ISTANBUL OKAN UNIVERSITY
INISTITUTE OF SCIENCE AND ENGINEERING

ARCHITECTURE AND URBAN DESIGN IN JORDAN:
A CASE STUDY FOR GHWEIRIH NEIGHBORHOOD

QUSAI AL- KHAWALDEH

(163009010)

THESIS

FOR THE DEGREE OF

MASTER OF ARCHITECTURE

IN ARCHITECTURE PROGRAM

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ABSTRACT

ARCHITECTURE AND URBAN DESIGN IN JORDAN:

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Urbanization is usually seen as an essential process for socioeconomic transformation, development, and welfare. With this potential for meaning, urban areas have always been rich scenes for research, since they embody too much diversity and dynamicity, both physically and socially, for any one discipline to tackle. In the current era, the criticality of urban areas has grown with their rapidly increasing populations and problems globally.

The aim of this thesis is to collect data about urbanization and development that can help us plan for the future, especially if we consider the UN-Habitat agenda and work together. The research also aims to provide an overview of urban design and architecture in the Middle East, and particularly in Jordan. In order to understand and evaluate the current tendencies in these practices in the region, it is necessary to see some projects in the region, which compose the examples and evaluation part of the research. Moreover, the thesis focuses on the historical and architectural background of the evolution and improvement of Jordanian architecture by looking at its interaction with the architectures of other civilizations that have passed through Jordan.

In light of the current architectural and urban practices in the Middle East, following the theoretical background, the research then builds its case study on Ghweirieh neighborhood in a Jordanian city, Zarqa. Looking at both neighborhood and regional scales also reveals the potential conflicts and commonalities.

Key Words: Urban Design, Middle East, Jordan, Architectural Heritage, Zarqa

ÖZET

ÜRDÜN'DE MİMARİ ve KENTSEL TASARIM
GHWEIRIH SEMTİNDE ÖRNEK BİR ÇALIŞMA

Kentleşme çoğunlukla, sosyıekonomik kalkınma, gelişim ve refah için gerekli olan bir süreç olarak görülmektedir. Bu potansiyel anlamıyla kentsel alanlar; barındırdıkları sosyal ve fiziksel çeşitlilik ve dinamizm ile de pek çok disiplin için zengin bir çalışma ortamı oluşturmaktadır. İçinde bulunduğumuz 21.yy'da, bu zengin çalışma ortamları; hızla artan nüfus ve küresel problemler etrafında daha da önemli bir noktada yer almaktadır.

Bu çalışmanın amacı, BM-Habitat gündemini takip eden ve onu referans alan bir yaklaşımla, kentleşme ve gelişim ana başlıkları etrafında veri toplamayı hedeflemektedir. Çalışmanın bir diğer amacı ise, Ürdün özelinde, Orta Doğu'daki mimarlık ve kentsel planlamaya dair genel bir bakış sunmaktır. Bölgedeki bu pratiklere dair güncel eğilimleri anlamak ve değerlendirmek amacıyla ele alınan projeler, çalışmanın örnek ve değerlendirme bölümünü oluşturmaktadır. Güncel eğilimlerin tarihsel izlerini sürmek amacıyla çalışmanın kapsamında yer alan bir diğer bölüm ise, Ürdün sınırlarında var olan diğer medeniyetlerin mimarlık miraslarına bakmakta ve geçmiş ve bugün arasındaki etkileşimi irdelemektedir.

Orta Doğu'daki tarihsel miras, güncel mimari ve kentsel pratiklerin takip eden teorik çalışmanın ışığında, tezin alan çalışması ise bir Ürdün kenti olan Zarqa'nın Ghweirieh mahallesi üzerinde odaklanmaktadır. Geçmiş, bugün ve olası gelecek verileri üzerine kurulan bu alan çalışmasının amacı, genel tasarım prensipleri etrafında bir rehber önerisi oluşturmak ve hem bölgesel hem de mahalle ölçeğinde ortaklaşan potansiyelleri ve çelişkileri ortaya koymaktır.

Key Words: Kentsel Tasarım, Orta Doğu, Ürdün, Mimari Miras, Zarqa

ACRONYMS

AURP Abdali Urban Regeneration Project

BC Before Christ

BCD Beirut Central District

BCE Before Common Era

CSBE center for the study of the built environmen

GAM Greater Amman Municipality

GDP Gross domestic product

GDAR Group for Design and Architectural Research

GIS Geographic information system

HU Hashemite University

IT Information technology

JD Jordanian Dinar

JREC Jordan Royal Estate Company

KAFD King Abdullah Financial District

KAEC King Abdullah Economic City

KABAA King Abdullah bin Abdul Aziz

KIPCO Kuwait Projects Company

KM kilometer

LRT Light Rail Transit

UN United Nations

NGOs Non-governmental organiza tions

WCR world cities report

1 INTRODUCTION

This chapter aims to give an introductory overview of the study. This chapter also includes the aim of this research, research objectives, key research questions, methodological approach, and research contribution to knowledge.

1.1 Problem Definition

This thesis deals with urban design and urban planning in the Middle East and Jordan in particular. It covers some contemporary projects with the aim of understanding and evaluating the current state of architecture and urban design in the region, the obvious differences between various urban design approaches, their importance to the region, and the current urban conditions in the Middle East so as to find out the state of urbanization in the region and what weaknesses need to be reinforced in the region. The thesis addresses the region of the Arab world, consisting of the Arabian Peninsula and the Levant.

The driving force of this topic is the rapid growth in urban population globally and the decline in infant mortality and high fertility, resulting in a relatively young population. Children and youth aged below 24 account for 40% of the global population. This proportion also represents a promising reality in terms of the labour force (UN-Habitat, 2016).

Urban areas around the world are facing enormous challenges and more changes than they did 20 years ago, and cities are operating in economic, social, and cultural ecologies that are radically different from the outmoded urban model of the 20th century. Persistent urban issues over the last 20 years include urban growth, changes in family patterns, a growing number of urban residents living in slums and informal settlements, and the challenge of providing urban services (UN-Habitat, 2016).

The current model of urbanization is unsustainable in many ways in many cities all over the world, since they are grossly unprepared for the challenges associated with urbanization. One of these cities is Zarqa in Jordan. Unfortunately, the fields of urbanization and urban planning in Jordan remain extremely weak, where the latter is not a sought-after profession, and these specializations were not taught in Jordanian universities until 2008.[1] This resulted in a vicious

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1 The first specialization in urban planning in Jordan was at the University of Science and Technology.

circle characterized by a shortage of high-quality planners and a lack of demand for them, which led to the creation of random cities in Jordan. Therefore, a new agenda is required to address these challenges and take advantage of the opportunities offered by urbanization. Meanwhile, the current research addresses the challenges in the neighborhood of Ghweirieh in the Jordanian city Zarqa.

One of the reasons that led to the selection of the topic of urbanization and the city of Zarqa and the neighborhood of Ghweirieh is that the city was not built as a city but as a cluster of refugee camps that started as slums and then developed into a permanent city where poverty, unemployment, and inequality as well as mismanagement and lack of urban planning have been the main characteristics.

In addition, my being from this neighborhood is another important reason for the selection of this topic and can add personal perspective and information to the research. My personal belonging to the neighborhood also includes the responsibility to make a contribution to the development of Ghweirieh.

1.2 The aim of the research

The aim of the research is to develop a clear understanding and evaluation of the current tendencies in urbanization and urban planning in the region and especially in Jordan to identify the different factors that will provide useful information about urban projects adopted by the private and public sectors, as well as to deal with the current situation in one of the cities in the region.

Contribution to knowledge

The aim of the research is to develop a clear understanding and evaluation of the current tendencies in urbanization and urban planning in the region and especially in Jordan to identify the different factors that will provide useful information about urban projects adopted by the private and public sectors, as well as to deal with the current situation in one of the cities in the region.

1.3 Research Objectives

1. To evaluate the current tendencies in urbanization practices in the region.

2. To provide useful information for public and private sector organizations in the region considering adopting urbanization projects.

3. To identify the levels of interaction and design relations between contemporary Jordanian architects and the architectural heritage that remains from various civilizations that passed through the region.
4. To study the current conditions of architectural and urban development in Jordan and identify its general characteristics.

Key Research Questions

RQ 1: What is the level of awareness of urbanization among the private and public sectors in the region?

RQ 2: Are there any factors that provide useful information for private and public sector organizations considering adopting urbanization projects in Jordan?

RQ 3: Are the functions of heritage important from the viewpoint of the professionals in Jordan?

RQ 4: What is the effect of the level of awareness about urbanization among the professionals on the reduction of urbanization barriers in Jordan?

1.4 Research Methodology

The research adopts qualitative and analytical methods to answer the research questions through case studies, identifying problems, and revealing an urban design proposal for Ghweirieh neighbourhood. The required data have been collected by the following methods:

1. Literature survey.
2. Interviews with local architects and residents.

   Analysis of current architectural design and practices in Jordan.

2 CONCEPTS OF URBANIZATION AND DEVELOPMENT

Urban development of human settlements is a very important issue for both citizens and governments in order to ensure well-being and justice for future generations. In the era of the steadily increasing population, which is mostly called the global era, the creation of new cities and efforts to solve urban problems require healthy and sustainable environmental and social solutions. Urbanization and growth go hand in hand, and no one can deny that urbanization is essential for socioeconomic transformation, wealth generation, prosperity, and development. This section includes information from the reports of the first, second, and third UN-Habitat[2] conferences on urban design and the new urban agenda, "Habitat III", which provides values that guide major shifts in strategic and policy thinking.

The first Conference of UN-Habitat, "Human Settlements", was held in Vancouver in 1976. There were two major outcomes of the meeting. The first was advice to countries and the international communities to commit to human settlement strategies that would combine spatial planning with elements of economic, social, and scientific thinking in order to relieve the worst conditions of uninhibited urbanization within a framework of social justice. The second outcome was the launch of the United Nations Centre for Human Settlements in December 1977.

