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1 Identification and Analysis of Land Use Change in Doha Downtown

2 Neighbourhoods

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15

16 Abstract

17 The Neighbourhood Concept was first introduced in the 1920s by Clarence Perry. This paper
18 adapts Clarence Perry's Neighbourhood Concept and other neighbourhood planning theories. It
19 studies the land use dynamics of Fereej Abdul Aziz, one of downtown neighbourhoods in Doha. The
20 theory is reinterpreted to study three parameters: physical, mobility, and social aspects. The main
21 objective is to empirically investigate the dynamics of existing land uses of downtown
22 neighbourhoods. The study aims at exploring types of land activities and their existing conditions in
23 the study area. The findings aid in making land use guidelines for the downtown neighbourhoods in
24 Doha taking into consideration preferences of the inhabitants. The study would provide useful insights
25 and efficient planning preferences for land use and how change in Downtown neighbourhoods occurs
26 due to the rapid urban growth not only in Doha but also in other emerging cities.

27

28 Keywords: Doha; Downtown Neighbourhood; Housing Diversity; Land Use Mix; Urban
29 Development.

30 **Background and Objectives**

31 Doha as an emerging city has become major business investment hub with unique opportunities to
32 drive economic growth. The dynamics of studying land use will result in new urban forms and new
33 patterns of well-being for people, new patterns of behaviour and resource use and new opportunities
34 ad risks.

35 Neighbourhoods are the primary urban blocks that make up the city. The grouping and
36 organization of neighbourhoods in relation to streets and public spaces constitute the spatial structure
37 of the city (Marans, 2012; Fincher et. al., 2014). A neighbourhood is a group of people who share
38 services and some level of cohesion in a geographically bounded place. Among three key words
39 defining neighbourhoods (people, place, and cohesion), place is the most noticeable term to
40 distinguish neighbourhoods from other terms like community. Community refers to a group of people
41 with a unity of values, beliefs, circumstances, interests, and culture. This is regardless of geographical
42 boundary (Chaskin, 1998; Keller, 1968). According to Patricios (2002), the “neighbourhood unit is
43 described as a scheme of arrangement for the family life community”, where it offers residents a
44 convenient access to the neighbourhood facilities such as schools, parks, shops, and public facilities.
45 Neighbourhoods are communities with a more tangible and geographic concept that is useful for many
46 planning purposes such as analysis, service, delivery, and intervention (Wellman and Leighton, 1979;
47 Forrest and Kearns, 2001; Mullan et. al., 2004).

48 Neighbourhood planning allows local communities to develop a vision for their neighbourhood
49 and to shape its development and growth. A particular form of social reproduction where human
50 activities include: daily life, social interaction, political and economic commitment, is taking place
51 (Patricios, 2002). Hence, defining the geographical and physical conditions of a neighbourhood
52 provides the foundation for planning and research at the neighbourhood level.

53 Neighbourhood planning was has evolved since the 1920s after the industrial revolution
54 (Silver, 1985). The Neighbourhood Concept was first introduced in 1929 by Clarence Perry to solve
55 urban issues related to housing and urban centres (Perry, 1929). It was developed from the Garden
56 City theory and from the social reform aimed at adapting population growth in urban centres (Herbert,

57 1963; Lawhon, 2009; Dempsey, 2012). The Neighbourhood Concept has considered the accessibility
58 of residents from their houses to schools and community centres (Rohe, 2009; Brody, 2013). It has
59 provided specific guidelines for the spatial distribution of housing, community facilities, retail areas,
60 and streets (Verburg et. al., 2004; Serag El Din et. al., 2013).

61 The Neighbourhood Concept theory has contributed to improve the standards of developing
62 residential environments and it is based on six solid principles: 1) an institution at the center of the
63 neighbourhood; 2) local shopping areas along the perimeter; 3) area dedicated for parks and open
64 spaces; 4) arterial streets along the perimeter; 5) local street network; and 6) size of the neighbourhood
65 supports its residents, housing, and walkability (Perry, 1929; Choguill, 2008). Depending on the size,
66 level of cohesion, and services shared, neighbourhoods are defined at multiple scales.

