The Impact of Land Mix-use on Inhabitants' Social Wellbeing in the Qatari Neighbourhoods

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Abstract

Health and wellbeing have been key considerations in designing sustainable environments. However, most research on built environments and wellbeing has been conducted in Western communities, with very little research in the context of Middle Eastern countries. This study aims to fill the gap by investigating the impact of the residential built environment on social wellbeing in the cultural context of Doha, the capital of Qatar. The research studied six neighbourhoods in Doha. The investigation used subjective and objective methods such as interviews and spatial models (space syntax), complemented by questionnaires and an observation survey. The data were analysed separately; however, they are thematically discussed in this research. The findings of this research broadly support the work of other studies in this area, linking public spaces with the inhabitants' casual interactions. However, this research found that some uses have a higher impact than others. In Doha, mosques significantly influenced inhabitants' social interaction, especially men. The social relationships between neighbours were maintained in private spaces – *Majles-*. *Majles* had low integration with other spaces in the dwelling, which ensures household privacy. Based on the findings of this investigation, recommendations are made and guidelines developed for future residential developments in Qatar and the surrounding region to ensure the social wellbeing of communities.

Keywords: Wellbeing; Doha; Neighbourhood; Mix-use; Social

1 Introduction

Researchers have examined the use of space in residential environments under many different names, including land mix-use, community spaces, public spaces, and third spaces. Communal space is defined by the Ministry of Housing, Communities and Local Government (2021) as a public space in which most inhabitant movements take place. Communal space includes streets and squares designed as multi-purpose and multi-user. Small and Adler (2019) refer to communal spaces as 'fixed spaces' and define them as sites for unplanned social and direct interaction. Finlay et al. (2019) identify communal space as a 'third space' with a wide range of uses in which people can meet beyond home and work. Third spaces substantially impact social interaction, social support, social network, sense of community, and belonging (Finlay et al. 2019). The mixed uses include the local services, facilities, and functions available in the neighbourhood, supporting the daily lives of inhabitants (Földi, 2006; Ministry of Housing Communities and Local Government, 2021).

Wickes et al. (2019) categorised spatial-use typologies into four groups. These are shown in Table 1, along with the nature of the interactions that occur within the space and the types of interactions. Wickes et al. (2019) claim that collective community identity and social cohesion differ, as some inhabitants who use the space have no interest in its social role.

Table 1: Wickes et al. (2019) categorisation of communal spaces

Type of Land Use	Nature of Interaction	Type of Interaction	Example
Anchoring sites	Scheduled and routinised opportunities for copresence	Frequent interactions between a regular group of users	Schools, libraries, health clubs
Local exposure sites	Unscheduled	Frequent interaction which encourages acquaintanceship ties between regular users	Park
Scheduled conduits sites	Scheduled activities for different users	Unplanned interaction between the same users	Train stations, Cinemas
Extra-local exposure sites	Unscheduled and sporadic interaction	Sporadic interaction with diverse users	Shopping mall

Finlay et al. (2019) noted that communal spaces are associated with quality of life –QOL-, health, and wellbeing. The academic literature on the impact of communal space on social wellbeing examines 1) the characteristics of the neighbourhood's layout design, as well as its functions and the user's proximity to them (Montford, 2013; Wickes et al., 2019; Williams, 2006) and 2) the location, accessibility, and visibility of the communal space (Abu-Ghazzeh, 1999; Cooper, 2014; Francis et al., 2012; Karuppannan and Sivam, 2011; Williams, 2006). It is argued that street syntactic accessibility influences land-use mix, as some uses – such as retail – benefit from high levels of pedestrian movement (Ozbil et al., 2011), while short and direct routes encourage short-distance walking (Ozbil et al., 2011; Stevenson et al., 2016). Other researchers point out that integrating public gathering spaces into the street fabric enhances inhabitants' copresence at different times and for various purposes that facilitate constant street monitoring (Brown and Lombard, 2014; Ministry of Housing Communities and Local Government, 2021; Wickes et al., 2019). It is claimed that communal spaces are a critical motivator for frequent and spontaneous social interaction between inhabitants (Francis et al., 2012; Jackson, 2003; Mouratidis, 2018), which is found to subsequently increases place attachment (Zhu & Fu, 2017) and lead to social support (Finlay et al. 2019). It is argued that living in close proximity to a communal space results in denser social networks (Small & Adler 2019). Additionally, Francis et al. (2012) found that the social interaction that results from a mix of land use enhances community cohesion and, therefore, creates a stronger sense of safety. However, social cohesion may be negatively affected if the neighbourhood includes communal spaces that attract large numbers of strangers, as this can reduce local interaction between inhabitants (Wickes et al. 2019).