The Second UN Conference on Human Settlements (Habitat II) was held in Istanbul in 1996. The conference contributed to elevating world awareness regarding urban and human settlement problems. Habitat II invited NGOs and civil society organizations to speak and contribute to the recommendations. The most important matters raised at the conference were as follows:[3]

- Cities had returned to the forefront of methods for development; however, housing conditions were increasing in incidence.
- Cities urgently required competent and responsible governance.
- Governments would be enablers much more than providers in the future.
- Citizen teams, community organizations, and NGOs were necessary and required a lot of attention.

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[2] United Nations Human Settlements Programme in 2016
[3] UN-Habitat, 2016, p. 3

Currently, the world is facing many serious challenges, such as rising inequality, increasing insecurity in various forms, and of course the very severe and widespread effects of climate change. This has been clearly elucidated in the UN-Habitat report (UN-Habitat, 2016, p. iv). At the same time, the report recognizes that humans have also made major advances in medicine, life expectancy, information and communications technology, governance, and knowledge. On both the positive and the negative side, cities play a central role in what changes take place and are in fact the arenas that host these varying dynamics. Urban areas carry and reflect the various transformations that emerge in the world. Today, cities are home to 54% of
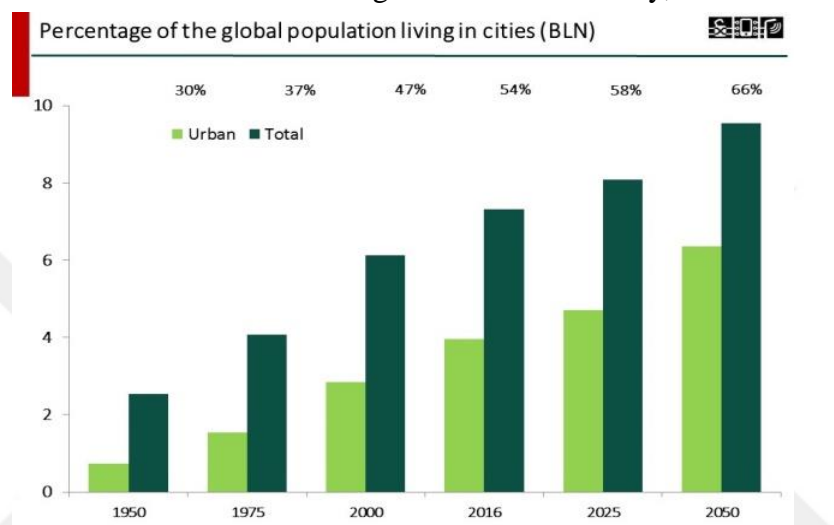
Figure 1 world's population in cities (percentage of the global population , 2016)

the world's population, and by the middle of this century, that figure will rise to 66% (UN-Habitat, 2016, p. iv). While cities face major problems, from poverty to pollution, they are also powerhouses of economic growth and catalysts for inclusion and innovation. For this potential of cities to be harnessed, great effort has to be put into envisioning, planning, and financing the right steps in the administration and transformation of cities.
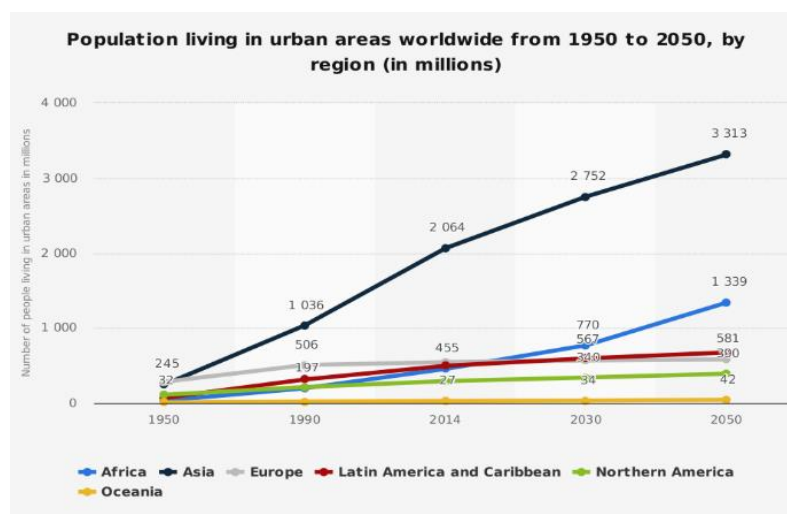
Figure 2 population living urban areas by region (Statista)

The population in urban areas has increased during the last 28 years. In 1990, 43% of the world's population lived in urban areas; by 2015, this had grown to 54%. The increase in urban population has not been spread throughout the world homogeneously. Asia has the highest number of people living in urban areas, followed by Europe, Africa, and Latin America.

The past two decades came with multiple new forms of collaboration and cooperation—planning, governance, finance, and learning—that can sustain positive change. Yet, the current urbanization model is regarded as being unsustainable in many respects: A UN report called it "unnecessarily costly", environmentally disastrous, and, put lightly, unjust (UN-Habitat, 2016, p. v). The report sends a clear message: The current trends of urbanization need to change to better respond to the challenges of the 21st century. If urbanization patterns do not change, issues such as inequality, climate change, economic informality, and insecurity will be left unchecked. The surrounding agenda adopted at the United Nations Conference on Human Settlements (Habitat II) in 1996 was potent, with recognition of correct and adequate housing, human settlement development in the urbanizing world, and therefore the redoubled participation of the private sector and non-governmental organizations in urbanization. It bolstered the role of local authorities and stirred progress in strengthening business and monetary management capacities. In overall terms, implementation, funding, and observance have remained main challenges (UN-Habitat, 2016).

The third UN Conference on Human Settlements (Habitat III) was held in Quito in 2016. The main event of the conference was the adoption of the New Urban Agenda on Housing and Sustainable Urban Development, in which all people have equal rights and access to the welfare and opportunities that cities can offer. The New Urban Agenda was endorsed by the United Nations General Assembly at its 68th plenary meeting.[4]

The New Urban Agenda sets out criteria and principles for the planning, construction, development, management, and improvement of urban areas:

- National urban policies.
- Urban legislation and regulations.
- Urban planning and design.
- Local economy and municipal finance.

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[4] It was in the 71st session on 23 December 2016.

- Local implementation.

The New Urban Agenda was created by mental act cities and human settlements to[5]

1. Fulfil their social responsibilities, as well as the social and ecological use of land.
2. Ensure equal access to democracy, promote civic engagement, and engender happiness, and eliminate poverty among all their inhabitants.
3. Deliver gender equality and empower female teams.
4. Meet the challenges and opportunities of present and future sustained, comprehensive, and proper economic processes.
5. Fulfil their territorial functions.
6. Promote investment in proper, safe, and accessible urban environments for all, irrespective of age and gender.
7. Adopt and implement disaster risk reduction and management, reduce vulnerability, build resilience and responsiveness to natural and human-made hazards, and foster mitigation of and adaptation to climate change.
8. Protect, conserve, restore, and promote their ecosystems, water, natural habitats, and diversity; minimize their environmental impact; and alter property consumption and production patterns.

2.1 Contemporary Architectural and Urban Design Trends in the Middle East

This chapter focuses on the master plans for urban districts and new cities by mentioning some outstanding examples in the region. The driving force of this focus point is to see the obvious differences between various urban design approaches and their importance for the region, to reveal the current urban conditions, and to understand and evaluate the current tendencies in these practices in the region.

At the beginning of the 21st century, new ways of urban architectural practice and thinking began to emerge in the region that can be linked to the increase in flows of globalization.

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[5] New Urban Agenda, Habitat III (pp. 5–7)

The Western world commonly considers the Middle East region to be dominated by violence. The Western press has frequently overlooked the economic and political stability that has prevailed in many countries in the region during the past few decades and the possibilities for growth and development. Furthermore, the international press covers Middle Eastern news by showing the political instability and the critical problems in the region. The critical Middle Eastern news always shows religious extremism, military adventurism, oil prices, and the acts of terrorism that affect the overall stability in the region. However, the passion for building projects in the Middle East reflects the belief in the potential of this growing part of the world. Indeed, some of the projects in the region have preceded the world, such as the hyperloop project in Dubai.

Despite ambitious projects in the region, the past few decades have not been good for the cities of the region, as they have been overwhelmed by tremendous population growth. The negative effects of this can be seen in the higher costs in the cities that are able to provide adequate water, sewage, transportation networks, and public spaces. Moreover, the disciplines connected to urbanism, urban planning, and landscape architecture have occupied a marginal position in the region relative to architecture. In fact, cities outside the rich Arabian Gulf countries, such as those in Jordan, Lebanon, and Egypt, have an additional challenge due to the lack of financial resources necessary for urban management and development.

The following examples were chosen to express the truly remarkable scale of the region's recent building boom. They feature contemporary projects to which significant resources have been devoted. They are instant urban settlements that would evolve in decades under normal circumstances. A number of the master-planned districts featured in this section are larger than some of these new cities. These examples are evaluated through their budget, area, completion date, designer, function, and location in order to create a general view of current building practices.

2.1.1 Master Plans for Urban Districts

Durrat Al Bahrain, Bahrain

Durrat Al Bahrain is an exclusive community where different existences complement one another—the island and the city, the desert and the sea. Durrat Al Bahrain, which in Arabic means "Pearl of Bahrain", is conceived as Bahrain's largest residential area, created across a cluster of 15 enormous islands and extending over an area of 20 square kilometres.

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Durrat Al Bahrain is an emerging contemporary example as an artificial island with a global construction network. Projects like Durrat Al Bahrain reflect the expanding power of architecture in global business and its role in creating new artificial and exclusive geographies.

- Area: 600 hectares
- Budget: US$ 6 billion
- Completion: launched in 2004.In February 2008 interrupted. In 2017 completed 85%.
- Designer: Atkins firm (design, planning, project management and consulting / British)
- Function: Residential, Leisure, and Tourist.
- Location: Near the southern tip of Bahrain Island.

