (Inam, 2014; Madanipour, Knierbein, & Degros, 2014; Németh & Langhorst, 2014; Taylor, Ni, & Liu, 2016).

The concept of globalization, which is commonly understood as an economic process of market liberalization, has unlimited definitions based on the specific approach that fits the targeted topic of research. Hence, globalization could be defined under any theory based on what the researcher aims to justify while maintaining the essence of the definition as a trend of openness, flows and global connectivity.

In the context of urban transformation, a possible definition of globalization is explained by Lim as “an integration of the world economy, removing trade barriers and allowing freedom of interaction” (Lim, 2005, p. 14). The author further examines the relationship between globalization and urban spatial development based on arguments for and against globalization, global problems and trends, as well as historical observation on urban development. The major argument is that globalization leads to resource allocation consequences, which results in major urban and spatial impacts in cities and urban centres (Lim, 2005; Richardson & Bae, 2005).

The concept of urban transformation has recently been a catalyst of intensive theoretical debate as the discipline of urban planning and design is becoming more responsive toward the creation of better cities. In a book entitled *Designing Urban Transformation*, Aseem Inam argues that the most vital transformations occur by rethinking concepts, practices and outcomes (Figure 5) (Inam, 2014). The book presents urbanism as a process of transformation, “ultimately, urban transformation must be experienced as a process, an outcome, or a possibility – even if, sometimes, it can only be recognized in hindsight” (Inam, 2014, p. 215).

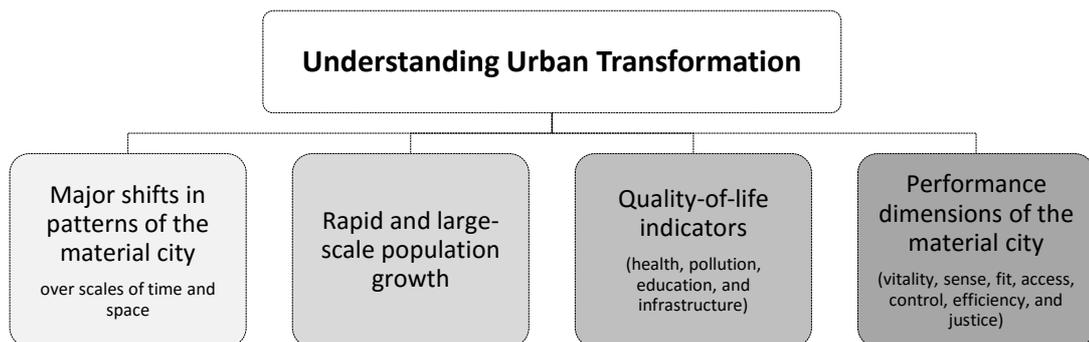


Figure 5: Understanding Urban Transformation. Source (Inam, 2014).

In the era of globalization, transformation has been associated with rapid urban growth and accelerated population rates, in addition to migration from rural areas to cities, putting the latter into a state of urban pressure (Jones, 2010; Marx, 2013; Portnov & Hare, 1999). It is not only the city that is becoming a scene for urban transformation, but also the hinterlands and deserts that were once landscapes for temporary or enduring human settlements challenged by harsh weather conditions and

mobility for survival. Today, living in the desert might present a privilege or a removal from ordinary living conditions, rather than a necessity. What remains a necessity is the preservation of the socio-cultural identity and cultural heritage of desert inhabitants, who consider the desert a home and a valuable historical reference. In this respect, “the cultural construction of “Bedouin” in this way is a clear example of the essentializing approach to collective identity. Bedouin are constructed as a distinct, unique social type, or to borrow Foucault’s phrase again, as an organic autonomy” (Layne, 1994, p. 13).

Projecting the phenomena of living in the desert in our recent time as well as the contextual setting of the MENA region prompts important commentary on the effect of time on urban transformation. Regarding the modern history of the MENA region, “until well into the twentieth century, many communities in MENA were overwhelmingly rural; the vast majority lived in villages earning their livelihood from farming and animal husbandry” (Clancy-Smith & Smith, 2014). Relating such socio-historical facts to the urban transformation and human-behaviour studies of the pastoral-nomadic communities as well as inhabitants of the desert supports the research on socio-cultural ways of life in an evolving era as well as the preservation of global cultural heritage (Biagetti & Lugli, 2016; UNESCO, 2016).

Referring to the MENA region, most of the nomadic societies were exposed to major transformation of urban areas from the open desert to the administrative city, aided by state policies and economic opportunities assumed to elevate citizens’ living standards. Yet, the socio-cultural way of life of such societies is substantially constant, leading to a process of urban adaptation characterized by innovative strategies clearly contemplated within modern city neighbourhoods to satisfy social and cultural identity.

The Gulf Region



Figure 6: The Arabian Gulf Region. Source (Pahl-Weber *et al.*, 2013)

The Arabian Gulf region is a vast area extending over the coastline of the Arabian Gulf Sea and including the six countries of the Kingdom of Saudi Arabia, Sultanate of Oman, United Arab Emirates (UAE), State of Qatar, Kingdom of Bahrain and State of Kuwait (Figure 6). These countries make up the union of the Gulf Cooperation Council (GCC), and border the inland sea from the southwest, while the Islamic Republic of Iran borders the northeast coastline. The naming of the region has been a source of dispute between Arabs and Iranians since the 1980s due to the region's political instability, the series of wars—such as the Iraqi-Iranian war and the second Gulf war of Kuwait—and the most recent geopolitical disputes (Al-Nahyan, 2000).

Until the 1950s–70s, the entire population of the Arabian Gulf region was 7.8 million residents of Arab and nomadic origins. Most of the population were active in trade and hunting, while those who resided on the Gulf coastlines were engaged in sea activities such as sea-trading, pearling and fishing (Agius, 2005; Ramadan, 2015). Today, the Arabian Gulf region is experiencing a rapid population growth with 40 million inhabitants living in urban areas and participating effectively in the creation of their global cities.

According to the United Nations Statistics Division, the causes of this rapid population growth are international immigration, migration due to national conflicts and a high human development index especially in the coastal gulf countries of the UAE, Qatar and Bahrain (UN-Habitat, 2012). Considering the wider region of MENA, countries within the Gulf region are viewed as relatively small oil-rich countries with a high per capita income allowing for better human conditions, fewer socio-economic disparities and greater investment in citizens' education and health care.

The GCC region has an arid climate, desert landscape and hot temperature. These geographical facts remain constant over time and have inspired the rural population of the region to adopt a wide range of urban strategies to survive the harsh climate (Abedi & Soltanzadeh, 2014). The sea was historically the source of life, income, activity and connection to the external world; thus, urbanism in the Gulf was initiated along the coastline and developed into the hinterlands, creating cities of an active coastal character with various activities and job opportunities for the indigenous population (Agius, 2005).

Today, the Gulf region highly depends on the oil and gas industries as the modern wealth generators that have transformed the entire region into a globalized

hub. However, negative consequences of these industries have become apparent, such as high energy consumption, environmental problems and high carbon dioxide emissions, are more recently becoming evident (UN-Habitat, 2012). The urbanization of the Gulf region, therefore, is challenged by the negative consequences of globalization including urban infrastructure, housing development, energy demand and quality, coastal degradation and governance issues. Along with the indirect effects of globalization, direct global crises are complicating the role of urban planning on the sustainable growth of Gulf cities (Reisz & Koolhaas, 2010).

History of Urbanism in the Gulf Region

Frequently, “development in one city affected other Gulf cities in subtle as well as obvious ways” (Reisz & Koolhaas, 2010); hence, the urban evolution of the Gulf city is exponentially phased (Figure 7). Four predefined phases of the urban evolution identify the historical urbanism of the Gulf city, excluding the phases of old civilization and the pearl industry due to this research study’s focus on modern history. The four phases are the pre-oil phase (1950–60); the modernization period (1960–70); the oil-price inflation phase (1970–80); and the globalization era (1980–present) (AL-Mohannadi & Furlan, 2018a; Fox, Sabbah, & Mutawa, 2006; Khalaf, 2006).

During the pre-oil phase, which is characterized by the autonomous planning practice of the indigenous population the most important urban features of Gulf cities were their reliance on sea activities for income and the existence of old urban cores within coastally-oriented cities. The main building establishments were mere housing facilities of a courtyard typology built with simple local techniques and materials. However, the modernization period’s most urban features included the establishment

of urban cities and modern infrastructure aided by the British administration (Zahlan, 1979).

The oil-price inflation phase is marked by massive urbanization in the Gulf capitals, which were seen as the centres of political authority. The capital cities were the stage for most of the built and planned state establishments such as road networks and governmental offices. Finally, the recent globalization era is characterized by the comprehensiveness and effective governance of the planning process (Khalaf, 2006).

The final globalization phase could be further divided into two stages. The first is the domination of initial free trade zones and offshore banking between the 1980s and 90s. The second stage is characterized by the massive construction boom, which was marked by restructured development visions for Gulf cities in an attempt to maintain growth rates and challenge global crises as the negative consequence of the process. (Fraser, 2013).

The recent conflict that arose in the regional urban context stems from the ambitious vision of developing global hub cities clashing with growth-dependent cities struggling to keep a steady economic growth. Another urgent conflict is the need to consider a sustainable design practice through the responsive application of urbanism to local requirements, as the recent construction industry is adjusting to efficient development rather than reinventing sustainable design practices (AL-Mohannadi & Furlan, 2018a).

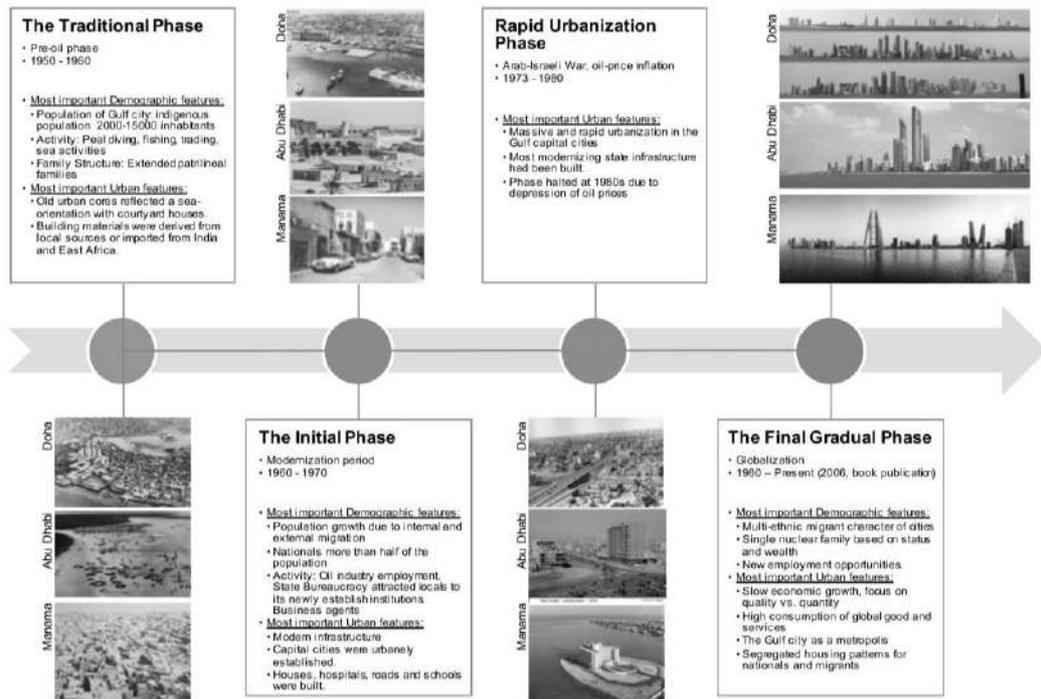


Figure 7: Exponential Evolution of the Gulf City. Source (Khalaf, 2006) Author's Summary

Urban Planning Typology of the Gulf Cities

The theory of planning is “an act of intellectual vanguard, pushing the professional field to rethink its out-dated practices and the assumptions that underlie them” (Campbell & Fainstein, 2012, p. 14). It is highly responsive to up-to-date urban phenomena such as sprawl, globalization and rapid urban growth. In addition, planning theory is characterized by its evolution and adaptation to a certain context.

In the current globalized world in which planning theory is seen as an idea that could flow and move across societies, it is local practice that manages the global flow of ideas within an inclusive perspective, allowing cities and regions to evolve in a

balanced way. Global theories of planning aid the progressive development of cities. According to the theory of planning diffusion:

“Planning ideas are not always imported unadulterated: they are often filtered, diluted, altered, or subverted. Diffusion frequently leads to innovation in which local ideas; institutions, and capacities are incorporated” (Campbell & Fainstein, 2012, p. 475).

The international diffusion of planning is classified into a set of types based on the attributes of globalization: borrowing and imposition, or import and export. Steven V. Ward, the developer of the typology of international diffusion of planning, notes that “the essential basis of the typology is that of context, specifically the power relationship between the countries originating and receiving planning models, is always of critical importance” (2012, p. 482). The typology includes six variants categorizing the level of diffusion based on the indigenous role in planning, external role, mechanism or practice of planning, key actors and potential of the diffusional type for distinctiveness.

The Gulf region was under British informal domination from the 1820s until the 1970s, right after the discovery of oil. In general, the Gulf region was freed from direct forms of colonization since the British Empire’s interest in the region was purely logistic and economic (Al-Shelek, Aquil, & Al-Abdula, 2009; Onley, 2005). Fitting this historical context, the planning theory type best resembling the practice in the Gulf region is undiluted borrowing. According to Ward’s explanation of the diffusional type, “it reflects a rather underdeveloped indigenous planning movement and, quite often, a high reliance on foreign planners to supply leadership” (2012, p. 487).

The twentieth century planning practice in the Gulf region was developed through the prism of the British experience, as the region's low-populated and poorly urbanized sheikhdoms were self-governed and lacked professional planning resources. The informal British Empire in the Gulf, which was peaceful and collaborative rather than forced and colonial, supported the dependence on imperial planning models and eased the process of borrowing. During the initial phase of modernization in most of the Gulf region, beginning right after the discovery of oil in the 1960s, British administrative planning was adopted in the capital cities of the Gulf states (Elsheshtawy, 2011).

Later, with the inflation of oil prices and the presence of the American powers in the area due to the global and regional wars, American and Western influences became dominant and replaced, or in some cases coexisted, with what the British planning system had created on ground.

Future of Urbanism in the Gulf Region

The urban planning and design practice in the Arabian Gulf region is challenged by globalization and its transformations at different urban scales. It lacks continuity and long-term vision based on a comprehensive development framework. However, such challenges are thoughtfully recognized as national priorities in most of the Gulf countries and have been translated into a series of comprehensive master plans that attempt to introduce efficient management solutions into infrastructure and urban development based on the pillars of sustainable urbanism. With the assistance of international expertise and foreign investment as efficient forms of global flows, the Arabian Gulf coastal capitals currently provide dynamic case studies to trace the evolution of cityscapes in the context of globalization.

The efforts towards better urban planning practices are intensive. Promising development visions are launching a collaborative framework between the spectra of stakeholders guided by local development authorities that are responsible for the preparation of planning schemes and implementing grand development projects in the local and regional context. However, the question of urban identity and the conservation of the valuable genesis of urbanism remain unsolved as most of the recent projects in the Gulf capitals are adopting a foreign design scheme (Alkhalidi, 2013; Reisz & Koolhaas, 2010). In order to utilize theoretical aspirations, careful planning should respond to the urban challenges in an evolving, participatory way. Ignoring references to the past or relying on quick, temporary planning practices, similar to the trends followed by the Gulf cities during the post-oil eras, would result in a poorly managed urbanism.

The Context of the Research Study: Qatar

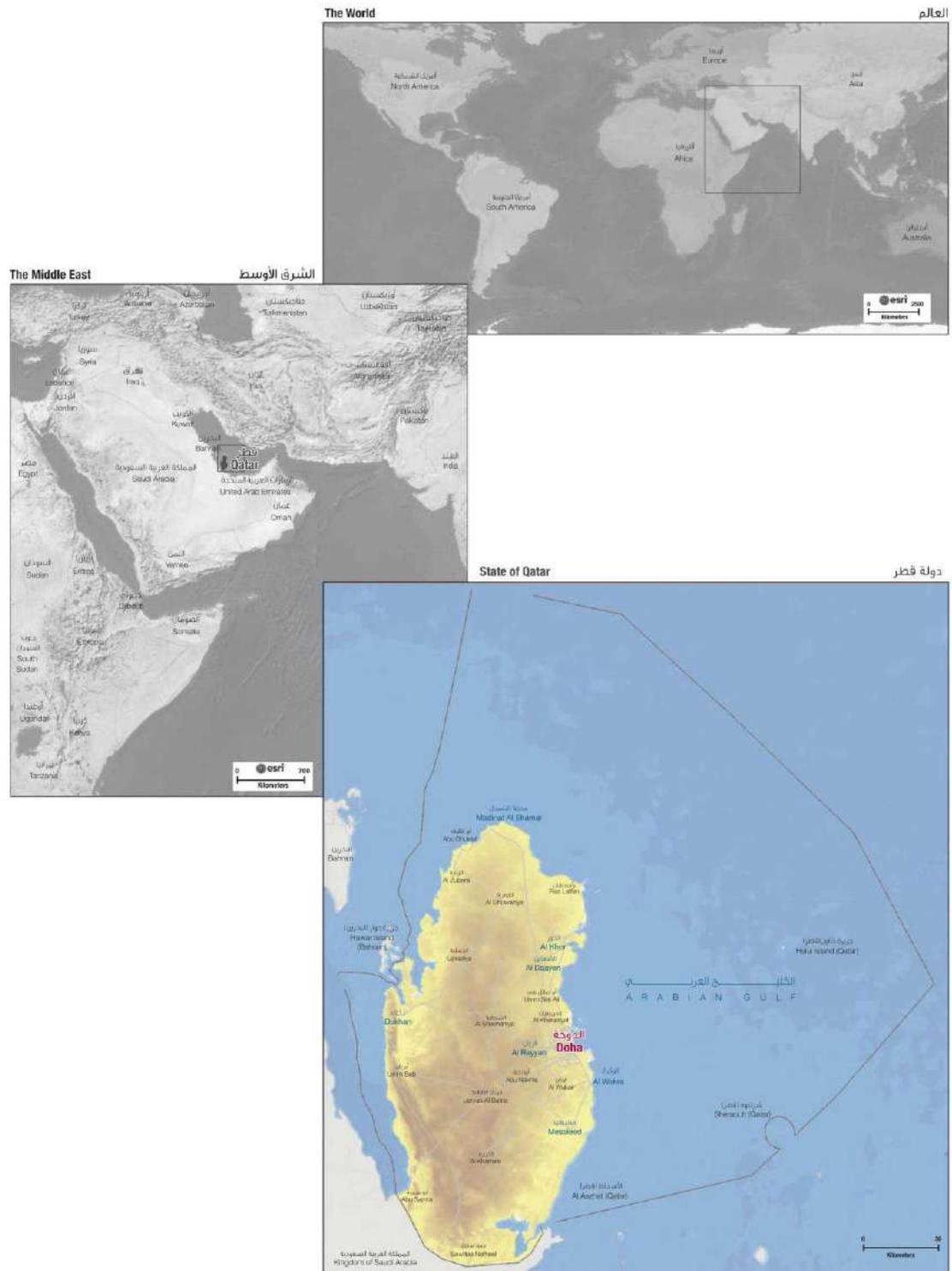


Figure 8: Qatar Location Map. Source (QSA, 2013, p. 2)

General Profile of the Country

The State of Qatar is globally recognized for its active hydrocarbon-related industries and liquefied natural gas wealth compared to its regional neighbours (Figure 8). The transformation of the state's progress from a dependent oil economy into a diversified knowledge economy is key to fulfil the anticipated sustainable development vision of the country (GSDP, 2008) .

According to recent global reports, Qatar's economy is said to be resilient to current political crises that previously led to interruptions in economic performance due to close inland borders and trade routes with neighbouring Gulf countries. The country maintains its high GDP per capita rates and high economic performance index in bank stability and economic gross national product (CountryWatch, 2018; IHS, 2016; Ingram & Al-Rowas, 2018). Therefore, Qatar should be able to sustain its economic progress by maintaining its high competitiveness and financial performance rates.

At the same time, the social overview of Qatar implies that the Muslim culture dominates the cultural scene, where "self-presentation and behaviour should be appropriate to this more conservative environment" (CountryWatch, 2018, p. 235). Arabic is the official language of the state, and Islamic identity is reinforced through everyday activities and communications. In addition, the Arab way of life as represented by the Bedouin culture is still intensely visible in contemporary society due to strong identity manifestations. It is used as the preferred practice of Qataris to reflect their national stance in contrast to the huge foreign presence in the country.

Conversely, urbanism in Qatar is characterized by substantial growth and development resulting in a rapid urbanization process. Emerging issues of land use planning challenge the sustainable development practices of Qatari cities, especially

the capital city of Doha (Furlan, 2016; Rizzo, 2014). Emerging issues include the fragmentation of urban structures within the city fabric, traffic congestion, environmental impacts and the absence of public participation. The speedy bureaucratic process of planning does not advocate for public participation opportunities and therefore lacks social integrity and constructive planning criticism.

The current organizational pattern of general urban planning in Qatar is embedded within a partly decentralized structure due to “the lack of coordinating and communicating organization between various departments and stakeholders” (Wiedmann *et al.*, 2014, p. 72). In an attempt to restrain decentralization of urban governance, under the Emiri Decision No. 5 of 2016, the Ministry of Municipalities and Urban Planning was reorganized and merged with the Ministry of Environment to become one entity: the Ministry of Municipality and Environment (MME) (MME, 2018). The administrative concerns of urban planning and land-use management were delegated to the assistant undersecretary for urban planning affairs, as indicated by the updated organizational structure of MME (Figure 9).

Within this structure, the Urban Planning Department is responsible for the development of urban strategies, preparation of planning studies and master plans as well as the planning criteria and regulations for all planning patterns of land usage (Masons & AECOM, 2016, p. 24).

