The Urban Morphology of Mshereib, the Heart of Downtown Doha

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Abstract

Doha experienced a remarkable transformation since oil and natural gas exportation began in the mid-twentieth century. Rapid urbanization and globalization ('process of interaction and integration among people, companies, and governments worldwide involving goods, services, data, technology, and capital') characterize this transformation. Doha expanded to accommodate significant population increases and lifestyle changes. The urban expansion was auto-centric and suburban, similar to post-war development in the United States and other western societies. Qatari citizens 'emptied' Old Doha as they moved to contemporary villas in new developments at the suburban periphery. In response, the Qatari government launched plans for Msheireb Downtown Doha. Its purpose is to attract Qataris back to Doha's historic center by providing a walkable, mixed-use urban environment promoting a new model of sustainable urbanism. The design and planning explicitly seek to become rooted in Qatari social identity while preserving cultural heritage and historic resources. Our paper investigates the urban form and function of Msheireb Downtown Doha to evaluate its success. It examines the urban morphology, including figure-ground and pedestrian sheds analysis from crucial locations and surveys of ground-level land uses, active/inactive frontages, and the pattern of building heights. The goal is to illustrate and understand the project's urban form and function logic. Based on this, we argue that Msheireb Downtown Doha does satisfy the inhabitants' desire for a downtown lifestyle. It offers a model for urban regeneration consistent with the Qatar National Vision 2030 for an advanced society, sustainable development, and a high standard of living for people.

Keywords: Development; Land use; Morphology; Regeneration; Urban studies

1 Introduction

Qatar, a country with a total land area of 11,571 km², occupies a small flat peninsula in the Persian/Arabian Gulf. It has a desert climate with very mild winters and hot summers. It has a post-war modernized economy that has witnessed unprecedented urban growth due to the discovery of oil and natural gas. Doha, initially an offset of the fishing village of Al Bidda, hosted the ruling families for the first migration in the 1800s due to tribal conflicts over land at Al Zubarah in northwest Qatar. With oil discovery from 1942-1947, the country transformed from patches of pearling and fishing villages along the coastline in the 18th century into an oil-producing country after the 1950s, focused on developing its capital city of Doha. As a result, the country encountered rapid urbanization and globalization like other Gulf Cooperation Council (GCC) cities. In addition, the rise of the oil and gas exporting industry led to a significant shift in lifestyle and economy in the late 20th and early 21st

centuries. Doha witnessed two primary waves of urbanization. The first included massive economic and population growth since the 1970s due to oil and gas revenues leading to dramatic urban development. The second wave of urbanization started in the 2000s, endorsed by the national governmental vision to diversify the economy and globalize the city by participating in international sporting events. Since then, urban sprawl and automobile dominance with minimal considerations for pedestrian design have come to represent significant urban challenges in Doha. As a result, ex-pat laborers and construction workers came to occupy the neglected neighborhoods in the old city center. Qatar's development has three main phases: traditional, transitional, and modernization:

1. **Traditional Phase–Pearling and Fishing Economy:** Early inhabitants shifted from the northwestern part of the country to Al Bidda and later its offshoot Doha and started developing a national government and policies that made Doha the capital and center of urbanization.
2. **Transitional Phase–Oil Discovery:** Resulting in the transformation of Qatar from 1942-1970, despite initial exploitation of resources halting due to World War 2.
3. **Modernization Phase–British withdrawal and Qatar's independence declaration in 1971:** Later, in 1972, the government contracted a foreign planning consultancy to start the construction of governmental buildings around the capital's seashore, which continues to this day.