However, the spatial-use impact cannot be generalised, as Muzayanah et al. (2020) found no correlation between mixed-use density and social capital variables in Indonesian metropolitan cities. Historically, in Middle Eastern culture, the mosque has been a critical communal space (Mortada, 2003). The mosque has been used as a multi-purpose space that unifies and strengthens relationships and facilitates conflict resolution (Mortada, 2003). However, recent literature on land use has failed to emphasise the role of the mosque as a critical social space in the residential environmental context.

2 Methodology

There is a need for both qualitative and quantitative approaches based on the identified indicators in this research. Combining subjective and objective data in a mixed-methods study enhances the research results and allows for comprehensive analysis (Bonaiuto 2004; Hanson et al., 2005; Bonaiuto & Alves, 2012; Rezvani et al., 2013; Bakar et al., 2015; Creswell & Creswell, 2018). The methods

used in this study are listed in Table 4.5. The ethics committee at the Welsh School of Architecture approved all the methods and tools used in this study.

Case studies of low-density neighbourhoods were utilised to investigate the impact of different residential environments on the social wellbeing of residents in the cultural context of Doha. According to the proposed national masterplan for Doha city and the percentage of detached dwellings in Qatar, low-density neighbourhoods dominate the majority of city land. (Ministry of Development Planning and Statistics – Qatar, 2017). The case study selection ctiteria was based on the physical characteristics of the neighbourhood such as 1) ensure comparable travel distance to the city centre, 2)variety of residential layout design, 3) public facilities within walkable distance.

A basic socio-economic and physical analysis of the neighbourhoods was the starting point for the fieldwork. After this activity, each neighbourhood underwent a structured mapping of social behaviour. A questionnaire survey was then distributed to public space residents after the observation mapping was completed. Interviewing the residents was the final fieldwork activity.

As for the participants, the researcher introduced the research to local networks and then used snowball sampling to interact with other residents. Residents who have lived in the neighbourhood for at least five years were eligible to participate. The demographic characteristics of the selected participants were vetted to ensure the inclusion of a range of social groups, age groups (>16 years), genders, and work statuses.

Table 2: Indicators and methods of measuring social wellbeing and residential environment design

	Indicators	**Measure**	**Tool**
Social wellbeing	Social interaction	Frequency interaction	Interview
		Type of interaction	
	Privacy	Personal privacy	Interview
		Family privacy	Spatial analysis
Residential environment	Layout	Connectivity	Spatial analysis Space Syntax
	Spatial use	Integration	

3 Impact of Land Mix Use on Social Interaction

Public spaces within the neighbourhood were categorised as indoor or outdoor facilities. No significant correlation was found between the total number of public spaces within the neighbourhood and the interviewees' average number of social contacts (Table 3). Furthermore, some demographic and cultural characteristics (discussed below) were found to affect the relationship between public space use and social wellbeing.