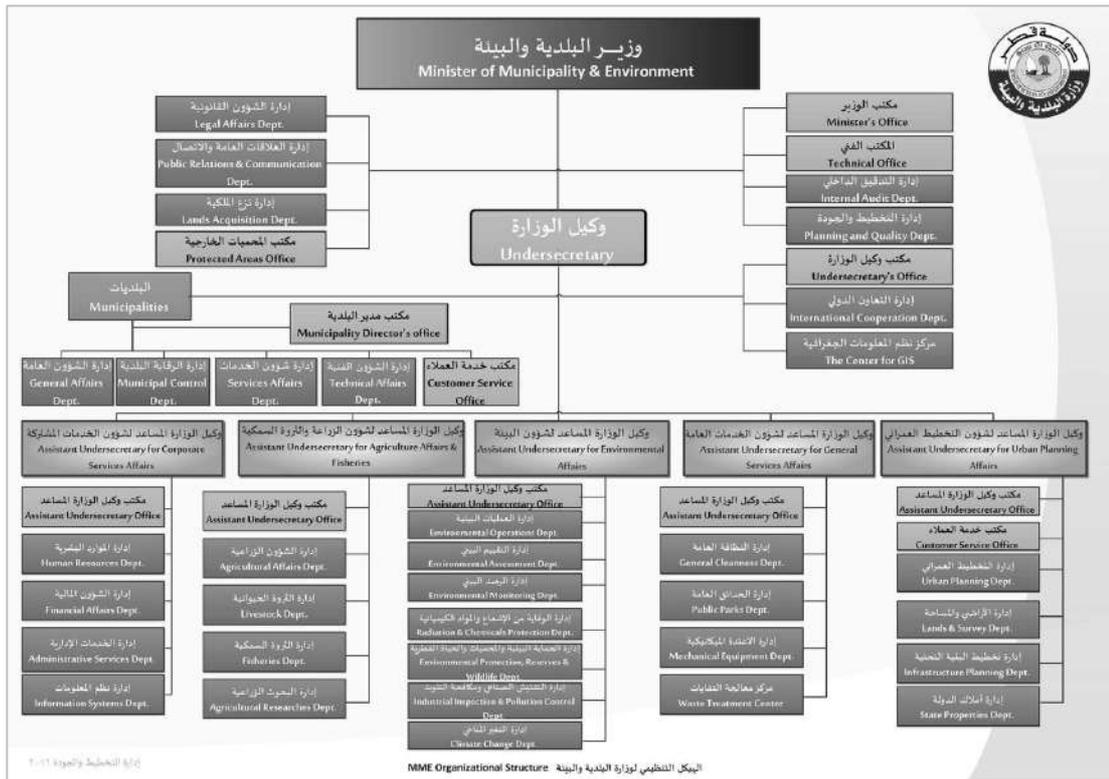


Figure 9: MME Organizational Structure. Source: (MME, 2018)

Urban Transformation of Qatari Society: The Tent as a Unit of Dwell in the Past

Globalization and urban transformation are considered the evolving forces that reshape societies and contribute to change in the cultural way of life of indigenous communities worldwide. Among the most primitive societies are the nomads; namely, the Bedouins—people of the desert. Their cultural life script presents a valuable case for sociological research in the global and local scale, considering the historic records of the Arab nomads and their distinctive way of life. Historically, the Arab Bedouins coexisted in a sustainable way within their ecologically challenged territories and with a lack of basic living resources. They were able to construct their socio-economic

systems, cultural and legal structures and their collective knowledge of life and survival through adaptation and endurance.

In the recent era of globalization, urban transformation has triggered major changes in the Bedouins' way of life of due to the elevation of life standards, the existence of supporting technologies and the structuring of urban areas based on the development of administrative cities. Today the Bedouins are highly involved in the community-making process as active members of society, yet their cultural heritage of tangible and intangible assets remain a sign of identity and appreciation.

The behavioural aspect of desert nomads is defined by their fast travel, temporary settlement and tendency to adapt to harsh environmental conditions using minimal resources (Fromherz, 2017; Lindholm, 2002; Parsons & Abrahams, 2009). The socio-spatial arrangement of the basic unit of dwelling, represented by the portable tent, supports the behavioural attitude of the nomadic society in Qatar as well as the majority of the nomads of the MENA region (Kronenburg, 2003). The following description provides insight on the internal configuration of the tent, which reflects the behavioural aspect of the nomadic tribal settlements (Figure 10):

“Internally there are dividing curtains and specific areas set aside for certain purposes – cooking, sleeping (separated by sex), guests area. The decoration and pattern of the tents vary greatly, even within the same tribe, and though these are simple dwellings, they can be beautifully decorated” (Kronenburg, 2003, p. 22).

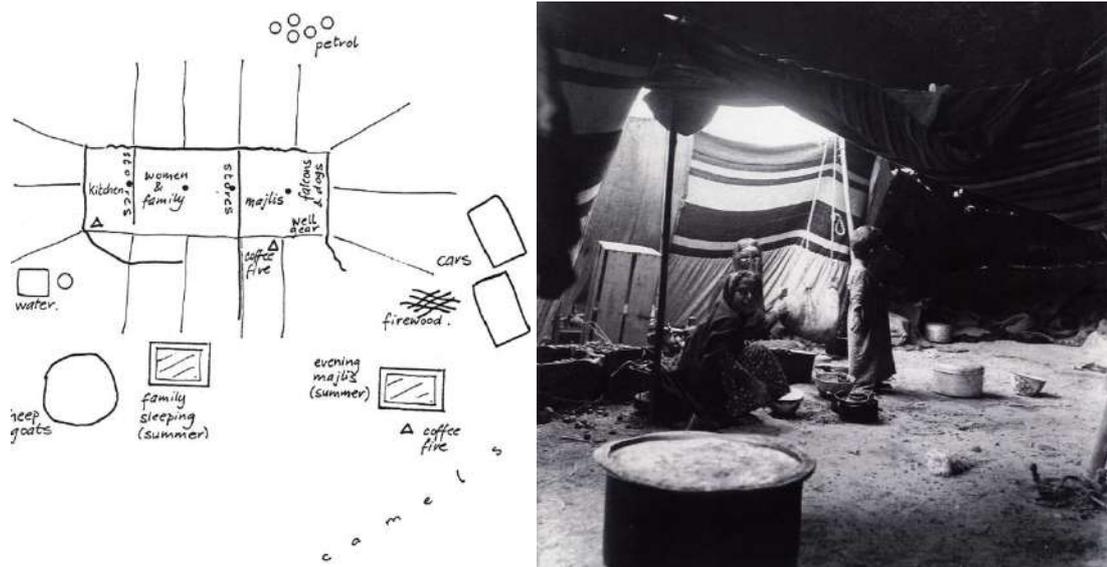


Figure 10: Layout and Internal View of a Typical Tent in Southern Qatar. Source (Ferdinand, 1993, p. 90)

Due to the lack of sense of city and settled urbanism, desert communities are best described as lightweight settlements of camps with tents in close proximity to water sources (Dickson, 2015; Ferwati, 2017; Mundy & Musallam, 2000). The spatial organization of the Bedouin camps reflects a logical sequence of environmentally sensitive design (Figure 11). So, “the size of the camps reflected the specific conditions of that area, and the opportunities for an optimal exploration of the grazing, made possible by the abundant and widespread occurrence of wells” (Ferdinand, 1993, p. 83).

In the Qatari hinterland, contextual and climatic necessities affect the arrangement of tents within a camp area, resulting in all camps lying with an east-west axis opening to the desert with limited natural protection. This spatial arrangement results in the tent being the only unit of shelter and protection facing the

vast desert. Thus, the Bedouins developed collective knowledge over generations regarding the tent's furnishings and physical construction to respond to the need for a durable, private and socially inclusive means of shelter in the desert.

Considering the physical and spatial structure of the Bedouin tent, the “precedence of practice over physical structure in constructing social space” is evident in the way that Bedouins handle privacy within their portable dwelling (Layne, 1994, p. 66). The notion of privacy as an environment-behaviour phenomenon is reflected in the tent's spatial layout, as it is contained within an open physical environment without walls or fences. The internal configuration of the tent is subject to privacy considerations, with spaces assigned for domestic activities and additional specific spaces for guests. This shows that the socio-cultural attributes of the Bedouin society are based on the values and ethical morals of hospitality and generosity, regardless of the lack of resources and underprivileged economic conditions.



Figure 11: Tribal Camp in Qatar with Various Tents. Source (Ferdinand, 1993, p. 102)

Tribes inhabiting the southern and northern deserts of Qatar have developed their distinctive construction patterns to represent a coherent social context, which results in special features of the tent reflecting indigenous sub-cultures and tribal affinity. For example, Ferdinand hypothesizes that the development of specific tent types of two tribes in Qatar demonstrate the special tribal identity of the Bedouin tents:

“The Al-Murrah tent has decisive points of obvious similarity with, for example, the Kuwaiti tents, whereas there are decisive differences on this point between the Al-Na’im tent and the Al-Murrah tent. As Al Na’im came from the South in the last century it is reasonable to assure that, in the course of adapting to local conditions in North Qatar, these Bedouins have taken over features which were in common use in the more enclosed local form of tent” (Ferdinand, 1993, p. 365).

In summary, the transformative characteristics of the nomadic societies in Qatar and the regional MENA are embedded in behavioural, spatial and socio-cultural aspects. Each aspect responds to urban transformation in a clearly manifested way, as seen through the built environment and the human-behaviour interaction. The tent is an interesting unit of analysis to assess the degree of urban transformation brought on by modernity and globalization.

The Qatari Tent Now and Then: Analysis of Spatial and Socio-Cultural Aspects

The analysis of the tent as a transformative unit of investigation results in the classification of the influential layers characterizing its urban significance into behavioural, spatial as well as socio-cultural aspects. The aspects are outlined over time and reflected into modern practices to assess the degree of urban transformation.

The behavioural aspect of the tent is traced based on the inspection of a typical modern neighbourhood in Doha. Within the neighbourhood, tents are used in their traditional form as well as modern tensile structures with traditional fabric finishes. The only resemblance to the traditional Bedouin tent is that such structures are placed in the open area with no gated walls. Modern tents extend beyond the housing unit, providing an open-air space for leisure and gatherings (Figure 12). Consequently:

“The function of the tent as the sole form of shelter has been abandoned, and the tent now exists as a complementary extension to the new concrete housing, where this traditional lightweight structure is set up in the forecourts adjacent to or outside the walled villas” (Damluji, 2006, p. 39).



Figure 12: Tents Constructed Outside the Premises of Modern Houses in the GCC.

Source (Damluji, 2006, p. 41)

Considering the socio-cultural transformation of Qatari society in the era of globalization, there is a huge emphasis on the creation of a national identity that is enforced by society's local cultural heritage (Alshawi & Gardner, 2013). According to Al-Malki, "the promotion of the Bedouin narrative has caused an elevation of tribal identity over other sub-identities" (Al-Malki, 2016, p. 253).

The modern tent is contemplated through this specific approach when referring to its socio-cultural relationship to the national identity of the Qatari society. Although the Bedouin tent has been characterized by sub-cultural traits that are exclusive to definite tribes within Qatar, the modern tent does not have a similar significance. It is rather an element of social and cultural integrity associated with hospitality of the Qatari nuclear family, which replaces the tribal structure as the cornerstone of modern society. In addition, local Qataris still utilize the traditional Bedouin tent, due to its durability and practicality, as a means of shelter during

seasonal camping as well as an extended space for the household. This fact supports the socio-cultural sustainability of the tent over generations, including its compliance to modern lifestyles (Sillitoe, 2014).

The value of the tent as a national symbol and an element of Qatari identity fosters the current approach toward the sustainable development of the social and cultural ways of life. This trend in social engineering provides a counter process against the drawbacks of globalization, representing the society's tendency to brand itself through its particular cultural heritage, while celebrating diversity and openness to the global community through effective engagement and mutual cultural dialogue. This approach is ideal for sustainable development and may ensure that the pillars of growth are well established in the foundations of civilized society.

To conclude, urban transformation has influenced indigenous cultural communities to adapt to recent urban realities, while maintaining the cultural way of life as a socio-cultural reference associated with constructed identity. What remains a challenge are the forces beyond globalization, which might enforce certain development scenarios insensitive to the locality of the urban setting and therefore could distort the remains of any valuable historical knowledge; however, this is not a preferred outcome.

Urbanism in Qatar in the era of Globalization

The global transformation of nearby cities in the Gulf has triggered a tendency for urban transformation in the regional context, specifically in Doha, Qatar. This phenomenon proves the strong connectivity and interrelations between the Gulf cities due to the set of common characteristics that unite the Gulf region.

The growth of Qatar's capital city, Doha, is characterized by economic development, increased population rates due to migration of labour forces and the

emergence of megaprojects (Figure 13). Recent studies indicate that the initial planning scheme of Doha has a few drawbacks:

“Master plan formulated by external consultants who are insensitive to local dynamics; lack of a serious discussion about on-going megaprojects or nonparticipation in planning processes; fragmented governance and lack of integrated land management; and incapable and redundant local government agencies” (Minghong, 2016).



Figure 13: Urban Evolution of Doha and its Megaprojects. Source (Rizzo, 2014)

Such failures reflect on land rent and land use patterns; high land prices raise the policy of “land acquisition in the centre and land granting on the edges” (Hutzell *et al.*, 2015, p. 88) due to Doha’s outward expansion as well as the ring-road infrastructure system. In addition, a significant alternated trend of globalization on the planning practice of Doha is that of mega-projects, “which are usually launched by newly founded holdings, whose main shareholders are usually public institutions, because most un-built land is considered property of the state and thus under the authority of the rulers” (Wiedmann *et al.*, 2014, p. 68)

The trend of megaprojects supports the provision of modern urban facilities and attracts global flows into Doha through investment, transit, cultural and knowledge hubs. Examples of such megaprojects include the on-going Qatar FIFA World Cup stadiums, Qatar Rail, infrastructure developments, and both public and private real estate investments. However, the trend has created fragmentation in the urban structure and has led to many negative consequences (Rizzo, 2014).

Responding to such emerging issues, Doha’s urban planning practice shifted toward a collective planning framework. The aim is to avoid out-dated planning practices as well as to limit the decentralization of decision-making. Recently, Doha has implemented QNDF as a strategic plan targeting the long-term management of land use and urban growth in Qatar. According to the urban analysis of QNDF:

“Livability, identity, and integration of existing and planned megaprojects are amongst the main policy priorities indicated in the plan, while density, mixed-use-development and hierarchy of centers are the main spatial concepts that should deliver the vision” (Rizzo, 2014, p. 54).

Practices of Land-Use Planning in Globalized Doha

The practice of land use planning in Doha is managed and implemented by urban governance, which faces the challenge of guiding the rapid development of the city along with active public-private partnerships. Historically, the first comprehensive land-use planning initiative in the city of Doha, known as the Physical Development Plan, was introduced in the 1990s (Al-Kubaisi, 1984; Hutzell *et al.*, 2015; Wiedmann *et al.*, 2014). The plan is still used as the basis for general land-use policies. However, it has been limited and out-dated since the expansion of development projects around the country created a tendency for individually planned land use.

When QNV2030 was first introduced in 2008, the organizational bodies of the government—including its ministries, authorities, and public and semi-private institutes—directed the efforts toward fulfilling the pillars and strategies of the vision. MME has been reforming and updating the planning function with priority given to establishing an effective planning legislation (Cox, 2016).

Recently, the proposal for a legal basis for the planning system in Qatar was introduced by MME to create the desired legal framework of implementation, based on the previously mentioned sets of strategic plans. According to the developers of Qatar Planning Legislation (QPL), “it will give legal status to a range of planning processes including decision making, plan making, planning assessment and relationships between various stakeholders” (Masons & AECOM, 2016, p. 7).

Challenges Limiting Planning in Doha's Urban Growth

With the promising development of planning legislations and the reorganization of planning governance, challenges that limit the effectiveness of planning in Doha's urban growth management are expected to be resolved, especially those concerning the partnership, collaboration and comprehensiveness of the planning practices.

Among the most important challenges that require immediate intervention is the implementation of planning practices. Any planning initiative on a national scale should demonstrate awareness of the existing challenges and realities to avoid overlapping strategies or placement in the wrong context. With many mega-projects and foreign large-scale developments operating in Doha, this challenge is evident; many megaprojects are regarded as special developments that do not necessarily adhere to the existing local regulatory framework (Aoun & Teller, 2016). With reference to the proposed planning legislation project of Qatar by well-known international experts such as Pinsent Masons and AECOM, the issues of conflict of interest and acting beyond the scope of expertise demand further regulation over the developers of the regulation itself.

In addition, the city of Doha is subject to further reforms, changes and growing pressure for openness and market liberalization. The sustainability of such organizational developments raises the question: Is land-use planning procedure developed correctly? Are such procedures flexible enough to adopt any further change in the strategic and implementation directions of the city? Such questions require a critical scope of analysis for any suggested planning regulation to ensure its compatibility, sustainability and ideal adaptation to the challenging local context.

Sustainable Urbanism

Emerging theories of urban design, which arose in the late nineteenth century as a discipline advocated for the public realm, are united under a common mission of reviving cities responding to breakdowns of the industrial revolution and the modernist movement (AL-Mohannadi & Furlan, 2018c; Alexander, Neis, Anninou, & King, 1987; Brown, Dixon, & Gillham, 2014; Day, 2003). However, urban design for the 21st-century community building integrates core principles including (1) enhancing liveability, (2) creating community, (3) expanding opportunity, (4) promoting equality, and (5) fostering sustainability (Brown *et al.*, 2014). The last principle is of critical importance as it relates to the concept of sustainable development, which is the benchmark for recent movements and urban development envisioning a better future for the global society, the world economy and the physical environment and ecosystem (Calthorpe, 2011; Sachs, 2015).

In this respect, sustainable urbanism—also referred to as green urbanism—is a school of thought merging urban design and sustainable development to respond to the updated environmental and ecological debate on climate change as a recent global challenge. In a study that attempts to provide an integrated definition of sustainable urbanism that bears in mind the responsiveness of terminology to contemporary urban design and planning practices, sustainable urbanism is defined as “an application of public health and societal ethics in places, which encompasses the formal, policy, economic, and technological elements as tools for applying the system” (Adhya, Plowright, & Stevens, 2010, p. 29)

Other scholars define sustainable urbanism as a continuous process aimed at “the creation of adaptive communities that are designed to be flexible to whether ever-changing demographic, environmental, social and economic challenges”

(Mazzeo, James, Young, & Farrell, 2017, p. 192). The concept of adaptive communities ensures that individual as well as community development is pursued in an evolving approach, following Place methodology that advocates proactive and interdisciplinary planning based on community consensus (Relph, 1976).

Even though the theories of urban design and sustainable urbanism emerged in North America and Europe, the same theories are still applicable in the context of the MENA region and the Arabian Gulf (Fraser, 2013; Furlan, 2016; Furlan & Sipe, 2017; Zaina *et al.*, 2016). The history of urbanism in the GCC suggests that oil wealth and the sudden urge for urban development led to a process of undiluted borrowing, where reference to the local environment was underestimated and rapid, ready-made Western solutions to urban development dominated. Under the circumstances:

“The problem also concerns cities that do not relate to any pre-industrial base, but emerged instead out of the very urgent demand for an urban structure, infrastructure and civil context to entertain and house an industry based on the wealth processing of oil revenues. This began in the 1960s and was exacerbated by the oil boom in the 1970s, a time, internationally, when modern city and town planning was under considerable review in debate and reassessment” (Damluji, 2006, p. 26).

Presently, urbanism in the GCC and Qatar is expected to keep pace with the global paradigm shifts towards sustainable design as the region becomes more interconnected and integrated with the global economy. The process of borrowing is now a process of knowledge-transfer, which allows for more inclusive and locally responsive designs to inaugurate in the strategic planning of sustainable urbanism (Furlan & Faggion, 2015; Furlan & Petruccioli, 2016).

The Disciplinary Context: Architectural Sociology

“Residential buildings resist transfer. They are rooted in a place because every civilization is in flux and continuously readapts its house to both new needs and requirements” (Petruccioli, 2007, p. 10).

The above argument directly aligns with this thesis’s theme of comparing vernacular to contemporary dwellings in Qatar based on specific socio-cultural patterns. However, the assured resistance of residential buildings to transfer is a doubtable statement when considering the era of global flows, which tend to detach architectural forms from the local context (Furlan, 2015; Furlan & Faggion, 2015; Gharib, 2014).

As a general approach, housing studies is a multidisciplinary field of research incorporating different disciplines including urban studies, architecture, planning, history, sociology, economics and other basic as well as integrated human sciences. However, this research study is specific in its disciplinary context as it deals with issues related to architectural sociology, limiting the scope of analysis to the housing unit and the socio-cultural patterns affecting its spatial form (Andersson, 1998; Hillier & Hanson, 1984; Salama, 2013b; Smith & Bugni, 2002).

Considering its integrated approach, architectural sociology has emerged as a disciplinary context to scale architectural studies within the human-behaviour schemes that highly accounts for the role of social science in the design of spatial environments (Altman, 1975; Furlan & Faggion, 2016; Knowles & Sweetman, 2004; Smith & Bugni, 2002). In *The Sociology of Architecture: Constructing Identities*, Jones merges the gap between architectural theory and the heavily-contested discipline of sociology by stating that “sociology is used as a proxy for a critical

approach to the connections between architectural field, political power, and the construction, maintenance and mobilization of collective identities” (Jones, 2011, p. 1). Hence, the role of sociological studies in architecture is directed towards understanding the collective identities that shape built forms and contributing to the preservation of social characteristics.

The discussion of architectural sociology in housing studies is linked to concepts of urban regeneration and social sustainability (Colantonio & Dixon, 2011; Furlan, Rajan, & AlNuaimi, 2016; Hutchison *et al.*, 2014). In this respect, urban regeneration and social sustainability are assimilated to provide a comprehensive understanding of the evolutions of the built environment. These changes exceed the limits of environmental and economical sustainability to include social and cultural imperatives of a definite society. Therefore, urban regeneration is defined as “a comprehensive and integrated vision and action which leads to the resolution of urban problems and which seeks to bring about a lasting improvement in the economic, physical, social and environmental conditions of an area that has been subject to change” (Roberts, 2000, p. 34).

The urban regeneration of housing presents a specific approach that considers remediation, development and investment of the wider urban context of cities and provides solutions to various urban challenges, including the housing challenge. Such solutions are enforced by development scenarios that are not limited to the economic or financial support of urban development but that also embrace the socio-cultural sustainability of existing communities (Colantonio & Dixon, 2011). In a conceptual exploration, Chiu summarizes five aspects of the social and cultural sustainability of housing based on pillars of sustainable development (Figure 14):

“(A) The social preconditions conducive to the production and consumption of environmentally sustainable housing; (B) equitable distribution and consumption of housing resources and assets; (C) harmonious social relations within the housing system; (D) an acceptable quality of housing conditions; and (E) preservation of housing heritage”
(Chiu, 2004, p. 69).

