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# **Green camps: Sustainable future for refugee camps by green infrastructure interventions**

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## Foreword

This thesis marks the end of our education  
 and degree in landscape architecture at the  
 Norwegian University of Life Sciences.

It comes from an interest in global issues,  
 politics, urban development and landscape.  
 Our passion for social issues meet landscape  
 architecture when it is challenged at it's  
 most extreme: in situations where people  
 are threatened by catastrophes, violence and  
 conflict. Refugee camps is one of those.

Working with refugee camps was a natural and  
 immediate response to the refugee crisis in  
 2015, and the Syrian conflict (and many others)  
 that captured our attention in the years since  
 the Arab Spring. We wanted to explore what  
 kind of contribution landscape architects  
 can provide, and where our profession can  
 help people in desperate situations. While no

solution on it's own, landscape architecture  
 can indeed be used in extreme situations.

From an urban perspective refugee camps  
 pose another question as well: How do you  
 plan camps that grow into cities, all the while  
 they're intended as temporary solutions -  
 but often end up as permanent. What kind  
 of urban structure and fabric is the result of  
 such *temporary permanence*?

With that question in mind we started on this  
 thesis. Gradually it evolved into a thesis more  
 about the green infrastructure possible in a  
 refugee camp, then in Al Za'atari in Jordan  
 specifically. Through this, we began exploring  
 the possible interventions landscape  
 architects can contribute with in the refugee  
 crisis.

A big thank you to our supervisor Shelley  
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 that may have played out.

We hope you'll enjoy your read!

*Christian Fredrik Leknes-Kilmork &  
 Beathe Gillebo*

*Oslo, December 2018*

# ABSTRACT

With more than 68 million forcibly displaced persons in the world as of 2018 (UNHCR), a response is needed within several professions, also landscape architecture. Although few refugees actually live in refugee camps, but it is these camps that so often catches our attention and imagination. These spaces are a very extreme frame for human habitation.

As landscape architects, we take a look at how a green infrastructure intervention can increase the quality of life for camp dwellers. Green infrastructure is the totality of the natural systems in a place and can be both man-made and naturally grown.

Through a literature review we look at the available knowledge of how green infrastructure affects our lives and health, and what kind of situation refugees are in. Most of the literature on green infrastructure have not been done on refugee populations and not at all on refugee camp populations. Still, we make some assumptions on how green infrastructure can be beneficial for refugees, and how in an extreme situation (as a refugee camp is) it may mitigate and ease the problems facing them. A better quality of life for refugees is a more sustainable future – for the refugees but also for host countries and possible future host countries. A healthier, more robust and resilient refugee population is a more sustainable future for the whole World indeed.

Several millions of Syrians have fled the country during the civil war that has ravaged the country since 2011. Many of those has ended up in Jordan, where one of the world's largest refugee camps is – Al Za'atari camp. Located just some 11 km from the Syrian border, in the semi-arid Mafraq region, this camp had at its largest a population of over 130,000 people. This has shrunk to 78,000 people today, but the camp is still a sizeable city. Renowned for its resident's entrepreneurial spirit, the camp has a vibrant business life. However, it lacks a sense of community, safety and is ridden with the issues coming with a war-weary population, some of whom has been through traumatizing and violent situations.

With a basis in plans made for the future development of the camp by a Dutch humanitarian organization, LOGOReP, we have looked at a possible future development of the camp. Through analyzing Al Za'atari, we have discovered possibilities for a greener camp. Even being in a semi-arid desert region, the refugees themselves have grown gardens, a sign of an innate need for green infrastructure, but also showing that it is possible to grow a more green camp. Our proposal is a plan for a green network, consisting of greenspace in the form of greenways, public spaces and gardens. The already existing gardens can be built upon and form a backbone for green infrastructure. In addition, public green space is needed, and serving both as placemaking identity

builders for the camp and recreational spaces, the greenways has an added value of serving as waterways for the rainy season. The plan is a conservative one, in that it want to use resources within the camp to build the green network.

Acknowledging the limitations of our thesis – most prominently being that we did not have the chance to actually go to Al Za'atari, we conclude that green infrastructure and landscape architecture should and could be utilized in refugee situations as an approach to issues facing refugee camps. Modern planning approaches in camp management focus too much on efficiency and too little on human well-being; camp design should include green infrastructure from the start and specifically when camps grow older and more permanent.

Even though many governments are vary of 'allowing' camps to be more permanent, they would do well in incorporating greenspace in camps. It is a small, but important contribution to reducing the impact of the refugee crisis – and the refugees deserve it.

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# INTRODUCTION

## Status the refugee crisis and the Syrian civil war

The United Nations High Commissioner for Refugees (UNHCR) estimates there are 68.5 million forcible displaced people worldwide where of 25.4 million are refugees. Since the Syrian civil war outbreak in May 2011 the world is witnessing the highest levels of displacement on record and the largest number of refugees since the Second World war. This current status of the refugee crisis has resulted in swollen refugee camps, as large as cities, where people live in state of exception for generations. There is a urgent need to rethink and reframe long term displacement as sustainable development rather than just seeing the world's vast forced migrations as a humanitarian challenge.

## Questions and aim of the thesis

It seems conventional solutions and planning approaches to solve the spatial organisation of forced migration struggle to meet the new demands, having been designed for a different era, and do not take into account the huge amount of refugee flows occurring today due to long lasting warfare.

The main aim of refugee camps is spatial organisation of forced migration; yet places planned for temporarily emergency environmental projects and green infrastructure are regarded a luxury and a neglected area when planning and designing refugee camps. But when temporary refugee camps turn into instant cities, as is the reality today, there is a need for rethinking. That is why we by investigating green infrastructure 's influence on refugees' health and how landscape architect's expertise may contribute when developing refugee camps as urban

areas to connect to and integrate in a regional context, are aiming to illuminate how green infrastructure can better life quality and wellbeing for refugees living in temporarily permanence.

As case study we use Al'Zaatari refugee camp in the Mafraq region of northern Jordan, having now turned into Jordan's fourth largest city and the second largest refugee camp in the world.

## GREEN CAMPS: a sustainable future for refugee camps through green infrastructure interventions

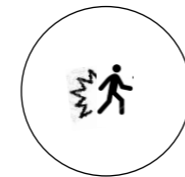
- How can green infrastructure intervention better the quality of life in Al Za'atari refugee camp in Jordan within a sustainable framework?

## Method

In attempt to apply the discipline of landscape architecture in a refugee camp setting, we needed to identify refugee camp as spatial phenomenon and identify problems with current refugee camp planning approaches, in general, and challenges and opportunities in Al'Zaatari refugee camp, in particular, and have therefore chosen a two folded approach for this thesis:



### 1. Landscape architecture approach



### 2. Approach on forced migration, refugees and refugee camps

## Landscape architecture approach:

Landscape architecture serves as a multidisciplinary platform involving, studies on green infrastructure, health studies, critique of current conceptual plans for Al Za'atari refugee camp, landscape analysis, defining landscape in a humanitarian setting and landscape as a driver for well being.

## Approach on forced migration, refugees and refugee camps:

This approach concerns with presenting and discussing previous and current refugee camp planning solutions, to define camp as space and identify key challenges of the spatial organization of forced migration and also include discussion on the legal definition of being a refugee.

Literature studies and analysing and defining the opportunities and challenges in Al Za'atari refugee camp have served as the background and given a better understanding of the refugee camp context and served as arguments for our proposal, as the diagram of the structure of the thesis shows.

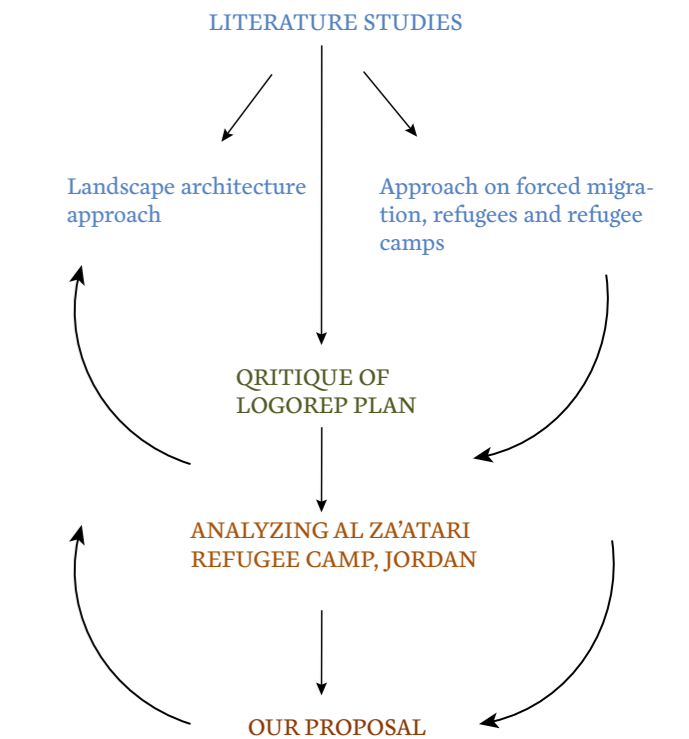


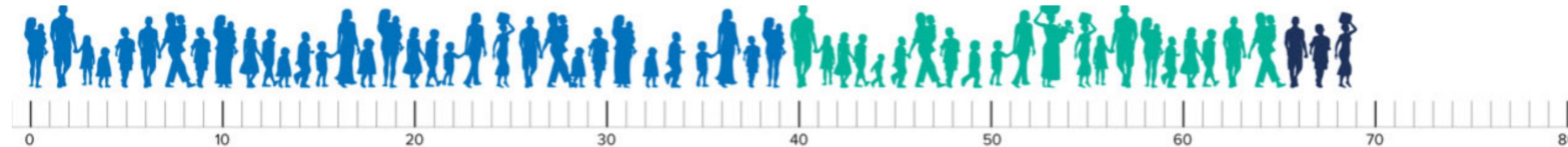
Diagram showing the structure and approaches of the thesis.

## 68.5 million forcibly displaced people worldwide

40 million internally displaced persons

25.4 million refugees

3.1 million asylum-seekers



Units in millions.  
Source: UNHCR, 2018





## CHAPTER 1:

# THEORY AND LITERATURE

In this chapter we will go through literature on landscape, sustainability, green infrastructure and refugees. This literature review will focus on refugees and their situation, and how general knowledge of these topics can be related to a refugee camp situation.

Much focus lays on the development of refugee camps as places, and how green infrastructure influence our health and hence quality of life.

*Photo opposite side:  
Satelite view of central Oslo, Norway. Green infrastructure in terms of parks, cemeteries and greenways make up an important part of the urban fabric seen here. Here, the green infrastructure permeates the city - making it accessible for citizen. Although a very different situation than the one in Jordan, or for refugees in general, it is an example of green infrastructure and the city.  
(Google Maps)*



# DEFINING LANDSCAPE

When working with landscape architecture, no matter the situation or case, we work with and within *landscapes*. Large and small, natural and urban; green, grey and blue. The multitudes of landscapes and the people that live in them is vast and diverse.

It is therefore, in our opinion, important to define landscape - to set limits to landscape architecture and contextualize our work. Such a central concept must be clear, although different professionals (landscape architects and others) will have multiple definitions amongst them. To define landscape is not only to define our general professional understanding of the term, it is also to define it in the context of the thesis and the project.

## Landscape definitions

Landscape has had multiple definitions over the course of history, and the definitions have been further developed and refined especially over recent decades. One milestone, politically and professionally, came with the European Landscape Convention (ELC) (Council of Europe, 2000), that defined landscape as

*“[...] an area, as perceived by people, whose character is the result of the action and interaction of natural and/or human factors”*

This broad definition sums up quite well the importance of fluidity of landscape and the natural and human processes that

continues to change different landscapes. It also includes the idea of landscape as something that is perceived by people. This is important, as it shows that landscape is a cultural and social construct, and cannot exist in itself without an audience. Without humans, landscape would be a meaningless, empty concept. Understanding landscape as a construct is important to landscape architects and others working with landscape, as it exposes the fact that different people, cultures and stakeholders view landscapes differently. This is something that needs to be considered when designing projects and understanding the world around us.

Further, the ELC also states that landscape is *“a key element of individual and social well-being and that its protection, management and planning entail rights and responsibilities for everyone”*. This gives a moral imperative to good landscape management, and a verification of the notion that landscape is a right for everyone (including refugees).

The ELC thus gives a pretty thorough and open definition of both what landscape entails and what landscape can mean to all people. It gives fodder to the ideas that landscape is valuable and necessary for human well-being. It also acknowledges that landscapes are important to the quality of life both in rural and urban contexts, as well as in beautiful landscapes and the more mundane, everyday landscapes. This is important for landscape

architects (and others, of course), as it shows that no matter where, no matter for whom, no matter the scale, our work is intertwined with life quality.

Landscape has thus a political aspect, but the very concept itself is far wider and has a much longer and broader history than the ELC. Of course, different fields of science define landscape differently; consider the definition a geologist would have versus an art historian. There are, however, several people who have tried to give landscape a more intersectional and generic definition.

In the anecdote-laden *“What is Landscape?”*, John R. Stilgoe (2015) defines landscape as a noun, as an adjective (such as in ‘landscape architecture’), and a verb (2015). Landscape is something that is, something we make, and something we do. There is, however, a human centric approach to all this: Landscape is nothing without the eyes, words and hands of man, even though a lot of landscapes are primarily natural, and that wilderness without human habitation also is a landscape. At the same time nature is so complex that talk of landscapes without the human perspective becomes difficult - terms like ecosystems or climate zones are better adapted to a solely natural approach. Hence, landscape must be understood in a human context, but not without the natural processes or the natural surroundings: It is a cultural artifact (Girot and Imhof, 2017).

The understanding of landscape must be local and global at the same time. It is shaped by processes both in a smaller context (e.g. local farmers) and at a global scale (e.g. climate change). Any landscape architect needs therefore to understand both the local, regional and global processes that shape their project site.

## Landscape urbanism

Landscape architecture may be understood as bringing ‘the natural’ into the built environment. It also may be viewed as nature-based design. This can, though, end up in excluding the urban environment and the urban context from landscape architecture, and that would be a mistake. 55 % of the world’s population now lives in cities (United Nations, 2018), so most of the people landscape architects work with and the projects we do, happen in an urban context (even more so in Europe, North America and the Middle East, where urbanization figures are even higher).

Several people have made the case thereof for *landscape urbanism*, the combination of the natural inclinations of the landscape architect and the context of the urban, built up, non-natural environment. One of those is Charles Waldheim, setting landscape in the context of architecture, and arguing that landscape interventions is important in an urban world (2017). The urban landscape is, with the ELC

in mind, just as much of a landscape as a corn field. Manly landscapes exist within the city, and many landscapes include large and small bits of urbanity. It is therefore a central part to our understanding of landscape and landscape architecture that creating an artificial barrier between the natural and urban is a bad for cities, nature and landscape architecture alike.

That does not mean that we would define ourselves as landscape urbanists, necessarily. It is the natural landscape and the broader landscape picture that is our backdrop and foundation as landscape architects. It is here we find our solutions and inspiration, and it is within the natural sciences our profession finds its *raison d’être*, especially compared to other fields of architecture.

## Landscape in the refugee context of Jordan

Landscape is thus a social, cultural and natural phenomenon, those aspects of it always present and intertwined. The ELC definition does a good job at formulating this. Wait a minute, you may think; what about the “European” part of the convention? Although the convention absolutely was made by and in an European context, its definition is adaptable to many other cultural and political contexts, and is therefore applicable to other situations. It has been used as the backdrop for several analyses of global issues in other parts

of the world, and has relevance in multiple countries (Egoz, 2011). Even so, we should not pretend to have a universal, definite definition, especially in this thesis. Our understanding of landscape is our own, and therefore colored by our cultural and social background.

The notion of *landscape urbanism* has gained momentum also across the world, for instance in the green urbanism developments of East Asia (Waldheim, 2017). Thinking refugee camps as urban developments is not very controversial (as further explored elsewhere in this thesis), and thus a landscape approach to that kind of urbanization is needed and natural. That is why it is the urban landscape as well as the natural landscape that we work with in this thesis.

# CAMP AS SPACE

## Defining refugee camps as space

Research on the topic of defining what sort of space a refugee camp is varies over a long range of diverse disciplines, from political geography, anthropology, philosophy, forced migrations studies to case-based and design studies.

In the following we will briefly discuss and compare some key theoretical definitions of camp as space and illuminate dilemmas and contradictions.

## Homo sacer

The Italian philosopher Giorgio Agamben (1942-) has become almost of a prerequisite when studying refugee camps. He claims refugees to be a modern example of “homo sacer” referring then to a person in roman law “who is banned and can be killed by anyone but may not be sacrificed in a religious ritual”(Agamben 1998, p.9).

Homo sacer is then subject for an including exclusion; at one hand excluded from the rights in society, on the other hand included in the law by virtue of his exclusion. This mechanism Agamben makes current for refugees defining refugee camps as “zones of indistinction between exclusion and inclusion”(Oesch 2017, p.110).

## State of exception

Agamben also conceptualises the term “state of exception” considering that: “In the camp, the state of exception, which was essentially a temporary suspension of the rule of law on the basis of a factual state of danger, is now given a permanent spatial arrangement, which as such nevertheless remains outside the normal order”.(Agamben 1998, p169).

Post-doctoral researcher Lucas Oesch points out that “Agamben analyses the exception in relation to sovereign power and explains that exception is the structure of sovereignty” (Oesch, 2017, p.112). And further:” In the camp, the sovereign decides on the suspension of law. “ [...]Camp dwellers are left without a politically qualified life, or with what Agamben refers to as “bare life”, a life that is ‘included solely through an exclusion’”(ibid). By “bare” or “pure” life Agamben refers to humans as animals in nature without no legal status, political definition or political freedom.

## Refugee camps: “bare life” or political space?

Yet, others have challenged the definition of refugee camps as “bare life” by politicizing space. Anthropologist Ilana Feldman is one of them, arguing that although a humanitarian perspective on refugee camps are as spaces apart from politics and apart from crisis; a camp is still very much a political space,

defining refugee camps as “anomalous geopolitical spaces”(Feldman 2014, p.244). Feldman seems to agree upon Agamben's comparison to homo sacer saying that the space of refugee camps are: “operating in a realm beyond conventional legal and social parameters yet are subject for these structures” (Lee 2015, p.13). Feldman is supported by architect Manuel Herz describing refugee camps as politics turning into space or the spatial ramification of political proceedings (Herz, 2008).

## Humanitarian space: care and control

Refugee camps are not just a political space. Refugee camps are also a humanitarian space functioning as places for protection. Yet, it has been argued seeing camps as humanitarian space limits refugee lives and development possibilities: “camps may be necessary for the protection of refugees, but are also an impediment to refugee rehabilitation”(Feldman 2014, p.247).

One of the main aims of a refugee camp is the spatial organisation of forced migration. Philosopher Michel Foucault states that “discipline proceeds from the distribution of bodies and individuals in space”(Foucault 1995, p.141)”. “As a disciplinary technology of power, the camp is concerned with the control and distribution of ‘bodies and individuals’ in a way that achieves efficiency, docility and

hierarchy”(Rabinow 2003, p.357). It seems refugee camps have been planned and designed in a disciplinarily and functional way where ‘care and control’ are physically and spatially merged. “The ‘camp’ was the dominant model for taking care of and isolating groups seen as problems, risks or threat during the colonial period. The creation of the refugee camp can be traced back to the modern period, becoming standardised during World War 2. The first Palestinian refugee camps were open not long after this standardisation” (Oesch 2017, p.114). Refugee camps as space has mainly functioned as a disciplinary devices providing aid, yet also segregated refugees of different nationalities (Ibid).

In concrete camp-design solutions this is conspicuous when, for example, the visibility of the surroundings by the authorities are total and all facilities are placed in the centre of the camps. This panopticon planning approach represents the archetype of a disciplinary plan according to Foucault (Foucault, 1995). In refugee camps aid and discipline, care and control are coexisting. (see chapter On Refugee camp design solutions 1901-present for examples).

## Placemaking in spaces of exception

Refugee camps are at one hand, neutral, humanitarian spaces of protection and aid, away from crisis and politics, yet a refugee camp is also a political space and a space of ambiguities and multiple subjectivities with fragmented authorities and uncertain duration.

Placemaking, environment and spatial surroundings that strengthen quality of life, liveability and wellbeing are neglected factors in people's lives that have been shattered, now only receiving the most necessary of aid and shelter, living in spaces of exception, in a nexus between constraint and possibility. (Feldman, 2014).



# QUALITY OF LIFE AS SUSTAINABILITY

## On sustainability

Sustainability was first defined in 1987 in the report *"Our common future"* by the *World Commission on Environment and Development*. The commission was led by Gro Harlem Brundtland. In the report sustainable development is defined as:

*"development that meets the needs of the present without compromising the ability of future generations to meet their own needs."*

(World Commission on Environment and Development, 1987).

The essence of the report's definition on sustainability is to state that nature has limited resources as well as the report is concerned with fulfilling poor's' need for basic human rights and give poor the ability to achieve a better life. "Sustainable development has emerged as the guiding principle for long-

term global development. Consisting of three pillars, sustainable development seeks to achieve, in a balanced manner, economic development, social development and environmental protection"(UN, 2018).

## Environmental protection

Environmental protection concerns with the unsustainable use of natural resources due to current consumption as well as production patterns.

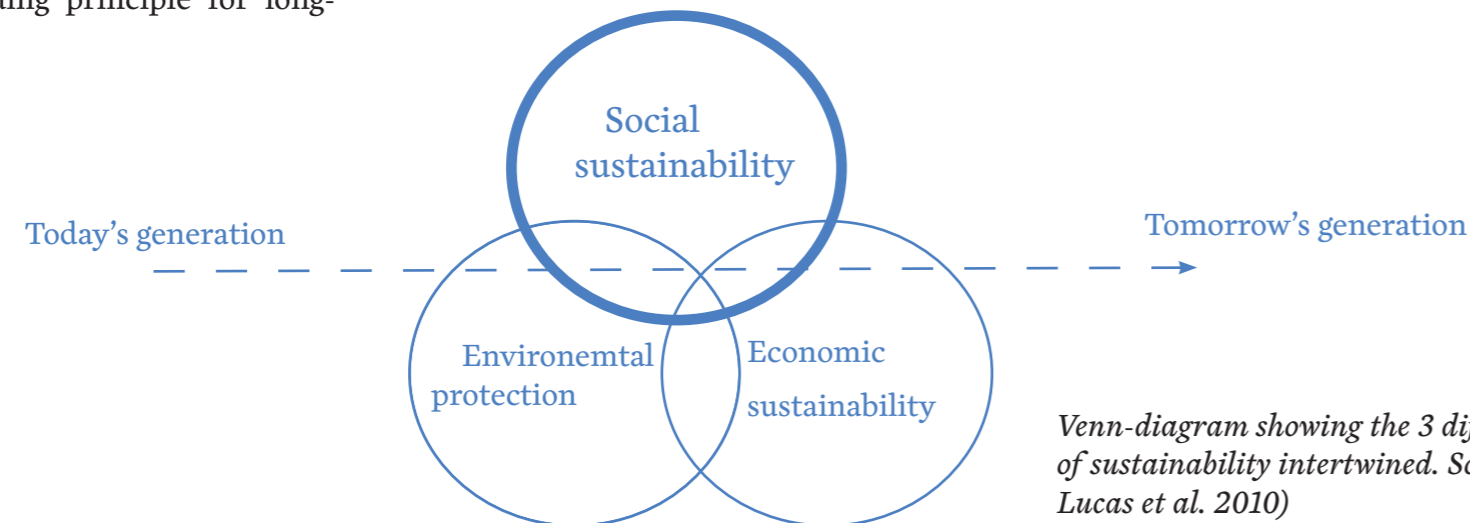
## Economic sustainability

Economic sustainable development concerns with maintaining optimal economic progress, yet at the same time protecting long-term value of resources.

## Social sustainability

Social sustainability is more difficult to define than that of the other approaches to sustainability, being a complex and comprehensive term. In the following we will present some key definitions on social sustainability, in attempt to define what sort of sustainable framework we want to propose for Al' Zaatari refugee camp.

Social sustainability can be defined as what "(...) occurs when the formal and informal processes; systems; structures; and relationships actively support the capacity of current and future generations to create healthy and livable communities. Socially sustainable communities are equitable, diverse, connected and democratic and provide a good quality of life." (Western Australia Council of Social Services, 2000)



Venn-diagram showing the 3 different pillars of sustainability intertwined. Source: (Manzi, Lucas et al. 2010)

Based on this definition of social sustainability some core principles can be derived, describing what makes a community healthy and liveable both now as well as in the future, which is the goal of social sustainability:

- Equity - the community provides equitable opportunities and outcomes for all its members, particularly the poorest and most vulnerable members of the community. It's noted that while equity is listed as a separate principle, that is such a fundamental component that it cannot meaningfully be separated from the other principles.
- Diversity - the community promotes and encourages diversity.
- Interconnectedness - the community provides processes, systems and structures that promote connectedness within and outside the community at the formal, informal and institutional levels.
- **Quality of Life - the community ensures that basic needs are met and fosters a good quality of life for all members at the individual, group and community level.**
- Democracy and governance - the community provides democratic processes and open and accountable governance structures.

