

Assessment of Social Sustainability in Urban Regenerated Neighborhoods in the United Arab Emirates: A Local Community Perspective

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Abstract— Derived by its current 2030 Urban Structure Plan, Al-Ain City is currently experiencing an active urban regeneration process through the revitalization of existing neighbourhoods and districts. One of the pioneering projects within this plan is the Asharij district urban redevelopment as a new Gateway Transit Corridor. This study focuses on Bida' Bin Ammar neighbourhood as the most important neighborhood in this district. Based on the developed conceptual framework for social sustainability principles and their relevant indicators on the urban neighbourhood level, six main principles with their related indicators were identified from literature. These principles include availability of basic needs, accessibility, social equity, safety, social coherence, and sense of identity. The research adopted a qualitative case study method that permitted in-depth neighborhood exploration through appropriate investigation tools of field observations and in-depth interviews with a sample of residents of the selected neighborhood. The findings show that four principles have been mostly achieved, namely, availability of basic needs, accessibility, social equity, and sense of identity. Meanwhile, the remaining two principles of safety and social coherence have been assessed as poorly or not achieved respectively. The research outcomes highlight the importance of local community perspectives about the neighborhood regeneration process in order to improve its future implementation.

Index Terms— Social Sustainability, Urban Regeneration, Neighborhood, Local Community, United Arab Emirates, Al Ain

I. INTRODUCTION

In recent decades, social sustainability has started to receive significant attention as a critical aspect of Sustainable Development and Sustainability in general. Several research works on social sustainability has been undertaken to investigate its impact on urban planning and urban regeneration of neighbourhoods and districts [12]. The main objective is centered around designing sustainable urban communities, that besides the well-recognized environmental and economically dimensions, focuses also on developing a framework for socially viable communities [3]. Accordingly, sustainable development should be referred to as a resource-use pattern that attempts to fulfill human needs while simultaneously maintaining the environment,

so that these needs could be satisfied, not just for the present generation, but also for future generations 4.

On another front, urban regeneration is generally having a social dimension throughout the sustainable approaches 5678. Urban regeneration activities are essential pillars of city redevelopment, where the main goal of urban redevelopment is to enhance the urban environment to meet people's evolving economic and social requirements. The significance of urban regeneration process emerges in multiple facets including rebuilding dilapidated buildings, conserving historic structures, enhancing urban open spaces, and improving the efficiency of road networks and other infrastructures. However, while urban regeneration may effectively serve to sustain the function and viability of urban centers, it can also lead to potentially detrimental social concerns such as social exclusion, gentrification, and social life discontinuity, among others 9. Furthermore, the idea of "neighborhood" and "social life" has been the key focus of the investigation in redeveloped built environments. As a result, urban regeneration processes that consider the attainment of social sustainability have emerged as a mainstream policy for the creation of "sustainable communities" 10. A recent study on urban social sustainability reveals one of the major limitations of the present research where despite the emphasis on the significant role of urban form in achieving urban social sustainability, it is still not clear how exactly an urban area can be (re)designed to meet the social needs of its residents 11.

The United Arab Emirates (UAE) is regarded as one of the avant-garde countries that have implemented pioneering strategies to attain sustainability in all domains of urban development including housing 3. Hence, along the adopted sustainability path, the UAE local and federal governments intend to create the right combination of economic and social growth while ensuring sustainable development and environmental preservation. To that aim, the National Agenda of the UAE's Vision 2021 focuses on improving air quality and enhancing clean energy contributions. Furthermore, to improve the quality of life of its residents, this Agenda has set a goal of providing sufficient and efficient housing for UAE nationals 12. Accordingly, the Urban Planning Council of Abu Dhabi proposed 'Plan Al Ain 2030', with the main objective to make a difference for Al Ain's future generations by designing structures that enhance sustainable social, cultural, environmental and economic aspects of the city in general and its housing in specific. The growth of Al Ain for the coming quarter-century is shaped by conceptual solutions that are taken from the Urban Structure Framework Plan of Al Ain Plan 2030 13. Currently Al-Ain city is experiencing urban redevelopment and in different areas especially in Asharij district. It is dubbed Gateway Transit Corridor in Plan Al Ain 2030, with its significant urban regeneration processes in the recent years. This study is focusing on Bida' Bin Ammar neighborhood where the main redevelopment activities have taken place 13.

Sustainable redevelopment of urban neighborhoods is a complex, multi-purpose, and challenging process, where many unaccounted-for issues may emerge throughout the redevelopment process 14. As mentioned above, with the increasing attention that social sustainability within the neighborhoods is receiving in recent literature on urban planning and urban regeneration, however, most of the research about sustainability in the UAE, in general, and in the field of sustainable urban redevelopment in specific, has been concentrated on the

environmental aspects of sustainability. Little research has been tackling the issue of social sustainability in the regeneration of existing neighborhoods 15.

II. RESEARCH AIMS AND QUESTIONS

The study aims to explore how socially sustainable the selected existing neighborhood has become after experiencing the urban redevelopment process. This exploration is undertaken through utilizing a suggested assessment method encompassing the principles, indicators and measuring tools for social sustainability achievement on the redeveloped neighbourhood level. It is envisaged that the findings of this research could help the decision-makers and urban planners, not only in the UAE but also in other GCC (The Cooperation Council of the Arab States of the Gulf) countries, to appropriately address the social aspects of sustainability in urban redevelopment processes of existing neighbourhoods. To achieve its main objective, the research poses these questions:

1. What are the principles and indicators for achieving a socially sustainable urban neighborhood?
2. What is the selected case study and how it was selected?
3. What is the implemented urban redevelopment process in Bida' Bin Ammar neighborhood?
4. What are the appropriate assessment tools of the determined social sustainable neighborhood indicators and principles?
5. What are the behavioral field observation in Bida' Bin Ammar neighbourhood after the urban redevelopment?
6. How the local community members perceive the change related to the social sustainability principles and indicators in their neighborhood after the urban redevelopment?