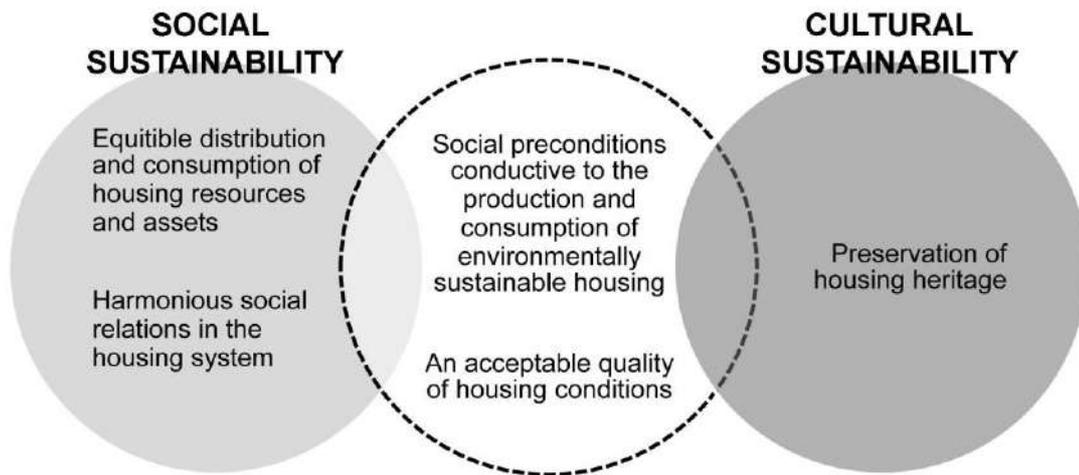


Figure 14: Social and Cultural Sustainability of Housing. Source (Chiu, 2004).

The House and Culture; Basic Definitions

House Form and Culture by Amos Rapoport clearly defines the house as a formative architectural concept and culture as a human product (Rapoport, 1969). The book was first published in 1969, a time in academia when urban design was mistaken for urban geography and architecture was merely an over-appreciation of the monumental. It is a reference to the seeker for clarity of thought and simplicity of doubtable urban meanings bounding concepts of the house, its form and culture.

According to the book, “tradition has the force of a law honoured by everyone through collective assent” (1969, p. 6). The collective control or agreement of society defines its tradition, which is a time-dependent variable that is associated with accepted norms, affectivity and consensus. The author argues that one reason for the disappearance of ‘tradition as a regulator’ in the modern times is the social dissatisfaction of traditional forms, which in turn links to socio-cultural factors evolving in time.

The author states that building a house is an utterly cultural phenomenon, noting that “the house is an institution, not just a structure, created for a complex set of purposes” (1969, p. 46). He further explains that the provision of shelter is the basic functional requirement of the house, whereas the creation of a “social unit of space” that envelops the occupant’s way of life is the purpose of the house:

“My basic hypothesis, then, is that house form is not simply the result of physical forces or any single casual factor, but is the consequence of a whole range of socio-cultural factors seen in their broadest terms”
(Rapoport, 1969, p. 47).

He emphasizes that the vision of the people and their aspirations for ideal living conditions has the final decision on the form of dwelling they collectively create, share and belong to. A vision is a guiding principle that directs the process of societal evolution and its enforcing power lies in the collective agreement of people within a society. Referring to the context of this research study, the QNV2030 could be the point of departure for the creation of the collective identity in all scales, including the urban scale and specifically housing (GSDP, 2008). By targeting sustainability as a goal, residential architecture in Qatar is a promising sector for the establishment of the country's national identity due to its reflection of culture and support of socio-cultural development.

In Rapoport's word, "a house is a human fact" (1969, p. 48) wherein the house has a primary role in the creation and facilitation of human culture although it remains a purely physical form. Whenever the delicate, intangible link between culture and house form is strong, the intensity and manifestation of socio-cultural patterns become more obvious in the internal, external and symbolic configuration of the housing unit. Taken to the extreme, destroying a house could destroy a culture, which implies that society's collective identity is directly symbolized by its urban, physical and environmental settings. Any city that is easily identified by its housing unit is a city of established cultural foundation and therefore has a strong national identity.

In defining the constraints of house form between the past and the present, Rapoport's philosophy is that "the more forceful the physical constraints, and the more limited the technology and command of means, the less are nonmaterial aspects able to act" (1969, p. 58). Hence, constraints are similar in their absolute effects regardless of the changes brought by time and era. In the past, constraints on the house form included the lack of economic surplus, forces of tradition, limited

technology and materials as well as the climate. Whereas constraints of the current involve freedom of the designer as a form-giver, institutionalization of controls through building codes and regulations and density and population growth especially in city areas.

To summarize, the concept of the house is highly interrelated to culture, therefore must be tackled as a comprehensive subject rather than an isolated idea. In the study of urban transformation or other urban design phenomena, it is essential to consider the enduring relationship between the house and culture. This provides a holistic understanding of the evolving nature of architectural form within the dynamic social background.

Socio-Cultural Patterns in the Spatial Form the House

The review of the literature reveals a rarity of references that comparatively reconnect the spatial form of houses to specific socio-cultural patterns; namely, in the context of Qatar. However, a few studies establish a fair interdisciplinary approach considering the analysis of the built form and spatial organization of houses in other Islamic countries. Among them is a recent journal article entitled *Privacy, Modesty, Hospitality, and the Design of Muslim Homes: A Literature Review*, which is based on the theory of home environments. According to the authors, “the design of traditional Muslim homes is subject to guidelines from principles outlined in Islamic Sharia Law, which are derived from the Quran as well as hadiths and sunnahs” (Othman, Aird, & Buys, 2015, p. 13). The authors outline three basic principles as criteria for evaluating the spatial design of Muslim homes: privacy, modesty, and hospitality.

Another paper elaborates on the principle of privacy through the analysis of behavioural patterns in the spatial configuration of housing in the regional context

(Alitajer & Nojoumi, 2016; Aycam & Varshabi, 2016). The study applies the methodology of comparative analysis between traditional and modern dwellings in the city of Hamedan in Iran through computer simulation, with the aim to investigate the effect of privacy over the course of time. The study concludes that the difference between traditional and modern houses revolves around the integration and equivalence of all spaces in a house, or the hierarchy of access to spaces.

Within the same regional context, a study titled Process of Housing Transformation in Iran (Mirmoghtadaee, 2009) provides a theoretical analysis of the transformation of housing form and lifestyles in developing countries. The study argues that Iranian houses have changed dramatically in recent decades due to social, economic and technological transformation. A very similar trend in the process of housing transformation can be seen in Qatar's recent past. The economical and industrial evolution of the country in the 1950s is the source of the physical and morphological changes in housing. The demographic features, physical and functional characteristics of the house, and change in social setting and lifestyles demonstrate the parameters for analysing the process of housing transformation in developing countries.

With reference to applying participatory design, such as the theories of Alexander (Alexander *et al.*, 1987) and Gehl (Gehl, 2011), a study of social participation in the design of residential architecture established the comparative base for analysing socio-cultural patterns of residential units. In the local context of Poland, a researcher illustrated the direct positive effect of mutual social interactions in the process of housing participatory design. According to the study, "social participation in the design of residential architecture has a positive impact both on the

architecture and on the relations between people who are involved in the creation of such architecture” (Kosk, 2016, p. 1469).

The study refers to nine characteristics of space as evaluation criteria extracted from the literature review of participatory design theories; it then applies the criteria to a selection of three case studies. The selected case studies are examples of residential architectural projects created as a result of participatory design. This methodology is highly effective, considering the social sustainability of residential architecture.

In this research study, there are three definite patterns embedded within the socio-cultural profile of Qatari society that highly govern the spatial form of houses. These include (1) privacy that is investigated through space syntax methodology, (2) gender segregation as an intermediate pattern of analysis between the public and the private and (3) hospitality as a social pattern that deals with the public realm.

(1) Privacy is the main socio-cultural parameter that affects the spatial form of Qatari houses. In the literature, the notion of privacy has been widely discussed by Western scholars within specific socio-political contexts; meanwhile, the focused scope of analysis is placed on Qatar as a Muslim and Arab country in the MENA region (Hanson, 2008; Margulis, 1977; Michelle, 1986; Newell, 1994; Westin, 1970). Thus, the concept of privacy is considered in its Islamic approach and defined as “the inviolable and scared character that Arab-Muslims attribute to their homes and precludes violation of this scared space as haram, or sinful” (Sobh & Belk, 2011, p. 322). There is a proportional relationship between home and privacy, where the latter gives the unit of the house its sense of peaceful sanctuary beyond the physical form. Most of the houses in the MENA region and the GCC make a sharp distinction between the public and private spheres, where

privacy covers various requirements including functional privacy, visual privacy, acoustical privacy, and olfactory privacy (Al-Thahab, Mushatat, & Abdelmonem, 2014; El-Shorbagy & Abdel-moniem, 2010; Mortada, 2003). Privacy is layered hierarchically from privacy from the neighbours' dwellings to privacy between family members within the household (Othman *et al.*, 2015). As a matter of fact, Islam appreciates the individual's right to have a privatized space and supports the maintenance of personal privacy at home (Figure 15).

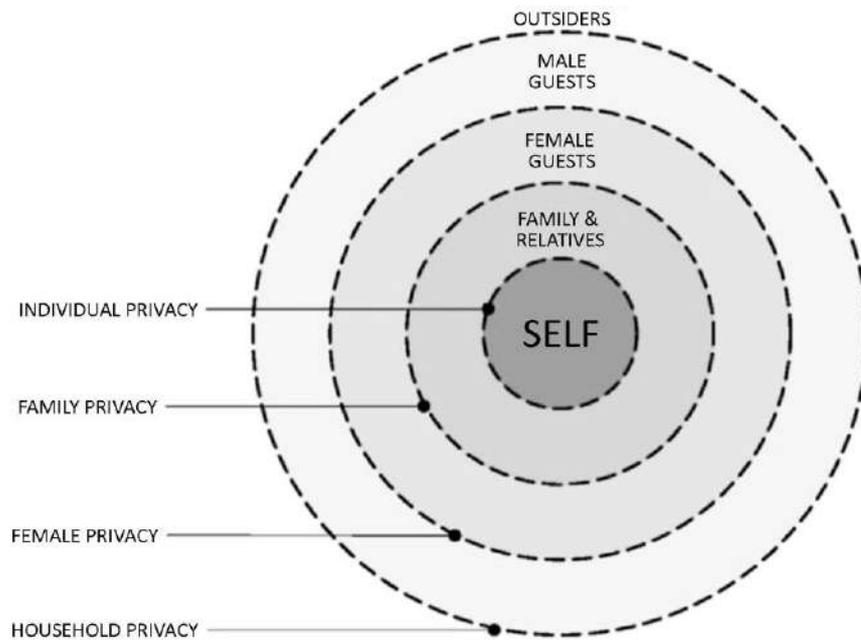


Figure 15: Layers of Privacy in Traditional Muslim Homes. Source(Bahammam, 1987)cited by (Othman *et al.*, 2015)

(2) One outcome of privacy is gender segregation, which in itself is a highly influential pattern in the spatial form of Muslim houses (Farah & Klarqvist, 2001). The level of gender segregation tends to vary between Muslim cities in the MENA region as it has been subject to different interpretation of religious norms, economic conditions, specific socio-cultural circumstances and identity guidelines. Such differences enriched the urban history of Muslim cities as seen through the variety of house models and design forms of domestic spaces, subjecting architecture to local imperatives (Campo, 1991; Cooper, 1995; Nageeb, 2004; Spain, 1992). In this respect, Qatar is a traditional Muslim country and is a gender-divided society. According to a study on the cultural life script of Qatar, Denmark-based authors note that the clear segregation of men and women in Qatar presents “an ideal opportunity for exploring gender differences and the effects of religion” (Ottsen & Berntsen, 2013, p. 393). This could include an analysis of the spatial form of residential units, as this form is highly interrelated to the pattern of gender segregation.

(3) Hospitality is another noticeably effective socio-cultural pattern that influences the spatial form of houses in Qatar, considering the social distinctions of family lineages and their deeply rooted lifestyle in the pure Arab culture. Hospitality is integral in pre-Islamic Arab culture, and its value has been approved by Islamic divine sources as it supports the creation of a tied, faithful community. Throughout urban history, “a place for the gathering of men and for reception of guests existed in most courtyard houses within Arab Muslim cities” (Almahmoud, 2015, p. 44), which in turn was subject to regional differences in terms of naming the designated space, its internal arrangement, building methods and other architectural aspects. Meanwhile, such spaces are created based on similar needs

and a clear function, specifically fulfilling the socio-cultural pattern of hospitality. In Qatar, the rise of Majlis spaces within pre-oil tent settlements, traditional courtyard houses and contemporary houses is a by-product of embraced cultural norms. In the contemporary context, however, “nobility, hospitality and generosity—for example, are seen as essential traits somehow “bred” into the Bedouin that are weakening with miscegenation and materialism” (Nagy, 2006, p. 131). This argument initiates the basis for the comparative analysis between vernacular and modern dwellings, with reference to transformation of socio-cultural patterns in Qatar.

Comparative Assessment between Traditional and Contemporary Housing

In terms of architectural intention, both traditional and contemporary housing fulfil the basic human needs for shelter, protection physically and psychologically, establishment of a private territory for the family and a gateway into society marking the boundaries between the public and private spheres in the urban scape. Comparing them as alternatives allows for an understanding of the basic characteristics in their evolution as the typical forms of residential architecture (Krier, 2009; Shin, 2014).

In addition, a comparative assessment based on the variable of time or history would include aspects of evolution that exceed the limits of symbolic, functional and aesthetic qualities of houses belonging to two different eras. It would furthermore consider the socio-cultural and intangible qualities that relate to certain socio-political contexts of the society, tolerating an in-depth analysis of sociological effects on the process of housing transformation in any region of the world.

The following question arises: Does the so-called contemporary residential architecture, specifically the house as a typology, with its insatiable drive from globalization and forces determined by industrialized market options, truly satisfy our

present society both socially and culturally and allowed for the pillar of social sustainability to be fulfilled? The assumption is that the traditional house is approved as a socially responsive unit and therefore its internal configuration and spatial formation align with the socio-cultural qualities of the local inhabitants (Krier, 2009, p. 7).

What is Traditional?

Leon Krier's book *The Architecture of Community* provides a thorough explanation of his conceptual ideas on creating sustainable and liveable urban settlements and cities (Krier, 2009). He presents the enduring debate on traditional and modern architecture, representing the former as a process that tends to produce objects of long-term use and the latter as a process that creates objects for short-term consumption. Although much of Krier's contribution focuses on the Western context and the transformation from vernacular, traditional and classical architecture to modern architecture due to geo-political and economic realities, his analytical explanation of urban concepts creates a general framework that aligns with various global contexts.

When questioning the nature of architectural objects in region and style, Krier argues that "the idea of replacing the world's rich panoply of traditional architectures by a single international style is dangerously insane" (2009, p. 53). He further supports his argument by rethinking the reconstructive progress of traditional architecture, which ensures its sustainability as a cultural choice of a determining influence (Figure 16).

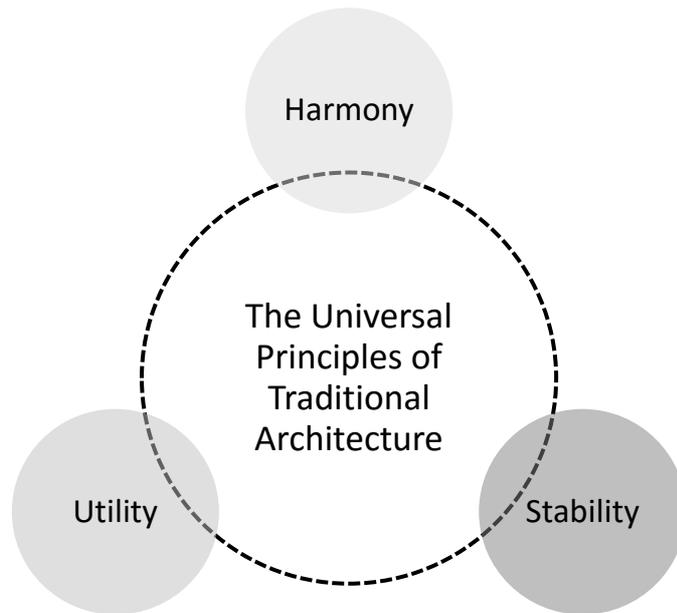


Figure 16: The Universal Principles of Traditional Architecture. Source (Krier, 2009)

What is Contemporary?

In urban design theory, the concept of the contemporary is greatly associated with the styles and approaches emerging in the 21st century as a reaction to technical innovation, socio-economic developments, political openness and cultural reforms on an international scale (Campbell & Fainstein, 2012; Steele, 1997). Correspondingly, the so-called international style dominates the arena of architecture, city planning and design by advocating for a world-city model, which gives rise to the following contemporary externalities:

“The response of each urban entity to rising rates of deteriorating housing stock, increasing pollution, homelessness, poverty, transportation problems and traffic congestion and increasing density now have global implications” (Steele, 1997, p. 466).

World cities have an emerging role that continuously reshapes the urban future, in which cities strive for balanced growth that fulfils both current and future needs. Therefore, contemporary city planning and design targets the design of spaces and places to facilitate social, economic and environmental progress through sustainable and compact-city growth models, maintaining a balance between the local, traditional imperatives and the global, futuristic aspirations (UN-Habitat, 2012).

Housing in Qatar

Characteristics of Qatari Architecture and Urban Design

Qatar’s vernacular architecture is a manifestation of harmony between the needs of its inhabitants, the physical environment and the availability of building techniques and materials. The characteristics of a typical Qatari house in the past were limited to certain architectural elements that reflected this strong interaction. The traditional characteristics of Qatari urban design and architecture, illustrated in (Figure 17) below, could be defined by three conceptual themes: simplicity, solidity and passive low energy design (Beattie, 2014). With the introduction of 21st-century technology, it is possible to achieve a timeless architecture that has direct relevance to Qatar’s past and sustains its characteristics into the future.

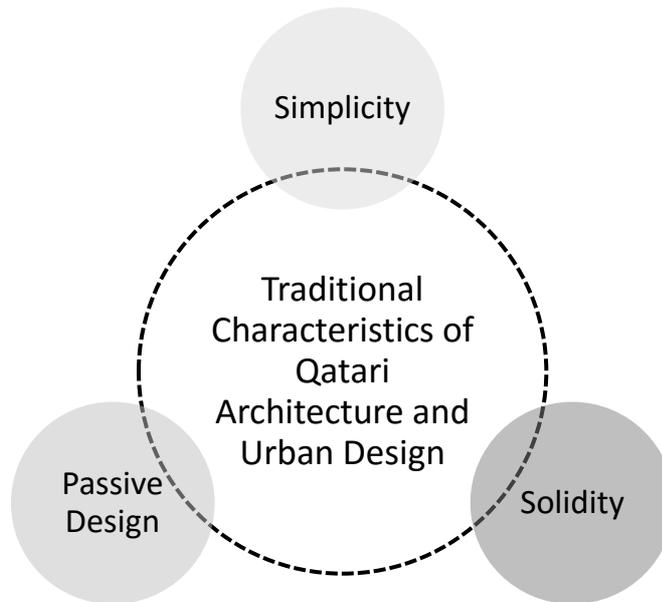


Figure 17: Traditional Characteristics of Qatari Architecture. Source (Beattie, 2014)

Overall, the conceptual representation of the contemporary urban design language of Qatar is inspired by the past, which is highly relatable to the patterns of the Qatari society and people's traditional means of life. Culture is an integral part of the concept that defines sustainability both as a spatial and social experience (Douglas, 1971). Accordingly, the hope of contemporary urban design is to create a portion of the city with shaded, pedestrian-friendly spaces. Another important goal is to bring Qatari families back to use the city in an effective way, limiting sprawl and enhancing the compact-city growth model.

Through urban design elements such as courtyards, communal gardens, secure private spaces, shaded rooftops, patterns of shade and shadow, choice of colour or patina, shaded open spaces and walkability strategies, the outcome is a form associated with the urban identity of Qatar (Figures 18 & 19). Such influences on

Qatari architecture and urban design are drawn from studying architectural heritage, craft traditions, archaeology, the natural environment and the local landscape, rather than simply transcribing form from the past (Bullivant, 2012; Excell & Rico, 2013; Law & Underwood, 2012; Makower, 2014).

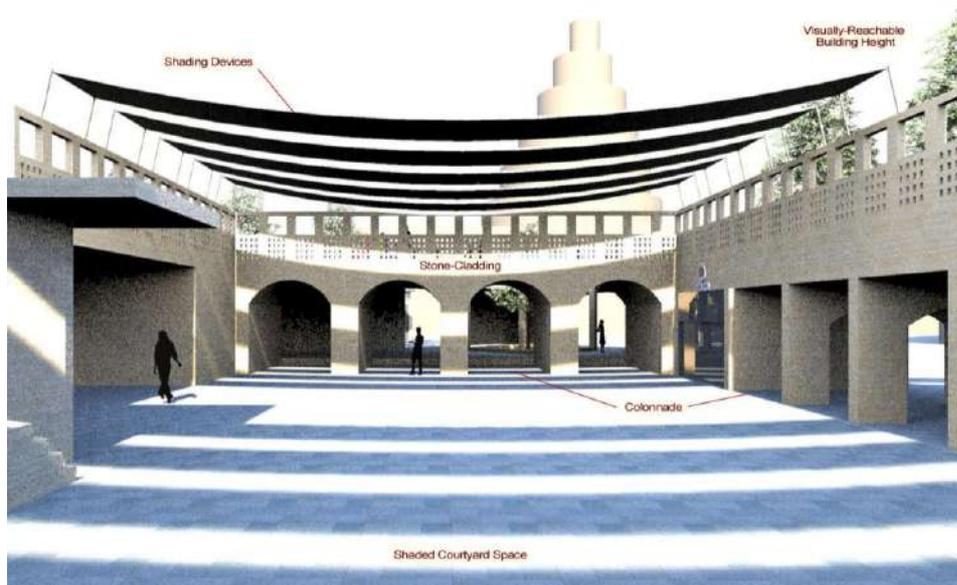


Figure 18: Conceptual Representation of Qatari Architecture and Urban Design



Figure 19: Cont. Conceptual Representation of Qatari Architecture and Urban Design

Housing in Qatar: Now and Then

According to a study conducted in the late 1990s, “vernacular buildings in Qatar have employed some ingenious passive techniques in order to restore thermal comfort within the building particularly during the hottest hour of the day” (Sayigh & Marafia, 1998, p. 26). Such techniques relate to spatial form as well as physical layout.