(Martin, Hondros et al. 2004)

## Social sustainability in humanitarian settings

Quality of life as sustainable development, one of the core principles, is an aspect of social sustainability, that requires the basic needs to be fulfilled in a way that promotes good quality of life, meaning access to key services such as health services, education, housing, but also access to recreation spaces and leisure. In Al Za'atari refugee camp basic aid and shelter, promoting efficiency and protection are provided, while aspects that, in this humanitarian setting, could increase quality of life is a neglected area. Yet, increased quality of life as social sustainable development may be a more acceptable approach to the concept of a sustainable framework within temporarily humanitarian settings, as sustainable solutions applied in refugee camps are so often encountered by political unwillingness.

Other definitions on social sustainability include PhD-researcher Stephen MacKenzie. He defines social sustainability as:

*" a life-enhancing condition within communities, and a process within communities that can achieve that condition."*

(MacKenzie 2004.p12)

He also defines some indicators to the condition:

- equity of access to key services (including health, education, transport, housing and recreation)
- equity between generations, meaning that future generations will not be disadvantaged by the activities of the current generation
- a system of cultural relations in which the positive aspects of disparate cultures are valued and protected, and in which cultural integration is supported and promoted when it is desired by individuals and groups.
- the widespread political participation of citizens not only in electoral procedures but also in other areas of political activity, particularly at a local level
- a system for transmitting awareness of social sustainability from one generation to the next
- a sense of community responsibility for maintaining that system of transmission
- mechanisms for a community to collectively identify its strengths and needs
- mechanisms for a community to fulfil its own needs where possible through community action - mechanisms for



political advocacy to meet needs that cannot be met by community action (ibid).

Principal Lecturer Tony Manzi at the University of Westminster defines social sustainability as concerned with:

*“the relationships between individual actions and the created environment, or the interconnection between individual life-chances and institutional structures”*

(Manzi, Lucas et al. 2010, p.4).

He further states that when the boundaries between the natural and built environment become increasingly blurred, as is the case of the “bare life” and temporarily shelters in refugee camps, “(...) issues such as sustainability, or the lack of sustainability, are seen as essentially social problems” (Manzi, Lucas et al. 2010, p.4)

The spatial settlements in Al Za'atari and other refugee camps do not invite to establishment or development of life quality, as refugee camps function as humanitarian space of protection for people living in temporarily permanence, social problems are increased when quality of life seen as social sustainability is a neglected area.

### **Quality of life as sustainable development**

When we in this thesis argue green infrastructure in Al Za'atari refugee camp as a sustainable proposal, we mean as social sustainability achieved by increased life quality.

We see social sustainability as a process for creating places that promote wellbeing and liveability by defining what people need, enchanting facilities and access to amenities, making infrastructure that engage and enhance social life for people and place to evolve.

### **Intertwined**

Although increased quality of life is a form of social sustainability, we acknowledge the interdependent character of social sustainability. The three pillars of sustainable development are very much intertwined and the interaction between economic, social and environmental issues have many overlaps as the Venn-diagram shows. “The Venn diagram suggests there are potential positive “win-win” calculations in the overlaps, but also areas outside that need prioritization” (Manzi, Lucas et al. 2010, p.2). These entities can not be solved separately, but by an integrated holistic, sustainable solution.

# GREEN INFRASTRUCTURE & LIFE QUALITY

## Introduction

In this thesis, we seek to explore more of what quality of life means for refugees in refugee camps, and how green infrastructure (GI) may lead to better, more socially sustainable lives for people fleeing war and conflict. Green infrastructure and landscape are inextricably connected and is thus a major part of what landscape architecture is about – none the less in extreme situations, such as that refugees are in. After all, nature with all its plants and landscapes are the foundation of note only landscape architecture, but all of human civilization.

Further, green infrastructure has been proven to improve health and social capital, and as we will go through in this chapter, this holds benefits not only for the refugees themselves, but also for the communities hosting them. It does not, of course, hold all the answers to the problems facing refugees. It will not, however effective, end the war in Syria, or heal all wounds made by conflicts the world over. Refugees will still need acute humanitarian aid; host communities will still face deep social division and mounting costs. Even so, we think that thinking greener, in the sense of access to greenery, in refugee situations may mitigate some of the effects of displacement.

That people seek greenery and thus green infrastructure is something quite universal,

as shown by the hypothesis of *biophilia*. This hypothesis stipulates an innate connection between humans and nature, and that we all seek nature and the natural (Wilson, 1984). Since Neolithic times humans have evolved into beings deeply connected with and emotionally attached to the nature around us. That idea have led to architectural design approaches, through biophilic design ideas, for instance in biophilic urban design, as seen in Timothy Beatley's *Biophilic Cities* (2011). This approach to urban design is important as it seeks to restore nature into urban settings – no less important for refugees than for everyone else. This is not merely a deep-ecology method to reduce human impact or lift nature's intrinsic value but builds on those ideas at the same time as acknowledging that humans benefit from such design approaches. We get better health, better social relations and fulfils a part of our lives so often denied in a time of machinery and technology.

In this chapter we will therefore go through some of the known health benefits of green infrastructure, with regards to both mental and physical health. Then we will explore the social capital benefits of GI, before we finally put this into context of refugees – specifically Syrian refugees (where applicable). Does the knowledge we have on health and GI apply to people with a very different cultural background than most study objects have?

## Definition of green infrastructure

Green infrastructure – GI needs a bit more definition before being used in such a thesis as ours. M. A. Benedict and E. T. McMahon has in their book *Green Infrastructure: Linking Landscapes and Communities* defined green infrastructure as this:

*“We define it as an interconnected network of natural areas and other open spaces that conserves natural ecosystem values and functions, sustains clean air and water, and provides a wide array of benefits to people and wildlife.”*

(2006) pp. 1

This definition is very nature based, and ecologically oriented. While that is true and all well, it does not quite grasp green infrastructure as something constructed. While one could argue that their definition opens up for including greenspace that are constructed or man-made, it doesn't quite include the green infrastructure that in a lot of places are merely opposite of gray infrastructure and blue infrastructure (the last one often linked to green infrastructure) (Coutts, 2016).

Coutts further makes a distinction between the natural environment and *representations* of the natural environment. The natural environment is the environment in which green infrastructure exist – as nature itself, surrounding us, not only in wild parts of

the world, but also in urban built-up areas. Representations of the natural environment, however, are elements of the natural environment wherever and however they may occur, but always as experienced by humans. Thus, in his eyes, these two sides to the natural environment, it itself and the representation of it – can be combined into the term green infrastructure. This definition is good – as it considers not only the ecological function of green infrastructure, but also the value of GI as elements in our lives.

Whichever definition we use is not necessarily decisive to whether GI is beneficial for humans or not. Both Benedict and McMahon's; and Coutt's definitions acknowledges the human benefits of GI, and as such may be applied to this thesis' use of the term. In addition, as landscape architects it does not make much sense to exclude water systems from such a definition. Even though strictly speaking not 'green', water remains an inherent feature of landscape design and structural understanding. As such, for this thesis, we include the blue in GI.

As landscape architects one important part of the term is the inclusion of the word *infrastructure*. This separates the term from mere greenspace or urban parks. That doesn't mean they are not green infrastructure, but they are included in that term as parts of a wider system of greenery. The benefits of GI is explored as biophilic design by many (e.g.

Beatley (2011)). It is exactly the benefits from a coherent, connected natural environment that is important to us when making plans for a larger area such as Al Za'atari. These benefits have been known for a long time, for instance in Frederick L. Olmsted's regional plans from the latter half of the 19<sup>th</sup> century (Fabos et al., 1968). Thus, green infrastructure thinking has a long tradition within the landscape architecture profession and is applicable in even such an extreme situation as the one in Jordan.

## Green infrastructure and health

GI has positive health benefits, as we shall see in this part of the chapter. Its health benefits vary by type of health – physical or mental, so this part is divided into those two. Further, this chapter talks about how GI influence health on a general level, not on refugees and the extreme psychological and physical stress they live under.

### Physical health

Green infrastructure has positive health effects on people when used for activities and exercise, but also in a much more basic, fundamental way (Coutts, 2016). After all, plants provide oxygen to our air, cleaning it of CO<sub>2</sub>. Water gives us, well, water, and all the food we eat is either plant based or eats plants.

Roots and plants purify water and air and is essential to sustain life on Earth. At a smaller scale, too, these effects can increase water and air quality at a local level. These ecosystem services are what Coutts call *provisioning* and *regulating* services. These essential services often work in the background and are “the ones most likely taken for granted by most humans [...]”, as Coutts puts it (p. 23).

Especially air quality and the effects of green infrastructure on air in general has wide applications for different places, and direct, positive impact on human health. There are several benefits from GI when it comes to air quality and pollution, not only the physiological processes. For instance, a well-developed green infrastructure system (or a *biophilic city*) may lead to less air pollution from its users walking and biking instead of driving cars (Coutts, 2016). This two-sidedness of GI is important, as often one positive effect enhances the other.

One example is the several positive effects from trees, as shown very well by the 'TREE' model made by D. J. Nowak (2002):

- Temperature reduction and other microclimatic effects
- Removal of air pollutants
- Emission of volatile organic compounds and tree maintenance emissions
- Energy effects on buildings



This acronym effectively summarizes the benefits (but also the disadvantages) of trees. Although we will not go into all the aspects of this model here, the first two are essential to human health and wellbeing. The temperature (T) effect of trees is important, especially in urban environments, where the urban heat island-effect rises temperatures in cities by several degrees; some estimates 1-3°C increase in temperature in one million-person cities (US Environmental Protection Agency, 2018). This effect can to some extent be mitigated by trees. Under small groups of trees, the temperature may be up to 1,3°C cooler than in the open surrounding area (Nowak, 2002). Even though trees in some circumstances may even increase temperatures, the shade provided by them alleviates some of the heat, especially in sun-intense circumstances – for instance the temperature reduction has been measured at up to 2,52°C under tree canopies in subtropical situations (Lin and Lin, 2010). Further, the temperature reducing effects of trees has been used as an argument for better green infrastructure in cities to reduce temperatures and the negative health effects associated (Norton et al., 2015).

The atmospheric effect of trees and their binding of pollutants (R) is also important to human health, especially in situations with high levels of pollution and particulate matter, as in cities. Some pollutants, such as ozone, can be reduced by up to 15% in areas with

100% tree cover (e.g. parks) (Nowak, 2002). Though it is significantly less for solitary or less dense trees, there is still an effect. One study from the Eastern USA has shown increased mortality among people living in areas that has seen massive loss of ash trees (Donovan et al., 2013). Several thousand extra deaths from cardiovascular and respiratory diseases were shown in counties affected by tree loss across fifteen US states.

### Physical activity

Not only the essential ecosystem services that affect air and water quality and temperature (and more) are important benefits of GI. Benefits from more physical activity and the use of the green infrastructure is important to human health. Especially in industrialized countries, the chronic health conditions related to physical inactivity account for a huge part of deaths, constituting some 71% of all deaths in 2016 (World Health Organization, 2018). Not all of these deaths were directly related to physical inactivity, but many of them were. Increased physical activity can decrease the occurrence of these conditions. Without going into the details of the health benefits from a more physically active life, we will discuss the role of GI in promoting activity.

Green infrastructure can act as *behavior settings* – the physical and social contexts

where behavior occurs (Coutts, 2016), and can thus be places that encourages activity. GI must, however, be designed so that the users perceive it as a behavior setting – but if done right it may well contribute to physical activity (Sallis et al., 1998). Not only is the form of the GI essential to whether or not activity occurs at all, but it is also important to what kind of activity occurs. Green connections may for instance make people walk to work rather than drive, whereas sporting facilities may encourage sports instead. Not all people perceive the possibilities of GI the same either, and cultural background, sex, age, wealth etc. may all influence this perception. One of the most important characteristics of GI that facilitate activity, seems to be size of the greenspace, as suggested by some research (Giles-Corti et al., 2005). Greenways (green connections between patches of greenspace) is a good way of ensuring that the size of the local GI is large enough to be attractive for physical activity when there is little room to expand or conserve large areas of land, for instance in a dense city (Coutts, 2016).

Even so, variations in culture may influence a lot of how much extra physical activity one can get from green infrastructure. As Coutts (2016) summarize, different studies have shown different levels of extra activity in different countries. For instance, studies in the US and the Netherlands have shown that the Dutch much less than the

Americans alter their commuting behavior due to GI access (Cohen et al., 2007, Maas et al., 2008). Coutts speculates that this may be due to the overall higher level of walking and biking in the Netherlands, and that the extra physical activity prompted by access to green infrastructure is more pronounced in countries and cultures with less access to pedestrian infrastructure. Even so, the benefits from GI in regard to mental health, social cohesion and other quality of life aspects is there also in countries where this difference in physical activity cannot be measured.

### Mental health

Green infrastructure not only benefits our physical health, but even more so perhaps, our mental health. Both are important to have a full and true healthy life. A healthy mental life is also deeply connected to quality of life – a physically fit but unhappy person is, after all, unhappy (even though having good mental health is not necessarily confluent with happiness).

The mental health benefits of GI and the theories surrounding them finds its basis in environmental psychology, and the research examining the innate human preference for natural environment, exemplified in the theory of biophilia (Wilson, 1984), as mentioned earlier. Even though this theory stipulates that this preference is genetically

developed through eons of human contact with nature, there are other, sociocultural factors that influence people's natural preferences (Coutts, 2016).

The positive mental effects of green infrastructure can be summarized in two ways of restorative benefits (Coutts, 2016):

- Recovery from stress
- Recovery from attention fatigue (attention restoration theory (ART))

Of these, the effects on stress-recovery has been most explored and researched, whereas recovery from attention fatigue has been less studied. Individually, these terms talk about separate psychological functions, and collectively they may be considered restoration (but not separately) (Coutts, 2016). These two terms are not at odds and may complement each other – attention fatigue may for instance be a result of stress.

Some general studies, not attributing their findings to stress or attention fatigue have concluded that increased access to green infrastructure is good for mental health (Lewis and Booth, 1994). This has been shown through higher levels of psychological morbidity in cities than in rural places, but Lewis and Booth also showed that higher access to GI in urban areas gives lower psychological morbidity. This shows that a conclusion that it's unhealthy to live in urban areas is wrong – the access to GI is key to living

healthy lives. Other studies have shown that even when level of physical activity and social capital (as discussed later) are accounted for, increased access to greenery improves mental health (Sugiyama et al., 2008).

### Attention restoration theory

The attention restoration theory, or ART, is a theory that stipulates the effect of GI on attention and cognition. Cognition is our ability to process and receive information through sensory input and then use it (Coutts, 2016) – essentially our everyday process of perceiving and processing the world. This capability, together with attention, is reduced during our everyday lives. The mental fatigue that is the result of this can be draining and we need to recover from it to lead healthy lives, as attention and cognition is associated with stress and emotion (Tzoulas et al., 2007).

We have multiple ways of doing this, whether it be sleeping, watching Netflix or having fun with friends. Here, access to GI may, again, be beneficial. Several studies, as shown by Coutts (2016), show that the attention restoration offered by GI may be substantial for many of us – including children with attention disorders, such as ADHD (Kuo and Taylor, 2004).

## Stress

As mentioned earlier, recovery from stress forms one of two main fields of research when it comes to mental health and green infrastructure and is very important to our understanding of the relationship between the two. Stress is a major health threat, responsible for everything from cardiovascular illnesses (American Psychological Association, 2013) to bed-wetting in children and a wide range of other physical symptoms from stress (World Health Organization, 2013). It is also an integral part of and reason for a lot of mental illnesses as well – such as depression and anxiety (American Psychological Association, 2013). Stress has been adopted to our everyday language, whether it's at work, in relationships or before Christmas. Stressful situations and the toll stress in itself take on us is essential to combat to lead good lives – indeed a whole section of our economy and culture is devoted to rid us of stress.

Green infrastructure can help us from recovery of stress, both chronic and acute (Coutts, 2016). Acute stressful situations – sometimes called trauma – can lead to health problems later on, such as post-traumatic stress disorder (PTSD) or even heart attacks (American Psychological Association, 2013). In addition to offering recovery from stress, GI may also help reduce the impact of stressful noise and visuals (Coutts, 2016). In other words, GI may help recovery from

already experienced stress as well as reducing the negative impacts of stressful situations around us.

The stress recovery impact of nature has been proven to happen not only when being in nature, but also when viewing nature (Coutts, 2016). In other words, merely viewing greenery may help us recover from stress, albeit to a lesser degree than direct exposure to nature may. Studies have shown that having both access to real nature (indoor plants) and a view of nature (through a window) is better than having only one of the two, even if the view is more important than the indoor plants (Chang and Chen, 2005). Even though this study was done in an office setting, it nevertheless shows that greater access to green infrastructure = better stress recovery. This has applications for the larger, outdoor GI as well – the more green structures people have access to, and the more our senses are stimulated by nature – the more complete natural experience we get. Not only do we need access to greenspace, we should also have views of greenery around us, and once we are outdoors, hearing birds and trees may also benefit our mental health.

Other studies have shown a relationship between the use of greenspace and stress-levels (Grahn and Stigsdotter, 2003, Stigsdotter et al., 2010). People using greenspaces report lower levels of stress, and people with lower stress-levels are more likely to use greenspace.

Even though this is not 100% causal, it points to the stress-recovering qualities of GI. It may be that GI reduces stress, or that people with less stress are more prone to use it. Even so, it may well be that the two assumptions are self-reinforcing – that GI reduce stress, and that in turn makes people use greenspace more, which in turn reduce stress.

How parks are designed can greatly alter their effect on stress recovery, as implied for instance in research done on how small urban parks contributes to stress recovery (Nordh, 2010). Clear indication was seen towards a preference for softer features like grass, flowers and trees, and less towards hard surfaces, like asphalt, wood or stone. How public spaces are designed and what elements are used can therefore increase or, at worst, decrease the levels of stress recovery gained from GI.

The health impact of stressful life events can also be mitigated by green infrastructure, as suggested by a study in the Netherlands (van den Berg et al., 2010). Here, the number of health complaints and the perceived mental health of those with good access to green space within a 3km radius was lower than for those with less access. This points to what the article writers name the buffer effect of green infrastructure – that the health impact of stress and stressful life events is less when people have good access to greenspace and GI. It is also noted here that the size of green

space may play a role, as the larger green areas within a 3 km radius had an effect, whereas within 1 km it had not (and within 1 km more green space is small and unbroken).

Green infrastructure may therefore not only reduce recovery times from stress or reduce stress over all, it may also lower the consequences of stressful life events and chronic stress situations. Moreover, the added health value of increased access to greenspace in terms of physical activity may even more help on the stress-recovering effects of GI.

## Green infrastructure and social capital

Social capital is the relationships between people, the trust in these ties and resources or benefits from them (Poteyeva, 2016). This is important to quality of life and lays the foundation of lots of other important aspects of our life, as employment, economy, self-realization, friends and family. Our physical environment is essential to how our social life and capital influence our lives (Coutts, 2016). Thus, also green infrastructure lays the foundation of the social function of societies and individuals. Of course, culture is also very important to how our social capital is developed and how we use and perceive the physical environment around us – thus any assumptions made on the influence of GI on

social capital may not be universally applied, although perhaps lessons may be learned. Social capital may be divided into four categories, as done by Cooper et. al. (1999), rendered by Coutts (2016, p. 216) (we were not able to access the original source):

- *Social resources* – Informal reciprocal support arrangements between neighbors, within and between friendship networks and in specific “communities.”
- *Collective resources* – Level of civic activity as evidenced by community organizations, collective action and trust in institutions, and social cohesion
- *Economic resources* – Evidenced by opportunities for employment and the quality of environmental amenities.
- *Cultural resources* – Quality of cultural amenities such as libraries, meeting places and performance venues.

These categories show that the physical environment – and GI – is integral to many of the aspects that define a good social capital. Our social resources may be strengthened by having public meeting rooms and outdoor activities, same goes for our cultural resources. The collective resources may be stronger if they find room for development and community organizations may well be connected to GI in some way or another (e.g. communal gardening organizations). The economic resources are directly linked to the

natural environment and may be influenced by GI on an individual as well as societal level, for instance through employment in the upkeep of parks and GI. Coutts (ibid.) further states that “GI provides the physical environment necessary to support all four categories of social capital.” (p. 216)

It has been pointed out that lack of green infrastructure correlates with low social health (or unhealthy social capital) in deprived, low-income areas (Kuo, 2003). Poor individuals are more dependent on the public outdoor facilities of their neighborhoods, as they experience less mobility. Kuo's work also show that access to GI in low-income areas are linked to less crime, greater sense of safety, more use of public space and stronger ties between neighbors. In other words: the presence of accessible green public space is linked to a range of factors that suggest a higher quality of life.

The use of greenspace has a positive impact on social capital – in one study, it was shown that in architecturally identical housing projects, residents living in buildings with greener outdoor facilities had more social ties in the neighborhood, such as sense of community and familiarity of neighbors (Kuo et al., 1998). Greenspace, it is suggested, may encourage a more active social use of neighborhood facilities, and hence increase the social ties among residents. However, there is little knowledge to whether the presence



of more public parks and other ‘neutral’ greenspace in the neighborhood would have to this effect – this may reduce the use of greenspace directly connected to housing, and hence reduce the contact between immediate neighbors (Coutts, 2016).

Greenways have also been shown to facilitate activities important to social capital, for instance in a study where the perceived level of greenness correlated with social interaction as well as social cohesion – both important to social capital (Sugiyama et al., 2008). Connected green infrastructure is also connected with increased community pride, perceived opportunities for interaction and community identity (Shafer et al., 2000), all important aspects of social capital. The same study showed that people perceive greenways to enhance overall quality of life as well.

Public parks (and other public greenspace) is important as they’re neutral grounds for interaction between people. Worpole (2007), for instance, stresses the importance for investment in public green space – both for health reasons and social capital reasons. He concludes even that “There is no sustainable future without them” (p. 20). Jan Gehl (2003) has shown us how different uses of public space caters to different needs, and that open, public space is essential to many parts of our life and society. Public space is important not only to personal relations, but also democracy and diversity.

Although non-green public space can facilitate a lot of the social mechanisms increasing social capital, GI have added benefits regarding physical and mental health, that grey public spaces have not. Both as a facilitator and as a health benefit GI may increase the quality of life for city-dwellers in multiple aspects, and better the lives of many people in diverse life situations.

### Refugees and green infrastructure benefits

Most of the research on the health and social benefits of GI has been made in western countries, and – as far as we have been able to find – not at all on refugee camps and people in extreme situations. Some literature might have been available to us were we not confined to Norwegian/Scandinavian and English-language texts, but the summaries in some of the literature review done suggests the same: it is mostly the Western world that has been studied. Even so, some assumptions and conclusions can be made.

Even so, there are some major obstacles to taking the conclusions and evidence on GI, health and social capital as earlier presented, when transferring it to a refugee population. Cultures may view landscape quite differently, and the cultural, religious and historical context refugees live in is vastly different from

those of the study subjects we have looked at. Even so, studies from East Asia gives some of the same conclusions as studies done in Europe or North America does – for instance studies done in Taiwan (Chang and Chen, 2005). This points to at least some universality in the biophilic tendencies among humans, as suggested by the notion that this tendency can be traced back to our evolutionary development (Coutts, 2016). Maybe the perception of landscape is different, but our benefits from a natural environment less so. This should not mean that the same solutions are applicable in different solutions, or that the same designs should be made in a refugee camp in Jordan as in Norway, but rather that the ultimate goal of increasing quality of life may be applied in both situations, and that local culture and traditions must be respected in the design proposals.

In this aspect, the knowledge of how different people perceive different landscapes are important. Not only about whether or not we seek natural landscapes at all, but also to what kind of landscape we prefer (Thompson, 2013). Several studies have shown a preference for landscapes that support ART (attention restoration theory) among diverse populations, and that landscape preference is more about restoration possibilities than cultural background (ibid.). One example is studies on Italians and Australians and different landscapes, where the preference

towards landscapes with strong restorative elements were much more important than the cultural preferences that can be explained by background (Purcell et al., 2001, Purcell et al., 1994). Of course, also the perceived safety of the green infrastructure is important. Not only when considering crime or intra-personal safety, but also the very safety of nature itself. Of course, a more dangerous nature is perceived less safe and thus less accessible than a relative risk-free nature. There are fewer predators in the forests of the Netherlands than Kenya for instance. This could, however, be mitigated by better design and community involvement in activities, as shown by work done towards and amongst ethnic minorities in the UK (Wong, 2007), where active use of public green space by these groups have been increased.