67 Perry's theory had been followed and, in most cases, reinterpreted. Schoenberg and
68 Rosenbaum (1980) have supported Perry's theory in terms of the neighbourhood elements. They have
69 emphasized that a neighbourhood exists if boundaries are identified, a name is associated with the
70 area, an institution is centralized, and neighbours share at least one common tie through a social
71 network or shared use of public space. Wang (1965) has redefined the physical elements of the
72 neighbourhood to include social aspects and the neighbourhood principles has been modified to
73 include: 1) people and environment, 2) street system, 3) institution, 4) shopping centre, 5) housing, 6)
74 recreation, and 7) school. Different people have different sizes of families, incomes, and preferences
75 (Wang, 1965; Delmelle et. al., 2013; White, 2015).

76 The American Planning Association (2006), classified neighbourhood based on Chaskin
77 (1998) and Suttles (1972), and presented the physical requirements of a neighbourhood into three
78 categories:

- 79 • Physical closeness of face-block neighbourhoods encourages individual and interpersonal
80 relationships,
- 81 • A residential neighbourhood consists of several face-blocks, in which it shares amenities and
82 services to evoke direct participation from residents,

- 83 • An institutional neighbourhood includes several residential neighbourhoods and bounded by
84 official limits of institutions. Its size should allow to accommodate several services and financial
85 institutions.

86 In Hakim (1986) study, the development of building and urban design principles focused
87 primarily on housing and access. The development was integrated based on Islamic law, and then
88 became semi-legislative in nature. Since building and the development of communities is continuous
89 process, related rules and guidelines were in a demand constantly. Hakim (1986) has incorporated the
90 physical components of downtown area in an Arabic-Islamic city which includes: grand mosque, a
91 government office and a market.

92 Focusing more on personal relationship and political voice than physical conditions, Jacobs
93 (1961) proposed three levels of neighbourhoods.

- 94 • Street neighbourhoods highlight the acquaintances and personal relationships along with streets.
95 Because of overlapping perceptions and personal relationships, the boundaries of street
96 neighbourhoods are not well defined. Even though it was hard to say which level of
97 neighbourhoods is more important, she highlighted street neighbourhoods as the smallest but the
98 most vital and effective self-governing units.
- 99 • A large district refers to an area with a recognizable name and consists of 100,000 or more people.
100 Large districts have moderate political power to meet the needs of residents, visitors, and workers.
- 101 • The city as a whole is rarely referred to as a neighbourhood. However, she assumed the city
102 would be one of the neighbourhood units having a complete range of services and common
103 interests allowing people to associate with each other. It is argued that bonding to the city, as a
104 whole is the greatest asset.

105 Land use planning takes into account the physical environment and the social environment
106 where accessible and diverse activities are taking place to enrich the urban living of people (Qaddumi
107 and Ahmadi, 2017). Land use change occurs due to the rapid urban growth in emerging cities. In the
108 case of Doha city, as an emerging city, the land use change is best represented in the downtown

109 neighbourhoods which are the early formed neighbourhoods in the center of Doha. The rethinking of
110 the urban structure and land use pattern will enhance the downtown neighbourhoods and firmly will
111 define their role as the premier location for cultural and community living in Doha.

112 Therefore, the significance of this research lies in the need for a holistic planning process for
113 neighbourhoods which is committed to the planning of Doha. This paper applies Perry's
114 Neighbourhood theory and other pioneers' theories to study the land use dynamics of downtown
115 neighbourhoods in Doha. It is reinterpreted to conclude that physical, mobility, and social aspects are
116 responsible for defining the neighbourhood's land use pattern. The objective of this paper is to
117 empirically investigate the dynamics of existing land uses of downtown neighbourhoods in Doha.
118 Therefore, the parameters that have been implemented from previous studies are defined to include:
119 land use mix and open spaces, accessibility, and housing diversity [Figure 1].

120 In the Gulf region, the design of neighbourhoods proves the social inference where the *fereej*
121 (neighbourhood) is the core place for social interaction and bonding. Like other Gulf cities, Doha
122 metropolitan has evolved based on housing agglomerations which have formed unique
123 neighbourhoods around the market and harbour areas [Figure 2, a and b]. In these neighbourhoods,
124 each family built their houses in close proximity to each other, usually wall on wall, due to their strong
125 affiliation and social bonding (Ibrahim, 2013), [Figure 2, c]. This has formed a unique urban fabric for
126 Doha which remained intact until the middle of the twentieth century.

127 During the second half of the twentieth century, Doha has witnessed its first urbanization
128 period due to the increase of oil production processes. The rapid economic growth has led to the
129 transformation of Doha's built environment. The governmental strategies of economic diversification
130 and living condition improvements were set to build the city image (Hutzell et. al., 2015; Salama et.
131 al., 2017). This has resulted in rapid population growth and high migrants-to-nationals ratio.