In the past, houses within compact neighbourhoods shared thick mud walls resulting in mutual shade and improved thermal comfort within the interior space (Figure 20). The interior space, however, surrounds an open-air courtyard that resembles the core of the housing unit, physically and socially (Al-Kolaifi, 2006; Alraouf, 2014; Gharib, 2014; Soflaei, Shokouhian, & Zhu, 2017).

The courtyard house typology dates back to the Graeco-Roman period and was later developed by Arab nomads who were familiar with locating their tents around “an open central space to provide shelter and security” for their settlements (Almahmoud, 2015, p. 44). Thus, the open space in the courtyard house was the result of a series of historical urban transformations responding to a set of common socio-cultural and environmental necessities (Dunham, 1961; Edwards *et al.*, 2006; Khalili, 2012).

The contrast of solid and void between the thick exteriors and the open interiors responds to the socio-cultural parameters of vernacular Islamic architecture, as an introverted typology of a veiled nature. Therefore, “in Islam, attention is given to the external appearance of the house where homogeneity is the main aspect. However, the symbols of status and identity are expressed throughout the interior of the house” (Alkhalidi, 2013, p. 291).

In *The History of Qatari Architecture*, the traditional Qatari house form is defined by four basic elements: the courtyard, the various spaces lining the courtyard, the ground floor rooms and the first floor rooms (Jaidah & Bourennane, 2009). Most domestic activities take place within the protected core of the courtyard, and the rooms are reserved for private family use. In this respect, “courtyard houses, which are common in regions with hot and dry climates, demonstrate strict territoriality and attempts to create private space for introversion” (Bekleyen & Dalkil, 2011, p. 908).



Figure 20: A Typical Vernacular Qatari Neighbourhood in the Past. Source (QNDF, 2014)



Figure 21: Recent Situation of an Old Courtyard House in Doha. Source (PEO, 2015)

The transformation of housing in the modern era is traced through an evolving process starting in the early 1950s with the discovery of oil and the wealth generated by its production and infrastructural development (Abdulla, 2010; Adham, 2008; Furlan & Petruccioli, 2016). Hence, “the most important development during this period was the establishment of modern housing connected to modern infrastructure” (Remali *et al.*, 2016, p. 6).

Factors that account for the transformation of spatial form of Qatari houses from traditional to modern models include the administrative development of the state, foreign investment, Western construction methods and standards, social welfare mechanisms and other transformative socio-economic factors (Figure 21). The transformation of the traditional courtyard house into a multi-storey villa is the major

shift in the spatial form of housing in Qatar, marking a break in the evolution of house form (Remali *et al.*, 2016; Sayigh & Marafia, 1998; Talib, 1984).

The contemporary villa is designed and built without regard to local contexts, providing a housing typology that is extroverted and box-like in structure and defined by an enclosed wall (Figures 22 & 23). According to a typological study of housing in the Gulf cities including Doha:

“In contrast to the traditional typology of courtyard houses, the internal spaces of a modern villa are oriented outward towards the surrounding yards or outdoor spaces” (Remali *et al.*, 2016, p. 10).

The socio-cultural pattern of privacy, however, is preserved spatially by local families, resulting in a certain spatial configuration of the interior spaces of the modern house. For instance, the courtyard is replaced by a salon or a living room that “acts as a circulation space on the ground floor to which all other rooms have access” (Talib, 1984, p. 127). Another example is the appearance of guest rooms or the Arabic Majlis as spaces for hospitality, secured and isolated from other functional spaces within the household and located next to entrance spaces to enable separation between the family and visitors—the private versus the public. Such patterns are contemplated within the limited choices of the market and other international design imperatives.



Figure 22: A Typical Alignment of Modern Neighbourhoods in Doha, Bani Hajer District. Source (Elblaus, 2017)



Figure 23: Houses Built and Under-Construction in Al Gharrafa District, Doha. Source (Elblaus, 2017)

Privacy and Gendered Spaces in Contemporary Qatari Houses

The publication titled *Privacy and Gendered Spaces in Arab Gulf Homes* reports the outcomes of a qualitative study on Qatari houses as a focused context in the MENA region; the authors affirm that privacy and gender segregation are anchors for both national and religious identity in Qatari houses. Accordingly, the maintenance of such anchors help Qatari families resolve the effects of globalization and “embrace the global more freely” (Sobh & Belk, 2011, p. 320).

The authors highlight three aspects that contribute to the creation of reliably unique research on housing transformation in the context of Qatar:

- (1) **Socio-cultural Aspect:** The strong devotion to traditional ethics and cultural values by Qatari people that could be symbolized by every aspect of everyday life including clothing, social interaction, housing and other cultural facets;
- (2) **Economic Aspect:** The luxurious lifestyle of Qataris as a result of high per capita incomes as well as citizenship privileges such as free education and healthcare; and
- (3) **Demographic Aspect:** The high presence of foreigners from various cultures in Qatar, while Qataris comprise less than 20% of the national population, which invokes a commitment to national identity.

The study’s methodology involves observation and in-depth interviews with a sample of middle-class Qatari families, followed by a coding analysis of opinions expressed by interviewees. The findings of the study asserts that there is a prevalent need for privacy in Qatari houses, specifically to protect the privacy of women (2011). Therefore, the spatial configuration of the house results in separated quarters designated for different private uses.

Another notable finding of the study is women's domination of domestic space in Qatar. The house is a space for women's self-expression, freedom and spatial control, unlike the exposed public spaces that require women to restrict their freedom physically and socially. However, within the Qatari household, the men's Majlis or the guest room represents the public face of home sanctity.

In conclusion, the study affirms the following:

“Expansive Qatari home design and gender segregation can be seen as forms of conspicuous consumption that both celebrate global consumer culture and at the same time resist the charge of Westernization” (Sobh & Belk, 2011, p. 337).

Space Syntax

“The built environment is both a product of society and an influence on society. Space syntax aims to investigate and understand this relationship. It has developed a set of techniques for the simple representation of architectural and urban space” (Major, 2017).

Space syntax is a research framework capable of generating a descriptive and qualitative analysis of the spatial formations and urban systems, ranging from the interior of a room to the city and its wider landscapes (Dursun, 2007; Nourian, Rezvani, & Sariyildiz, 2013). It is both a concept and a methodology used in urban morphology and architectural research to analyse spatial configuration within the active social system in addition to other economic and environmental phenomena. The literature review indicates a high application of space syntax methodology in

recent publications and studies concerned with residential spaces and housing transformation (Jiang & Claramunt, 2002; Ratti, 2004; Xia, 2013)

The theory of space syntax was originally developed by researchers at the University College London in the mid-1970s, and “has been used by architects to examine the influence of the spatial layout of buildings and cities upon the economic, social, and environmental outcomes of human movement and social interaction” (Dawson, 2002, p. 465). Its purpose is “understanding the influence of architectural design on the existing social problems in many housing estates that were being built in the United Kingdom” (Oliveira, 2016, p. 101). Accordingly, publications that are focused on examining the transformation of domestic space in relation to family structure are dominant in the field of space syntax research, with an emphasis on space as a primary arena of sociocultural events.

Space Syntax Case Studies

Space syntax provides effective approaches to understanding housing transformation in local contexts. In the article titled *Uncomfortable Prototypes: Rethinking Socio-Cultural Factors for the Design of Public Housing in Billiri, North East Nigeria* (Maina, 2013), space syntax is utilized to analyse space use patterns in forty-five randomly selected public compounds (Figures 24 & 25). The compounds are government-funded and occupied by a local community, which has its own socio-cultural lifestyle. The study examines the transformation of the prototyped housing units by local communities to suit their changing needs, resulting in dysfunction and dissatisfaction with the units. Space syntax provides insights on the space use patterns and relates to the issues of kinship and security considerations of local communities. The study supports the creation of public housing schemes that respond to socio-cultural patterns of native communities.

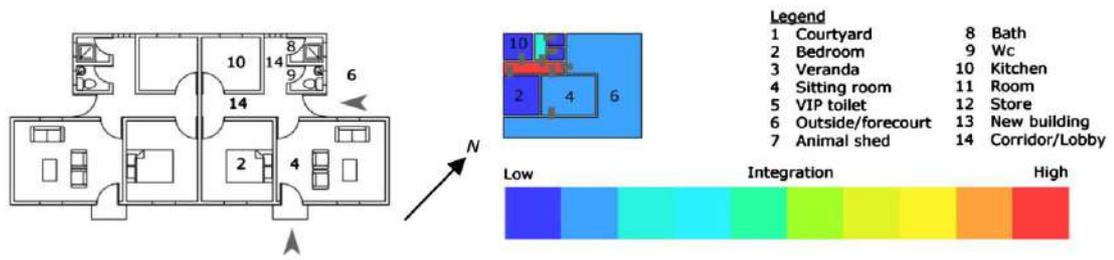


Figure 24: Spatial Analysis of Government-Provided Prototype I in Billiri. Source (Maina, 2013)

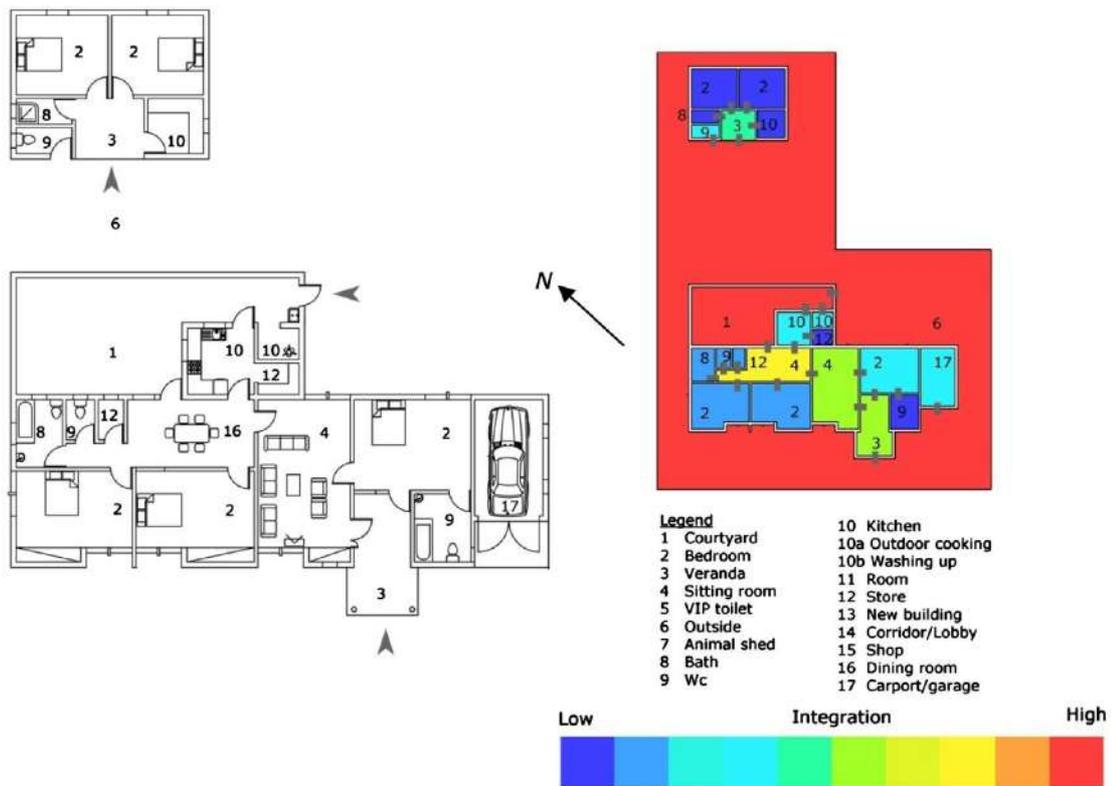


Figure 25: Spatial Analysis of Government-Provided Prototype II in Billiri. Source (Maina, 2013)

On the contextual extreme, space syntax analysis is applicable in the case of snow house architecture in the Canadian Arctic. Considering the simple forms of residential units, which are occupied by native social groups that follow clear kinship systems, the direct analysis of space syntax proves the strong relationship between spatial layout of buildings and socio-cultural interaction (Dawson, 2002). According to the author of the study, “space syntax approaches have the potential to shed new light on the relationship between house form and culture in both the recent and distant past” (Dawson, 2002, p. 478).

Space syntax is an applicable methodology in establishing comparative assessments to evaluate housing transformation within a limited timeframe and for a wide range of urban design purposes. In Lisbon, Portugal, a study entitled *Transforming Housing Typologies: Space Syntax Evaluation and Shape Grammar Generation* attempts to analyse three housing types from the 18th–20th centuries for rehabilitation purposes as well as “promoting the refurbishment of the existing housing stock in cities” (Eloy & Guerreiro, 2016, p. 108).

In the study, the tools of shape grammar and space syntax are used mutually to set out a workable framework for adapting historical housing types to modern living conditions. Thus, space syntax is a supportive tool in developing comprehensive analytical approaches to contemplate housing transformation as it closely relates building form to social effect. The study is based on a clearly defined socio-political context, permitting a justified comparative analysis of the evolutionary approach of mass housing in Lisbon in addition to connecting dwellings of a certain historical period to their proper social framework (Figure 26).

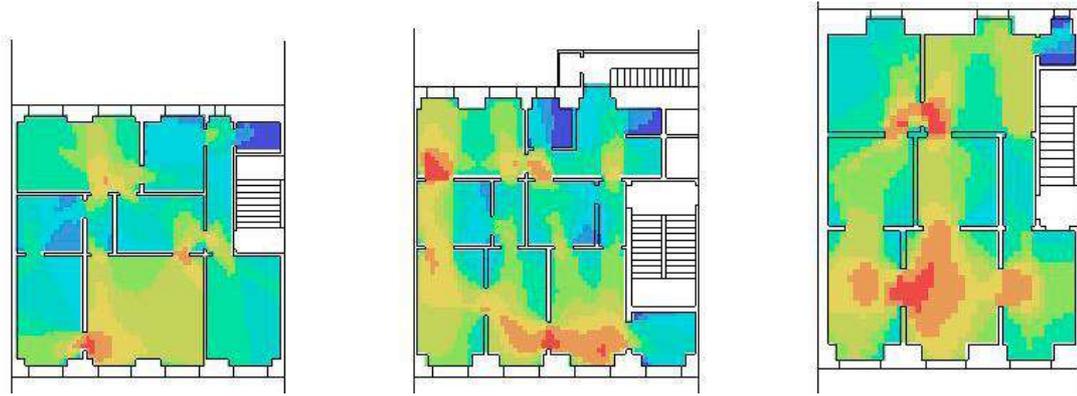


Figure 26: Connectivity VGA of a Historical Housing Typology in Portugal. Source (Eloy & Guerreiro, 2016)

Connectivity in Space Syntax

Space syntax is utilized to analyse the two-dimensional spatial properties of architectural plans at different scales, from a single house to the analysis of the entire city (Hillier & Hanson, 1984; UCL, 2018). The relationship between spaces and their social properties are revealed graphically in convex maps. In theory, convex maps are concerned with enclosure spaces with limited movement and perception, and their connectivity is represented as nodes and edges (Lee, Ostwald, & Lee, 2017).

Quantitative arithmetical descriptions are developed based on the generated convex maps, including the index of connectivity, defined as the number of direct connections to other spaces or movement paths capable of describing mutual relationship between spaces. Connectivity is a syntactic measure and a local property; it represents the number of convex spaces that are directly connected with one certain element (Bus & Pedraza, 2016; Hillier & Hanson, 1984).

The index of connectivity provides basic information that relates to the user's understanding of the entire building configuration. Appropriately, "the most significant aspect of the connectivity concept is the reflection of the form of the space based on the visual perception it has created in the mind of the person using the space" (Arslan & Köken, 2016, p. 90).

In this research study, connectivity is analysed in a collection of housing units belonging to two different eras, which establishes a comparative assessment between traditional and contemporary houses in Qatar based on internal configuration of the selected units.

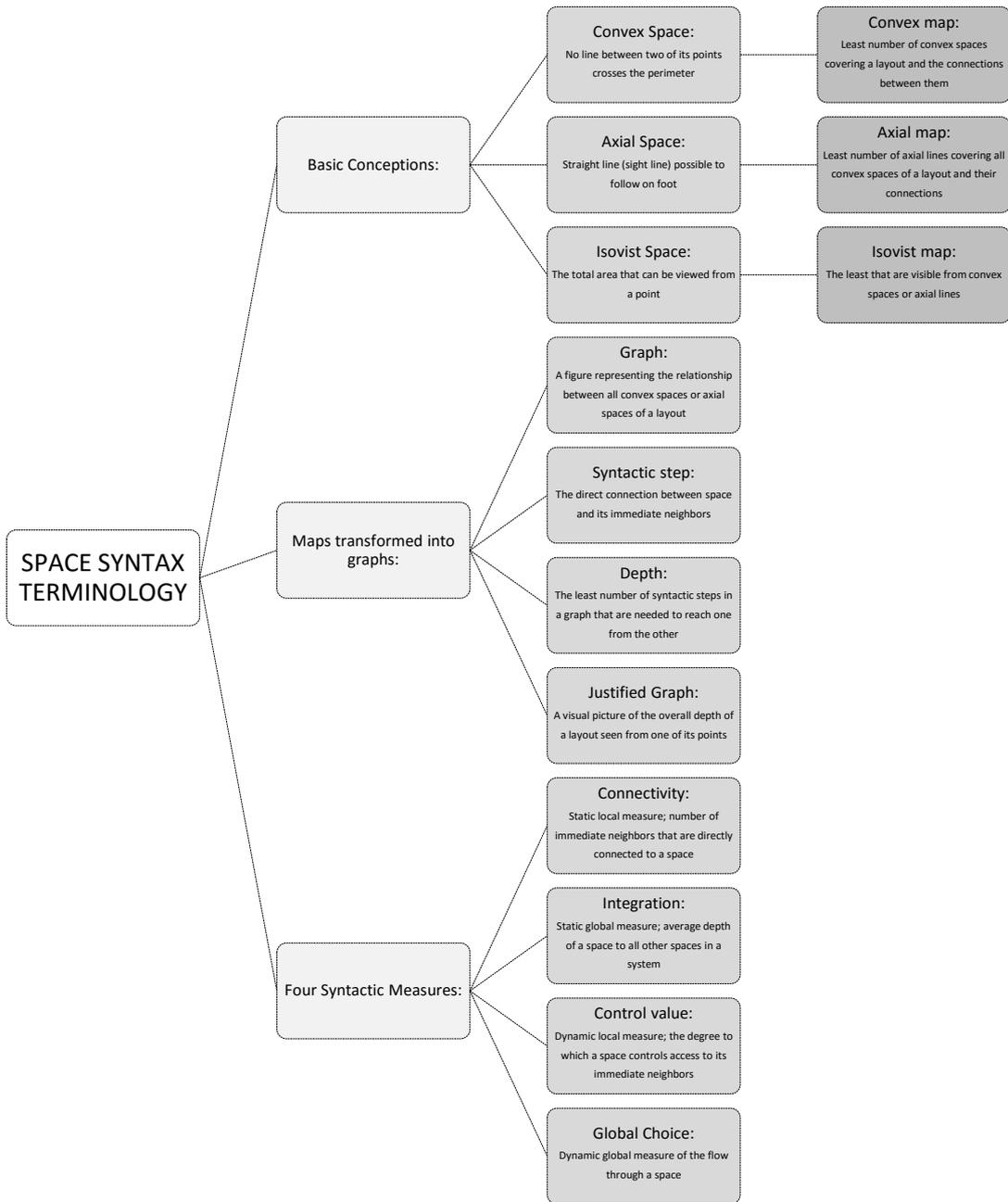


Figure 27: Summary of Space Syntax Terminology. Source (Klarqvist, 1993)

Chapter's Summary

In this research study, the spatial culture of housing in Qatar—which is found to integrate wider Islamic and Arab influences as well as global and westernized trends, striving to reach a balance between tradition and modernity—is analysed through the methodology of space syntax. The methodology is selected to contemplate the spatial configuration of Qatari houses through proper socio-cultural lenses. Such predefined patterns include (1) privacy, (2) gender segregation and (2) hospitality. The patterns are embedded into the architecture of vernacular housing in Qatar as a result of socio-cultural beliefs and take on altered forms in contemporary housing. Thus, space syntax provides the technical opportunity to explore meanings behind the physical spatial form and configuration of spaces with reference to the recent time in a comparative approach. Comparative analysis is enriched by the outcomes of space syntax analysis, providing impressive feedback on the current social sustainability of housing in Qatar and projecting results into the future. Not only social sustainability, but also comparative analysis allows for a critical evaluation of housing transformation aimed at assessing the recent changes and allowing architects and urban designers to intervene in the process to design better-built environments. A graphical summary of the chapter is presented in (Figure 28).