Even so, some cautions must be made when we try to establish a link between current knowledge of the benefits of GI and refugee camp residents. As already mentioned, the differences between the study objects in the existing literature and the uncertainty of the cultural perception of landscape for Syrians and Jordanians might change some of our understanding of the benefits of GI, although it might well be that the differences are smaller than we might think. One other aspect to consider is how people in extreme life situations (as refugees are) respond to GI and landscape interventions. Most of

the benefits explored in this text have been studied in groups of people in relatively stable and normal circumstances. One of the studies cited earlier, however, from the Netherlands, where health benefits were recorded amongst people going through stressful life events (van den Berg et al., 2010) – can be used as an argument for the health benefits even in an extreme life situation. In war times diverse groups of people in diverse locations turn to community gardening as an activity as well (Tidball and Krasny, 2014), providing some indication that neither extreme life situations nor cultural differences fundamentally alters our preference and need for green infrastructure.

### Landscape, access and identity for refugees

When discussing refugees and green infrastructure, and in the broader terms, landscape, it is important to touch upon landscape rights and the status of refugees in their host countries. The refugee situation is taken up more in other parts of this thesis, but some notion to it here is important as well – as it greatly influences refugee’s ability to utilize and enjoy the GI around them. Landscape (and therein GI) is a scene for social justice (and *injustice*), as explored by many landscape theorists (Setten and Brown, 2013). This shows how landscape is part of the wider society,

and how the complex power structures and relations also influences our relationship with landscape. Especially for marginalized communities – that refugees more often than not constitute. This should mean that for refugees to have the access to the facilitating properties of GI, it must be designed with their access in mind. This has also to do with identity, and how landscape is an important identity factor both for existing populations, but also for newly arrived migrants (some who may be refugees) (Egoz, 2013). Landscape identity is indeed a factor in violent conflicts as well, such as the Israeli-Palestinian conflict, where both the Zionist narrative of the Jewish homeland, and the Palestinian narrative of the lost homeland plays a significant role on both sides (ibid.). This affects, of course, refugees too, especially in a more globalized and fluid world. The landscape response to these questions are important and may provide dignity and recognition to people in difficult life situations.

In refugee camps it is extra important to build this identity and dignity. This may help increase social cohesion and social capital amongst camp residents. As shown earlier, this is important both to quality of life and health, and this in turn may help alleviate some of the issues facing refugee camps and their surroundings. Green infrastructure interventions, through placemaking may therefore be very important to the refugees

and their host community. Indeed, identity is seen as a fundamental issue facing the refugees in camps, for instance in a plan for the future development of Al Za'atari refugee camp (LOGOReP, 2016 p. 63). Indeed, the plan shows that the refugees themselves spontaneously start to build and organize placemaking. It is very well summarized in a quote from Killian Kleinschmidt, camp manager of Al Za'atari:

*"[...] I mean the Syrians, for their wellbeing, they need a fountain and a birdcage and a plant and they need to sit next to the fountain to drink tea. That's their expression of home. So everybody at Zaatari was building fountains [...]. Because when you arrive at a camp you have basically been stripped naked and lost everything that has to do with your identity. And in a camp you are treated the same as everyone else, you are supposed to eat the same, drink the same, you get the same clothes. That's the humanitarian standard [...]"*

(ibid. p. 63)

A comprehensive green infrastructure intervention may well be able to facilitate identity development and sense of place. Building arenas for a social life in the camp, as well as providing both private and public spaces to meet in a green setting can be essential to building the social cohesion that is also needed in these places.

### GI, health and refugees

The health issues facing refugees are many and complex, and many of them may not be helped by GI. Green infrastructure can help part of the total health picture of individuals and refugees as a group, however. The physical health benefits of GI discussed earlier of course applies to refugees as well. Al Za'atari camp is in a semi-arid, dusty landscape (see analysis chapter), so one immediate effect may be the pollutants taken up by plants. Also, the temperature reducing effects of trees and shade in general is important in a place frequently exceeding 35° C and intense sun.

Fleeing war, conflict and violence, the mental health toll on refugees are, however, one of the more specific health issues facing camp residents and the organizations involved in management. Some of these mental health issues can be attributed to adjustment disorders, the direct toll suddenly flying your home and having to adjust to a new life situation takes, some others to more chronic disorders, as depression and anxiety (Schouler-Ocak, 2015). One of the most telling statistics is that post-traumatic stress disorder (PTSD) is up to ten times more present among refugees than in the general population, and that up to 86 % of refugees may have symptoms of the disease. This is important, as all of these disorders are stress related, and that among their most persistent symptoms are stress (Anxiety and Depression

Association of America, n.d.). Further, refugees face cultural, linguistic and socio-economic barriers to getting professional help, not to mention the lack of psychiatric professionals in camps (Schouler-Ocak, 2015). These issues are prevalent in not just refugee populations, but the ostracism and deprivation they face furthers complicates them.

Prolonged stays in refugee camps themselves can also be traumatizing, as shown with Syrian adolescents studied in a refugee camp in Germany (Braun-Lewensohn and Al-Sayed, 2018). The longer the teenagers had stayed in the camp, the more symptoms of PTSD they reported. The camp situation can be called a very stressful situation, with internal conflicts, stress on resources, unemployment and poverty, as seen in Za'atari (Kruijt, 2014).

With the refugee health status in mind, it is not hard to draw a line between the extreme stress and trauma refugees live under and green infrastructure's ability of stress recovery. Even though not all refugees suffer from stress related disorders, being a refugee is still a stressful situation. This goes for the same in other populations: We don't build parks in cities simply to help depressed people - we all benefit from greenspace, but some people with mental health problems even more.

### Conclusion

Green infrastructure helps human health, maybe most when it comes to mental health problems. Refugees are in a very stressful and special situation, and their need for stress reduction is even greater than ours. GI may help reduce the impact of stress related symptoms, and may even function as a buffer between the stressful life of camps and the long term mental health consequences. Green infrastructure may even help to reduce the impact of traumas experienced before and during a stay in refugee camps.

Social capital (and cohesion) may also be increased by adding GI to camps. As mentioned, the placemaking and need for public space is essential, even in a 'temporary' solution as refugee camps are meant to be. How refugees in Za'atari do placemaking spontaneously, as mentioned in the LOGOReP plan (2016). If refugee camps develop better public space it may also lead to less conflict and create meeting places that in turn can help heal the wounds of war.

Further, these spaces may even help ease the pressure on health facilities in the camp, making them more effective to combat health issues. Of course, GI may never truly replace therapy and professional help, but the social structures and the stress recovery capacity of greenspace may nevertheless be a good addition to existing facilities.

Through health and social capital and the positive effects of GI, refugee camps can be better arenas for a higher quality of life for their residents. The benefits of landscape identity through placemaking may also make the refugee experience less of a toll. Indeed, the refugees themselves seem intuitively interested in the greening of their environments; in Al Za'atari private gardens have sprung up around homes (see later analysis).

Finally, for governments afraid of the permanency and long-term effects of a prolonged refugee situation, providing for better life quality in refugee camps should be a priority. Both host countries neighboring or close to conflicts and possible future host countries would be wise in accepting GI as an integral part of refugee camps - the benefits provided may help on many other issues. Refugees staying in camps have less issues and in turn makes less impact both economically and socially on their host countries. Refugees leaving the camps for a better future for instance in Europe will have better health and social capital - making their integration easier. GI is not *the* solution to the refugee crisis or to camps in general, but one of many to make them more sustainable.



# WHAT IS A REFUGEE? - On 1951 convention

A refugee as a legal term was first defined in the *1951 Convention Relating to the Status of Refugees* and the *1967 Protocol*. Before, there were no universally acknowledged term for people fleeing persecution. The convention was established as a response to Second World War to handle the mass migrations, mainly in Europe. And with this legal document the legal space of the refugee camp was founded.

## The criteria of refugee status

In article 1 A(2) of the convention the term “refugee” is defined as any person who:

*“(...) owing to wellfounded fear of being persecuted for reasons of race, religion, nationality, membership of a particular social group or political opinion, is outside the country of his nationality and is unable or, owing to such fear, is unwilling to avail himself of the protection of that country; or who, not having a nationality and being outside the country of his former habitual residence as a result of such events, is unable or, owing to such fear, is unwilling to return to it”*

(UNHCR, 1951)

What define a refugee is:

Persons being outside their country of origin, unable or unwilling to protection from that country owing to a well-founded fear of been persecuted. This fear of persecution is based on these factors: race, religion, nationality, membership of a particular social group or political opinion.

## Inadequate convention

The convention is the key legal document defining who that is a refugee, the refugees’ rights and the responsibility and legal obligations of states towards refugees.

Yet, several scholars have identified the inadequacy of the convention.

Adrienne Millbank are one of them, claiming that the 1951 Convention does not respond to the changed refugee context of today:” The problem with the Convention is that it was designed in and for a different era”. (Millbank, 2000).

She points out that *“the Convention definition of refugee is outdated, as is its notion of exile as a solution to refugee problems”* (ibid). She is supported by Professor in Politics and international relations Philip Cole, arguing that the convention’s definition of refugee does not include people fleeing violence when for example their homes have turned into war zones. Yet, it would seem, Cole states:

*“governments who consider cases of asylum do not stick to the letter of the Convention definition, but work with a wider understanding of who can be a refugee. But the fact remains that the Convention as it stands allow states to interpret who is a refugee more or less broadly.”* (Cole, 2015) In practice this means that states may choose a broad definition from asylum seekers from one region and a more strict definition form another region.

## Other definitions

There are other canonised definitions on who that may be a refugee, functioning mainly as regional instruments, but these are not officially legally binding.

One of them are adopted by the Colloquium on the International Protection of Refugees in Latin America, Mexico and Panama in 1984, enlarging the definition of refugees to include:

*“...persons who have fled their country because their lives, safety or freedom have been threatened by generalized violence, foreign aggression, internal conflicts, massive violation of human rights or other circumstances which have seriously disturbed public order.”*

(Betancur, 1984)

The Organization for African Unity has also adopted a wider definition:

*“the term refugee shall also apply to every person who, owing to external aggression, occupation, foreign domination or events seriously disturbing public order in either part or the whole of his country of origin or nationality, is compelled to leave his place of habitual residence in order to seek refuge in another place outside his country of origin or nationality.”*

(AU, 1974 p. 2)

Cole also states that: *“as far as the Convention goes, you are only a refugee once a state has granted you that status. Until that moment you are an asylum-seeker. And so once more the vast majority of people fleeing violence in the world today are not, according to the UN Convention, refugees – they are people seeking refuge”*

(Cole, 2015, webpage).

## On protection and the non-refoulement principle

One of the most crucial principles and obligations on all states is that of Article 33 in the Convention on non-refoulement:

“No Contracting State shall expel or return (‘refouler’) a refugee in any manner whatsoever to the frontiers of territories where his life or freedom would be threatened

on account of his race, religion, nationality, membership of a particular social group or political opinion”(UNHCR, 1951).

Cole claims that this formulation states not to harm, but lacks any obligation to assist. Allowing then states to give only temporary shelter until refugees can return. He follows: “What is required is a positive right to immigrate and establish a new life in another country – the idea of safe passage – and the right to permanent settlement, rather than simply a temporary status which can always be revoked whenever the government decides it is safe for you to go home”(Cole, 2015).

Although the right of refugees to protection is formulated in the convention, the operationalization of the protection is not further defined. States, that in accordance to this legal agreement, are providing protection are not bound to provide a particular quality or form of protection. Each country may decide what protection will look like.

## On conventional solutions

The Office of the United Nations High Commissioner of Refugees (UNHCR) is the protector of the Convention and the Convention underpins all of UNHCR’s work. The mandate of UNHCR is to:

*“lead and manage international action for the universal protection of refugees*

*and the resolution of refugee problems by protecting and supporting refugees at the appeal of a government or on request of the United Nations (UN) helping refugees in voluntary repatriation, local integration or resettlement to a third country.”*

(Nimiri, 2014, p.54)

The three conventional durable solutions that may end refugees’ exile are:

- repatriation
- local integration
- resettlement

These, though, are in need of evaluation and discussion.

## Repatriation

Repatriation is return to the country of origin, prerequiring safety and peace in the country of origin and based on an informed decision by the refugee himself.

*“Repatriation - which remains the ideal solution for policy makers, is often neither possible – due to the conflict and instability – nor desirable – especially for younger and second generation refugees who may often not know the ‘home’ to which they are returning”*, Professor Katy Long states (Long, 2014, p.476). Also, anthropologist Liisa H. Malkki argues the



ambiguity of this solution supporting Long, saying that: “*State’s continued support for repatriation as the best solution arguably reflects their own political interests in retaining a ‘national order of things’, rather than a concern with refugees’ welfare*”

(Long, 2014, p.476).

### Local integration

Local integration, meaning “permanent residency or naturalization in the first country of asylum” (Long, 2014, p.476) is the second solution for solving refugee crisis allowing refugees to stay permanently.

Long states that this solution is the so-called ‘forbidden solution’ depending on laws “which are deliberately intended to prevent refugees mixing with host communities and restrict access to citizenship”(Long, 2014, p.476).

### Resettlement

The solution of resettlement, ordered migration to a third country,

UNHCR estimates only 1 percent of refugees actually benefit from this solution. To be able to be resettled, refugees must meet UNHCR’s criteria as well as criteria for the country of which they shall resettle.

Long states that these existing durable solutions’ framework and the policy makers’

focus on seeing them as separate solutions fail to “(...)recognize a fundamental need to move away from understanding all solutions simply in terms of “fixing” people in places”(Long, 2014, p.477).

She argues for a holistic approach asking for an integrated whole when seeking durable solutions for protracted refugee lives, that may not be at risk anymore, yet a better life beyond the humanitarian space of exception is very much needed.

### Conclusion

Although states operate with a more or less broader definition of the term refugee, the Convention is still the legal document defining who that is a refugee. The Convention also functions as a favorable legal framework for refugees, making the legal rights of internally displaced people and migrants without the legal status as refugees even more limited than that of refugees.

In this thesis however, it is specifically the situation of refugees living in camps we illuminate, and how their lives can be enhanced by landscape architecture and a more green approach to their surroundings. The conventional solutions to the refugee crisis - repatriation, local integration or resettlement - seem to mainly function to retain states’ own political interests rather than a concern for those fleeing persecution.

Therefore, the three conventional ‘solutions’ to refugees is not the only ones valid in the refugee crisis. Long-term displacement is an unfortunate result of global processes, and will be here in the future, when climate change and conflict still will force people to migrate and seek refuge. This situation can be made more sustainable, by reframing long-term displacement as sustainable development rather than just a humanitarian challenge.

## WHAT IS A REFUGEE CAMP?

### From 1901 to modern day camp-design solutions

A thorough study on the development of refugee camps as architecture and urban structures have been done by Studio Basel ETH Contemporary City Institute in Zürich, lead by architect Manuel Herz. In the following we will present some key design solutions from the first tent- settlements to modern day solutions based on Herz’ work in his book ‘*From camp to city: Refugee camps of the Western Sahara*’ from 2011.

1901-1939

### 1901 Norvals Point: camp consisting of tents

The first camp for displaced, consisting mainly of tents, were established in South Africa during the war between the British Army and the Boer. The British Army that established the camp had made no proper provision for housing putting the civil population mainly in tents. By the mid 1901 the population living in the camp, both refugees and prisoners had reached a number of 3, 000 people. Because of wretched conditions more than 15% of the population died of measles epidemic and typhoid fever.

The East Cape Province, where the camp was located, is now a popular tourist destination because of its sights of natural beauty.



Norval's Point today. With settlements at the former camp sight. (GoogleEarth.2018)



Norval's Point, South Africa, 1901(waschbank.co.za)



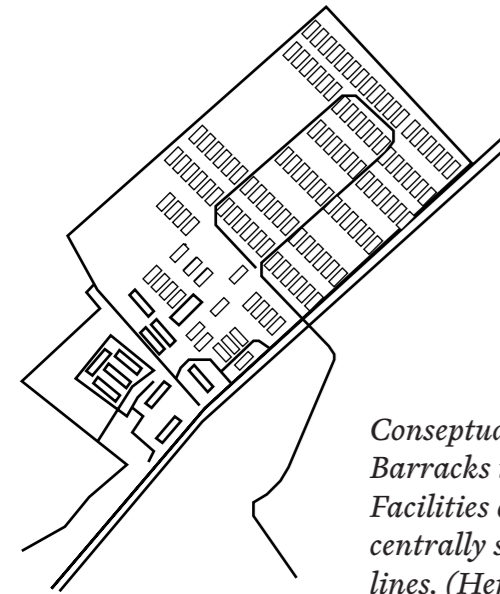


### 1915 Mittendorf: first barrack camp

The kaiserliche Barackenlager in Mittendorf, Austria, was established as housing for Italian displaced after the First World War in 1915 by the Austrian government. Characteristic about this camp is that it is the first camp with more firm conjectures consisting of wooden barracks and services and facilities such as 4 hospitals, a church, 3 schools, cinematheater, post office and administrative buildings were all available at the site. Despite these facilities the living conditions were terrible and close to twenty percent of the camp's population died by the three years duration of the the camp. The administrative buildings and hospitals were placed in front of the area with baraccs for the refugees for easier control.



The Mittendorf area today with Lagerstrasse running through the city (GoogleEarth.2018)



Conceptual drawing of Mittendorf camp: Barracks in strict lines for better control. Facilities and administrative buildings centrally situated in front of the barrack lines. (Herz, 2011)

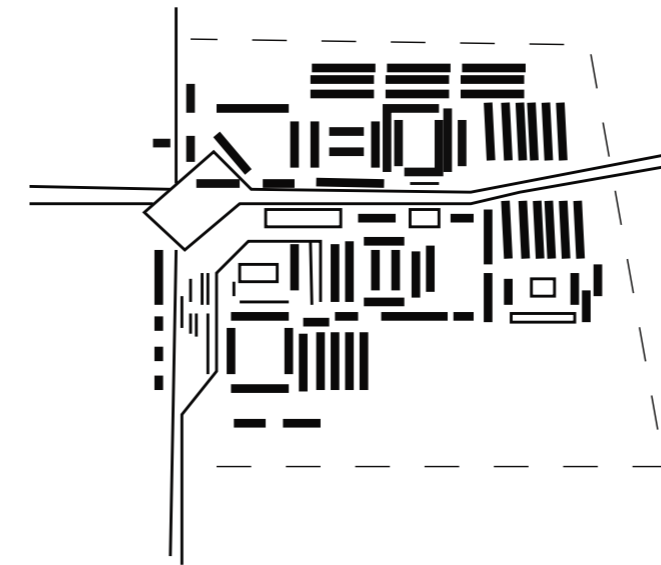


Some settled permanently in the camp and consequently city structures of Mittendorf today are still influenced by the foot print of this camp, for example is the main street running through the city is still called Lagerstrasse.

### 1939 Westerbork: concept of an open camp

Westerbork camp in Netherlands was established in 1939 for Jews fleeing Nazi-Germany by the Dutch government. This camp was planned and designed without borders and had an open plaza, planned as a village. Yet, this open camp was built in the middle of the forest, the next villages being situated far away.

Netherlands being occupied by Germany in 1942, the camp, established to protect Jews, was taken under the control of the SS and turned into a prison camp.



Conceptual drawing of Westerbork: a camp modeled as a small village with more open spaces. (Herz, 2011)



The structures of the Westerbork camp are visible still today. Now it is located a Radio telescope on the site. (GoogleEarth.2018)

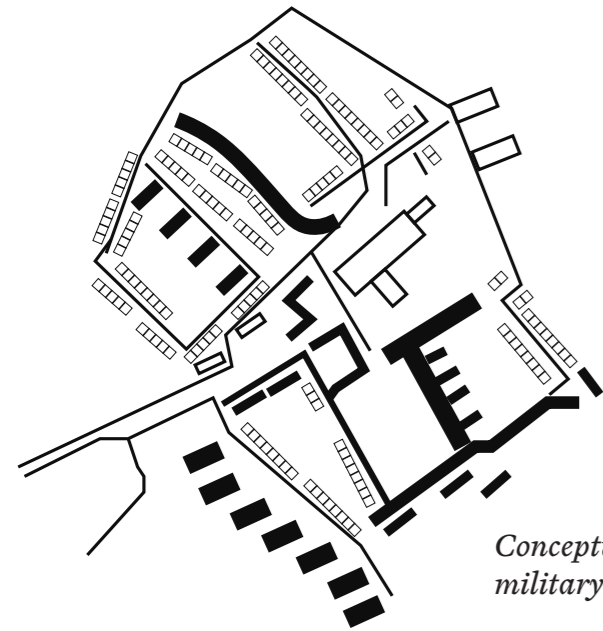




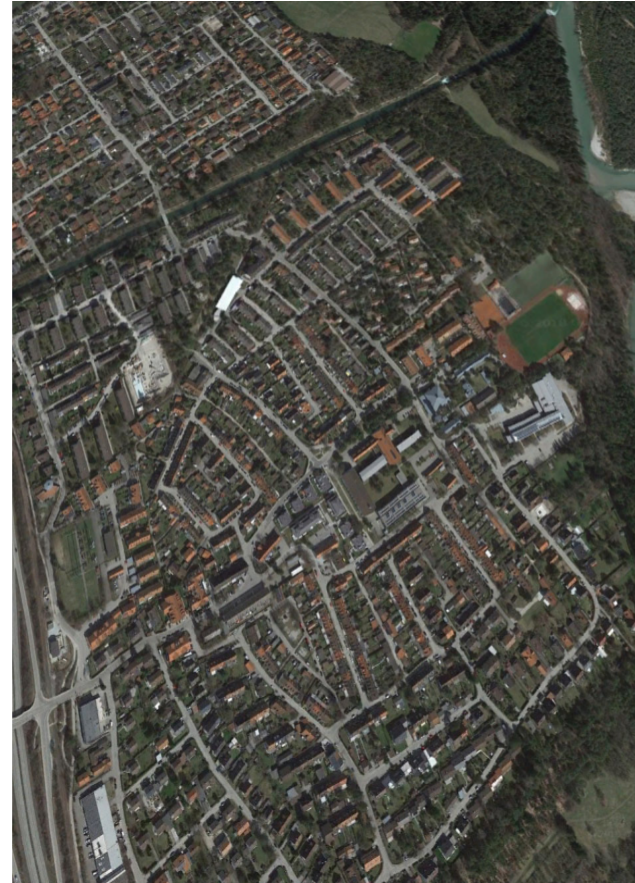
## After Second World War

### 1945 Föhrenwald: military site turned into refugee camp

This camp, established in Germany just after the Second World War, was originally a military camp turned into a refugee camp. It consisted of solid houses beeing a military camp, as well as houses belonging to german locals before the war, making the living conditions in this camp profound compared to other similar sites. Due to the good standard this camp was quickly overcrowded, and Jews were favoured and the camp turned into a home for Jews only. Today the houses are integrated as part of the town of Wolfratshausen.



Conceptual drawing of Föhrenwald in Germany, a military site turned into a refugee camp. (Herz, 2011)

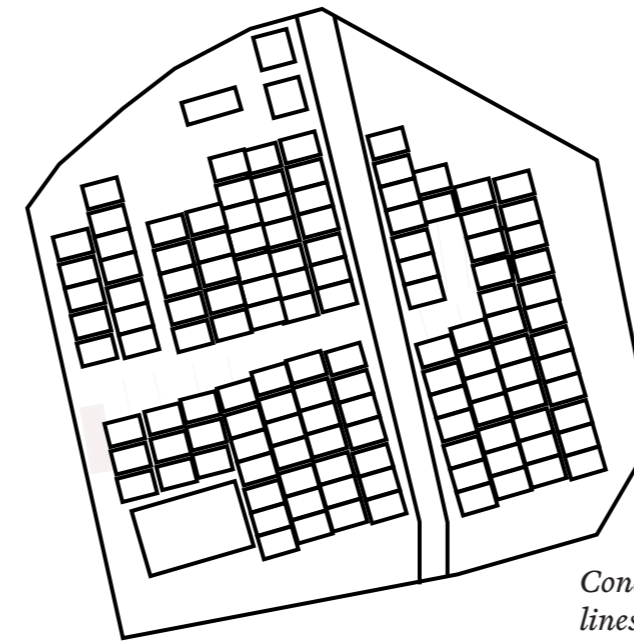


The structures of the camp still visible at the site today (GoogleEarth.2018)



### 1954 Djebabra: Roman castrum

Djebabra was established as a result of the Algerian war by the French government in 1954. The Algerian fought for their independence from France and until 1962 France fought against the FLN, a war that turned into a girillia war. For easier control the French put people from the mountain area into centres de regroupement, to break the populations resistance. The camp planned as a roman Castrum with absolute geometric as principle, had a terrible impact on the displaced, the French trying then to discipline and control the Algerians treating the refugees as prisoners.



Conceptual drawing of the Djebabra camp with strict lines for controlling the refugees. (Herz, 2011)



The site of the Djebabra camp is a village today (Google2011)



The effects of displacement in Djebabra refugee camp has been characterized by sociologist Pierre Bourdieu as the most brutal in the history of the colonial system.