III. METHODOLOGY

A. Research Design

Based on the research questions, a qualitative case study research method has been applied in this study to investigate and assess the level of consideration of the principle and indicator of the social sustainability pillars in the urban redeveloped neighbourhood in Al Ain City. To address the first research question comprehensive literature review was conducted to determine the main principles of social sustainability in urban regeneration to establish a conceptual framework based on a set of related indicators and principles. The framework was developed while considering the local circumstances of urban neighborhoods in the Arabian Gulf region, in general, and the UAE in specific.

As for answering the second question, the research adopts the case study method that permits in-depth investigation of the addressed questions in appropriately selected neighbourhood as a case study. First, Al Ain city was chosen for the field study due to its significance as one of the cities in the UAE that has experienced urban redevelopment projects to accomplish the Al Ain Plan 2030. The selected case study neighborhood is Bida' Bin Ammar Fig. 1 in Asharej district. This neighborhood is the most appropriate urban setting to study the research issues as it is a

pioneering context that has undergone through profound urban regeneration process. On the other hand, the neighborhood forms a link between Al Ain city center (downtown) and Al Maqam district that accommodated the UAE University campuses. According to Al Ain Plan 2030, this urban link will be developed into a new center for Al Ain city.

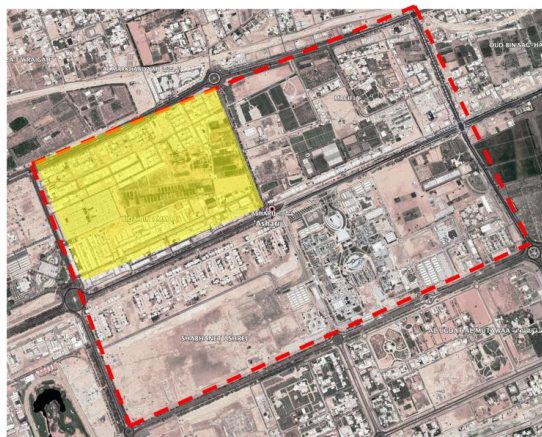


Figure 1. Selected case study location

Historically as conveyed by the current elderly residents, Bidaa' Bin Ammar was first occupied by random tents and later a farm was established for the royal family of Abu Dhabi. After the establishment of Tawam hospital and the UAE University, construction starts to host the accommodation for the hospital staff and university faculty and students due to the close location of the neighborhood. Students' dorms were built on the northern part of the neighborhood. These dorms consisted of separate villas where each villa hosted around six students. In the center there was a cafeteria and a sports area. These facilities are abandoned now and are used randomly by residents. During late 90s, some villas have been distributed to citizens and a market was built to satisfy their needs. Starting from 2000, private development started to appear as gated communities to attract people. In the recent years the area also has become an attraction for businesses. With its very recent urban redevelopment, the neighborhood could be considered an urban memory with significant evidence of layers of urban development since the union of the UAE in 1970s.



Figure 1. Observed urban spots.

To answer the third question about the implemented urban redevelopment process in Bida' Bin Ammar neighborhood and its urban outcomes, secondary data about the process was collected through satellite images from google earth along a time span of before and after the urban redevelopment process. This was supported by filed visits to better understand the urban redevelopment activities.

The appropriate assessment tools in the case study analysis were determined based on the type of investigation and the research main objectives as reflected in the fifth and sixth questions. So, as detailed below, the study employed two qualitative assessment tools; behavioral field observations for two weeks and in-depth interviews with a sample of residents, respectively.

As this type of studies has not been conducted before, thus, this research should be perceived as a pilot study forming the launching base for more wider and in-depth investigations that involves a representative sample of residents in a way that credibly reflects local community opinion and behavior. For such further research a questionnaire will be prepared and administered based on the findings of this pilot study.

B. Behavioral Field Observation

The observer used two techniques, first, participant observation where the observer acted as resident and experienced different urban contexts through walking. Second, recorded behavioral field observation, where the observer recorded behavioral observations while roaming with her car in the neighbourhood. During both observation sessions over two weeks in different timing of the day, WhatsApp mobile application was used to take field notes since it has different ways of capturing information from writing, voice recording and photographs. This allowed the observer to take notes immediately while observing. Also, the used smart phone device enabled the observer to capture high resolution pictures and videos associated with the accurate locational information for each of them. Fig. 2 below shows the main important urban spots that were observed.

C. In-Depth Interview

The in-depth interview process was applied in order to assess the opinions of the residents' of Bida' Bin Ammar neighborhood after the redevelopment. This is envisaged to introduce new aspects about the investigated issues and shed light on the problems they might have faced in their neighborhood. The interview questions were developed as semi-structured interviews (see appendix B). According to the pilot nature of this research, the in-depth interviews were performed with mixed nationalities 10 residents of Bida' Bin Ammar neighborhood. To facilitate the interviewing processes all interviewees were reached first through personal connections to secure their initial approvals to take part in the interviews. A total of 9 respondents were interviewed face-to-face, while 1 respondent was interviewed through Zoom meeting. The interviews duration ranged between 15 to 20 minutes. Moreover, the respondents were selected from different locations in the neighborhood to avoid locational bias and to guarantee that most residents' experiences after the urban redevelopment are explored.