LITERATURE REVIEW: THE SPATIAL CULTURE OF HOUSING IN QATAR

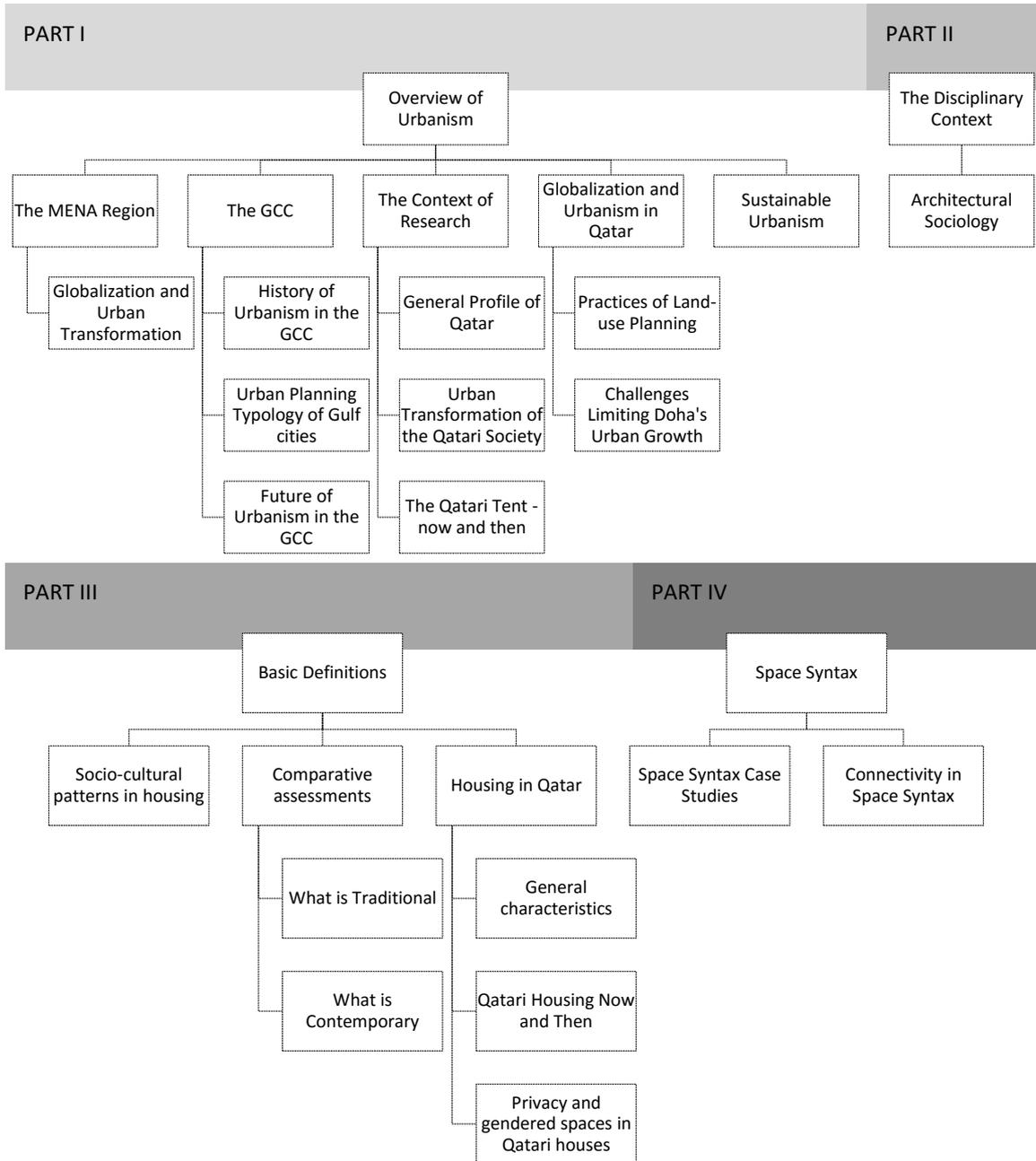


Figure 28: Summary of Chapter 2 – Literature Review

CHAPTER 3: RESEARCH DESIGN

Urban design is an interdisciplinary field of study that incorporates a high utilization of participatory approach in design. It actively involves end users, stakeholders and the public realm, wherein the urban designer is believed to be the advocate of the design process (Brown *et al.*, 2014). It is a common practice in academic research in architectural studies and urban design to depend on participant observation along with applicable empirical methodologies, especially when considering the social and cultural practices of a definite community (Amedeo, Golledge, & Stimson, 2009; Groat & Wang, 2002; Newman, 2007; Taylor *et al.*, 2016; Yin, 2003).

This research study combined empirical and simulation methods that use inductive and deductive reasoning, participatory observations, direct impressionistic observations, field study and on-site analysis. The variety of methods ensured a rich research process; it also promised reliable results through multiple feedback methods considering the study of a qualitative urban design subject of the spatial culture of housing in a definite socio-cultural context.

This study used an analytical approach to assess socio-cultural patterns in the spatial form of houses belonging to Qatari nationals. It was a comparative assessment between houses in the past and the present. It utilized the methodology of space syntax and correlated formative architectural schemes to social and cultural patterns.

Overall Research Methodology

The overall research methodology is divided into three parts:

- (1) The theoretical framework involves an overview of urbanism in the regional context as well as a conceptual review of related concepts such as the basic definitions of house and culture, the socio-cultural sustainability of housing, the spatial form of houses especially in the context of Qatar, a comparative assessment between traditional and contemporary housing in Qatar based on certain evaluation criteria extracted from the literature as well as a brief explanation of space syntax.
- (2) An applied methodology focused on a space syntax analysis of the design aspects of traditional and contemporary housing units in Qatar. The analysis involved a selection of four traditional housing units in which the interior spaces were explored and sorted according to a set of common features. The characteristics of the interior space within the household of the past were defined as a base of reference when comparing vernacular to contemporary houses. A similar selection of four more recent Qatari housing units was used, listing the interior space features and elaborating on the spatial form and configuration.
- (3) A comparative analysis was established between traditional and contemporary houses in terms of visibility graph analysis (VGA). The index of connectivity was conducted with reference to the predefined socio-cultural patterns of privacy, gender segregation and hospitality. Such patterns established the methodology's evaluation criteria.

Method of Analysis

Since the analysis concentrated on socio-cultural patterns in the spatial form of houses, the interior spaces were the main focus of the research. Accordingly, space syntax, which is defined as the representative technique to quantify spatial patterns in buildings, was used to analyse spatial configuration of spaces with socio-cultural significance in contemporary and historical contexts (Bellal, 2004). It was translated into a series of computer-aided programs and applications to ease the process of analysis.

The computer program Depthmapx-0.5 assists with simulation and modelling techniques, and it can produce visibility analysis in terms of space connectivity, integration and depth under the theory and method of space syntax. In general, Depthmap is a user-friendly platform that allows for importing two-dimensional (2D) layouts, then creating visibility graphs according to the user's set of requirements (Knowles & Sweetman, 2004; Smith & Bugni, 2002; Turner, May 2011; Yin, 2003).

The focus of analysis in this research study was limited to the index of connectivity, defined as “the number of points at which a space is directly connected to other spaces” (Alitajer & Nojoumi, 2016, p. 344). A graph of connectivity is two-dimensional and capable of representing “the relationships of accessibility between all axial spaces of a layout model” (Dettlaff, 2014, p. 286). A colour code system visualizes connectivity, ranging from warm red for high connectivity in a space through orange, yellow, green and finally dark blue for the least connective spaces.

The following steps describe the process of applicable methodology for the creation of visibility graph analysis VGA files in Depthmapx-0.5 software (Hanson, 2003; Turner, May 2011; UCL, 2018):

- (1) House plans were collected as DWG and transferred into DXF file extension. It was important to prepare plans ahead in AutoCAD by providing clear, defined layout plans with all house spaces clearly named and tagged.
- (2) DepthMapX-0.5- was installed from the official webpage (UCL, 2018). House plans were imported individually into DepthMapX-0.50 software.
- (3) A visibility graph was created through Visibility Tool --> Make Visibility Graph. A default grid was placed over the imported house plan. The grid was refined to match the proper analytical measure of the research.
- (4) Every space of the plan was filled with a conventional filling tool to indicate major spaces and prepare them for connectivity analysis.
- (5) VGA processed through Visibility Tool --> Run Visibility Graph Analysis with predefined options.
- (6) The analytical diagram was created with a colour-coding scheme and was ready for analysis. The colour-coded diagram was exported as an image.

Primary and Secondary Sources

Based on the objective of analysing socio-cultural patterns in the spatial form of traditional and modern houses in Qatar, a literature review of traditional houses archived in books and references was utilized in this study to cover the historical analysis (Creswell, 2003; Newman, 2007; Zeisel, 1975). Similarly, a database of recent houses was collected, investigated and, when possible, visited to provide a counter-assessment of contemporary houses.

It is important to note that the collection of old housing plans and detailed architectural drawings were provided by governmental authorities working in the conservation sector, such as Qatar Museums Authority (qm.org.qa, 2016) and the Ministry of Culture and Sports (mcs.gov.qa, 2016). More traditional housing plans are

cited in *The History of Qatari Architecture 1800-1950* (Jaidah & Bourennane, 2009), which is one of the few references that archives the vernacular architecture of Qatar. In the book, a wide collection of domestic buildings is presented; however, this study limits the selection to four cases.

The analysis of the traditional houses covered the following areas: entrances; courtyard style and ratio, spatial forms and configuration of the interior spaces, room typologies and other aspects (Remali *et al.*, 2016; Sayigh & Marafia, 1998; Talib, 1984). The exploration of the selected houses was cumulatively approached, where knowledge of traditional architecture in Qatar as well as the Gulf region was utilized to understand the spatial configuration of old houses and the effect of socio-cultural aspects on the process of transformation.

General historical knowledge was collected through oral as well as visual data. Oral data was gathered by attending seminars and architectural talks on traditional architecture in Qatar, such as the seminars delivered by Eng. Ibrahim Mohammed Jaidah (CIRS, 2016), the author of *The History of Qatari Architecture 1800-1950*, and Eng. Mohammed Ali Abdulla, the designer of Souq Waqif regeneration project - Private Engineering Office of the Emiri Diwan (Figure 29). Other seminars included the 2010 Aga Khan Awards for Architecture in Doha (Figure 30). Such seminars and talks provided a first-hand approach to detailed information on the aspirations and challenges of the historical urban development of the city of Doha and glimpses of urbanism before the discovery of oil in 1950s. The Department of Architecture and Urban Planning in Qatar University organized most of these lectures, seminars and talks through a collaborative academic seminar series.



Figure 29: Seminar Conducted by Mr. Mohammed Ali on Souq Waqif, Qatar University. Source Author



Figure 30: Aga Khan Awards for Architecture Seminars in Doha, (2010). Source Author

While in the case of the four recent housing units, a similar collection of plans is illustrated. The process of analysis depended on an extra factor of site inventory since most of the presented houses were currently owned and inhabited by Qatari families. The architectural plans were collected during the author's course of service in one of the governmental agencies responsible for the housing sector of Qatar. This group of houses belongs to the Public Housing Program granted to middle-class Qatari families. The houses were repeatedly built in similar plot areas with similar built mass ratio, enabling a reliable process of comparative assessment.

Since the collection of contemporary housing units analysed in this research study belong to public housing, it is worth mentioning that the State of Qatar places great interest in the housing sector and encourages the provision of adequate housing for citizens of all social groups. To ensure the implementation of rules and regulations concerning housing in Qatar, competent authorities were established to achieve the directives of Qatar National Vision 2030, by providing adequate housing that combines modernity and originality of Qatari heritage (QNDF, 2014). Based on Law No. 2 of 2007 on the Housing System, the law grants the ownership of the beneficiary citizens of a housing loan and land, in coordination with the authorized development bank (Almeezan.qa, 2018). Architecture and design-wise, beneficiary citizens are offered a choice of either using a private contractor or choosing one of two standard public housing models designed by government authorities (Figures 31 & 32).



Figure 31: Public House Type I Provided by Public Housing Program. Source (Hukoomi, 2018)



Figure 32: Public House Type II Provided by Public Housing Program. Source (Hukoomi, 2018)

Regarding secondary sources, the author has published a journal article titled *Socio-Cultural Patterns in Domestic Spatial Form: A Comparative Study of Traditional and Modern Qatari Houses* that is a summarized paper and a continuity of the thesis approach and methodology (AL-Mohannadi & Furlan, 2018b). It directly aligns with the thesis theme and serves as a reviewed, shortened version for publication purposes. In addition, the author has co-written a recently published journal article entitled *The Practice of City Planning and Design in the Gulf Region: The Case of Abu Dhabi, Doha and Manama*, published by the *International Journal of Architectural Research (IJAR)* (AL-Mohannadi & Furlan, 2018a). Most of the relevant data on urbanism in the GCC and Qatar are cited from the article, which has been thoroughly discussed and presented in the Literature Review chapter.

Chapter's Summary

The overall research methodology is summarized in (Figure 33) below,

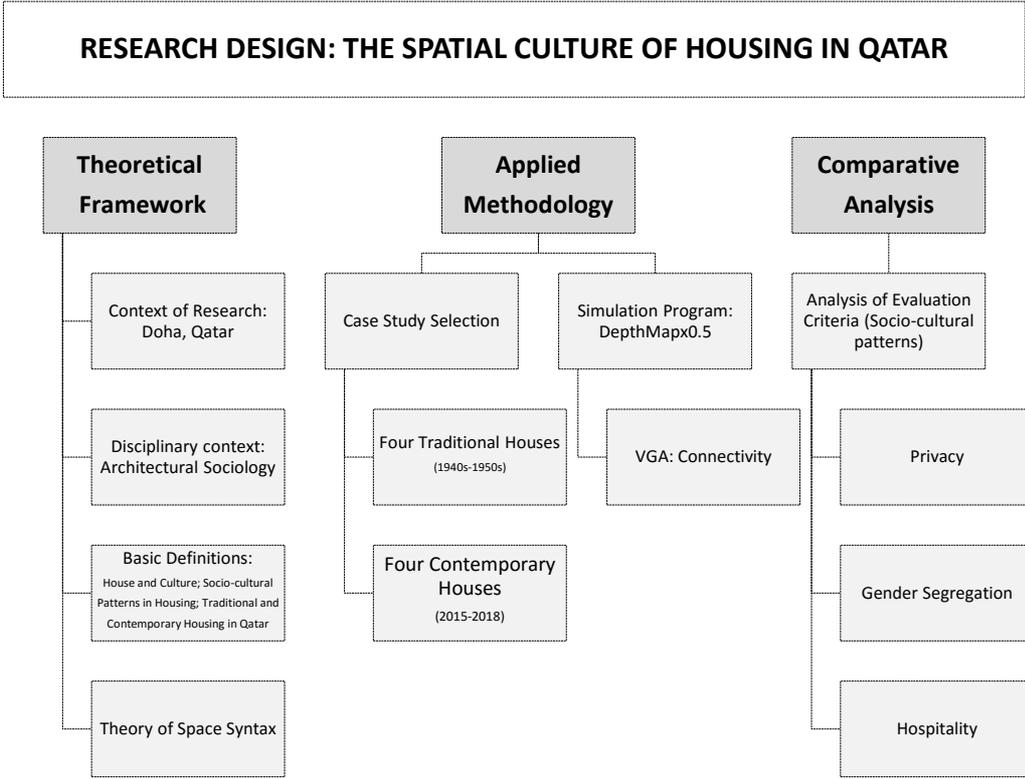


Figure 33: Methodological Framework of the Research Study. Source Author

CHAPTER 4: FINDINGS

The findings chapter of this research study is divided into three main sections: (1) data collection, (2) data analysis, (3) results and discussion. The data collection section documents the samples selected for the application of the simulation methodology, including architectural plans, building profiles and general facts about the housing unit collection. The data analysis section examines the connectivity pattern applied to the selected unit of investigation through software simulation. The results and discussion section is dedicated to the comparative analysis of houses based on connectivity, referring to the evaluation criteria of privacy, gender segregation and hospitality.

The outcomes verify the hypothesis of this research study, which assumes a relatively common influence of socio-cultural patterns in the development of housing units in Qatar since the 1950s. In addition, the outcomes deliver justified answers to the research questions, specifically the question of socio-cultural factors influencing the development of the spatial form of Qatari houses now and then.

Data Collection

To test and validate the influence of socio-cultural factors, a sample of traditional and contemporary houses in Qatar was examined in terms of internal configuration and graphically analysed in terms of connectivity utilizing space syntax as simulative software. The methodology of space syntax was applied to a case study sample that was limited to (1) four traditional and (2) four contemporary housing units as shown in (Table 2). The selection was based on several criteria including the availability of floor plans and architectural references, time of construction, location of the housing unit and other functional and dimensional criteria.



Figure 34: Collection of Houses used to Perform VGA Analysis

Most of the traditional houses were built during the 1930s and 1940s, whereas the contemporary houses were built in 2015. The analysis was conducted on the architectural line drawings of the ground floor level. The following pages present the selected case studies of traditional and contemporary houses with a brief discussion of the spatial form and interior configuration of the units along with architectural layout plans signifying important spaces of each house. Architectural drawings presented are not to scale.

Traditional House- Case 1:

Noura Bint Saif House | Al Asmakh, Doha | Built 1930



Figure 35: Traditional House, Case 1

The Noura Bint Saif House is a single-storey house with one of the largest courtyards in the remaining old houses in the city of Doha. It consists of two main blocks including the guest section, the western corner, and the main household section with seven rooms, reflecting the typical arrangement of courtyard traditional houses in Qatar. The owner of the house is a middle-income family although currently it is accommodated by Asian migrant labourers. Originally, the house was named for its

female owner. The house is accessible from two entries: the main north gate and the northwest gate. The main gate centralizes the house and is located between the family section and the guest section where the Majlis is situated. It therefore maintains the family's privacy whenever guests use the Majlis space.

The house has an L-shaped plan with the rooms surrounded by a three-meter-wide porch, arcaded and decorated in simple geometric Islamic patterns. The porch has a social and climatic function, creating a gathering space within the household while providing a shaded canopy from excessive sun, especially around the most utilized rooms. Blocks on the southeast corner were built in a later stage, since one of the spaces is dedicated for a car garage as a modern addition to the traditional house. The four linear rooms in the southwest were also built in the current era.

Traditional House- Case 2:

Faraj Al Ansari House | Msheireb, Doha | Built 1935

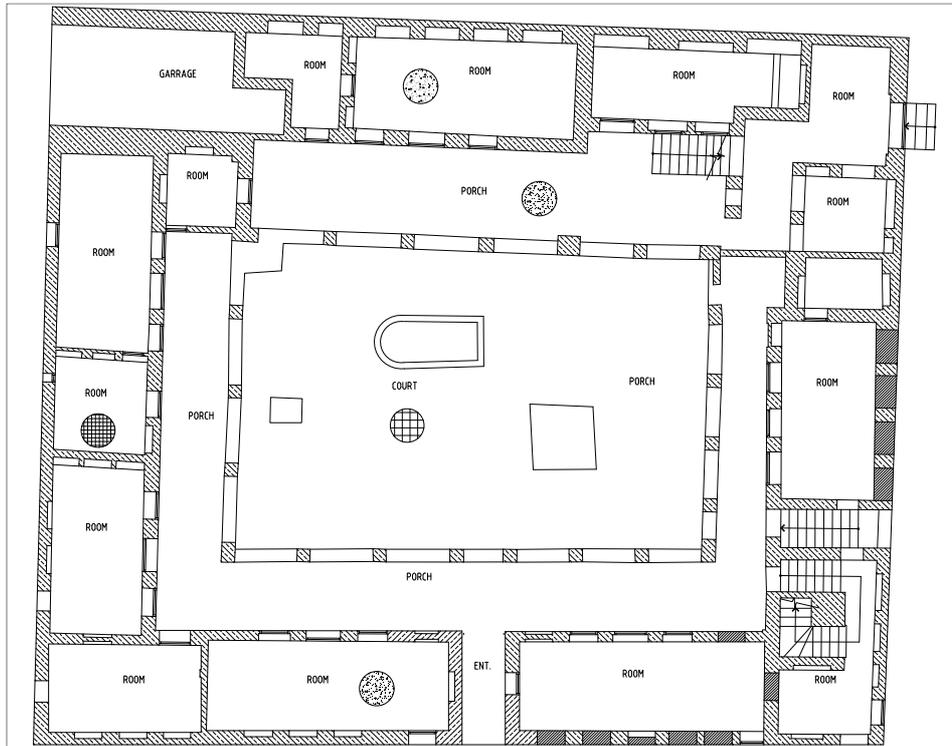


Figure 36: Traditional House, Case 2

This two-storey house has four entrances to the lower courtyard, which is surrounded by a porch. The ground floor consists of nineteen rooms. The space syntax analysis is limited to the ground floor only. The house belongs to members of the Al-Ansari family, who are known as merchants in Qatari society and were previously involved in trading and business activities. The house is located in close proximity to Souq Waqif, the central market of Doha.

The two levels were built at different times as indicated by their different architectural styles. The house is accessible from four entries: three from the east and one from the south. The main entrance is the largest eastern entrance, while the other two entrances from the south lead to staircases. A large courtyard centralizes the house, around which the nineteen rooms are gathered and the courtyard itself is surrounded by a concrete porch. The architectural features of the house's façade include the typical assortment of small windows and few air-catching rectangular openings known as badgiers, while the roof of the interior rooms is made of traditional beams known as danchal (PEO, 2015).

Traditional House- Case 3:

Al Jaber House | Al Asmakh, Doha | Built 1935

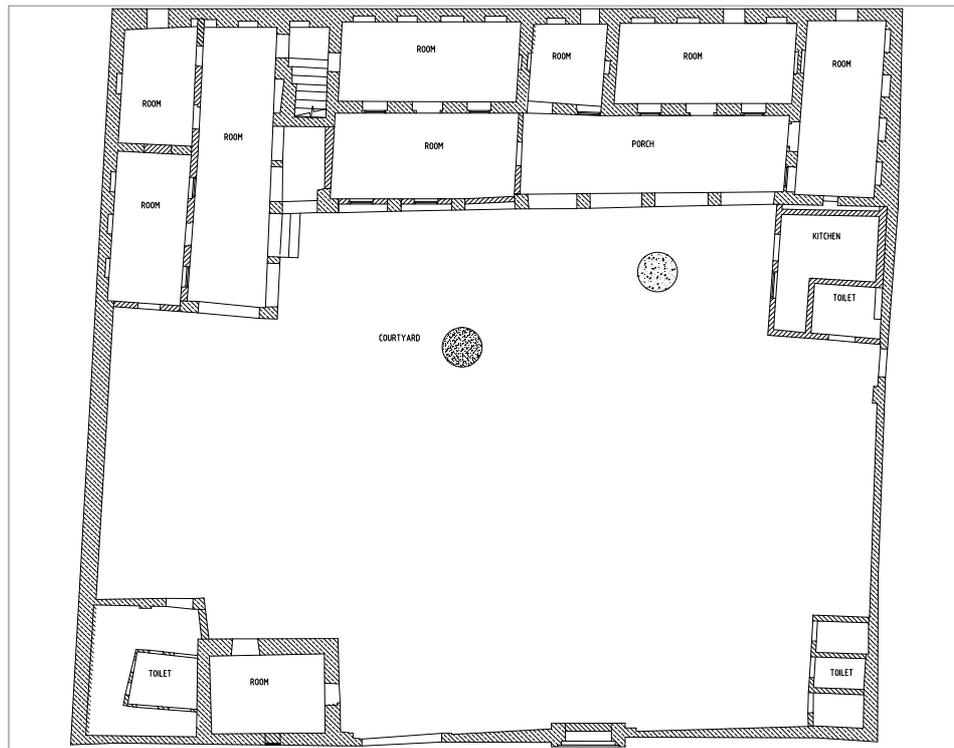


Figure 37: Traditional House, Case 3

The house is located in one of the most valuable residential districts in old Doha, namely the Al Asmakh neighbourhood. The significance of the area lies in its proximity to Doha's old port and the active commercial centres so that access to the market and other public spaces was historically assured. The house has a typical architectural configuration with its walled courtyard and L-shaped room arrangement.