# MODERN DAY PLANNING AND DESIGN

After the Second World War populations were scattered all over Europe and were regarded a treat to the security. The responsibility of these populations was then given to the military as seen in the Föhrenwald example above." In spatial terms the military model was important. The basic blueprint of the military camp and its characteristic techniques were appropriated by those new spatial and disciplinary practices that were emerging in the 1940's refugee camps in Europe" (Malkki, 1995, p.3).

"Militaries used POW (prisoner of war) camps, prisons, and military barracks to contain, order, and redistribute displaced populations. Military camp planning and design goes back to the Roman era, as spatial structures to maximize the needs of efficiency, not humanity. Consequently, today's camps are designed using the same spatial structure. A refugee camp is made to process, contain, and secure an individual. It is not a space to facilitate the expression of rights." (Sipus, 2014)

Humanitarian expert and UNHCR executive in Al Za'atari refugee camp, Kilian Kleinschmidt, claims little has happened since the time just after Second World War in revolutionising refugee camp planning and aid approaches. In an interview with Dezeen, an architecture magazine, he says: "We're doing humanitarian aid as we did 70 years ago after the Second World War. Nothing has changed.

In the Middle East, we are building camps: storage facilities for people" (Radford, 2015).

## On current guidelines

UNHCR is responsible for the planning of UNHCR's refugee camps, using UNHCR's Handbook for Emergencies as toolkit to define minimum standard service and infrastructure requirements to be available at the refugee camp site (see boxes on next pages) and functions as the official planning strategy of refugee camps.

## Refugee camps today: the cities of tomorrow

Today the number of forced migrations worldwide has turned over 60 million (UNHCR numbers 2018), significantly increased by the Syrian conflict, and the main picture of refugee camps are now as swelling slums functioning separately and isolated from normal society offering only the most necessary of aid and shelter. Due to the shift in war-fare, wars lasting longer and having lower intensity (Winther, 2013), refugee camps have expanded rapidly and spatial arrangements meant for temperance have turned into permanent settlements, some at the size of cities. Yet, the fact is that in these wretched spatial structures people have been living for decades, generation after generation, especially in the case of Palestinian refugee camps. Kleinschmidt characterizes refugee

camps as the "cities of tomorrow". (Radford, 2015) due to the magnitude of populations living in refugee camps, but also to the average stay estimated seventeen years (ibid).

*"It may seem inconsequential in a city's existence, but it represents a transformational number in an individual's life" (Stevenson, 2011, p.139).*

Kleinschmidt's characterization of refugee camps developing as cities is supported by Dr. Bram J. Jansen defining a refugee camp as "a temporary place that slowly shakes its features of temporality through process of place-making that are similar to forms of urbanization" (J.Jansen, 2009, p.11). As seen from the historical examples above, in several cases, refugee camps have turned into permanent city structures or at least laid the foundation of the urban structures we see at the same sites today.

## European city planning ideal

Architect Herz claims that with the current universal guidelines in the Handbook for Emergencies, an image of an idealized European city starts to emerge that, in its belief in structured organisation and clear separation of functions, "...is reminiscent of those of early modernist urban planning of the 1920s" (Herz, 2008, p.283).

Yet, the planning and design discourse

remain on a purely technical level based then on a principle of neutrality (ibid), even though it is a built environment that is meant to be applied in places that are very much political, conflictual and ambiguous.

## Orthogonal design for order, functionality and efficiency

"After discussing criteria for site selection that take issues such as accessibility, climate and health risk into consideration, the handbook introduces the planning of the physical organization of the refugee camp through the tool of the master plan." (Herz, 2008, p.283)

The smallest unit is a tent meant for one refugee family, also regarded as the smallest basic unit. A camp is built as a modular form. Units of tents at 3.5 square meters per person are organized into Clusters, where 16 of these clusters make up a Block and four blocks make a Sector, each sector having a clinic, and a school. And, finally 4 sectors make up the complete camp which in its ideal case houses 20,000 refugees (Herz, 2008) Drawing of this modular planning approach can be seen on the next pages.

Herz point out that the spatial arrangement of a refugee camp is organized in this hierarchy manner to promote efficiency, functionally, especially hygiene and order:

*"The units of the camps are most often designed as orthogonal areas, creating a hierarchical matrix of spaces from the smallest unit of the tent to the camp as a whole. Smaller paths and non-motorized lanes separate clusters and blocks from one another, while roads for motorized traffic access the larger camp sectors" (Herz, 2008, p.283).*

## Segregational planning

*"Different ethnical groups are usually housed in separate camp blocks. Block and sector representatives of the refugees are divided along religious and tribal lines. Refugees are kept at a distance from humanitarian workers" (Herz, 2008, p.285).*

With this spatial arrangement it seems the organization of refugees strives to avoid mixing of different refugee groups and the goal seem to be a homogeneity of the different camp units. Herz claims this planning, motivated by the fear of violence between different refugee communities and/or other people in the camp, the refugee camp becomes a place of segregation.

## Problems with current refugee camps planning approach

The problem with this strict modular and orthogonal planning and design approach, that might be appropriate for efficiency and functionality, is that it is meant, being universal guidelines, to fit in any parts of the

world where emergency occurs. It is a planning approach to be applied anywhere regardless whether it fits this European city ideal or not. In other words, there is taken no account in knowledge and understanding of the local scene. The result of this planning approach is that "we end up with several hundred refugee camps in every part of the world and in every climate zone, but with the same plans used to build camps, no account is taken of the specific setting of the location, nor of cultural or ethnic aspects" (Ruta, 2012).

This together with UNHCR stressing the 20,000 as ideal amount of refugees in each camp, do not accommodate realistically for camp life span and population growth, making these guidelines outdated and inadequate to meet today's challenges in the case of coping with the ongoing refugee crisis. The handbook places emphasis on the emergency phase only and does not function as a guideline to develop camps over a longer duration of time.

There is a urgent need to rethink refugee camp planning approach to meet today's challenges due to the magnitude of migration flows and the duration of refugee camp settlements, acknowledging refugee camps' character as permanent structures and planning and designing them as such. Seeing refugee camps as places that grow and develop and may benefit the host communities rather than being a burden on the host nations.

### Minimum planning standard UNHCR 2015 and Sphere Project 2011

- 1 latrine per 1 family (6 - 10 persons)
- 1 water tap per 1 community (80 - 100 persons)
- 1 health centre per 1 camp (of 20,000 persons)
- 1 hospital per up to 200,000 persons
- 1 school per 1 sector (5,000 persons)
- 4 commodity distribution sites per 1 camp module (20,000 persons)
- 1 market per 1 camp module (20,000 persons)
- 2 refuse drums per 1 community (80 - 100 persons)
- Land 30 - 45 m<sup>2</sup> per person
- Sheltered space (tents, or other structures): 3.5 m<sup>2</sup> per person
- Fire break space: a clear area between shelters 50 m wide should be provided for every 300 m of built-up area. A minimum of 1-1.5 m should be provided between guy-ropes of neighboring tents on all sides

### Site selection factors of importance

(Greaney, 2011, UNHCR, 2015)

#### Topography:

- easy drainage,
- above flood level,
- avoid rocky,
- impermeable soil,
- grass coverage to prevent dust,
- avoid steep slopes,
- narrow valleys and ravines,
- slope 2-4%, to avoid erosion and need for earthmoving for constructions,
- avoid areas that are likely to become marshy or waterlogged during rainy season, subsoil quality in relation to infiltration and pit latrine, groundwater table at least >3m below surface camp site, if possible, select a site where land is suitable for vegetable gardens or small scale cultivation

#### Water resources:

- Reasonably close to adequate source of good water
- near high grounds with good surface water runoff and drainage
- at least one water point for 250 people

#### Land rights

- No purchase of rent, exclusive use
- agreement with local community on entitlement

- Refugees to carry out activities

#### Accessibility

- ensure adequate road infrastructure is reliable, also in rainy seasons
- site proximity to services

#### Security

- sufficient distance to international borders
- (>50km), conflict zones and other potential sensitive zones
- avoid extreme climate conditions, environmental or other risks,
- high winds can damage shelters and increase fire risks
- evaluate seasonal varieties

#### Environment and vegetation

- Ensure sufficient ground cover, vegetation provides shade, protects from wind, and reduces erosion and dust,
- avoid sites where dust clouds are common,
- avoid sites within 1 day walk of an environmentally protected area



### Placemaking in spaces of exception: environmental and sustainable solutions

Former UN High Commissioner Sadako Ogata said in 1992 that the “relationship between refugees and the environment has been long overlooked”(Harper, 2016). Now almost thirty years later there is still a critical time for refugees and their environment. Projects on environment and sustainability are regarded luxuries in these temporary settlements of protection. But when acknowledging refugee camps as permanent settlements sustainable solutions are crucial. Although aspects of landscape are mentioned in the Handbook for Emergencies recreation space and leisure are not. When human life is reduced to “bare life” and concerned mostly with provision of food and medications and other basic aid, activities of enjoyment are regarded almost as something disrespectful in a situation of conflict (Herz, 2011).

Place-making in refugee camps should not just involve highly technical solutions just for protection and containing people fleeing persecution, but involve strengthening life quality, liveability and wellbeing for refugees in states of exception, using landscape and the local scene as drivers for green, environmental and sustainable solutions that can benefit the refugee community as well as the host nations.

### Spacial planning and design as medium for politics

Yet, in the wake of acknowledging refugee camps as permanent structures it is important to be aware of especially two political aspects:

Political powers may often work against making refugee camps sustainable, permanent settlements as they regard repatriation as the solution for the refugee crisis, making sustainable planning approaches in humanitarian settlements a neglected issue and a political challenge.

Secondly, as Hertz writes:

*“(...) it is the spatial strategies and decisions made for a temporarily intended emergency support that become the permanent 'solution'. This reduces the urgency of dealing with the conflict and its political causes, as the 'human catastrophe' has been dealt with and contained. The permanent settlement, a solution with architectural means, turn into a strategy of sidestepping the political settlement”*

(2008, p.288).

The expertise of landscape architects and spatial planners within the context of humanitarian settings becomes then very much intertwined with politics as refugee camps are maybe the most direct translation of politics into space. As the spatial dimension of the camp is immediately influenced by

political strategies and decisions, as well as any spatial moderation, change or adjustment at any scale, resounds on a political and demographic level. (Herz, 2008).

*Opposite side: Drawing of a ideal masterplan.  
Drawn after the principles of UNHCR's Handbook for Emergencies' modular planning approach.*

### Modular planning approach

*Family*

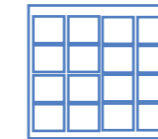
*The smallest unit: a tent (or other sheltered space) for one family*



5 persons

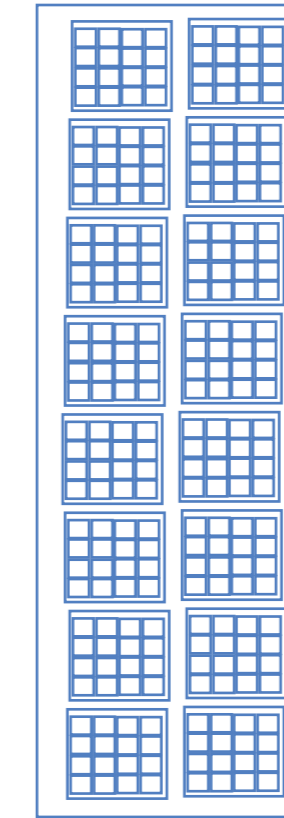
*Community*

*Camp cluster: 16 tents*



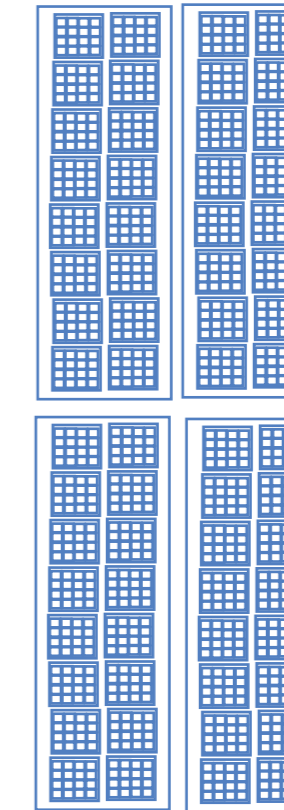
80 persons  
1 water tap  
2 refuse drums

*Block:  
16 clusters*



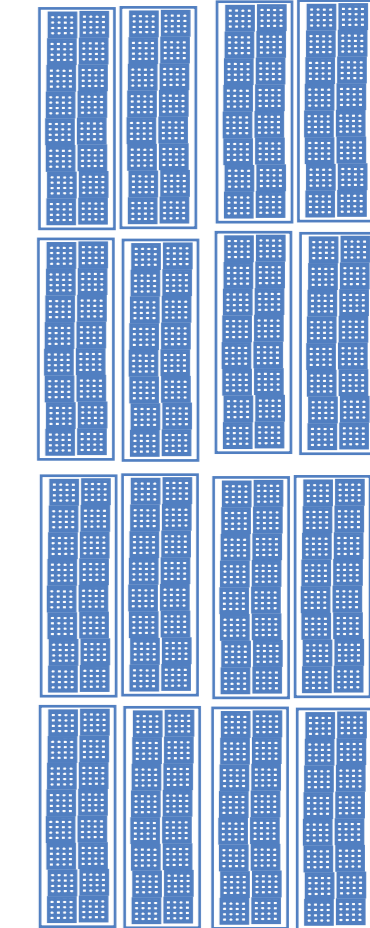
1, 250 persons

*Sector:  
4 blocks*



5000 persons  
1 school  
1 clinic

*Camp module:  
4 sectors*



20, 000 persons  
1 market  
1 health centre





## CHAPTER 2: **CONTEXT**

The Syrian war, the Middle East in general and Jordan specifically creates the regional backdrop to Al Za'atari refugee camp. What kind of situations is this really?

Understanding the cultural, political and historical context of this area is important.

In addition, this chapter gives some oversight into the numbers and statistics behind the refugee crisis in the region.

*Photo opposite side:  
Aerial view of Al Za'atari, looking in direction  
south-east. Main entrance gate in foreground,  
Al Souq street ('Shams-Elysees') prominent from  
main gate southwards.  
(Mandel NGAN/AFP/Getty Images, 2013)*



# JORDAN AS A HOST COUNTRY

## Historic overview

The history of Jordan as a host country for refugees goes far back in time long before the Syrian civil war started in 2011. Jordan has in fact been called the refugee “melting pot”(George, 2005) of the Middle east. This characteristic relates not just to the geographical location, Jordan situated between Syria in the north, Iraq in the north-east, Israel and Palestine in the west and Saudi-Arabia in the south-east, but also refers to the extend the variety of refugee flows have influenced the Jordan society both within political and economic structures.

## Variety of migration flows:

### Palestinian refugees

“Like most other Middle East states, Jordan is a recent creation, having been established in 1921 with borders drawn by European colonial powers. It soon became the first host for Palestinian refugees. These people have arrived in several waves since the creation of the State of Israel in 1948, forming a very large and integral part of the kingdom’s population”(Chatelard, 2010,p.3 )

In her article *Jordan: a refugee haven* known for being a thorough contribution on illuminating the history of Jordan as a refugee host country, yet written before the Syrian civil war outbreak, Gèrlandine Chartelard states that the Palestinian refugee flows have

been a challenge to the Jordanian regime, yet an indispensable asset to the country’s economic growth and development: “In particular, it has allowed Jordan to receive large amounts of development assistance from the international community to help resettle and integrate the refugees. The remittances of those Palestinians who went to look for work in the Gulf also played a major role in developing Jordan’s public and private sectors” (Chartelard, 2010, p.8).

### Iraqi refugees

Besides hosting Palestinian refugees, Jordan has also hosted refugees from Lebanon during the civil war 1975-1991 and Iraq since the Gulf War 1990-1991 and after the end of Saddam Husseins regime in 2003 and the following American military invasion, all flows of migration that have reshaped the labour supply and labour demand. Chartelard claims that Jordan’s economic development is bound to the dynamics of mobility: “On the one hand, this means the reception of forced migrants. On the other hand, this has evolved labour exports to feed the oil-producing Gulf states’ demand for foreign workers” (Chartelard, 2010, p.8).

### A shift in who that may emigrate to Jordan

Palestine refugees fall under the mandate of the United Nations Relief and Works Agency for Palestine Refugees in the Near

East (UNRWA). 2,175,491 Palestine refugees are registered in Jordan after UNRWA numbers. Palestinian refugees with Jordanian citizenship officially have access to public services, while those living in camps use UNRWA services.

The main Iraqi refugee flows are as mentioned the one during the Gulf War and the years that followed, the second flow those arriving after the fall of Saddam Hussein, Jordan being the only neighbouring country with open borders the years between 1990-2003. Yet, after several terror attacks in Amman in November 2005 by Iraqi nationals, restrictions on entry requirements were introduced allowing only those with capital entering Jordan, favouring only then the Iraqi educated middle class. This selective effect making the refugee flow consisting mainly of professionals (Nimiri, 2014, p.28).

Jordan has in other words, a history of receiving various migration flows mainly Palestinian and Iraqi refugees. Since 2011 Syrian refugees have entered in thousands. It seems Jordan manages to maintain what their neighbouring countries of political unrest do not: stability.

## The Jordanian response to the Syrian civil war refugee crisis

The current Syrian civil war has added strain on the recourses and capacities of the Jordanian government and the international humanitarian system, the following refugee crisis being the largest the world has ever seen. Since March 2011 11 million Syrians have fled their homes. There are estimated to be 666, 294 Syrian refugees in Jordan due to registered UNHCR numbers of November 2018. Jordan has responded by establishing 3 official refugee camps: Al’Zaatari, Azraq and Emirati Jordanian Camp.

Al Za’atari being the first refugee camp, and as of today also the largest, was established in 2012 to ease the pressure from Jordanian cities. Al’Zaatari expanded rapidly (see pictures in the chapter Analyzing Al Za’atari) and quickly became overcrowded and the year after Azraq refugee camp was established. Azraq was build on principles and lessons learned from the establishment of Al Za’atari. The third and smallest of the refugee camps are Emirati Jordanian Camp, also established in 2013.

### Refugees in urban settings

Yet, only 16,8% of the total amount of refugees in Jordan live in refugee camps. Remaining 83,2% live in urban settlements. A report by The Assessment Capacities

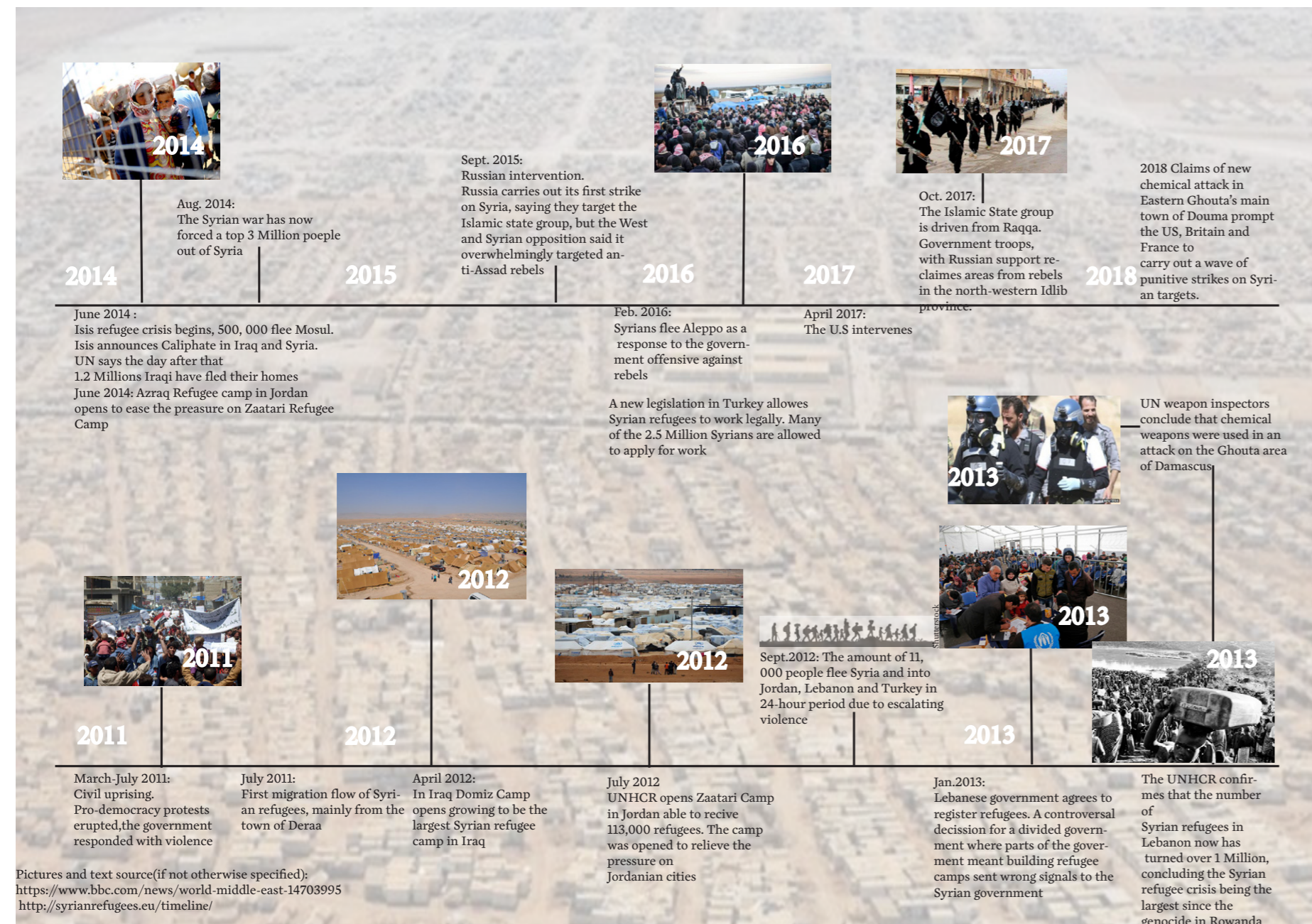
Project, a non-government project providing independent humanitarian analysis, states that the largest concentration of refugees living in urban settings in Jordan are:“(…)in the border areas of Irbid and Mafraq governorates and the capital Amman. Unregistered Syrians in urban communities have limited access to services. They cannot access the public health system; children cannot attend school for free; they are not included in the WFP food voucher programme; and they are not eligible for UNHCR’s cash assistance. There are, however, several NGOs that provide assistance to refugees regardless of whether they are UNHCR registered” (ACAPAS, 2016).

### Legal status and access to protection

There are regarded to be 3 categories of asylum seekers, persons who have applied for asylum but whose refugee status have not yet been determined, fleeing Syria and crossing the border to Jordan: there are those residing in refugee camps, second are those that have legal papers and therefore regularly residing the country, and the third and final group are those residing in Jordan without the required documents. (ACAPS, 2016). Jordan has not signed the 1951 Convention, yet is bound to the Convention against Torture and Other Cruel, Inhuman or Degrading Treatment or Punishment (1991):

“[Jordan] currently receives all foreigners, including Syrians, within the framework of its *Alien Law*. It is subject to the general principles of international law not to return refugees to a place where their lives or freedom would be threatened. Jordan is party to the *Convention against Torture and Other Cruel, Inhuman or Degrading Treatment or Punishment (Convention against Torture) in 1991, and is bound by its Article 3 not to return or expel any persons to states where they would be in danger of being tortured*”(ACAPS, 2016)





Timeline of key events in the Syrian Civil War and the Jordanian and regional response to the refugee crisis following the war

## Protection

Regarding protection refugees in Jordan fall under 4 categories:

- UNHCR recognized refugees
- Asylum seekers card holders under UNHCR's temporary protection programme
- Persons UNHCR rejected as refugees prior to 2003, but whose need for at least temporary protection may have changed because of the war
- Persons who have not approached UNHCR, but who fled persecution or generalised violence

*"The UNHCR in Jordan operates under a 1998 Memorandum of Understanding with the Jordanian Ministry of the Interior and is responsible for processing asylum claims and status determination. According to the memorandum, asylum seekers can remain in Jordan pending status determination, and UNHCR-recognised refugees can remain in the country for 6 months after recognition"* (ACAPS, 2016)

## Employment

The right to work in Jordan is, according to a Assessment Capacities Project's report, reserved for citizens."Non Jordanians with legal residency and valid passports must obtain work permits from the Ministry of Labour which show that the job requires experience or skills unavailable among Jordanians" (ACAPS, 2016).

## Education and health care

If Syrian refugee children are registered with UNHCR, they may go to public schools. Yet, additional costs make it hard for refugee's maintaining their children in the schools.