Thematic analysis was undertaken after the interviews to extract themes from the manuscripts of the interviews by studying the word and sentence structure. Coding up was applied to analyze the in-depth interviews to find out common themes and concepts. The data were analyzed by identifying the responses' categories which are a set of replies that can be grouped because they are part of repetitive themes from each open-ended question. Accordingly, each repetitive theme was coded and correlated with each relevant principle and indicators in order to evaluate each indicator based on the total attained number of each theme.

D. Assessment Criteria

For the assessment, the initialed conceptual framework for the main principles and indicators for socially sustainable urban redeveloped neighborhood was applied. The application of the field observations and the in-depth interviews tools was used to assess the behavior and the opinion of residents regarding the defined social sustainability principles. The assessment was based on a qualitative scale, which expresses the level of achievement of each principle. The scale includes five levels of achievement, first, 'fully achieved' where all indicators are achieved, second, 'significantly achieved' where around 75% or more of the indicators are achieved, third 'partially achieved' where around 50% of the indicators are achieved, forth 'poorly achieved' where 25% of the indicators are achieved and finally 'not achieved' where none of the indicators are achieved.

IV. SOCIAL SUSTAINABILITY PRINCIPLES FOR URBAN REGENERATION OF EXISTING NEIGHBORHOODS

This section concludes by proposing a theoretical framework for assessing social sustainability in old urban neighborhoods. To provide a sufficient and successful theoretical framework, several measures must be satisfied for relevant indicators to be established. For example, the indicators should be appropriate to local conditions, focusing on urban redevelopment and social equality. Indicators must be relevant, believable, conceptually sound, and scientifically/theoretically sound. They should be capable of representing relevant concerns and reflecting the interests and perspectives of many stakeholders 16.

First, Basic Needs, this principle enhances the social sustainability in the old neighborhoods through developing sustainable urban land-use structures. Basic needs is achieved by the provision of different activities such as educational facilities, recreational facilities, children and youth physical activities, religious, retail and tourist destination.

These results, in creating a livable neighborhood to encourage the residents for social interaction 1718. In addition, creating jobs opportunity by developing the old areas within the neighborhood 5. Furthermore, in order to achieve a sustainable neighborhood, The design of the community should encourage a high level of walking and cycling. This might be accomplished by creating safe, attractive, well-maintained and comfortable pathways and bicycle networks, as well as a linked street plan with appropriate catchment distances among services and facilities 5.

Second, Accessibility is a key concept in achieving social sustainability. Residents must be able to live, work, and participate in cultural and recreational facilities without traveling too far 16. Community facilities and public transit stops should be located within a walking distance of houses. It is visible to locate all services around

the transportation node to create an accessible and focal point for users and residents. In addition, citizens should have easy access to the surrounded neighborhood via efficient public transportation, and pedestrian connections such as tunnels or bridges. to enhance a safe environment for residents when crossing the main streets 17.

Principle	Indicator	Evaluation tool
1. Basic Needs	1.1 A hierarchy of services and facilities of different capacities and scales	FO, IDI
	1.2 Provision of children and youth physical and sport activities.	FO, IDI
	1.3 Provision of shaded, well-lit, pleasant, and comfortable pedestrian and cycling routes leading to all services and community facilities.	FO, IDI
	1.4 Provision of pleasant public transportation stop	FO
	1.5 Provision of tourist destinations	FO
	1.6 Provision of a wider range of job opportunities and facilities including a diverse shopping center, banks, several pubs and cafes, health center, schools, and mosque.	FO, IDI
2. Accessibility	2.1 Services and facilities are located within walkable and bikeable distances through well-defined pathways/ cycling lanes for all ages and residences.	FO, IDI
	2.2 Connection with the surrounded neighborhood through pedestrian and cycling.	FO, IDI
	2.3 Accessible and connected transport corridors and nodes by pedestrian and cycling from all facilities and activities. (Accessible to people of all ages and abilities)	FO, IDI
3. Social Equity	3.1 Accessible community facilities and services for all ages and users.	FO, IDI
	3.2 Provision of a wide range of housing choices in sort and design.	FO, IDI
4. Safety	4.1 Good visibility at night, street lighting and accessibility of spaces.	FO, IDI
	4.2 Safe and clear pedestrian lanes	FO, IDI
	4.3 Safe streetscape and open spaces.	FO, IDI
	4.4 Safe and clear cycling lane	FO, IDI
	4.5 Safe public transportation stops	FO, IDI
	4.6 Set speed limits linked to livability for higher density urban areas (e.g., 50km/h) and for inner streets (e.g., 15km/h)	FO
5. Sense of Identity	5.1 Good physical quality and maintenance of the built environment	FO, IDI
	5.2 Preservation of urban image, identity, and heritage building value within its historical character	FO
	5.3 Preserving the traditional practices of the local society	FO
6. Social Coherence	6.1 Provision of social gathering spaces. (e.g., public open spaces, plazas, community parks)	FO, IDI
	6.2 Encouraging the community to involve in the renewal process.	IDI

Table 1. Theoretical Framework for Socially Sustainable Urban Regeneration Old Neighborhood. FO: Field Observation, IDI: In-Depth Interview

Third, Social Equity indicates that the facilities and services provided locally are available to individuals of all ages, genders, nationalities, social levels, and physical abilities 18. The differences in the housing choices and types within the community will enhance the equity between all-income people 19.

Fourth, Safety entails the provision of safe, secure, and accessible spaces for all members of the neighborhood redevelopment residents and visitors 8. Additionally, traffic calming measures, good visibility, and the provision of safe and connected mobility networks should all be developed in public areas within the neighborhood 17.