Figure 4 Durrat al- Bahrain (durratbahrain, 2010)

Figure 3 Durrat al- Bahrain (durratbahrain, 2010)

Bahrain Bay, Bahrain

Bahrain Bay is a seafront developed property located on the north coast of Manama in the Kingdom of Bahrain. It was created from reclaimed land. Bahrain Bay consists of three islands: North Island, South Island, and Four Seasons Island. An inland port for the project, connected to the mainland, was constructed with two bridges. Bahrain Bay has won numerous awards.[6]

Bahrain Bay is a powerful tool to generate economic opportunities and facilitate economic development. A well-planned and functioning city is an efficient city that can reduce congestion costs and negative externalities. If we can take it one step further beyond just function and efficiency and towards liveability and attractiveness, which will generate even greater economic benefits.

- Area: 135 hectares
- Budget: $ 2.5 billion
- Completion: launched in 2006 - 2018
- Designer: Woods Bagot firm (design and planning / Australia)

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[6] For example, Bahrain Bay won the International Arch of Europe in 2007 (a vanity award).

- Function: Residential, Leisure, and Tourist
- Location: on the main island of Bahrain and 6.8km from Bahrain International Airport.

Figure 5 Bahrain Bay (bahrainbay, 2010)

Figure 6 Four Seasons Bahrain Bay (bahrainbay)

Abdali Urban Regeneration Project, Jordan

Abdali is a major urban regeneration project on the site of a former military base in the heart of Amman. Abdali created a modern downtown, earlier missing from the national capital, which is able to cater to business needs and produce extra employment opportunities and an unprecedented flow of investments from Jordan and therefore the region.

Projects like Abdali aim to put order to the "chaos" in Amman through infrastructure dealing with access to water, sewage, and transport and efforts addressing issues related to housing, urban mobility, public space organization, and urban patrimony.

- Area: 200 hectares
- Budget: US $5 Billion
- Completion: launched in 2005 – 2014
- Designer: Abdali Investment & Development Psc firm(develop and manage mixed-use urban development's/ Jordan)
- Function: commercial, business, public, medical and touristic.
- Location: In the capital of Jordan.

Figure 8 Abdali Project (AURP)

Figure 7Abdali Project (AURP)

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Madinat al-Fahaheel, Kuwait

According to al-Asad, The development has received several regional and international architectural and retail-design awards [and] is divided into two major components. The first is al-Kout Waterfront project, which extends into the Gulf through its twin North and South Piers, defining an inner harbour. It features shopping and entertainment facilities. The South Pier houses a supermarket as well as various food markets. The North Pier houses a shopping mall, a food court, and a cinema complex. The development also includes a fishing harbour and a marina. (al-Asad, 2012, pp. 240–241)

Al-Fahaheel District is a great contemporary example of how to deal with an existing city. It reflects the expanding power of architecture in global business.

- Area: 30 hectares
- Budget: $250 million
- Completion: launched in 200 - 2007
- Designer: Dar al Omran / Rasem Badran
- Location: in the south of Kuwait City, along the shores of the Gulf

Figure 10 Madinat al-Fahaheel (al-Asad, 2012)

Figure 9 Madinat al-Fahaheel (al-Asad, 2012)

Beirut Central District, Lebanon

One-third of the Beirut Central District (BCD) consists of reclaimed land from the Mediterranean. It originally had a 1.5-km shoreline along the Mediterranean, but land reclamation has extended the shoreline by an additional 3.5 kilometres. The project's master plan divides the BCD into 10 sectors and calls for constructing about 4.7 million square metres of building space. It also devotes 39 hectares to public open areas that include more than 60 squares and gardens (al-Asad, 2012).

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BCD is an evolving urban planning example of reclaimed land that helps to provide housing, public places, and gardens. BCD is a great contemporary example that could be applied elsewhere in the region.

- Area: 191 hectares
- Budget: $1.82 billion
- Completion: launched in 1994 - Ongoing.
- Designer: Solidere (planning and redeveloping /Lebanon)
- Function: Offices, Residential, Commercial, Cultural Facilities and Hotels.
- Location: Beirut, Lebanon.

Figure 12 BCD (al-Asad, 2012)

Figure 11 BCD (al-Asad, 2012)

2.1.2 New Cities

Neom, Saudi Arabia

Neom is the world's first freelance special zone stretching over three countries. It is expected to emerge as a major world hub that exemplifies the long run of human civilization by giving its inhabitants an idyllic style combined with exceptional economic prospects. Neom seeks to draw in prime talent from around the world to push the boundaries of innovation like never before and drive the expansion of this region and its residents (Neom, 2018, p. 1).

Neom is one of the most ambitious and large-scale projects in the world, and it will be designed and constructed from scratch. Plans involve robots performing functions corresponding to security, home, delivery, logistics, and caregiving and for the city to be powered solely entirely by wind and alternative energy.

- Area: 62650000 hectares
- Budget: $500 billion
- Completion: 2017 - 2030
- Designer: unknown
- Location: In Tabuk, Saudi Arabia in the northwest of the Kingdom

New Amman, Jordan

The new capital of Jordan town, a replacement sensible and property metropolis, equipped with all infrastructure services and can adopt a long-run urban coming up with a theme with a vision that leaves the door open for more future development. As well, the new town can use renewable energy resources to supply clean energy and water purification, what is more to having a complicated transportation hub that links it with Capital of Jordan, Zarqa, the aerodrome and alternative close cities.

The new city aims to internalize part of the fast urban growth of the capital of Jordan—Amman—and Zarqa, among other cities, and to provide convenient alternative residences for voters, further assuaging pressure and overcrowding in major cities. The government expects the population of the two cities to reach some 10 million by 2050. Neither city will be able to accommodate such a population increase with its current infrastructures.

- Area: 39000 hectares
- Budget: unknown
- Completion: 2017 - 2050
- Designer: unknown
- Location: East of Amman

The King Abdullah bin Abdul Aziz City, Jordan

King Abdullah bin Abdul Aziz City consists of six phases and is planned to house 500,000 residents. This city will help relieve pressure in Zarqa, which is Jordan's most congested city, with more than 1,403,000 people.[7]

The region desperately needs such urban planning and design projects to ensure well-being and justice for future generations.

- Area: 2500 hectares
- Budget: unknown
- Completion: 2006 – 2025
- Designer: GDAR (Architecture & Design/ Jordan), Bitar Consultants (Consultant / Jordan), and Bilal Hammad Architects (Architecture, Interior, Urban, Landscape)
- Location: less than 30 km northeast of Amman

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[7] Jordan in Figures 2016, Department of Statistics

Figure 13 KABAA (al-Asad, 2012)

Figure 14 KABAA (al-Asad, 2012)

Silk, Kuwait

Silk is one of the largest mega-scale urban projects in the region. The city is projected to have a population of 700,000 and to contain its own seaport and international airport.

Silk is developing a new profile by upgrading its urban stock in an effort to hold its own in competition with other urban communities. The expectation is that success in these endeavours will retain present residents, attract new ones, and improve the level of infrastructure utilization.

- Area: 25000 hectares
- Budget: $132 billion
- Completion: 2012 - 2036
- Designer: CivicArts/ Eric R. Kuhne & Associates (architecture, landscape, urban, interior and industrial design/ UK)
- Location: Opposite Kuwait City, across Kuwait Bay**.**

Figure 15 Madinat AL-Hareer(www.weetas.com)

King Abdullah Economic City, Saudi Arabia

This project has been introduced as a way to provide 1 million job opportunities and accommodate 2 million inhabitants. According to the plans, designed by world-famous architect Norman Foster, the city will comprise a seaport; an international airport; an industrial

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district; a central business district that consists of commercial, mixed-use, and retail areas; a financial district; a resort; an educational zone; a hospitality zone; and a residential area.

- Area: 17,000 hectares
- Budget: $100 billion
- Completion: 2006 - 2025
- Designer: Norman Foster (sustainable architecture, urbanism / British)
- Location: on the Red Sea coast, about 100 km north of Jeddah, Saudi Arabia.

Figure 17 KAEC (City, n.d.)

Figure 16 KAEC (City, n.d.)

Masdar, United Arab Emirates

Masdar aims to be a zero-carbon, zero-waste community that will become the Silicon Valley for clean, green, and alternative energy. This championing of renewable energy technologies is an element of a trial aimed at diversifying Abu Dhabi's economy away from its dependence on oil exports toward trade and information. It is meant to accommodate 50,000 inhabitants. As a large-scale settlement designed from scratch, it permits the incorporation of ideas that may not be possible in existing urban settlements.

Masdar is one of the region's most inspiring contemporary architectural projects in terms of urbanization and development, which reflects the expanding power of architecture in global business.

- Area: 600 hectares
- Budget: $20 billion
- Completion: 2008 - 2030
- Designer: Foster and Partners firm (sustainable architecture, urbanism / British)

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- Location: 17 km to the east of Abu Dhabi City.

Figure 19 Masdar City, United Arab Emirates (masdar, n.d.)

Figure 18 Masdar City, UAE (masdar, n.d.)

The previous examples are just a few of the many ambitious projects in the region. The previous examples show the awareness in the region about urbanization and the challenges that face the region, such as population growth.

Despite the political limitations, the intervention of great powers in the region, economic crisis, and preoccupation with war, it is very clear from the examples mentioned above that the Middle East is aware of urban planning and population growth. It is obvious that the region is planning for future generations despite challenges and constraints, especially in the Gulf states, where political stability and financial capacity are available to implement projects. Indeed, there are also some countries struggling to come up with the financial resources to achieve their ambitious projects, such as Jordan and Egypt. They have drawn up plans, legislation, and facilities for investors but are looking for financiers. As well, there are some countries in the region that do not have any ambitious projects because of preoccupation with war, such as Syria, Iraq, and Palestine.

3 A SHORT ARCHITECTURAL STORY OF JORDAN

Jordan is an Arab country located at the crossroads of Asia, Africa, and Europe in Western Asia, on the east bank of the Jordan River. Before 1946,[8] Jordan was part of various empires, kingdoms, and lordships. Jordan is bordered by Saudi Arabia to the south and east, the Red Sea to the south, Iraq to the northeast, Syria to the north, and Palestine to the west. Jordan is a constitutional monarchy with representative government based on a constitution established in 1952. Jordan has an area of 89,213 square kilometres, and the lowest point in Jordan and on Earth is the Dead Sea (408 metres below sea level), and the highest point in Jordan is Jebel Umm El Dami, which lies 1854 metres above sea level.