The house consists of eight rooms with a simple architectural style. It has two wells of salt water and an imposing entrance. The rooms open onto a raised porch. A high fenced wall surrounds the house with its main door facing the street. The main entrance has a special door design, with a small door embedded into a larger door; this is called khokha, and it is a familiar door style in Islamic architecture. The khokha door is designed in a flexible way that regulates access to the household; family members and guests use the small door individually as it requires pending, while the large door is used for services, piles and other larger packs.

All rooms are located on the northern side of the house. The courtyard has a large seating area shaded by a big tree beside an old well. Another well is found in the southern corner, which was transformed into a toilet after it was initially built.

Traditional House- Case 4:

Ismail Mandani House | Al Asmakh, Doha | Built 1940

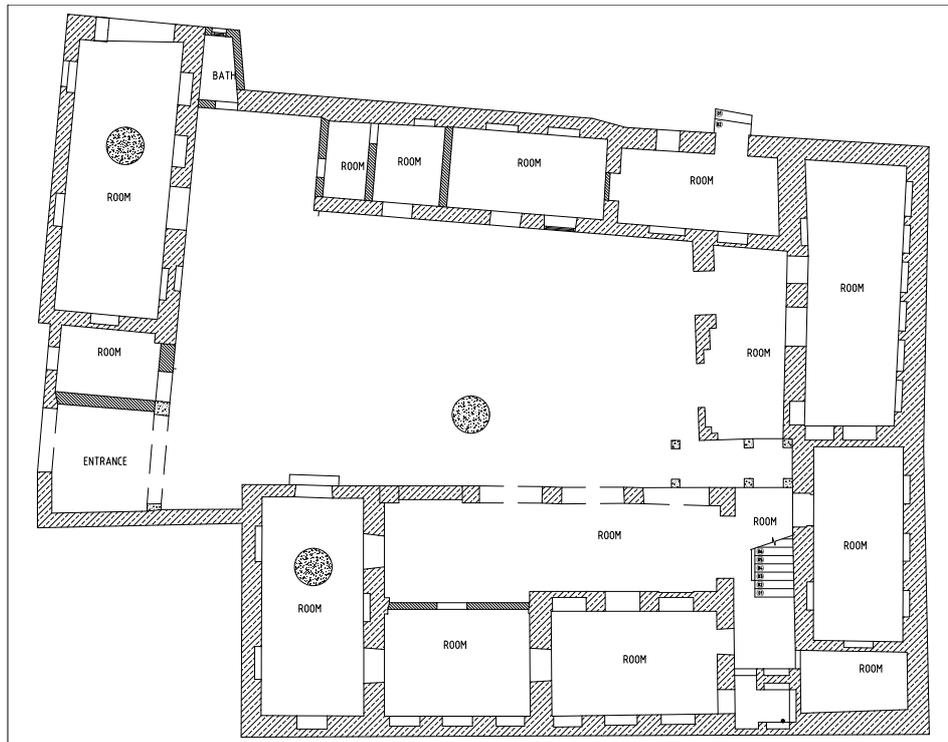


Figure 38: Traditional House, Case 4

This two-storey house has an entrance gate at the south-western corner. The courtyard is a trapezoid measuring 16 by 7.5 meters. Fifteen rooms occupy the ground floor, while only four rooms occupy the first floor. As a socio-economic trend, wealthy families in Qatari society usually construct their houses in two levels due to financial means to obtain more building material and technical construction skills. The main access to the house is through its south-western entrance. The house plot is

divided into a family section occupying the northern, eastern and southern walls, while the Majlis block is on the western side.

The courtyard has two iwans, which are vaulted rectangular spaces walled on three sides and open on one side. The first iwan faces the main entry gate while the second is located in the southern block of the house. The first floor is accessible through a concrete staircase leading to four rooms. An arcaded porch surrounds some of the upper floor rooms. Roofs are part of the social life of the old Qatari family; they are mostly used as recreational spaces during the summertime since the night breeze is cooler in the elevated levels.

Contemporary House- Case 1:

Villa 1 | Al-Wakra | 2015

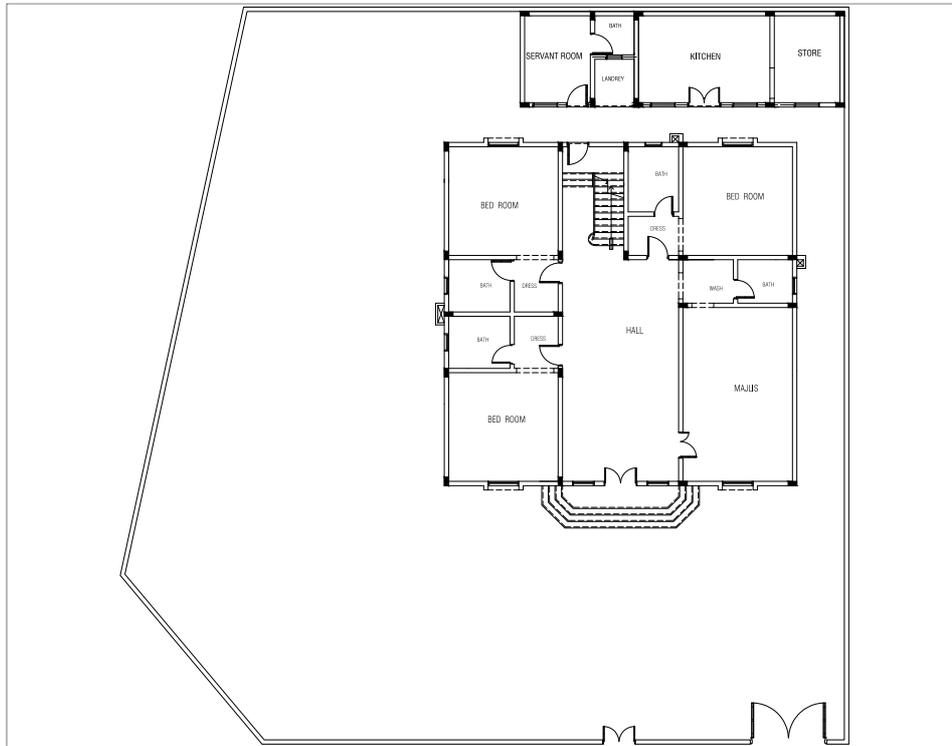


Figure 39: Contemporary House, Case 1

This villa consists of ground floor covering 260 square meters, a first floor and an outer service block with a kitchen. The total covered area is 30% of the total plot area. The villa is located between three local roads and shares a fence wall with a neighbour to the east. The main entrance is from the southern road. The villa belongs to a small Qatari family with medium level of income. The villa was designed locally by a consulting engineering office specializing in design and supervision.

The household block consists of a spacious entry hall, approximately ten by five meters, leading to the Majlis space with its washing room and toilet, three bedrooms with dressing spaces and toilets and the staircase unit. The Majlis room is accessible from the villa's main door, requiring visitors to access the hall before approaching the Majlis door on the right. In addition, the Majlis utilities are accessible from the main hall through an arched entry, allowing the family to access the visitors' space for services, maintenance and other uses.

All ground floor rooms provide views of the outer yard through 1.2-m windows. The outer block unit consists of two main spaces, namely the kitchen and its connected storeroom, and the servant room. A laundry space is located between the two rooms without an access door. The villa is fenced with a high wall approximately 2.5-3 meters high; with two gates located on the southern wall. A large gate dedicated to car access faces an empty quarter while a small gate faces the main door of the villa. The architecture style of the villa is modern, with simple grooving plaster and glass fibre reinforced concrete (GRC) decorations on the façade.

Contemporary House- Case 2:

Villa 2 | Al Rayyan | 2015

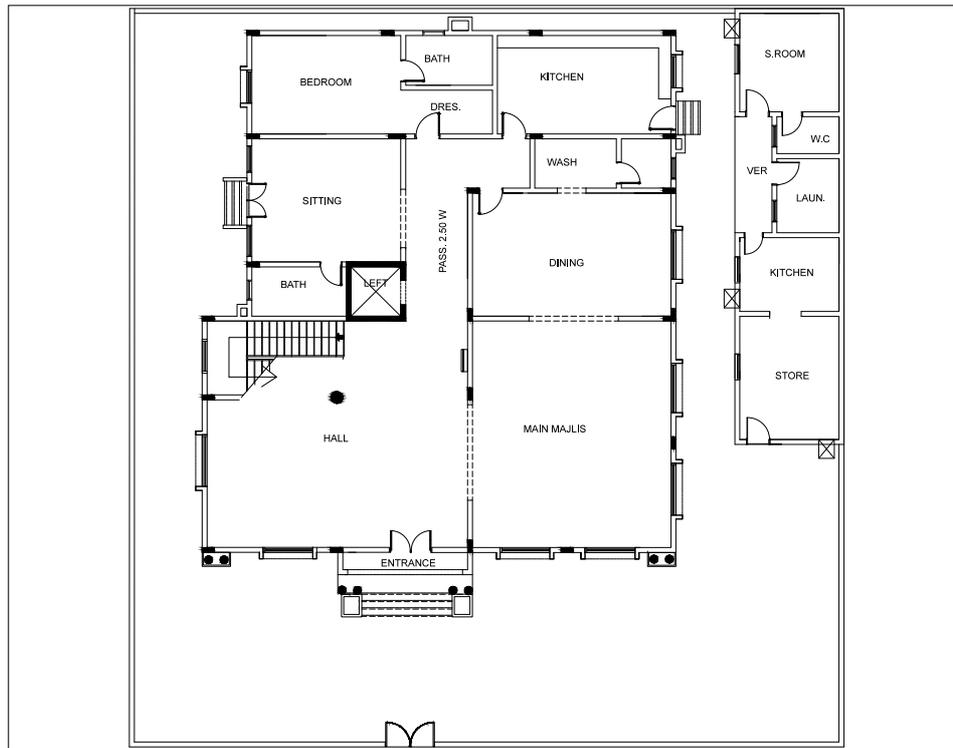


Figure 40: Contemporary House, Case 2

This simple villa consists of ground floor, a first floor and a penthouse, with an outer kitchen block. The main guest room is located on the ground floor. The villa is located along 40 meters of road to the south and shares the rest of the fence walls with neighbouring villas. The total plot area is 865 square meters, 54.5 percent of which is covered. The ground floor area is around 393 square meters. The villa belongs to a middle-income family within a populated district of the Al Rayyan

municipality; this area is occupied by a majority of families belonging to a certain tribal affinity.

The villa is accessible through a two-meter main door while a wider garage door provides vehicle entry to a shaded and sloped space of the yard. The main entrance opens into a wide hall with the Majlis room to the left, and the main staircase with an elevator. Through a two-meter passageway, the hall passes into the rest of the villa's spaces including a bedroom with its utilities, a kitchen and a sitting room. Both the kitchen and the sitting room have separate side entrances. The outer kitchen block consists of a store, kitchen, laundry room and a separate room for domestic assistants. The villa's façade is treated with natural stone finishing and decorated with slanted Roman-style columns, reflecting a classical villa style.

Contemporary House- Case 3:

Villa 3 | Umm Salal | 2015

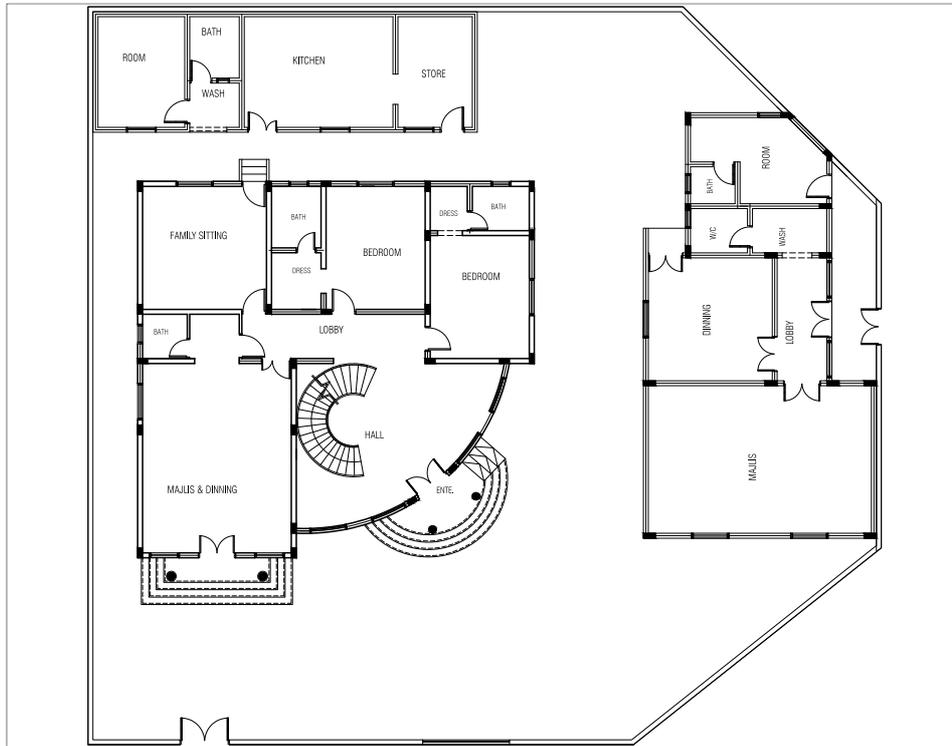


Figure 41: Contemporary House, Case 3

The villa consists of a ground floor, first floor, penthouse and extensions with guest rooms and kitchen blocks. The ground floor area is approximately 200 square meters, while the plot area is 880 square meters. The villa is located in a corner of the plot, sharing its western wall with a neighbouring house. The main gate is on its southern fenced wall along with a 3.5-meter roll-up door for vehicular access. The

shaded garage fits two cars. On the eastern wall, another small gate opens from the street into the Majlis block.

The main villa has two entry points: the main household door leading to a living space and the staircase; and the Majlis door opening into a separate guest section. The two sections are connected internally via a lobby leading to the various living spaces and rooms within the villa. It is worth mentioning that the family sitting area is located far from the main entrance on the north-western corner of the villa. It has its own side entry to access the outdoor blocks.

The kitchen block is two meters away from the back door of the villa. It has a typical block layout consisting of the main kitchen space, a store, a washing room and a bedroom for domestic assistants. The Majlis block has a separate entry from the street, avoiding any use of the main household and the front yard. It covers an area of 133.6 square meters, which is equivalent to 60% of the total ground floor area. The block is spacious and has various rooms for different functions mostly dedicated to male guests.

Contemporary House- Case 4:

Villa 4 | Doha | 2015

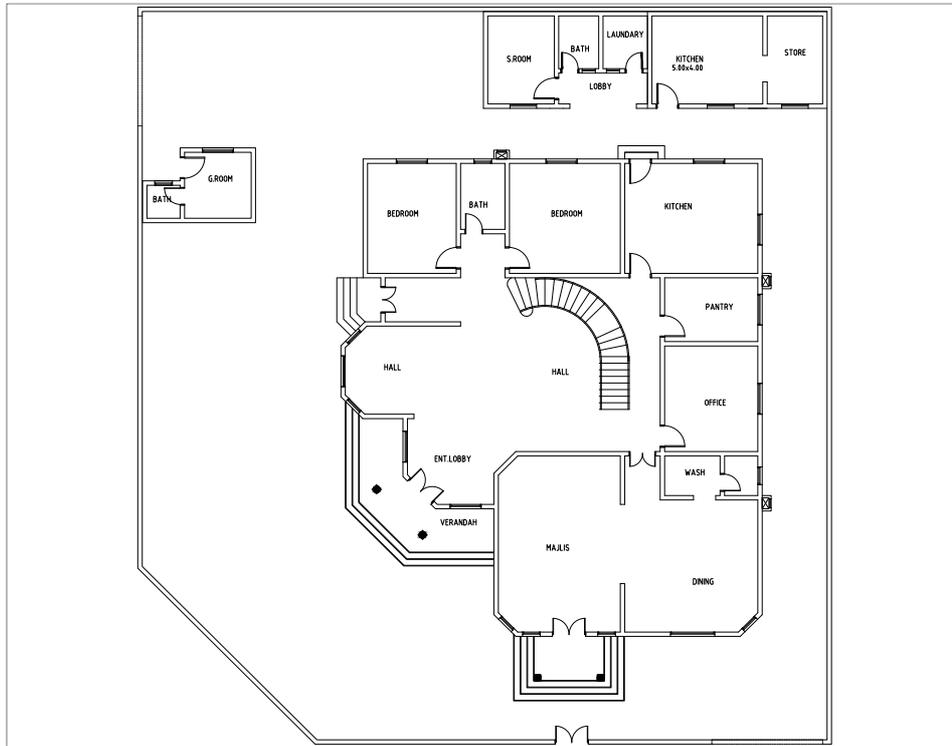


Figure 42: Contemporary House, Case 4

This villa consists of a ground floor of 360 square meters, a first floor, a penthouse and an outer kitchen block. The Majlis unit is embedded within the ground floor and accessed directly through the main gate. To the north and east, the house faces 16 meters of road, and it shares its remaining two walls with neighbouring plots.

The villa has two main entry doors; one is secured for guests, leading to the Majlis room and its accompanied dining space. Although the Majlis room is part of

the main household rather than a separate block, it is still preserved as a secure space with its isolated services. The second entrance to the villa is used by the family and leads to an entry lobby, a staircase hall and the rest of the spaces and rooms, which are mainly located on the edges of the villa.

A small side entrance leads towards a two-meter-wide corridor, connecting the backyard to the main hall of the house. Another side entrance connects the kitchen to the typical outdoor service block. On the eastern wall there is a shaded garage space adjacent to a small room of 15 square meters. The room is dedicated to the family's male domestic assistant and is entirely separate from the household unit.

Data Analysis: Connectivity

Through the space syntax simulation software Depthmap0.5x, the index of connectivity is presented in color-coded plans based on the number of points at which a space is directly connected to other spaces within the building envelope. Red corresponds to connected space, while blue indicates low connectivity. Table 3 below presents a collective summary of the analysed houses in colour-coded visualization. Referring to the socio-cultural pattern of privacy, low connectivity can represent a private space, such as a bedroom or a separated room. Conversely, high connectivity assumes a public space or a space where interaction is supported by built form. The space's ratio, dimensions, location and entry points determine its connective performance. An analysis of the connectivity of the case studies is presented in the following pages.

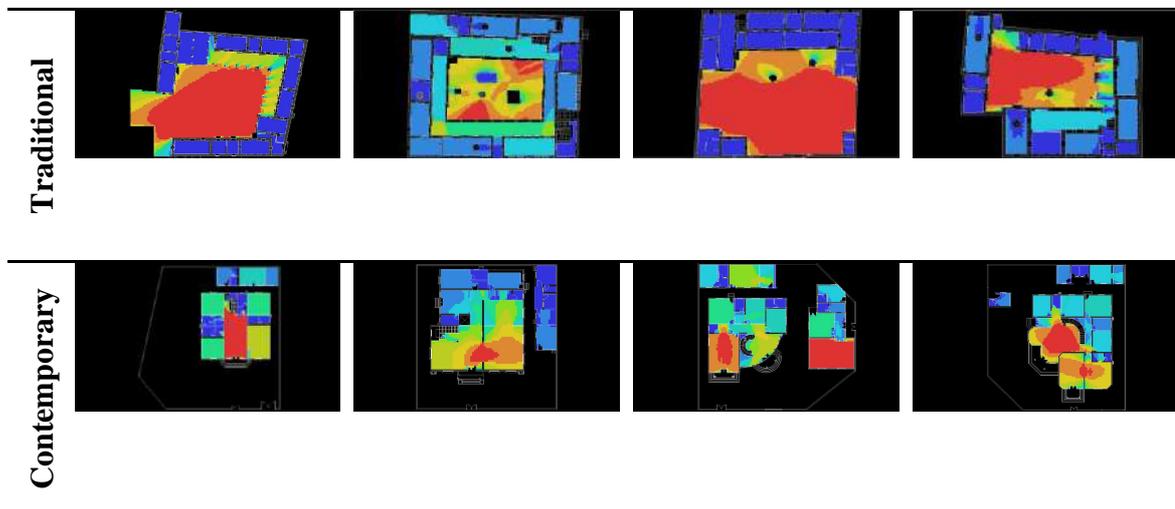


Figure 43: VGA Analysis Based on Connectivity for Houses in Qatar

Analysis of Traditional House- Case 1:

Noura Bint Saif House | Al Asmakh, Doha | Built 1930

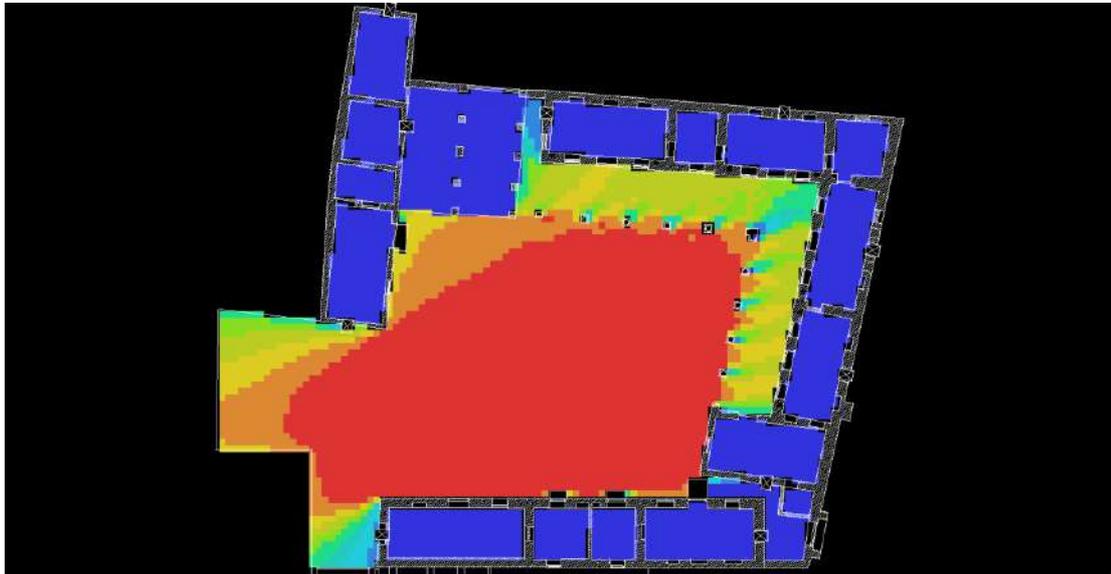


Figure 44: VGA Analysis of Traditional House, Case 1

High connectivity is observed in the spacious central courtyard. The pattern gradually reduces around the arcades and the porch area, with medium connectivity observed in the colour-coded scheme. The main gate on the north wall exhibits a slightly higher connectivity than the rest of the household rooms, signifying its functionality as an access point. The linear passageway connecting the gate to the courtyard presents a gradual connectivity pattern, where connectivity is lower by the door and increases with the approach towards the courtyard. All the rooms within the L-shaped arrangement illustrate low connectivity, as each room is only connected to the central space of the courtyard. A related pattern to consider is the gradual yellow-

green shades behind the columns of the porch, which indicate that behind the column, connectivity is reduced due to visual privacy.