Fifth, Sense of Identity is a principle that aims to enhance the identity and image of the neighborhood. This could be achieved through the preservation of urban image, identity, and heritage building value within the neighborhood and preserving the traditional practices of the local society. These results reflect a sense of belonging and 1. Furthermore, the good physical quality of the services and streets of the neighborhood increases the satisfaction with the neighborhood images among residents 5.

Sixth, Social Coherence, building places for gathering and interaction such as community parks, public open spaces, and plazas is necessary for achieving social interaction 20. It is also about the right to participate in the community and engage with other members of the community. It entails the coexistence of culturally and socially different populations in societies where individuals participate in a wide range of social activities and the prevention of social exclusion 5.

V. FINDINGS: SOCIAL SUSTAINABILITY ASSESSMENT OF ASSESSMENT OF SOCIAL SUSTAINABILITY IN REDEVELOPED BIDA' BIN AMMAR NEIGHBORHOOD

A. Bida' Bin Ammar Neighborhood after urban redevelopment from a resident's perspective

Basic Needs: the first investigated indicator is the hierarchy of services and facilities of different capacities and scales. During the interviews with the local residents of Bida' Bin Ammar neighborhood, they claimed that most of services are available after the redevelopment but a few of them mentioned that some services are still missing or not close enough to them, such as a public park, gym, big supermarket, outdoor sports facilities, kindergarten, toddler play area, and cafeterias. So, this indicator is 'Significantly Achieved'.

The second investigated indicator is the provision of children and youth physical and sport activities. Most of the interviewed residents indicated that there are no youth activities and sport facilities for adults and children. So, this indicator is 'Not Achieved'. The third evaluated indicator is the provision of shaded, well-lit, pleasant, and comfortable pedestrian routes leading to all services and community facilities. All interviewed residents of the neighborhood affirmed that walking within the neighborhood after development is not comfortable because the quality of the pedestrian lane is significantly low, where the pedestrian lane is not paved with materials suitable for walking, besides the lack of sitting equipment, shading trees, and well-defined pedestrian crossing. Furthermore, most of the interviewed residents mentioned that the quality of lighting at night is low in some areas. Meanwhile, some of the residents

claimed that walking along the main street is somehow possible. These results indicate that this indicator is 'Poorly Achieved'. In addition, the fourth indicator is the provision of shaded, well-lit, pleasant and comfortable pedestrian routes leading to all services and community facilities. All interviewed residents mentioned that the bus stops are not convenient for them to use because there are no seats and no shading. As a result, the evaluation of this indicator indicates that it is 'Not Achieved'. The above results illustrate that the principle of 'Basic Needs' is 'Partially Achieved'.

Accessibility: the first investigated indicator is Services and facilities are located within walkable and bikeable distances through well-defined pathways/cycling lanes for all ages and residences. Most of the interviewed residents who are living in apartments or single-family houses within Bida' Bin Ammar neighborhood mentioned that it is difficult for them to reach the main services on foot, and they need to use their cars to do so. This is even not easy because of the cul-de-sac street pattern and disconnected street grid. Only interviewed residents living in Mreifa Villa Compound claimed that it is easy for them to reach some of the community facilities like mosque, swimming pool and supermarket. Actually, most of the services are placed along the main streets and a few number of them are distributed among residential clusters with no consideration of the appropriate catchment distances. Also, a majority of the interviewees claimed that they cannot easily reach the services by walking because the internal pedestrian lanes are not connected and not integrated, which causes a feeling of being lost inside the area. Because of that, some of the residents who are living closer to the main roads used to go to other nearby districts to satisfy their daily and casual needs. These results indicate that this indicator is 'Partially Achieved'. The second evaluated indicator is Connection with the surrounded neighborhood through pedestrians and cycling. The majority of the citizens of the neighborhood claimed that there are no connections between the neighborhood and its surrounding and therefore it is dangerous to pass from the neighborhood to another nearby neighborhood due to the high speed of cars. Also, there is no pedestrian bridge or subway that connects the neighbourhood with its the surroundings. As a result, this indicator can be considered as 'Poorly Achieved'. The third assessed indicator is Accessible and connected transport corridors and nodes by pedestrians and cycling from all facilities and activities. Among interviewed residents, only a few of them living near by the main streets claimed that it is easy for them to reach the bus stop by walking, while the rest of the residents living in the center of the neighborhood mentioned that it is not easy for them because there is no bus stop near to their homes. Furthermore, some of the residents mentioned that having bus stops for schools' buses will help children be safe while waiting for their school buses. These results make this indicator 'Partially Achieved'.

Social Equity: the first evaluated indicator for this principle is Accessible community facilities and services for all ages and users. most of the interviewed residents mentioned that all services and facilities are accessible for all ages and users despite they are not always easily accessible by car from within the neighbourhood, as discussed in the previous principle. Thus, this indicator can be considered 'Significantly Achieved'. The second investigated indicator is the provision of a wide range of housing choices in sort and design. Most of the residents in the neighborhood either live in two- and three-bedroom apartments or in single-family houses in

gated communities. As a result, this neighborhood provides diverse options of housing choices. Therefore, this indicator is evaluated as 'Fully Achieved'.