In Jordan health care is state-subsidised and benefit both citizens and foreigners. However, the subsidised Governmental healthcare system is overburdened and provides only basic care. Syrian refugees living in the urban community and registered with UNHCR, can access the public health system, as mentioned, while those living in transit sites and refugee camps receive shelter, protection and humanitarian assistance by the UNHCR. Syrian refugees registered with UNHCR may receive primary health care and education, according to the report.

The protection space for both refugees and asylum-seekers is then regarded to be favourable in terms of access to protection,

employment, education, health care and public services in Jordan. While not mutually exclusive the level of access to protection and public services varies among the different legal groups and whether resident in a urban setting within Jordan or in transit refugee camp settings.

*"The UNHCR in Jordan operates under a 1998 Memorandum of Understanding with the Jordanian Ministry of the Interior and is responsible for processing asylum claims and status determination. According to the memorandum, asylum seekers can remain in Jordan pending status determination, and UNHCR-recognised refugees can remain in the country for 6 months after recognition"* (ACAPS, 2016)



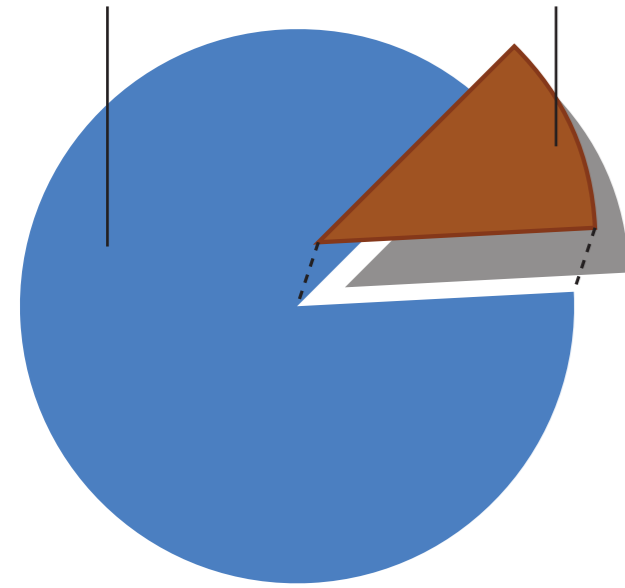
# FACTS & FIGURES

These are some of the numbers the refugee situation and Syrian war has produced. Most refugees do not live in camps, and most Syrians have fled elsewhere than Jordan. Still, some 751,275 refugees are registered by the UN as of 2018. The real number is likely much higher. Al Za'atari is the largest refugee camp in Jordan, and is a common first stop for people fleeing Syria.

All figures are from the UNHCR (2018). They do not include Palestinian refugees under the responsibility of the UNRWA, that counts more than 2 million Palestinians in Jordan (UNRWA, 2018).

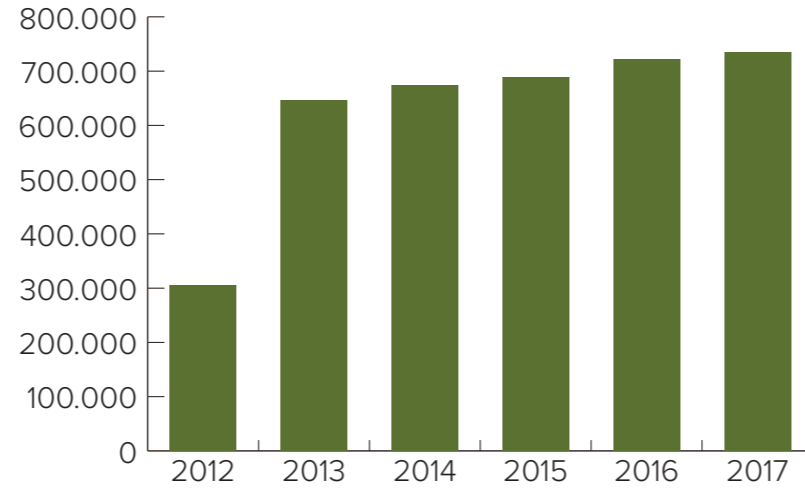
## Syrian refugees

In total: 5,646,298  
In Jordan: 666,294

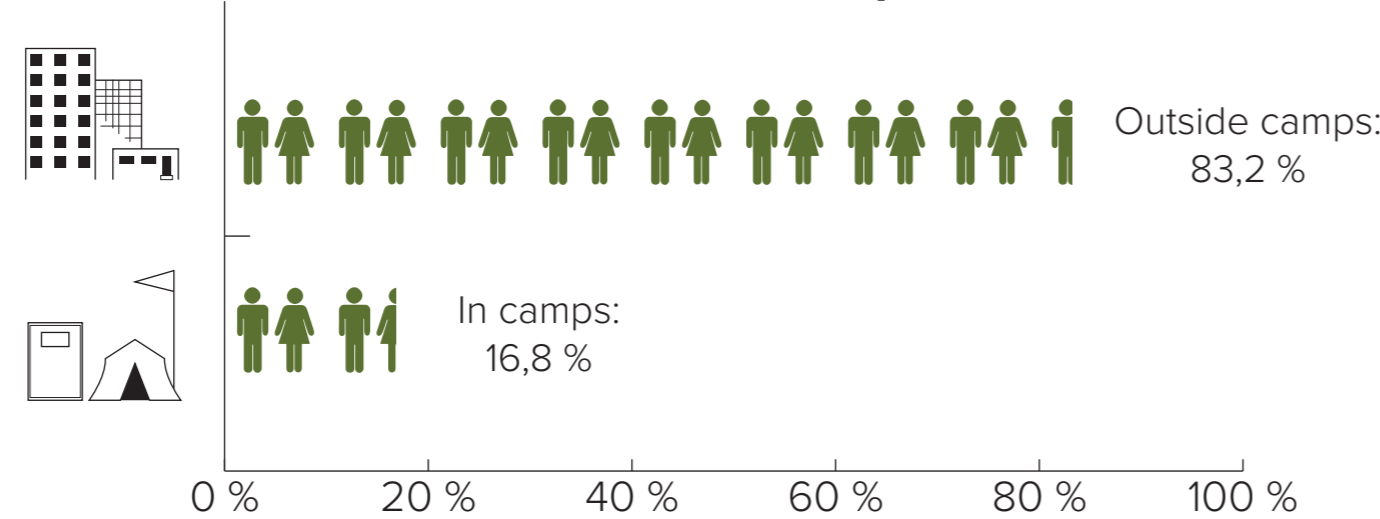


## Refugees in Jordan

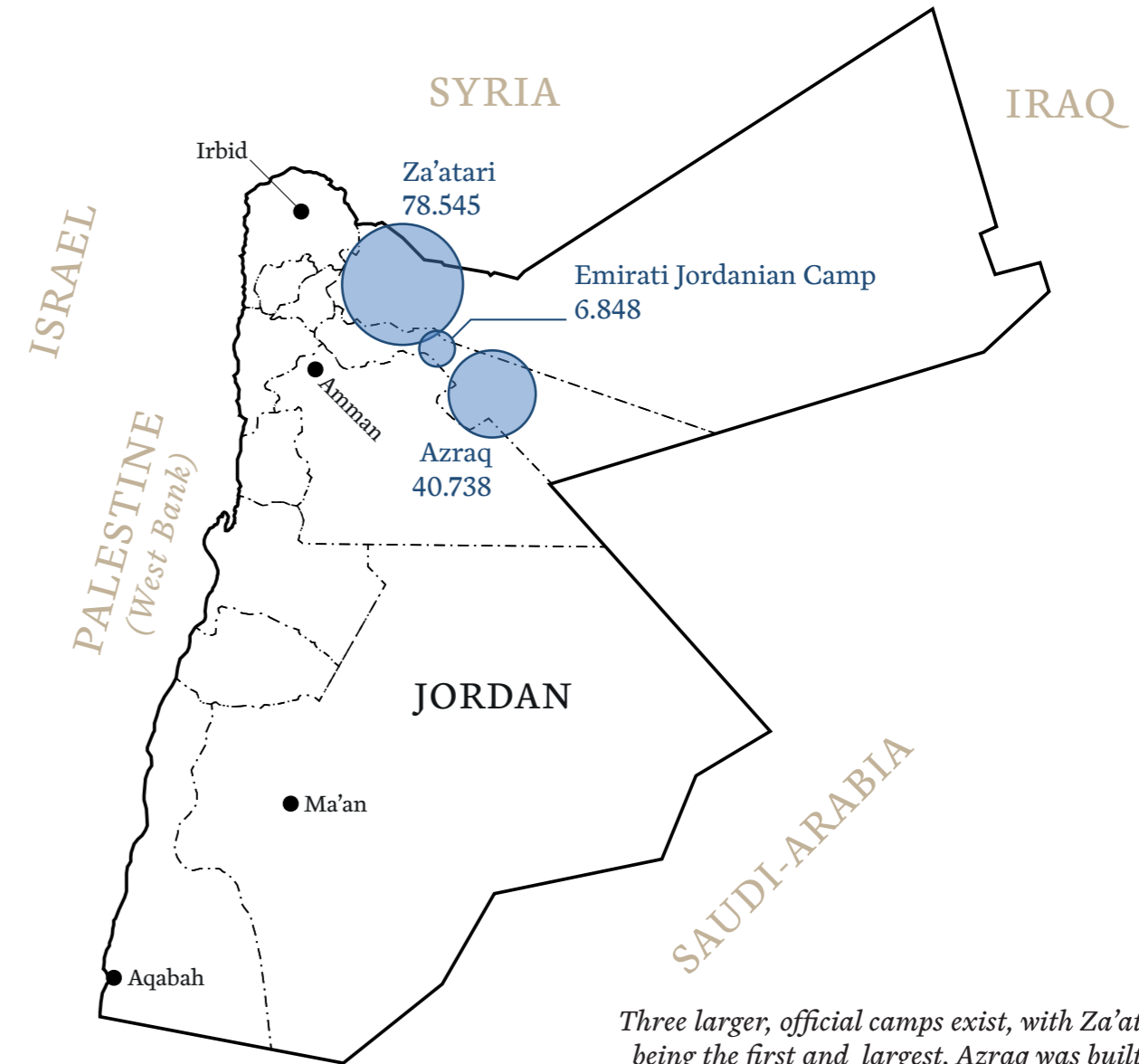
The Syrian war started in the wake of the Arab spring in 2011, and by 2013 over 600,000 refugees had fled to Jordan. This number is still increasing, albeit slower, and is now at 734,841 people. This is not only Syrians, also Iraqis fleeing the unrest in Iraq has moved to Jordan.



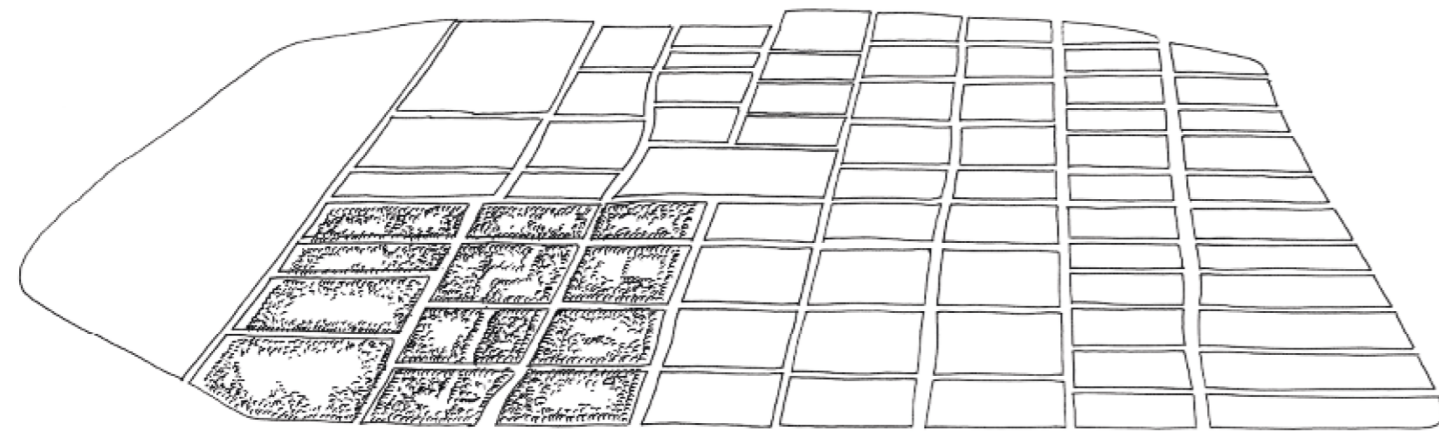
## Percentage of refugees in Jordan in camps/ outside camps



## Official refugee camps in Jordan (non-Palestinian)



Three larger, official camps exist, with Za'atari being the first and largest. Azraq was built on principles based on the experiences in Za'atari. The smaller Emirati camp is funded by the United Arab Emirates.



**New block structure (maximalized 70x210)**



**Existing block structure (maximalized 40x210)**

*Proposed block structure in Al Za'atari plan. (LOGOReP, 2016)*

## CHAPTER 3:

# LOGOReP PLANS

Some of the foundation for this thesis is the existing plans made by LogoRep, a local government aid programme set up by the Dutch government. These plans have been made to better integrate and utilise the possible values Za'atari camp may give to the region.

LOGOReP (*Local Government REsilience Programme*) was started as a programme by the Dutch aid organization VNG International, and has, since 2015, provided peer-to-peer assistance to Jordanian and Lebanese municipalities (LOGOReP). It was established as a response to the refugee crisis in the Middle East and Europe, and focuses on the long-term involvement and response of the municipalities, and co-operates with UNDP and UNHCR as well as Jordanian

and Lebanese governments.

It has resulted in three plans directly focusing on Al Za'atari and the surrounding region (the Mafraq):

- Mafraq Regional Scenarios
- Urban plan for Al Za'atari
- Wadi Park plan

We have looked at these plans with the following questions in mind:

- What does this mean for the camp?
- What is missing or not taken into account?
- What does this plan mean for our project?

All plans and documents can be found at: [logorep.nl/resources](http://logorep.nl/resources)

### What is LOGOReP?

- Dutch aid programme, led by VNG International, established 2015
- Established 2015
- Works with local governments in Jordan and Lebanon

Provides assistance in following fields:

- Water, sanitation and hygiene
- Sustainable waste management
- Governance
- Urban planning and public spaces
- Local economic development



# URBAN PLAN FOR ZA'ATARI

With a basis in the Syrian war and the following refugee crisis, VNG International and LOGOReP has been involved in humanitarian aid and development assistance in Mafraq Governorate since 2013. One of the results of this assistance, by the LOGOReP programme, is an urban plan for Al Za'atari camp. The plan is titled "Developing Zaatari - Urban Planning in a Syrian Refugee Camp, Jordan" (LOGOReP, 2016).

The plan was made in co-operation with the local government, Jordanian national ministries, UNHCR camp management, UNICEF and several NGOs, and has a tiered approach to the urban planning, starting at the international and regional level, then zooms into camp level, before in the end it goes into an infrastructure plan for basic services. The regional level is based on four scenarios, and the camp level focuses on larger measures that benefit the camp as it is today, and most of the different scenarios. The last level, the basic services level, will not be presented or discussed in this critique any further, as it is beyond the competence of the writers and more detailed and not as relevant to this thesis as the other parts.

→  
*Regional scenarios, as layed out in the plan. Two main drivers create two axes: Geopolitical situation and economic situation (Illustration: LOGOReP)*

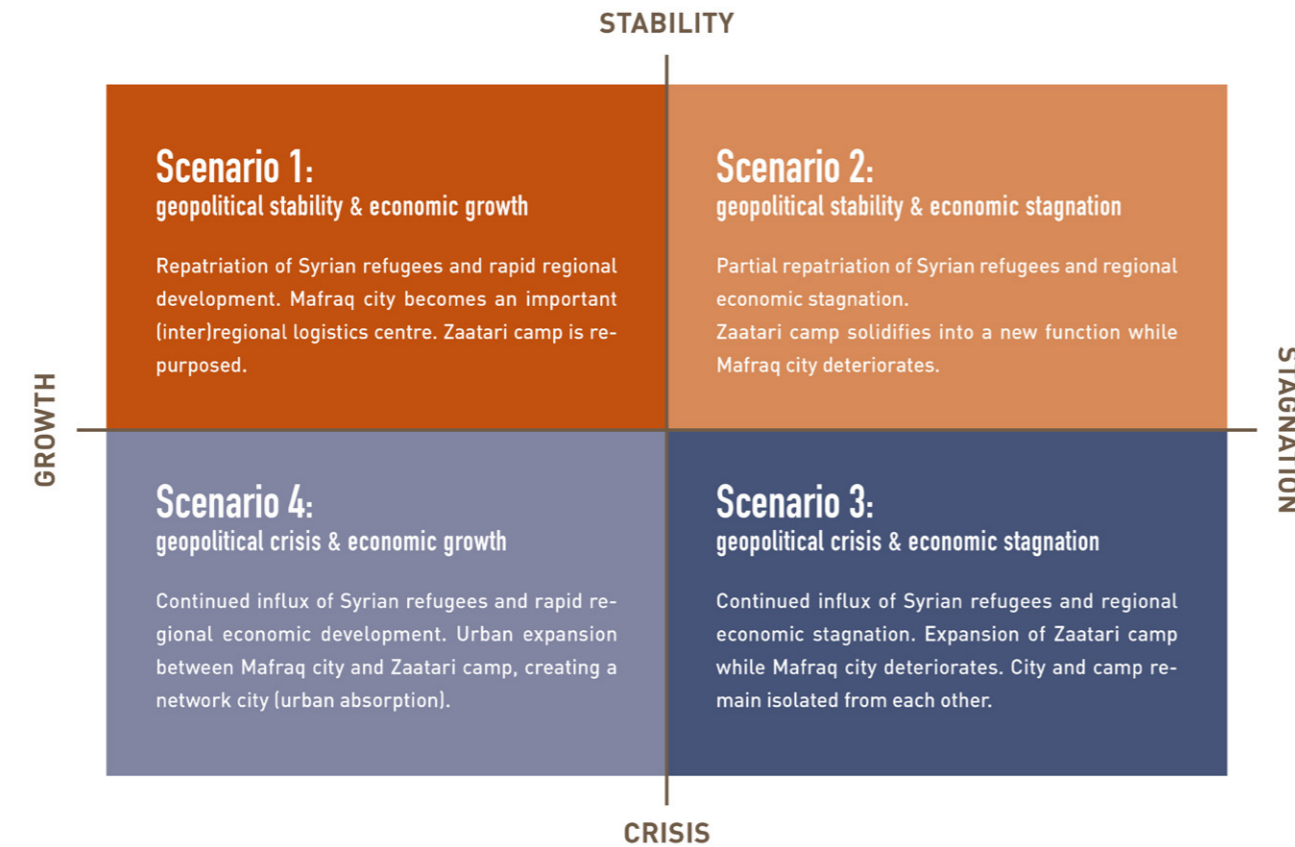
The main goal of the plan is to see how the structures and infrastructure investments in Za'atari can be utilized in the future as a more sustainable solution to the refugee crisis and the regional development.

## Method

All in all, the plan is a result of broad co-operation between LOGOReP, governments

and organizations. There has been a traditional process of participation, with workshops and meetings.

The regional part of the plan has been utilizing methods of scenario planning. The scenarios have been made in a process where they; 1: identified dominating variables; 2: looked at variables and risks; 3: envisioned four scenarios and 4: made strategies for future development from these. The scenarios



were then explored in the plan.

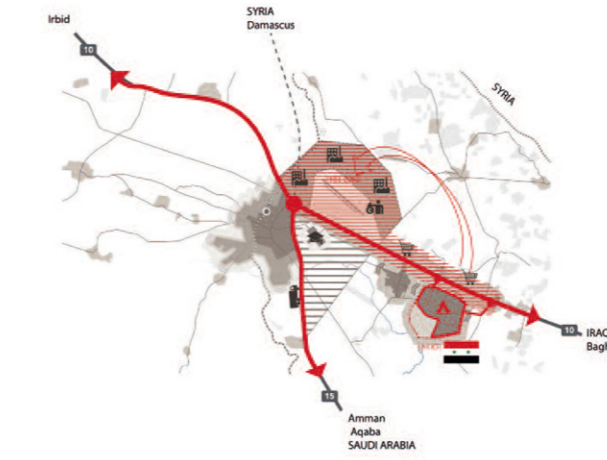
On the camp level, due to the uncertain nature of the development of the camp, most ordinary methods of urban planning have been scrapped, especially blueprint planning, with designated and precise spatial plans. However, a layer-based approach has been used. This approach is about thinking in hard and soft layers, where the *hard layers* compose the hard, physical structures - like terrain and block grid - while the *soft layers* compose the more dynamic, less frigid structures - like amenities and functions.

The methodology of the plan is well-suited for this particular case (though, of course, it's applicable to a lot of other urban contexts). With such an uncertain future as Al Za'atari's, there is little use in using very deterministic or rigid planning methods.

## Regional scenarios

The two dominating variables identified as influencing Za'atari today is the A) geopolitical situation (read: the war in Syria), and B) the economic development of the region and Jordan. These two has been put on two axes, creating four main scenarios for the region (see illustration):

1. Economic growth and geopolitical stability (no war in Syria)

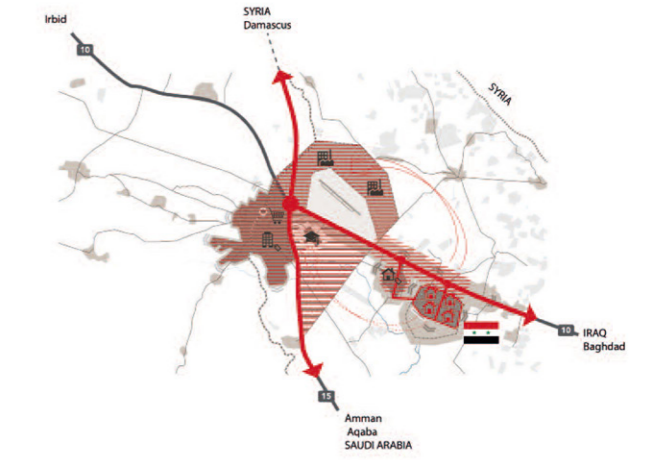


4A Mafraq 'free zone'

Strategies based on scenario 4: Geopolitical crisis and economic growth (Illustrations: LOGOReP)

2. Economic stagnation and geopolitical stability
3. Economic growth and geopolitical crisis (continued Syrian war)
4. Economic stagnation and geopolitical crisis

These scenarios depend much on whether there's economic development and if the refugee camp is still in existence. In all scenarios the result is plans that try to put the camp into a regional context. All investments in infrastructure and buildings in the camp are therefore seen in the light of the scenarios and how they can be used in the long-term as drivers for development and integration into



4B Zaatari as residential area

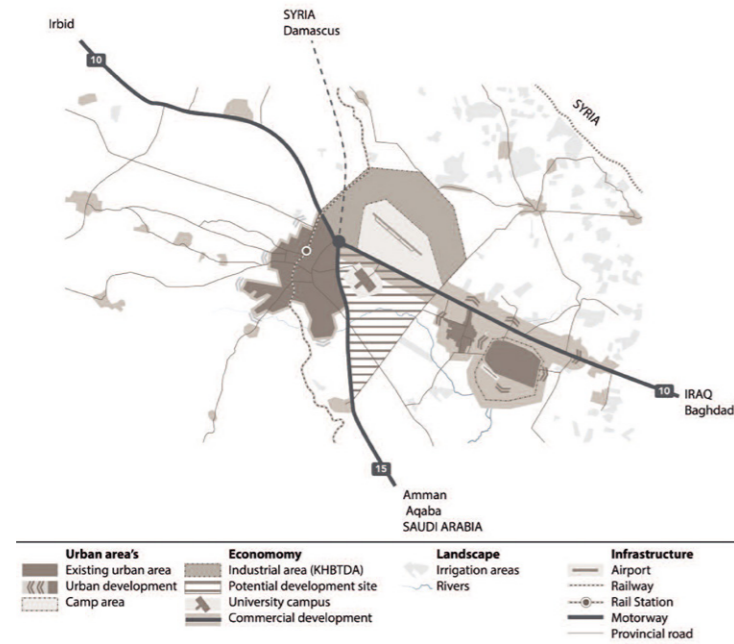
Different uses for the region and Za'atari's place in those are shown. To the left, a strategy for an economic 'free zone', right; Za'atari as a residential area.

the region, between the local community and the refugees.

The scenarios provide a good way of seeing future possibilities in structures as refugee camps. The different strategies based on the scenarios also make a lot of sense in the regional context and is a good way of promoting and exploring the benefits of a refugee camp, as opposed to the costs of having it nearby. They expose some challenges the region may face in the future, such as an increased refugee population, increased demand of water and a reduced food production along an increased demand.



