
Master's dissertation

*Assessing disaster risk reduction in refugee camp
design: the case of Al-Wehdat and Azraq refugee camps
in Jordan*

Abdel Rahman Ghalib Al Zoubi



Aquest TFM està subject a la licència [Reconeixement-
NoComercial-SenseObraDerivada 4.0 Internacional \(CC BY-NC-
ND 4.0\)](https://creativecommons.org/licenses/by-nc-nd/4.0/)

Este TFM está sujeto a la licencia [Reconocimiento-NoComercial-SinObraDerivada 4.0
Internacional \(CC BY-NC-ND 4.0\)](https://creativecommons.org/licenses/by-nc-nd/4.0/)

This TFM is licensed under the [Attribution-NonCommercial-NoDerivatives 4.0 International \(CC
BY-NC-ND 4.0\)](https://creativecommons.org/licenses/by-nc-nd/4.0/)



TECHNISCHE
UNIVERSITÄT
DARMSTADT

MASTER OF INTERNATIONAL
COOPERATION SUSTAINABLE
EMERGENCY ARCHITECTURE

UIC
barcelona

mu

International Cooperation
in Urban Development

Master's Dissertation

Assessing Disaster Risk Reduction in Refugee Camp Design

The Case of Al-Wehdat and Azraq Refugee Camps
in Jordan

Academic Year 2019/2020

Student Name: Abdel Rahman Ghalib AL ZOUBI

**Master of Science in International Cooperation in Sustainable Emergency
Architecture**

Supervisor Name: María del Carmen MENDOZA ARROYO

Date Presented: 8 June 2020

Assessing Disaster Risk Reduction in Refugee Camp Design

The Case of Al-Wehdat and Azraq Refugee
Camps in Jordan

MUNDUS URBANO PROGRAMME 2018/2020

Master of Science in International Cooperation in Urban Development

Technische Universität Darmstadt, Department of Architecture | Darmstadt, Germany

Master of Science in International Cooperation in Sustainable Emergency Architecture

University Internacional de Catalunya, School of Architecture | Barcelona, Spain

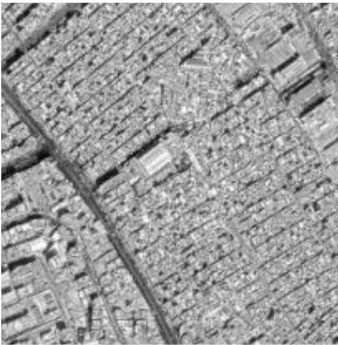
<https://www.mundus-urbano.eu/>



With the support of the
Erasmus+ Programme
of the European Union



**RETHINKING
IN OUR
EMERGENCY
SOLUTIONS**



Acknowledgements

All praises are due to Allah for this achievement

During this experience, I had the opportunity to know many people who gave me essential inputs to the development of this research.

I would like to thank my supervisor Dr. Carmen MENDOZA ARROYO for her support and guidance, even when Skype was our only possible means of communication. I will always be grateful to her, for showing real commitment to the development of this thesis and for encouraging me to give my best.

Thank you to my family who gave me the possibility to study this Master's, to believe in and be proud of me. Special prayers full with forgiveness to my father's soul - *Allah yerhamak*, Rest in Peace - who supported me and showed me the good way.

Thank you to the Mundies & MICSEAs who made these two years an unforgettable experience, and to all the people close to my heart whom I wish to see very soon.

Last but not least, I would like to express my gratitude in being part of the two-year journey. I met incredibly exciting human beings along the way, all different, wiser and more experienced than me, who brought me so much love and humanity. Those culturally diverse people taught me a lot of things and helped me grow throughout my young age and in this specific field of international cooperation.

Chukran - Thank you

Table of Contents

Abstract

Chapter One: Introduction

1.1 Presentation of Research Problem, Objectives & Questions

7

1.2 Research Structure and Methodology

8

1.3 Beneficiaries of this Research

9

1.4 Limitation of Research

9

Chapter Two: Conceptual Framework

2.1 Understanding Disaster Risk Reduction

10

2.2 Analysing Disaster Risk Reduction Frameworks

13

2.3 Camp Design Manuals and Disaster Risk Reduction Strategies

17

2.4 Key Findings from Literature Review

22

Chapter Three: Case Study Background

3.1 Jordan and Risk Reduction Strategies

23

3.2 Emergency and Risk Management in Jordan

25

Chapter Four: Analysing Refugee Camps and Risk Reduction Strategies

4.1 The Palestinian Asylum Case

29

4.2 The Syrian Asylum Case

46

Chapter Five: Conclusion

Bibliography

Annexe

Abstract

Regionally, Jordan is considered one of the most refugee-welcoming countries, as today it hosts around three million refugees and asylum seekers. This situation puts cities in confrontation with accommodating these populations, whether it is in informal urban settlements or emergency planned camps. As a result, they are a burden to the existing social and urban infrastructure and natural resources to cope with refugees' needs, which might hinder the national development plans, thus elevating the vulnerability of the cities and their dwellers to low-level hazards. The focus of this research is to advance an understanding of Disaster Risk Reduction frameworks that comply with refugee camp design and informal camp settlements. The research method consisted of an extensive review of relevant literature on Disaster Risk Reduction frameworks, camp design guidelines, coupled with a context-based review of case studies. The latter is based on comparative analysis of informal camp - protracted settlement within the urban fabric - and emergency camp - planned campsite in a remote area - in Jordan. The findings from this research show that refugee camp design parameters do not adequately represent Disaster Risk Reduction strategies, specifically in the informal camps. Also that introducing them in initial camp planning stages with including the local-based knowledge of disasters could benefit their sustainable urban upgrading, and raise their preparedness and risk mitigation profile.

Keywords

Disaster Risk Reduction; Refugees; Refugee Camp Design; Jordan; Al Wehdat Palestinian Refugee Camp; Azraq Syrian Refugee Camp; Urban; Resilience; Informal Camp Settlement; Emergency Camp; Informality; Urban Settlements;

Chapter One: Introduction

1.1 Presentation of Research Problem, Objectives & Questions

Jordan's contemporary history for more than seventy years is associated with hosting refugees from neighbouring countries. This linkage formed many urban agglomerations in most of the Jordanian cities, especially the capital Amman, where the Palestinian asylum since 1948 has played a significant role in the urban expansion of the city. These urban spaces are called refugee camps, which are supervised by the Jordanian government and the United Nations Relief and Works Agency for Palestine Refugees in the Near East (UNRWA). Furthermore, with the continuation of the Palestinian-Israeli crisis, camps evolved from the state of emergency (short-term settlements) to informal (long-term settlements) in terms of planning, growth, and density. It is also described as administrative neighbourhoods according to the department of land and survey in the municipalities.

During the war on Iraq in 2003, the massive influx of Iraqis continued to enter Jordan in search of asylum from the war. Still, the crisis did not require the establishment of refugee camps. Still, instead, refugees were hosted in urban areas in the Jordanian cities, especially Amman, because it is the economic and commercial centre in Jordan. The Jordanian government, in cooperation with the United Nations High Commissioner for Refugees (UNHCR), assisted in protecting Iraqi refugees, as well as providing housing for all Iraqis. Recently, Syrian asylum in Jordan still exists to this day. Jordan has received thousands of Syrian refugees, as they were hosted inside UNHCR refugee camps, while others still living in urban areas in the Jordanian cities. Where UNHCR and the government provide and manage assistance inside and outside the camp, in cooperation with several humanitarian organisations.

Jordan is the most welcoming country to receive around three million refugees and asylum seekers¹ seeking safety. Despite the fact that Jordan is an upper-middle-income class² with high levels of human development³. It suffers from high population density in cities and an overburdened capacity of the social and physical infrastructure, especially where there is a high concentration of the refugee population (CADRI 2018_a, 2019). In particular, informal Palestinian settlements have significantly been affected by the increasing population density and the inability of the built-up environment to put pressure on infrastructure, as well as face natural

1 1.4 million is the total Syrian population in Jordan, of whom 656,246 are Syrian refugees. Whereas 67,266 are Iraqi refugees and more than 2 million Palestinian refugees. Also, 14,730 Yemeni asylum seekers, 6,116 Sudanese, 743 Somalians, and around 1,700 other nationalities. (UNDP, 2016; UNRWA, 2018; UNHCR, 2019_a, 2020)

2 The classification is based on the socio-economic conditions (including the rate of employment, ownership of assets, services provided by the government) besides, Gross National Index (GNI) per capita. Based on the World Bank classification for the upper-middle-income class are those with a GNI per capita between \$3,996 and \$12,375 (Jordan US\$4,380). (Ababsa, 2013; Beer Prydz & Wadhwa, 2019)

3 The United Nations Development Programme (UNDP) developed the Human Development Index (HDI), which is considered as a summary measure for assessing long-term progress in three basic dimensions of human development: a long and healthy life, access to knowledge, and a decent standard of living. Jordan's HDI value for 2018 is 0.723—which put the country in the high human development category—positioning it at 102 out of 189 countries and territories. (UNDP, 2019)

hazards. Moreover, Refugees inside the camps suffer from inferior living standards, poor housing conditions, more physical and mental health problems (Beinin & Hajjar, 2014). The urban settings of these camps are inadequate to be resistant to disaster risks. The main risk drivers in Jordan are rapid population growth, unplanned urbanisation, unsustainable land use, and water management practices, which makes cities prone to serious impact even with low-moderate hazards. These hazards are expected to happen in more frequent order due to climate change, which can cause significant socio-economic and environmental losses (UN–Jordan, 2020).

The relationship between camp design and Disaster Risk Reduction (DRR) strategies is the primary goal of this research as it highlights the importance of the camp design strategies, as it often turns over time from emergency camps to informal settlements. The research argues that the designing guidelines of the camps lack standards to cope with potential disasters; therefore, the possibility of disasters increases the chances of damage to the population, buildings, and infrastructure, as well as increases the number of victims. The problem that this research is trying to analyse is the lack of DRR strategies in camp design generally, and within informal camps specifically. Within the context of refugee camps in Jordan, the specific objectives of this research are to:

1. Analyse the existing DRR frameworks.
2. Examine the existing national emergency plan in Jordan, and to what extent it includes DRR for camps.
3. Analyse what parameters of DRR are applied to camp design.

The overall aim of this research is to advance an understanding of DRR as a critical element for camp design, by questioning; Are disaster risk strategies complying to camp design? Does the urban configuration of the informal camps comply with DRR parameters? To what extent DRR is applied to existing camps, especially informal camps, and how can it be implemented? To what extent camp design manuals and DRR frameworks include context-based knowledge?

1.2 Research Structure and Methodology

The research examines two camps in Jordan (i.e., Amman New Camp for Palestinian refugees, which is an informal settlement, and Azraq Camp for Syrian refugees built with guidelines of camp design)⁴. The Primary data were not excessively produced, and field research was not conducted, due to the limitations of the spread of *COVID-19* pandemic, and applying confinement measures by the government. Therefore the research scope altered to analyse the camps through secondary data. The method of gathering the primary data based on a qualitative

⁴ The selection of the camps was based on a comparative analysis of two cases to develop a comprehensive approach to the research. The selection of the Amman New Camp based on the initial research methodology (as it is an informal settlement within the urban fabric of the city of Amman), while Azraq Camp has recently been built following clear guidelines of camp design, the research will examine it after seven years of operation.

analysis, through conducting semi-structured interviews with two staff from UNRWA⁵ and Greater Amman Municipality⁶ (GAM), in order to discuss the main topics of DRR and its applications in urban settlements in Amman, and the implications of informal settlements within urban structures.

For the present study, This research will depend heavily on secondary data by reviewing relevant literature, frameworks, and manuals on camp design, through studying the case of refugee camps in Jordan. The secondary data (i.e., literature reviews) will mostly come from journals (e.g., Journal of Refugee Studies); official websites (e.g., www.undrr.org); multimedia resources (e.g., UNRWA photo and Film archive for Palestinian Refugees). In addition to that, databases have been used (e.g., JSTOR) to support this research.

The objective of the information collected was thematically analysed and explained in order to develop a better understanding of the physical evolution of camps and its urban scale, how frameworks and camp design parameters affect DRR strategies in informal camps. This understanding allowed for some conclusions about what guidelines are lacking in terms of disaster risk strategies, and how the national DRR plan interacts with camps, and how can improve DRR level inside camps, specifically the informal settlements.

1.3 Beneficiaries of this Research

This research will benefit the scholar community, and professionals by building onto the field of emergency architecture and urbanism in the area of DRR in the context of informal settlements and refugee camps. The outcomes of this research - primary and secondary data - could enrich other research projects in the field of informal settlement upgrading, and applying DRR parameters to vulnerable urban configurations. Furthermore, these outcomes could be introduced to governmental and non-governmental organisations (NGOs) that work on the development and building resilience, to build capacity in prevention and preparedness across socio-economic and environmental sectors against natural hazards due to climatic change.

1.4 Limitation of Research

The inability to develop the empirical data (i.e., fieldwork) is the primary interruption of this research, and the main reason for this is the spread of the current *COVID-19* pandemic, which led the government to emphasise on the citizens to abide by their homes. Further, the lack of sufficient time for interviews due to the inability to visit the camp and conduct any analytical mapping and interview the people concerned. Moreover, the research study needs more time to analyse and study as many camps as possible in order to develop the necessary outputs to respond to the research questions.

⁵ Chief architect in the department of infrastructure and camp improvement, UNRWA Headquarter, Amman, Jordan.

⁶ Urban planning specialist in the planning department, GAM, Jordan.

Chapter Two: Conceptual Framework

This Literature Review will appraise the central issue of hazard prevention and DRR within refugee camps - including protracted refugee camps – in Jordan, through reviewing the most relevant frameworks, and parameters which can be implemented in the camp design guidelines. The study within this review of literature emphasis on research objectives 1, 2 and 3.

The historical background of the Arab migrations to Jordan and the disaster risk topic along with the international frameworks that are addressing the concept of adaptation and preparedness, the national level of implementation of the DRR, and leading stakeholders in the frame of DRR will be defined. Significantly, the primary principals, key drivers, and elements for the camp design that integrate a system for disaster prevention will be assessed. At the end of this major chapter, a critical understanding of key issues is expressed, that the reader will be better educated in these areas and this will bring a clear focus, and justification, for empirical research in the field of camp design and disaster preparedness.

2.1 Understanding Disaster Risk Reduction

In order to create a comprehensive picture of the DRR, a detailed analysis of the main components must be conducted. What is disaster risk? What does it mean to reduce preparedness? What are the drivers and key elements behind the concept? All these questions will be answered as follows.

2.1.1 Disaster Risk

Based on the United Nations Office for Disaster Risk Reduction (UNDRR), disaster risk refers to “*the potential loss of life, injury, or destroyed or damaged assets which could occur to a system, society or a community in a specific period, determined probabilistically as a function of hazard, exposure, vulnerability and capacity*” (UN Secretary-General, 2016, P.14). The definition presents the risk as to the result of the interaction between a hazard and the characteristics that make people and places vulnerable and exposed (see *Figure 2.1*). Therefore, two types of risks can be defined based on the probability of occurrence and its impact; *intensive risk* is disaster risk associated with low-probability, high-impact events, whereas *colossal risk* is associated with high-probability, low-impact events (UNISDR, 2015_a, 2016; Prevention Web, 2015).



Figure 2.1 Risk Definition. Edited by the author, 2020. Adapted from “Disaster Risk” by Prevention Web, 2015 (<https://www.preventionweb.net/risk/disaster-risk>). Copyright 2015 by Prevention Web.

The exposure and vulnerability of people and places in correlation to the severity of the hazard event are what characterise disaster's losses, and impacts (UNISDR, 2014) and that comply with the camp settings. From the point of view of development, disasters are considered as an indicator of development collapsing, meaning that disaster risk can be used as a scale of sustainability of development. Risk drivers - towards the degradation of development – can influence hazard, vulnerability, and exposure, including inequality, poverty, unplanned and badly managed urban development, and climate change (Twigg, 2015). For a broader understanding of the disaster risk, society's capacity to cope with disaster must be taken into consideration. Therefore, *“the ability of communities, societies and systems to resist, absorb, accommodate, recover from disasters, whilst at the same time improve wellbeing”* (UN Secretary-General, 2016, P.22) is known as resilience.

Understanding disaster risk matters both national and international levels, as exposure, rapid urban development increases in global patterns, as reported between 1994 and 2013, that 1.35 billion people have been killed in disasters (CRED, 2015, P.7). The observations of the past decades demonstrated that disasters usually hit and affect the needy people, whereas elevating vulnerabilities, widening the gap of social inequalities, and harming economic expansion. (UN-Habitat, 2007, P.17). On the one hand, success shows that death rate derives from a disasters such as; flooding and tropical cyclones have been reduced, but huge risks play an increasing role in the number of deaths. Eventually, increasing losses of large disasters are clear evidence of the failure of development (CRED, 2015).

Critically important to identify, assess, and understand disaster risk to reduce its severity by analysing trends of disaster risk (i.e., previous disaster losses help to evaluate whether DRR is effective or not). Conducting a risk assessment⁷ can provide us with a future estimation of casualties, *“a comprehensive risk assessment considers the full range of potential disaster events and their underlying drivers and uncertainties”* (Prevention Web, 2015). It requires a complete analysis of the history of each event, considering the future estimations (*forward-looking perspectives*), integrating rare occasions that could have any impacts on future hazards. Risk assessment lies in scientific knowledge and interdisciplinary expertise, which implies a range of information, along with building simulation technology (CRED, 2015; Prevention Web, 2015)

Three main components are considered for assessing risk and losses; Hazard defined by the UN as *“a process, phenomenon or human activity that may cause loss of life, injury or other health impacts, property damage, social and economic disruption or environmental degradation”* (UN

⁷ *“Risk assessment is a process to determine the nature and extent of such risk, by analysing hazards and evaluating existing conditions of vulnerability that together could potentially harm exposed people, property, services, livelihoods and the environment on which they depend. A comprehensive risk assessment not only evaluates the magnitude and likelihood of potential losses but also provides a full understanding of the causes and impact of those losses.”* (BCPR-UNDP, 2010; Simmons et al., 2017)

Secretary-General, 2016, P.18). Hazards can be multi or individual and caused by different drivers (such as biological, environmental, and geological). Historical scenarios and risk assessment can determine the certain intensity of hazards at a specific location. Secondary danger can be associated with some hazards (such as fires caused by earthquakes, or storm surge associated with a cyclone); Exposure is known as *“the situation of people, infrastructure, housing, production capacities and other tangible human assets located in hazard-prone areas”* (UN Secretary-General, 2016, P.18). It represents the physical assets but also can include socioeconomic factors; Vulnerability is *“the conditions determined by physical, social, economic and environmental factors or processes which increase the susceptibility of an individual, a community, assets or systems to the impacts of hazards”* (UN Secretary-General, 2016, P.24). Damage ratio and social cost can be estimated by assessing the fragility of a system against a hazard, according to defined exposure (GFDRR, 2014).

2.1.2 Disaster Risk Reduction

Disaster Risk Reduction is *“aimed at preventing new and reducing existing disaster risk and managing residual risk, all of which contribute to strengthening resilience and, therefore, to the achievement of sustainable development”* (UN Secretary-General, 2016, P.16). Historically, dealing with disaster seen as an emergency response (as a consequence), late the 20th century, the discourse directed towards reducing vulnerability and exposure as we cannot control and reduce the severity of natural hazards. To look at DRR as part of sustainable development, it must be a people-centred and multi-sector approach (i.e., every component of community, authorities, non-government organisations, academics, and professionals, and the private sector must take part in achieving DRR holistically). Working on strategies that include disaster risk management (such as avoid the construction of new risks, address pre-existing risks) can lead to successful results if we assure the combination of bottom-up, local, and community-based approaches can be integrated within the development and planning goals (Ammann, 2013; Twigg, 2015).

Reducing disaster risk can be achieved by activities that work aligned with disaster risk management. Which include; Prevention *“activities and measures to avoid existing and new disaster risks”*; Mitigation *“the lessening or minimising of the adverse impacts of a hazardous event”*; Transfer *“the process of formally or informally shifting the financial consequences of particular risks from one party to another, whereby a household, community, enterprise or State authority will obtain resources from the other party after a disaster occurs, in exchange for ongoing or compensatory social or financial benefits provided to that other party”*; And preparedness *“the knowledge and capacities developed by governments, response and recovery organisations, communities and individuals to effectively anticipate, respond to and recover from the impacts of likely, imminent or current disasters”* (UN Secretary-General, 2016, P. 21,

20, 23 & 21 respectively). Mitigation and preparedness are commonly used to protect communities against hazards and disasters.

2.2 Analysing Disaster Risk Reduction Frameworks

Hyogo Framework for Action 2005 - 2015 & Sendai Framework for Disaster Risk Reduction 2015 - 2030

In January 2005, Governments adopted a 10-year plan to reduce disaster risk, and vulnerabilities to natural hazards, this plan called the Hyogo Framework for Action (HFA) held in Hyogo, Japan. The outcome of HFA is *“the substantial reduction of disaster losses, in lives and the social, economic and environmental assets of communities and countries”* (UNISDR, 2005, P.3). HFA Contains three strategic goals: The integration of DRR into sustainable development policies and planning; The development and strengthening of institutions, mechanisms, and capacities to build resilience to hazards; And the systematic incorporation of risk reduction approaches into the implementation of emergency preparedness, response, and recovery programs. HFA has five priorities for action, as follows:

- Make DRR a priority; Ensure that DRR is a national and local priority with a strong institutional basis for implementation.
- Know the risk and take action; Identify, assess, and monitor disaster risks- and enhance early warning.
- Build understanding and awareness; Use knowledge, innovation, and education to build a culture of safety and resilience at all levels.
- Reduce risk; Reduce the underlying risk factors in various sectors.
- Be prepared and ready to act; Strengthen disaster preparedness for effective response at all levels.

(UNISDR, 2005)

HFA has a mechanism to follow-up this action plan, where it must be multi-sectoral, which can include civil society, private sector, science and academia, state and regional levels for support, coordination, and cooperation. Moreover, the international level, including the UN system to facilitate coordination, develop guidelines and tools.

After ten years of implementing HFA – from 2005 to 2015 – it was notable that losses on different scales⁸ continued to happen due to disasters, specifically in the most vulnerable and most impoverished nations. The new framework for DRR was finalised in Sendai, Japan, in March 2015. Sendai Framework for Disaster Risk Reduction (SFDRR) based on the lessons learned from the implementation of HFA (Tozier de la Poterie & Baudoin, 2015). It comprises set of targets and priorities to achieve the main goal *“to prevent new and reduce existing disaster risk through the implementation of integrated and inclusive economic, structural, legal,*

⁸ Human, economic, infrastructure, and ecological losses.

social, health, cultural, educational, environmental, technological, political and institutional measures that prevent and reduce hazard exposure and vulnerability to disaster, increase preparedness for response and recovery, and thus strengthen resilience” (UNISDR, 2015_b, P.12).