Safety: the first and the second evaluated indicators are good visibility at night, street lighting and accessibility of spaces, and Safe and clear pedestrian lanes, respectively. Most of the interviewed residents claimed that they do not feel safe while walking in and around the neighborhood during the day, due to the obstructed, unpaved, and narrow pedestrian lane. This feeling is also affirmed by the disconnected pedestrian network, and high car speed due to of the insufficient traffic calming measures. Furthermore, most of them mentioned that they do not feel safe while walking or driving at night within the neighborhood. The reason for this is the insufficient lighting in the internal streets and the mixed nationalities. Furthermore, most of them claimed that they might change their routine routes because, as they mentioned, in some corners of the neighborhood there are gatherings of a number of potentially dangerous people! Based on these results, these indicators are considered 'Poorly Achieved'.

The third investigated indicator is safe street-scape and open spaces. Most of the interviewed residents affirmed that there are a lot of children playing freely in the streets due to the lack of public parks or play areas within the neighbourhood. This negatively affects the safety level within the street-scape and also for the children. Furthermore, most of the interviewed residents claimed that the speed of private cars is relatively high as discussed earlier. The above investigation revealed that this indicator is 'Poorly Achieved'.

The fourth investigated indicator was a safe and clear cycling lane, a great majority of the interviewed residents claimed that it is not possible to cycle within the neighborhood because there are no dedicated cycling lanes. Furthermore, they claimed that it is not safe to share the vehicular lane while cycling. Also, it is not comfortable to them to cycle along the pedestrian lane. This indicator is therefore considered 'Not Achieved'.

Sense of Identity: the first investigated indicator is good physical quality and maintenance of the built environment. The majority of the interviewed residents asserted that the neighborhood is clean, and the cleaning trucks come regularly to collect garbage and clean the streets. Furthermore, they claimed that the physical condition of the streets is very good, while most of them said that the internal streets beside their houses, as well as the pedestrian lanes, need maintenance. Meanwhile, some of the interviewed residents mentioned that most of the street redevelopment in the neighborhood has been within and beside the newly developed mixed-use blocks area. They feel that the redevelopment process is very slow and will not reach the residential areas. The above investigations revealed that this indicator is 'Significantly Achieved'.

Social Coherence: the first evaluated indicator is the Provision of social gathering spaces. A great majority of interviewed residents claimed that there are no open spaces for gathering such as public parks or even well-maintained and convenient pedestrian lanes. Additionally, the majority of the residents stated that they have never participated in voluntary work related to their neighborhoods. Therefore, this principle was found to be 'Not Achieved'.

B. Bida' Bin Ammar Neighborhood after urban redevelopment from behavioral perspective

As shown in Figure 3a, basic needs were clearly identified through observation. Many informal youth sport activities were repeatedly noticed in the vacant lots especially in the evening. Sometimes, dead-end streets are also used as playgrounds and cycling activities. Shading by trees were observed at the neighborhood border and through the colonnades of the mixed-used buildings (Figure 3b). The neighborhood contains different commercial activities, such as cafés, restaurants, spas, banks, offices, and private schools. This helped create diverse and available job opportunities.



Figure 3a. Existing informal sport activities in vacant plots.



Figure 3b. Existing shading walkways, walking and sport activities.

Accessibility, some parts of the neighborhood have been significantly redeveloped while other areas have been noticeably less redeveloped. Pedestrian walkways in the newly developed mixed-used areas are well defined, while there is a lack of well-designed pathways in the less developed area. Still, walking and cycling were frequently noticed towards some facilities especially supermarkets. Moreover, accessibility from some parts of the neighborhood towards the mixed-use area is not well defined either by car or on foot. As shown in Figure 4, there are available pedestrian crossings in the mixed-use area and its surrounding areas. Still, some people cross the road randomly to reach the next neighborhood.



Figure 4. Pedestrian crossing and cycling.

Social Equity, the neighborhood includes many housing options, such as apartments, single-family houses, and compounds with different facilities around. However, the housing option seem affordable for only medium to high-income individuals, hence, labor working in the newly developed mixed-use area usually live in other more affordable neighborhoods.

Safety, as shown in Figure 5, in some parts of the neighborhood, especially in the less redeveloped areas, the streets lack sufficient lighting posts where they are lit through the lighting fixtures on the facades of the buildings.

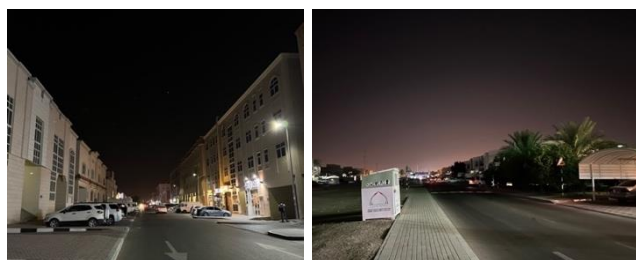


Figure 5. presence of streetlights around mixed-use areas and absence of streetlight in residential plots.

Sense of Identity: Figure 6 shows the old commercial area which is planned to demolished very soon to be replaced by a new mixed-use building. The architectural design of the new development generally tends to preserve the cultural elements and colors related to the original identity of the place. With the noticeable demographic transformation of the neighborhood from Emirati social housing to market housing many citizens left the neighbourhood and as a result several traditional practices have disappeared including outdoor seating and socializing in front of houses (Majlis). On the other hand, both existing and newly developed mosques are important social gathering spaces after prayers, so this practice is somehow still maintained.