Figure 20 Jordan map

Jordan is deep in history and home to some of mankind's earliest settlements and villages and relics of many of the world's great civilizations. Archaeologists have found evidence of habitation dating as far back as the Palaeolithic period. As well, three kingdoms emerged in Jordan: Edom, Moab, and Amon. After these kingdoms, the lands were part of several empires, most notably the Roman Empire, the Nabataea Kingdom, and all periods of Islamic caliphates. Then, the Great Arab Revolution began in 1916 and ended the era of empires. There is great heritage left from these empires, including many important cities and architectural landmarks such as temples, castles, Masjids, public squares, and so. In 1922, the Council of the League of Nations officially recognized the Emirate of Transjordan. In 1946, Jordan officially became an independent sovereign state, divided into 12 governorates. After the establishment of Jordan, Jordanian architecture passed through numerous stages, especially under the influence of Ottoman and English architectural styles, which had clear effects, especially on public buildings and houses. The most famous "Ottoman-style" buildings in that period were al-

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[8] Independence of Jordan from the United Kingdom mandate

Husseiny Grand Masjid (1923) and Raghadan palace (1926). The English architectural style came from the influence of elites who had authority and had received their education in Western countries.

Figure 22 Raghadan palace (Ermakvagus)

Figure 21 al-Husseiny Grand Masjid (foudeh, n.d.)

Jordan has diverse landscapes, from dry steppes in the north to large expanses of sandy desert in the south. Some of the richest and longest archaeological sequences in the Middle East are found in Jordan. An example is the 9,000-year-old Neolithic houses of Beidha (Petersen, 2011, p. 1). The Nabatean city of Petra, which dates mostly from the first century BCE to the third century CE, is another such architectural wonder. In Petra, series of magnificent (and quite large) façades are carved into the light-coloured sandstone (sedimentary) rock. Further north, a series of cities called the Decapolis (Umm Qais, Jerash, Pella, and Umm Jemal) testify to the prosperity of this space throughout the Classical and Byzantine periods. Throughout this era, multiple churches with mosaics were designed, an exemplar being the one at Madaba, which incorporates a mosaic map of the West Bank of Palestine (Petersen, 2011, p. 1).

Figure 24 Petra (Petersen, 2011)
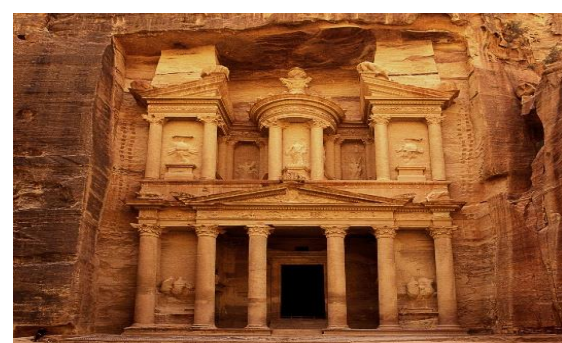
Figure 23 Al Khazneh (The Treasury)

18

3.1 Architectural Heritage

Roman-Byzantine Influence (63 BCE 224 CE)

In 63 BCE, Pompey conquered the Levant, which was the beginning of Roman control of Jordan, Syria, and Palestine. In 106 CE, Emperor Trajan annexed the nearby Nabataean Kingdom with no opposition. Throughout Roman rule, the Nabataeans continued to flourish and replaced their native gods with Christianity. In 390 CE, Christianity became the official state religion within the empire. There is a great heritage from the Roman-Byzantine time that incorporates several architectural landmarks like Jerash, the Temple of Hercules, and the Roman Theatre. Jerash seems to be the most marvellous architectural heritage outside of Italy and one of the greatest district cities in Rome's empire.

Figure 26 Theatre of Jerash (theplanetd, n.d.)   *Figure 25 The Gate of Jerash (theplanetd, n.d.)*

Sassanian Influence (224- 651 CE)

The Sassanian Empire was the fourth Iranian dynasty.[9] The Persian Empire was one of the main powers in Western Asia and Europe alongside the Roman and Byzantine Empire. During Khosrau II's rule in 590–628, Egypt, Jordan, Palestine, and Lebanon were also annexed by the Empire. Qasr Kharana is among the most important architectural heritage left from the Sassanian Empire. Kharana contains two floors, corner towers, and a rounded entrance. The building is made out of mortar, with decorative courses of flat stones placed in bands running around the outside of the building, but the building lacks a water source.

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[9] In 224 CE, the first dynasty of the Persian Empire was founded by Ardashir.

Figure 28 exterior of Qasr, Kharana (Wikimedia, n.d.)

Figure 27 Interior of Qasr (Wikimedia, n.d.)

East-West Influence (661-750 CE)

The combination of eastern and western influences was represented by two buildings dated to the late Umayyad era. The employment of baked brick walls, vaults, and dressed stone masonry as the basis and architectural details was the foremost apparent demonstration of those mixed influences. Qasr Mashatt is the most notable of these buildings; it consists of an outsized square enclosure with four semilunar strut towers. The southern face, which encompasses fine inscribed stones and mouldings incorporating animals and plant motifs at intervals in a geometric pattern of huge triangles, is the best-known feature of this palace. Within, the building is split into three longitudinal strips; only the central strip (from north to south) was developed and contains the doorway, the central court, and the audience hall (Petersen, 2011, p. 1).

Figure 29 The facade of Qasr Mushatta now located in Berlin at the Pergamon Museum (Umayyad Art and Architecture, 2008)

20

Medieval Period (750 - 1516 CE)

Jordan was ignored during the Abbasid and Fatimid dynasties due to the geo-political conditions when the Abbasids moved the capital city from Damascus to Kufa. Because of this, relics of the Abbasid and Fatimid periods in Jordan are rare. The only place that has been Later on, the intrusion of the Crusaders took place during the Ayyubid and Mamluk periods. Therefore, most of the well-known buildings from this period that represent the Crusaders' uncovered from this period is Aqaba,[10] which seems to have reached its peak of prosperity during this period. presence are castles and forts. Qal'at Rabad,[11] which consists of several thick-walled towers with V-shaped arrow slits linked by curtain walls, is one of the castles from this period.

Figure 30 Qa'lat Al-Rabad (crumbs on travel, 2014)
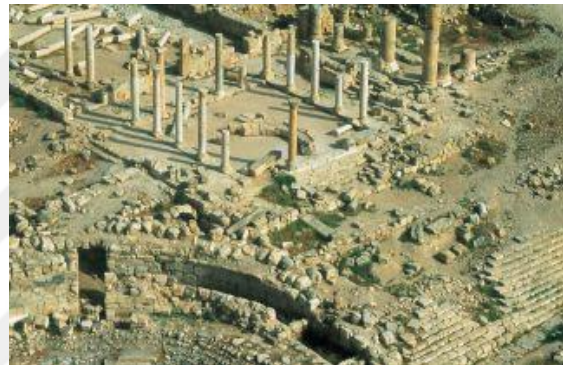
Figure 31 Mamluk mosque at Pella, Jordan (after Bishe)

Later Islamic Architecture (1516-1918 CE)

Early Ottoman architecture was very simple and was not grandiose or lavish. As well, it is very difficult to determine the shape of early Ottoman architecture. It consisted of little square structures with giant embellished arrow slits, protrusive machicolations, and huge crenelated parapets. Forts from throughout this era (i.e., early Ottoman) are also square and have little gun slits rather than giant arrow slits, incorporating protrusive corner towers to extend or vary the firing range. Other early Ottoman buildings in Jordan are difficult to date so precisely, though the fortified farmsteads at Yadudeh and Udruh in all probability each date back the eighteenth century. Umm Qeis, in the north of Jordan, is one of the best examples of 19th-century design, as well as al-Salt west of Amman. Amman, however, differs from other cities in north Jordan because it was settled by Circassian refugees. Distinctive features of Circassian homes are the employment of wood, the introduction of chimneys, and little rooms (Petersen, 2011, p. 1).

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[10] Located on Jordan's Red Sea coast.
[11] It was built by Saladin around 1184 CE in the city of Ajlun.

Figure 32 Hajj forts (Dauphin., 2016)

The Materials used in Jordan

The utilization of natural materials such as stone, straw, and mud characterize architecture in Jordan. Jordanian architects interact with natural materials and connects these materials to the local environment and the climatic characteristics of the place. Since the birth of the ancients, stone has been one of the elementary building materials, including for Jordanian architects, especially as Jordan is characterized by the availability and diversity of building stone due to the spread of the rock layers with specifications suitable for construction purposes. However, Jordanian architecture has not used stone in internal façades in buildings, preferring the interior to be comfortable and calm. The use of stone is limited to external façades.

In each area in Jordan, people have used the stone from that area. They have used basalt in the northeast, sandstone in the south, and limestone in the north and west (Mohannad Tarrad, 2012).

3.2 Contemporary Urban Conditions and Architectural Practices in Jordan

Jordan's economy is one of the poorest in the region. As it fails to absorb the annual inflow of new job seekers, the unemployment rate reached 18.2% in 2017, which led to 14% living below the poverty line. Jordan's active-to-total population ratio is one of the lowest within the world, with an average of four non-active persons relying on a single employee. In addition, Jordan's population continues to increase, with a fertility rate of 3.37 births per woman. The current population of Jordan is 9,830,729 as of Wednesday, February 21, 2018, based on the latest United Nations estimates. Jordan's population is equivalent to 0.13% of the total world population. The population density in Jordan is 112 per square kilometre (289 people per mi^2). The total land area is 88,780 square kilometres (34,278 mi^2). Urban people make up 67.8% of the population (6,710,702 people in 2018). The median age in Jordan is 22.4 years.
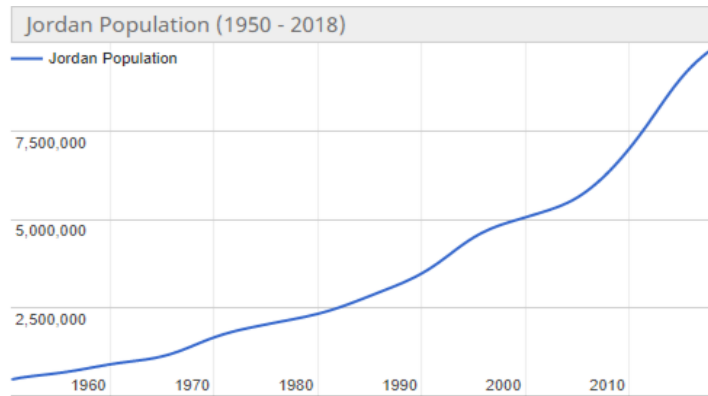
Figure 33 Population of Jordan (worldometers, 2018)

According to the UN-Habitat website,[12] Jordan will have a water shortage by 2025 if the population continues to grow, and water supplies are more and more strained, especially as Jordan hosts 1.4 million Syrians, particularly in the urban area of Amman and the northern governorates of Jordan. Jordan's industrialization and urbanization cause aquifers and polluted water to be exploited, and Jordan's agricultural practices account for most of its water consumption (77.5%), heightening Jordan's water scarcity problems. Having a young population (57%) creates greater demand for jobs, affordable housing, transit, and social services within our urban areas.