Table 3: Comparison of the total number of mix-uses and average number of contacts

Case study	Layout	Case study area (hectare)	Average number of social contacts (neighbour)	Total number of public buildings
Thumama	Semi- gridded	42.3	21	10
Dahl Alhamam	Semi- gridded	18.5	14	13
Onaiza	Cul-de-sacs	31.0	13	13
Hazem Almarkhiya	Cul-de-sacs, Loops	30.3	20	5
Duhail	Loops	33.4	20	8
Khulaifat	Loops	13.8	17	28

3.1 Outdoor Spaces and Social Interaction

In general, satisfaction with outdoor spaces was found to correlate with more frequent gatherings between neighbours (Spearman correlation coefficient of 0.151, p-value 0.017) and create more opportunities for casual interaction (Spearman correlation coefficient of 0.130, p-value 0.042). The following subsections discuss sidewalks and public parks separately as outdoor spaces and their impact on social wellbeing.

Sidewalks

The impact of sidewalks was investigated using several data analysis methods. The correlation test found that, in general, satisfaction with the sidewalks in the neighbourhood had a significant positive relationship with various indicators of networking and social interaction (Table 1).

Table 1: Sidewalk satisfaction correlation with social variables

	Number of known neighbours	Number of close relationships	Frequency of chatting to neighbours
Satisfaction with the sidewalks	0.227	0.201	0.198
	0.000	0.002	0.002

The interview analysis revealed intervening factors that affected sidewalk use – such as the season, distance, and destination. The quotes below concern walking patterns and the influence of the neighbourhood's physical quality:

'I used to walk to the grocery store and the health centre, but now I am afraid of falling as the road has been dug up. So, I use the car' (female, 50s, semi-gridded layout).

'The main daily destination is the mosque. I walk in the neighbourhood, especially after sunrise. My path depends on what is the shortest and the quickest. Sometimes in winter, puddles make me avoid some paths' (male, 60s, owner-designed dwelling).

The physical environment condition mapping revealed that the sidewalks in most neighbourhoods were used for parking spaces (Fig. 1 and Fig. 2). The elderly and families with young children used the sidewalks less often than other populations. The neighbourhood observation confirmed that the walking population was primarily young men. Additionally, parked cars reduced the visual field, which reduced visibility and limited casual interaction between neighbours.

Fig. 1: Sidewalk condition in Khulaifat neighbourhood

Fig. 2: Sidewalk used as a parking space

Vehicle

The observational survey data illustrated the impact of the public spaces' location and quantity on pedestrian movement. Distinct pedestrian distribution and movement can be seen across neighbourhoods. For instance, the pedestrian movement was more widely distributed in Khulaifat neighbourhood, which has several small shops (Fig. 3), whilst in Dahil Alhamam neighbourhood, it was concentrated around a large grocery store (Fig. 4). Moreover, neighbourhoods with fewer communal spaces – such as Duhail – were found to have less pedestrian movement.

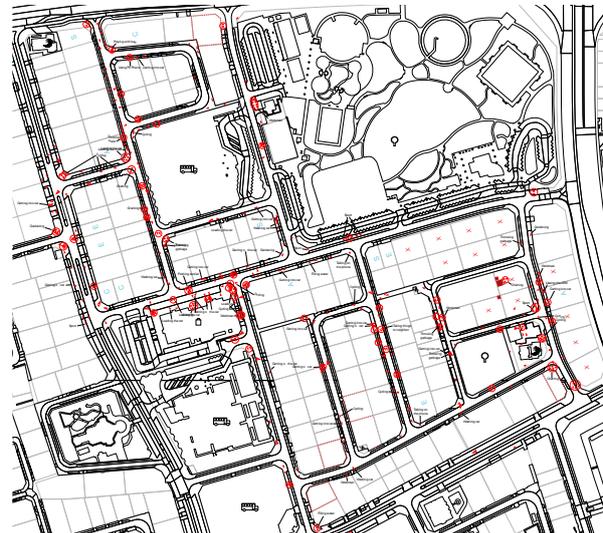**Fig. 3:** Khulaifat neighbourhood   **Fig. 4:** Dahil Alhamam neighbourhood