Llewelyn Davies, a leading planner in the UK, proposed that the government buys back the central plot of Doha's traditional quarters and use it for high-density commercial and governmental buildings. As a result, significant urban regeneration efforts focused on the heart of Doha, including preserving Souq Waqif to maintain the city's architectural heritage and traditional urban fabric. Around 1977, William Pereira's firm was appointed to develop the reclaimed land of Al Dafna around the coastline of Doha Bay (today’s West Bay). The enhancement of the healthcare system resulting in life expectancy growth and population increases, and Qatari locals migrated to the suburbs. As a result, the city center became old and congested. Many migrants moved to Qatar as long-term residents or short-term construction workers to handle specific projects. Unfortunately, only Asian workers seemed to manage to live under those conditions in the abandoned city center. Today, according to the Planning and Statistics Authority, Qataris constituted only 10% of the population. In comparison, the expatriates and migrants compose 90%, which subsequently influenced planning strategies in the city to cater to varying cultures and backgrounds. Qatar's developmental framework shifted from focusing on the local and surrounding regions to the global context. As a result, city planning began purposely implementing elements to attract people to live and work in Qatar. This planning approach also helped position Qatar within the spectrum of the global economy. The strategic objective is to reverse the development pattern in Doha, which has tended towards isolated land use, dependence on car transportation, and energy-hungry structures. Mega-projects like Msheireb Downtown Doha (MDD) aim to change the direction of urban development by creating new social and civic hubs in the city where it is enjoyable to live, work, shop, visit and spend time. The project proposed creating compact, walkable, and well-connected neighborhoods with naturally cooled streets built at a human scale. Smart City technology and effective connectivity are the influential development aspects of this project. In addition, the plan embodies a diverse land-use mix that supports the national vision of economic diversification and real estate development.

MDD is the country’s first sustainable downtown regeneration project, developed by Msheireb Properties in 2010, a real estate developer owned by the Qatar Foundation, to revive the commercial district of Old Doha and bring new vitality to Doha's downtown by the highest standards in green building. Utilizing the latest innovative technologies supporting the old core areas while upgrading the surrounding land uses and street network. AECOM, with Allies and Morrison Architects,

designed the project in the center of Doha, adjacent to the historic site of Souq Waqif and the significant location of the Amiri Diwan, only minutes from the Hamad International Airport and midway between two critical routes into the city. It was opened for the public in 2019 after substantial completion (90%), yet stage 4 was delayed by the COVID-19 pandemic; however, it was recently completed in March 2022. Furthermore, it has a unique architectural language yet is inspired by traditional Qatari heritage and architecture based on its proportion, simplicity, space, light, layering, ornament, and response to climate while maintaining much of the traditional fabric pattern (**Figure 1**). The urban pattern of the area emerged from a process of restricted random aggregation of dwelling units over time, following simple rules catering to movement on foot and domesticated animals. There were later mid-twentieth-century interventions, primarily road width, to accommodate vehicles. MDD makes further accommodations with variations in the width of route sections for different modes of movement, including a local tram network (**Figure 2**). The MDD project aims to change the direction of urban development in Qatar by creating a livable neighborhood in response to the local climate. For these reasons, researchers selected MDD as a case study for three ongoing studies. The first examines the relationship between urban morphology and real estate economics. The second as one of several case studies in a comparative investigation of neighborhood structure in Doha. Lastly, a study examining the child-friendly provisions in the project's urban design. We limit this paper to reporting on aspects of the morphological survey work and analysis.