Architectural Practices in Jordan

This section focuses on examples of architectural practices in Jordan from the 1980s until today. The examples are examined through a series of criteria such as the project's title, the name of the designer—if it's known—the date of implementation, and explanation about the concept of the design and how it is related to urbanization or to the architectural heritage of the region. The reasons for selecting these buildings are as follows:

1. To understand and assess the amount of urbanization and the importance of urban planning/design for Jordanian architects.
2. To understand and evaluate the current tendencies in these practices.
3. To identify the levels of communication and design relations used by Jordanian architects to communicate with the heritage resources deployed in the region.

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[12] https://unhabitat.org/jordan/

23

Al Burj Building

- Architect: Consorzio Trocon Percoco (Contractor)
- Year**:** 1979
- Location**:** Amman, Moyed Street

Al Burj is a 91-metre-tall multi-purpose centre made of reinforced concrete that consists of a shopping centre, a car park, a health club, offices, and a hotel. It was designated by the government as a historic building. Al Burj is one of the earliest projects of contemporary architecture in Jordan, and the tower has a Western character, or "English style".

Figure 34 Al Burj Building (archilovers, 2014)

Jordan's Parliament Building

- Architect**:** Rasim Bardan
- Year**:** 1980
- Location: Amman

The building consists of the main hall, where the meetings of the Senate and the House of Representatives are held. The designer adopted a variety of modern and Islamic styles. The Islamic style appears in the use of the octagonal shape in the plan, the repeated arches in elevations, and the use of the dome, even though the dome is monopolized by mosques. The modern style appears in the use of hollow bricks and glass.

Figure 35 Jordanian Parliament Building

Ministry of Information and Communications Technology

- Architect: Deeb Sha'a'ash
- Year: 1982
- Location: Husni Soubar St 3, Amman

The Ministry of Information and Communications Technology sets policies and legislation to regulate the ICT sector and to complete and sustain the e-government network in Jordan. The building consists of ten equivalent floors. The designer combined Nabataean style, which appears in the replicated elevation of "Khazna" in Petra, with modern style, which appears in the use of materials such as stone and glass surfaces on the elevation.
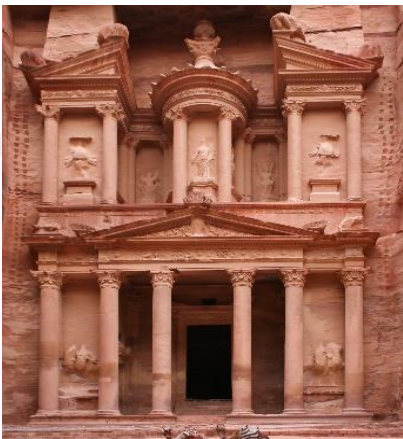
Figure 36 Khaznah (Khan, n.d.)

Figure 37 The elevation (Google)

Greater Amman Municipality

- Architect:, Touken & Badran
- Year: 1997
- Location: the Amman downtown area

This five-storey building accommodates various municipal departments, with an area of 17,382 square metres. It has squares with stone pavement, fountains, and flower pots and a metal overpass linking the building with City Hall. The building was designed with a mixed style that combines both modern and Roman-Islamic features. The circular part of the building embodies Roman castles, the arches and columns symbolize Islamic architecture, and the glass indicates

Figure 38 City Hall of the GAM (Google)

Figure 39 City Hall of the GAM (Google)

25

Landscaping of Ras al-Ain

- Architect: Bilal hemad
- Year: 1997
- Location: the Amman downtown area

The site is located in the core of the city of Amman within a 1,400-by-120-metre area running along one of the city's main thoroughfares. It consists of an administrative building of GAM, the historical museum of Jordan, the cultural centre, parks, and public squares. The foremost critical landmark of the site is the fountain square, which is located at the end of the complex. It's a circular plaza surrounded by the colonnaded building. This spatial organization can be interpreted as an attempt to simulate the exclusive oval colonnaded Forum in Roman Jerash.

Figure 41 Jerash city (atlastours, n.d.)
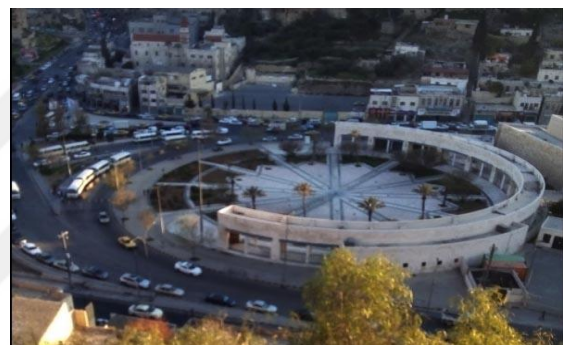
Figure 40 Ras al-Ain complex (google earth)

Royal Hotel

- Architect: Richard Martine
- Year: 2002
- Location: Zahran St, Amman

The Royal is one of the tallest buildings in Amman, with a height of 108 metres and 31 storeys. It is also one of most distinguished monumental buildings in Amman built in a modern style. The building embodies the culture of the Iraqi owner, which is evident in the design through the imitation of the Tower of Babel in the city of Samarra in Iraq, which belongs to the Islamic style in Iraq.

Figure 42 The Royal hotel (right) and the Tower of Samarra (left)

Palace of Justice

- Architect: Abu Eisheh (Contractor)
- Year: 2002
- Location: Sulayman An Nabullsi, Amman

The Palace of Justice is a government building with several main courts located in the centre of the Jordanian capital, Amman, with a total area of 47,000 square metres. The building is designed in accordance with the Islamic architecture style, embellished with complicated ornate stone arks, and the lobby in the middle is covered with decorative granite.

Figure 43 Palace of justice (abueisheh)

The Gate of Petra University

- Architect: unknown
- Year: unknown
- Location: Airport Rd , Amman

There is no reliable information about the gate, but it is clear that the designer tried to combine the modern and Nabataean styles; however, the designer did not rely on replication but used the style of abstraction through height, shape, and the use of stone as a sign of modernity.

Figure 44 The gate of Petra University (University)

King Hussein Park "Islamic Gardens"

- Architect: Aiman Zoaiter
- Year: 2005
- Location: Amman

The Islamic Gardens or Islamic Village is part of King Hussein Park, covering an area of 10,000 square metres. It's very clear that the arches, columns and decorations symbolize Islamic architecture and the diverse heritage and topography in Jordan. The designer of the Islamic Gardens employed water elements with elegant mosaics and stone works to indicate Islamic Spanish style.

Figure 45 Islamic gardens in King Hussein Park (Rjoub, 2016)

King Abdullah II Performing Arts Center

- Architect: Zaha Hadid - Patrik Schumacher
- Year: 2008 - in progress
- Location: Amman

This building consists of a concert theatre, an educational centre, and galleries. World-renowned architect Zaha Hadid declared that the design was inspired by the eroded elevation of Al-Siq canyon in Petra, with its rose-coloured, carved, and polished walls.

Figure 46 King Abdullah II performing arts center (Rjoub)

Figure 47 al-Siq- the canyon of Petra (Rjoub)

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Jordan Museum
- Architect: Ja'far Toukan
- Year: 2010
- Location: Amman

The Jordan Museum is the new national museum and is one of the largest museums in Jordan, located in the Ras Al Ain area of downtown Amman. The Jordan Museum presents Jordan's historical and cultural heritage within its unique design halls. It is a national centre of knowledge that reflects the history and civilization of the country in an innovative, educational way. The architect used local stone, reflecting the traditional style of the region.

Figure 48 Jordan Museum building (Rjoub)

Al-Hamshari Masjid

- Architect: Atelier White
- Year: 2012
- Location: Amman

The masjid in Khalda, covering an area of 21,000 square metres, was constructed as three separate rectangular entities, two of which are the main halls, and the third, the courtyard entrance. The minaret is separate from the building itself, as a separate sculptural element. The style of the masjid incarnates the new approach of Islamic contemporary architecture abstractly with the key elements of the mosque (Goldaste, Dome, and Mihrab) to grant them fresh forms and distinctive architectural style and gives a special concern to the local environmental conditions and contemporary construction systems (Rjoub, 2016).

The pervious examples show that the field of urbanization and urban planning in Jordan remain extremely weak The previous examples show that the field of urbanization and urban planning in Jordan remains extremely weak in terms of master plans for urban districts and new cities for several reasons:

1. Urban planning has not been a sought-after profession.
2. Urbanization and urban planning were not taught in Jordanian universities until recently.
3. Jordanian architects have had extensive interest in preserving the heritage resources of past civilizations in Jordan.
4. Massive forced migration has led to the establishment of refugee camps, which started as slums and then developed into permanent cities.

By looking at the projects in Jordan, it's obvious that there was no prior planning of most cities, except the twins of Zarqa, new Amman and Aqaba. And that requires great efforts and joint coordination in dealing with existing cities that were built without planning to reduce the suffering in cities.

On the other hand, the results of the selected projects confirm two different types of relations that Jordanian architects use to ensure communication with heritage resources: (a) imitation, when the creator copies part of a heritage resource and implements it on the new building façade, which supplies the viewer with a sense that the building is old while presenting it in a very modernist vogue that concentrates on aesthetics and uses many building materials; (b) inspiration, when the designer/architect takes the roots of a heritage resource, its philosophy of style, and its content into consideration and attempts to combine them with new and innovative style ideas.