S Shop E Educational A Authority C Clinic X Empty land ⌃Pedestrian movement

The behavioural observation survey and the spatial analysis of the neighbourhood layouts suggest that visually integrated spaces have higher levels of pedestrian movement. Nevertheless, some of the spatial uses located in a low visual integration street attracted inhabitants (Fig. 5).
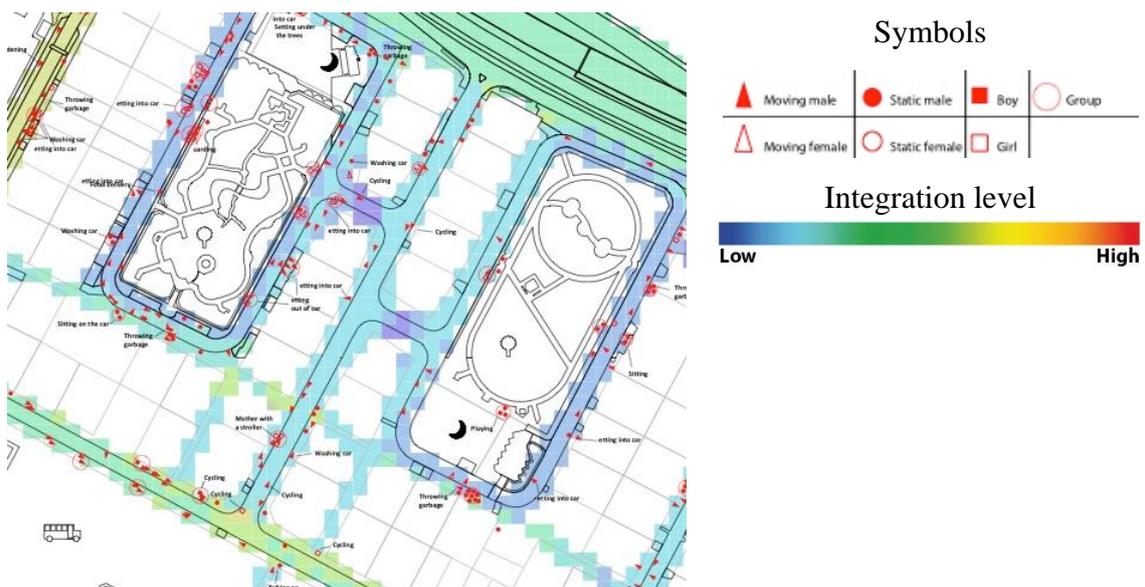

Fig. 5: Observed movement around public spaces, overlaid with the visual integration analysis

Public parks

Previous research has extensively explored the impact of public parks on residents' physical, mental, and social wellbeing. The weather conditions in Doha are an obvious limitation on inhabitants' use of outdoor spaces. In addition, the thematic analysis found that the size of the park was an obstacle, limiting the activities that could be practised there and restricting the use of the park by both sexes at the same time. In this cultural context, the distance between men and women is crucial for maintaining personal privacy. Therefore, inhabitants tend to use the park at different times to maintain cultural norms. Many interviewees reported that they avoided using the park in case privacy was not possible.

> *'I go to many parks – not only the one in our neighbourhood. I use the park approximately every week. Sometimes I find the park full of women, so I go to another park; if the park is small, I don't use it. I go to Al Rayan park and Aspire park once or twice a week to do my exercise there' (male, 50s, loop layout).*

> *'My neighbours walk as a group during the night, but I don't join them. They walk in the park and they ask me to turn off the house lights so they have their privacy when exercising. When my children were young, they used to go to the park. I used to watch them from my room window. Only during summer, when it is very humid, we don't want to go to outdoor spaces. My husband and the neighbours (men) who are retired gather in the park after the Fjeer prayer. Also, they gather during the weekend to work out in the park. Women use the park during the night. Kids always play football in the park. During the weekends, some strangers come to use the park, as Dhal Alhamam park gets crowded' (female, 50s, semi-gridded layout).*

The investigation found that the park was used for certain activities by specific populations. Inhabitants with young children or grandchildren tended to use the park more frequently than others. The statistical analysis revealed the importance of public parks as family spaces within the neighbourhood for children's safety (Spearman correlation coefficient of 0.503, p-value 0.000). The senior population used the park for exercise, whilst the younger generation preferred the large national parks in the city.