SFDRR comes with a set of innovative transformations than HFA; The shift from disaster loss to disaster risk, and from disaster management to DRR and management, and focus on (*how to do?*) rather (*what to do?*); People-oriented preventive approach to DRR; Shared responsibility for DRR among stakeholders; And a clear set of global targets for this framework, and guiding principles (Matsuoka, 2018). SFDRR addresses the new challenges that face today’s world, such as climate change, globalisation, new sciences, and technologies in the area of risk reduction. It provides four priorities for action, as follows:

- Understanding disaster risk.
- Strengthening disaster risk governance to manage disaster risk.
- Investing in DRR for resilience.
- Enhancing disaster preparedness for effective response, and to (*Build Back Better*) in recovery, rehabilitation, and reconstruction.

(UNISDR, 2015_b, P.36)

Table 2.1 The Key Points Between Hyogo Framework For Action & Sendai Framework For Disaster Risk Reduction. Produced by the author, 2020.

	Hyogo Framework for Action 2005-2015	Sendai Framework for Disaster Risk Reduction 2015-2030
Strategic goal	The integration of disaster risk considerations into sustainable development policies and planning	Prevent new and reduce existing disaster risk through the implementation of integrated and inclusive economic, structural, legal, social, health, cultural, educational, environmental, technological, political and institutional measures that prevent and reduce hazard exposure and vulnerability to disaster, increase preparedness for response and recovery, and thus strengthen resilience
	The development and strengthening of institutions, mechanisms and capacities to build resilience to hazards	
	The systematic incorporation of risk reduction approaches into the implementation of emergency preparedness, response and recovery programmes	
Outcome	The substantial reduction of disaster losses, in lives and the social, economic and environmental assets of communities and countries	The substantial reduction of disaster risk and losses in lives, livelihoods and health and the economic, physical, social, cultural and environmental assets of persons, businesses, communities and countries
Priorities	Ensure that disaster risk reduction is a national and a local priority with a strong institutional basis for implementation	Understanding disaster risk
	Identify, assess and monitor disaster risks and enhance early warning	Strengthening disaster risk governance to manage disaster risk
	Use knowledge, innovation and education to build a culture of safety and resilience at all levels	Investing in Disaster Risk Reduction for resilience
	Reduce the underlying risk factors	Enhancing disaster preparedness for effective response, and to (<i>Build Back Better</i>) in recovery, rehabilitation, and reconstruction
	Strengthen disaster preparedness for effective response at all levels	

Targets	Not defined / Targets and indicators to be developed according to needs	Reduce: Mortality; Affected people; Economic loss; and Damage to critical infrastructure and disruption of basic services
		Increase: Countries with national and local DRR strategies; International cooperation; Availability and access to multi-hazard early warning systems and disaster risk information and assessment
Main features	Recognize risk reduction as both a humanitarian and development issue – in the context of sustainable development	Shift their focus from managing disasters to managing risks, which requires a better understanding of risk.
	The framework focuses in particular on National Implementation with the support through bi-lateral, regional and international cooperation.	Focus on people-centred, all-hazards, and multisectoral based approach to disaster risk reduction. The framework goes beyond natural hazards to include Biological hazards such as Epidemics and pandemics as a key area of focus for disaster risk management.
Shifting from Hyogo to Sendai	The shift from disaster loss to disaster risk	
	The shift from disaster management to disaster risk reduction and management	
	Focus on people-centred preventive approach to DRR	
	Shared responsibility for DRR with stakeholders “ <i>All of Society Engagement</i> ”	
Migrants Inclusivity in Frameworks	(iii) Priorities for Action (e) <i>Cultural diversity, age, and vulnerable groups should be taken into account when planning for disaster risk reduction, as appropriate. P.4</i>	Role of Stakeholders (vi) <i>Migrants contribute to the resilience of communities and societies, and their knowledge, skills and capacities can be useful in the design and implementation of disaster risk reduction. P.23</i>

To conclude, there are some deficiencies in both frameworks; the language used in the latter framework is pressing more on the one-direction flow of knowledge from experts to communities, giving superiority to science and technology – as a western approach – rather than traditional knowledge. The speech deviated toward a top-down approach to DRR, instead of engaging local actors and context-based knowledge. An assigned section about stakeholders takes place in the SFDRR, where it calls for participation of underrepresented groups of society such as women, children, people with disabilities, indigenous people, and migrants (Tozier de la Poterie & Baudoin, 2015). Even though each framework seems to provide cities and governments with guidelines on DRR, clearly they look at the city as the homogenous urban fabric, whereas neglecting the different characteristics of this fabric (Johnson et al., 2016), especially the unplanned zones, where informality, and adequate development taking place. These frameworks failed to address the methods of mitigating and preparing against disaster risks in camps and informal settlements. The next section will try to investigate the parameters that can shape the DRR within camp design guidelines.

2.3 Camp Design Manuals and Disaster Risk Reduction Strategies

2.3.1 Humanitarian Organisations and Disaster Risk Reduction

The humanitarian sector plays a significant role in emergencies, as it assists affected peoples, as well as providing necessary support to governments. In most cases, governments are unable to cope with these disasters on their own, the reason may be due to the lack of national expertise and competencies, or the capacity of the infrastructure is unable to bear, or the lack of financial resources to address these disasters. This humanitarian sector comes in the form of international aid from organisations working all over the world, headed by the United Nations system, and The International Federation of Red Cross and Red Crescent (IFRC). It provides several relief aids according to the occurred disaster, the resulting damage, and post-disaster situation, such as food, medicine, and health assistance, providing protection for refugees and displaced people, education and children, as well as providing shelter and settlement planning. Many organisations have played an essential part in providing shelter to the affected people, namely UNHCR, UNRWA. Furthermore, there are many guidelines on this topic, such as the Sphere Handbook⁹ and the UNHCR Emergency Handbook¹⁰. In this section of the thesis will review if these guidelines, in terms of standards for camp design include DRR strategies.

⁹ The Sphere Handbook is the oldest initiative in the field of humanitarian standards, and one of the most widely known and internationally recognised sets of common principles and universal minimum standards in humanitarian response. It has been field-tested over twenty years and regularly updated to ensure it remains fit for purpose in a changing world. (Sphere Association, 2018)

¹⁰ Issued in 2015, this is the 4th edition of UNHCR's Handbook for Emergencies, first published in 1982. This digital edition replaces all previous print editions of the Emergency Handbook. It is primarily a tool for UNHCR emergency operations and its workforce. (UNHCR, 2015_a)

Usually, humanitarian organisations see people of concern¹¹ are associated with disaster-prone areas. Part of the UNHCR Emergency Handbook offers a set of guidelines about the essential considerations for site planning, either refugee settlements or camps. “*Site planning is the physical organisation of settlements*” (UNHCR, 2015_b, P.1) through which delivery of services is more efficient and centralised to host government, other humanitarian actors, and the community itself. Settlement planning standards have protection objectives as it is UNHCR’s mandate:

- Plan and manage settlements by encouraging collaboration with the host community and reduce possible friction.
- Keep settlements away from sensitive zones such as international borders or military sites.
- Invite all stakeholders to give people of concern their rights to free movement.
- Respect Age, Gender, Diversity (AGD) approach.

(UNHCR, 2015_b; Sphere, 2018)

Following the UNHCR approach to settlement planning, it provides the framework for defining the layouts of the site. It includes ten guiding principles, summarised in the following:

- The selection and design must be driven by regulations and emergency response standards which, followed by hosting local government, also, should consider the environment as a design driver through addressing disaster risks and its impacts.
- Defining the available resources which included in the site, and the possible conflict to happen between the host community and displaced population over resources.
- The relation between density and physical context must be taken into consideration, as well as working on supporting safe access to essential services and work to upgrade the existing facilities as a priority instead of providing a new one.
- The settlement should positively affect the livelihood and economic inclusion which can generate employment.
- Lastly, the layout must respect social and physical needs over time.

(UNHCR, 2015_b; DG ECHO, 2017)

To summarise, humanitarian aid is strongly associated with disaster risks; therefore, these guidelines are trying to implement DRR and its standards. They are varied and depend on the field of assistance, such as DRR in food assistance, education, nutrition, and health. DRR in shelter and settlements are the focus of the research, after investigating on this topic, all the guidelines are discussing the early stages of disaster response and post-emergency situation, but not about informal (protracted) camps, these guidelines include mitigation and preparedness strategies to some extent that will not comply with informal-camp settings. The fact is, these manuals are following the same generic standards that applied all over the world in any case of emergency but not respecting the context or characteristic of the disaster. As a living example,

¹¹ Including refugees, asylum-seekers, returnees, internally displaced and stateless persons.

by acknowledging the need to analyse the diverse existing risk situations, respectively. The global *COVID-19* pandemic puts the whole world in the front line to prevent its spreading to most vulnerable areas. Although with different profiles of preventive measures, comparing emergency camp and its mitigation and preparedness strategies, certainly will not be valid in informal settlements, as high-density population, and separation of people in such an environment becomes an immense risk.

2.3.2 The Parameters for Disaster Risk Reduction that are Applied in Camp Design

From the previous section, some design standards are emitting into DRR. In terms of the parameters of camp design that are related to DRR, the Sphere Handbook offers a set of guidelines for designing a planned settlement, as follows:

Shelter: It suggests 30 m² minimum per person as surface area, it should comprise the different activities that people might use, including circulation, shared spaces such as education and health facilities, recreation areas, firebreaks, administration zone, food storage, and assigned area for the market. The ratio of shelter footprint (built-up area) to assigned plot size is about 1:2 or 1:3, to keep space for outdoor activities. This indicator must be combined with expectations and studies of changing in population over time, and the outcomes of higher-density occupation such as conflict among the dwellers themselves, and privacy issues which are connected to the cultural and social norms (Sphere, 2018).

Drainage, wastewater, and rainfall: This is one of the most crucial elements for indicators because of its relevance to the public health, livelihood, mobility, and the structure of shelters. The main consideration for selecting the campsite is to be away from the floodplain, and the network must be maintained (Rooij et al., 2016; Sphere, 2018).

Accessibility: Ensures the availability of the central access along with the camp that will facilitate aid distribution, emergency evacuation, and security controls. To achieve Accessibility that serves DRR, it must include people with disabilities in the scope, the connectivity to transportation means in the city is very vital to access services and activate dwellers' livelihood, and lighting in the camp which will increase the safety of dwellers. Also, ensuring proper design and quality control for street pavement can help with achieving well-designed Accessibility and a better drainage system (UNDP & PNDMA, 2012; Sphere, 2018).

Open spaces and fire safety: Open spaces play a significant role in advocating for positive mental health, where it can be used for social gathering, extended market, or assembly point in case of emergency or meeting with aid providers. Environmentally, open spaces can help by collecting rainwater that is absorbed into the ground that will reduce the risk of floods. These open spaces can serve as firebreaks as it is required to include 30 meters of firebreaks every 300 meters in built-up areas in camp sitting, and at least two meters space between each building, or in ideal case spacing can be double the building height. The standards play a role to reduce crime and gender-based violence (GBV), ensuring the safety of community infrastructure. Also,

it can address the potential opportunities for supporting livelihood and generate a job market (Sphere, 2018).

Table 2.2 Extended DDR Parameters That Integrate Into Camp Design Guidelines. Produced by the author, 2020.

Parameters	Guidance for temporary (emergency) shelter
The Surface area of planned or self-settled settlements	For planned settlements, the minimum usable surface area is 45 m ² per person in camp-type settlements, including household plots.
	The minimum surface area should be 30 m ² per person. If the minimum surface area cannot be provided, actively take steps to address the consequences of higher-density occupation.
	Settlement planning should also consider changes in the population.
Plot size for shelters	A ratio of shelter footprint to plot size of 1:2 or 1:3 is recommended, to allow sufficient space for the essential outdoor activities of the households.
	The ratio should consider cultural and social norms and practical space availability.
Material of shelter	Each material of emergency shelter has advantages and disadvantages depending on the context in which it is used;
	Such as Plastic sheeting, Prefabricated shelter, containers, and Rental subsidies.
Drainage of rainfall and floodwater	Poor drainage of rainfall or floodwater can severely limit people's living spaces, mobility, and access to services.
	Avoid selecting a site that is on a floodplain; it can compromise safety and security, particularly in congested or confined spaces.
	The primary public health threat associated with poor drainage is increased exposure to diarrhoeal diseases from contact with contaminated water.
	Uncontrolled water can also damage other infrastructure, dwellings, and belongings, limit livelihood opportunities, and cause stress.
Access	Consider the condition of local roads and the proximity to transport hubs for the supply of relief assistance and other goods.
	Consider seasonal constraints, hazards, and security risks.
	Consider the quality of streets - as paving - which can help water drainage.

Fire safety	Fire risk assessments should inform the site planning team. To include 30-meter firebreaks every 300 meters in built-up areas in camp settings.
	The space between buildings should be at least 2 meters; ideally, it should be double the building height to prevent collapsing structures from touching adjacent buildings.
	Consider local cooking and heating practices, consider providing safe stoves, fire safety equipment, and awareness training to residents.
	Prefer fire-resistant construction materials and household items.
	Inform residents (including those facing mobility or accessibility barriers) about fire prevention, management, and evacuation plans.
Public space	Such as healthcare facilities, schools, social facilities such as places of worship, meeting points, and recreational areas, and space for culturally appropriate burials and associated rituals.
	Prefer fire-resistant construction materials
Mobility	Provide safe, secure roads and pathways within settlements, and all-weather access to all individual dwellings and communal facilities.
	Consider the needs of people facing mobility or access barriers.
Reducing crime	The design of the settlement can contribute to reducing crime and gender-based violence.
	Consider the location and accessibility of shelters, buildings and facilities, night lighting, and passive surveillance through visual lines.
Livelihood support	Consider pre-disaster economic activities and potential livelihood opportunities in the post-disaster context.
	Identify available land for cultivation and grazing, or access to markets and employment opportunities.
Operation and maintenance	Create an operation and maintenance plan to ensure the effective running of any facilities, services, and utilities (such as water, sanitation, drainage, waste management, schools).
	Key components of a plan include community participation, establishing user groups, defining roles, and responsibilities.

2.4 Key Findings from Literature Review

To summarise the most relevant points of this chapter, we can affirm that, although the focus of DRR in the existing manuals includes many discussions about understanding hazards - whether natural or human-made - and what mitigation strategies are used. However, many of these practical plans and frameworks attempt to lay down the legislative foundations that address states at a governmental level regardless of the local level of risk, meaning that camps and migration have not been discussed in these frameworks. Instead, it is the task of a country to translate, reformulate these frameworks according to risks that it faces. That requires expertise and analytical studies to adopt these frameworks at the local level and on the scale of disasters and the existing or potential risks.

In parallel, some humanitarian institutions include risk management in their practical approaches and long-term plans. Nevertheless, the discussion mainly revolves around DRR in emergency camps, which are short-term camps. Still, the debate did not adopt any opinion to activate these frameworks within the long-term camps or informal camps that exist within the urban city structure. Also, the design guidelines that have a relationship with DRR are mostly universal standards, not generated from a comprehensive and local understanding of natural phenomena, the resulting risks, or even the nature of the region. Also, among the guidelines reviewed there is no reference to the construction materials and building methods to be better used in the informal camps, as well as greening and vegetation methods, which have a profound connection with the issue of return and the national and urban identity of refugees.

Chapter Three: Case Study Background

3.1 Jordan and Risk Reduction Strategies

3.1.1 Jordan

Jordan is classified as a country of "*high human development*" by the 2019 Human Development Report and an emerging market with an "*upper middle income*" economy (Ababsa, 2013; UNDP, 2019). Jordan has particular importance in terms of regional geopolitics, as it has been over the years a pro-western foreign policy while maintaining good relations with neighbouring countries in the region, as well as the United States and the United Kingdom. At the same time, it has also followed a peaceful and non-confrontational approach with its neighbouring states even in time of the Arab Spring. Being a stable and safe country, it is one of the reasons that attracted thousands of refugees over the years as results from regional conflicts. Furthermore, because it has always kept its doors open to refugees, it has, to some extent, acquired the status of a "*refugee haven*" (Chatelard, 2010). This open-door policy and the fact that a majority of the refugees ended up staying longer than expected because most of the conflicts have not been resolved, were the main reasons for the country's population growth (Potter et al., 2007 cited in Schmidt-Roßleben, 2014).

Before the Israel-Arab war in 1948, Jordan's indigenous population consisted of a mix of urban, village and Bedouin communities, spread throughout the country. With the influx of refugees such as Palestinians in 1948 and 1967, Iraqis in the 2000s and most recently Syrians. The country's population sprang up from 586 thousands in 1952 to 2.13 million in 1979 and 10.6 million in 2020. These waves of refugees were absorbed mostly by Jordan's cities, resulting in a high urbanisation rate of the population from 43.2% in 1955 to 91.5% in 2020 (Ababsa, 2011; DoS-Jordan, 2019; Worldometer, 2020).

3.1.2 Amman

Amman is the capital and most populous city of the Hashemite Kingdom of Jordan. Almost 4.4 million inhabitants were living in the Greater Amman area in 2018 (DoS-Jordan, 2019). The city is Jordan's political, cultural, and economic centre. In 1921, when *Abdullah The First* chose Amman as the capital city. Since that time, the city started to gain political and economic power; however, it was considered a small city until 1948, where the city witnessed population growth, drastically, and rapid transformation in physical and social aspects resulted from the huge influx of Palestinian refugees (see *Table 3.1*). Different nationalities¹² have taken Amman as a second home to live, while others have considered the city as a transitional point to other countries. This phenomenon, whether it is migrants or refugees, both international and domestic, was the main reason for the population growth. Not only this rapid population growth caused an even

¹² Palestinians, Iraqis, Kurds, Circassians, Armenians, work migrants from Asia and Egypt, recently Syrian refugees and asylum seekers from Yemen, Sudan, Somalia, and others. (Fanack, 2009; UNHCR, 2019_a)

faster physical expansion (see *Figure 3.1*) but also the division of the city. While the more inferior segment of refugees and migrants settled in the old part of the city and towards the East in or close to refugee camps, the more affluent population triggered massive suburbanisation, mainly in the north-western parts. The size of Amman expanded between 1947 and 2005, from 2.0 km² to 226.6 km² (see *Figure 3.2*) (Al Rawashdeh & Saleh, 2006; Potter et al., 2007; Ababsa, 2011; UNDP & NCSCM, 2019).

Table 3.1 Amman population 1945-2019. Edited by the author, 2020. Adapted from “Social Disparities and Public Policies in Amman” by M. Ababsa, 2011, *Villes, pratiques urbaines et construction nationale en Jordanie*. Copyright 2011 by Presses de L’Ifpo.

Year	The Population of Amman (based on Census data)
1945	56.000
1962	214.219
1979	623.925
1994	1.392.195
2004	1.896.426
2012	2.473.4
2019 (estimated)	4.430.700

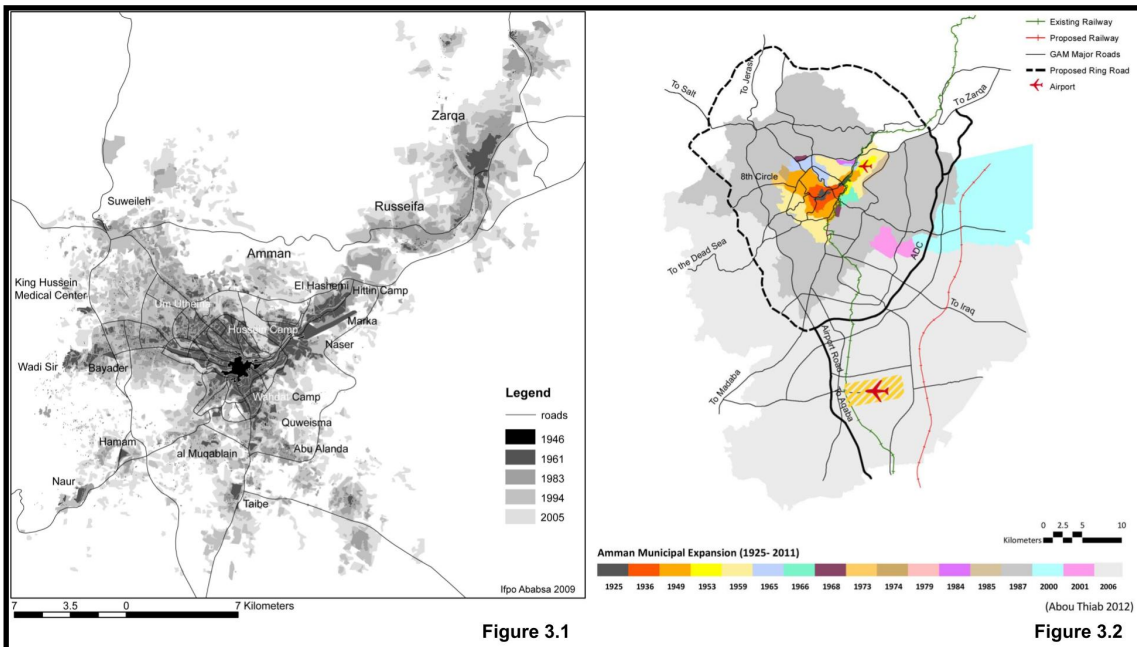


Figure 3.1 The physical expansion of Amman according to satellite images and aerial photographs 1946-2005. Reprinted from “Social Disparities and Public Policies in Amman” by M. Ababsa, 2011, *Villes, pratiques urbaines et construction nationale en Jordanie*. Copyright 2011 by Presses de L’Ifpo. **Figure 3.2** The expansion of Amman Municipal boundaries 1925-2011. Reprinted from “The Amman Ruseifa-Zarqa Built-Up Area: the Heart of the National Economy” by M. Ababsa, 2013, *Atlas of Jordan: History, Territories and Society*. Copyright 2013 by Presses de L’Ifpo.

Of course, Amman witnessed a social transformation. While in 1952 of the 250 thousands inhabitants, around 40% were living in tents (Bedouin style). Today, the city is seen as a contemporary, which has the characteristics of a modern metropolis. Nevertheless, that did not make everyone benefit from this modernity, which makes the socio-economic-based segregation notable in the city. Central Amman to the East is where the majority of poor to lower-middle-income class living, either in formal and informal settlements or in one of the Palestinian refugee camps. West Amman, on the contrary, has a more high-income class with a luxurious lifestyle. In contrast, the latter has a low density and well-planned infrastructure, the former considered densely populated 14.000 to 30.000 inhabitants per km² with poor infrastructure and lower construction standards and materials (Potter et al., 2007; Ababsa, 2011; Pavenello & Haysom, 2012; Schmidt-Roßleben, 2014).