Overview of strategic urban development plan for Mafraq region in scenario 4. Za'atari shown as urban development direction to/from Mafraq city. In an economic favorable situation, the refugee camp may be used as workforce and competence in a developing region. (LOGOReP)



The scenarios propose several different after-uses for Za'atari, provided it no longer is needed as a refugee camp:

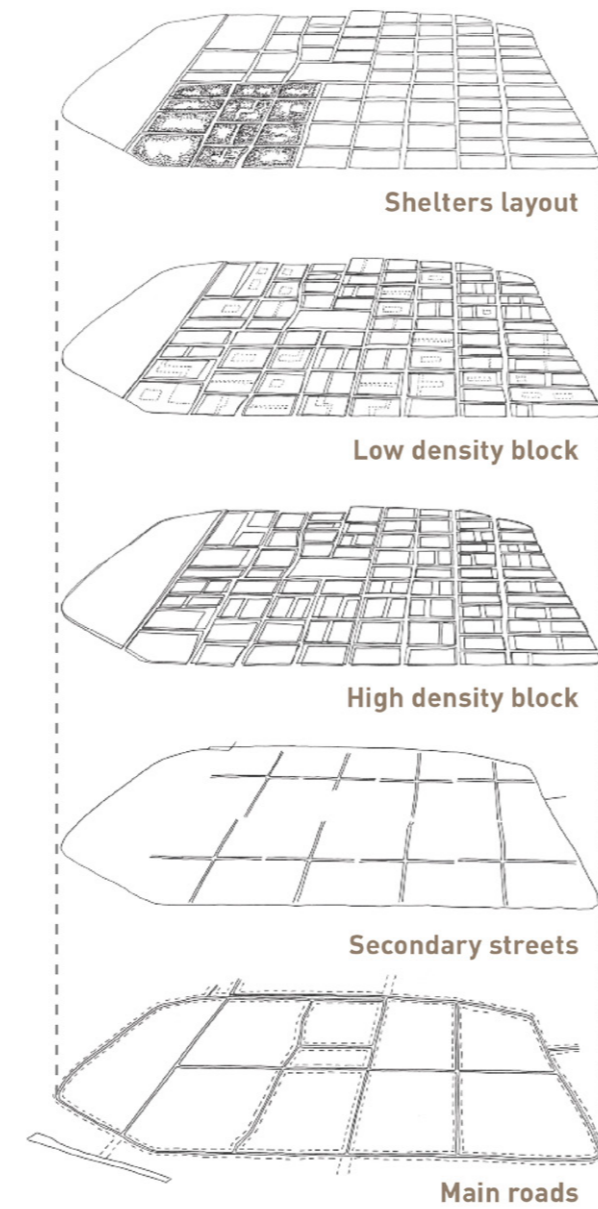
- Logistics center
- Agricultural production
- Village
- Suburban town
- Labour camp/military compound

These after-uses try to mitigate negative consequences of regional developments (as producing food or providing work for refugees), as well as build upon the added values in a continued camp existence. The backdrop they provide is - in general - a

positive one, a hopeful backdrop to the challenging developments of the region.

#### Camp level plan

The camp level plan concentrates on the hard layers of the camp: the roads, block structure, infrastructure and terrain. Very little focus and place is given to the soft structures - the contents of the camp. This is consistent with their view that the camp end-values is its infrastructure, not "its tents or caravans" as said in the report. Therefore, early work is needed, as not to solidify the existing structure of the camp (as has happened in other, long-lasting refugee camps).



Grid structure at different levels in the proposed interventions for the camp. (LOGOReP)

Within this frame, the main interventions that is proposed is:

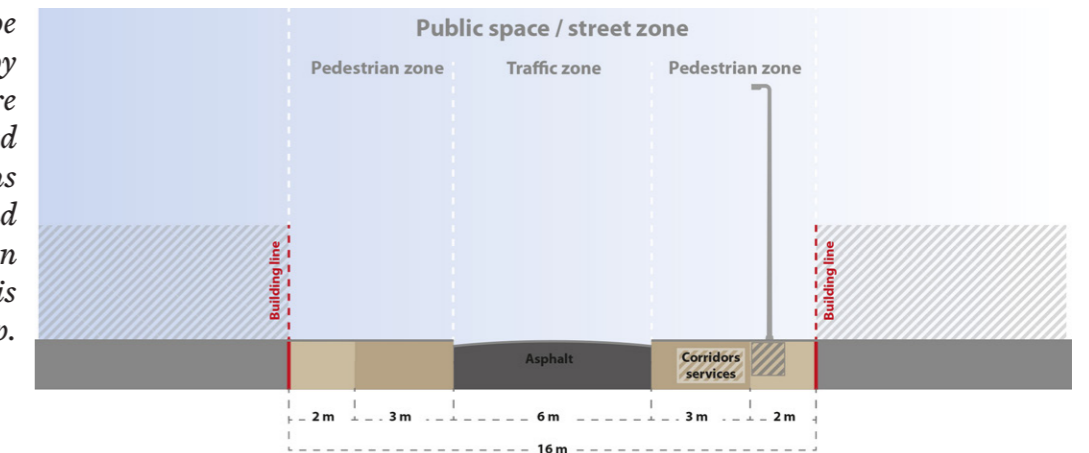
1. Define a hierarchy within the existing grid and decide which streets will become the main grid;
2. Make sure that the size of blocks and areas within the main grid is sufficient for a variety of future developments and land uses;
3. Make sure that the main grid will function as planned, with ample space for traffic, parking and public transport, commercial and public services. In the main grid the transverse street profile should be designed carefully with strictly defined dimensions;
4. Create underground infrastructure (electricity, sewerage, water) only in parts of the grid that correspond with the desired future block sizes;
5. Reserve zones adjacent to the main grid for future additions, which can be linked to the main grid like plug-ins. These could consist of a bus station, a clinic, a secondary school et cetera.

These interventions are a good foundation for the future development of the camp and provide a great deal of quality of life-improvements for residents. It seems though that the plan here is more concerned with not creating obstacles for any type of future use

than the improvement of the camp as it is: For instance, the lack of green infrastructure focus in these interventions are quite obvious (although there's some mention of it). Also, the plan could benefit from a bit more ideas as to how the bigger blocks can be organized - today the blocks are organized as they are on the basis of lot sizes and house size - the smaller blocks are the result of a need as well. Even though the plan does not want to go into the soft layers of the park, the organization of the blocks is still vital to how the camp function and how the refugees organize their lives.

Transport planning is also a part of the plan, with measures taken for public transport and pedestrian and bike infrastructure. There is a bus running around the ring road today, but the plan also proposes a better route with different stops - servicing both the perimeter of the camp and the central shopping areas. Bikes are also applied by aid agencies, and

New streetscape as proposed by LOGOReP. More space is allocated for pedestrians and services, and the organization of the street is straightened up.



promoting biking and walking is suggested.

In addition to this, a straightening of the streetscape with better place for pedestrians and services is supposed to both support the infrastructure developments made in water supply and such, and better the accessibility of the streets and especially main streets.

The plan also talks about place-making processes in a refugee camp. This part is interesting as it goes deeper into how communities are formed and how they spontaneously pop up in refugee camps. It is also noted how this spontaneous place-making can be further developed and encouraged by planning. Here, the plan delves further into how the districts and blocks can be organized: Building community spaces is important. This is a very important part of the plan and should be further developed. These community spaces should be based on local needs and



customs and is a good starting point for a green infrastructure intervention.

The final chapter is more engineering-based and says a lot about how the water supply, power supply and waste management parts of the camp should be invested in and supported as long term infrastructure investments. These investments can be repurposed and reused in later developments of the area.

The main interventions proposed in the plan are all logical and good measures to prepare the camp for an afterlife and may well be doing the refugees some good as well. Some exploration into how the soft layers of the camp should be formed when the grid structure changes would be good, though. As it stands now, in some sense it seems like the camp plan is more concerned with the infrastructural legacy of the camp, rather than the enhancement of the camp for the refugees.

### What this plan means for our project

The plan does not say a lot about the green structures of the camp, neither what is existing nor what can be the future. Some of the scenarios for the regional development, though, provide good arguments for the development for green infrastructure:

- If the camp is repurposed as an agricultural area, the green infrastructure is not in the way of the new development. Green pathways may still be used to lead runoff water away and contain said water for longer periods.
- If the camp is developed as a residential area/village/town, the green infrastructure will benefit future residents as well as current refugees.

Two of four scenarios stipulates that the camp will continue to exist for a prolonged time, in case of a continued political instability. This also means that any investment made in the green infrastructure, with the benefits thereof, will be even more worth it. This type of investment is also much easier to be made now, when the camp consist of relatively flexible and moveable structures, rather than later, when the phsyical structure has become more rigid.

In addition, making a green infrastructure investment at the same time as making other infrastructure investments, among them the increased grid size proposed in the plan, is

both cheaper and easier than making these investments later. The increased grid size also offers an opportunity to look at the inside of the blocks, and to fill them with green conections throughout the camp.

All in all, this development plan is not in the way of a green infrastructure plan, but is a good foundation for such work. To tweak it in a greener direction would be beneficial for the refugees, the region, the Jordanian government, and camp management.

*Opposite: Za'atari zoning map. This map is a zoning map of Za'atari, with plenty of space reserved for future development around the camp, and the main commercial and functional axes marked out through the park. The area between surrounding developments and the camp is filled with different developments, but the green infrastructure and the interior of the camp is less visible and/or planned out. (LOGOReP)*





# WADI PARK PLAN

Wadi Park Za'atari Jordan is a concept design project made in 2018 in cooperation with landscape architects Marie-Laure Hoedemakers and Amina Mnif from LODEWIJK BALJON Landscape architects and hydrologist Cedric Gijsbertsen, Wareco. The project was ordered by the International Cooperation Agency of the Association of Netherlands Municipalities (VNGI) and City of Amsterdam.

The base of the project is the wadi between Al Zaatari refugee camp and Zaatari Village in the Mafraq region in northern Jordan. A wadi is defined in Cambridge Dictionary as a valley, ravine or channel that is dry except in the rainy season. The goal of the project is that the wadi park will be a park to the benefit to both the refugee community and the host region.

## Key problems with the area

The project starts with identifying two key problems in the Zaatari refugee camp and the nearby surrounding due to prerequisites in the landscape and weather conditions:

- due to the clay-like soil and topography, rain causes flooding, and the whole refugee camp becomes muddy. This is a risk to the security as well as a factor to discomfort

- Shortage of water supply in the area: it is an opportunity of storageing the huge amount of water running down the wadi in the rain season for use when in short of water supply, that not yet have been taken to advantage in this area

Their concrete proposal is to slow down the water that flow through the wadi, by making a system of bypasses with side streams and dams, increasing then the storage capacity of the water system between Zaatari village and the refugee camp, as a basis for a park development. Shallow dams constructed by clay soil and basalt boulders slow down the water. Strains consisting of both narrow and

broader ones make it possible to plant trees in the wide streams (flood plains). Planted floodplains can be used as passages when in dry times. As a whole the park will result in a:

*“structure of wide planted flood plains. From both the camp and the wadi a tree line avenue for pedestrians and cyclists connects to the park. In the camp this connects to the shaded Health Loop; a shaded pedestrian route through the camp”*

(Hoedemakers 2018).

New pedestrian roads aswell as a extended Health Loop from inside the refugee camp and to the Wadi Park, make the landscape outside the camp easily accessible and the new water streams, dames and flood plains encourage to new meeting places, and may contribute to liveability and activities along these arteries.

Opening water streams and using the wadi for recreational purpose is a way to use landscape as a driver for shared experiences between the refugee community and local inhabitants in the Mafraq region, which they also state to be the goal for The Wadi Park-project. Yet, the functional aspect of the project, avoiding flooding by harvesting and redirecting rainwater seem to be the main occupation of this project with focus on sustainability in choosing materials as basalt and clay, easily accessible in the area, rather than seeing landscape architecture as a factor also to social sustainability.

*The planted floodplains that make up the Wadi Park. (Lodewikj Baljon, 2018)*



*The Wadi Park in rainy season. (Lodewikj Baljon, 2018)*

When the goal is to intertwine refugee community with locals why have they not, in a wider extend, integrated the new water streams inside the refugee camp, but only redesigned the wadi outside the camp? There is also just one pathway connected to and leading in and out of the camp and to the Wadi Park in addition to the Health loop and one pathway leading to the main road, in an area stretching several hundred meters.

## Relevance to our proposal

Harvesting and redirecting rainwater gives opportunity for greening in the area. Greening that will improve public spaces inside the camp is what our project proposal for Zaatari Refugee camp is concerned about. The Wadi park plan is therefore a prerequisite to our plan. Especially of relevance to our proposal is registrations of water streams in and outside of the refugee camp and their proposals of trees that may grow in an otherwise dry area. Also of relevance is their proposal on a participative process in achieving their project encouraging social meeting between the refugee community and locals when establishing new spatial structures.





## CHAPTER 4: **ANALYSIS OF ZA'ATARI**

### **Introduction to the Za'atari refugee camp**

Al Za'atari refugee camp in the Mafraq Governorate of Jordan opened the 28<sup>th</sup> of July 2012, located a few miles south for the Syrian border. It was built in the short time of two weeks, as a response to the Syrian Civil War, to meet the huge amount of refugees crossing the Syrian-Jordanian border. It is supported by the UN, partner organizations and the government of Jordan.

Since its opening it has developed and expanded to become the world's second largest refugee camp and Jordan's fourth largest city and serves well as an example of the tendency

described earlier: camps turning into cities. Initial views by the Jordanian government erupted some tension during the planning of the camp, with concerns that it would become a permanent city as the government had an interest in the Syrian refugees leaving at the end of the conflict (Nimiri 2014). The Syrian civil war now being in its 7<sup>th</sup> year, UNHCR estimates that the camp is being the home of almost 80,000 refugees, 20% of them under the age of 5 years old. In total almost 500,000 refugees have passed through the refugee camp since its opening.

How does the camp work?

*Photo opposite side:  
Picture of street in Al Za'atari.  
(Nina Berman, 2014  
[www.darkcenter.org/content/syria](http://www.darkcenter.org/content/syria))*



## PLANNING AND DEVELOPMENT

The Jordanian government provided land from a former military base, an area of total 5.3 square kilometres, to be used as refugee camp area, surrounded by a ring road that is 8.3 kilometres, in 2012 at the start of the civil war in Syria (Ledwith 2014).

Za'atari started expanding from the northwest side of the camp. The settlements then spread south, eastward, eventually filling the centre north part of the camp (Huynh, 2015). As seen from the figure on the next pages, the camp expanded rapidly in a 7-month period of time when in September 2012 consisting of 2,400 shelters to only seven months later in April 2013 expanded to a camp of 25,378 shelters (Huynh, 2015).

As seen in the orthophotos the shelters are organized in strict lines in September 2012. Just two months later the shelter pattern is denser occupying space that before used to be empty. By 2013 the shelters have started to organize in pattern of smaller clusters, to better meet community structures and resist this strict military pattern. This structure had to depart, when even more space was occupied by new migration flows. Also a main crossroad was built at the centre of the camp (Huynh, 2015).

The refugee camp being an emergency response established in a short amount of time, Zaatari started with small tent-infrastructure, with little space in between, structures that

still can be seen today in the old parts of the camp (west side) (Nimiri 2014). Further on, the formal layout of the camp became a grid system with caravans placed in rows, recommended by the UNHCR guidelines. The spacing of the caravans is designed to accommodate vehicles, guard against fire, and promote hygiene (Ledwith 2014).

The refugees has reorganized the caravans into smaller, denser units, with to/three caravans each. This has led to an increasingly chaotic structure, but has been addressed in future plans for the camp, where these smaller units and clusters are planned to become more permanent.

### Management

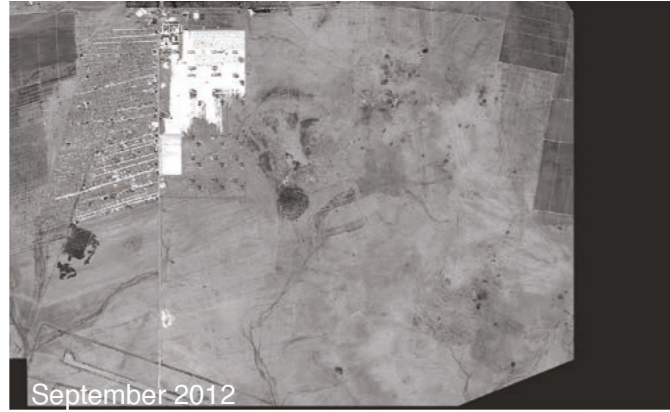
The camp management is a cooperation between the Jordanian government and UNHCR, while NGOs and other organizations provide basic services. In addition most other functions in the camp, such as schools, hospitals, sports facilities and community facilities are managed and run by different organizations, some NGOs other official humanitarian governmental organizations.

As seen later, the refugees themselves have organized a vibrant economy, with shops and businesses tending to the everyday life of camp residents.

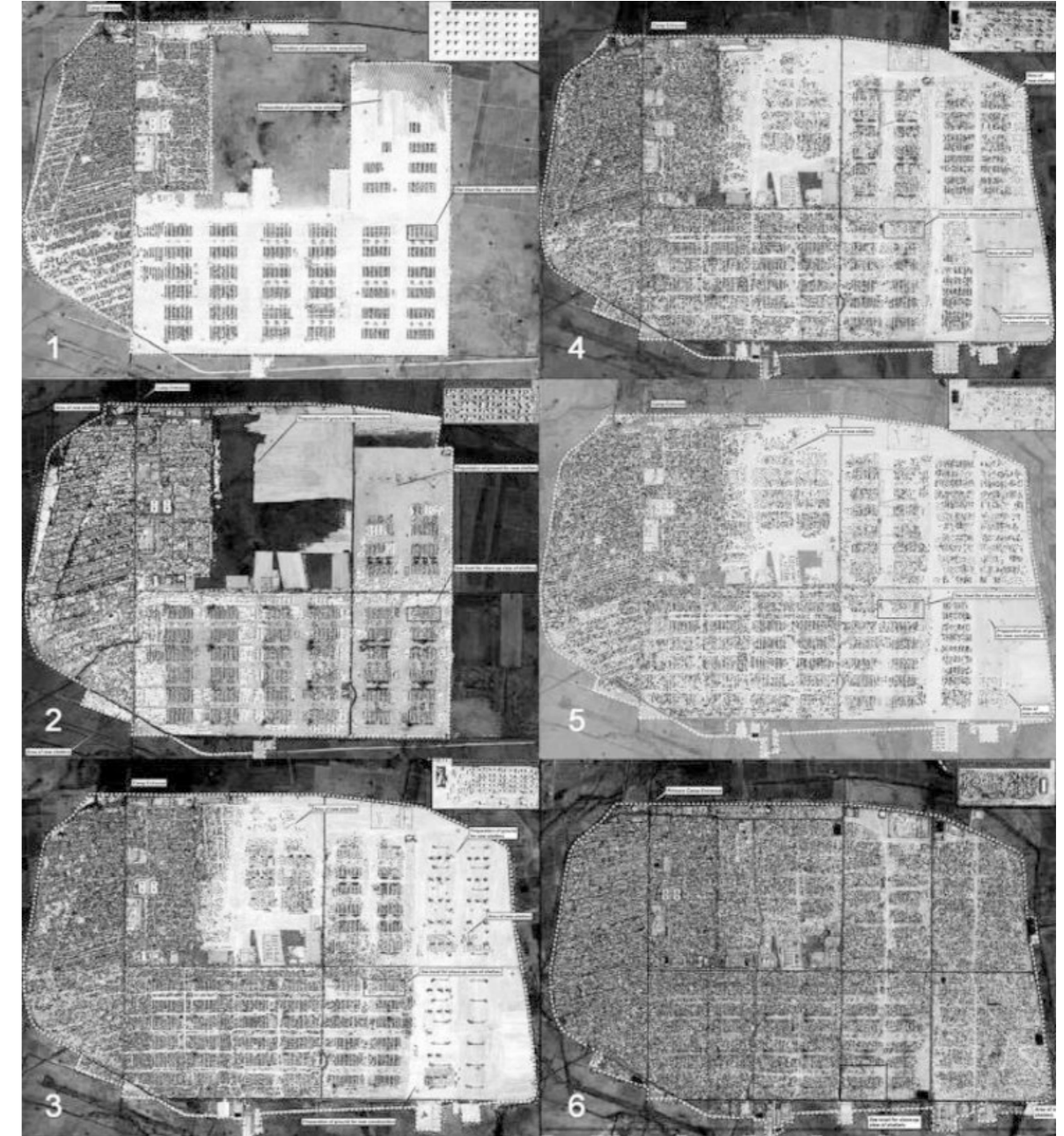
### List of stakeholders and organizations involved in Za'atari refugee camp

- Jordanian Ministry of Planning and International Cooperation
  - Jordanian Ministry of Municipal Affairs
  - Jordanian Ministry of Water and Irrigation
  - Syrian Refugees Affairs Directorate
  - Governorate of Mafraq
  - UNHCR (United Nation High Commissioner for Refugees)
  - UNHCR Geneva, Amman and Za'atari
  - UNICEF and UN Development Program
  - NGO's: ACTED, Oxfam, ILO
  - World Bank
  - World Food Program
  - UNESCO (UN Educational, Scientific and Cultural Organization)
  - IRC (International Rescue Committee)
  - IOM (International Organisation for Migration)
  - NRC (Norwegian Refugee Council)
  - Host Communities Support Platform
  - Aid projects managed by the EU and other countries
  - Office for the Coordination of Humanitarian Affairs
- (UNHCR, 2018)





*Expansion over seven months, from September 2012 to April 2013. (Ledwith, 2014)*



*Rapid expansion of Za'atari refugee camp during 2013 (Reliefweb, 2013)*



# ZA'ATARI CAMP AND THE REGION

## The Mafraq region

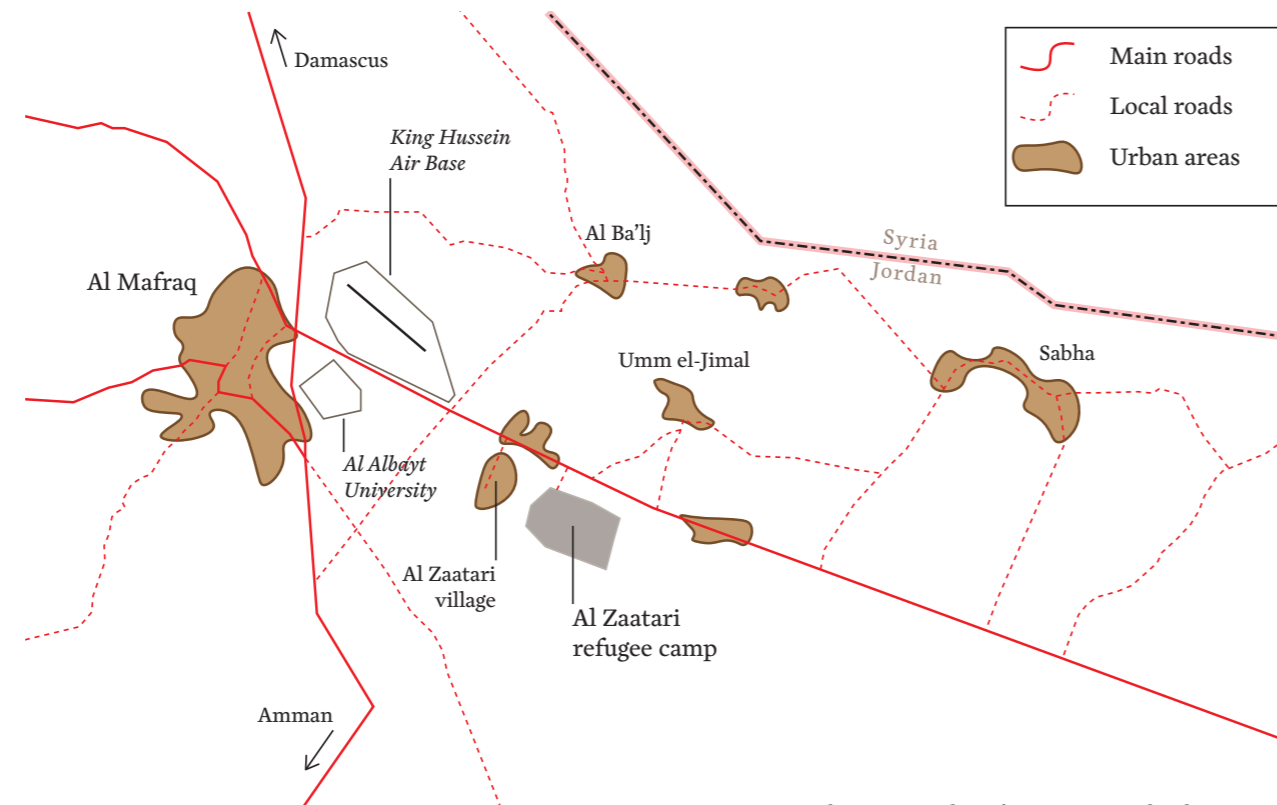
The northern part of the Mafraq region, where Al Za'atari is located, borders to Syria and Iraq. The first migration flows from Syria in 2011 came mainly over the border from the towns Daraa, Homs and Damascus, the Mafraq region then became a strategic and natural location of a refugee camp, meeting UNHCR's minimum standard demands of site selection. The refugee camp is also situated close to the village Al Za'atari. The region is situated north east of the capital of Jordan, Amman, and is one of the least populated regions of the country, with about 300, 000 people.