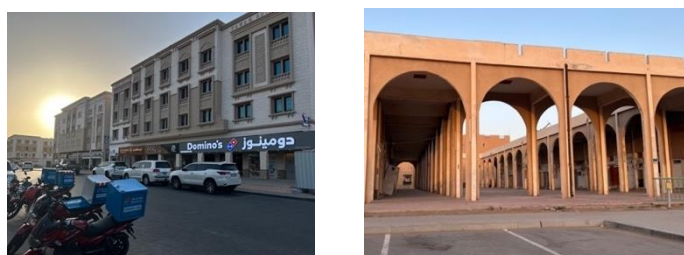


Figure 2. presence of old buildings and the representation of local architecture in the new developments

Social Coherence: There are no public spaces such as parks and plazas. Hence, residents had to create their own gathering spots as showing in Figure 7. Children play in empty parking area or sandy plots that have not been developed yet.

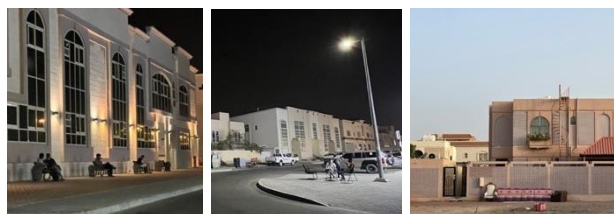


Figure 3. Presence of a few street furnishing to facilitate informal gathering for residents.

VI. DISCUSSION

Table 2 summarizes the final qualitative assessment of the in-depth interview, and the field observation tools. In brief, the findings indicate that both tools present almost similar results. However, the evaluation differs between expert analysis and local community perception for some indicators. It is important to remember that the neighborhood has not been fully redeveloped as it is practically divided into a more developed part around the newly constructed mixed-use area and the other part, which has experienced less redevelopment activities especially in terms of infrastructure. This division has been significantly reflected on residents' experience based on their location in the neighborhood after the redevelopment.

In the redevelopment of the neighbourhood various facilities have been added, which contribute to the provision of job opportunities and residents' basic needs. However, the local services and amenities are not equally distributed within the redeveloped neighborhood. The disconnected and low-quality walkways in some areas make reaching local destinations hard, and therefore negatively affect accessibility. Also, the cul-de-sac and disconnected street grid pattern force the residents to reach to local facilities via the main roads. The neighborhood is well connected with the surroundings through streets, but it lacks pedestrian crossings with some few exceptions where pedestrian traffic signals exist. Public transportation is not covering the whole neighborhood and some housing plots are not within the catchment area for local destinations. Social equity has been significantly achieved where all facilities are open for all factions of the local community, and there is a wide range of housing types such as apartments, villas, and compounds for medium and high income. However, low-income employees working in the redeveloped mixed-use area live in other neighbourhoods.

Table 2. Final qualitative assessment of the attainment of the social sustainability principles.

Principle	In-depth interview assessment	Observational assessment	Overall assessment
Basic needs	Partially achieved	Partially achieved	Partially achieved
Accessibility	Partially achieved	Partially achieved	Partially achieved
Social equity	Significantly achieved	Significantly achieved	Significantly achieved
Safety	Poorly achieved	Poorly achieved	Poorly achieved
Sense of identity	Significantly achieved	Partially achieved	Partially achieved
Social coherence	Not achieved	Not achieved	Not achieved

Since the neighborhood is going through redevelopment phases, it is essential to highlight the sense of identity. The neighborhood contains private properties, and since the area is changing towards commercial mixed-used, owners are demolishing and reconstructing their old buildings. The new developments represent in the building façades some traditional and Islamic design elements. The neighborhood also faces a profound demographic change, and the Emirati citizens are moving out the neighborhood. Hence, many local practices are disappearing. The physical condition of the streets is in good condition around the mixed-use area; however, the roads in the less developed area are not maintained.

Some main concerns have appeared during the investigation are related to social coherence and safety. The absence of cycling lanes, narrow pedestrian lanes, the lack of streetlight within the neighborhood, and a few speed humps have all led to mostly unsafe walking and driving, especially at night. In addition, many female respondents indicated that they do not feel safe walking partially due to mixed nationalities. Also, the neighborhood contains many abandoned buildings, which may cause informal activities. Moreover, children play freely in the streets due to the absence of public parks, kids play areas, and public plazas.

CONCLUSION

The analysis of the six main social sustainability principles and their related indicators on the neighborhood level, as defined in the study's conceptual framework, has indicated that only one of the principles, namely, social coherence, is 'Not Achieved.' Meanwhile, the Safety

principle is assessed as 'Poorly Achieved.' Another two principles, Basic Needs, and Accessibility, have been found 'Partially Achieved.' The remaining principle: Social equity is 'Significantly Achieved'.

It is believed that the findings of the study investigation and assessment could help develop a learning tool for redeveloping other neighborhoods to be more socially sustainable. Moreover, these findings contribute to the existing literature on the urban regeneration process and product in the UAE. In addition, the findings help identify the importance of local community perspective and behavior within the redeveloped neighborhood. Since this study is a pilot exploratory study, an in-depth investigation including a more significant number of families from the residents and a longer duration of observation are issues for further research. On another front, the study faced many limitations. First, is limited access to data specially for the historical background.

Second, is the nature of research as a pilot study due to the time limitation where the results are correlated directly to the selected case study, albeit it is possible to somehow generalize the findings due to the demographic and urban contexts similarities with other neighbourhoods which are/will experience urban redevelopment process. Third, is that some elements might have been missed in the conceptual framework due to time limitation.

Based on the results of the assessment, here are some recommendations for future neighborhood redevelopment that would help achieve more social sustainability:

- Enhance pedestrian connectivity through walkways and streetlights.
- Provide public open spaces with sports and recreational activities.
- Increase shaded and paved pathways.
- Add traffic calming measures to control fast cars.
- Establish social spaces that reflect the sense of identity.