3.2 Emergency and Risk Management in Jordan

3.2.1 Hazards Profile

According to INFORM GRI 2019 risk index, Jordan has a medium risk profile. However, it is exposed to multiple hazards (see *Figure 3.3*) within this region, including geophysical (i.e., earthquakes, landslides), hydrogeological (i.e., flash floods, drought), biological (i.e., locust invasions, epidemics) as well as technological (i.e., dam failures, industrial pollution, toxic wastes, chemical spills) (CADRI, 2018_b). Even though - natural and human-made - hazards are relatively low to occur, highlighting the current urban issues that are facing the country such as highly dense and populated cities, the existence of marginalised and disadvantaged populations, and the increased burden on physical infrastructure and social services. All that combined with low-risk hazards can result in a severe impact on the socio-economic structure. Moreover, natural hazards due to climate change are becoming more frequent, actively dangerous, that cause significant socio-economic and environmental losses across the country. Disaster records of the last three past decades, showing hundreds of fatalities, thousands more affected population, besides the economic loss among different sectors (see *Table 3.2*), (UNDP & GDCD, 2008; CADRI, 2018_b; UNDP & NCSCM, 2019; DRMKC, 2019).

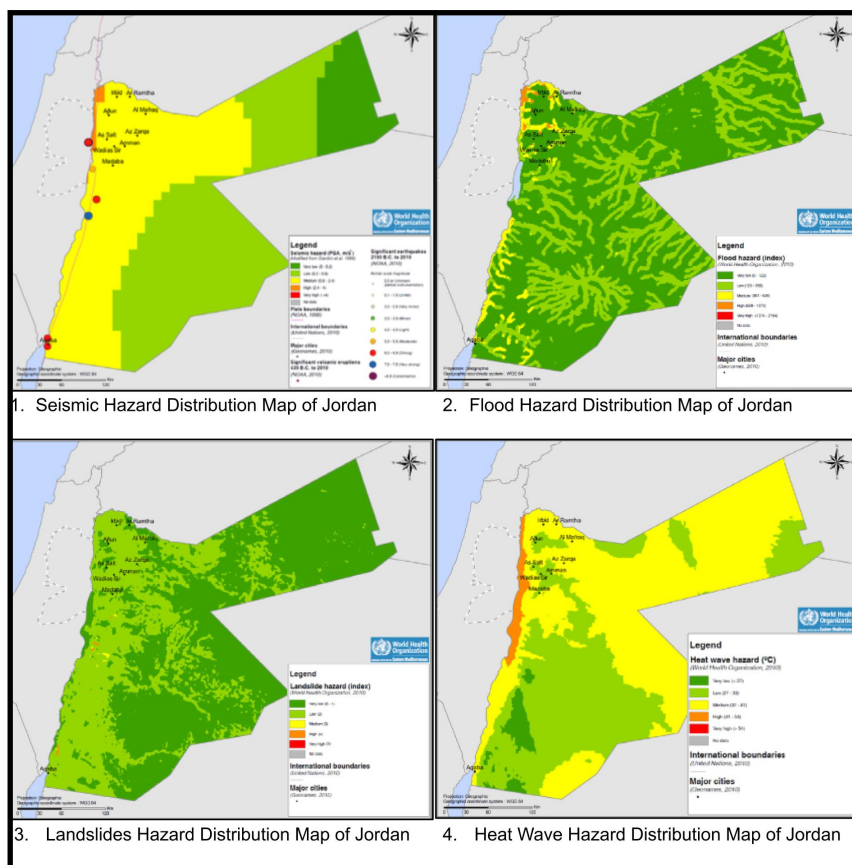


Figure 3.3 Distribution Maps of Natural Hazards Developed by The World Health Organisation (WHO). Reprinted from “Jordan National Natural Disaster Risk Reduction Strategy” (P.14), by National Center for Security & Crises Management and UNDP, 2019. Copyright 2019 by UNDP.

Table 3.2 Major Disasters in Jordan 1927-2018. Adapted from “Jordan National Natural Disaster Risk Reduction Strategy” (P.12), by National Center for Security & Crises Management and UNDP, 2019. Copyright 2019 by UNDP.

Disaster	Date	Killed	Affected	Disaster	Date	Killed	Affected
Earthquakes	1927	242	No Data	Flood	2008	6	185
Flood	1963	25	No Data	Flood	2009	6	265
Flood	1964	6	No Data	Flood	2010	7	522
Flood	1966	259	No Data	Flood	2011	7	132
Flood	1987	9	29	Flood	2012	6	491
Flood	1991	11	18000	Flood	2013	0	2214
Flood	1997	2	No Data	Flood	2014	0	540
Drought	2000	0	150000	Flood	2015	4	300000
Storm	2000	9	200	Flood	2016	3	200000
Storm	2002	5	125	Flood	2018	35	150000
Flood	2007	9	169				Approx

3.2.2 The Exposure and Vulnerability to Hazards

Population profile; With the continuous growth of the population, which reaches 10 million, more than half of the Jordanians considered youth are under the age of 25. More than 80% of the population living in cities, where most fertile lands are located, consequently, impose serious stress on natural resources (land and water) and the urban planning sector. In 2015, 15.8% of the urban population was living in informal settlements with higher expectations to increase due to the influx of refugees, and rising the poverty line, which profoundly affects the social services provided by the government. Regarding gender equity, although the female literacy rate is high in the Jordanian society and the region, the participation of women in political and economic life is very limited this consequently reduces the effectiveness of women's participation in decision-making in regard to risk management and empowering women in the most inferior societies (UNDP & GDCD, 2008; Pavenello & Haysom, 2012; UNDP & NCSCM, 2019).

Impact of the refugee crisis on increasing vulnerability to disaster and climate risk; Adding to the Palestinian refugees in Jordan, Syrian refugees are 80% settled in urban areas, predominantly located in the Northern governorates and Amman. The 2015 Vulnerability Assessment found that over 85% of Syrian refugee households live under the Jordanian poverty line, 51% of them are children, and 4% are elderly, which makes the Syrian population more vulnerable to the potential impact of disasters. As a result, the burden on urban planning increased, as on other services such as Solid Waste Management, Water, Sanitation, Hygiene (WASH), Health, and Environment. Adding to that, limited capacity of housing and lack of urban planning resulted in informal settlements, which considerably increases exposure to earthquakes, flash floods, and epidemics risks. More generally, the crisis has exacerbated vulnerabilities for the poorest segments of the Jordanian population and deteriorated access to quality basic services in the most affected governorates (Saif, 2014; UNDP & NCSCM, 2019).

3.2.3 National Disaster Risk Reduction Strategy

The strategy is the motive for moving from the stage of understanding risks and evaluating risk management systems to establishing clear goals for DRR. This strategy is based on supervision by the National Center for Security and Crisis Management (NCSCM) as the supreme authority in crisis management in Jordan. As a roadmap, it must be compatible with the objectives and goals of national development, as well as the priorities of the country in facing risks, so that they are designed to meet the society, environment, and socio-economic settings. Emphasising *Jordan Vision 2025* and achieving the goals of economic and national development and Sustainable Development Goals¹³ (SDGs) would require targeted investment in key sectors to protect socio-economic and environmental assets against the impact of future hazards. Those key sectors include Construction, Infrastructure, Tourism and Cultural Heritage, Environment, Water and Agriculture, Education, Health, and WASH (UNDP & NCSCM, 2019).

The vision of the national strategy for DRR is “*strengthened resilience and comprehensive security for Jordan*” (UNDP & NCSCM, 2019), guided by the principles for SFDRR. The strategy headed by objectives that work on different sectors and levels, as follows:

- To establish and incorporate the foundational guiding arrangements for DRR in the country.
- To increase the awareness and knowledge of DRR methods and opportunities.
- To inform the legal and institutional basis for efficient DRR planning and implementation.
- To contribute towards the inclusion of DRR into development policy, programs and projects.
- To establish a strategic platform for public-private-sector cooperation in DRR.
- To contribute to community resilience against the threats and effects of disasters.
- Strengthening of risk management capacities.
- Creation of safe and resilient communities from disasters.

(UNDP & NCSCM, 2019)

To conclude, Jordan has a hazardous profile range from natural disasters to human displacement and migration, that put pressure on the capacity of urban environment, physical and social infrastructure. Nationally, the existing frameworks work to mitigate disasters in Jordan, whereas this research will look at the refugee camps in the lens of implementing these parameters and strategies in both informal settlements through the case of New Amman camp (Al-Wehdat) and planned emergency camps through the case of Azraq refugee camp.

¹³ Sustainable Development Goals (SDGs), “*also known as the Global Goals, were adopted by all United Nations Member States in 2015 as a universal call to action to end poverty, protect the planet, and ensure that all people enjoy peace and prosperity by 2030. The 17 SDGs are integrated—that is, they recognise that action in one area will affect outcomes in others, and that development must balance social, economic and environmental sustainability.*” (UN, n.d.)

Chapter Four: Analysing Refugee Camps and Risk Reduction Strategies

4.1 The Palestinian Asylum Case

4.1.1 Background

The Arab-Israeli conflict¹⁴ between Arab Palestinians and Jews is the most significant confrontation over land in twentieth-century still ongoing until today. Prolong history of events¹⁵ have shaped the current dispute, mainly the decision of the United Nations (UN) General Assembly on November 29, 1947, to divide Palestine into two states, one Jewish and the other for Arab Palestinians. Following the decision, brutal clashes between the Arab States¹⁶ and Israel led to change the area, where it was known internationally as Palestine, has been divided into three parts, the state of Israel, the west bank¹⁷ and the Gaza Strip (Bocco, 2010; Bein & Hajjar, 2014).

Hundreds of thousands of inhabitants became refugees, between 1947 - 1949. Thousands of them were recognised as refugees in the occupied Palestine territory (the West Bank) and the surrounding host countries. The UN Refugee Agency has described their situation as *"by far the most protracted and largest of all refugee problems in the world today"* (Loescher & Milner, 2006, P.112). Many Arab states hosted the Palestinian diaspora, namely Jordan, Lebanon, Syria, Saudi Arabia, and outside the Middle East. Some populations were under the protection and support of the UNRWA. Based on the UNRWA's definition for the Palestinian refugees as *"persons whose normal place of residence was Palestine during the period 1 June 1946 to 15 May 1948, and who lost both home and means of livelihood as a result of the 1948 conflict"* (UNRWA, n.d._b). Jordan hosts the highest number of Arab Palestinians, around 750 thousand refugees came to Jordan, seeking safe, and shelter. Full citizenship rights have been granted to all of them except those who came originally from the Gaza Strip (Bein & Hajjar, 2014; DPA, 2013b).

The protracted situation led to incremental processes in terms of the physical characteristics of the camp and led to informal urban settlements around Amman and other cities in Jordan. In most cases, refugees inside the camps suffer from inferior living standards, poor housing

14 Many reasons push the Jewish to assert ownership of the land; based on the biblical promise to Abraham and his descendants; it was the site of the Jewish kingdom of Israel; the haven land to live far from anti-Semitism Europe. On the contrary, the existence of the Arab Palestinians for hundreds of years in the land, and being the demographical majority, were strong arguments to defend the right over land for themselves.

15 Started in 1882, when the Zionist Movement took the charge to bring the Jews together in one land, Palestine seemed the logical and optimal place. On 29 November 1947, following World War II, the UN General Assembly voted to divide Palestine into two states, one Jewish and the other Arab. The partition plan was based on the majority of the population on each side. Later on, the Zionist leaders declared the state of Israel.

16 Egypt, Syria, Jordan, and Iraq.

17 Of the Jordan River.

conditions, more physical and mental health problems. Moreover, the lack of proper urban planning makes them directly in front of the hazards that can be resulted from the natural disasters or the exhausted built environment (Al-Azhari, 2012; Beinin & Hajjar, 2014).

4.1.2 Policy Framework for Palestine Refugees

The Jordanian government took several steps to mitigate the overcrowds of the Arab Palestinian diaspora. First, the Unity Agreement in 1950 that granted the full right of Jordan citizenship for them, but to keep the right to return as the first priority for the government to work on (DPA, 2013a). At that time the establishment of the Department of Palestinian Affairs (DPA) as the legislative arm of the Jordanian government. Internationally, following the *UN General Assembly Resolution 302 (IV)*¹⁸ of 8 December 1949, The UNRWA took charge to be the international supporting agency for the Palestinian diaspora in the countries were accepted to sign the agreement with them (the UNRWA). Despite the fact that the main role of the government towards the agency is to affirm the continuation of UNRWA's mandate, and emphasising that the UNRWA must treat all the refugees in the same way and service regardless of where they are located, the current situation shows a very different reality than what written on these agreements, there are many aspects of living have been neglected, such as housing, urban upgrading, and risk mitigation policies (UNRWA, n.d._a; Rueff & Viaro, 2009; Schmidt-Roßleben, 2014).

4.1.3 The Palestinian Refugee Camps

Jordan considered one of the most hosting countries to the Palestinian diaspora, as the refugee population in Jordan is 2.2 million (UNRWA, 2018), which inhabit urban areas and camps. A Palestine refugee camp defined as *"a plot of land placed at the disposal of UNRWA by the host government to accommodate Palestine refugees and set up facilities to cater to their needs"* (UNRWA, n.d._b). This land is either owned by the government or local landowners, giving the right to the refugees to use it for residence not to own it. Around 18% of the country total live within ten official camps managed by the UNRWA (UNRWA, 2016) and three unofficial camps¹⁹, managed by the Jordanian government. The ten *"official"* camps took two stages; the first stage in the years that followed the Palestinian exodus of 1948, four camps erected in three main governorates, as follow:

- Zarqa camp in 1949 in Zarqa Governorate.
- Irbid camp in 1950 in Irbid Governorate.

¹⁸ UNRWA is created by General Assembly resolution 302 (IV), with the initial mandate to provide *"direct relief and works programmes"* to Palestine refugees, in order to *"prevent conditions of starvation and distress... and to further conditions of peace and stability"*. UNRWA takes over from the United Nations Relief for Palestine Refugees (UNRPR), established in 1948. (UNRWA, n.d._a)

¹⁹ Jordan hosts three *unofficial* camps; Sukhneh camp (1969) in Zarqa governorate; Prince Hassan Quarter (1967) in Amman governorate; and Madaba camp (1956) in Madaba governorate, that are recognised only as such by the local authorities, and a series of *"informal refugee gatherings"*, namely urban neighbourhoods inhabited predominantly by Palestinian refugees. (Al-Husseini, 2011)

- Jabal Al-Hussein camp in 1952 in Amman Governorate.
 - Amman New Camp (or *Al-Wihdat* camp) in 1955 in Amman Governorate.
- The second stage, six other camps labelled “*emergency camps*”, were set up after the 1967 Arab-Israeli war to accommodate homelessly, displaced Palestinians, as follow:
- Souf camp in 1967 in Jerash Governorate.
 - Baqa’a camp in 1968 in Balqa Governorate.
 - Al-Husn camp (or *Martyr Azme al-Mufti* camp) in 1968 in Irbid Governorate.
 - Jerash camp in 1968 in Jerash Governorate.
 - Marka camp (also known as “*Hitteen*” or “*Schneller*” camp) in 1968 in Zarqa Governorate.
 - Talbieh camp in 1968 in Amman Governorate.
- (DPA, 2013b, 2013c)

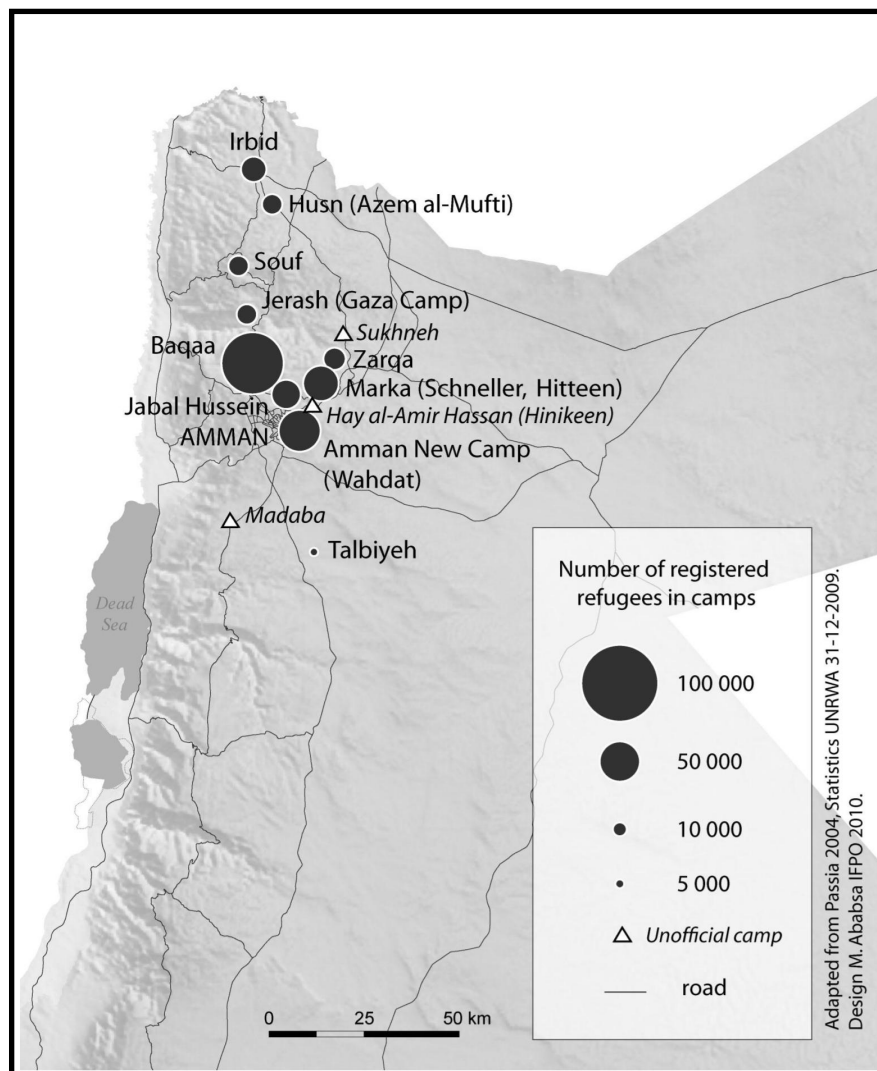


Figure 4.1 Location of the Palestinian Refugee Camps In Jordan. Reprinted from “*The Evolution of the Palestinian Refugee Camps in Jordan. Between Logics of Exclusion and Integration*” by J. al-Husseini, 2011, *Villes, pratiques urbaines et construction nationale en Jordanie*. Copyright 2011 by Copyright 2011 by Presses de L’Ifpo.

The history of camps started as temporary hosts for all refugees, located on the outskirts of the cities. Which started by a group of tents scattered, following the creation of UNRWA, the refugee camps were designed to accommodate those scattered groups of destitute refugees. The settlement plan was based on military base design, (i.e., line of shelters along the main street, that is used for providing services by aid providers). With more international funding, the one-room shelter has been erected to protect camp dwellers from suffering during winter, accommodating all the family. People were living, sleeping, and studying in that single space (Al-Husseini, 2011). later than, with their savings, they could afford to start building and extending to another room, and so on, until what we can observe today. Alnsour and Meaton define the urban built environment as *"the buildings, structures, physical, and social structures that enable people to live, work, play, and communicate"* (Alnsour & Meaton, 2014, P.68) with less than 12 m², small living spaces not enough for five people to live in 80 m². *"Buildings are old and in need of repair and reconstruction... walls between shelters are shared, and camps are overcrowded...this creates social as well as psychological problems"* (Jabr, 1989, P.85). Home is an essential element in this urban built environment, where the condition of homes can reflect the socio-economic characteristics of the dwellers and their ability to cope with vulnerability to hazards (Tiltne & Zhang, 2014).

4.1.4 The Physical Evolution of the Palestinian Refugee Camps

4.1.4.1 Location to City

As mentioned earlier, Palestinian refugee camps were established on the periphery of cities, due to the presence of empty lands. Over time, camps evolved in response to the natural urban expansion of the city, to be linked entirely to the urban structure, forming informal settlements. The following maps show camps within urban centres (i.e., cities) where most of the camps are currently situated in the inner zone for most cities, such as Irbid camp and Al-Wehdat camp (see *Figures 4.2 & 4.3*). On the other hand, there are some camps, despite their distance from the centre of the city, they are considered within its urban structure. An example is the Baqa'a camp, where it is relatively far from the centre of Amman, but it is connected to the urban structure through the main highway leading to the city, as well as the presence of some residential satellite districts surrounding it. The same applies to Jerash refugee camp and Souf refugee camp (see *Figure 4.4*), as the city's extension over 70 years has not been linked to the camp, due to the geography of the area, where it is considered a mountainous region.