Analysis of Traditional House- Case 2:

Faraj Al Ansari House | Msheireb, Doha | Built 1935

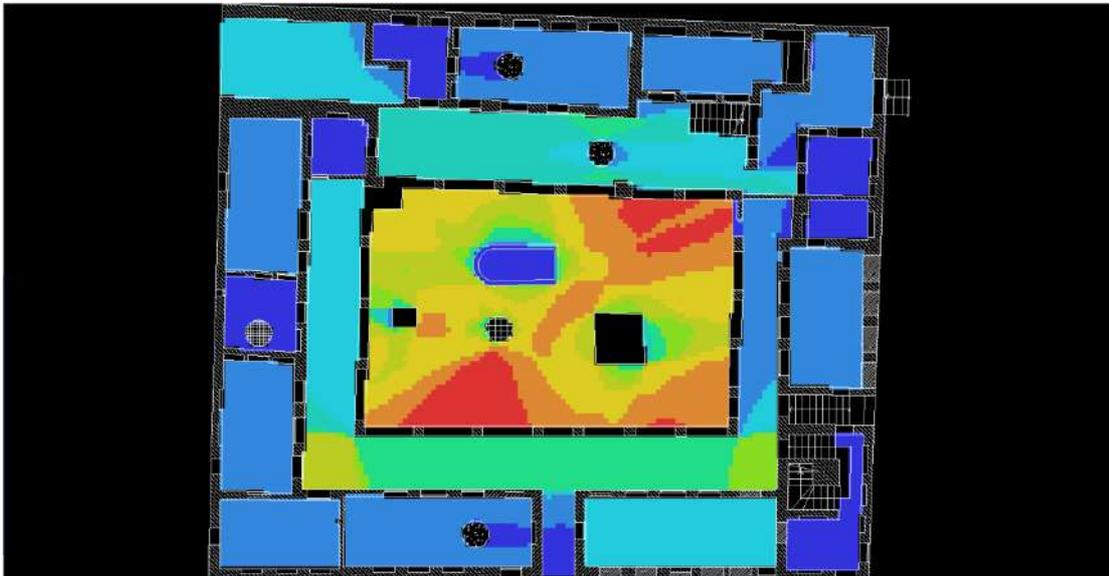


Figure 45: VGA Analysis of Traditional House, Case 2

Connectivity gradually increases from the private rooms on the edges toward the core of the house, where the porch presents an intermediate connection to the highly connective central courtyard. The entry points on the east and south demonstrate low connectivity, responding to the socio-cultural pattern of privacy to avoid direct exposure of the household. Entry points gradually opening into the porch, which in turn entirely opens into the main courtyard of the house. This sequence of spatial arrangement reflects the colour-coded layout of connectivity. Within the courtyard itself, some areas are less connected than other areas, due to visual barriers and blocks such as small landscape features and palm trees.

Analysis of Traditional House- Case 3:

Al Jaber House | Al Asmakh, Doha | Built 1935

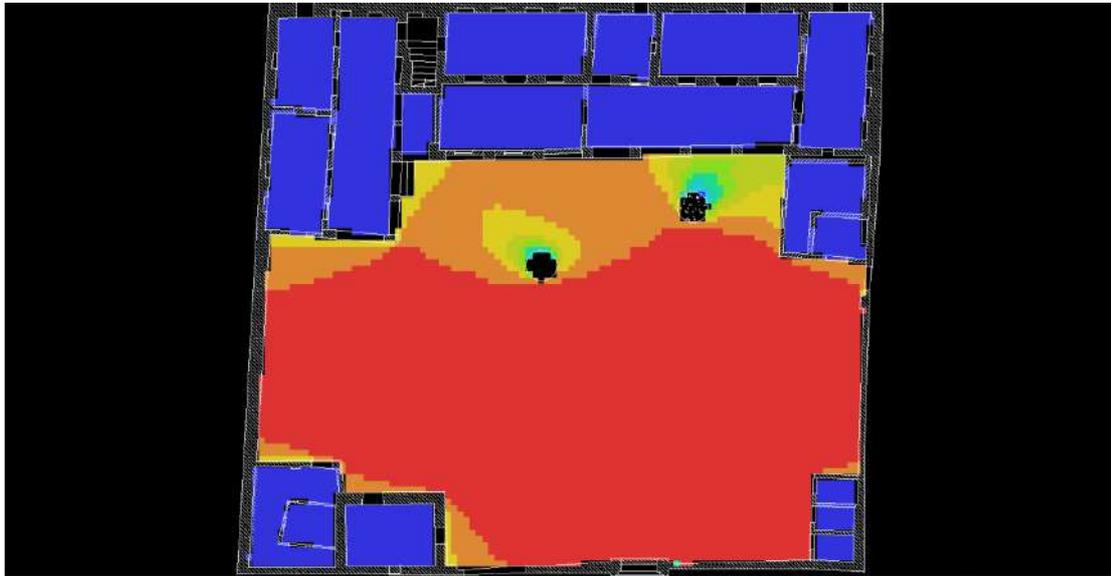


Figure 46: VGA Analysis of Traditional House, Case 3

This house presents extreme connectivity, where intermediate spaces representing moderate connectivity do not exist. In general, connectivity in the house is equally divided between the highly connective courtyard and the low connective rooms. This is related to the spacious area covered by the open-air courtyard and the minimal space occupied by rooms and other functional areas.

The main entrance to the south reveals a high connectivity to the rest of the household. Meanwhile, the khokha design of the door prevents direct exposure to the household. In addition, rooms are located relatively far from the main entry point, reducing exposure and maintaining the family's privacy.

Analysis of Traditional House- Case 4:

Ismail Mandani House | Al Asmakh, Doha | Built 1940

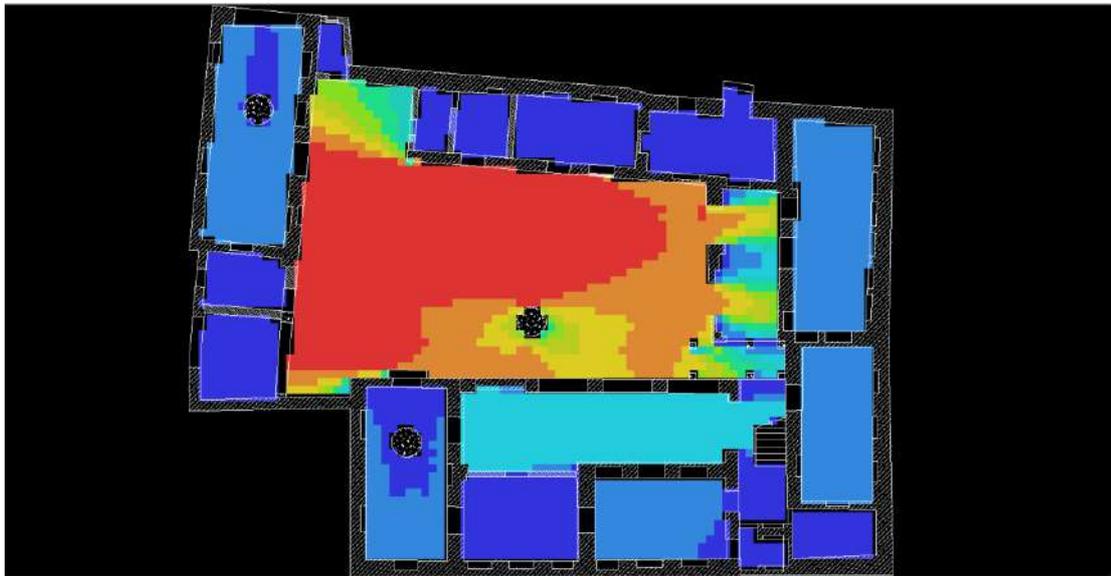


Figure 47: VGA Analysis of Traditional House, Case 4

The courtyard exhibits a high connectivity pattern to the surrounding spaces. The rest of the spaces including the entrance in the southwest have low connectivity that might contradict the purpose of an entrance as a point of connection. Considering the socio-cultural pattern of privacy in the spatial form of Muslim homes, “Entrance doors in traditional Muslim homes are placed away from the main street and not directly facing the opposite neighbours” (Othman *et al.*, 2015, p. 15). This architectural idiom is manifested in the Mandani house.

The intermediate spaces of the iwans present a medium-connectivity pattern, which proves their functionality as mediating spaces that utilize the internal

configuration of the house to support privacy, rather than imposing temporary solutions such as furniture or screens. In the upper north-western corner, the wide room is used as a garage that opens to the outside and has a low connectivity to the rest of the spaces within the household. In fact, it has recently been transformed into a small trading shop accessible from the street.

Analysis of Contemporary House- Case 1:

Villa 1 | Al-Wakra | 2015

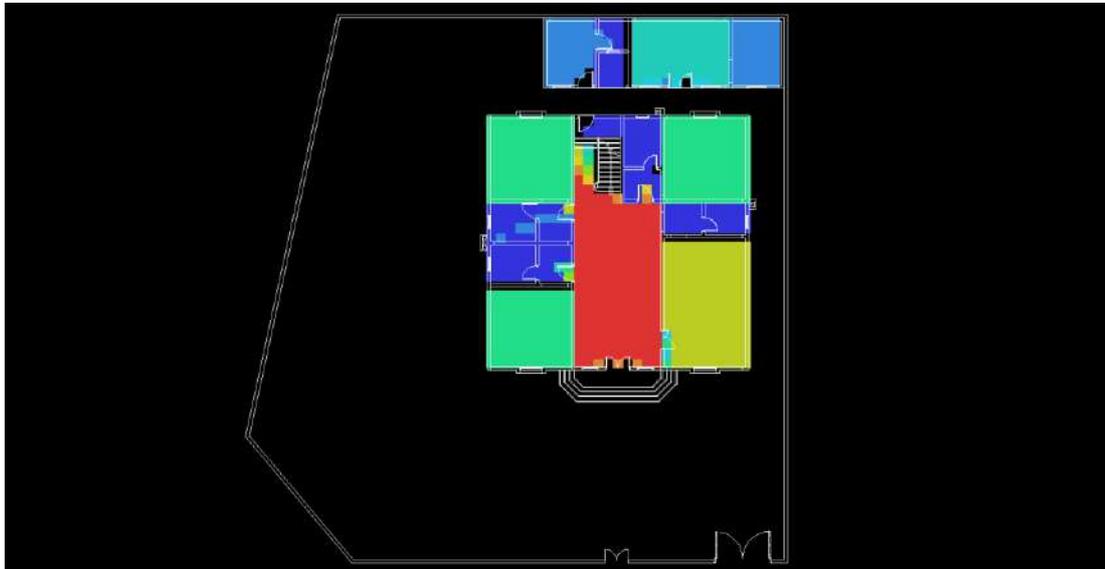


Figure 48: VGA Analysis of Contemporary House, Case 1

Connectivity has the highest values in the entrance and the main hallway, around which rooms of different function experience variable connectivity levels. The yellow space is assigned as a Majlis, with a separated washroom and bathroom. Green spaces are rooms that are accessed through a dressing room. Thus, the Majlis room is the second most-connected space in the entire ground floor level, following the highly connective entrance hall.

The outer block contains a kitchen that has low connectivity to the rest of the spaces. This demonstrates that the kitchen block is functionally and visually separated from the main household due to its use as a space for food preparation rather than a

serving space or a family dining area. One third of the entire ground floor level is highly connected, signifying that the house is visually exposed to the exterior once the main door is opened. Behind the main door of the villa, a lower connectivity is indicated by the orange shade of colour.

Analysis of Contemporary House- Case 2:

Villa 2 | Al Rayyan | 2015

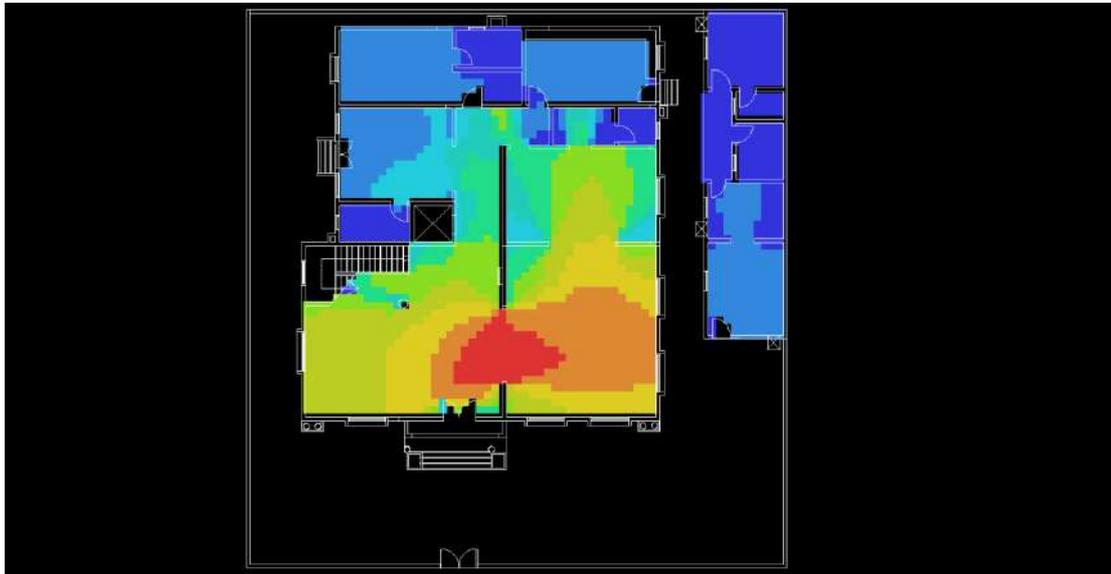


Figure 49: VGA Analysis of Contemporary House, Case 2

The space between the main hall of the villa and the main Majlis presents a high connectivity pattern, signifying such spaces as the main core of the household. Connectivity presents a linear pattern as it decreases from the main entrance and hallway into the rear end of the villa, which is occupied by the most private spaces, such as the family's living room, indoor kitchen and bedroom. The passageway connecting the entry hall to the rest of the rooms presents an intermediate connectivity pattern, supported by the passage's linear form that acts as a distributor. The external services block is the least connected space to the main villa and acts as an isolated space.

The connectivity pattern of the villa logically aligns with the spatial configuration and functional use of the spaces. The gradual pattern supports the creation of a desirable family life allocating the front part of the villa to the public and shared services such as the staircase while securing the rear spaces for the family.

Analysis of Contemporary House- Case 3:

Villa 3 | Umm Salal | 2015

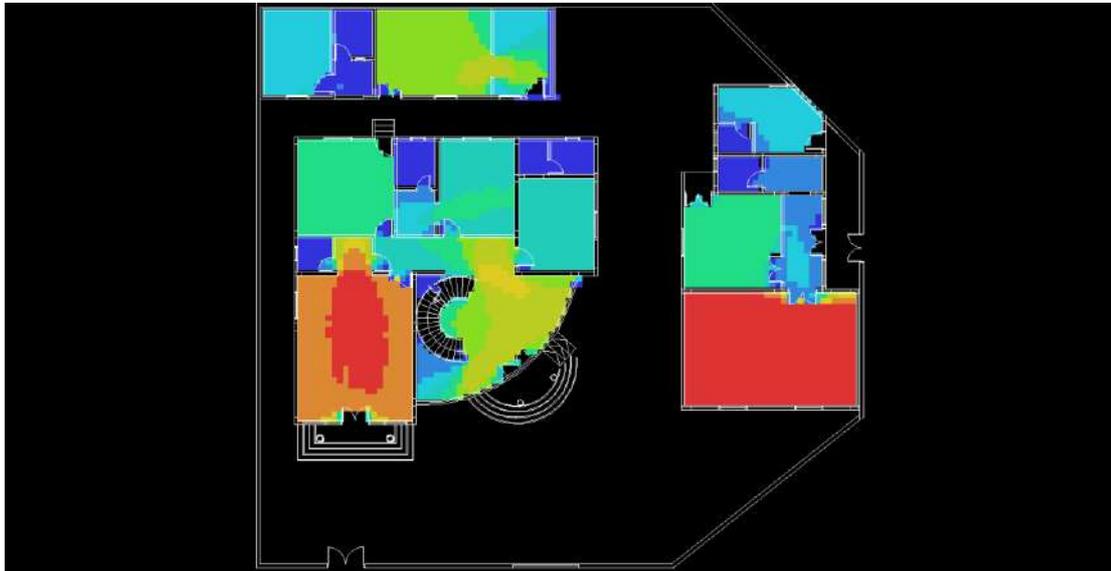


Figure 50: VGA Analysis of Contemporary House, Case 3

High connectivity exists in both the guest room and the extended Majlis unit, which presents an unusual connectivity pattern. This might be the result of the spatial configuration of the space, considering its dimensions and accessibility to the rest of spaces within the outdoor Majlis block. However, connectivity in the rest of the rooms within the floor plan follows a linear and logical pattern from the highly connective core to the least connective household spaces.

The Majlis room within the villa is more connected than the living room although both spaces are approached through main entries. This is justified by the

limited spaces that connect to the Majlis room, while the main hallway connects to all rooms in the ground floor level, widening the connectivity spectrum.

Analysis of Contemporary House- Case 4:

Villa 4 | Doha | 2015

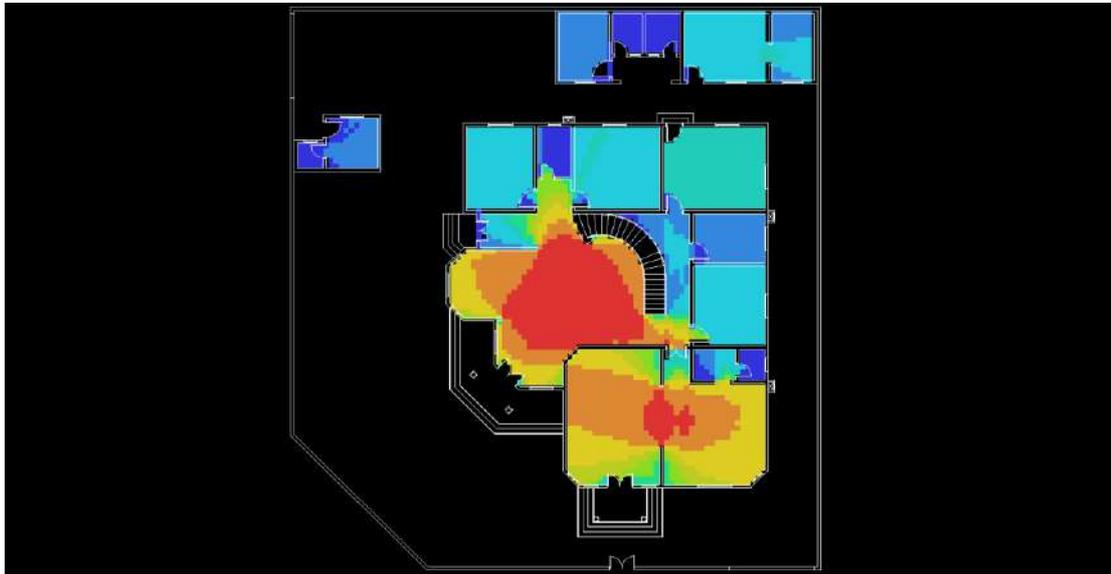


Figure 51: VGA Analysis of Contemporary House, Case 4

Both the main hall of the villa and the main Majlis area are shaded red to yellow, indicating high connectivity. The two spaces are accessed by separate main entries. The main hall within the villa is a highly connected space highlighted by red colour. This might present a challenge to the villa's occupants in designing the interior space to prevent exposure to the outside while creating cosiness, breaking up the wide area with flexible furniture and utilizing the space socially as the courtyard of the villa.

Within the main hall area, connectivity spreads across the internal spaces, leading to low connectivity in rear rooms and intermediate connectivity in the

hallways. The staircase is located in a space that is highly connected and visible from the main entrance. The pattern of connectivity supports the functionality and accessibility of the staircase as a vertical connection between various levels. For the Majlis unit, which is part of the household yet separated with its own main entrance and services, it represents the ideal case of a public space within the private household.

Results and Discussion: Comparative Analysis Based on Connectivity

Based on the three socio-cultural patterns of privacy, gender segregation and hospitality, the following discussion provides a comparative analysis of traditional and contemporary houses in Qatar based on the index of connectivity. Table 4 below presents the entire collection of house plans including plain and graphically analysed layouts.