132 The urban fabric of Doha was shaped as a result of landfill policies over recent decades, which
133 has started from the downtown area, forming a radial form of planning. Throughout the years, the
134 planning policies in Doha have been expanding towards the northern and western directions, creating
135 various projects that contribute to the urban development (Nagy, 2008; Murray, 2013; Al Shawish,

136 2015). Since the 1960s, urban planning in Doha has envisioned the development of neighbourhoods
137 aiming at creating communities away from the downtown area [Figure 3]. According to Shandas et. al.
138 (2017), the neighbourhoods have been formed based on the planning of the road network. Within the
139 road grids it was anticipated that there would be neighbourhood units. In the north of Doha, a new
140 downtown area has been developed by the government as the premier location for business and high-
141 end residential living in the city (Ministry of Municipality and Environment, 2014). It is administered
142 as an expansion of a growing modern city centre.

143 The downtown area of Doha is the economic, cultural, and administrative heart of the country.
144 This is where urban design and public realm improvements will be undertaken to improve the quality
145 of the living and working environments. Therefore, the downtown neighbourhoods are selected for
146 study based on the following:

- 147 • The different development stages that took place during previous decades which have resulted in
148 diverse urban and land use changes in the area,
- 149 • The imbalanced demographic structure where migrants are the dominant population in the area,
150 and
- 151 • The governmental vision to revive the old center of Doha which plays a major role in enhancing
152 city identity, memory, and belonging.

153 The rethinking of the urban structure and land use pattern will enhance the downtown
154 neighbourhoods and firmly will define their role as the premier location for cultural and community
155 living in Doha.

156 The study area of Fereej Abdul Aziz neighbourhood is selected based on: its typical land use
157 pattern of downtown neighbourhoods, demographic structure of migrant population, and governmental
158 vision of retrofitting its physical form. Its urban fabric is expanded to the surrounding downtown
159 neighbourhoods. Fereej Abdul Aziz is located in Zone 14, between the B and A Ring roads within the
160 municipality of Doha. It is located in a central location in the downtown area where significant
161 projects and places are adjacent. Fereej Abdul Aziz is located near popular places with historical and

162 national significance, such as Souq Waqif. It is surrounded by Mushiereb and Al Asmakh
163 neighbourhoods from the north, Al Doha Al Jadeeda and Fereej Bin Derham neighbourhoods from the
164 east, Fereej Bin Mahmoud neighbourhood from the west, and Rawdat Al Khail neighbourhood from
165 the south. Several main roads, specifically the A-Ring and B-Ring roads define the neighbourhood
166 [Figure 4].

167 **Methodological Approach**

168 ***Research Questions***

169 The paper presents a contextual analysis to investigate the downtown neighbourhood land use in Doha
170 through answering the following questions: What are the major forces of the real estate market in
171 terms of downtown neighbourhood development? What are the considered factors for improving the
172 downtown land uses? and How the contextual and social aspects of Doha's urban life in downtown
173 neighbourhoods can be enhanced?

174 In this study, three main research tools were implemented as follows:

- 175 • A content analysis of real estate reports and census data based on governmental documents have
176 been reviewed to understand the neighbourhood planning from a governmental point of view. It
177 aims at analysing the changing conditions of the local market, which affects the dynamics of the
178 physical, mobility and social aspects of neighbourhoods.
- 179 • An observation survey of Fereej Abdulaziz neighbourhood (physical aspects): which is conducted
180 to investigate the physical features including the activities performed by the residents. Fereej
181 Abdulaziz was observed twice during weekdays and twice during weekends following a defined
182 circulation route, during afternoon and evening times. In the beginning, the observation was
183 dedicated to the investigation of the neighbourhood's perimeter and surrounding boundaries. This
184 has resulted in annotating the external observation route. The next stage of the observation was
185 dedicated to the investigation of the local roads and developments where various features have
186 been recorded and this has resulted in annotating the internal observation route.

187 • A questionnaire survey of residents' preferences (social aspects) in Fereej Abdulaziz
188 neighbourhood has been distributed to include 130 residents' samples, where 103 are valid and to
189 be considered in the survey. The survey aims at understanding physical, mobility and social
190 aspects from residents' point of view in neighbourhoods. According to questionnaire survey,
191 expatriates comprise the highest percentage 99% of the total respondents (Asians, Arabs, and
192 Westerners), while nationals (Qataris) comprise 1% of the total respondents. Male respondents are
193 more than female respondents (56% males and 44% females). This confirms that the
194 questionnaire data are parallel to Doha's actual population profile in which the majority of
195 population are expatriate males (67% males and 33% females), (Ministry of Development
196 Planning and Statistics, 2015), [Table 1]

197 **Historical Background of Fereej Abdul Aziz Neighbourhood**

198 Fereej Abdul Aziz is one of the early-formed neighbourhoods in the downtown area. It has high-
199 density housing, cultural, and economic activities. It is comprised of mid to high-rise apartment
200 buildings surrounded by retail activities.