In fact, Islamic architecture is considered as a source of pride, as evidence of the achievements of this fantastic civilization, and as a means to revive the Islamic subject again and to connect the Jordanian community to history and an authentic civilization.

However, these interests emerged within modern Jordanian design by highlighting the technical aspects of Islamic design that specialize in the aesthetic and academic values regarding the social lives of the individuals who fashioned the original multi-functional Islamic urban environments. Jordanian architects targeted the standard heritage resources to revive them in elegant, trendy ways that incorporate up-to-date design. This method arose by implementing totally different meanings and values and presenting acceptable design solutions for modern Jordan by exploiting either native building materials or the standard structural systems, which are socially, economically, and environmentally acceptable. Additionally, this method is essential to trendy Jordanians, as it is nearer to the human and in harmony with nature.

Finally, Jordan is a country descended from ancient civilizations, with a substantial architectural heritage. This heritage is viewed as a cultural wealth that should be preserved along with its new layers throughout history. This connected reference to history must be studied to clarify its characteristics and advantage and to complete its development to fit the circumstances and variables of the current era. In fact, the association with heritage connects consecutive generations with completely different cultures, and it obtains an authentic present full of values and noble meanings supported by solid roots and stable foundations derived from its past.

Furthermore, the architectural attempts to connect to Jordan's heritage are essential to counter the dominance of international designs in various buildings within the Arab world, including Jordan. These attempts of Jordanian architects to link the past with the present in their design through the employment of heritage resources in modern architecture can help the development process and the modernization of Jordanian architectural character, as well as help to discover new architectural features to shape the local architectural identity to fit with the social, economic, and environmental conditions of Jordan.

4 ZARQA: A GENERAL VIEW OF JORDANIAN CITY

Zarqa is the city I will deal with. One of the reasons that led to the selection of Zarqa and the neighbourhood of Ghweirieh is that the city was not built as a city but as refugee camps, which started as slums and then developed into a permanent city suffering from poverty, unemployment, and inequality as well as mismanagement and a lack of urban planning. Moreover, from a personal perspective I am from the city and the neighbourhood of Ghweirieh. So, out of a sense of responsibility towards my society and my city, I want to provide something to alleviate their suffering, as I feel what they feel, and I understand their needs and requirements.

Therefore, this chapter focuses on the city of Zarqa in Jordan. It includes background on Zarqa, interviews with some architects and local residents, personal interpretations of current architectural practices and designs in Jordan generally and Zarqa in particular. It also includes a plan proposal for Ghweirieh to meet residents' needs and reduce their suffering. The scale and scope of the proposal at the neighbourhood level means that urban cultural functions such as opera houses, museums, malls, and theatres are not a part of the proposal because these needs require large swathes; moreover, these needs must be at the city level, not at the neighbourhood level. The previous chapters focused on the importance of urban design, planning, and architectural history in Jordan, but this chapter focuses on developing/upgrading an existing neighbourhood. Here are some picture from Google to visualize the current view of Zarqa.

Figure 50 some pictures in the city (google 2017)

4.1 Background of Zarqa

Zarqa is a city in the Zarqa River basin in northeast Jordan. Zarqa borders Amman to the south and south-west, Mafraq to the north and northeast, and Balqa and Jerash to the west. The city is situated 15 miles northeast of Amman. It hosts a large military base and a Palestinian refugee camp dating back to 1949, which is home to 15,000 people.
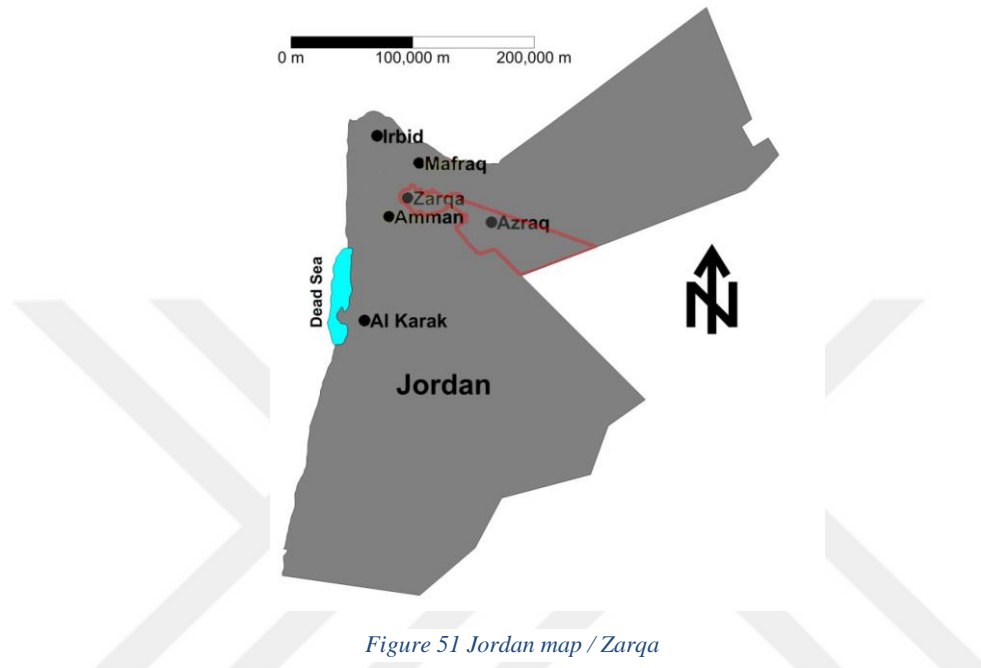
Figure 51 Jordan map / Zarqa

The city of Zarqa is divided into three districts, four sub-districts, and seven municipalities, including Zarqa, Russeita, Al Hashimiyah, Ad Dhlier, Al Hallabat, Al Azraq, and Berrein. Zarqa has a relatively comfortable, sunny climate. The average annual temperature is 17.4°C, and around 182 millimetres of precipitation falls annually.

Most of Jordan's population (54%) lives in Amman and Zarqa, where 80% of GDP is generated. Women's contribution to the formal economy continues to be limited, as they comprise only 14.7% of the total workforce. The city has a population of 514,600, which constitutes 51.7% of the governorate's population of 994,500. The municipality comprises 51.7% males and 48.3% females. The average household size is 5.4 persons, compared to the national average of 5.2. The dependency ratio is 68%, where four or more people depend on one actively working person. The population is youthful—more than half are between the ages of 15 and 64 (USAID LENS, 2016).

The average family income inside the Governorate of Zarqa is 7,877 JD per household per year, which is lower than the national average of 8,823.9 JD per year. Citizens spend most of their income on food, housing, and transportation (37.7% for food, 23.4% for housing, 16.5%

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for transportation, and 9.3% for clothing/durable goods, while the remainder goes toward education, health care, tobacco, and so on). In 2010, the poverty rate was 14.1%, compared to the national level of 14.4%. The unemployment rate is 11.3% in the governorate, and perhaps slightly lower in the city, compared to the national average of 12% (USAID LENS, 2016).

Zarqa has 320 schools, 31% of which are leased or private, serving 98,801 students and employing 9,228 teachers. The average scores on the national high school (Tawjihi) test are among the highest in the country. The city also has several universities and colleges, including the Hashemite University (HU), Zarqa Private University, and Al Balqa Applied University, which offer a wide variety of educational opportunities in the arts, science and research, education, nursing, and engineering. There are also vocational training institutions. There are several libraries and cultural centres. For youth, there is an aquatic park for swimming and entertainment, as well as numerous sports centres and youth clubs. There is also a cultural directorate in the municipality (USAID LENS, 2016).

The Investments Department brought in 2,282,432 JD in revenue and created 4,020 jobs. Those projects include a recycling plant, commercial warehouses, malls, auto-parks, kiosks, billboards, and amusement/recreational facilities. The municipality owns land that could host investments, and it hopes to expand the city limits, annexing another 100 square kilometres to build projects with the private sector. Most of the departments have computers, although only 22 are connected to an internal network and a public server. Most do not have internet connectivity. The municipality lacks a web site but does communicate using Facebook. However, unlike most municipalities, it does have a GIS system, which utilizes Oracle Database 11G and AutoCad. Fourteen employees are proficient in GIS. Integrating these employees' skills will be very important to future land planning efforts in Zarqa (USAID LENS, 2016, p. 13).

Zarqa is a major industrial area with a vibrant commercial sector. There are 408 large installations, including leather tanning factories and therapeutic and medical, engineering/IT, plastics, rubber, and paper/cardboard companies. There are major commercial, retail and office areas including 11,000 commercial businesses.

The city offers comprehensive healthcare facilities, with eight hospitals with 940 beds, including the Al Zarqa Governmental Hospital and the Prince Faisal Bin Al Hussein Hospital. There are also five private hospitals with 315 beds, 44 healthcare centres, 36 maternity centres,

30 dental clinics, 206 pharmacies, and one communicable disease centre in the city. There is a lack of specialized medical equipment and staff.

The electricity network covers the entire city. A broadband network is in place. There is a total of 15 police and fire stations operated by one directorate. In general, the road networks cover most municipal areas, serving the local population and linking it to nearby cities. There are three bus and taxi companies that serve the city. The closest airport is Queen Alia International Airport, which is about a 40-minute drive from the municipality. There are train lines and an old train station that are currently not operative. All solid waste is collected on a daily basis, with five rounds made in different locations, for a total of 400–500 tonnes, of which 60% is organic and the remainder is plastic, glass, paper, cardboard, metal, and pharmaceutical waste. There is no landfill within the municipal borders, but there is a 10-hectare holding and transfer station located about 7 kilometres outside the city where waste is dropped off. The majority of municipal residents (72% of the population) are served by sewage lines, and 28% use cesspits.

The water pipeline network is extensive and covers about 70% of the municipal area. Zarqa Municipality is very concerned about its water supply, and its water resources are scarce. The number of artesian wells is decreasing.

The municipality has an updated general plan, regulations, and zoning map but lacks a master plan and zoning map (land use blueprint) and comprehensive database to direct investors to specific appropriate parcels and investment opportunities on both public and private lands.