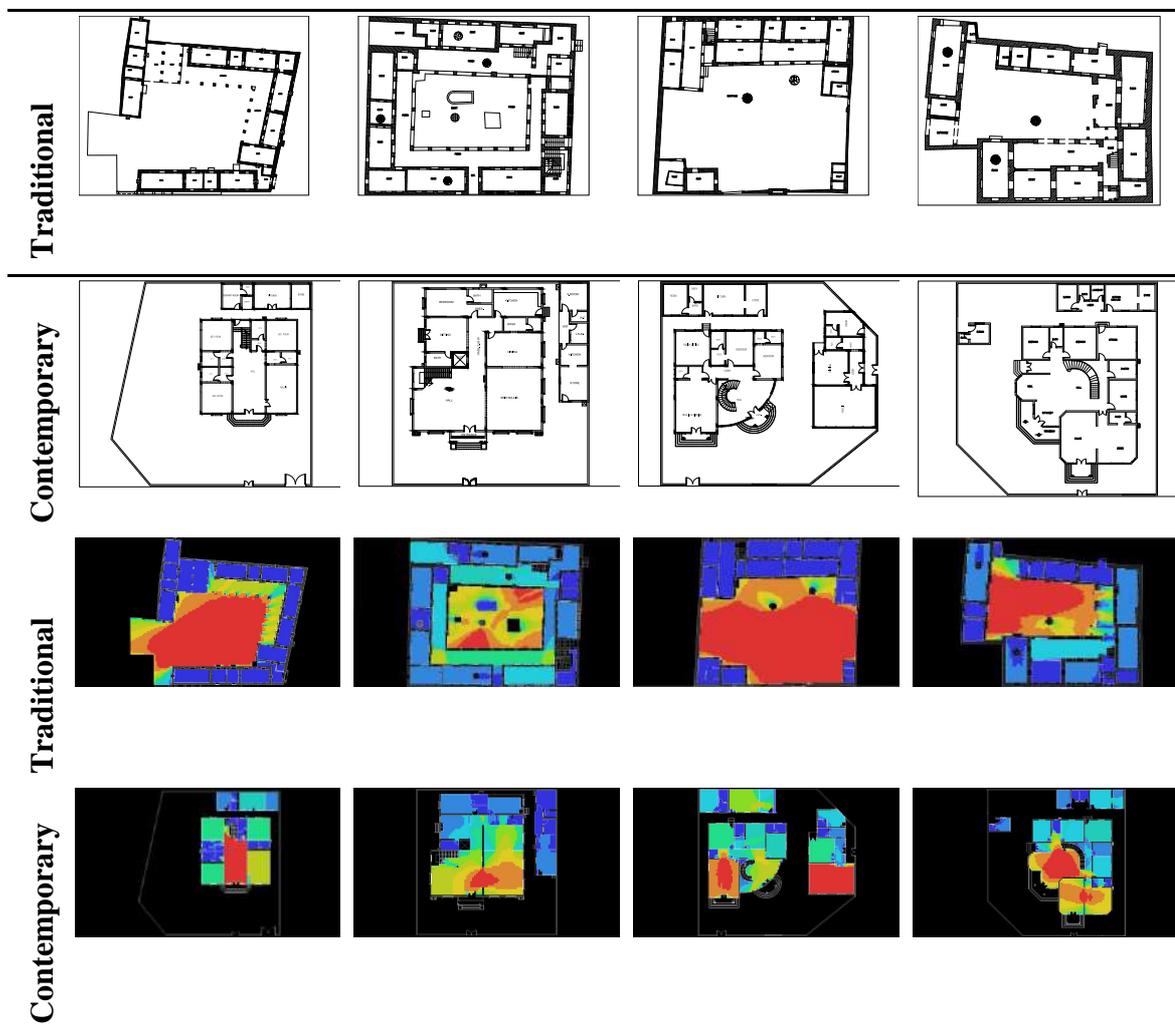


Figure 52: Summary of Plain Layouts and VGA Analysis of Qatari Houses

(A) Privacy

Traditional House:

In the traditional house, the pattern of privacy is contemplated through a number of established scenarios of connectivity. The first is gradual connectivity in which the intensity of connective spaces ranges from the least connective private rooms to the most connective central courtyard. This pattern of connectivity directly relates to the socio-cultural pattern of privacy that is supported by the spatial form of the courtyard house and its nuclear arrangement. The location of the courtyard in a protected, privatized core of the household unit enhances its social purpose as an open-air space for gatherings, activities and domestic functions.

The main entrance in the traditional house exhibits a gradual connectivity pattern, as it tends to be less connective near the doorframe and increases in connectivity towards the core of the house or the courtyard through an intermediate narrow corridor. The pattern is clearly consistent with the Islamic and Arab principles of home design, which guarantee family privacy to be maintained from external visual approach by the main entrance through internal architectural configurations.

The second scenario is balanced connectivity, revealing an ideal situation of the traditional house. Most of the rooms surrounding the courtyard are small, narrow, private and arranged in a compact order. This formative configuration results in the possibility for each room to have direct integration with the central, spacious public courtyard. The courtyard as a whole balances the small rooms in terms of cumulative plot area, resulting in a well-balanced and compact housing form.

The third scenario is intermediate connectivity achieved via entrances, porches, corridors, arcades and other intermediate architectural forms. These ensure a fluid connectivity between the open-air courtyard and the surrounding narrow rooms.

Contemporary House:

In the case of the contemporary house, connectivity takes an altered approach resulting in different implications of privacy in the spatial form of the housing unit. The first scenario is two-core connectivity, which indicates that connectivity is high at two definite spaces: the main hallway of the house and the guest section. The main hallway connects the main entrance to the services and is usually linear. The isolation and compact nature of the guest section results in its perception as an independent unit within the housing unit.

In some cases, each villa has two main entrance doors leading to the main household and the Majlis block separately. Another approach uses a common entrance door; however, the main hallway is kept undisturbed, as it would otherwise be exposed to visitors when approaching into the Majlis space through the singular main entrance. Such challenges would limit the villa's owner from utilizing most of the interior spaces, which—as an internal configuration mistake—results in dedicating a huge area of the floor plan to hallways, corridors and intermediate spaces while limiting the family's gathering spaces and living rooms.

Another scenario is linear connectivity. It reflects the hierarchical spatial configuration of contemporary houses that tends to relocate highly connected spaces in the front of the house plot, while securing the rear spaces for private family use. This trend contrasts with the uniformity of courtyard houses, which have a compact radial configuration around a central core. However, due to its linear connectivity pattern, the contemporary house is more systematic in its functional distribution of spaces, clarity of approach and ease of access.

The third scenario is fragmented connectivity, as it justifies the division of the contemporary house into several isolated blocks. The main household is located

within a multi-storey villa, where extensions and blocks spread around the plot area based on privacy of function, usage and users. For example, the Majlis unit is privatized for guests rather than ordinary family members, whereas the kitchen block is private to shield others from its noises, scents and general high level of activity. The fragmentation of the built masses could be a disadvantage to the overall architectural form of the housing unit, reducing its aesthetic appearance, eliminating the sense of uniformity and invoking other accessibility and approach issues. However, houses in the past were also fragmented into blocks due to growth, such as increasing the house capacity or expanding sections for more family members. The plot area's flexibility for growth could be seen as a positive aspect of fragmentation; however, this growth should fit the existing masses and harmonize with the overall built form.

Figure 53 summarizes the comparative assessment of traditional and contemporary houses in Qatar based on the index of connectivity, highlighting the effect of privacy in relation to how connectivity is analysed.

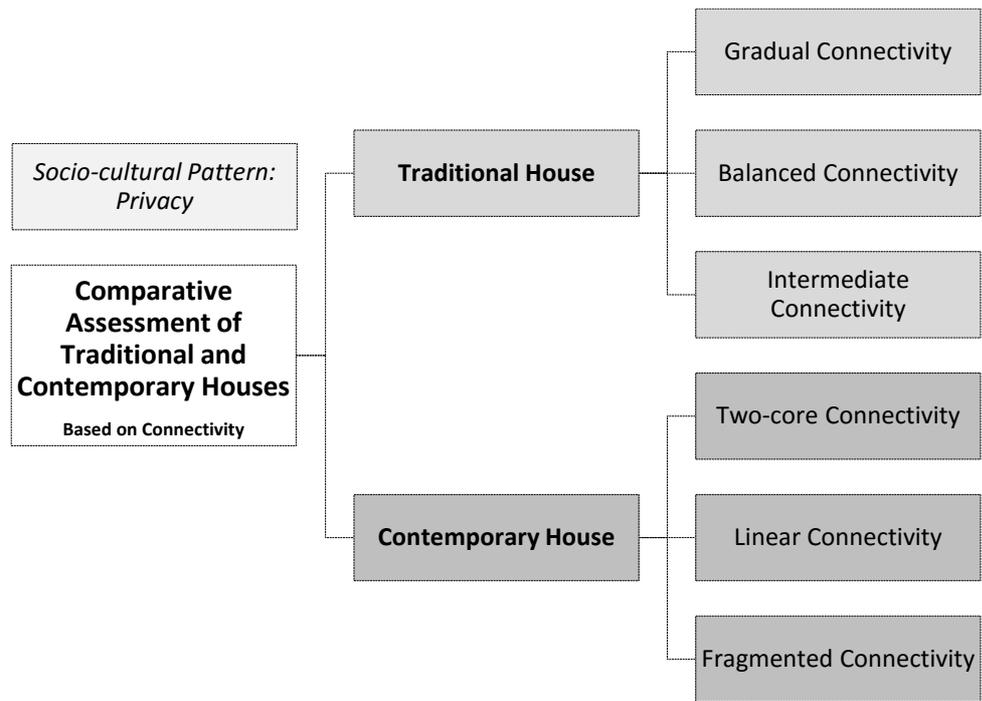


Figure 53: Comparative Analysis of Traditional and Contemporary Houses based on Connectivity – Privacy

(B) Gender Segregation

Traditional House

In the case of traditional houses, the analysis of gender segregation is restricted since the occupants' gender information is unavailable. However, in some cases, the main courtyard is divided into separated courtyards to serve two families occupying the household. The families belong to the married sons of the house's owner. This reflects the kinship social structure of the Qatari family, as "the cultural ideal is for a married son to bring his wife to live with and raise a family amongst his birth family" (Nagy, 2004a, p. 53) .

While a woman is not expected to live with her family in her father's household after marriage, she could maintain a room for occasional use. The son is expected to live with the extended family to maintain social ties and support his parents through aging and retirement. Finances form part of this social arrangement, since at an early stage of his life, the son requires assistance from his family to establish himself until stabilizing his income and gaining an independent financial source.

The second noticeable pattern of gender segregation refers to household entries, which present a low connectivity pattern in most cases. Main entries are designed to prevent exposure of the inner courtyard and the private spaces to the street. Thus, women tend to use a side entry rather than the main entrances, allowing for flexible accessibility while maintaining privacy. This is not specific to Qatari traditional houses, but rather is applicable to many Eastern Muslim societies. In Iraq, for instance, "The space of the entrance has been articulated in a way that prevents any kind of direct visual intrusion from the outside towards the main social core of the

house associated with the courtyard or the family room” (Al-Thahab *et al.*, 2014, p. 242)

Contemporary House

The spatial form of the contemporary house is a subject of gender segregation, where certain spaces are classified based on the user’s gender. The outdoor Majlis unit is mainly a designated space for male users, and the indoor Majlis area is secured for female guests. In some cases, the Majlis room is embedded within the villa where male visitors could utilize it, while women gather in the family’s living spaces instead. As a general trend, female guests can utilize the private rooms of the villa more flexibly than male guests, who should not travel through the household unaccompanied.

Another noticeable pattern of gendered spaces in contemporary houses is related to the front yard. Although it is not included in the connectivity analysis, the outdoor yard space is not utilized by women due to their exposure to the outside and the fact that drivers or domestic assistants, who could be male, use the yard. If the main gates and garage doors are well secured, then it is acceptable for women to use the yards especially for outdoor events and social gatherings when the weather is mild.

Most Qatari nationals are dependent on domestic assistants for household maintenance, which is reflected by the internal configuration of the contemporary house. Gender segregation is seen through the allocation of bedrooms for women assistants either in the penthouse of the villas or within the outdoor kitchen block. Male domestic assistants use either a specially designed room in the front yard or a room within the Majlis extension block, located away from the main villa.

Considering gender segregation within the villa block and between family members, the conventional division of bedrooms between girls and boys is expected, while family members equally share other spaces.

(C) Hospitality

Hospitality is spatially defined by the existence of guest rooms, reception areas, and quarters designated for family friends and visitors who belong to the public realm. In both traditional and contemporary houses, the Majlis unit represents “masculinity and honour of a Muslim home” (Othman *et al.*, 2015, p. 20). In some cases, the guest section occupies more than one-third of the entire plot area, which could be interpreted as the spatial cost for the preservation of a socio-cultural norm.

In the past, Majlis rooms were usually embedded within the household; however, they were separated and treated as secured spaces (Ferdinand, 1993). Depending on the family’s wealth and the availability of space, the Majlis room might have been accompanied by a small kitchen in addition to a separated entrance that presents a low connectivity to the household. In the absence of guest rooms, the courtyard itself was the favoured space for social gatherings due to its open nature and the climatically pleasant atmosphere created around its arcades and porches.

Today, the Majlis room covers a wider floor area, signifying its importance to the socio-cultural lifestyle of Qatari families. It usually has its own extended block outside of the main household, either as a concrete built room or a modern tensile structure resembling the old tent.

Modern tents are used as extended guest rooms, where men gather occasionally for special events such as festivals, Eids, weddings and funerals. Most of the modern tent structures within Qatari neighbourhoods are air-conditioned and furnished with high-class amenities. However, this is not the case for the traditional

fabric tents installed during the winter seasons adjacent to households or within a deserted area of the neighbourhood, which resemble the old tent in form and function (Damluji, 2006; Sobh & Belk, 2011).

The internal configuration of modern tents includes a wide, spacious seating area with modern services. It resembles a living room with traditionally themed furniture of durable Sadu patterned finishing. Within the tent, there are bathrooms for guests, a small kitchen for coffee preparation and in some cases a bedroom wing for domestic assistants or guests. Unlike the traditional Bedouin tent, treatment of the tent as a household for family members including men and women is no longer valid. Privacy by gender is in fact unrequired due to the use of the tent for men's social gatherings and leisure activities for men only.

Majlis blocks are in general accessible directly from the street, where male guests are welcomed and freed from disturbing the privacy of the family. Conversely, female guests use the indoor reception areas and enjoy a similar level of social interaction within the accepted limits of privacy.

CHAPTER 5: CONCLUSIONS AND DISCUSSION

Summary of Findings

The research study examines the socio-cultural aspects embedded in the built form of residential houses in Qatar, which is a challenging topic of analysis as it has a strong connection to the cultural and social profiles of the society. Based on the preliminary review of the literature, studies of socio-cultural patterns in the spatial form of houses are directly related to the disciplinary context of architectural sociology. The analysis supports the social sustainability of architecture in Qatar, marking the progress of housing as a phenomenon contributing to the country's sustainable urban development.

Through the methodology of space syntax, the research study presents a comparative assessment of traditional and contemporary houses in Qatar, marking the effect of socio-cultural patterns in the spatial form of houses. The findings uncover the direct effect of the socio-cultural patterns in housing spatial form, despite the change of time and era.

A comparison of traditional and modern houses indicates that the effects of privacy, gender segregation and hospitality vary in intensity depending on the response of the built form to the required implementation of socio-cultural patterns. In addition, traditional houses are highly governed by Islamic and cultural norms and represent typical architectural trends. However, contemporary houses are designed according to international standards of the modern villa. Thus, the challenge of contemporary architecture and urban design is to localize the residential unit and subject the built form to innovative, responsive tactics of adaptation.

Regarding the hypothesis of the research study, the assumption of a common influence of socio-cultural patterns on the spatial form of housing is relatively valid in

the context of Qatar. According to space syntax analysis of both traditional and contemporary cases, the contemporary house is highly responsive to the patterns of privacy, leading to clear implementations in the built form. The fragmentation of blocks that extend over the floor plan of the house is a noticeable formative trend in the architecture of recent residential units. The loss of the compactness of the built form and the isolation of spaces according to functional requirements disturb the internal spatial configuration of current housing units.

Answers to Research Question/s

- What are the socio-cultural factors that influenced, and are influencing, the transformation of the spatial form of Qatari houses?

The three predefined socio-cultural patterns of privacy, gender segregation and hospitality are influencing the transformation of housing in Qatar.

- How can such socio-cultural factors in the contemporary context be investigated and approved?

Socio-cultural factors can be investigated and approved through qualitative, simulative research based on a contextual comparative approach between housing units belonging to different eras within the same region.

- How the influence of socio-cultural factors, local spatial practices and values in reshaping the spatial configuration of houses, can be tested and validated, utilizing the theoretical tool of space syntax?

The analysis of the index of connectivity in Depthmap-0.5x software could provide a valid testing tool based on space syntax's approach in examining spatial arrangement of floor plans.

- What would such conclusions articulate about the architectural sociology of housing in Qatar and its sustainability in the future?

There is a relatively common influence of socio-cultural patterns on the spatial form of Qatari houses- now and then. Thus, architectural sociology is well sustained from generation to generation.

Key Findings

The architectural sociology of housing in the State of Qatar requires further attention due to the challenges associated with the spatial form and architectural configuration in the era of globalization. In this respect, the fast process of urbanization introduced to Qatar since the 1950s contributed to a major shift in housing form and architecture, which resulted in a growing gap between global requirements and local imperatives. Until recently, problems of residential architecture have emerged as the disturbance of the built form, unresponsive foreign plans of residential architecture as well as local dissatisfaction with the poorly integrated modern villas that are continuously readapted to meet the socio-cultural needs of their inhabitants.

Socio-spatial relationships in the housing unit highly influence the development of Qatari residential architecture and construction. This is especially true in the contemporary era, where locally intensive practices are key to reviving the urban identity of cities and settlements. In order to maintain urban identity, both socially and architecturally, the following aspects of housing socio-spatial design should be considered:

- (1) The privacy of the housing unit must be maintained through architectural interventions that are designed using careful data collection and precedence

analysis, avoiding reactive solutions that result in formative difficulties and inharmonious built form. A contemporary example is the existence of scattered block-masses within the same household, in addition to the loss of architectural solidity and simplicity established in the traditional models of housing in Qatar.

- (2) Gender segregation has to be accepted as a cultural norm of Qatari society, despite recent global debates advocating for gender equality and rights in other social and urban contexts (Terlinden, 2003). It is a social norm that has been long practiced in Qatar in a peaceful, thoughtful manner. In terms of architecture and urban design, gender segregation results in special internal configurations in public and private buildings. This maintains an essence of the Islamic and Arab cultures in Qatari houses while unrestricting other aspects of everyday life.
- (3) Hospitality is a social pattern that balances privatized living within the household and is a sign of social integrity and acceptance. Since developing from the portable tent, houses in Qatar have been a symbol of generosity and sincerity, where the individual family unit merges with the society through specific designated spaces. Maintaining the essence of the Majlis unit as a dedicated space for hospitality is significant in maintaining the architectural and social identity of the Qatari society, which supports its sustainability in the future.

Today, trends in sustainable development are promising for a positive change that bears in mind the contextual parameters of urbanism. Residential architecture in Qatar reflects demand for the integration of local culture, heritage and indigenous lifestyles into architecture. This is not limited to symbolic embedding of architectural elements; rather, integration requires consideration of local sensitivities early in the gradual process of architectural design. This task is surmountable through the effective coordination and collaboration of governmental agencies, ministries, the

public and the private sectors. The aim is to regulate the administrative process of residential architecture and design by refining existing building laws to allow the concept of the courtyard house and design-by-privacy to fit into modern architecture schemes.

In addition, the introduction of policies that enforce the application of socio-cultural patterns in the spatial form of houses would support the creation of an architectural identity in residential units. This would ensure that the built form of Qatar would be in harmony with the local context.

Contribution to Knowledge

The research study contributes to knowledge within socio-cultural studies of housing environments in Qatar and the Middle East region, which faces a rarity of research interest and publication. Most of the studies reviewed in the literature are limited to the typological analysis of residential housing in Qatar rather than those that integrate interdisciplinary fields, such as sociology and human behaviour studies. The sensitivity of such local-oriented studies requires an inclusive knowledge, unbiased and analytical in order to provide valid interpretation of the issues concerned. Thus, this research study merges the gap between architecture and sociology by providing the missing linkage in the context of Qatar.

Limitations and Implications for Practice and Advancement of Research

This research study has limitations in terms of its originality, representativeness of the selected units of analysis as well as the boundaries of connectivity analysis. The methodology of space syntax simulation might present the first time being executed in the context of Qatar, meanwhile the literature review covers a similar analytical approach done in other countries in the MENA region specifically within Islamic domains such as Iraq and Iran.

The second concern is related to the number of housing units selected for analysis, which is limited to four traditional and four contemporary units. A justification is related to the degree fulfilment requirements as this research study is done in partial fulfilment of the requirements for a master's degree. Another justification is related to the limited number of traditional houses and vernacular settlements conserved in Qatar as well as the rarity of archived material on traditional architecture.

The analytical simulation of connectivity is limited to the internal configuration of the built units. In the case of contemporary villas, the outdoor yard spaces were excluded from the analysis. Meanwhile, the central open courtyard spaces have been included in the VGA analysis of all traditional houses presented in this study. This choice of analysis is restricted by the spatial arrangement of traditional houses where internal and external spaces are inseparable due to the formative scheme of the courtyard house, marking an interesting architectural phenomenon.

This study could be further expanded to incorporate various fields such as strategic planning, sustainable development and urban design:

- (1) Strategic planning is capable of reviewing topics of architectural sociology within an administrative, applied framework based on the current laws and regulations of the country. In fact, QNV2030 and QNDS set the proper strategic foundation for approaches concerning urban development and the social dynamics challenging the country's national growth (Tok *et al.*, 2016).
- (2) Sustainable development is concerned with the visionary approach of the issues studied through envisioning innovative scenarios and predicting the future of housing in Qatar in light of natural resource sustainability, environmental pollution and climate change predictions (Alalouch, 2016; Sammani, 2011; Sillitoe, 2014). Not only the ecological and environmental approaches, but also cultural and social encounters must be considered in the process of designing sustainable residential architecture in Qatar.
- (3) Urban design could utilize and test the outcomes of the theoretical application of space syntax in housing to propose formative schemes that bear in mind the historical and current development of residential architecture in Qatar. The outcome of the urban design approach would be testing and proposing contemporary residential schemes designed based on socio-cultural patterns or examining the future of residential architecture in the neighbourhood scale by foreseeing transformative parameters of the society such as evolution of culture, demographic transformations, change of climate, building material advancement and other innovative approaches.

In order to strengthen the outcomes of the research study, the following recommendations should be considered:

- (1) The selected unit of investigation involves a collection of housing units that belong to Qatari nationals. It would be interesting to test other residential typologies such as flats, public and private accommodations, compounds, gated communities and other housing alternatives. Also, widening the scope of selection to include non-Qataris, or integrating the demographics of the country into the selection of the household owners, would lead to an equitable and socially justified analysis. This approach would enrich cross-cultural research in domestic architecture by investigating the range of social and cultural practices by non-nationals living in Qatar.
- (2) The current study involves a selection of four traditional houses and four contemporary houses. Adding more units would enrich the discussion and improve the outcomes of the space syntax analysis, thus improving the study's reliability. The contemporary houses belong to the Public Housing Program for Qatari nationals; however, this selection could be expanded to include housing for senior citizens and palaces designed to reflect a superior architecture and luxurious lifestyle.
- (3) Instead of selecting individual housing units, it is recommended to perform the analysis on a neighbourhood scale where aspects of the urban fabric are included in the study. Such aspects could involve the street level, solids and voids, public spaces and other important components of the urban morphology. In the case of the traditional neighbourhood, primary sources exist and require further documentation to support the comparative assessment in the neighbourhood scale.

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