201 The urban morphology of Fereej Abdul Aziz has evolved combining both organic and grid-like
202 planning. The earliest houses in the neighbourhood were traditional courtyard houses within a closely
203 intertwined network of streets and passageways. The development of Fereej Abdul Aziz has started
204 since the 1950s where few houses were scattered in remote settings (Jaidah and Bourenane, 2009).
205 The demographic rates have increased significantly, streets were constructed to define the perimeter of
206 the neighbourhood, and the initial planning of land parcels has started.

207 During the 1960s, stand-alone houses have become a popular housing typology. New land uses
208 have been introduced to the neighbourhood, such as commercial, industrial and religious buildings. In
209 the 1970s, high-rise buildings were constructed in the neighbourhood. This period has shown a clear
210 vehicular influence, in which a new requirement for parking spaces has been considered.

211 In the 1980s, several governmental institutions have evolved as a new land use. Ring roads
212 have evolved defining the boundaries of the downtown neighbourhoods in Doha. Migrants have

213 started to inflow in response to the rapid urbanization. New housing typologies have emerged such as
214 apartments and hotels which are defined as multi-family residential.

215 In the 2000s, local streets are clearly defined, and vacant lands have been utilized as random
216 parking areas. Migrants comprise the highest percentage 89% of the total population in Doha in 2017
217 (Snoj, 2017). Since then, almost all of the residents of Fereej Abdul Aziz are migrants. The downtown
218 area has started to be characterized by overcrowding, high number of single male migrants and a
219 predominantly low-income migrant population. Because of the absence of a clear planning vision, the
220 neighbourhood has failed to promote a quality of urban life. Nationals have moved away to settle in
221 suburban neighbourhoods, leaving the downtown with low conditions in terms of physical, mobility
222 and social aspects.

223 During the 2010s, new governmental projects have started aiming at reviving the downtown
224 area where there was a strong aim to define the character of the city. The concentric urban structure,
225 that dominated the early evolution of Doha, is still visible today forming a key element in the legibility
226 of Doha and its downtown area [Figure 5].

227 **Analysis of Land Use Dynamics in Fereej Abdul Aziz Neighbourhood**

228 The following research tools are used: 1) content analysis of real estate data, 2) observation survey,
229 and 3) questionnaire survey of the residents' preferences.

230 The analysis of real estate data includes reviewing statistical reports of Fereej Abdul Aziz. This
231 tool aims at understanding the land use dynamics from a governmental point of view. These reports
232 contribute in understanding the changing conditions of the local market, which affects the land use
233 dynamics of downtown neighbourhoods over the years.

234 The observation study is conducted to analyse the existing neighbourhood conditions in order
235 to investigate the physical features including land uses and activities performed by the residents. The
236 observation has been conducted through a series of visits to explore the physical, mobility, and social
237 aspects of the neighbourhood. Fereej Abdul Aziz was observed twice during weekdays and twice
238 during weekends following a defined circulation route. In the beginning, the observation was
239 dedicated to the investigation of the neighbourhood's perimeter and surrounding boundaries. This has

240 resulted in annotating the external observation route. The next stage of the observation was dedicated
241 to the investigation of the local roads and developments where various features have been recorded.
242 This has resulted in annotating the internal observation route [Figure 6]. The observation has been
243 conducted during afternoon and evening times to observe the peak hours of activities.

244 The survey of residents' preferences is conducted through questionnaires that aid in
245 understanding the land use changes from residents' point of view in downtown neighbourhoods. The
246 questionnaire survey has a total of 103 residents' samples, where migrants comprise the highest
247 percentage 99% of the total respondents (Asians, Arabs, and Westerners), while nationals (Qataris)
248 comprise 1% of the total respondents. According to questionnaire survey, male respondents are more
249 than female respondents (56% males and 44% females). The selected sample represents approximately
250 the characteristics of the population in Doha, in which the majority of population are migrant males
251 (67% males and 33% females), (Ministry of Development Planning and Statistics, 2015).