Natural Resources
- There is very little agricultural or forest land in Zarqa, as it is an industrial area.
- Al Zarqa River is a potential resource in Jordan that passes through three major Jordanian cities. The Zarqa River Basin extends from the Syrian border in the north of Jordan to south of Amman and westward toward the Jordan Rift valley. The entire basin encompasses approximately 4,154 square kilometres, of which 3,739 are within Jordan. Yarmouk River is the largest tributary in Jordan, followed by Zarqa River (Anzeeh, 2015).

4.2 Current Physical/Infrastructural/Social Conditions

4.2.1 Density

The major problem is the high density of the city, which is leading to numerous other problems: traffic, congestion, public off-the-record settlements, insufficient infrastructure, pollution, sprawl, and elimination of vegetation. These problems stem from the fact that the city is an extension of a refugee camp that led to slums and then developed into a regular city.

The city of Zarqa was not founded as a city but comprises extensions of the growth and expansion of informal settlements whose buildings had tiny footprints. The city began to grow without any supervision from the authorities or any land use or building regulations. A policy of non-interference has resulted in the development of poor social habits, a scarcity of public or civic sense, and a lack of responsibility within the town. However, throughout this time, the residents began finding their own issues and considerations outside the regulatory agency's influences. Therefore, building permits were given out in line with municipal land use. However, at the same time, they did not adjust to the municipal regulatory arrangement because of the rules for the allowable settled space, building heights, etc.

The city suffers from a lack of public space and poor infrastructure and housing structures. This lack has led to high housing density and commercial density and poor quality of life. Furthermore, there are many households that are trapped in their present locations without any prospect of an alternative. In fact, many of them have missed out on previous allocations of land or social housing; others came as temporary renters and are now searching for more permanent accommodation. Although the municipality modified its regulatory plan to include the existing buildings, and despite the upgrading project that was conducted by the Housing and Urban Development Corporation,[13] the area still needs further upgrade initiatives in respect to its density, infrastructure, public services, and social problems.

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[13] http://www.hudc.gov.jo/Default.aspx

Figure 52 part of the city (google map 2017)

4.2.2 Refugee crisis

On 9 March 2014, the mayor of Zarqa, Emad Momani, called for international grants to help the heavily populated city deal with the influx of refugees.

The mayor said in an interview with the *Jordan Times* that there were more than 100,000 refugees residing in Zarqa, which has put more burdens on the already stagnant financial resources of the municipality and on the services provided to residents. According to the mayor, Zarqa is one of most populated cities in Jordan. The population of Zarqa is estimated at 1 million, out of a total population of more than 7 million in 2014. Momani added that the outlay of services had gone up pointedly due to the influx of refugees, and the municipality's vehicles were working three shifts to meet rising demand for services, especially sanitation (Jordan Times, 2014). By 2016, the number of Syrian refugees had increased to 175,280 in Zarqa alone (Jordan Times, 2016).

Challenges

Momani cited environmental problems because they are the most pressing challenge for the town of Zarqa, 23 kilometres northeast of the capital, adding that the municipality still has additional work to do to boost sanitation services. He noted that residents' lack of confidence in municipal councils is another challenge. People have lost confidence in previous municipal officers, not just Zarqa but across the country; according to Momani, the present council is functioning to bridge the gap between residents and town administrators through increasing the services offered to them and through conferences staged to concentrate on their demands. People want to see better services and a cleaner town to regain their confidence, he added. Momani underlined that "poor" infrastructure is another hindrance facing Zarqa (Jordan Times, 2014).

4.2.3 Public transportation and Road network

Residents of the city suffer from narrow streets, a lack of parking lots, and a lack of alternative routes to transport people from the city to other areas without passing through downtown, causing congestion (Figure 53 zarqa city (google map)). Most of the city's population relies heavily on public transport, yet the public transport system is suffering from indiscriminate and low-level service and a lack of integrated geographical coverage, which drives the residents to use their own cars, which also increases congestion. It is imperative to promote and control public transport and cover the entire city to reduce the use of private cars. Figure 54 Ghwariyah in zarqa (google map), shows the lack of parking lots, the narrow streets, and the number of private cars.
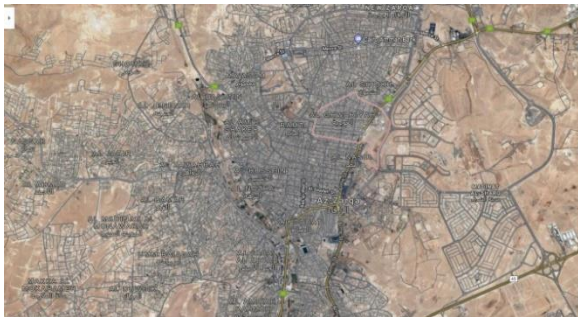
Figure 53 zarqa city (google map)

Figure 54 Ghwariyah in zarqa (google map)

4.2.4 Water and Wastewater System

Jordan is one of the 10 poorest countries worldwide in water resources. The available renewable water resources have dropped drastically to an annual per capita share of less than 160 cubic metres in recent years, compared to 3,600 cubic metres per capita in 1946. The first piped sewer system was constructed in 1985, serving the central areas of Zarqa and Russeifa. Today, the total length of the gravity sewer network is about 851 kilometres, with a diameter of 20 centimetres to 1 metre, serving most of Zarqa, Russeifa, and al-Hashmiyah. The total length of the main sewers with diameters of at least 30 centimetres is about 117 kilometres. The secondary collection system is a dense network of 20-centimetre-diameter sewers covering most of the populated areas of Zarqa, Russeifa, and al-Hashemiyah, with a total length of about 789 kilometres. Most of the sewers are made of concrete, and a few are made of ductile iron and vitrified clay. The major problem with the existing sewer system in Zarqa Governorate is its extent, as the system's coverage is around 72%. Future wastewater generation rates for the Zarqa Governorate, based on population forecasts, water consumption rates, and the wastewater return value, are estimated at 143,408 cubic metres per day by the year 2035. It is

urgent to improve, renew, and extend the wastewater collection, treatment, and disposal systems (Governorate, 2010).

4.3 Interviews with the Architects in Zarqa

The purpose of conducting interviews with architects in Zarqa was to assess the status of the city from the point of view of specialists and professionals and to identify the reasons that led to the current situation and what the architects need to upgrade the city. The reason for choosing this methodology was to learn and understand the meaning of what the interviewees said. In the interviews, the interviewees could ask to clarify the questions. The target number of interviewees in Zarqa was 20 architects, divided between two groups: 3–10 years' experience and 11–40 years' experience. The questions included the following:

- What do you think about the current situation in Zarqa?
- If negative or positive, what are the reasons that led to it?
- What improvements can be made to Zarqa?
- What are your expectation of and priorities for Zarqa from a professional point of view?
- Have you had any role in participating the environmental architectural problem-solving processes?

There is no engineering/architectural company in Zarqa, only offices. The interviews were with the owners of engineering/architectural offices. Most of the participants were divided into two categories: young and older architects. The difference between them was clear in points of view, but there was agreement that urbanization is really important and that the city's situation is very bad and needs a lot of work; they considered the main problem in the city to be extensions for the refugee camp, which started as slums and then developed into a permanent city with mismanagement and a lack of urban planning. But a difference emerged between them in the present changes and improvement of the city's status within the existing legislation environment, institutions, and available possibilities.

The older architects seemed to be more pessimist; they did not see any improvement in the short and medium term due to the weakness of the state institutions (the Ministry of Works, the Municipality, and the Engineers Syndicate), which are rife with bribery, nepotism, and tribalism. Meanwhile, young architects aspire to empower these institutions to change the current situation in the city, believe they are more efficient than old architects in terms of using modern technologies such as software, and have a positive vision for the future. They believe

corruption and weakness in the institutions of the state are not a big problem and can be solved by creating electronic institutions and thus eliminating bureaucracy, bribery, nepotism, tribalism, and follow-up projects. Young architects believe that older architects should learn modern techniques because modern techniques save a lot of time and money, provide more details, and are more efficient. Note: The older architects in other cities (e.g., Amman) differed in terms of the use of modern technologies. These opinions are limited to those we interviewed in Zarqa only. **The answers were as follows:**

Questions	Older architects 10 – 40 years' experience	Young architects 3 - 10 years' experience
Current situation?	Unsatisfied and bad	Unsatisfied, crowded and miserable
Reasons that led to it?	• The shelter camp led to being slums and then developed into a city. • Permanent. • Mismanagement and lack of urban planning.	• The shelter camp led to being slums and then developed into a city. • Mismanagement and lack of urban planning. • The economy, the rate of inflation, unemployment rates and social justice.
Existing problems?	• High density, bribery, nepotism and tribalism • Congestion • Randomness • No parking areas • Lack of Green areas • No walkways • Follow-up	• Legislation • Follow-up • Bribery • Nepotism • Tribalism • High density • Congestion
Improvements they want it to the city?	• Reduce the density • alternative routes • Demolish some areas • Empower the young architects • prohibit any new construction	• Expansion outside the city • Legislation • Follow-up • Transfer some popular markets • Reduce the density
Have you participated problem-solving?	No one of them, but they are willing to have a role in engaging	Just two of them in terms of legislation
Prioritizing about zarqa in a professional point of view?	Empower the young architects, should prohibit any new construction, reduce, the density and the economy.	Economy, legislation, follow-up, and transparency development

Table 1 The answers of the architects / interviews

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4.4 Case Study: Ghweirieh Neighborhood in Zarqa

This sections focuses on a field survey of the neighbourhood of Ghweirieh through interviewing residents. Additionally, it provides a masterplan proposal for Ghweirieh that includes land use, affected areas, land ownership, and the proposal.

4.4.1 Field Survey: Interviews with residents

This section focuses on face-to-face interviews with residents in the neighbourhood of Ghweirieh to figure out the requirements of residents in the neighbourhood, their problems with the neighbourhood, and improvements they want for it. The target groups of residents (50 people) were divided into children between 7 and 14, youth between 15 and 25, and adults 26 and older. The reason for dividing residents into three age groups was that each age group has different needs and requirements. The questions for the residents were as follows:

- What are the problems of the city?
- What improvements do you want for the city?
- Do you feel that you belong in Zarqa?
- Would it be possible for you to give up your home (with compensation) in order to redevelop the city?
- Any other opinions?