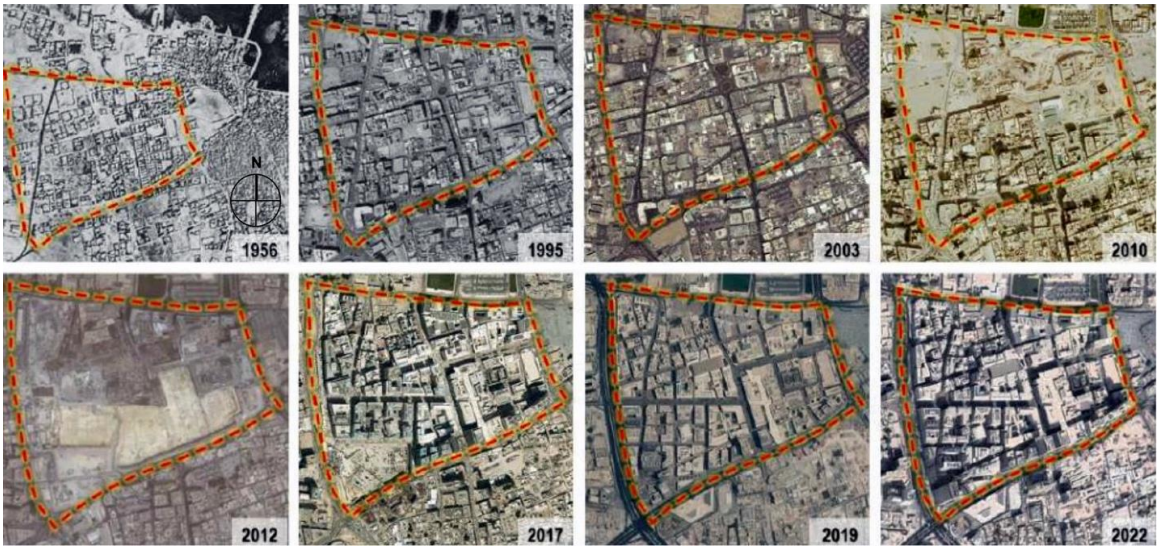

Fig. 1: Satellite views of the Msheireb area and subsequent redevelopment into Msheireb Downtown Doha from 1956-2022 (Source: Ministry of Municipality/Google Earth)

Fig. 2: Sketches of typical route section views in Msheireb Downtown Doha today including (left-to-right) the traditional pedestrian-only *sikka*, expanded pedestrian *sikka* routes to accommodate tramline and public plazas in *fereej* subareas, and primary routes accommodating all modes of movement including the tram and vehicles

2 Literature Review

In general, urban morphology refers to the study of urban form and its connected physical elements that structure and shape urban fabric, such as streets, buildings, and properties, considering the spatial logic of the space and the structured urban principles. It also includes the policymakers, governors, and regulatory processes involved in shaping and organizing cities. Urban morphology is a source of knowledge that highlights several aspects of life in cities. A comprehensive function of urban morphology recognizes the recurring spatial patterns in the structure, appearance, and transformation of the new and existing urban forms. As a resource of information on the historical urbanization process in Qatar and its contextual impact, researchers from Qatar University conducted morphological analyses for various projects in Doha. The projects are diverse in size, function, and date of creation. The purpose is to understand the design logic of the built environment and highlight the physical and functional parameters, such as ground-level land uses, pedestrian sheds, and active/inactive frontages, that might relate to the socio-economic factors influencing its urban morphology. Recent examples include an artificial island development, The Pearl-Qatar, and two souqs in Qatar, Souq Waqif and Souq al Wakra. The data about design and planning in each project's layout were collected based on on-site surveys, visualized concisely, and translated into quantitative numerical data in various forms. In early 2022, Qatar University researchers did the same for MDD to understand better the urban fabric and land use in the urban regeneration project.

Doha's recorded history includes the Al Thani tribe, the current ruling family that existed in the early settlement around 1847, which was called at that time Al Bidda. Like other Gulf cities, the early settlement started as a fishing village and later became a modern face in the Arab world and the Middle East after the discovery of oil. Moreover, the fishing village had a strategic location due to its proximity to the coastline as the central water resource, which helped facilitate trade purposes. As a result, early settlers of Al Bidda brought economic developments along the coastline, creating eight settlements representing two social classes at that time, original Qatari families and Persian immigrants. The mosque, port, and market represented the social hub for the two groups, except for their more isolated living spaces. Historically, Msheireb was the first ‘suburb’ of Doha and Souq Waqif and the original business district of old Doha, which is currently connected to the waterfront through Al Corniche Road. As population growth occurred over time, the inhabitants were strongly associated with the coastline. The area was accessible and connected to the central historical market, Souq Waqif, through old wadi routes, later called Wadi Msheireb or Al Kahraba Street. Al Kahraba Street recreated a commercial hub because it was the nation's first to have an electricity connection. Thus, it represented a meaningful street that was essential at that time. Later, the neighborhood of Msheireb was constructed using local materials. The design layout and logic of most buildings, transport networks, and vehicular movements are inspired by Islamic vernacular architecture. The continuous urban development of Doha as a commercial center led to the establishment of many vital neighborhoods, such as Al Asmakh and Al Najada, the areas surrounding MDD today.