3.2 Indoor Public Spaces and Social Interaction

The thematic analysis of the interviews found that some public buildings had more positive social influence than others in Doha's neighbourhoods. Almost all the male participants mentioned the mosque as a regular location for meetings and interactions between neighbours. However, few said they also met with neighbours in other public buildings, such as the grocery store. In contrast, women reported seasonal use of the mosque during the holy month of Ramadan for Tarawih prayer. But they did not report the use of any public buildings for regular interaction with their neighbours. Shopping facilities, for example, had a statistically significant correlation with social interaction and networks for men, but not for women (Table 2). In addition, the behavioural observation documented more men than women interacting in communal spaces.

Table 2: Sex and interaction with neighbours in communal spaces

	Gender	Number of known neighbours	Number of close relationships	Number of recognised neighbours
Satisfaction with shopping facilities	Female	0.0132	0.139	0.210
		0.133	0.113	0.016
	Male	0.2940	0.378	0.096
		0.002	0.000	0.322

Interviewees indicated the importance of the mosque for initiating social interaction between neighbours:

> 'I meet the neighbours at home. My mum sometimes meets her neighbours in the park, but not me. We also meet at the mosque during Ramadan' (female, 20s, cul-de-sac layout).

> 'As men, mostly we meet in the mosques. We have visits to neighbours' Majles, we know people who come to masque. We used to have a public Majles next to the mosque. It was supposed to be for us (neighbours), but they took it and gave it to "Mowater Qatar" – a centre under the Ministry of Youth and Sports. We need a common Majles for happy and sad occasions. I saw this idea in Oman; they have big halls next to the mosque' (male, 60s, cul-de-sac layout).

Whilst people met at their neighbours' Majles, many – male and female – stated the need for communal Majles for the neighbourhood. They said this would expand their social networks, as it would resolve some constraints, such as the need to know the Majles' owner and the location of the Majles frequently used for gatherings with neighbours.

The women had other non-spatial methods for initiating and maintaining relationships, as they did not meet regularly in person. The first method involved sharing food with their neighbours. This practice increased during the holy month of Ramadan. Although this behaviour was not a kind of social support in this context, the women reported sharing food to initiate social contact with new neighbours and to maintain relationships with old neighbours. Another method involved 'virtual communication' via social media. Many of the neighbours are members of a WhatsApp group. Here are some quotes from the inhabitants:

> 'We talk to each other on the phone and via WhatsApp. During Ramadan, we interact more and we send food to each other. Our neighbour at the back – we share a wall – we pass things over the wall' (female, 50s, cul-de-sac layout).

> 'The most interesting thing in our neighbourhood is that even if we do not socialise regularly, we communicate through food. We always share food' (female, 40s, loop layout).

Although the use of social media for communication between neighbours is common worldwide these days, sharing food is a characteristic method of communication in this cultural context. The difference between the two methods is that a new neighbour needs to know a group member before they can join the virtual network. In contrast, food-sharing gives individuals a chance to form a network themselves.

In contrast, some interviewees expressed dissatisfaction with some uses that they said caused disturbance, including noise, traffic, and infringement on private property. For example, schools, embassies, and parks have been associated with annoyance of the local inhabitants. Below are some comments from inhabitants who live near schools:

> 'I don't think that there is better than this neighbourhood. It is very tidy, the park is nearby, the only noise is this school. It should be illegal to open a school in the middle of a neighbourhood. There should only be a nursery. They park cars in our private parking area. The school should have its own parking area' (female, 60s, cul-de-sac layout).