252 ***Analysis of the Physical Aspects: Land Use Mix and Open Spaces***

253 In reference to the zoning map of Doha in 2008, the residential land use makes-up most of Fereej
254 Abdul Aziz, followed by the commercial land use. Other land uses are planned to provide urban
255 services, such as recreational uses (green open spaces), religious uses (mosques), community centers,
256 and governmental institutions [Figure 7, a]. According to the Ministry of Development Planning and
257 Statistics (2015), the total number of completed buildings in Fereej Abdul Aziz are 475 buildings, in
258 which 442 buildings are residential, 5 buildings are mixed-use (residential and commercial), and 28
259 are establishment buildings (religious, governmental institutions, etc.)

260 The 2015 land use of Fereej Abdul Aziz shows that the amount of commercial land uses has
261 increased as compared to the 2008 land use. The increase can be viewed as a result of the
262 government's vision to reinforce the commercial identity of downtown Doha through providing new
263 economic activities (Ministry of Municipality and Environment, 2014). Open spaces have been
264 removed and replaced by residential land uses and community facilities. Residential land uses
265 remained as multi-family residential. The land use of commercial offices has been relocated along the
266 northern and southern sides of the neighbourhood's perimeter, [Figure 7, b].

267 The observation of the existing land uses shows more homogeneity of land use mix in
268 comparison to the planned land use in 2015. Single-family residential (such as villas), and utility land
269 uses (such as the under-construction metro station) have been observed along the perimeter of Fereej
270 Abdul Aziz. Significant types of commercial uses have been also observed such as restaurants and
271 hotels. However, a number of vacant lands exist in the centre and perimeter areas of the
272 neighbourhood [Figure 8].

273 Fereej Abdul Aziz is characterised by mixed-use commercial frontage in form of shops along
274 the perimeter, and commercial offices on the eastern side [Figure 9, a and b]. Construction sites of
275 new apartment buildings are distributed across the neighbourhood [Figure 9, c]. On the opposite, a
276 number of vacant lands are used as random parking spaces, and as sites for construction wastes in
277 some locations [Figure 9, d]. The northern end of the neighbourhood is a large-scale construction site
278 for the metro station [Figure 9, e]. Open spaces do not exist, which makes the land use planning
279 inefficient and does not support public activities. Few existing villas represent high quality of housing
280 in the neighbourhood, as compared to the poorly maintained apartment buildings in surrounding areas
281 [Figure 9, f and g].

282 According to the survey of residents' preferences, it is concluded that 77% of the respondents
283 prefer to have mix of land uses. A high preference was given to commercial uses, followed by
284 educational and religious uses [Figure 10, a]. In terms of open space preferences, 66% of the
285 respondents signifies the presence of open spaces in Fereej Abdul Aziz which can be adjusted in the
286 future for an efficient mix of land uses [Figure 10, b]. If provided, open spaces would improve the
287 physical environment in view of three benefits: diversify the land use in which recreational uses would
288 be provided, improve the neighbourhood's climate and ecology, and create an aesthetically-appealing
289 urban environment.

290 ***Analysis of the Mobility Aspect: Accessibility***

291 The accessibility is analyzed based on vehicular, pedestrian, and cyclist movements. The analysis aims
292 at improving local conditions for walking, cycling, as well as facilitating safe access to the
293 neighbourhood facilities (such as shops, mosques, parks) and public transport services.

294 Accessibility is determined by attributes of both the activity patterns and the transportation
295 system in the neighbourhood. The spatial distribution of activities as determined by the land use are
296 important components of accessibility, as well as the transportation system that links these activities.
297 Fereej Abdul Aziz has a network of arterial and local streets. It is surrounded by four main streets that
298 provide direct access to the neighbourhood facilities [Figure 11]. Despite the frequent pedestrian
299 movements in the neighbourhood, streets are designed to support vehicular use only. This results in
300 lack of safety where the majority of residents are pedestrians.

301 The main type of activity in Fereej Abdul Aziz is commercial transactions and retailing, which
302 defines the main purpose for pedestrians to move between different land uses. The significant presence
303 of pedestrians in the neighbourhood reflects that most of the mobility trips are walking trips. Despite
304 the importance of the pedestrian travel mode, the design consideration for pedestrian facilities across
305 Fereej Abdul Aziz are very minimal. According to the observation survey, vehicles are considered the
306 main mode of travel with a clear absence of pedestrian sidewalks and cyclist lanes [Figure 12, a]. The
307 neighbourhood is, thus, characterized by unsafe street life where pedestrians and cyclists are mixed
308 with vehicles [Figure 12, b]. Consequently, the mobility patterns in Fereej Abdul Aziz need
309 improvement to comfortably accommodate all street users and to support the adjacent land uses
310 [Figure 12, c].