The region is economically depending on agriculture, growing vegetables and fruits, gas fields and the presence of military bases (LogoRep, 2016).

The development of Mafraq region is also intertwined with the economic development of Jordan and the outcome and duration of the Syrian civil war. Due to the complex situation in Syria the future of Al Za'atari refugee camp remains uncertain.

### Challenging effects on the region

The influx of Syrian refugees since 2011 has given both economical, social and spatial challenges on the region.



Map showing Al Za'atari, marked in grey, in a regional context, with border to Syria and directions to main cities.

## Economic effects

The Jordanian Government has developed a National Resilience Plan in attempt to respond to the refugee crisis, a plan that, among other issues, also describe the economical challenges, on a national and regional level. The Mafraq region is mentioned as the region with the most massive pressure on social, economic, natural and institutional resources among with Irbid, Amman and Zarqa. Main key economical challenges are the refugee crisis' impact on the job market and inflation:

*"Despite hosting the Syrian refugees, Jordanians have also found themselves confronted with additional competition from Syrians in local job markets, with a worrisome increase in child labor. This has put downward pressure on local wages and caused food, fuel, rent and water price inflation. In some areas rent alone are reported to have increased by 300 percent. This has placed a squeeze on household budgets and living standards. Vulnerabilities among Jordanians are beginning to reappear in households that had not long since escaped poverty. In those areas most affected by the refugee influx all populations are affected in some manner. But as in all crisis, it is the poorest and most vulnerable Jordanian households, and the most vulnerable people within them, that are impacted the most."*

(National Resilience Plan, 2014, p.11)

Yet, the economic effects are not all bad. Representatives for private sector, also chambers of industry and commerce regard refugees as an important source for new investments that may have a positive effect on the overall economy and on the local community in Mafraq. A report by Jordan Independent Economy Watch states that: "(...)many industrialists in the northern governorates of Irbid and Mafraq see that attracting Syrian investors, and promoting small and medium-sized industries, especially in the food industry could bring considerable benefits to the economy" (Independent Economy Watch, 2015, p.24) Cities in Mafraq and Irbid both have factories specialized in food manufacturing that have re-located from Syria since the crisis, factories that cooperate with local Jordanian farmers to cultivate products that may be processed and exported. This cooperative has a positive effect on the agricultural and industrial sectors in the region.

## Social and spatial effects

In a small region as Mafraq, with a population of only 300, 000 people a sudden increase of several thousand people and a development of an instant city as Al Za'atari refugee camp is, has to be a source to social tension between the Jordanian host community of Mafraq and the refugees living in the area, as well as it puts strains on the spatial capacity, natural resources and regional infrastructure.

The Mercy Corps, a global humanitarian organization, has done a report interviewing members of the Syrian community and the Jordanian community in Mafraq. Besides describing the impact on the job market as a source for tension, the report also highlights housing issues and spatial capacity as sources of social tension: "Rental prices have skyrocketed at the same time that availability has plummeted. Jordanians also complain that they have been priced out of their own housing market." (Mercy Corps, 2012, p.2) And further: "Jordanians express deep frustration over the housing situation and the consequences of having to share limited space with thousands of visitors" (Mercy Corps 2012, p.3)

The Syrian community also express discontent with elevated rents, the report states. The refugees are mainly depending on income from aid organizations. Yet, the opening of Al Za'atari refugee camp lessened the aid resources to refugees living in Mafraq's



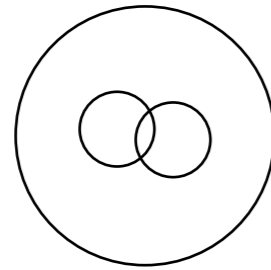
towns and villages, due to the overwhelming need of those recidenced in the refugee camp.

Other more visible, physical and spatial effects Za'atari refugee camp have on the region are the damage on roads due to all the water tanks needed to service the refugee camp. The strain on the local water supply is also severe. In addition, the lack of no internal waste managment in Za'atari refugee camp causes enormous pressure on the regional infrastructure. And futher, the lack of sewage systems is a crucial problem in the camp. The wastewater dripping directly into the soil is i serious threat to the reservoir, a threat that may escalate to a regional level (Kruijt, 2014).

### Challenges and oportunities

The main challange with Za'atari refugee camp in a regional context, due to the effects described above, seem to be to connect the refugee camp to its regional sourroundings.

The refugee camp as an instant city in a small region as Mafraq, and the crisis enduring, the host community have reached their capacity. Therefore, there is a need to rethink Za'atari refugee camp as a permanente spatial arrangment in the Mafraq region, and planning and designng the camp to connect and integrate economically, socially and spatially with the region.



*Connecting with the region*

The establishmnet of Za'atari refugee camp has challanging effects on the Mafraq region, but the reports illuminated above also show the refugees benfit the local economy by trade and are not only relaing on aid as passive individuals. Za'atari refugee camp, as spatial arrangment, first built as a emergceny space has a organic development inivitable to the host region and is a most important contriubting factor to developing the Mafraq region.

*Al Za'atari village in front  
and the refugee camp in  
the back  
(LogoRep, 2016)*





# FUNCTIONS

The refugee camp consists of functions similar to a average large city, such as hospitals, schools, mosques, ware houses and shopping street. Functions are spread all over the area of the 12 districts, but with main functions such as those regarding health and education situated in District 5, in the centre of the

refugee camp, along the main road Al Yasmin Street (see UNHCR map). Placing the main functions of the refugee camp in the centre of the camp is equivalent to the conventional refugee camp planning approaches criticized in earlier chapters. It also confirms Za'atari refugee camp's development being similar to

city centre development in any average large city.

Kilian Kleinschmidt, UNHCR camp manager in Za'atari, explains that the oldest part of the refugee camp, District 1, have turned into the 'slum' part of the refugee camp

or 'down town', while the districts closer to the main functions have some better standard, making the refugee camp segregated by zones of more or less developed districts common to how a urban city structure develop by population growth (Ledwith, 2014).

## Education

Non-Governmental-Organizations (NGO) and aid organizations contribute to social infrastructure in Za'atari. Yet, these contributions are insufficient and non existing in some key areas, promoting Syrian refugees themselves to develop a social infrastructure of their own (Ledwith, 2014).

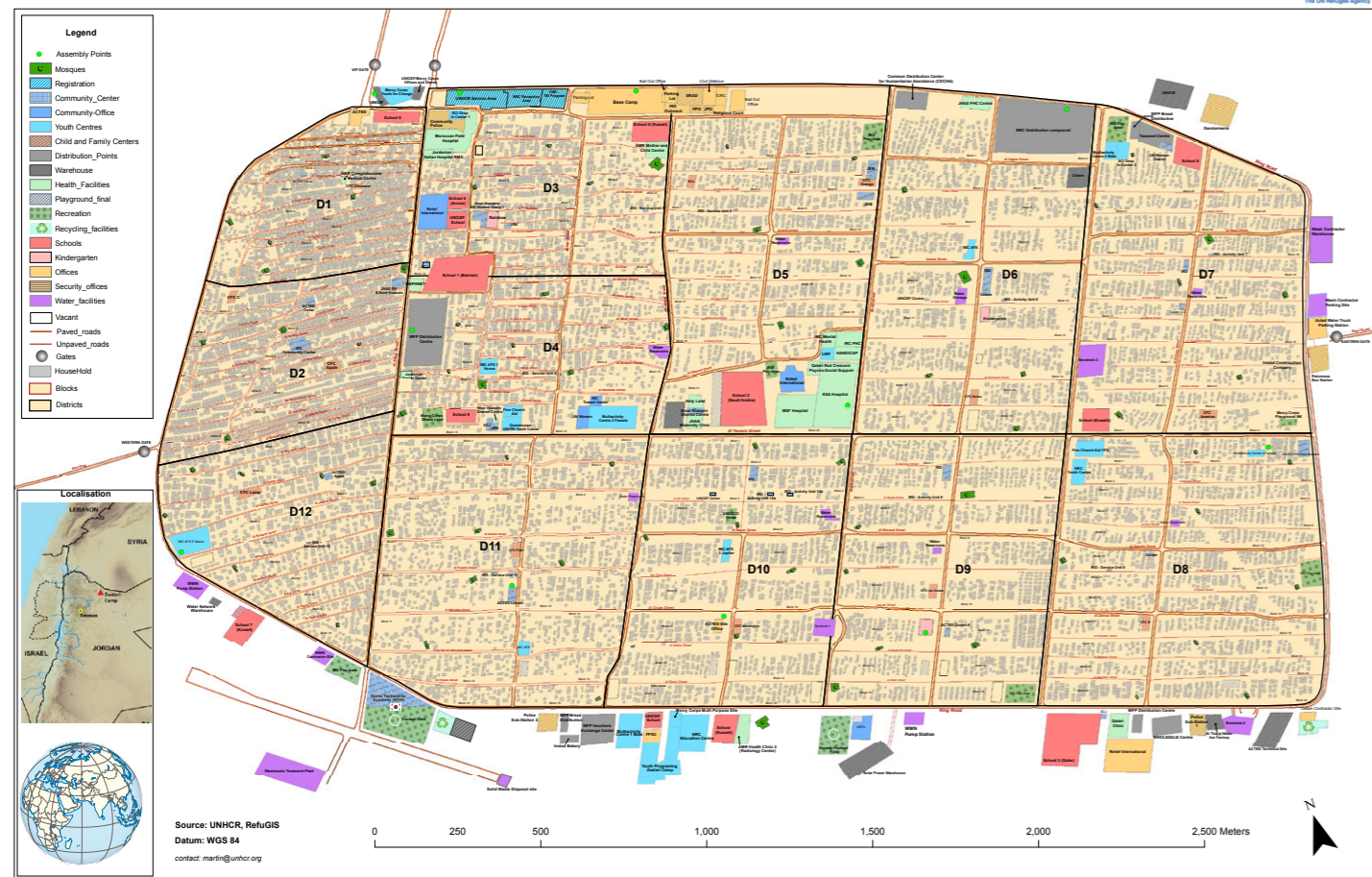
There are 14 school complexes in the refugee camp (Fricker, 2017). Syrian teachers may work as assistants, but the the Jordanian Ministry of Education, that certify the schools do only certify schools with Jordanian teachers (Ledwith, 2014).

Yet, not all children attend school although the facilities are available. Reasons children do not attend school include harassment and violence to, from, and during school, abuse and corporal punishment from teachers, desire to remain with family, employment needed to support the family, travel distance and insufficient toilet facilities (Ledwith 2014).

### JORDAN

#### Al Za'atari Refugee Camp - General Infrastructure Map

as of 06/04/2017



UNHCR GisMap of Functions and General Infrastructure in Za'atari Refugee Camp

## Map of main facilities: Education and Health



The schools are segregated by sex. Girls attend school in the mornings, while boys attend in the afternoons (Ledwith, 2014)



## Health

Three main hospitals help to ease the pressure of physical and psychological impact the crisis is having on the refugees, as well as health and sanitation problems that occur among huge populations living in informal conditions. Yet, as seen from the UNHCR mapping of functions, the Zaatari medical system is made up by partner organizations and smaller clinics as well as volunteers:

Health facilities available:

- The IMC Clinic
- The JHAS Clinic
- The Jordan Italian Field Hospital
- MDM Clinics 1 and 2
- The Moroccan Field Hospital
- The Saudi Clinic

When settling the refugee camp hospitals operated in tents, but was by the summer 2013 established in caravans (Ledwith, 2014).

## Water supply

The United Nation Children's Fond (UNICEF) and the Agency for Technical Cooperation and Development (ACTED) are the main providers of water to the camp. Water is available by water tanks (marked as water facilities in the map). To improve efficiency, cost effectiveness, sustainability and the overall quality in service delivery, in 2016 three internal water wells were established with a combined daily capacity of 3,800m<sup>3</sup>, and a wastewater treatment plant with a capacity of 3,600m<sup>3</sup>/d; to meet the needs of the camp's population. (UNHCR, 2018)



*A boy by a water tank in Za'atari (Ledwith, 2014)*

It is not yet piped water to every household, although plans are initiated, but when the improvement of proper water supply will be a available function is not made clear (The Share Project, 2011).

And with so many tankers entering the region, Jordanians have long-term fears regarding the over-pumping and pollution of the aquifer beneath Zaatari, one of the most important water sources in one of the ten most water-poor nations on the earth (Ledwith, 2014).



*The total number of kilometers with illegal electrical wires in the refugee camp are: 300 km (Ledwith, 2014).*

## Electricity

The United Nations funds, installs, and maintain the electricity used for streetlights and other key infrastructure in the camp. The UN is unable to provide equal lighting service to all areas (Ledwith, 2014.) Therefore, it is not unusual that the inhabitants of Zaatari illegally tap the street light grid for their own private electrical systems. This spaghetti-like connections of streetlight electricity makes the maintenance of the streetlight grid difficult and the illegal electricity connections a safety issue.

## Leisure and recreation areas

The main public open spaces in the refugee camp are the football fields and playgrounds. But they are not many, as seen from the map of religious and recreational facilities on the next page. The few football fields and playgrounds available have been made by the help of the Jordanian Woman's National Team and by resources from the United Kingdom and South Korea. An own, shielded women's football ground also exists (Ledwith, 2014). Al Za'atari refugee camp is yet another example confirming that space for leisure and recreation is a neglected area in refugee camp planning and design.

In lack of green recreation spaces, there is a starting tendency in Al Za'atari, that some

refugees make their own open, green space for private use, in connection with their living space. This tendency consists of both gardens as well as agriculture. Some refugees also sell vegetables they have grown themselves at the local market. The refugees make their surroundings more lively and make the surroundings resemble their old homes in Syria. The gardening gives a sense of meaning, working with their hands and a feeling of accomplishment as well as sustenance in addition to the food provided by the World Food Programme. (WFP, 2014).

The interment design dominating the refugee camp lacking public space between straight lines of shelters, confirms little



*Children from one of the Youth Centres in Za'atari are learning about agriculture (WFP, 2014)*

has changed in refugee camp planning and design approach since the first refugee camps emerged just after the Second World War, designed after the principles of military camps. "As Zaatari has strongly demonstrated, this type of design does not work because it does not cater to existing family and community structures and the needs to live a dignified life. In response to the lack of humane design, refugees have made changes on their own to the built environment." (Huynh, 2015, p.41)

These small gardens in connection to the refugees' living space is a proof of both empowerment, craftsmanship and resilience among the Syrian refugees living in Za'atari.



### Religious life in Za'atari

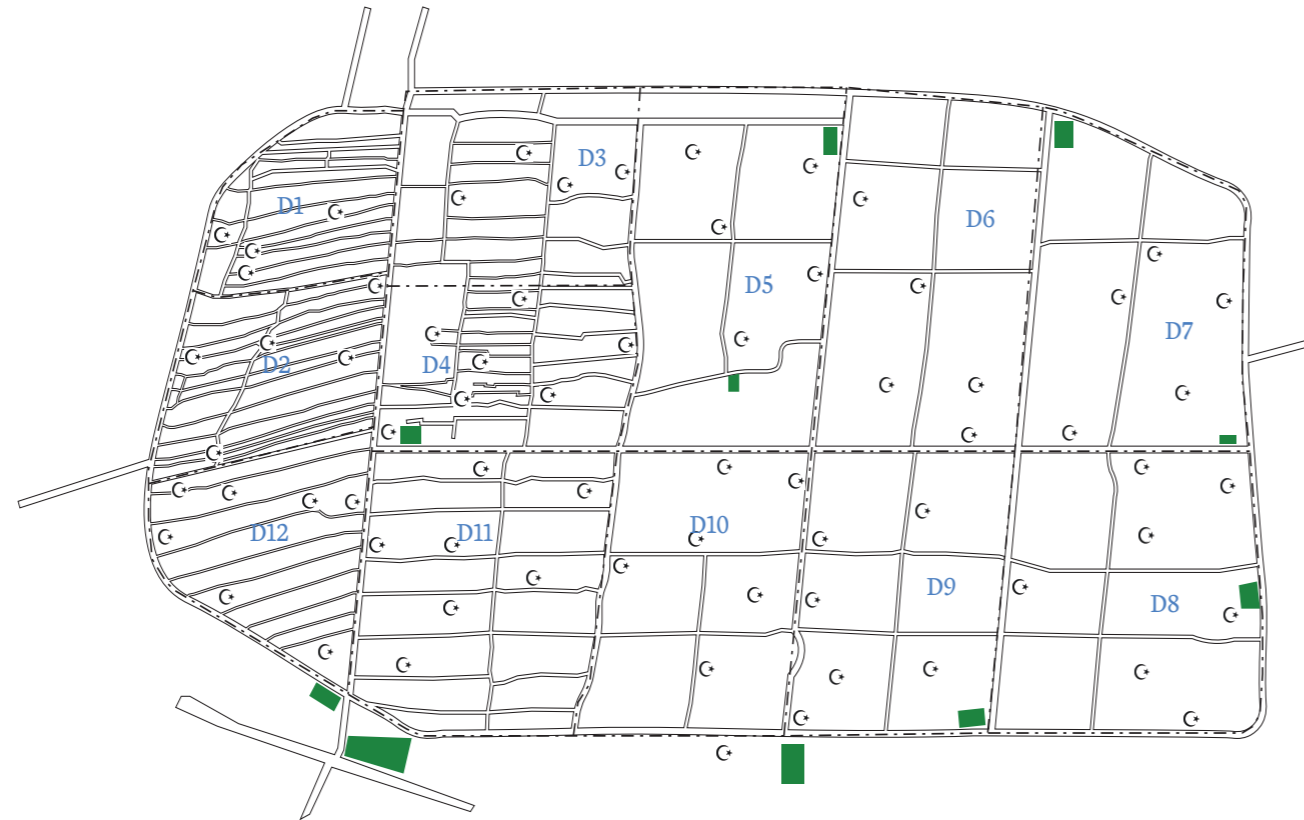
Religion and the mosques are an integrated part in Za'atari just as in Syria. (Ledwith, 2014). "The Syrian general population in the refugee camp is made up of 87% Muslims (74% Sunni, 13% Shiites, Alawites, Twelvers, Ismailis, or Zaydis), 10% Christians, 3% Druze, with no official statistics on minorities such as Jews, Baha'is, and non-religionists" (Eghdamian, 2014, p.38). There are at least 120 mosques, as seen registered on the map. Religious services and celebrations continue despite displacement (Ledwith, 2014).

### Community empowerment and self-reliance

The main market road in Za'atari refugee camp is nicknamed the Champs-Elysees after the avenue in Paris. The road is full of markets, small businesses, falafel restaurants, vegetables and other commodities, and even wedding dress shops. The road has become symbolic of the resilience of Syrian refugees and the entrepreneurship that can be found in the camp. Zaatari's informal market comprises of approximately 3,000 informal shops and businesses. (Lee, 2018)

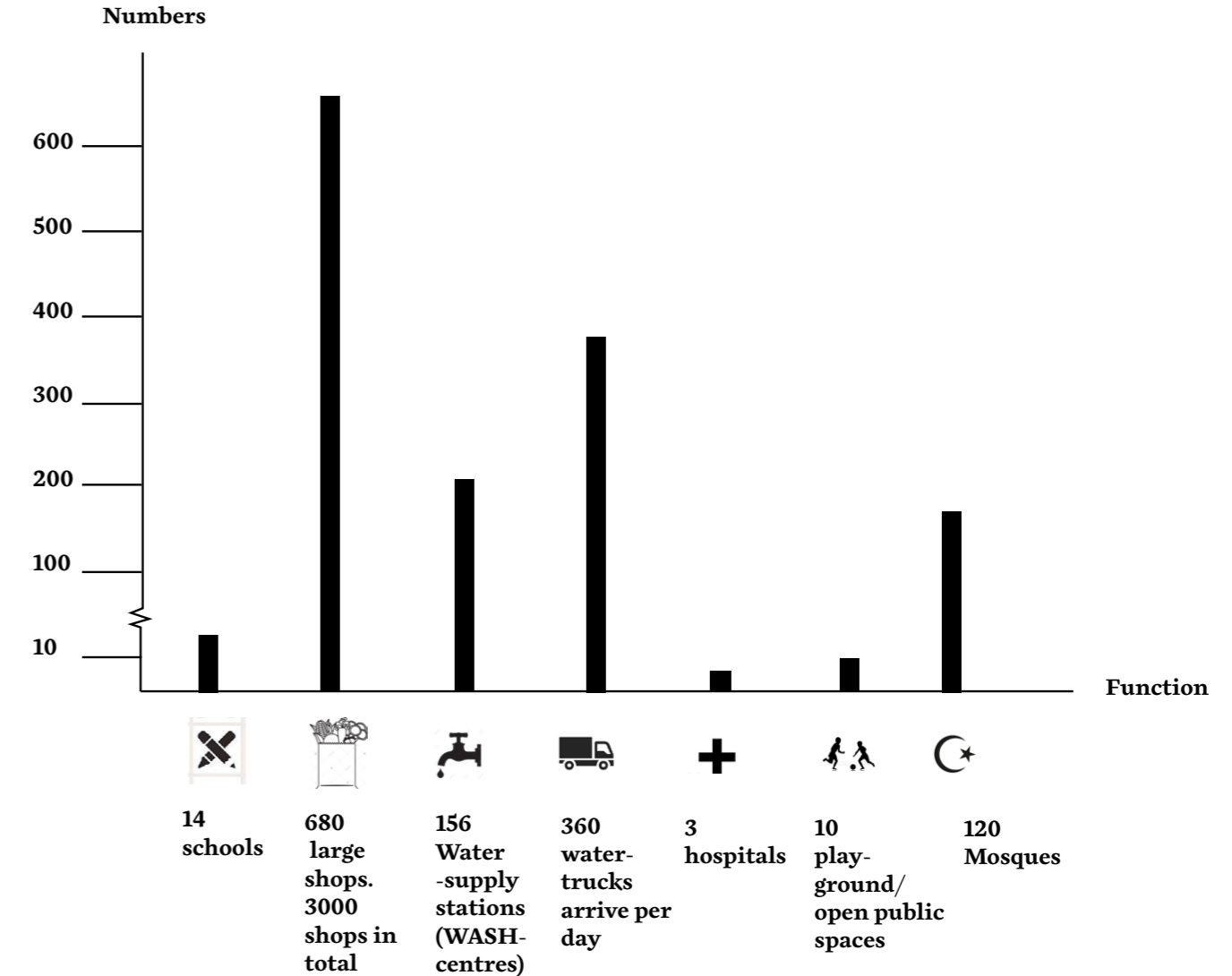
Although Syrians do not legally own the land and aid donors do not provide retail space, they still create spaces for retail themselves. Several Syrian merchants have re-established their businesses in Za'atari.

### Facilities: Religion and recreation



-  Mosque
-  Recreation/playground

### Number of functions



Different functions in Za'atari by numbers. Figure based on UNHCR numbers.



"UN officials report that, due to the skill and mercantile drive of Syrian refugees, Za'atari's development has surpassed in six months what many camps see in 20 years. Many believe that this development is due in large part to the semi-illegal trade in relief items, such as caravans. The main driver of Za'atari's economy is based on caravan trade, although illegal and donors do not approve of it. Instead of returning the unused caravans to the UNHCR, refugees sell them" (Al-Makhadi, 2013)

A part of the 'Champs-Elysees', the main market street (Lee, 2018)

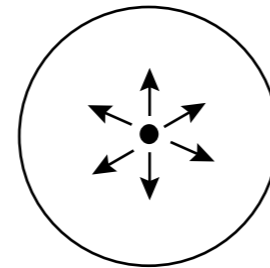


### Challenges and opportunities Za'atari faces regarding functions

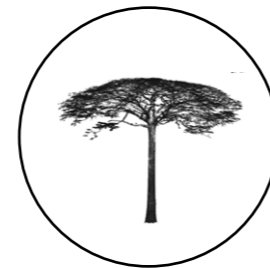
Analyses and registrations of functions show that a refugee life, in many ways, are similar to every day life in any city. In Za'tari refugees try to adapt their old life and way of living, starting their own businesses, sending children to school, practicing religion, marrying and having children. Yet, in more wretched conditions than before and their old lives shattered to the unrecognizable. A repetitive challenge, in the different categories of functions presented, seem to be the insufficient network of water- and electricity facilities: it is insufficient water- and toilet facilities in the schools, preventing children to attend school, water from all local waterstreams are not yet utilized to fill the water tanks and electricity- and water facilities are not available across the camp. Secondly, the mapping of main functions reveal a need for decentralizing the camp, providing public services and facilities in each district rather than in one central area, giving easier access for daily needs allowing better connection throughout the camp. Thirdly, green, recreation areas is a neglected facility in the refugee camp. There is a opportunity to utilize the inherent craftsmanship very much present in the refugee community to make more green spaces and a green network to connect to existing facilities to make more places for recreation and leisure.