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Appendix A. Detailed assessment of resident's perspective

Principle	Indicator	Repetitive Themes (X)	Total respondents who answered (X)	Perspective Evaluation
1. Basic Needs	1.1 A hierarchy of services and facilities of different capacities and scales.	All services available	4	Significantly Achieved
		No public park/ gathering area	7	
		No big supermarket	2	
		No gym for ladies and men	3	
		No outdoor sports facilities	5	
		No toddler play area	2	
		No cafeterias are distributed equally in the neighborhood	1	
		No kindergarten	2	
	1.2 Provision of children and youth physical and sport activities.	No gym for ladies and men	3	Not Achieved
		No outdoor sports facilities	5	
		No toddler play area	2	
	1.3 Provision of shaded, well-lit, pleasant, and comfortable pedestrian and cycling routes leading to all services and community facilities.	Not qualified pedestrian lane	5	Poorly Achieved
		No shading	10	
		No Sitting	10	
		No lighting	10	
		No water sprinklers	2	
		Not well paved	3	
		No pedestrian crossing	7	
		No exercise equipment	4	
		Walking along the main street is somehow possible	5	

		No cycling lane	10	
	1.4 Provision of pleasant public transportation stop	Not qualified/ no seating & no shading	10	Not Achieved
2. Accessibility	2.1 Services and facilities are located within walkable and bikeable distances through well-defined pathways/ cycling lanes for all ages and residences	Not easy to access by car/ Accessible by the main street	5	Partially Achieved
		Al-Ain Co-op Society-Al Bateen Branch	3	
		Supermarket easy to access	3	
		Mosque and swimming pool easy to access	1	
		Not accessible/ no connectivity (dead-ends)	5	
		Pedestrian lane not connected/ not integrated	8	
		Not qualified pedestrian lane	5	
		Use all Services/ easy to reach by car and walking	3	
		Use all Services available/ easy to reach walking	1	
	2.2 Connection with the surrounded neighborhood through pedestrian and cycling.	No pedestrian bridge or pedestrian crossing	10	Poorly Achieved
		No tunnel or subway	8	
		High car speed/ no speed obstacles on the main streets	5	
	2.3 Accessible and connected transport corridors	All bus stops located on the main streets	10	Partially Achieved

	and nodes by pedestrian and cycling from all facilities and activities. (Accessible to people of all ages and abilities)	No school bus stops	1	
		Accessible/ near to the house	2	
		Don't use public transportation	9	

3.Social Equity	3.1 Accessible community facilities and services for all ages and users.	Accessible for all ages and users by walking and cars	3	Significantly Achieved
		Not easy to reach by car/ Accessible by the main street	5	
	3.2 Provision of a wide range of housing choices in sort and design.	Department/ Two-bedroom	5	Fully Achieved
		Department/ Three-bedroom	1	
		Villa/ Two floor	1	
		Compound/ Villa two floor	2	
		Studio/ One-bedroom	1	
4.Safety	4.1 Good visibility at night, street lighting and accessibility of spaces.	Not safe/ no lighting	9	Poorly Achieved
		Not safe/ no speed obstacles (high-speed car)	8	
	4.2 Safe and clear pedestrian lanes.	Not safe/ dilapidated	2	
		Pedestrian lane not qualified to walk/ not well paved, narrow	5	

		Not safe/ mix nationalities	3	
		Not safe at night/ potentially dangerous people in some area	2	
	4.3 Safe street-scape and open spaces.	Car speed high/ No speed obstacles in front of the houses	9	Significantly Achieved
		Not safe/ children playing in the streets	10	
		car speed safe	4	
	4.4 Safe and clear cycling lane	No cycling lane	10	Not Achieved
		No lighting	10	
		Not possible and not safe/ cycling along the streets	3	
		Not possible/ cycling along the pedestrian lane	4	
		Not safe for adults and children/ no cycling lane	10	
	4.5 Safe public transportation stops	Not safe/ no side parking	10	Poorly Achieved
5. Sense of Identity	5.1 Good physical quality and maintenance of the built environment	Clean	10	Significantly Achieved
		Good condition of streets	6	
		Internal streets/ needs maintenance	4	
		Pedestrian lane/ needs maintenance	3	

6. Social Coherence	6.1 Provision of social gathering spaces. (e.g., public open spaces, plazas, community parks)	No public park/ gathering area	7	Not Achieved
		Pedestrian lane not qualified to walk/ no sitting	10	
	6.2 Encouraging the community to involve in the renewal process.	Not involved before	10	Not Achieved

Appendix B Interview Transcript

Section 1: Warming up

Section 2: Demographic Information

How old are you?

What is your nationality?

What is your marital status?

What is your academic qualification?

Section 3: Local Community Perspective Assessment

In the following questions, I will ask you to give your perspective and opinion about Bida' Bin Ammar neighborhood after the redevelopment in terms of availability of services and quality of infrastructure.

Num.	Principle	Indicator	Questions
1	Basic needs & Social coherence	1.1, 1.6, 6.1	Do you think after the urban redevelopment in your neighborhood all the facilities and services become available or not?
2	Accessibility	2.1	Do you use these services? Why?