311 The traditional urban patterns of pedestrian streets (*sikka*) that reflect the Qatari past, have
312 been lost and replaced by vehicle-dominated streets and indiscriminate parking that create pedestrian
313 barriers which isolate residents from the sense of community [Figure 13]. It has been observed that the
314 streets lack signage system, which affects the neighbourhood's legibility. Therefore, it can be stated
315 that social connectivity and legibility are constrained in most locations.

316 According to Ministry of Municipality and Environment (2014), higher densities of population
317 have been exhibited within the C-Ring Road, but outside the C-Ring the population densities are far
318 less, with no promotion of mixed-use centers or employment hubs to promote increased densities,
319 accessibility, convenience and vitality. This existing pattern of development has promoted low density

320 urban sprawl, which in turn is highly dependent on the private vehicle for access to highly centralized
321 locations of employment, shopping, and public facilities.

322 Based on the survey of residents' preferences, 50% of the respondents consider their work
323 travel distance as a significant travel consideration. Therefore, streets connecting work places and
324 houses should be highly accessible. Moreover, diverse modes of travel are preferred to access the
325 different facilities in Fereej Abdul Aziz. The main mode of travel is public transportation (75% of the
326 respondents) which implies the need for integrating taxis and public buses in the street network design
327 [Figure 14].

328 ***Analysis of the Social Aspect: Housing Diversity***

329 Housing diversity is a significant social parameter to investigate land use dynamics. It is a mix of
330 housing that supports socially-cohesive communities while enabling efficient urban operation. This is
331 viewed in terms of the income level and age group of the residents as well as housing typologies.

332 According to Ministry of Development Planning and Statistics (2015), the rapid population
333 growth in Doha is anticipated to continue for the next years where employment growth is expected to
334 increase supporting Qatar's position as a host for the FIFA World Cup 2022. The income level of
335 Fereej Abdul Aziz residents is characterized as low in which 63% of the respondents earn a monthly
336 salary less than 20,000 Qatari Riyals [Figure 15]. According to Colliers International (2014), an
337 analysis of monthly income levels suggests that the low-income bracket is defined as less than 20,000
338 Qatari Riyals which affords rental levels between 1,700 and 6,800 Qatari Riyals per month. Housing
339 diversity and affordability is, therefore, considered a critical need for the local residents of the
340 neighbourhood.

341 According to Ministry of Development Planning and Statistics (2015), Fereej Abdul Aziz has a
342 total of 3,324 housing units in which 40 units are villas, 245 units are Arabic houses (traditional
343 courtyard houses or single-story villas), 2,990 units are apartments, and 49 units are separate rooms as
344 part of establishment buildings. Housing diversity in Fereej Abdul Aziz is represented in the form of
345 mix of apartment typologies. Based on the regulations, the neighbourhood is originally planned for 10-
346 stories apartment housing typologies: 20% studio apartments, 40% one-bedroom apartments, 30%

347 two-bedroom apartments, and 10% three-bedroom apartments of the total housing (Ministry of
348 Municipality and Environment, 2014). However, it can be stated that housing lacks a regulated mix of
349 housing typologies.

350 Similarly, housing availability for the low-income residents is not envisioned where medium to
351 low-quality apartments are dominant. Most of the housing is devalued through neglect, lack of
352 services, and incompatible built form [Figure 16]. The quality of housing is considered low as a result
353 of the random practices of residents. Random gatherings in front of retail shops were observed along
354 the street, which indicates that there is a need for open spaces. The existence of such spaces can
355 provide recreational and aesthetic values to residents as well as serving a variety of
356 psychophysiological values related to neighbourhood attachment and community belonging. This
357 discourages nationals to move back to the downtown therefore limiting future housing diversity and
358 imbalances the demographic structure of the neighbourhood.

359 According to the survey of the residents' preferences, 48% of the respondents prefer diverse
360 housing typologies such as villas followed by 26% for compound apartments. Lifestyle-based housing
361 is preferred through the development of residential compounds where 72% of the respondents prefer
362 serviced compounds and 28% prefer high-rise apartments [Figure 17]. Residential compounds provide
363 mixed housing typologies supported by common gathering places where diverse housing attributes can
364 be met, such as typology and cost. Generally, the social environment of the neighbourhood would be
365 revived if diverse housing typologies were accessible to diverse groups of residents.