3 Research Design

To explore the physical form and function of MDD and understand its design logic, the researchers utilized a mixed-method quantitative and qualitative approach with selective research tools during two stages. The first stage is a literature review as a resource for information about the historical urbanization process in Qatar and the transformation of the Msheireb area, which stands as a background study and links it directly to the current context to understand the influence of the local heritage in its contemporary design. Moreover, selective international readings in urban design and

planning served as a foundation for basic concepts such as urban morphology and morphological analysis, objectives, and approaches to deeply analyze and investigate the spatial urban fabric and the land use of MDD. The second stage represents a morphological analysis of the physical form and land use of MDD. The analysis was conducted to find the site's physical characteristics and began with collecting data about the building geometry, such as the size of the blocks, building heights, and route structure. The active and non-active frontages and ground-level land use help us to understand the probable impact on pedestrian behavior and movement. It also highlights the central issue in the urban fabric regarding shading and walking distances.

4 Data Analysis and Results

MDD has four quarters, created by 69 blocks, 22 are regular in shape, and 47 are irregular due to building footprints with an average area of 13,414 m^2. Therefore, while analyzing the built-up form, we calculated the average block size by dividing the total ground level area by the number of blocks resulting in 194.4m^2. The block sizes of residential buildings in MDD are diverse to support the three types of housing as specified by Msheireb Properties: townhouses, premium apartments, and prestige apartments. Many buildings utilize a courtyard typology, but increased building heights transform this into air wells, with the space only operating as a 'courtyard' at ground level. It is evident in the figure-ground of urban blocks and spaces in MDD today, as well as those of four restored courtyard houses adaptively reused as museums (**Figure 3**, left). One of the remarkable things about MDD is the pleasure of walking as it is a pedestrian-friendly environment with extensive shading via building form, massing, and relation to adjacent buildings with an extensive distribution of the underground parking points, cars, pedestrians, or mass-transit users, and residents. For pedestrians, the Wadi area is considered the primary target for this group. It is accessible from both gateways, and its *sikka* (narrow passageway) is dedicated to pedestrians. The southern part of Al-Kahraba Street is also walkable, while pedestrians need to spend more effort to arrive at the north part or use other modes of transportation. Biking could extend user reach to most of MDD's areas, especially with the bike rental service provided by Ooredoo at different spots. The tram service is more convenient for pedestrians because it has many stops in the neighborhood, mostly when the hot climatic conditions deter walking in the neighborhood. Using another mode of transportation involves more activities, renting in case of bikes or waiting on the tram, which hinders pedestrians' desire to walk. The spatial distribution of mosques in MDD allows the third group to walk everywhere. Like external groups, other transportation modes enable them to arrive at most destinations (**Figure 3**).

Fig. 3: (left) Figure-ground representation with space (white) and urban blocks (black) and (right) pedestrian sheds of 200 m from mosques in Msheireb Downtown Doha

Fig. 4: Survey of building heights based on the number of floors in Msheireb Downtown Doha in January-February 2022

The urban form of the townhouses reflects the courtyard style of traditional Qatari houses, while the apartment buildings reflect the modern living of contemporary Qatari architecture. The masterplan's buildings have been classed into three-character types according to scale and massing low, mid, and high-rise buildings. Low-rise buildings are up to four occupiable stories (including the ground level). These buildings have a domestic scale and typically do not incorporate ground-level colonnades. Mid-rise buildings are between five and ten occupiable stories (including ground) and comprise most facilities. These buildings usually have a clear base, middle and top. They often incorporate a street arcade at the bottom and set-back accommodation at the top. Tall buildings have over ten occupiable stories, typically found to the south of the site. They are comprised of a podium and tower element. The podium element rises to the defined top of street height. The tower element rises above this line and can reach the target building height (**Figure 4**).

In MDD, there are more than 100 buildings, each distinct yet all expressing a shared architectural language rooted in the local culture and climate. MDD comprises a diversity of uses, including residential, offices, retail, food and beverage, hospitality, cultural (museums), and other ancillary services, such as religious and civic buildings. Most residential buildings are in the northwestern part of Msheireb, moving from the low-rise townhouses to the high-rise premium and prestige apartments to the south. The residential land use in MDD concentrates near vital areas across the local scale of MDD. The housing types developed as townhouses harmonize with the surrounding built forms and heights. The size of townhouses is conveniently supported by neighborhood facilities such as a school, mosque, and green public spaces, all within walking distance. The residential land use extends downwards until Sahat Al Nakeel, the second prominent public space after the Barahat in MDD. The residential buildings near Sahat al Nakeel are developed as apartments serving a more comprehensive population sector.