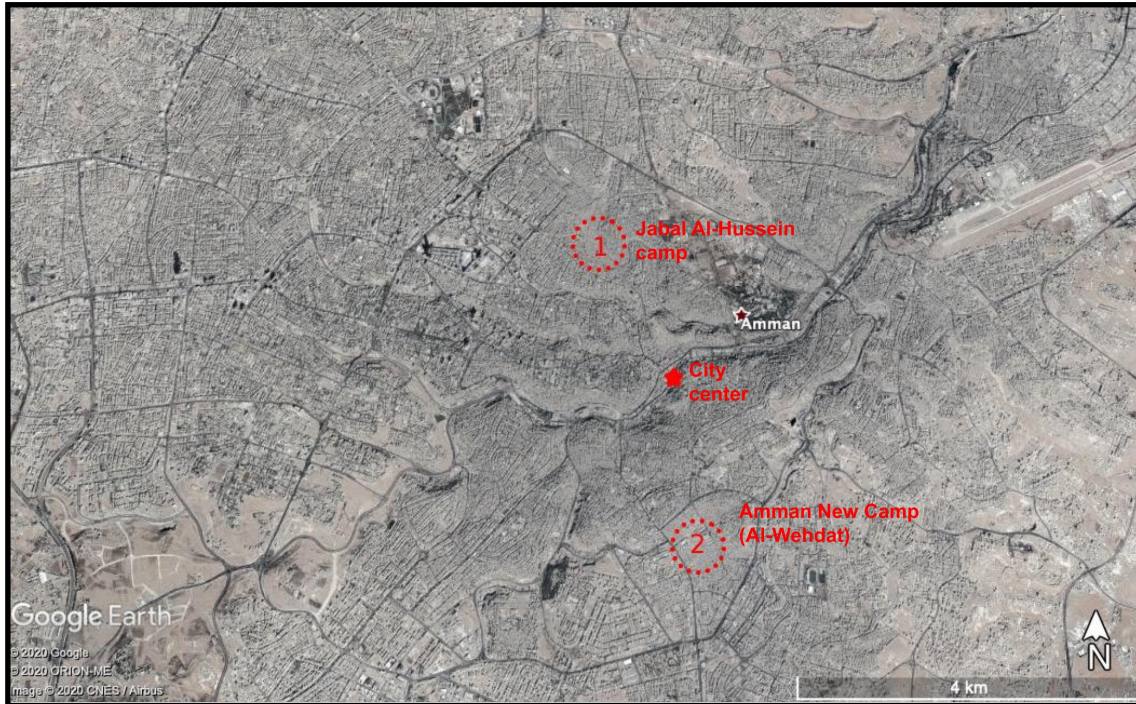


Figure 4.2 The Location Of Informal Camps Within Amman City. Edited by the author, 2020 (Aerial Photograph of Amman from Google Earth, 2020)



Figure 4.3 The location of informal camps within Irbid City. Edited by the author, 2020 (Aerial Photograph of Irbid from Google Earth, 2020)

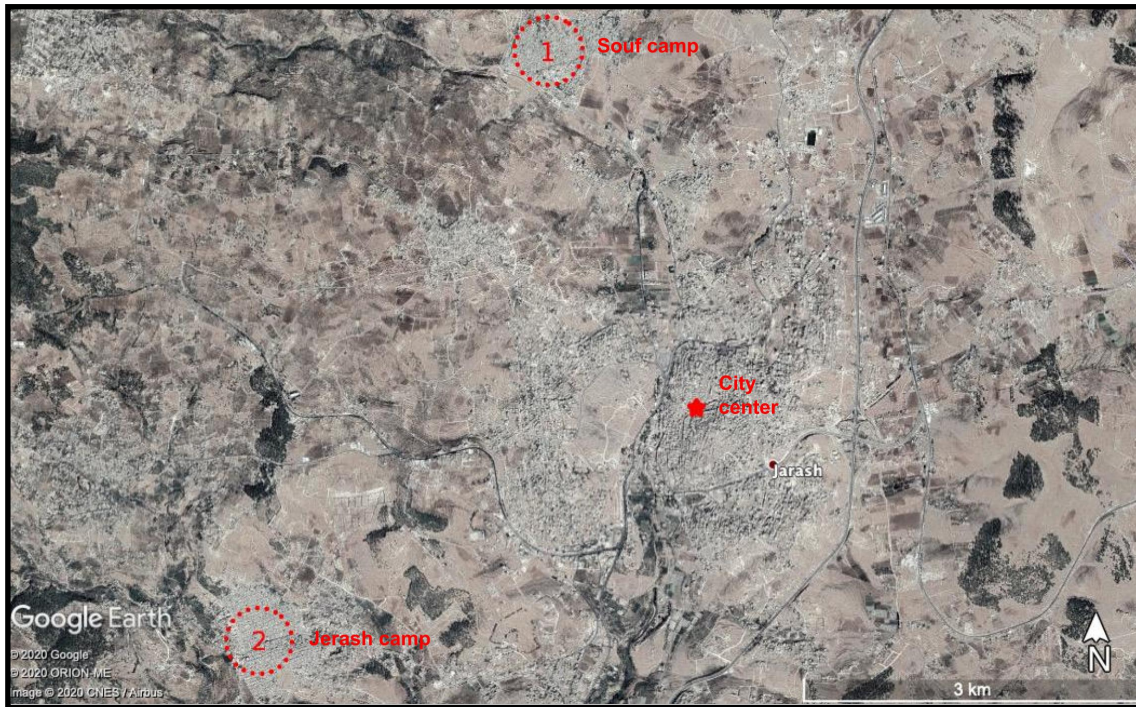


Figure 4.4 The Location Of Informal Camps Within Jerash City. Edited by the author, 2020 (Aerial Photograph of Jerash from Google Earth, 2020)

4.1.4.2 Camp Development: From Tents to Informal Settlements

Shelter, initially provided by tents and marquees, has evolved over the decades and refugees now live in stone, steel and brick houses that have gradually been built informally. The resulting townscapes look less like temporary ‘camps’ and more like permanent low income (informal) housing settlements. The refugee camps were designed to accommodate those scattered groups of impoverished refugees, who had not been able to afford any decent lodging (see *Figures 4.5, 4.6 & 4.7*). Their transfer from the caves, mosques, and various types of informal habitat to well-organised camps made it possible to improve the channelling of humanitarian aid. It also enabled the local authorities and UNRWA to control a potentially destabilising population primarily characterised by its attachment to Palestine (Al-Husseine, 2011; Alnsour & Meaton, 2014).



Figure 4.5 Image Of Displaced Palestinians Taking Natural Caves as Shelter. Screenshot by the author, 2020. (Refugee Life Conditions, UNRWA, 1950). **Figure 4.6** Image For Group Of Arab Palestinian Refugee Arriving To Shobek City. Screenshot by the author, 2020. (Refugee Life Conditions, UNRWA, 1950). **Figure 4.7** Image For Group Of Arab Palestinian Refugees Occupying Plot Of Empty Land In Area Of Wadi Dleil In Jordan. Screenshot by the author, 2020. (Refugee Life Conditions, UNRWA, 1950)

The emergency tents were the fastest solution for sheltering the displaced population inside the camp areas. The camp design took the pattern of designing the military camps, where shelters line up perpendicular along the main road, which is the service road, in order to facilitate the delivery of aid to all parts of the camp (see *Figures 4.8, 4.9 & 4.10*).

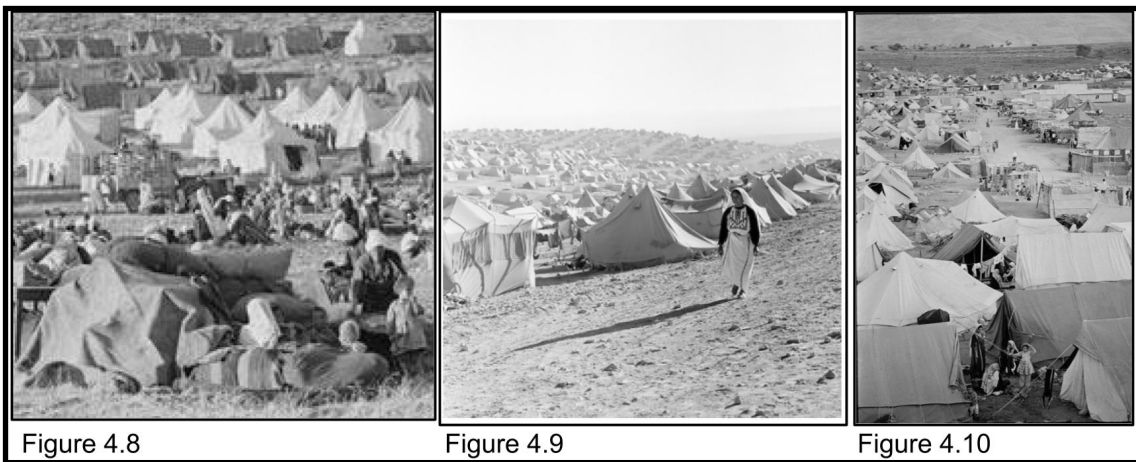


Figure 4.8 Image Of Providing Refugees With Emergency Tents. Edited by the author, 2020. (Palestinian Urban Refugee Camp, Amman, Jordan, 2014). **Figure 4.9** Image Of Marka Camp In Early 1950s. Screenshot by the author, 2020. (Refugee Life Conditions, UNRWA, 1950). **Figure 4.10** Image Of Jerash Palestinian Tented Camp. (Seventy+ years of suffocation, Chapter 2: Jordan, Amnesty, n.d.)

In subsequent years, the Palestinian refugee cause received international funding support to improve the refugees' living standards. At the same time, living in emergency tents was not ideal for protection from the dusty heat of summer and the severity of winter (see *Figures 4.11, 4.12, 4.13 & 4.14*), as these tents were designed to stand against the weather conditions for nearly two years. As it costs UNRWA to manufacture two tents, it is equivalent to erect one housing unit with an area of 9 m². UNRWA's motivation to improve the situation by replacing the tents with concrete units was met with strong opposition from the camp dwellers, as the refugees felt that this improvement necessarily means prolonging the period of stay in the country of asylum and permanence in this case, as this conflicted with their determination to return home. However, the improvement continued slowly until 1959, when the UNRWA Director declared that all tents had been replaced with brick huts (Jabr, 1989; Rueff & Viaro, 2009).

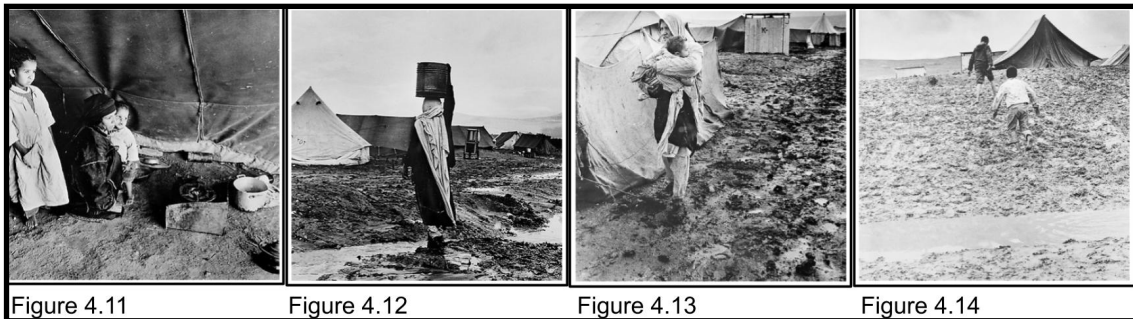


Figure 4.11 Image Of The Living Conditions Inside Emergency Tent In Baqa'a Refugee Camp. Screenshot by the author, 2020. (*Refugee Life Conditions*, UNRWA, 1960s). **Figure 4.12** Image Of The Suffering Of Living In Baqa'a Refugee Camp In The Winter Season. Screenshot by the author, 2020. (*Refugee Life Conditions*, UNRWA, 1960s). **Figure 4.13** Image Of The Suffering Of Living In Baqa'a Refugee Camp In The Winter Season. Screenshot by the author, 2020. (*Refugee Life Conditions*, UNRWA, 1960s). **Figure 4.14** Image Of The Suffering Of Living In Baqa'a Refugee Camp In The Winter Season. Screenshot by the author, 2020. (*Refugee Life Conditions*, UNRWA, 1960s).

The stage of the shelter development varied from one camp to another (see *Figures 4.15 & 4.16*), in terms of the size of the shelter or the way of construction. Generally, they were 12-square-meter-room sheltering a family of four to five individuals, while the family consisting of six to eight people or more was getting two rooms (see *Figure 4.17*). The provided total area of the plot of land ranges between 80 to 100 m², whereas the camp occupants are allowed to use the plot of land for cultivation and production as well as erecting additional rooms (see *Figures 4.18 & 4.19*), depending on the increase in family members either by birth or marriage. In terms of construction, the use of Prefabricated shelter²⁰ in a number of camps was more widespread because it had many advantages over the emergency tent, as it offers durability and low maintenance while withstanding harsh conditions such as extreme temperatures and humidity (see *Figures 4.20, 4.21 & 4.22*) (Jabr, 1989; Amnesty, n.d.; Rueff & Viaro, 2009).

²⁰ Prefabricated "or *Prefab*" shelters are among the most functional modular building systems as they offer extreme simplicity in design providing basic shelter at a very cost-effective rate. UNRWA's prefab shelters are composed of a frame made from timber, and walls of asbestos with hardboard lining which helps insulate against the elements of weather. Prefab shelters offer durability and low maintenance while withstanding harsh conditions such as extreme temperatures and humidity. (Amnesty, n.d.; Modular Buildings, n.d.)

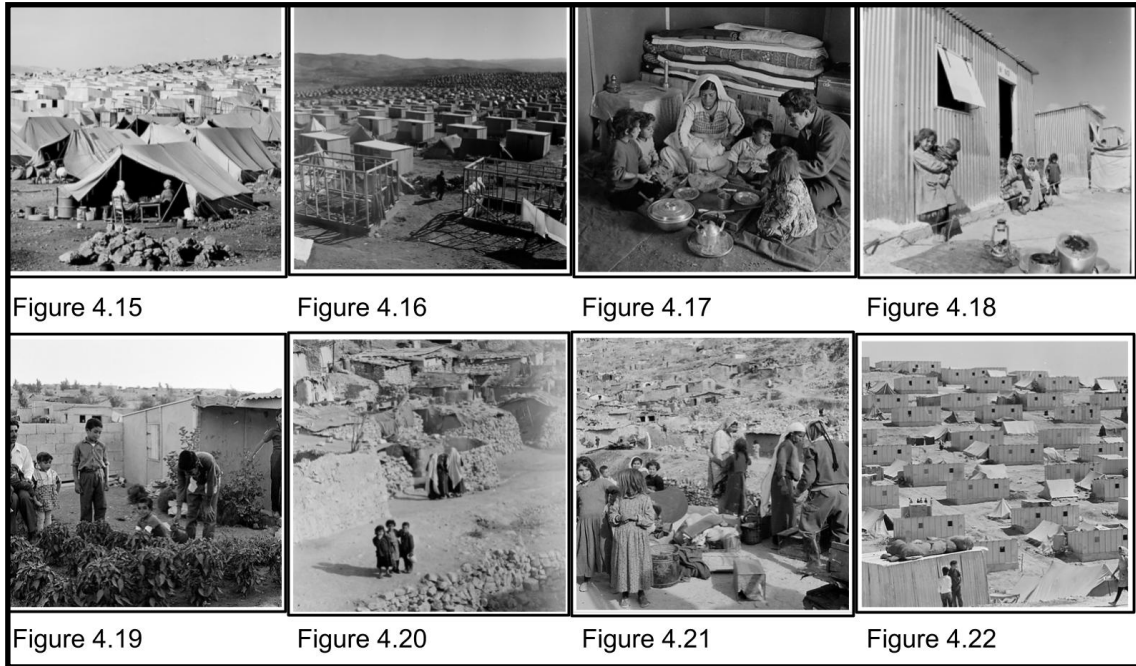


Figure 4.15 Image Of The Process For Transforming From Emergency Tents To Permanent Housing Units In AL-Husn Refugee Camp. Screenshot by the author, 2020. (Refugee Life Conditions, UNRWA, 1960s). **Figure 4.16** Image Of The Transformation From Tents To Pre-Fabricated Shelter In Jerash Refugee Camp. Screenshot by the author, 2020. (Refugee Life Conditions, UNRWA, 1960s). **Figure 4.17** Image Of Living Inside New Prefabricated Units, It Considered A Space For All Family Activities. Screenshot by the author, 2020. (Refugee Life Conditions, UNRWA, 1960s). **Figure 4.18** Image Of Refugees Using The Extended Outdoor Space For Their Activities in Al-Husn Refugee Camp. Screenshot by the author, 2020. (Refugee Life Conditions, UNRWA, 1970s). **Figure 4.19** Image Of Using The Extended Outdoor Space For Cultivating Activities By Camp Dwellers In Baqa'a Camp. Screenshot by the author, 2020. (Refugee Life Conditions, UNRWA, 1970s). **Figure 4.20** Image Of Another Construction Method With Available Rocks And Mud In Wadi Seir Area In Amman City. Screenshot by the author, 2020. (Refugee Life Conditions, UNRWA, 1950). **Figure 4.21** Image Of Mud Brick Shelters In Wadi Seir Area In Amman. Screenshot by the author, 2020. (Refugee Life Conditions, UNRWA, 1950). **Figure 4.22** Image Of Transformed Marka Refugee Camp Into Permanent Shelters, Camp Dwellers Keep Their Tents Next To Their New Shelters As Extended Living Space, Or Storage. Screenshot by the author, 2020. (Refugee Life Conditions, UNRWA, 1960s).

Gradually, the camp seemed to take a clear picture of an urban settlement, where the dwellers began to set a defined outline for the plot of land granted to them by UNRWA, as well as indicators of population growth began to take shape in conjunction with the integration of refugees in agriculture and livelihood activities. Most of the housing units took incremental expansion, where it was necessary to add an annexe space to the main room, due to the increase in family members. Subsequently, the housing units took the gradual development from prefab housing units to concrete walls and corrugated metal sheets, according to the family's financial ability (see *Figures 4.23, 4.24, 4.25, 4.26, 4.27 & 4.28*).

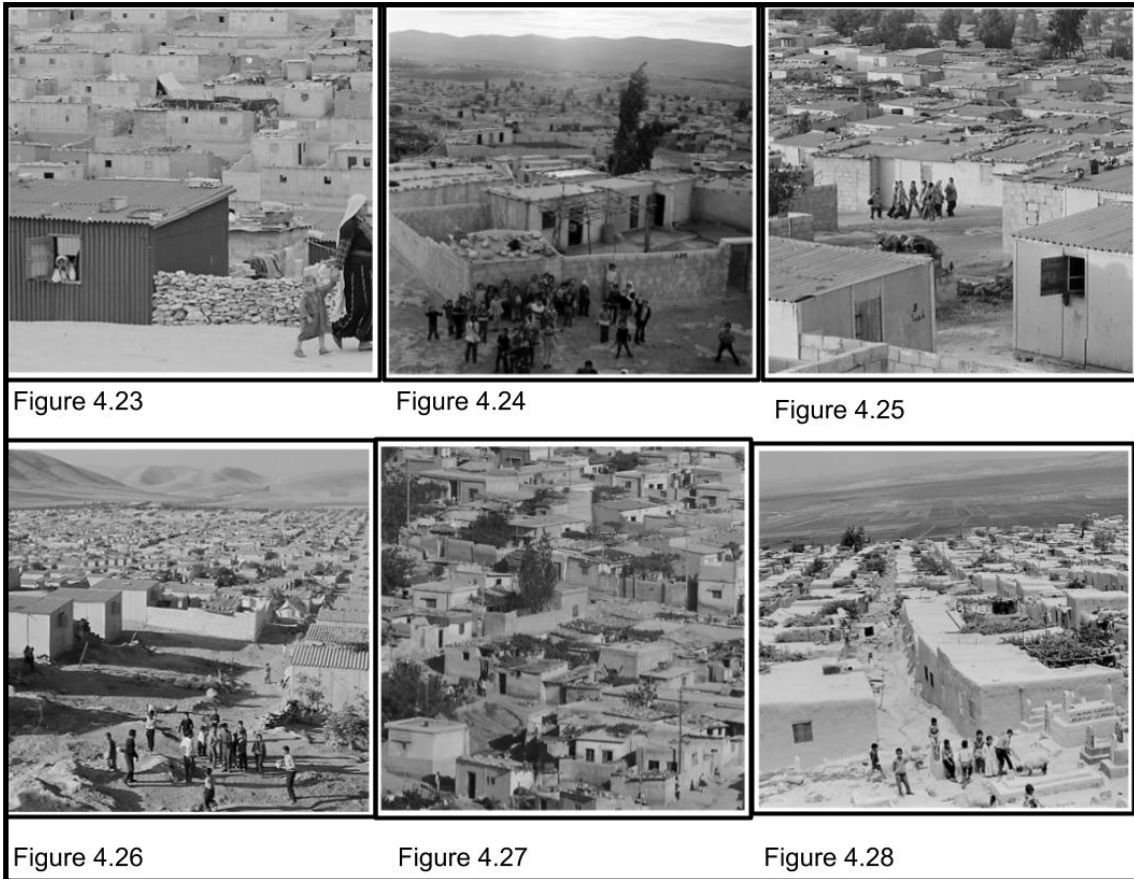


Figure 4.23 Image Showing The Self-Built Stone Fence That Surround The Assigned Plots In Marka Refugee Camp. Screenshot by the author, 2020. (Refugee Life Conditions, UNRWA, 1970s). **Figure 4.24** Image Of Extended House By Erecting New Room In Baqa'a Refugee Camp. Screenshot by the author, 2020. (Refugee Life Conditions, UNRWA, 1970s). **Figure 4.25** Image Of The Self-Incremental Housing By Adding Up More Rooms To Serve Camp Population In Baqa'a Refugee Camp. Screenshot by the author, 2020. (Refugee Life Conditions, UNRWA, 1970s). **Figure 4.26** Image Showing The Most Of Baqa'a Refugee Camp In Self-Built Phase. Screenshot by the author, 2020. (Refugee Life Conditions, UNRWA, 1970s). **Figure 4.27** Image Of Jabal Al-Hussein Refugee Camp Turned Prefabricated Units To Concrete Brick Housing. Screenshot by the author, 2020. (Refugee Life Conditions, UNRWA, 1970s). **Figure 4.28** Image Of Irbid Refugee Camp Developed To Brick Housing units. Screenshot by the author, 2020. (Refugee Life Conditions, UNRWA, 1970s).

The continuation of the Palestinian crisis throughout the past seventy years; most refugees obtaining all rights and privileges as Jordanian citizens; full engagement in the Jordanian economy and labour market (see *Figures 4.29 & 4.30*); as well as the continued support of UNRWA for various sectors concerned with refugees are the main drivers that led to the development of the camps in the manner we are witnessing today (see *Figures 4.31 & 4.32*). These features, which were initially established as temporary emergency camps, are today protracted-urban settlements, albeit random, but they are a vital part of the contemporary city plan. Whereas housing units have begun to expand physically in response to demographic growth, currently, most of the housing units in the camps consist of one to three floors made of concrete, and this includes the provision of essential services such as water, electricity, and markets (see *Figures 4.33, 4.34, 4.35 & 4.36*).

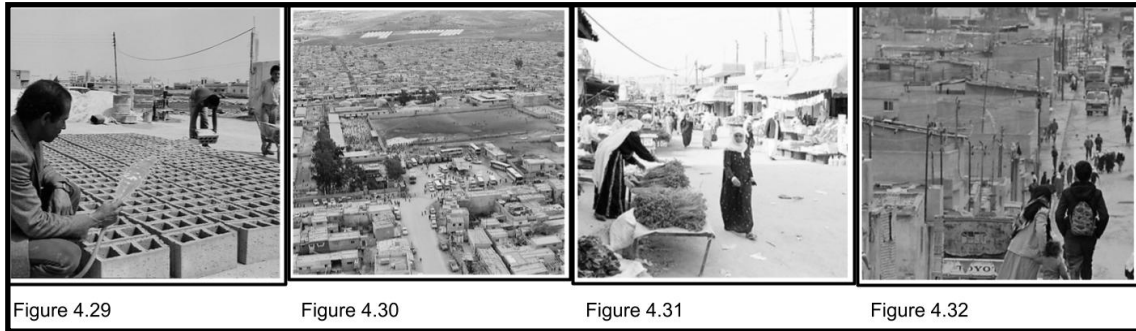


Figure 4.29 Image Of Producing Cement Blocks, As Main Construction Material For Irbid Camp Dwellers. Screenshot by the author, 2020. (Refugee Life Conditions, UNRWA, 1980s). **Figure 4.30** Image Of Baqa'a Refugee Camp Fully Built With Cement, And The Streets Are Paved In 1980s. Screenshot by the author, 2020. (Refugee Life Conditions, UNRWA, 1980s). **Figure 4.31** Image Of The Livelihood Activities In The Main Streets Of Baqa'a Refugee Camp. Screenshot by the author, 2020. (Refugee Life Conditions, UNRWA, 1990s). **Figure 4.32** Image Of Main Streets Of Baqa'a Refugee Camp Paved And Used By Vehicles And Pedestrians, And Electricity Network Clearly Showing The Permanency Of Camp Settlement. Screenshot by the author, 2020. (Refugee Life Conditions, UNRWA, 1990s).