From the interviews, it was very clear that the residents wished and hoped to change and improve the current state of the neighbourhood. They were all willing to give up their homes with compensation in order to improve the situation in the neighbourhood. Their demands were not impossible or fictitious. Their demands were only basic. None of them asked that the neighbourhood or city be smart.

7–14 Age Group

In the neighbourhood, the children are at risk; there is no place for them to play. Children play on the street, which is really dangerous. Not only that, the children are being "kicked out" of the street, not for their safety but because of their screaming and the inconvenience they cause. Abu Mohammed, a resident of the neighbourhood, said, "I cannot take a rest or a nap when returning from a long and hard day's work because of the children's voices on the street." So, what the children need most is places to play.

15–25 Age Group

Young people had another point of view: They were looking for jobs, life organization, and population reduction. One of their most important needs was for entertainment venues (water city, cinema, mall, and others). Zaid, a 24-year-old resident of the neighbourhood, said, "The main reason for crimes and problems among people is their leisure time, and to solve these things, the government must provide entertainment places and cultural activities to fill young people's leisure time, especially during the summer vacation."

26 and Older Age Group

The people who were older than 26 were more mature than children and young people in terms of requirements and improvements. They had a lot of things that they hoped would change and improve. They cared about ending the bureaucracy, solving traffic congestion, and improving the infrastructure; they asked to establish health clinics, alternative routes, parks, parking spaces, walking places, specializations for disabled people, cultural venues (theatre, museum, and opera), libraries, landscaping, and guiding boards.

The answers were as follows:

Age group	The problems they suffer from	The improvements they want	Belong to the city	give up their houses
[7-14]	Lack of places to play, overcrowded schools and cars	Parks, malls, recreational activities, painting houses, creating schools	No	Yes
[15-25]	Unemployment, narrow streets, infrastructure, population density, randomization, no system.	Public Internet, parks, parking lots, malls, alternative streets, pedestrian bridges.	Yes, but does not mean to live in the city	Yes

| [26-older] | Bureaucracy, cleanliness, population density, frequent alleys, lack of follow-up, motor speed, traffic congestion and infrastructure | Health clinics, alternative routes, parks, parking spaces, walking places, specializations for disabled people, cultural venues (theater, museum, and opera), libraries, landscaping and guiding boards | Yes, but does not mean to live in the city | Yes |

Table 2 The answers of the residents / interviews

4.4.2 Ghweirieh Neighbourhood

Following the evaluation of Ghweirieh's current state, it was observed that neighbourhoods have regulatory plans for local roads, but the buildings didn't follow these rules, as they were constructed on small parcels that were divided informally between partners outside the regulatory authority. This resulted in building on parcels less than the minimum allowable size, which in turn led to a very compact, chaotic area with winding, narrow paths due to some setbacks between buildings. It was also observed that the main road was really crowded because there was no parking area, and the people couldn't reach their houses without using the main road.

Figure 55 Al Ghwariyah (google map)

Ghweirieh is located in the sixth district of the administrative division of Zarqa. The neighbourhood has electrical service, and all dwellings are connected to the water supply network and public sewage system, which needs periodic maintenance to avoid overflow due to malpractice, which causes health and environmental risks/problems. It also has

- Three schools: one male-only with 650 students, one female-only with 513 students, and one mixed with 700 students (blue, 2018).
- One community health centre.
- Two major roads and five secondary roads, connecting roads, and paths. The roads require widening and maintenance.

The population in the neighborhood

2017 Population / family		Non-Jordanian			Jordanian			2017 Population of Ghweirieh		
Number of families	Average family s	Total	Female	Male	Total	Female	Male	Total	Female	Male
7507	4.7	11,184	4,474	6,709	24166	11750	12416	35350	16225	19125

Table 3 Population of Ghweirieh (head of population statistics, 2018)

Land use: The core of the block consists of private housing in addition to legalized construction on parcels smaller than the allowable measurement, 150 square metres. The outer area of the block was once designated as commercial.

Land ownership: Most plots of land in the neighbourhood are private property; some of them are designated treasury and a few to the state treasury. Therefore, it is necessary to take some private plots of land (with the compensation of their owners) to develop the neighbourhood (Attor, 2010).

Through the case study of the neighbourhood of Ghweirieh and conducting interviews with its residents, the problems experienced by the neighbourhood were identified as overcrowding, narrow streets, and the lack of parking, green spaces, places to walk, and entertainment.

5   CONCLUSION

This section summarizes the study and aims to provide recommendations and conclusions for the adoption of urbanization projects by the private and public sectors in the region.

An examination of the prospects and advantages of and barriers to successful urbanization workflow adoption in Zarqa, Jordan, was conducted. The purpose of the research was to develop a clear understanding about urbanization to identify the different factors that provide useful information for the private and public sectors about adopting urbanization projects in Jordan.

Interviews with 20 architects in Zarqa and 50 residents in the neighbourhood were analysed qualitatively. Through interviews with residents, it was found that change to the local character of the architecture and demographic change were not important for them, and they were willing to dispense with their homes in exchange for compensation and the development of the neighbourhood. The reason for residents' indifference to demographic change and the existing architectural character is that the neighbourhood was constructed in a random manner without consideration of urban design; the city and the neighbourhood have no architectural history, and the neighbourhood is suffering from overcrowding, narrow streets, and a lack of parking, green spaces, and entertainment.

The scale and scope of the proposal are at the neighbourhood level, not the city level, since some needs of neighbourhood residents cannot be implemented in the neighbourhood, such as an opera house, a museum, malls, and a theatre, because these require large swathes. The proposal (upgrade) focuses on solving problems in the neighbourhood.

Conclusions of the Research Objectives and Key Research Questions
The first objective was to evaluate the current tendencies in urbanization practices in the region. This objective is related to the following research question: What is the level of awareness of urbanization among the private and public sector in the region?

It is very clear that the Middle East is aware of urban planning and population growth from the examples mentioned in chapter 2 about master plans for urban districts and new cities. It is obvious that the region is planning for future generations despite challenges and constraints. Indeed, there are also some countries, such as Jordan and Egypt that are struggling to find the financial resources to achieve their ambitious projects.

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The second objective was to provide useful information for public and private sector organizations considering adopting urbanization projects in the region. This objective is related to the following research question: Are there any factors that provide useful information to private and public sector organizations considering adopting urbanization projects?

Chapter 2 mentioned information about urbanization from the UN-Habitat Human Settlements Reports[14] of the first, second, and third conferences on urban design, which provided values that guided major shifts in strategic and policy thinking for both private and public sector organizations in the region. If the private and public sectors work hand in hand with UN-Habitat's New Urban Agenda, that will make a huge different in our region.

The third objective was to identify the levels of interaction and design relations between contemporary Jordanian architects and architectural heritage that remains from various civilizations that passed through the region. This objective is related to the following research question: Are there the factors that provide useful information to private and public sector organizations considering adopting urbanization projects in Jordan?

The examples (chapter 3, p. 30) show that the levels of urbanization and urban planning in Jordan remain extremely weak in terms of master plans for urban districts and new cities for several reasons:

1. Urban planning has not been a sought-after profession.
2. Urbanization and urban planning were not taught in Jordanian universities until recently.
3. Jordanian architects have had an extensive interest in preserving the heritage resources of past civilizations in Jordan.

Recently, there has been useful information about urbanization projects such as King Abdullah bin Abdul Aziz City and New Amman.

The fourth objective was to study the current conditions of architectural and urban development in Jordan and identify its general characteristics. This objective is related to the research question: What is the effect of the level of awareness of urbanization among professionals on the reduction of urbanization barriers in Jordan?

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z[14] United Nations Human Settlements Programme in 2016

Being inspired by the heritage resources of past civilizations is one of the main characteristics of Jordanian architects. There is awareness about urbanization, but not at the required level.

Contribution to Knowledge

The study aimed to contribute to the existing knowledge about urbanization and development in Jordan. It contributes significantly to our understanding of urbanization and development in Zarqa in Jordan. Additionally, this comprehensive study can provide documentation of reference for the urbanization and development situation in Jordan, especially Ghweirieh in Zarqa. It can be used as a comparative guide for future development, to broaden our understanding of urbanization and development and foster a creative working environment. The research includes the history of architecture in Jordan and the impact of various civilizations on architecture in Jordan, as well as some ambitious projects in the region that give inspiration and experience to our region's urban design and development. The research addresses the challenges facing Jordan, which require Jordan to work harder and plan for the future within the outputs of UN-Habitat III[15] so that Jordan will be compatible with the rest of the world.

Founded on the objectives of this research as stated previously, the recommendations based on the case study and interviews are as follows:

- The private and public sectors should work hand in hand with the New Urban Agenda of UN-Habitat to make a huge different in our region.
- The governments in the region should provide professionals with useful information about urbanization to adopt in private- and public-sector projects as well as facilities.
- Training and education should be provided to raise urban design awareness. Offering experts such as the Engineers Association to train architects and engineers is the key to success. As stated earlier, until recently, urban design was not a sought-after profession in Jordan.
- Follow-up and monitoring should be practised by government agencies. There are many initiatives and improvements to the city that quickly fail due to the government's lack of monitoring and follow-up; as examples, Royal Village Park, the children's library, and many more are closed.

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15 Habitat III took place in Quito, Ecuador, in October 2016.

- Laws should be enacted to prohibit construction in existing cities to reduce overcrowding.

- Traditional management in the state institutions should be transformed into electronic management in order to eliminate corruption, nepotism, bribery, and tribalism.

- Modern techniques such as BIM should be used in design and urban planning.

- New cities should be planned to cope with population density, improve the economic situation, and ensure the people's welfare.

- Parking lots should be built throughout the city, and then legislation should be issued prohibiting street parking and lining up in designated places to limit road obstruction.

- Public transport should be enhanced and improved to minimize vehicle use, as the city suffers from suffocation.

- The population density and urban density of the city should be reduced within the long-term plan through the establishment of new cities or expansion outside the city.

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