Fig. 5: Survey of (left) ground-level land use and (right) active and inactive frontages in Msheireb Downtown Doha in January-February 2022

In contrast, the townhouses in the north are designed based on the *fereej* (neighborhood) concept and courtyard houses to attract Qatari nationals. There are medical facilities and a mosque near the apartment buildings to support the necessities of urban living. The townhouse cluster stands for the typical design of *fereej* with up to six townhouses, and the traditional urban courtyard form reinterpreted for modern living. The apartments in MDD range from compact business suites to homes for international residents and Qatari families. Each apartment has a formal and a family majlis, combined with a layout providing proper levels of privacy within the home. Community facilities such as pools, gyms, and majlis rooms also integrate into the common parts of the apartment buildings. They also have private outdoor space in various forms – roof terraces, balconies, and elevated courtyards. The three residential typologies aim at various end-users to provide critical density and mass in bringing activity to the area. A few buildings were preserved; including the five traditional buildings managed by Qatar Museums, Sheikh Suhaim Palace, and the original routes of Al-Kahraba and Abdallah bin Thani streets (**Figure 5**). It indicates the active and nonactive frontages along two types of routes. The active and inactive frontages are surveyed on the building's ground level only. Vacant shops with the provisions of active frontages (glazing) have a distinct color. Once operating, they are supposed to draw more attention from pedestrians. The nonactive frontages are limited to townhouses and civic buildings such as the tram depot. Building design does not leave any chance to activate the ground floor frontages. This matches the design intent for increased flexibility in ground floor uses. MDD's master development standards mandate that all ground floor levels have a 4-meter height to suit different uses and provide maximum flexibility in changing uses over time. This generous allocation of active frontages along the two sides of the routes significantly improves walkability, as users were motivated to walk more within the two routes. Active frontages allow people to mingle with others and interact with the goods displayed. This pattern is evident when comparing the already opened segments of *sikka* and streets with those still under construction (Phase 4) in early 2022. The people's movement decreases the more they move towards the west of Sikka or the south of the street. Therefore, plaza three will play a significant role in activating the connection between the two routes once more spaces around the plaza start to open.

5 Future Research

By 2030 around 60% of the world's population will reside in cities, and 70% of global children will live in cities by 2050 (Source: United Nations). Therefore, creating a healthy and sustainable

environment for children is a fundamental goal. However, according to UNICEF's Child-Friendly Cities Initiative (CFCI), Qatar does not host a child-friendly city or implement a CFCI design. Thus, creating MDD as a child-friendly city aims to bring children's needs into the urban planning agenda to contribute to Qatar's 2030 vision for more sustainable and inclusive communities. Since MDD succeeded in providing a sustainable and walkable neighborhood and family-oriented design for the residents and visitors, future research can explore the potential for the case of MDD as an example of a smart city to be a child-friendly neighborhood within the region. The research's primary objective will be to examine how MDD can be represented as a child-friendly city and highlight the guidelines to follow so the built environment can fill a gap in urban planning to complement the needs and views of the children in Qatar.

6 Conclusion

Qatar is a part of the Arabian Gulf's culture, economics, and society. Thus, residents of Qatar have sought a safe and stable life in various times and conditions, focused on making a living from the sea or land through grazing or desert life. However, the trajectory of social life changed after the discovery of oil and natural gas. Qatari society split into economic classes after being divided into multiple tribes for much of its history. With its distinctive vernacular architectural language and innovative green solutions, MDD is the country's first sustainable downtown regeneration project. The purpose behind this is to revive the commercial district of old Doha and bring new vitality to the downtown. The design is rooted in the Qatari heritage considering its proportion, simplicity, space, light, layering, ornament, and response to climate. On the environmental level, the MDD masterplan incorporates the *sikka* (narrow passageways) borrowed from Islamic architecture and *fereej* (neighborhoods) concepts to provide comfortable zones with natural cooling. The project also creates vehicle access with underground services and parking, facilitating contemporary urban life. Initially, the MDD aimed to reverse the development pattern in Doha, which has tended towards isolated land use, reliance on car transportation, and energy-hungry structures. Our study of the urban morphology of MDD suggests the project succeeds in creating a new social and civic hub in the city center where it is enjoyable to live, work, shop, visit and spend time.

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