Figure 4.33 Image Of Jerash Refugee Camp As Current Picture, Fully Concrete Settlement. (Jerash Camp, UNRWA, 2013). **Figure 4.34** Image Of Irbid Refugee Camp Image As Current Picture, Fully Concrete Settlement. (Irbid Camp, UNRWA, 2008). **Figure 4.35** Image Of Zarqa Refugee Camp As Current Picture, Fully Concrete Settlement. (Zarqa Camp, UNRWA, 2015). **Figure 4.36** Image Of Marka Refugee Camp As Current Picture, Fully Concrete Settlement. (Marka Camp, UNRWA, 2013).

4.1.5 Camp Morphology and Disaster Risk Reduction Parameters

The intended analysis of this section is to use the parameters of *Section 2.3.2* for DRR, through examining the urban morphology on a camp level. The following topics - as DRR parameters are embodied in - will be analysed furthermore; camp planning, building pattern which discuss shelter, open spaces and fire safety, the street pattern that related to accessibility and mobility, accessibility to livelihood, and camp services which include infrastructure (i.e., solid waste collecting, drainage and rainfall), and social services.

4.1.5.1 Camp Planning

The current aerial photograph of Al-Wehdat - *informal* - camp indicates the extent of its connection with the urban fabric of Amman (see *Figure 4.37*), as the camp is considered central to its surrounding zone, with similar class characteristics, as it is characterised by an architectural style, economic identity, and one country of origin. The informality expanded from the camp over the neighbouring districts with significant similarities in economic and architectural characteristics, but planning wise; it may appear to be improved, as it is subject to the regulation and control of the legal departments of the government. On the other hand, the areas that fall within the scope of the camp only were neglected in terms of planning, due to the large numbers of dwellers inside the camp and the urgent need to provide shelter to accommodate all refugees. Consequently, a large number of legislations related to building regulation were overlooked.

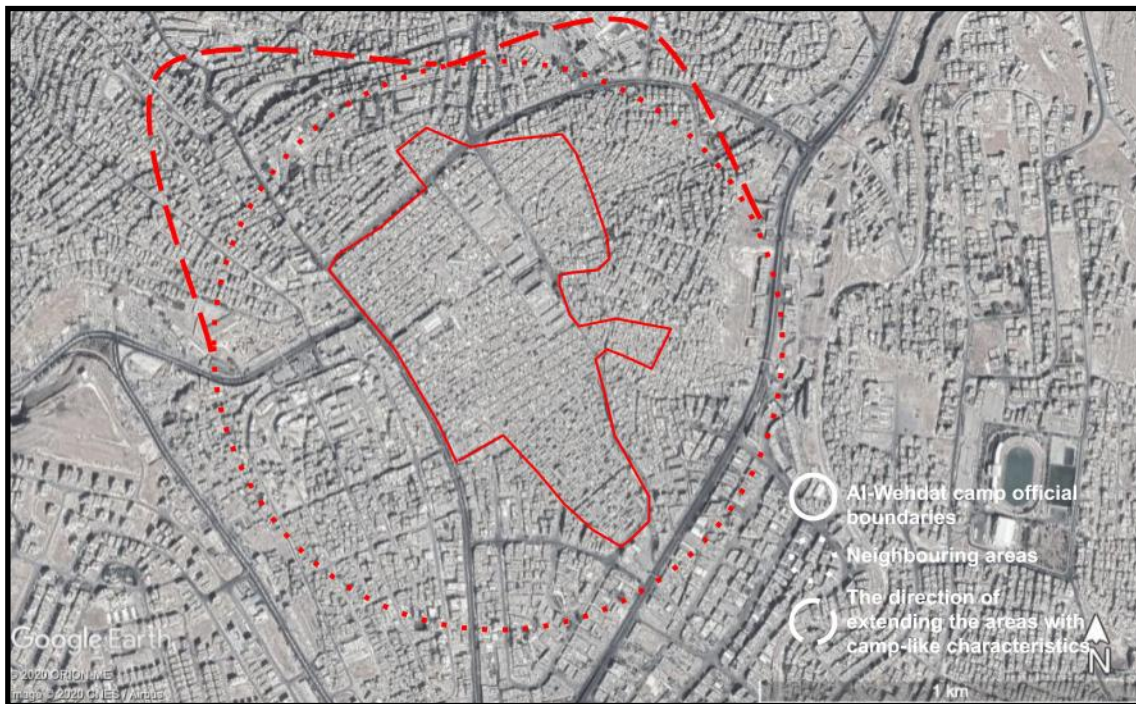


Figure 4.37 The Map Of Al-Wehdat Camp Showing How The Camp Relates To The Fabric Of The City, But At The Same Time Morphologically Distinct From The Surrounding Areas. Edited by the author, 2020. (Aerial Photograph of Al-Wehdat Camp from Google Earth, 2020)

4.1.5.2 Building Pattern

Regarding the building pattern, *Figure 4.38* indicates the ratio of built-up and open areas. Estimated more than 90% of buildings are randomly stacked irregularly, as it is difficult to count or define their external borders for each house, as all buildings are connected with attached walls (see *Figure 4.38 Zoom-in graph*). As for the open areas, they are only affiliated with schools – as playgrounds - or the areas surrounding the central market where street vendors occupy them permanently. As for the current construction pattern, it is of cement (see *Figure 4.39*), where the majority of the buildings in the camp consist of two to three floors, and there are buildings of one floor, and some of them have metal roofs, where they belong to the most inferior group of the camp population.

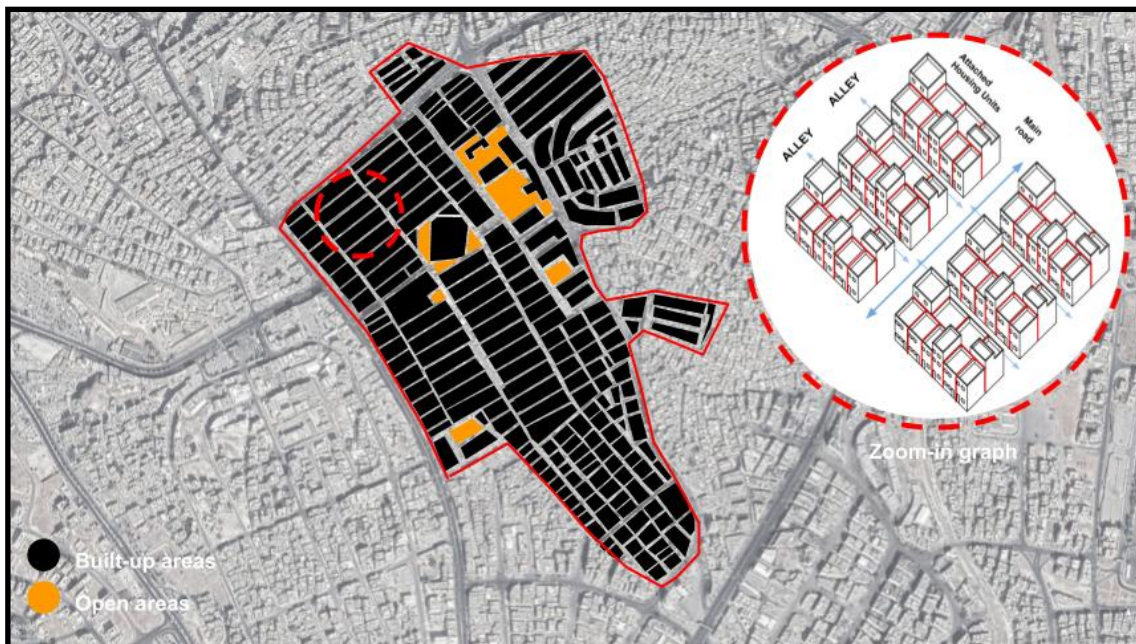


Figure 4.38 The Built-Up Areas And Open Spaces In Al-Wehdat Camp. Edited by the author, 2020. (Aerial Photograph of Al-Wehdat Camp from Google Earth, 2020)



Figure 4.39 Mapping The Building Pattern And Construction Method In Al-Wehdat Refugee Camp. Edited by the author, 2020. (Aerial Photograph of Al-Wehdat Camp from Google Earth, 2020)

4.1.5.3 Street Layouts

Concerning the patterns of streets, the camp is surrounded by main streets with three lanes for each direction and equipped with traffic signs. While four main streets are dividing the camp in a Longitudinal manner, these streets varied in width from four to six meters. Where cars are allowed to pass through or line up aside; thus, it impedes the movement of pedestrians due to the lack of paths designated for them. Furthermore, the occupation of street vendors for public roads impedes the movement of traffic, which leads to its lack in areas that are centred around the central market. On the other hand, cross alleys are more private, where residents of the sector pass to main streets. It does not exceed two meters in width, as cars are challenging to pass through, as well as they are not paved or prepared, but rather is a collective action by the residents of the sector to improve the road without the presence of any engineering supervision by UNRWA (see *Figure 4.40*).

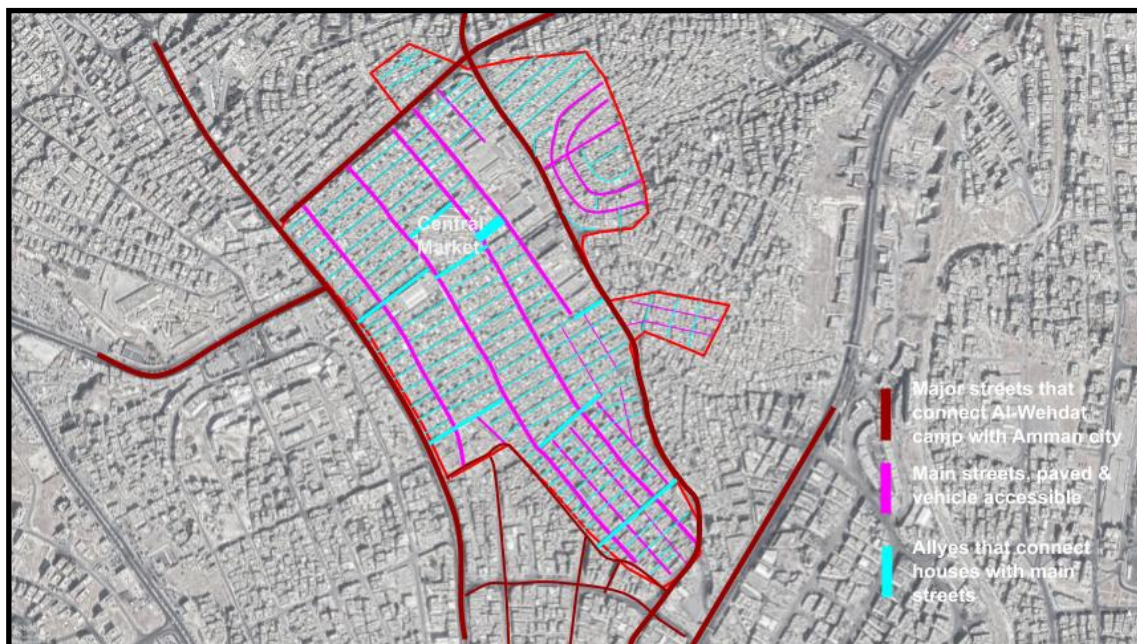


Figure 4.40 Map Of The Ways Of Accessibility In Al-Wehdat Camp. Edited by the author, 2020. (Aerial Photograph of Al-Wehdat Camp from Google Earth, 2020)

4.1.5.4 Accessibility to Livelihood

The accessibility of the residents of the neighbouring areas has made the central market an essential source of livelihood for the camp residents. Trade such as meat markets, vegetables, grocery, and clothing are the primary forms of the livelihood sector. The external facades of the camp overlooking the main streets and the upper part of camp are considered areas of commercial activity, where the commercial shops are lined up, as well as street vendors on the sides where they form an informal market that supports camp residents (see *Figure 4.41*).

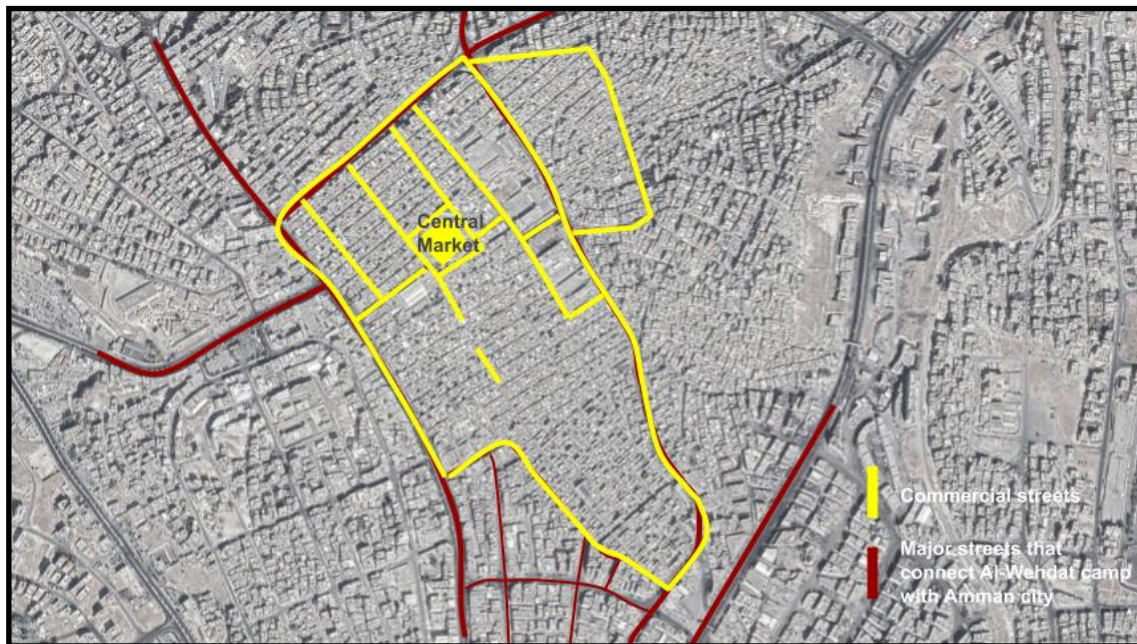


Figure 4.41 Livelihood Map Of Al-Wehdat Camp. Edited by the author, 2020. (Aerial Photograph of Al-Wehdat Camp from Google Earth, 2020)

4.1.5.5 Camp Services

Through the interview regarding camp services, the GAM provides a solid waste collection service, where UNRWA employees collect it from inside the camp to designated areas where the GAM collects them (Zeyad, 2020). This cooperation is essential between the GAM and the UNRWA in terms of its importance to maintain the environmental health in the camp. It is also considered a form of livelihood for the camp inhabitants. However, some camp's dwellers' negligence in collecting waste in the designated place exposes the residents to smells and diseases. Likewise, the water drainage system along the main streets allow the collection of black water and its discharge to the main network, but the absence of a rainwater drainage network may hinder the residents of the camp and neighbouring areas, and this coincides with the absence of any green areas where they form water absorption spots. Socially, the camp contains primary social services such as the Mosque, health centres, support centres for UNRWA, and a police station (see *Figure 4.42*).



Figure 4.42 Service Map Of Al-Wehdat Camp. Edited by the author, 2020. (Aerial Photograph of Al-Wehdat Camp from Google Earth, 2020)

4.1.6 Analysis Conclusion

To conclude, the case analysis demonstrates how the seventy-year-evolution took an informal developing pathway, producing unplanned settlements within the urban fabric. Thus the case of Al-Wehdat as informal camp does not comply with DRR strategies – based on *Section 2.3.2* - which are summarised in the following:

- **Shelter:** the surface area is less than 20 m² per person, due to the increasing population, since the beginning, settlement planning was not considering the change in population. The entire housing units were poorly engineered as there were no regulations from both the government and the UNRWA to look over the building standards, which put refugees at risk of disasters and emergencies, such as earthquakes or fire accidents. Furthermore, housing units were attached along the camp making natural light, and ventilation hardly to get inside.

- **Access and Mobility:** despite the proximity to main transportation hubs, the quality of streets are poorly conditioned; the pavement is not maintained; width of alleys and street vendors occupying most of the main streets which hinder emergency evacuation or to be accessible by emergency teams. People with disabilities are not represented through camp design scope as they suffer from moving through alleys, streets.

- **Rainfall Drainage:** the camp is lacking a mechanism for rainfall drainage which prone camp structures and dwellers to the risk of Flash Floods.

- **Open Spaces and Fire Safety:** the lack of green open spaces is evident from the analysis, as green open spaces play a role in water treatment as absorption rainfall areas, and fire safety which can break space to stop the fire from spreading, also create social gathering points. In addition, the current situation of the housing units, as all of them are attached with no respect to keeping at least two meters between, and not using fire-resisting materials make the camp, putting the whole camp at risk of fire spreading quickly.

In order to emphasise on the DRR in the informal camps, more funding must be utilised to create multi-scale DRR interventions, coupled with vulnerability assessment framework conducted through an active partnership between The UNRWA and DPA in order to establish a schematic approach that tackles the most vulnerable camp dwellers (i.e., vulnerable housing units), which can be further expanded to cover the network of streets within the camp. The scope of work foresees the possible modalities for achieving preparedness among camp occupants and assures more integration and active participation to maintain the operation of DRR strategies inside the camp and in the whole city.

4.2 The Syrian Asylum Case

4.2.1 Background

In conjunction with the Arab Spring, the Syrian crisis began in the spring of 2011 from Dara'a in the south of the country, after the arrest and torture of teenagers who drew revolutionary slogans on a school wall, which sparked the peaceful protest by anti-government. However, this opposition met with a brutal response by the security forces, where they opened fire on the demonstrators and killed several. The peaceful protests quickly escalated, and the unrest triggered nationwide protests demanding President Assad's resignation. By July 2011, hundreds of thousands were taking to the streets across the country. Violence escalated, and the country descended into civil war as army defectors had loosely organised the Free Syrian Army, and many civilian Syrians took up arms to join the opposition. Divisions between secular and religious fighters, and between ethnic groups, continue to complicate the politics of the conflict. The fighting started to take over most of the cities, and by June 2013, the UN said 90,000 people had been killed in the conflict. By August 2015, that figure had climbed to 250,000, according to activists and the UN (Rodgers et al., 2016). The nine-year-Syrian conflict has created one of the worst humanitarian crises of our time. Over five and a half million people are struggling to survive inside Syria or make a new home in neighbouring countries²¹. Others risked their lives on the way to Europe, hoping to find acceptance and opportunity (Rodgers et al., 2016; Mercy Corps, 2020; UNHCR, 2019_b).

Indeed, all countries neighbouring Syria have been affected by the refugee crisis, especially Jordan, as of 5 May 2020, Jordan was home to 656.733 UNHCR-recognised Syrian refugees (UNHCR, 2020). The phenomenon of asylum is not new to Jordan's history, but the social and economic effects of the crisis have nonetheless been devastating, as Jordan is one of the countries suffering from water scarcity. This crisis threatens Jordanians' access to decent water and sanitation services. Services such as education, electricity, and healthcare have deteriorated, especially in the cities of the north and the capital, as well as opportunities for workers and obtaining a job, have become increasingly challenging with competition between Syrians and the working-class, as well as migrant workers from other countries. Where the unemployment rate has risen and wages depressed. While most Jordanians have been hospitable towards the Syrian refugees, Jordanians often feel that organisations providing aid to displaced Syrians overlook their difficulties. These matters provoke the government to restructure its plans in terms of budgets and management crises and emergency response plans and refugee issues to align with the goals of national development (Shteiwi et al., 2014; UN-Jordan & JRPSC, 2014; S. Jauhiainen & Vorobeva, 2018).

21 Turkey, Lebanon, Jordan, Iraq, and Egypt. (UNHCR, 2020)

4.2.2 Syrian Refugee Camps

The Jordanian government works in cooperation with the UNHCR, to provide protection and accommodation to 1.4 million inhabitants (UNHCR, 2019_b), escaping the Syrian Civil War. Jordan adopted five Syrian refugee camps (see *Figure 4.43*), three of them considered to be official and have been erected on an empty plot distant from the city, while the rest are temporary. However, only 656.213 Syrians are registered with the United Nations, and around 124 thousands occupying these camps where the rest of Syrians do not live in these camps, but in Jordanian towns and cities (UN-Jordan & JRPSC, 2014; Shteivi et al., 2014).

The Official camps are:

- Zaatari camp opened in July 2012 in Mafraq Governorate.
- Mrajeeb Al Fhood camp (or *Emirati camp*) opened in April 2013 in Zarqa Governorate.
- Azraq camp opened in April 2014 in Zarqa Governorate.

While Temporary camps are:

- King Abdullah Park (KAP) opened in 2012 in Irbid Governorate (a small camp housing Palestinians who flee from Syria).
- Cyber City refugee camp opened in 2013 in Irbid Governorate (previously was industrial city) (UNOSAT, 2013).

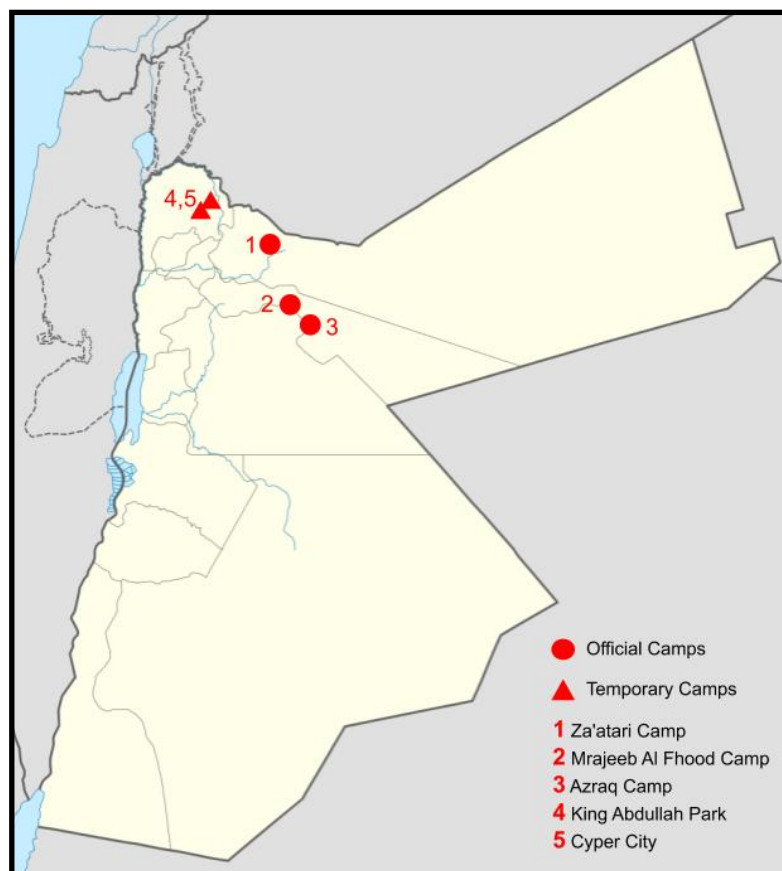


Figure 4.43 Location Of Syrian Refugee Camps In Jordan. Edited by the author, 2020. (Map of Jordan from Wikipedia, 2009)

4.2.3 The Physical Evolution of the Syrian Refugee Camps

4.2.3.1 Location to City

Unlike the Palestinian refugee camps in Jordan, Syrian refugee camps were designed to separate their inhabitants from the host population or to provide them with a different legal status from non-camp refugees. Although the nine years of asylum, their camps are still considered temporary, and they will go back to their country. The following aerial photographs show the distance between the closest urban centre (i.e., city) and refugee camps, which is located in arid desert areas.