3	Social Equity - Accessibility	2.1, 3.1	Do you find these services accessible for all users and ages? Why?
4	Accessibility, Basic Needs	1.3, 2.1	After redevelopment walking becomes possible in the whole neighborhood? Why?
5	Safety & Basic needs	1.3, 4.1, 4.2, 4.4	Is it comfortable to walk, in terms of shading, lighting, and sitting after the redevelopment of your neighborhood? Why?
6	Safety	4.1, 4.4, 4.6	Do you find it safe to walk at night and during the day after the redevelopment? Why?
7	Accessibility, Basic Needs	1.3, 2.1	After redevelopment cycling becomes possible in the whole neighborhood? Why?
8	Safety & Basic needs	1.3, 4.4	Is it comfortable to cycle, in terms of shading, lighting, and

			sitting after the redevelopment of your neighborhood? Why?
9	Safety	4.1, 4.4, 4.6	Do you find it safe to cycle at night and during the day after the redevelopment? Why?
10	Accessibility, Basic needs & Safety	1.4, 2.3, 4.5	Are there any public transportation facilities that are regularly used in your neighborhood after the redevelopment? Are these bus stops comfortable and safe to use? Why?
11	Safety	4.6	In your opinion, the speed of cars inside the neighborhood is safe or unsafe after the redevelopment? Why?
12	Safety	4.3	Do you find it safe to drive within the neighborhood without hurting anyone? Why?
13	Sense of identity	5.1	What do you think of the general

			appearance of the area in terms of general maintenance of services, streets and cleanliness after the development of the neighborhood?
14	Accessibility	2.2	Can pedestrians safely cross the streets between your area and adjacent residential when needed? Why?
15	Social Equity	3.2	What type of house do you live in?
16	social coherence	6.2	Have you, along with your neighbors or other residents, participated in any decisions or activities related to your area?

Closing

Section 4: Would you like to add anything regarding the above questions?

Appendix C. Detailed assessment of behavioral observation

Principle	Indicator	Behavioral assessment	Perspective Evaluation
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1. Basic Needs	1.1 A hierarchy of services and facilities of different capacities and scales.	The service scale is limited to a specific capacity. Most of the shops are designed for pickup services with limited seats except for three restaurants which are more significant than others. Other facilities are on a limited scale, such as mosques, spas, and gyms.	Partially Achieved
	1.2 Provision of children and youth physical activities and sporting activities.	Many informal activities indicated in the neighborhood due to the lack of public spaces	Not Achieved
	1.3 Provision of shaded, well-lit, pleasant, and comfortable pedestrian routes leading to all services and community facilities.	The shaded areas exist on the neighborhood border, where the pedestrian lane is shaded by trees and the colonnade of the new mixed-use development.	Poorly Achieved
	1.4 Provision of pleasant public transportation stop	Public transportation stops are available on the border; however, the shaded stop is on the main road only.	Partially Achieved
	1.5 Provision of tourist destinations	-	Not applicable
	1.6 Provision of a broader range of job opportunities and facilities, including a diverse shopping	The mixed-use area contains various commercial activities that increase job opportunities.	Significantly Achieved

	center, banks, several pubs and cafes, a health center, schools, and a mosque.		
2. Accessibility	2.1 Services and facilities are located within walkable and bikeable distances through well-defined pathways/ cycling lanes for all ages and residences.	The facilities are available within the walkable area. However, the pathways are not well developed in some areas. No cycling lane exists.	Partially Achieved
	2.2 Connection with the surrounded neighborhood through pedestrian and cycling.	The neighborhood is not connected with the surrounding (no presence of pedestrian crosses), except for one corner that has signals which should contain pedestrian crosses by default.	Poorly Achieved
	2.3 Accessible and connected transport corridors and nodes by pedestrian and cycling from all facilities and activities. (Accessible to people of all ages and abilities)	The neighborhood can be divided into two parts: developed and less developed. Both parts lack of cycling lane, and the developed area is connected through a pedestrian lane.	Partially Achieved
3. Social Equity	3.1 Accessible community facilities and	Different facilities are available	Significantly Achieved

	services for all ages and users.	(Supermarket, café, restaurant, bank, spa)	
	3.2 Provision of a wide range of housing choices in sort and design.	There is a variation of housing (flats, villas) for medium to high income.	Fully Achieved
6. Social Coherence	6.1 Provision of social gathering spaces. (e.g., public open spaces, plazas, community parks)	No public spaces are provided in the neighborhood, so people sometimes gather in front of their houses or shops. Few urban furniture is available in front of one apartment.	Not Achieved

4. Safety	4.1 Good visibility at night, street lighting, and accessibility of spaces.	No streetlight is provided within the neighborhood (except for mixed-use)	Partially Achieved
	4.2 Safe and clear pedestrian lanes.	Narrow pedestrian lane except for mixed-use area.	Partially Achieved
	4.3 Safe streetscape and open spaces.	The streets are quiet in general. However, inner roads face some traffic in some areas that connect with commercial activities.	Significantly Achieved
	4.4 Safe and clear cycling lane	No cycling lane	Not Achieved

	4.5 Safe public transportation stops	One stop contains a side stop for bass and a shaded waiting area, while other stops do not have side stops.	Poorly Achieved
	4.6 Set speed limits linked to livability for higher density urban areas (e.g., 50km/h) and for inner streets (e.g., 15km/h)	No speed signage within the neighborhood (however, it's known that the speed limit is 40 km)	Not Achieved
5. Sense of Identity	5.2 Preservation of urban image, identity, and heritage building value within its historical character	demolishing process stars for old buildings. On the other hand, the new developments represented some elements of traditional architecture.	Partially Achieved
	5.3 Preserving the traditional practices of the local society	The neighborhood is changing towards the commercial area, so local practices such as "Majlis" are not exciting due to a limited number of citizens.	Not applicable
6. Social Coherence	6.1 Provision of social gathering spaces. (e.g., public open spaces, plazas, community parks)	No public spaces are provided in the neighborhood, so people sometimes gather in front of their houses or shops. Few urban furniture is available in front of one apartment.	Not Achieved