> 'The condition of the street changes depending on the time of the day. For example, you will hate it in the morning. If you want to get out using your car, you need an hour because of the school traffic. There are more than five schools near the house' (female, 30s, loop layout).

Although previous studies have shown public buildings to have a positive impact on inhabitants' social interaction, in this context, they were found to have other impacts such as negative impact or no impact. When inhabitants were asked where they usually met and talked to their neighbours, the Majles was the most common response from the male participants, with female participants citing private dwellings. Visitor spaces are essential in this cultural context, as they facilitate social interaction with the wider community, ensure both household and visitor privacy, and consequently enhance overall social wellbeing. The spatial analysis of the dwelling designs found that the dwellings had at least two spaces dedicated to hosting guests (*Majles* and the dining space) in a strategic location that ensured family privacy and connectivity to the neighbourhood.

4 The Influence of Demographic Factors on Using Communal Spaces

The statistical analysis found that gender is a significant intervening factor that affects social interaction location and frequency. Men have more frequent interactions than women (Table 1). Male interviewees reported more frequent meetings with neighbours, and interacting in the mosque after prayers:

> *'We always gather in my neighbour's Majles. Also, we meet at the mosque or when we are walking to or from the mosque' (male, 50s, cul-de-sac layout).*

Table 4: Gender and frequency of gatherings between neighbours

Gender		Male	Female
Frequency of gatherings within the neighbourhood	Never	3	9
	Occasionally	21	38
	Once a month	8	14
	Once a week	16	21
	Twice a week or more	37	16
Pearson chi-square	0.001		

Another demographic factor found to affect the frequency of interaction between neighbours was the presence of children. The interviewees reported more frequent interaction with neighbours who had young children, confirming that they came to know other people through their children, who went to the same school or played in the park as their own children. The statistical analysis confirmed that the frequency of meeting with neighbours was positively correlated with the number of children in the household (Spearman correlation coefficient of 0.174, p-value 0.006). Below are some examples of interviewees mentioning the influence of children on their relationships with neighbours:

> *'I know people who come to the mosque and people whose children go out with my children' (male, 50s, loop layout).*

> *'We do not have young children. Maybe that is why there is no interaction with our neighbours' (female, 30s, loop layout).*

> *Other differences in social interaction associated with spatial use are discussed in the following sections.*

Although children were found to be a link between neighbours, a common view amongst the interviewees was that children were at risk of road accidents. Parents or grandparents were asked whether they allowed their children to independently play in or move around the immediate

neighbourhood (i.e., the street in which they lived), which negatively influenced social interaction between neighbours. One interviewee answered:

> *'My grandchild plays in the outdoor space only. He is not allowed to play beyond the fence of the dwelling. I am afraid of crazy people who drive very fast. And I want them to place speed bumps to reduce the cars' speed' (female, 50s, loop layout).*

5 Conclusion

This study found that patterns of use of spaces have different impacts on inhabitants' social wellbeing. A key finding that emerges from the analysis is that Doha's harsh weather conditions result in many people using indoor public spaces more frequently than outdoor spaces. Furthermore, the use of public space is influenced by the users' gender. This research presented evidence of the vitality of mosques as public spaces for social interaction, especially for men. Most of the men's social contacts are formed in public spaces, whilst women's social contact with their neighbours is less influenced by public spaces, relying instead on non-spatial forms of communication for initiation and maintenance. The relationships that were formed within the neighbourhood were maintained in an indoor privet space – Majles.

Services and facilities in the neighbourhood were shown to increase residential tenure and, therefore, stability. Similarly, a considerable number of the participants cited their extended families and social ties within the neighbourhood as the key reasons for their choice to remain within the neighbourhood

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