Figure 4.44 The Location Of Za'atari Camp in Mafrqa Governorate. Edited by the author, 2020 (Aerial Photograph of Mafrqa from Google Earth, 2020)



Figure 4.45 The Location Of Emirati Camp And Azraq Camp In Zarqa Governorate . Edited by the author, 2020 (Aerial Photograph of Zarqa from Google Earth, 2020)

4.2.3.2 Camp Development: Planned Camps in the Desert

Zaatari camp is considered the first to shelter Syrians; it is located 10 km east of Mafraq city (Mafraq governorate). It was first opened in July 2012, as an emergency camp, even though the camp was built based on UNHCR guidelines to accommodate 20 thousands inhabitants, Zaatari has always hosted four times the planned number, reaching the peak to shelter about 155 thousands dwellers at once, the reason that led to establish Azraq camp, later on, to distribute the populations. Between September and November 2012, significant capacity expansion took place by adding over 2.400 tents, this continued, in May 2013 the capacity increased by 450% than November 2012, and the total area increased from 2.16 km² to 5.31 km² (see *Figure 4.46*), which make it the biggest refugee camp in the world (Chamma, 2019).

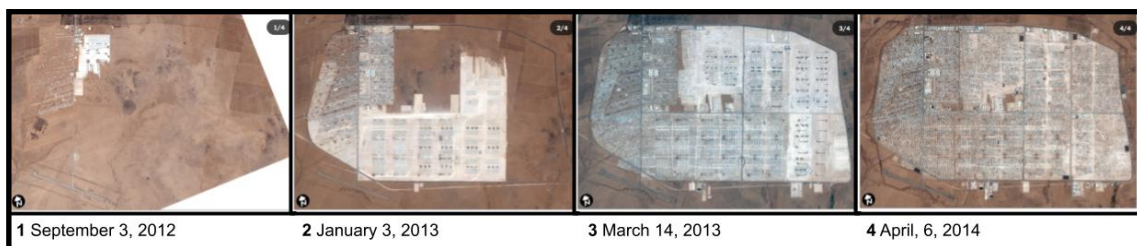


Figure 4.46 Satellite Images For The Development Of Zaatari Camp. Edited by the author, 2020. (Zaatari Camp, Reprinted from The New York Times, 2014)

Shelters in the camp varied depending on the availability of types of shelter at the time of extending the camp. Every family of seven members gets one shelter unit. Three types of shelters are provided in Zaatari camp; tents, small containers (Caravans of 12 m²), and Prefab units (18 m²) that have a living room, a bedroom, a private kitchen, and bathroom (Chamma, 2019).



Figure 4.47 Existing Shelter Units In Zaatari Camp. (Types of Shelter at Zaatari, Reprinted from Chamma, 2019)

Due to the maximum capacity in Zaatari camp, a second camp - Azraq camp - was opened in April 2014, 100 km east of Amman. Implementing the lessons learned from the experience of Zaatari, the design and management of Azraq camp shared between UNHCR and Jordan government with more security control, letting around 40.953 refugees occupy the camp (UNHCR, 2020). The campsite was previously used during the Gulf War of 1990–91 as a transit camp for displaced Iraqis and Kuwaitis (Scavino, 2014; Oddone, 2014).

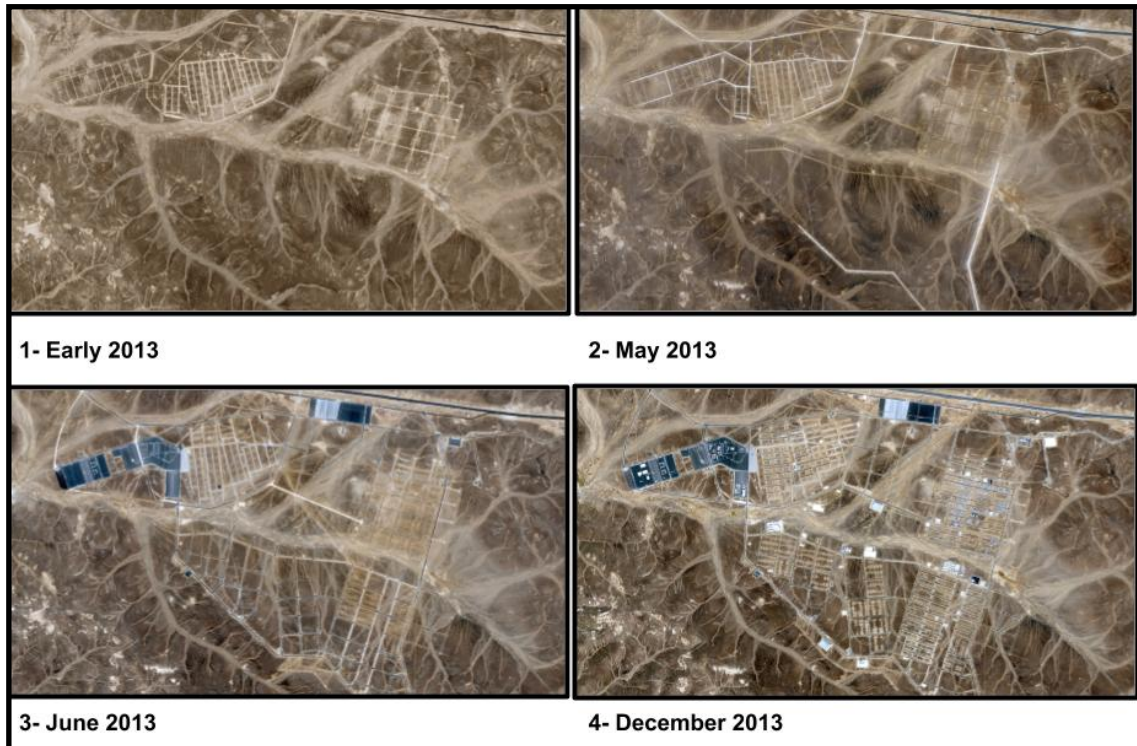


Figure 4.48 Satellite Images For The Development Of Azraq Camp. Edited by the author, 2020. (Azraq Refugee Camp, Reprinted from BBC News, 2014)

The military-design appearance of the new camp was the rows of white cabins with insulation and sloping roofs, the steel, and zinc shelter to withstand the hot and windy weather in the middle of the desert. Cement was not introduced for constructing the camp to emphasise the temporality of the camp, and this camp is not intended to be permanent (see *Figures 4.49 & 4.50*) (Oddone, 2014; Knell, 2014).

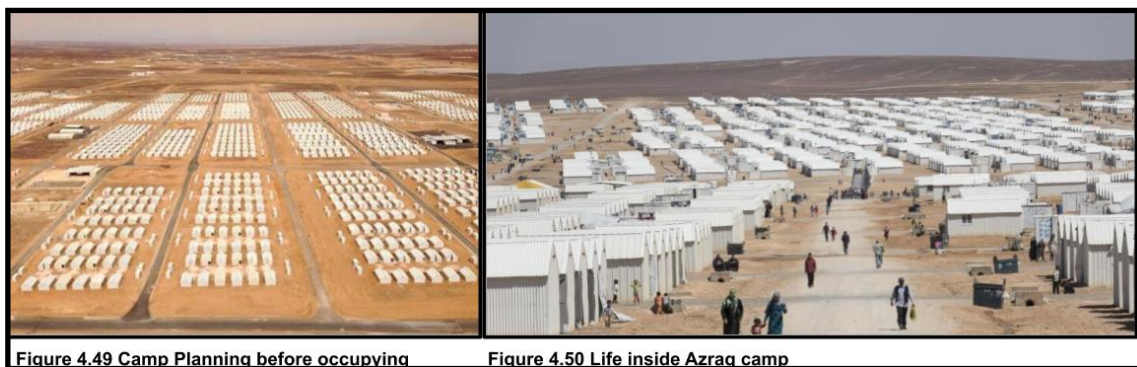


Figure 4.49 Top View Image Of Azraq Camp While Constructing. (Azraq Camp, The Jordan Times, 2014). **Figure 4.50** Image Of The Current Living Setting In Azraq Camp. (Azraq Camp, Norwegian Refugee Council, 2016)

4.2.4 Camp Morphology and Disaster Risk Reduction Parameters

In this section of the research, the analysis phase depends on the same methodology used in the previous section, as the Azraq camp area is distinguished by geographical, climatic, and planning characteristics that differ from its counterpart Al-Wehdat camp. As the most hazards that face Azraq camp dwellers are sand storms that result in vision and respiratory problems, in another case due to high temperatures, some shelters catch fire. Furthermore, permanent drought constitutes one of the natural hazards that overburden water infrastructure capacity.

4.2.4.1 Camp Planning

As mentioned earlier, Azraq camp is located 60 km from Zarqa city, in the middle of the desert. In contrast with Palestinian camps where they built on the periphery of the cities. It has distinctive boundaries (see *Figure 4.51*) that makes the possibility for expansion unlikely to occur, due to the defined boundaries, whereas Village four and seven are under planning, which opens the chance to future expansion. As a pre-planned emergency camp, it is subdivided into Villages, Blocks, and Plots (see *Figure 4.52*) and most services are available on the village level.



Figure 4.51 Azraq Camp Site Plan. Edited by the author, 2020 (Aerial Photograph of Azraq Refugee Camp from Google Earth, 2020)

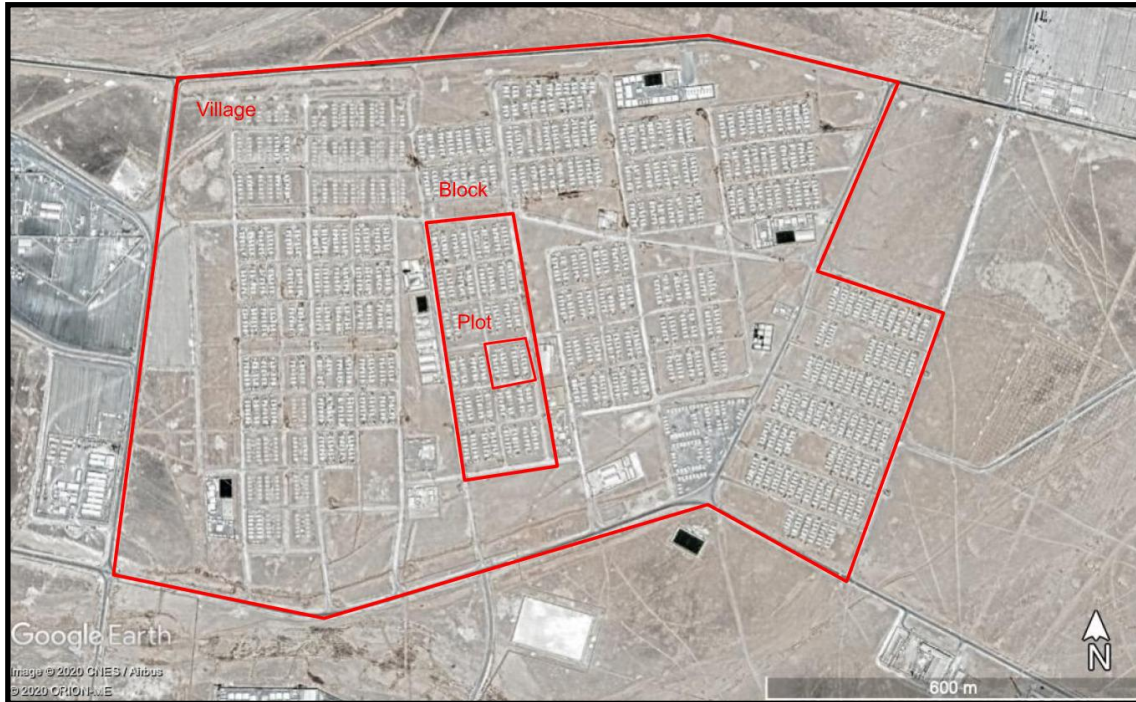


Figure 4.52 Camp Planning Into Villages, Blocks And Plots. Edited by the author, 2020. (Aerial Photograph of Village Two from Google Earth, 2020)

4.2.4.2 Building Pattern

Compared to Al-Wehdat camp, the seven-year Azraq camp is still in progress to get full capacity, which is obvious from the empty spaces (see *Figure 4.53*). Another type of spaces between shelters, considered as fire breaks, space for outdoor activities and social gatherings. Non-greenery aspect, as the area is not witnessing high levels of rain, dust storms are likely to occur most of the year, that effects on the health of camp occupants. That is connected to the no-trees policy from the UNHCR, as planting represents permanency. Another aspect is the layout of shelter which takes regular rows of Transitional Shelters (*T-Shelter*) (see *Figure 4.54*), the prearranged plan taking into consideration the spacing between T-Shelters, that offers privacy, fire safety, and access to natural light and ventilation.

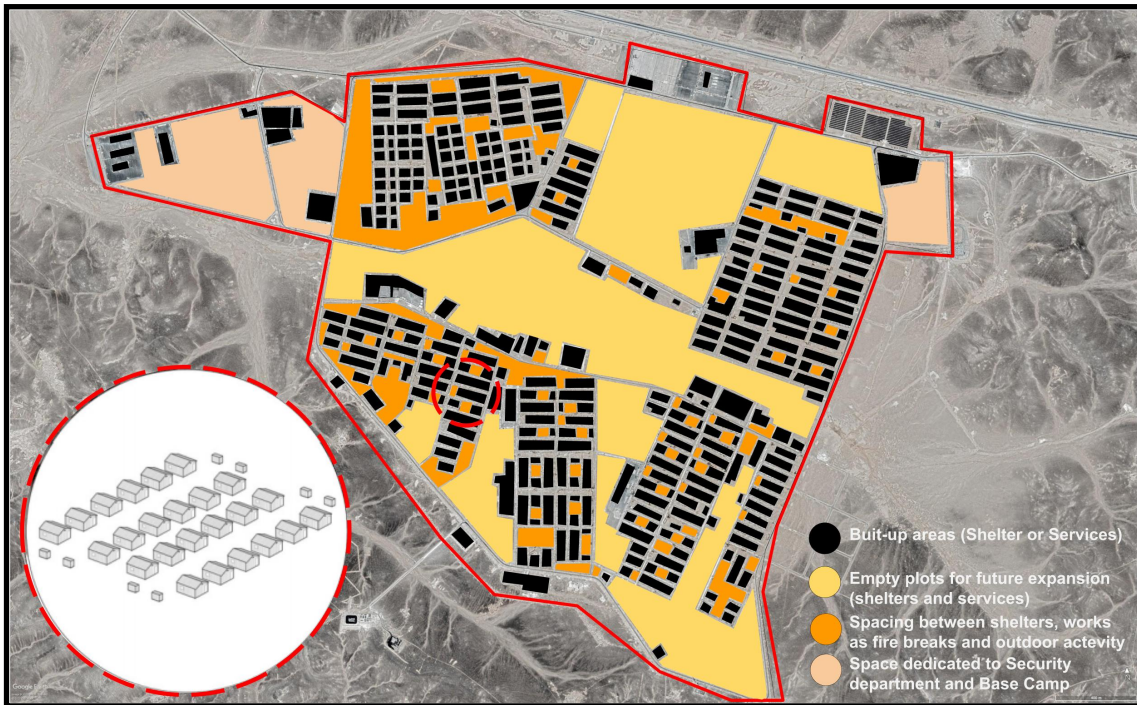


Figure 4.53 Map Of Built-Up Areas and Different Open Spaces In Azraq Camp. Edited by the author, 2020. (Aerial photograph of Azraq Camp from Google Earth, 2020)



Figure 4.54 (1) T-Shelter Design (2) Collective Images Of Construction Phase And T-Shelter Indoor Space. Edited by the author, 2020. Adapted from T-Shelter for Azraq Refugee Camp, by UNHCR, (2015_c). Copyright 2015 by UNHCR

4.2.4.3 Street Layouts

Street network in Azraq camp following a clear hierarchy depends on the type of construction, and average usage (see *Figure 4.55*). The main highway which leads to Zarqa city is considered a wide road (three lanes each side) and paved. With controlled entrance and exit gates, the main roads are the connectors between the main villages and other camp-level services, such as the main police station, and Base Camp. These roads are less engineered than the highway, two-way-paved roads. Lastly, the service roads are the network among each village and made of gravel. Following that with main regulations for the speed limit and controlling police officers, keeping the street free and easy accessed by aid providers, police and emergency teams can easily move around, keeping people with disability neglected in term of accessibility design, as the Palestinian camp (Al-Wehdat).

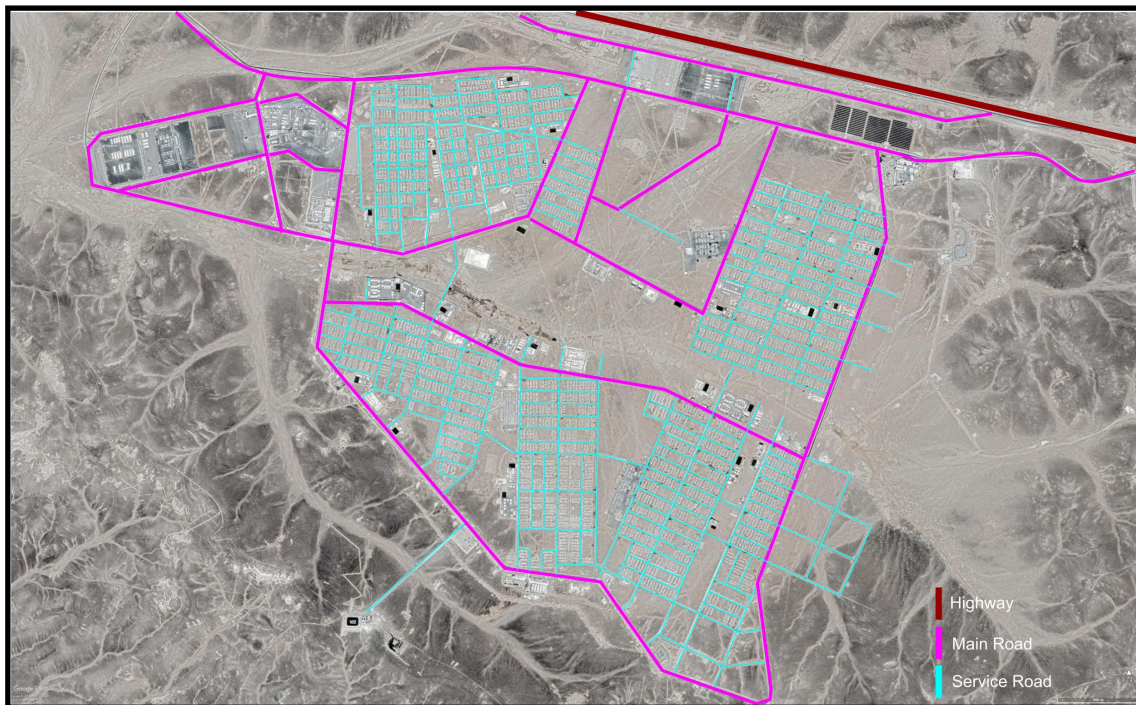


Figure 4.55 *The Hierarchy Of Street Layout In Azraq Camp. Edited by the author, 2020. (Aerial Photograph of Azraq Refugee Camp from Google Earth, 2020)*

4.2.4.4 Camp Services and Accessibility to Livelihood

The camp is 60 km far away from the nearest city; most services are available in the camp on the village level. Where camp services heavily depend on international funds that are divided among different humanitarian actors, their services varied from social support to health, education and protection (see *Figure 4.56*). That creates livelihood support for camp dwellers, as camp policy requires all NGOs to employ refugees for their operations in camp (e.g., incentive workers in construction, teaching, and warehouse management). Besides that, education and community services provide them with adequate knowledge that is needed for future integration and establishing a sustainable life.

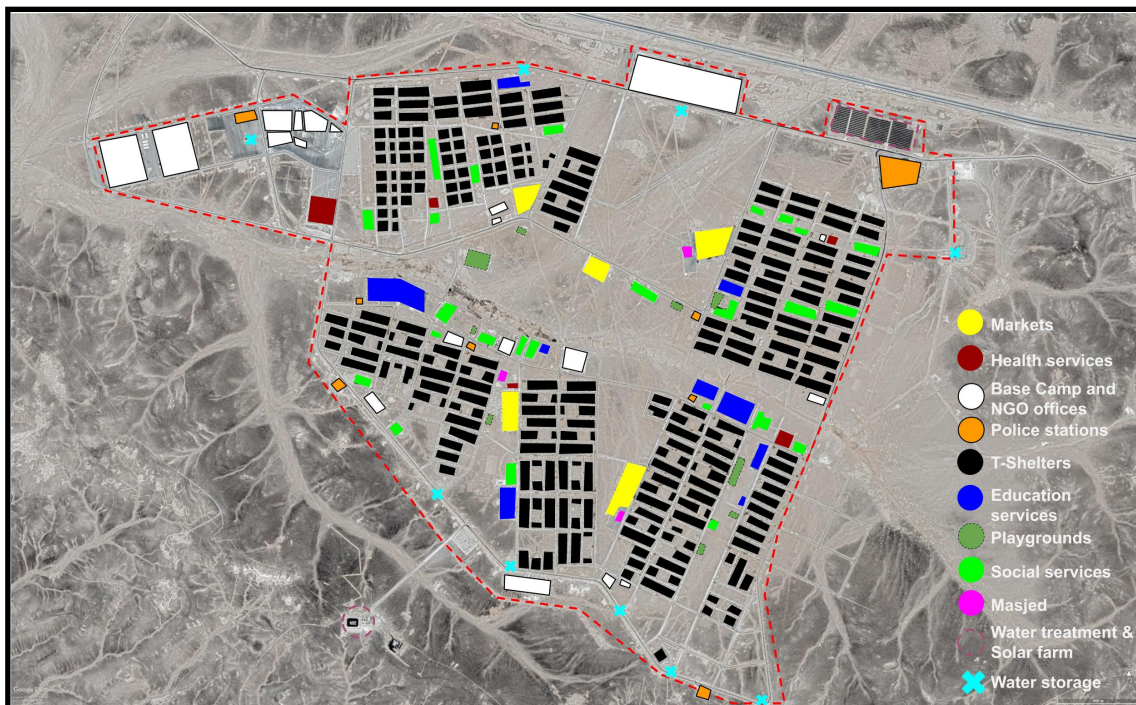


Figure 4.56 Distribution Of Services In Azraq Camp Based On UNHCR, 2018. Edited by the author, 2020. (Aerial Photograph of Azraq Refugee Camp from Google Earth, 2020)

4.2.5 Analysis Conclusion

In conclusion, as a planned emergency camp, the analysis shows that Azraq camp relatively complies with DRR strategies but neglects some key aspects at the same time. Where the parameters of *Section 2.3.2* are summarised in the following:

- **Shelter:** the pre-planned camp respects the surface area per person (30 m² per person), and provides outdoor spaces that can cover the needs of refugees. All T-Shelters are constructed in the same way, offering the same living environment.