366 **Reflection on the Land Use Dynamics of Fereej Abdul Aziz Neighbourhood**

367 The analysis has shown that the land use mix in Fereej Abdul Aziz complies with Perry's
368 Neighbourhood Concept, in which commercial and retail land uses are located along the perimeter
369 (Perry, 1929). Residential and commercial land uses are fairly distributed. However, the lack of open
370 spaces affects the public realm and devalues the quality of the physical and social environments.
371 Fereej Abdul Aziz lacks the existence of an institution at the centre, due to the governmental planning
372 vision of the downtown area as an economic hub for the city. Fereej Abdul Aziz lacks accessibility

373 which calls for a significant need for pedestrian, cyclist, and public transportation accessibility, safety,
374 and legibility considerations.

375 Despite being one of Doha's old neighbourhoods with vibrant commercial activities, Fereej
376 Abdul Aziz lacks basic public realm infrastructures, such as sidewalks, vegetation, street furniture, and
377 designated parking. Based on the questionnaire survey, the physical and mobility aspects of Fereej
378 Abdul Aziz are highly signified, in which 47% of the respondents prefer location and accessibility
379 considerations. This is followed by the neighbourhood facilities where 20% of the respondents prefer
380 serviced and facilities-supported living that meets their diverse lifestyles. However, 35% of the
381 respondents have considered the neighbourhood and neighbours as a not important consideration
382 which reflects the lack of neighbourhood attachment– devalued social aspects [Figure 18].

383 A proposal is developed to support sustainable neighbourhoods which aims to promote
384 integration of housing, workplaces, shopping, recreation, and community facilities, linked by walking,
385 cycling, and public transportation networks. It integrates the three land use planning approaches
386 (developed by the Ministry of Municipality and Environment, 2008 and 2015 in addition to the edited
387 map by authors based on the observation survey). The land use dynamics are concluded based on the
388 analysis of the physical, mobility, and housing diversity aspects, taking into account the survey of the
389 residents' preferences.

390 A community center is introduced in the center of Fereej Abdul Aziz to create the base for
391 social gathering and community bonding. Vacant lands in the south, east, and west of Fereej Abdul
392 Aziz have been transformed to green open spaces for recreation and urban revival purposes. Likely,
393 major improvements to the mobility aspect are attempted where accessibility, diversity, and
394 connectivity should be considered. Integration of all modes of transportation are considered for the
395 local street network by applying Complete Streets concept. The social aspect is improved through the
396 provision of affordable lifestyle-oriented housing to insure diversity, accessibility, and equity
397 measures. This can be addressed through the provision of mixed-use residential developments (such as
398 residential compounds) that account for housing preferences and diversity. The suggest proposal is

399 attempted for Fereej Abdul Aziz towards a policy-oriented vision to downtown neighbourhood
400 enhancement that serve the country's approach towards urban and community development.

401 The proposal is developed based on the following, [Figure 19]:

402 **Physical aspects:**

- 403 • The vacant land in the center is replaced with an institution based on users' preferences, such as a
404 community center, a school, a mosque, or any other form of community places. The location of the
405 institution can be in the center, as in Perry's theory, or other location based on the setting of the
406 neighbourhood.
- 407 • Vacant lands should be assessed by the local authority based on the land use classification to
408 balance and ensure the diversity of land use mix. In the case of Fereej Abdulaziz, a number of
409 vacant lands along the perimeter have been replaced with green open spaces serving as the
410 neighbourhood's pocket parks for recreational and social bonding activities.

411 **Mobility aspects:**

- 412 • Implementation of Complete Street concept in neighbourhoods where the different modes of
413 transportation should be integrated (automobiles, pedestrian and cyclists) depending on the need
414 and the size of the streets. Accessibility and safety measures are highly considered.
- 415 • Provision of private and public open spaces that are accessible to all residents.
- 416 • Provision of car parking and safe access to different buildings within the neighbourhood.
- 417 • The metro station is envisioned to provide a transit-oriented improvement and enhanced
418 accessibility measures in the neighbourhood where public transportation modes are provided.

419 **Social aspects**

- 420 • Study of residents' cultural backgrounds and the demographic structure of the neighbourhood.
- 421 • Diversity of housing typologies are proposed based on the study of the demographic structure of
422 the neighbourhood.
- 423 • Provision of building typologies that meet the future vision of the neighbourhood, such as
424 residential compounds.

- 425 • Increase housing affordability to match different cultural backgrounds and income groups
426 available to the community within the zone. Increase a specific housing typology based on
427 residents' preferences.
- 428 • Provision of open spaces for recreational purposes and to enhance the social interaction.

429

430 **Conclusion**

431 This study emphasizes the importance of investigating the land use dynamics and studies the
432 consequences of land use change in emerging cities. It is essential for policy makers to analyze the
433 changes of land use in order to place decisions that can be support the future circumnutates of a certain
434 context. In the case of Doha city, and like any emerging city, the extensive changes in land use occur
435 as a result of major economic and infrastructural development.

436 The overall analysis of Fereej Abdul Aziz has led to developing a proposal for downtown land
437 use planning through the analysis of three land use approaches, and the land use parameters that
438 concluded from Perry's theory and other earlier studies. Summaries of the physical, mobility, and
439 social aspects are discussed based on the current realities of urban governance. This is to achieve an
440 improved policy-oriented vision for land use development or enhancement for the downtown
441 neighbourhoods in Doha.

442 It is concluded that the analysed land use dynamics in Fereej Abdul Aziz have resulted in
443 disjointed built environment. The land use dynamics were ineffective in responding to urban realities,
444 placing more emphasis on the economy and neglecting social and cultural realms of development.
445 Downtown Doha presents challenges that have resulted in an irregular and inadequate public realm.
446 The trend of land use planning in downtown Doha is said to be unregulated as it reflects the
447 preferences of developers and not residents (end-users).

448 In terms of the physical aspect, the current zoning and development practices promote the
449 domination of single-use commercial corridors, with the existence of significant number of vacant
450 lands. In terms of the mobility aspect, some of the commercial shops are difficult to access by foot or
451 bicycle which are confirmed to be a major mode of transportation. In downtown Doha, a little

452 attention is given to the design of neighbourhoods, where there is a lack of connectivity and
453 accessibility. However, a promising governmental attempt highlights the transit-oriented development
454 of the downtown which would fulfill the neighbourhood needs. In terms of the social aspect, the
455 reality shows that real estate developers have focused on quick housing solutions to accommodate the
456 growing, diverse population and less consideration are given to the low-income residents which are
457 the majority of the downtown population. The underpinning of successful planning is to equalize
458 access to housing among different cultural diverse groups. Accordingly, the diversity of the downtown
459 neighbourhood residents requires that planners to consider community and participatory methods,
460 otherwise they risk relying on misconceptions. Advocacy role can be played by real estate experts to
461 encourage an informed public discourse on the development of downtown neighbourhoods in Doha.
462 This can be done by support local mechanisms for community participation such as establishing an
463 urban forum at the neighbourhood scale and launch a public awareness campaign.
464

465 The planning approach should play an active role in guiding the neighbourhood through
466 sustainable solutions in terms of economic, social, and environmental expansions, which should be
467 sought jointly and simultaneously through the planning process. This indicates that sustainable
468 development should be an integral part of planning, especially for historical neighbourhoods that are
469 developed to respond to social needs and individual preferences, as in the case of Fereej Abdul Aziz.

470 The study empirically investigates the dynamics of Doha land use of downtown
471 neighbourhoods as an example of emerging Gulf Cooperation Council (GCC) Cities. It reflects the
472 lesson learned during the analysis and therefore the required actions that help emerging cities in other
473 countries to achieve sustainable development and to deal with challenges of physical, mobility and
474 social aspects. Neighbourhood planning is a process for providing healthy and livable human
475 settlements. It helps in deciding objectives both in quantitative and qualitative terms. It is a setting of
476 goals on the basis of objectives to be pursued and achieved by the administrative authorities. The
477 efficiency of physical and mobility aspects in neighbourhoods depends on actions taken by national,
478 regional and local authorities. The efficiency of social aspects depends on developers who should
479 assess the integration of social aspects into neighbourhood planning and design, with the social and
480 well-being influences on the established plans. Neighbourhoods are dynamic places, where public
481 areas, housing, and mobility all offer unique opportunities for developers. This is to create potential

482 positive social impacts and benefits that include strengthening community bonds, enabling access to
483 jobs, and making streets safer for all. The three mentioned aspects are important facilitators for the
484 urban growth and for the sustainable development in emerging cities. In this sense, the article
485 contributes to the understanding of concrete development mechanisms, which are not a derivative
486 from but an integral part of transformation of emerging cities in other countries.

488 **Data Availability Statement**

489 All data, models, and code generated or used during the study appear in the submitted article.

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