- **Access and Mobility:** the clear grid of roads, offers easy access to aid and emergency providers, which make controlling disasters more efficient. On the other hand, neglecting the needs of people with disabilities can hinder the DRR. Furthermore, the distance from the urban centres can negatively affect the integration of the refugee community with city structure, especially in case of disasters, as the camp is located far away from the city where most assistance is located.

- **Open Spaces and Fire Safety:** fire safety has been taken into consideration while planning Azraq camp, in many aspects, such as spacing between shelters, using fire-resistant materials, and providing fire breaks through existing open spaces. The aspect that has been neglected is understanding the nature of the camp as its hot arid desert, the lack of greening by growing plants that are adapted to desert, can create a sustainable environment and help to reduce the impacts of dust storms on refugees.

Bearing in mind the transitional stage that the camp is going through and its location and characteristics, to advance the DRR strategies in Azraq camp; it is necessary to give priority to acquire climatic adaptation, through context-based environmental solutions. Furthermore, strengthening the livelihood profile of camp dwellers by actively investing in the agricultural lands close to the camp and moving to clean energy consumption, which requires strong collaboration among the UNHCR and multi-governmental agencies, where the stakeholders can implement the lesson-learned objectives from Palestinian case and Zaatari camp into upgrading Azraq camp.

Chapter Five: Conclusion

This research sought to determine the designing guidelines that raise the DRR profile inside the refugee camps and whether they comply with protracted refugee camp settings by using a comparative case study of informal settlement (Al-Wehdat - Palestinian - refugee camp) and the planned emergency camp (Azraq - Syrian - refugee camp). By answering the research questions, results from the analytical review of international and national guidelines and frameworks and academic journals were triangulated with analysis of the case studies yielding the following findings:

- Indeed, the international DRR frameworks succeed to achieve a milestone in disaster prevention on a regional and national level, that include implementation mechanisms, but translating that to a more deep domain fails to reach out and understand the complexity of the informal settlements within the urban fabric. On the other hand, the humanitarian guidelines developed a scope towards preparedness of emergency camps against hazards, but the gap of achieving methods of preparedness and mitigation systems can be explicitly addressed within the informal camps.
- The guidelines and frameworks fail to consider the context-based characteristics for each case which leads to generic standards that fail to include the context-based knowledge and do not analyse the hazards and planning profile for diverse settings. For example, the current *COVID-19* pandemic reveals this deficiency of these standards/measures while dealing with it inside camps, but mainly informal camps.
- As the camp design is an essential element since the early stages of receiving refugees, the DRR is one of the key pillars that plays a vital role as camps are developed. Various design aspects must be considered while implementing DRR, that include the particular characteristics of each shelter unit to the urban scale of the campsite.
- Furthermore, DRR strategies must take into consideration the expectation of population growth inside camps and the ability to expand the capacity of social, environmental, and physical infrastructures.
- Concerning the planning department that issues planning regulations for camp setting, they must apply a synchronised development model as '*a whole city concept*'.
- In order to achieve DRR Strategies, it is necessary to coordinate between local government, international humanitarian and development agencies, the private sector, and the local disadvantaged community, which must play a vital role. This partnership will consequently increase the sense of communal responsibility and accelerate the sustainable integration

process for the benefit of the refugees and the local population.

- Despite the disparities between each case, the DRR strategies were not complying to their structures, especially with Al-Wehdat camp as it has been neglected over seven decades, which has led to cumulative inadequacy in the camp infrastructure due to high density of camp residents and absence of planning and construction regulations. Hence, major steps towards DRR is hard to be taken as the existing physical environment needs generous funding but as a step forward, small scale DRR initiatives can be established such as greening projects, early disaster warning systems, establish communication channels with NCSCM in case of disasters, develop a new construction and maintenance methods that apply DRR parameters.
- On the other hand, Azraq camp is a bit advanced with DRR strategies, as they have to maintain and adapt that for long term needs, with the cooperation of camp dwellers and agencies to develop disaster preparedness, as the camp is getting permanent. Furthermore, introducing sustainable methods for accessing resourcing, such as develop the use of solar energy for household activities, and create a context-based-adaptation environment to reduce the effects of climate.

The findings of this research provide an important insight into how DRR parameters do not comply with camp design in general but in an informal camp in specific. The call to action for making DRR strategies part of early-stage camp design manuals that are associated with the knowledge of context-based disasters that may face (e.g., climate change & pandemics), and to include DRR strategies in urban upgrading plans of informal settlements. In addition, it is inviting different stakeholders to initiate disaster preparedness and prevention programs that translate the international frameworks into a multi-level approach which includes the vulnerable areas into its scope.

Bibliography

- Ababsa, M. (2011). Citizenship and Urban Issues in Jordan. In *Villes, pratiques urbaines et construction nationale en Jordanie* (2011th ed., pp. 39–64). Presses de l’Ifpo, Beyrouth. <https://pdfs.semanticscholar.org/52c2/eb404cc060fd8f99f89883c9c11088b28334.pdf>
- Ababsa, M. (2013). The Socio-Economic Composition of the Population. In *Atlas of Jordan: History, Territories and Society* (pp. 344–353). Presses de l’Ifpo, Institut français du Proche-Orient, Beyrouth. <https://doi.org/10.4000/books.ifpo.5038>
- Al Rawashdeh, S., & Saleh, B. (2006). Satellite Monitoring of Urban Spatial Growth in the Amman Area, Jordan. *Journal of Urban Planning and Development*, 132(4), 211–216. <https://ascelibrary.org/doi/10.1061/%28ASCE%290733-9488%282006%29132%3A4%28211%29>
- Al-Azhari, W. W. (2012). A Study of Housing Identity in Refugee Settlements in Jordan: Al-Wahdat Refugee Camp as a Case Study. *International Journal of Environment, Ecology, Family and Urban Studies*, 2(3), 26–45.
- Al-Husseini, J. (2011). The Evolution of the Palestinian Refugee Camps in Jordan. Between Logics of Exclusion and Integration. In *Villes, pratiques urbaines et construction nationale en Jordanie* (pp. 181–204). Presses de l’Ifpo, Beyrouth. <https://doi.org/10.4000/books.ifpo.1742>
- Alnsour, J., & Meaton, J. (2014). Housing conditions in Palestinian refugee camps, Jordan. *Cities*, 36, 65–73. <https://pure.hud.ac.uk/en/publications/housing-conditions-in-palestinian-refugee-camps-jordan>
- Ammann, W. J. (2013). Disaster Risk Reduction. In P. T. Bobrowsky (Ed.), *ENCYCLOPEDIA of NATURAL HAZARDS* (1st ed., pp. 170–174). Springer, Netherlands.
- Amnesty. (n.d.). *SEVENTY+ YEARS OF SUFFOCATION (Chapter 2: Jordan)*. <https://nakba.amnesty.org/en/chapters/jordan/#>
- Bureau for Crisis Prevention and Recovery – United Nations Development Programme (BCPR-UNDP). (2010). *Disaster Risk Assessment*. UNDP. <https://www.undp.org/content/dam/undp/library/crisis-prevention/disaster/2Disaster Risk Reduction - Risk Assessment.pdf>
- Beer Prydz, E., & Wadhwa, D. (2019). *Classifying Countries by Income*. <https://datatopics.worldbank.org/world-development-indicators/stories/the-classification-of-countries-by-income.html>
- Beinin, J., & Hajjar, L. (2014). *Palestine, Israel and the Arab-Israeli Conflict: A Primer* (pp. 1–16). Middle East Research and Information Project, Washington, DC. <https://merip.org/palestine-israel-primer/>
- Bocco, R. (2010). UNRWA and the Palestinian refugees: A history within history. *Refugee Survey Quarterly*, 28(2–3), 229–252. <https://doi.org/10.1093/rsq/hdq001>
- Capacity for Disaster Risk Initiative (CADRI). (2018_a). *Jordan: A renewed Focus on Disaster Risk Reduction*. https://www.cadri.net/sites/default/files/CountryStory_Jordan-web.pdf
- Capacity for Disaster Risk Initiative (CADRI). (2018_b). *Capacity Assessment of the Disaster Risk Management System in Jordan (Draft)*.
- Capacity for Disaster Risk Initiative (CADRI). (2019). *Annual Report 2019*. <https://www.cadri.net/sites/default/files/CADRI Annual Report 2019 - web.pdf>
- Chamma, N. (2019). *Future Refugee Camps as “Integrated Sustainable Settlements” Case-Studies: Syrian Refugee Settlement in Jordan, Turkey and Lebanon*. Doctoral dissertation, Universitat Internacional de Catalunya (UIC), Barcelona.
- Chatelard, G. (2010). Jordan: A Refugee Haven. *Migration Information Source*, 11. <https://www.migrationpolicy.org/article/jordan-refugee-haven/>
- Mercy Corps. (2020). *The facts: What you need to know about the Syria crisis*. <https://www.mercycorps.org/blog/quick-facts-syria-crisis#start-syria-crisis>

- Centre for Research on the Epidemiology of Disasters (CRED). (2015). *Report on Human cost of Natural Disasters: A global perspective*. <https://www.cred.be/node/1355>
- Dalal, A., Darweesh, A., Misselwitz, P., & Steigemann, A. (2018). Planning the ideal refugee camp? A critical interrogation of recent planning innovations in Jordan and Germany. *Urban Planning*, 3(4), 64–78. https://www.researchgate.net/publication/329837447_Planning_the_Ideal_Refugee_Camp_A_Critical_Interrogation_of_7_Recent_Planning_Innovations_in_Jordan_and_Germany
- Department of Palestinian Affairs (DPA). (2013_a). *Al Mawqef al Urduni hawl Qadeiat Al Lajeien*. <http://www.dpa.gov.jo/page.php?60-60>
- Department of Palestinian Affairs (DPA). (2013_b). *Mukhaimat 1948*. <http://www.dpa.gov.jo/page.php?53-53>
- Department of Palestinian Affairs (DPA). (2013_c). *Mukhaimat 1967*. <http://www.dpa.gov.jo/page.php?54-54>
- Department of Statistics – Jordan (DoS-Jordan). (2019). *Population*. <http://dosweb.dos.gov.jo/population/population-2/>
- The Directorate-General for European Civil Protection and Humanitarian Aid Operations (DG ECHO). (2017). *Humanitarian Shelter and Settlements Guidelines*. https://ec.europa.eu/echo/sites/echo-site/files/doc_policy_n9_en_301117_liens_bd.pdf
- European Commission Disaster Risk Management Knowledge Centre (DRMKC). (2019). *INFORM GRI Report 2019: Shared evidence for managing crises and disasters*. <https://drmkc.jrc.ec.europa.eu/inform-index/Results-and-data/INFORM-2019-Results-and-data>
- Fanack. (2009). *Population of Jordan*. <https://fanack.com/jordan/population/>
- Global Facility for Disaster Reduction and Recovery (GFDRR). (2014). *Annual Report*. <https://www.gfdr.org/en/publication/global-facility-disaster-reduction-and-recovery-annual-report-2014>
- Jabr, H. (1989). Housing Conditions in the Refugee Camps of the West Bank. *Journal of Refugee Studies*, 2(1), 75–87. <https://academic.oup.com/jrs/article/2/1/75/1518367>
- Johnson, K., Wahl, D., & Thomalla, F. (2016). *Addressing the cultural gap between humanitarian assistance and local responses to risk through a place-based approach*. <https://www.sei.org/publications/addressing-the-cultural-gap-between-humanitarian-assistance-and-local-responses-to-risk-through-a-place-based-approach/>
- Knell, Y. (2014, April 30). Azraq: How a refugee camp is built from scratch. *BBC NEWS*. <https://www.bbc.com/news/world-middle-east-27205291>
- Loescher, G., & Milner, J. (2006). Protracted refugee situations: the search for practical solutions. In *The State of The World's Refugees 2006: Human Displacement in the New Millennium* (1st ed., pp. 105–197). Oxford University Press Inc., New York. <https://www.unhcr.org/4444afcb0.html>
- Matsuoka, Y. (2018). *Session 8: Special Session - Contribution of Sentinel Asia to Achieving Global Agenda*. Sentinel Asia, Japan. <https://sentinel-asia.org/meetings/SA3JPTM6/agenda.html>
- Modular Buildings. (n.d.). *Prefab Shelters*. <https://www.modularbuildings.org/prefab-shelters/#read>
- Oddone, E. (2014, April 30). Azraq Refugee Camp officially opened. *The Jordan Times*. <http://www.jordantimes.com/news/local/azraq-refugee-camp-officially-opened>
- Pavanello, S., & Haysom, S. (2012). *Sanctuary in the city? Urban displacement and vulnerability in Amman*. Overseas Development Institute, London. <https://www.odi.org/publications/6357-sanctuary-city-urban-displacement-and-vulnerability-amman>
- Potter, R. B., Darmame, K., Barham, N., & Norteliff, S. (2007). *An Introduction to the Urban Geography of Amman, Jordan*. 182, 30. http://www.reading.ac.uk/web/files/geographyandenvironmentalscience/GP182_Amman_RBP_9Aug07.pdf

- Prevention Web. (2015). *Disaster risk*. <https://www.preventionweb.net/risk/disaster-risk>
- Rodgers, L., Gritten, D., Offer, J., & Asare, P. (2016, March 11). Syria: The story of the conflict. *BBC NEWS*. <https://www.bbc.com/news/world-middle-east-26116868>
- Rooij, B. De, Wascher, D., & Paulissen, M. (2016). Sustainable Design Principles for Refugee Camps. In *Regional Development and Spatial Use*. <https://research.wur.nl/en/publications/sustainable-design-principles-for-refugee-camps>
- Rueff, H., & Viaro, A. (2009). Palestinian Refugee Camps: From Shelter to Habitat. *Refugee Survey Quarterly*, 28(2–3), 339–359. <https://academic.oup.com/rsq/article-abstract/28/2-3/339/1584644>
- S. Jauhiainen, J., & Vorobeva, E. (2018). *MIGRANTS, ASYLUM SEEKERS AND REFUGEES IN JORDAN, 2017*. https://www.researchgate.net/publication/325594771_MIGRANTS_ASYLUM_SEEKERS_AND_REFUGEES_IN_JORDAN_2017
- Saif, I. (2014). *Impact of Syrian Crisis on Jordan*. <http://www.jordantimes.com/opinion/ibrahim-saif/impact-syrian-crisis-jordan>
- Scavino, S. (2014). *The Summarisation of Jordanian Shelters: Permanent Impermanence in the Design of Refugee Camps* [Doctoral dissertation, Politecnico di Torino, Italy]. <http://www.presidentsmedals.com/Entry-14240>
- Schmidt-Roßleben, L. (2014). *Finding Shelter in Amman: An Analysis of International, Domestic and Urban Policies Shaping the Housing Situation of Urban Refugees in Amman/Jordan*. Master dissertation, Universitat Internacional de Catalunya, Spain.
- Shteivi, M., Walsh, J., & Klassen, C. (2014). *Coping With The Crisis: A Review of the Response to Syrian Refugees in Jordan*. <https://doi.org/10.2307/j.ctt1tg5pkv.12>
- Sphere Association. (2018). Shelter and Settlement. In *The Sphere Handbook: Humanitarian Charter and Minimum Standards in Humanitarian Response* (2018th ed., pp. 237–288). Sphere Association, Geneva. <https://doi.org/10.2788/688605>
- Sphere Association. (2018). *About Sphere*. <https://www.spherestandards.org/about/>
- Tiltnes, Å. A., & Zhang, H. (2014). *The socio-economic conditions of Jordan 's Palestinian camp refugees*. <https://www.faf.no/en/publications/afao-reports/item/the-socio-economic-conditions-of-jordan-s-palestinian-camp-refugees>
- Tozier de la Poterie, A., & Baudoin, M.-A. (2015). From Yokohama to Sendai: Approaches to Participation in International Disaster Risk Reduction Frameworks. *International Journal of Disaster Risk Science*, 6, 128–139. <https://doi.org/10.1007/s13753-015-0053-6>
- Twigg, J. (2015). *Disaster Risk Reduction (GPR 9)*. Overseas Development Institute, London. <https://goodpracticereview.org/wp-content/uploads/2015/10/GPR-9-web-string-1.pdf>
- The United Nations. (n.d.). *Sustainable Development Goals (SDGs)*. <https://sustainabledevelopment.un.org/sdgs>
- The United Nations (UN) Secretary-General. (2016). *Report of the open-ended intergovernmental expert working group on indicators and terminology relating to disaster risk reduction: Vol. A/71/644* (Issue Sustainable development: disaster risk reduction). <https://reliefweb.int/report/world/report-open-ended-intergovernmental-expert-working-group-indicators-and-terminology>
- The United Nations – Jordan (UN-Jordan). (2020). *Home*. <http://jo.one.un.org/en/>
- The United Nations – Jordan (UN-Jordan), & Jordan Response Platform for the Syrian Crisis (JRPSC). (2014). *JORDAN RESPONSE PLAN 2015 FOR THE SYRIA CRISIS*.
- United Nations Development Programme (UNDP). (2019). *Human development report 2019 : beyond income, beyond averages, beyond today: inequalities in human development in the 21st century*. <http://hdr.undp.org/en/2019-report>

- United Nations Development Programme (UNDP). (2016). *United Nations Development Programme in Jordan Brochure*. https://www.jo.undp.org/content/jordan/en/home/library/UNDP_Jordan_Brochure.html
- United Nations Development Programme (UNDP), & General Directorate of Civil Defence (GDGD). (2008). *Disaster Risk Management Profile (Amman- Jordan)*. https://www.jo.undp.org/content/jordan/en/home/library/crisis_prevention_and_recovery/publication_1.html
- United Nations Development Programme (UNDP), & National Centre for Security and Crisis Management (NCSCM). (2019). *Jordan National Natural Disaster Risk Reduction Strategy*. <https://www.jo.undp.org/content/jordan/en/home/library/NationalNaturalDisasterRiskReductionStrategy.html>
- United Nations Human Settlements Programme (UN-Habitat). (2007). *Global Report on Human Settlements: Enhancing Urban Safety and Security*. <https://mirror.unhabitat.org/downloads/docs/GRHS2007.pdf>
- United Nations High Commissioner for Refugees (UNHCR). (2020). *Situation Syria Regional Refugee Response*. <https://data2.unhcr.org/en/situations/syria>
- United Nations High Commissioner for Refugees (UNHCR). (2019_a). *UNHCR Jordan - Factsheet (October 2019)* (Issue October). <https://data2.unhcr.org/en/documents/details/72076>
- United Nations High Commissioner for Refugees (UNHCR). (2019_b). *3RP Regional Strategic Overview 2019-2020*. <https://data2.unhcr.org/en/documents/details/67370>
- United Nations High Commissioner for Refugees (UNHCR). (2015_a). *About UNHCR Emergency Handbook*. <https://emergency.unhcr.org/about>
- United Nations High Commissioner for Refugees (UNHCR). (2015_b). Site planning for camps. In *UNHCR Emergency Handbook* (2.5, pp. 1–10). UNHCR. <https://emergency.unhcr.org/entry/35943/site-planning-for-camps>
- United Nations High Commissioner for Refugees (UNHCR), (2015_c). *T-Shelter for Azraq Refugee Camp (3D Diagrams)*. <https://data2.unhcr.org/en/documents/details/46026>
- United Nations Office for Disaster Risk Reduction (UNISDR). (2015_a). *Global Assessment Report on Disaster Risk Reduction 'Making Development Sustainable: The Future of Disaster Risk Management*. <https://www.undrr.org/publication/global-assessment-report-disaster-risk-reduction-2015>
- United Nations Office for Disaster Risk Reduction (UNISDR). (2015_b). *Sendai Framework for Disaster Risk Reduction 2015-2030*. <https://www.undrr.org/publication/sendai-framework-disaster-risk-reduction-2015-2030>
- United Nations Office for Disaster Risk Reduction (UNISDR). (2016). *Annual Report: 2014-15 Biennium Work Programme Final Report*. <https://www.undrr.org/publication/unisdr-annual-report-2015>
- United Nations Office for Disaster Risk Reduction (UNISDR). (2014). *Annual Report: Final Report on 2012-2013 Biennium Work Programme*. <https://www.undrr.org/publication/unisdr-annual-report-2013>
- United Nations Office for Disaster Risk Reduction (UNISDR). (2005). *Hyogo Framework for Action 2005–2015: Building the Resilience of Nations and Communities to Disasters*. <https://www.preventionweb.net/publications/view/1037>
- United Nations Development Programme & Pakistan National Disaster Management Authority (UNDP & PNDMA). (2012). *Guidelines for Mainstreaming Disaster Risk Reduction in Early Recovery Floods 2010*. <https://reliefweb.int/report/pakistan/guidelines-mainstreaming-drr-early-recovery-floods-2010>
- United Nations Relief and Works Agency for Palestine Refugees in the Near East (UNRWA). (n.d._a). *RESOLUTION 302*. <https://www.unrwa.org/content/resolution-302>

- United Nations Relief and Works Agency for Palestine Refugees in the Near East (UNRWA). (n.d._b). *PALESTINE REFUGEES*. <https://www.unrwa.org/palestine-refugees>
- United Nations Relief and Works Agency for Palestine Refugees in the Near East (UNRWA). (2016). *WHERE WE WORK - Jordan*. <https://www.unrwa.org/where-we-work/jordan>
- United Nations Relief and Works Agency for Palestine Refugees in the Near East (UNRWA). (2018). *PROTECTION IN JORDAN*. <https://www.unrwa.org/activity/protection-jordan>
- UNOSAT. (2013). *A Satellite Map of Cyber City Refugee Camp, Irbid Governorate, Jordan*. UNHCR. [Map]. <https://reliefweb.int/map/jordan/cyber-city-refugee-camp-irbid-governorate-jordan-16-july-2013>
- Worldometer. (2020). *Jordan Population*. <https://www.worldometers.info/world-population/jordan-population/>
- Zeyad, A. 2020, March 17. Interview with Ahmad Zeyad – GAM/Interviewer: Abdel Rahman Al-Zoubi (author) [voice recording file]

Annexe

I. List of Tables

Table 2.1 The Key Points Between Hyogo Framework For Action & Sendai Framework For Disaster Risk Reduction

Produced by the author, 2020

Table 2.2 Extended DDR Parameters That Integrate In Camp Design Guidelines

Produced by the author, 2020

Table 3.1 Amman population 1945-2019

Edited by the author, 2020

Ababsa, M. 2011. Social Disparities and Public Policies in Amman. *Villes, pratiques urbaines et construction nationale en Jordanie*. P.205-231. Beyrouth: Presses de l'Ifpo. <https://books.openedition.org/ifpo/1744?lang=en>

Table 3.2 Major Disasters in Jordan 1927-2018.

Edited by the author, 2020

National Center for Security & Crises Management & UNDP. 2019. Jordan National Natural Disaster Risk Reduction Strategy. P.12. <https://www.jo.undp.org/content/jordan/en/home/library/NationalNaturalDisasterRiskReductionStrategy.html>

II. List of Figures

Figure 2.1 Risk Definition

Edited by the author, 2020

Prevention Web. 2015. Disaster Risk. Retrieved from <https://www.preventionweb.net/risk/disaster-risk>

Figure 3.1 The physical expansion of Amman according to satellite images and aerial photographs 1946-2005

Ababsa, M. 2011. Social Disparities and Public Policies in Amman. *Villes, pratiques urbaines et construction nationale en Jordanie*. P.205-231. Beyrouth: Presses de l'Ifpo. doi:10.4000/books.ifpo.1744. Retrieved from <https://books.openedition.org/ifpo/1744?lang=en>

Figure 3.2 The expansion of Amman Municipal boundaries 1925-2011

Ababsa, M. 2013. The Amman Ruseifa-Zarqa Built-Up Area: the Heart of the National Economy. *Atlas of Jordan: History, Territories and Society*. P.384-397. Beyrouth: Presses de l'Ifpo. doi:10.4000/books.ifpo.5044. Retrieved from <https://books.openedition.org/ifpo/5044>

Figure 3.3 Distribution Maps of Natural Hazards Developed by The World Health Organisation (WHO)

National Center for Security & Crises Management & UNDP. 2019. Jordan National Natural Disaster Risk Reduction Strategy. P.14. Retrieved from <https://www.jo.undp.org/content/jordan/en/home/library/NationalNaturalDisasterRiskReductionStrategy.html>

Figure 4.1 Location of the Palestinian Refugee Camps In Jordan

Al-Husseini, J. 2011. The Evolution of the Palestinian Refugee Camps in Jordan. Between Logics of Exclusion and Integration. *Villes, pratiques urbaines et construction nationale en Jordanie*. P.181-204. Beyrouth: Presses de l'Ifpo. doi:10.4000/books.ifpo.1742. Retrieved from <https://books.openedition.org/ifpo/1742>

Figure 4.2 The Location Of Informal Camps Within Amman City

Edited by the author, 2020

Aerial Photograph of Amman, Google Earth, 2020

Figure 4.3 The location of informal camps within Irbid City

Edited by the author, 2020

Aerial Photograph of Irbid, Google Earth, 2020

Figure 4.4 The Location Of Informal Camps Within Jerash City

Edited by the author, 2020

Aerial Photograph of Jerash, Google Earth, 2020

Figure 4.5 Image Of Displaced Palestinians Taking Natural Caves as Shelter

Screenshot by the author, 2020

Refugee Life Conditions, UNRWA, 1950 early camps. Retrieved from <https://unrwa.photoshelter.com/galleries/C0000Z9oj72Ag584/G0000Xbj84k3pmj8/I0000PtI2N1QoZ7Y/Refugee-Conditions>

Figure 4.6 Image For Group Of Arab Palestinian Refugee Arriving To Shobek City

Screenshot by the author, 2020

Refugee Life Conditions, UNRWA, 1950 early camps. Retrieved from <https://unrwa.photoshelter.com/galleries/C0000Z9oj72Ag584/G000061b4.6DsPk4/I0000IrEmq2MzKXo/Refugee-Conditions>

Figure 4.7 Image For Group Of Arab Palestinian Refugees Occupying Plot Of Empty Land In Area Of Wadi Dleil In Jordan

Screenshot by the author, 2020

Refugee Life Conditions, UNRWA, 1960s. Retrieved from <https://unrwa.photoshelter.com/galleries/C0000WLNKZ5J4EWA/G00003wIwNjAg9Kk/I0000MF3gmqyIdxQ/Refugee-Conditions>

Figure 4.8 Image Of Providing Refugees With Emergency Tents

Edited by the author, 2020

Palestinian Urban Refugee Camp, Amman, Jordan, 2014. Retrieved from <https://urbancamps.wordpress.com/2014/11/26/palestinian-urban-refugee-camps-amman-jordan/>

Figure 4.9 Image Of Marka Camp In Early 1950s

Screenshot by the author, 2020

Refugee Life Conditions, UNRWA, 1950 early camps. Retrieved from <https://unrwa.photoshelter.com/galleries/C0000Z9oj72Ag584/G000061b4.6DsPk4/I0000VBgrUNbMODg/Refugee-Conditions>

Figure 4.10 Image Of Jerash Palestinian Tented Camp

Seventy+ years of suffocation, Chapter2: Jordan, Amnesty, n.d. Retrieved from <https://nakba.amnesty.org/en/chapters/jordan/#>

Figure 4.11 Image Of The Living Conditions Inside Emergency Tent In Baqa'a Refugee Camp

Screenshot by the author, 2020

Refugee Life Conditions, UNRWA, 1960s. Retrieved from <https://unrwa.photoshelter.com/galleries/C0000WLNKZ5J4EWA/G00003wIwNjAg9Kk/I0000kcVDpHpcMwU/Refugee-Conditions>

Figure 4.12 Image Of The Suffering Of Living In Baqa'a Refugee Camp In The Winter Season

Screenshot by the author, 2020

Refugee Life Conditions, UNRWA, 1960s. Retrieved from <https://unrwa.photoshelter.com/galleries/C0000WLNKZ5J4EWA/G00003wIwNjAg9Kk/I0000P0SUG1n4kIE/RJ-Baqaa-57-jpg>

Figure 4.13 Image Of The Suffering Of Living In Baqa'a Refugee Camp In The Winter Season

Screenshot by the author, 2020

Refugee Life Conditions, UNRWA, 1960s. Retrieved from <https://unrwa.photoshelter.com/galleries/C0000WLNKZ5J4EWA/G00003wIwNjAg9Kk/I0000rkOSQm2uIDg/RJ-Baqaa-56-jpg>

Figure 4.14 Image Of The Suffering Of Living In Baqa'a Refugee Camp In The Winter Season

Screenshot by the author, 2020

Refugee Life Conditions, UNRWA, 1960s. Retrieved from <https://unrwa.photoshelter.com/galleries/C0000WLNKZ5J4EWA/G00003wIwNjAg9Kk/I0000Uqq0akVupqA/RJ-Baqaa-67-jpg>

Figure 4.15 Image Of The Process For Transforming From Emergency Tents To Permanent Housing Units In AL-Husn Refugee Camp

Screenshot by the author, 2020

Refugee Life Conditions, UNRWA, 1960s. Retrieved from <https://unrwa.photoshelter.com/galleries/C0000WLNKZ5J4EWA/G00003wIwNjAg9Kk/10000IwocqAAmIJQ/Refugee-Conditions>

Figure 4.16 Image Of The Transformation From Tents To Pre-Fabricated Shelter In Jerash Refugee Camp

Screenshot by the author, 2020

Refugee Life Conditions, UNRWA, 1960s. Retrieved from <https://unrwa.photoshelter.com/galleries/C0000WLNKZ5J4EWA/G00003wIwNjAg9Kk/10000NVtFgosGO.U/Refugee-Conditions>

Figure 4.17 Image Of Living Inside New Pre-Fabricated Units, It Considered A Space For All Family Activities

Screenshot by the author, 2020

Refugee Life Conditions, UNRWA, 1960s. Retrieved from <https://unrwa.photoshelter.com/galleries/C0000WLNKZ5J4EWA/G00003wIwNjAg9Kk/10000QNZ4S6KgkJA/Refugee-Conditions>

Figure 4.18 Image Of Refugees Using The Extended Outdoor Space For Their Activities in Al-Husn Refugee Camp

Screenshot by the author, 2020

Refugee Life Conditions, UNRWA, 1970s. Retrieved from https://unrwa.photoshelter.com/galleries/C0000g3o.R_mVIOQ/G00006rFj_S6W7Jo/10000xezkFDJEH4I/Refugee-Conditions

Figure 4.19 Image Of Using The Extended Outdoor Space For Cultivating Activities By Camp Dwellers In Baqa'a Camp

Screenshot by the author, 2020

Refugee Life Conditions, UNRWA, 1970s. Retrieved from https://unrwa.photoshelter.com/galleries/C0000g3o.R_mVIOQ/G00006rFj_S6W7Jo/10000F0wXoakDldo/RJ-Baqaa-137-R-jpg

Figure 4.20 Image Of Another Construction Method With Available Rocks And Mud In Wadi Seir Area In Amman City

Screenshot by the author, 2020

Refugee Life Conditions, UNRWA, 1950 early camps. Retrieved from https://unrwa.photoshelter.com/galleries/C0000Z9oj72Ag584/G000061b4.6DsPk4/10000dJm2CP_VSQ8/Refugee-Conditions

Figure 4.21 Image Of Mud Brick Shelters In Wadi Seir Area In Amman

Screenshot by the author, 2020

Refugee Life Conditions, UNRWA, 1950 early camps. Retrieved from https://unrwa.photoshelter.com/galleries/C0000Z9oj72Ag584/G000061b4.6DsPk4/10000aU_Lp7LZThE/Refugee-Conditions

Figure 4.22 Image Of Transformed Marka Refugee Camp Into Permanent Shelters, Camp Dwellers Keep Their Tents Next To Their New Shelters As Extended Living Space, Or Storage

Screenshot by the author, 2020

Refugee Life Conditions, UNRWA, 1960s. Retrieved from <https://unrwa.photoshelter.com/galleries/C0000WLNKZ5J4EWA/G00003wIwNjAg9Kk/10000DQxsY.U0muk/Refugee-Conditions>

Figure 4.23 Image Showing The Self-Built Stone Fence That Surround The Assigned Plots In Marka Refugee Camp

Screenshot by the author, 2020

Refugee Life Conditions, UNRWA, 1970s. Retrieved from https://unrwa.photoshelter.com/galleries/C0000g3o.R_mVIOQ/G00006rFj_S6W7Jo/10000wXig19s52ho/Refugee-Conditions

Figure 4.24 Image Of Extended House By Erecting New Room In Baqa'a Refugee Camp

Screenshot by the author, 2020

Refugee Life Conditions, UNRWA, 1970s. Retrieved from https://unrwa.photoshelter.com/galleries/C0000g3o.R_mVIOQ/G00006rFj_S6W7Jo/10000R8YOBPyPF0o/RJ-Baqaa-168-jpg

Figure 4.25 Image Of The Self-Incremental Housing By Adding Up More Rooms To Serve Camp Population In Baqa'a Refugee Camp

Screenshot by the author, 2020

Refugee Life Conditions, UNRWA, 1970s. Retrieved from https://unrwa.photoshelter.com/galleries/C0000g3o.R_mVIOQ/G00006rFj_S6W7Jo/I0000AG8gWMbxOZE/RJ-Baqaa-173-jpg

Figure 4.26 Image Showing The Most Of Baqa'a Refugee Camp In Self-Built Phase

Screenshot by the author, 2020

Refugee Life Conditions, UNRWA, 1970s. Retrieved from https://unrwa.photoshelter.com/galleries/C0000g3o.R_mVIOQ/G00006rFj_S6W7Jo/I0000WVOKhgqRAsQ/Refugee-Conditions

Figure 4.27 Image Of Jabal Al-Hussein Refugee Camp Turned Pre-Fabricated Units To Concrete Brick Housing

Screenshot by the author, 2020

Refugee Life Conditions, UNRWA, 1970s. Retrieved from https://unrwa.photoshelter.com/galleries/C0000g3o.R_mVIOQ/G00006rFj_S6W7Jo/I0000.5Qu.DYiJXU/Refugee-Conditions

Figure 4.28 Image Of Irbid Refugee Camp Developed To Brick Housing units

Screenshot by the author, 2020

Refugee Life Conditions, UNRWA, 1970s. Retrieved from https://unrwa.photoshelter.com/galleries/C0000g3o.R_mVIOQ/G00006rFj_S6W7Jo/I0000UJozPbRtFqs/Refugee-Conditions

Figure 4.29 Image Of Producing Cement Blocks, As Main Construction Material For Irbid Camp Dwellers

Screenshot by the author, 2020

Refugee Life Conditions, UNRWA, 1980s. Retrieved from <https://unrwa.photoshelter.com/galleries/C0000FTFft3tYt0Y/G00006apwQYpUmZc/I0000v5PlhoudiKI/Refugee-Conditions>

Figure 4.30 Image Of Baqa'a Refugee Camp Fully Built With Cement, And The Streets Are Paved In 1980s

Screenshot by the author, 2020

Refugee Life Conditions, UNRWA, 1980s. Retrieved from <https://unrwa.photoshelter.com/galleries/C0000FTFft3tYt0Y/G00006apwQYpUmZc/I0000JLQ7.GZDPT4/Refugee-Conditions>

Figure 4.31 Image Of The Livelihood Activities In The Main Streets Of Baqa'a Refugee Camp

Screenshot by the author, 2020

Refugee Life Conditions, UNRWA, 1990s. Retrieved from https://unrwa.photoshelter.com/galleries/C0000ro3VqTHli08/G0000soTDOEdb_b8/I00003SkVaElJlig/RJ-Baqaa-260-jpg

Figure 4.32 Image Of Main Streets Of Baqa'a Refugee Camp Paved And Used By Vehicles And Pedestrians, And Electricity Network Clearly Showing The Permanency Of Camp Settlement

Screenshot by the author, 2020

Refugee Life Conditions, UNRWA, 1990s. Retrieved from https://unrwa.photoshelter.com/galleries/C0000ro3VqTHli08/G0000soTDOEdb_b8/I0000dLJxF9POO0w/Refugee-Conditions

Figure 4.33 Image Of Jerash Refugee Camp As Current Picture, Fully Concrete Settlement

Jerash Camp, UNRWA, 2013. Retrieved from <https://www.unrwa.org/where-we-work/jordan/jerash-camp>

Figure 4.34 Image Of Irbid Refugee Camp Image As Current Picture, Fully Concrete Settlement

Irbid Camp, UNRWA, 2008. Retrieved from <https://www.unrwa.org/where-we-work/jordan/irbid-camp>

Figure 4.35 Image Of Zarqa Refugee Camp As Current Picture, Fully Concrete Settlement

Zarqa Camp, UNRWA, 2015. Retrieved from <https://www.unrwa.org/where-we-work/jordan/zarqa-camp>

Figure 4.36 Image Of Marka Refugee Camp As Current Picture, Fully Concrete Settlement

Marka Camp, UNRWA, 2013. Retrieved from <https://www.unrwa.org/where-we-work/jordan/marka-camp>

Figure 4.37 The Map Of Al-Wehdat Camp Showing How The Camp Relates To The Fabric Of The City, But At The Same Time Morphologically Distinct From The Surrounding Areas

Edited by the author, 2020

Aerial Photograph of Al-Wehdat Camp, Google Earth, 2020

Figure 4.38 The Built-Up Areas And Open Spaces In Al-Wehdat Camp

Edited by the author, 2020

Aerial Photograph of Al-Wehdat Camp, Google Earth, 2020

Figure 4.39 Mapping The Building Pattern And Construction Method In Al-Wehdat Refugee Camp

Edited by the author, 2020

Aerial Photograph of Al-Wehdat Camp, Google Earth, 2020

Figure 4.40 Map Of The Ways Of Accessibility In Al-Wehdat Camp

Edited by the author, 2020

Aerial Photograph of Al-Wehdat Camp, Google Earth, 2020

Figure 4.41 Livelihood Map Of Al-Wehdat Camp

Edited by the author, 2020

Aerial Photograph of Al-Wehdat Camp, Google Earth, 2020

Figure 4.42 Service Map Of Al-Wehdat Camp

Edited by the author, 2020

Aerial Photograph of Al-Wehdat Camp, Google Earth, 2020

Figure 4.43 Location Of Syrian Refugee Camps In Jordan

Edited by the author, 2020

Map of Jordan, Wikipedia, 2009. Retrieved from https://en.wikipedia.org/wiki/Jordan#/media/File:Jordan_location_map.svg

Figure 4.44 The Location Of Zaatari Camp in Mafraq Governorate

Edited by the author, 2020

Aerial Photograph of Mafraq, Google Earth, 2020

Figure 4.45 The Location Of Emarati Camp And Azraq Camp In Zarqa Governorate

Edited by the author, 2020

Aerial Photograph of Zarqa, Google Earth, 2020

Figure 4.46 Satellite Images For The Development Of Zaatari Camp

Edited by the author, 2020

Zaatari Camp, Michael K., The New York Times, 2014; UNITAR-UNOSAT, 2014. Retrieved from <https://www.nytimes.com/2014/07/05/world/middleeast/zaatari-refugee-camp-in-jordan-evolves-as-a-do-it-yourself-city.html>

Figure 4.47 Existing Shelter Units In Zaatari Camp

Chamma, N. 2019. Future Refugee Camps As 'Integrated Sustainable Settlements' Case-Studies: Syrian Refugee Settlements in Jordan, Turkey, and Lebanon (Doctoral dissertation). Universitat Internacional de Catalunya (UIC), Barcelona, Spain.

Figure 4.48 Satellite Images For The Development Of Azraq Camp

Edited by the author, 2020

Azraq Refugee Camp, Yolande K., BBC News, 2014. Retrieved from <https://www.bbc.com/news/world-middle-east-27205291>

Figure 4.49 Top View Image Of Azraq Camp While Constructing

Azraq Refugee Camp, The Jordan Times, 2014. Retrieved from <https://www.jordantimes.com/news/local/syria-neighbours-meet-zaatari-refugee-camp>

Figure 4.50 Image Of The Current Living Setting In Azraq Camp.

Azraq Refugee Camp, Norwegian Refugee Council, 2016. Retrieved from <https://www.nrc.no/news/2016/september/installing-solar-panels-in-jordan-refugee-camp/>

Figure 5.51 Azraq Camp Site Plan

Edited by the author, 2020

Aerial Photograph of Azraq Refugee Camp, Google Earth, 2020

Figure 4.52 Camp Planning Into Villages, Blocks And Plots

Edited by the author, 2020

Aerial Photograph of Village Two in Azraq Refugee Camp, Google Earth, 2020

Figure 4.53 Map Of Built-Up Areas and Different Open Spaces In Azraq Camp

Edited by the author, 2020

Aerial Photograph of Azraq Refugee Camp, Google Earth, 2020

Figure 4.54 (1) T-Shelter Design (2) Collective Images Of Construction Phase And T-Shelter Indoor Space

Edited by the author, 2020

UNHCR, 2015. *T-Shelter for Azraq Refugee Camp (3D Diagrams)*. Retrieved from <https://data2.unhcr.org/en/documents/details/46026> And http://shelterprojects.org/shelterprojects2013-2014/SP13-14_A10-Jordan-2013.pdf

Figure 4.55 The Hierarchy Of Street Layout In Azraq Camp

Edited by the author, 2020

Aerial Photograph of Azraq Refugee Camp, Google Earth, 2020

Figure 4.56 Distribution Of Services In Azraq Camp Based On UNHCR, 2018

Edited by the author, 2020

Aerial Photograph of Azraq Refugee Camp, Google Earth, 2020. Service Map, UNHCR, 2018. Retrieved from <https://data2.unhcr.org/en/documents/details/64581>

III. Interview Forms

Questions for conducting interviews

UNRWA

Name of interviewee:

Title:

Date:

My name is Abdel Rahman Al-Zoubi. I'm a graduate student at the International University of Catalonia. This interview for an academic purpose, my research argue that there is lack of DRR strategies in camp design generally, but informal camps specifically, so I am intending in my thesis to show how can we upgrade this informal camp in order to achieve DRR strategies in it.

General Discussion

- Al-Wehdad refugee camp, history of the camp (plans of evolution, and phases of construction, and sectors/ neighbourhoods of camp)
- Figures about building, population, and typology and urban configurations, how the camp connected with Amman as informal (self-built) settlement.
- The presence of community associations or representatives/ community-based organization

Disaster Risk Reduction

- The hazardous profile of the camp; what are the risks that face the camp in terms of dwellers, physical structure, the infrastructure -i.g drainage network, the emergency routes inside the camp, and any concerns informed by the interviewee; Risk maps (pictures, maps, reports that helps me)
- How these concerns are connected to camp risk, and camp design?
- DRR in camp, any projects to achieve DRR; The implementation of Sendai framework, or any international frameworks (include them), What are the parameters of DRR that needed in Camp settings.
- Any improvements are taking place (by gov or INGOs) in order to improve the situation -DRR as camp development.
- Main risks in the camp/ your neighbourhood? (fire, floods, earthquakes)
- Infrastructure (drainage, and accessibility, mobility, and open spaces)
- Emergency routes in the camp
- Waste collection, and rainwater drainage?
- Is there any bottom-up (community-led) initiatives

Closing

- Any recommendations, findings, last statement.

Questions for conducting interviews

Amman Greater Municipality

Name of interviewee:

Title:

Date:

My name is Abdel Rahman Al-Zoubi. I'm a graduate student at the International University of Catalonia. This interview for an academic purpose, my research argue that there is lack of DRR strategies in camp design generally, but informal camps specifically, so I am intending in my thesis to show how can we upgrade this informal camp in order to achieve DRR strategies in it.

- DDR in Amman, any risk maps, any maps for Amman evolutions.
- How does GAM map risks in Amman, this will help with mapping activities
- Amman Topography maps
- The idea of localizing the guidelines

- How GAM perceives camps, as informal settlements?
- GAM and infrastructure inside Al-Wehdat camp, infrastructure services (drainage, waste collection, no rain network?)

What are your recommendations, findings in order to introduce the DRR to camp design - in case if not included- or what should be improved to be included further for camp (as informal settlement) upgrading?