Enhance supply



Decentralize



Green spaces

Mapping of different shops and businesses and density of these along Al Souq and Al Yasmin streets, also called Champs-Elysees, confirming Za'atari having a city centre development. Based on UNHCR numbers.





# PHYSICAL STRUCTURE

The physical structure of the camp is very fine-meshed, with mostly smaller structures (tents and caravans) dotted across the large camp. The camp is organized into 12 districts, with several blocks, within a main ring road. Two major streets running through the park, from north to south and east to west, structurize the camp. Bigger structures, such as schools, distribution points etc., are located either along these main roads or outside along the ring road.

Other than the major roads, none of the roads in the camp are paved. Any free space can therefore be used as a road, even though it is not "officially so". These dirt roads are also prone to erosion in heavy rain and creates a lot of dust when dry.

## Major roads →

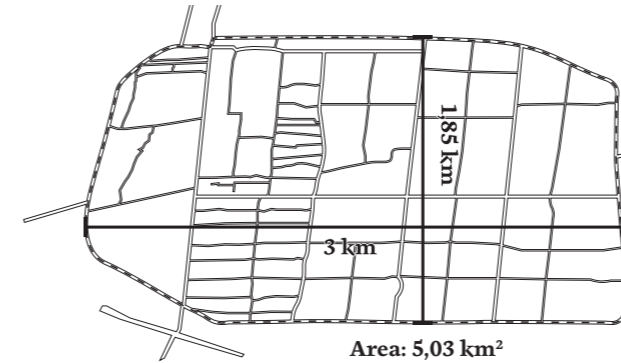
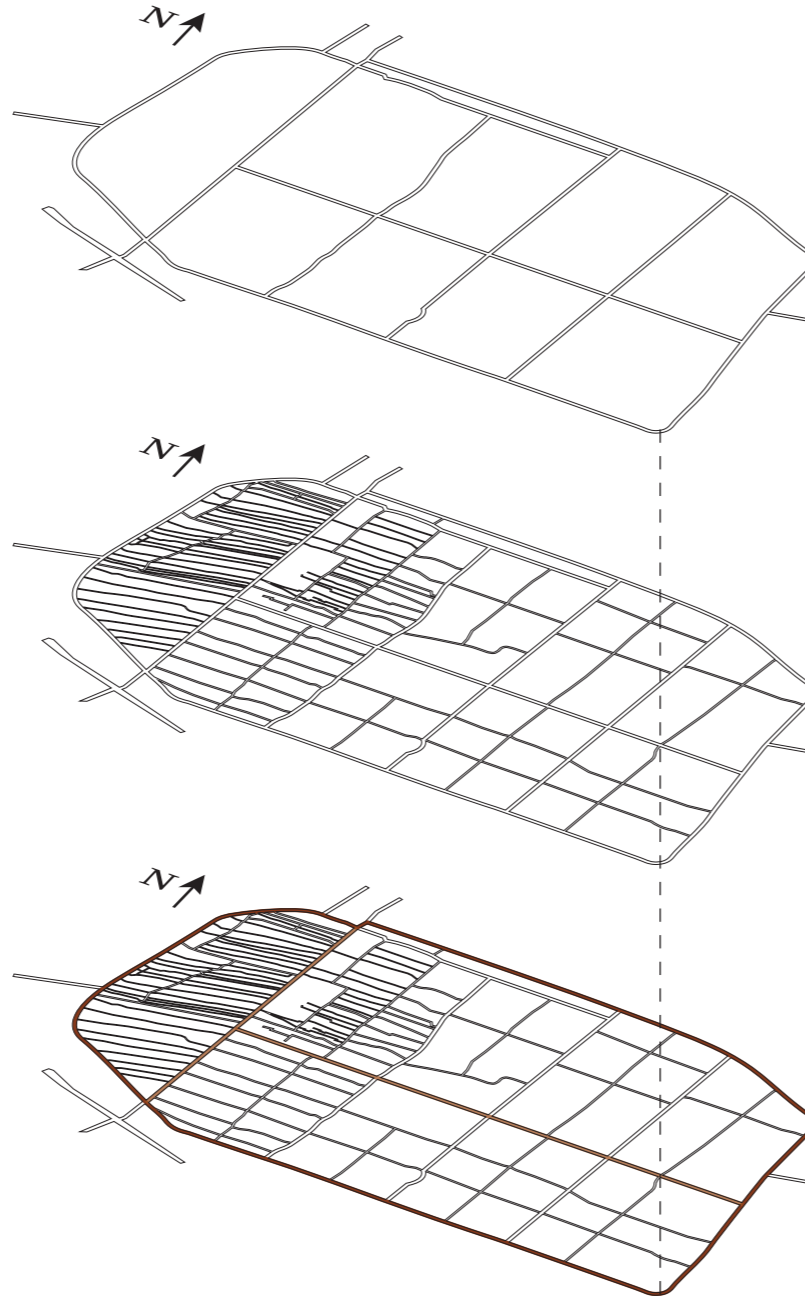
The major road system largely correlates with the district boundaries, and creates 'superblocks'. One big exception (also where population density is highest), is the westernmost block. The major roads correlates with the block structure proposed by the LOGOReP plan.

## Smaller roads →

The finer grained road structure exposes also to a large extent the density of dwellings and structures. In the western part of the camp the roads are much smaller and more dense. Especially in the densely populated districts at the end, this is true.

## Ring road and main streets →

The ring road (dark brown) and the two major streets (lighter brown) running through the camp is where important functions, both official and unofficial, cluster. The two throughfares, Al Souq street (north/south) and Al Yasmin street (east/west) can be considered the main streets.



## Distances and size

As seen in the above map, the camp has quite huge dimensions, 3 by 1,85 km. Under, this is compared to the city center of Oslo. The camp is roughly the size of this city centre - an area with two railway stations, five metro stations etc. There is a transportation need for residents in the camp, especially those living at the eastern fringes. Today, this is served by buses, cars and bikes. A more safe and green pedestrian network could encourage walking and biking as well as better communications across the camp.



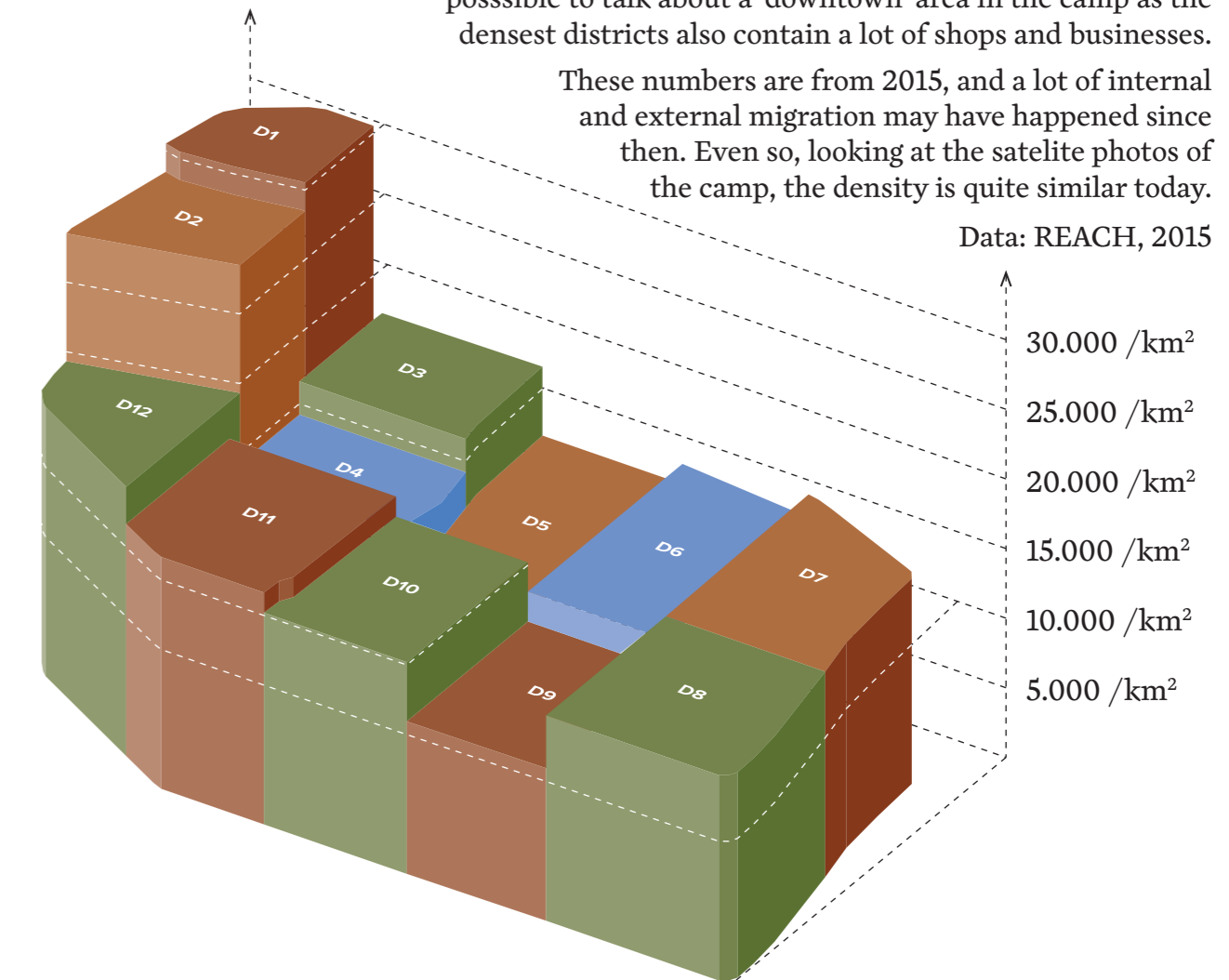
Satelite photo: Google Maps

## Density (by district)

As the diagram under shows, the camp is a lot more dense in districts 1 and 2 than in the rest of the camp. District 1 has a population density of more than 30.000 people per square kilometre, whereas district 9 barely reaches 10.000. The dense area correlates with the part first populated. It is possible to talk about a 'downtown' area in the camp as the densest districts also contain a lot of shops and businesses.

These numbers are from 2015, and a lot of internal and external migration may have happened since then. Even so, looking at the satellite photos of the camp, the density is quite similar today.

Data: REACH, 2015





## Satelite view

In this satellite image, we can see the current situation at Za'atari. The whole camp is now in use for shelter, but notice the much more dense built up area to the north-west. Also notice the larger structures located along the two major roads - Al Souq and Al Yasmin streets and along the ring road. To the south of the camp there is a newly constructed solar plant, providing the camp with energy.

*Satelite image: Google Maps*



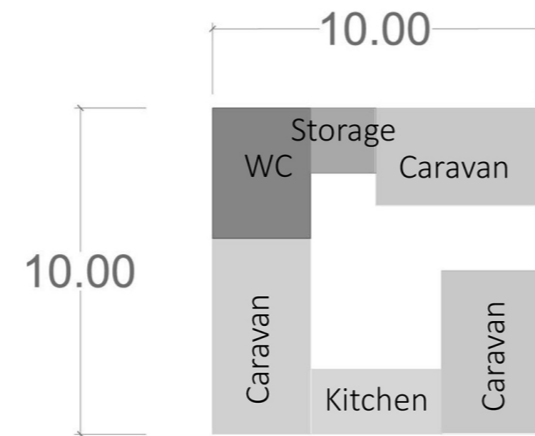
## Shelter

One of the major tasks for the camp and the organizations working there is to provide shelter for the arriving refugees. The majority of the camp consists of refugee shelters as well, making them a most important feature of the physical structure of the camp.

How these are organized varies, but the below structure of them is a long term solution proposed by the camp management, as a response to the refugees reorganizing the caravans themselves. Some refugees also live in tents, but as the camp has become older, this portion is shrinking.

*Restructuring plan for caravans:  
Plan to reorganize caravans into 10x10meter household plots. (UNHCR, 2016)*

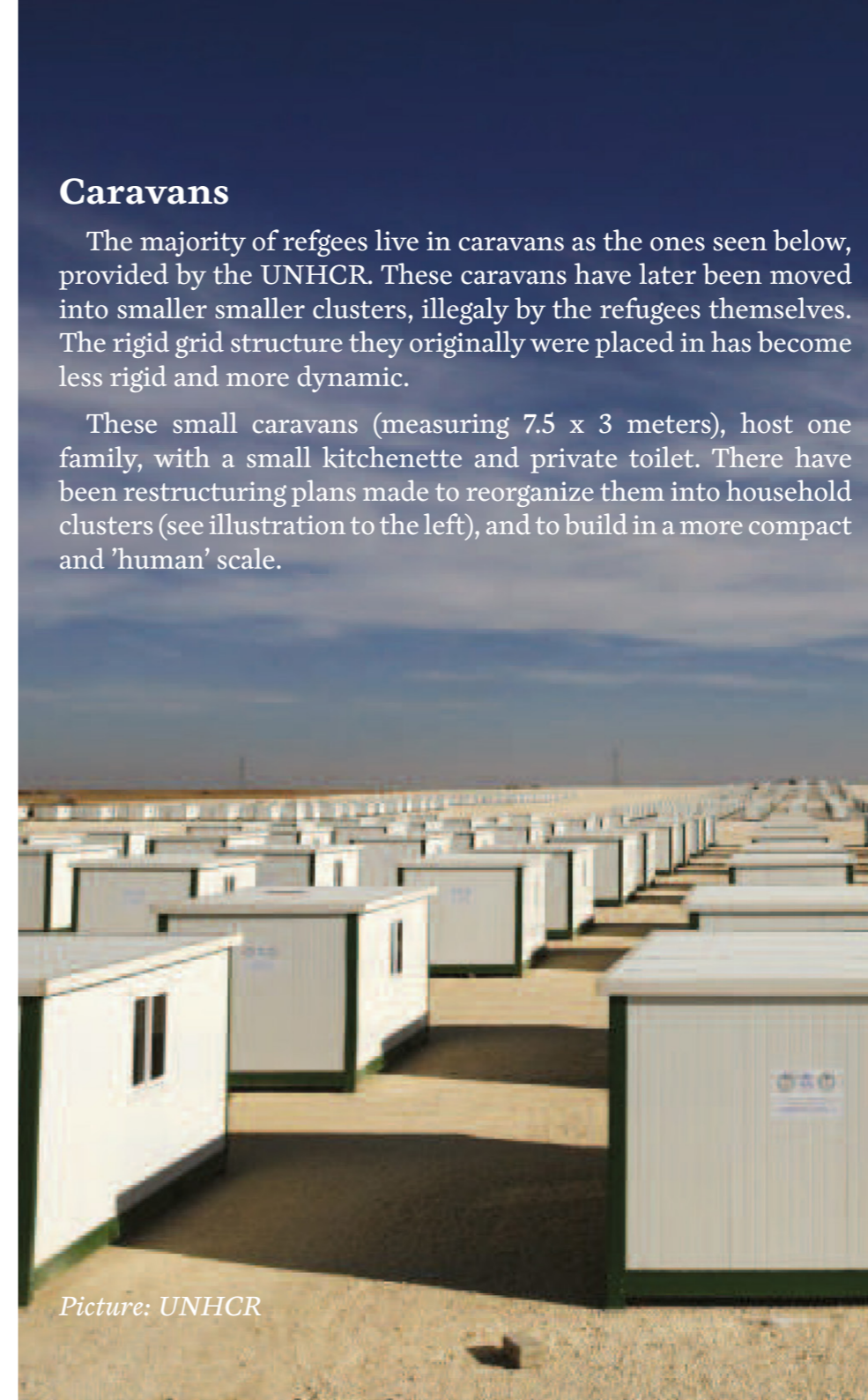
### Household Plot:



## Caravans

The majority of refugees live in caravans as the ones seen below, provided by the UNHCR. These caravans have later been moved into smaller smaller clusters, illegally by the refugees themselves. The rigid grid structure they originally were placed in has become less rigid and more dynamic.

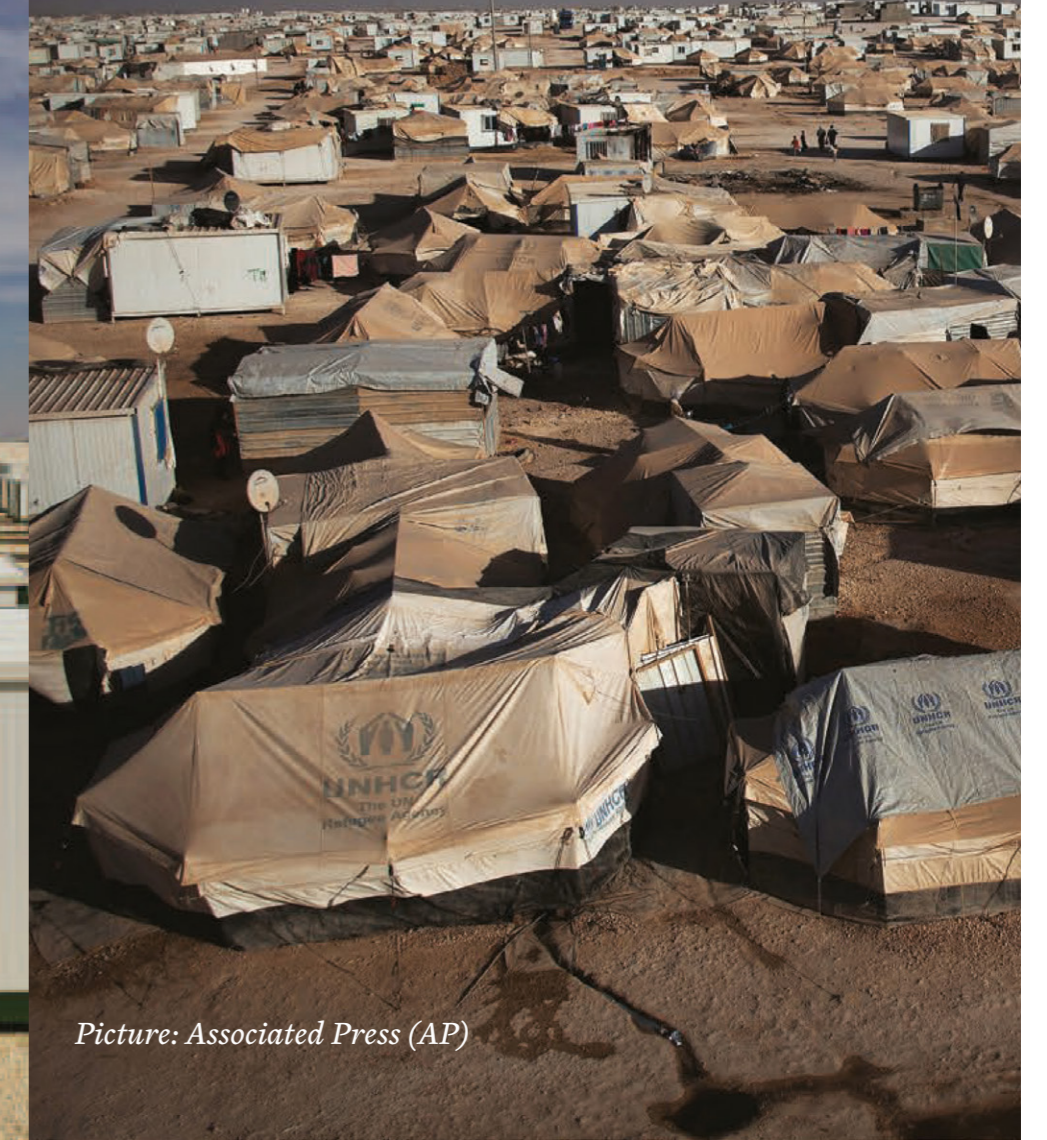
These small caravans (measuring 7.5 x 3 meters), host one family, with a small kitchenette and private toilet. There have been restructuring plans made to reorganize them into household clusters (see illustration to the left), and to build in a more compact and 'human' scale.



*Picture: UNHCR*

## Tents

A small part of the refugees live in tents, or a combination of tents and caravans. These tents offer a much more fluid and less rigid experience than the caravans, but of course the caravans are preferred by the refugees. The long term plan is to have all refugees living in caravans.



*Picture: Associated Press (AP)*



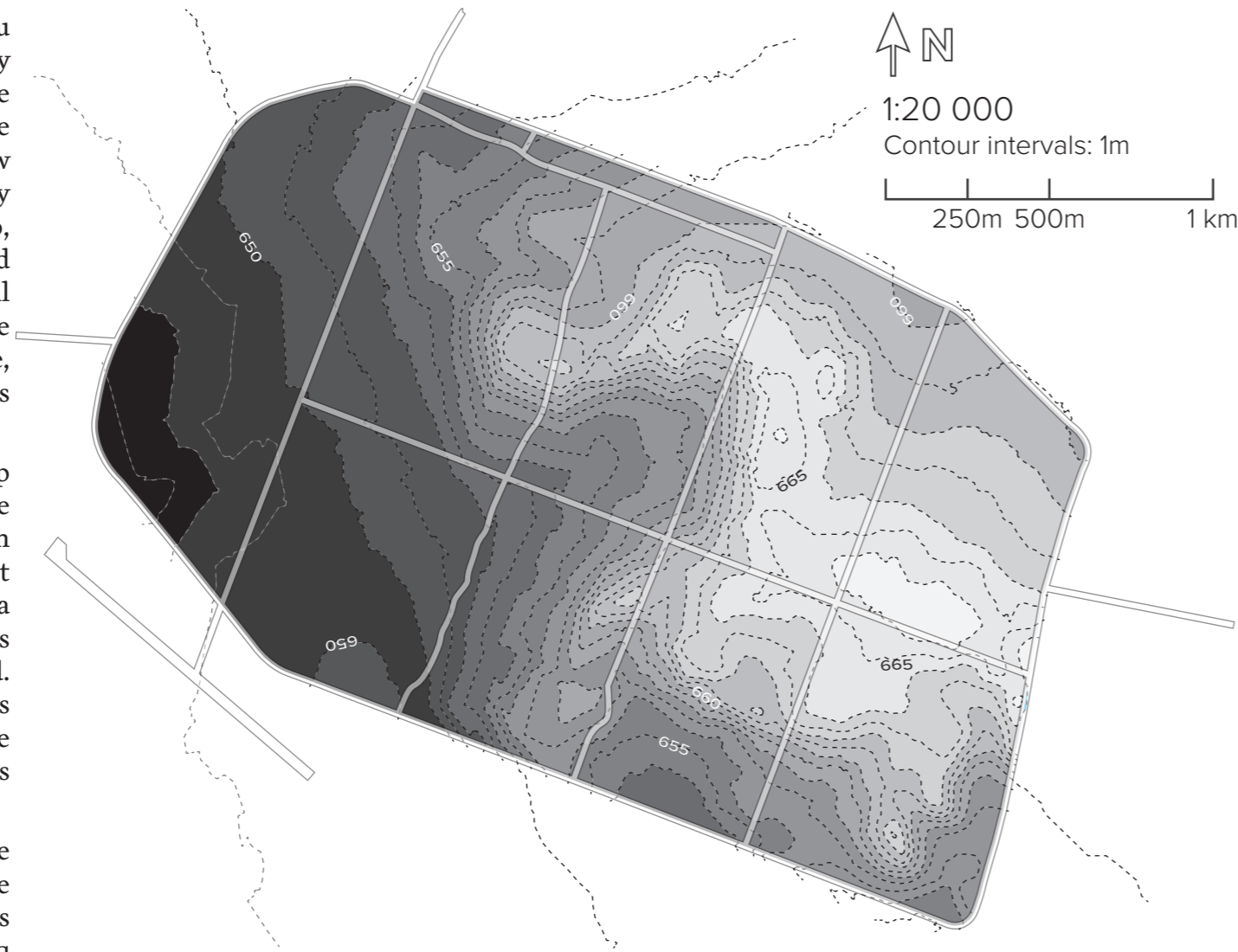
# LANDSCAPE

## Topography

The topography of Za'atari is, as you can see in the map to the right, relatively flat. There is a general elevation increase towards the east, but with the sheer size of the camp in mind, it is obviously few topographic elements that are visually and functionally important. Even so, the camp area is not completely flat, and the landscape form with the highest hill to the east and the 'valley' towards the middle of the camp is recognizable, especially in a contour elevation map as this one.

Between the lowest point of the camp at the south-western corner, and the highest point just north of Al Yasmin street in the eastern end, there is a height difference of only 20 meters. Over a distance of almost three kilometres, this height difference is not very pronounced. The steepest parts of the camp only has an incline of approximately 5 %. The camp has an altitude of 650-660 meters above sea level.

In the wider landscape perspective, the landscape around Za'atari is also quite flat, although there is higher mountains to the west of the camp, west of Mafraq city.



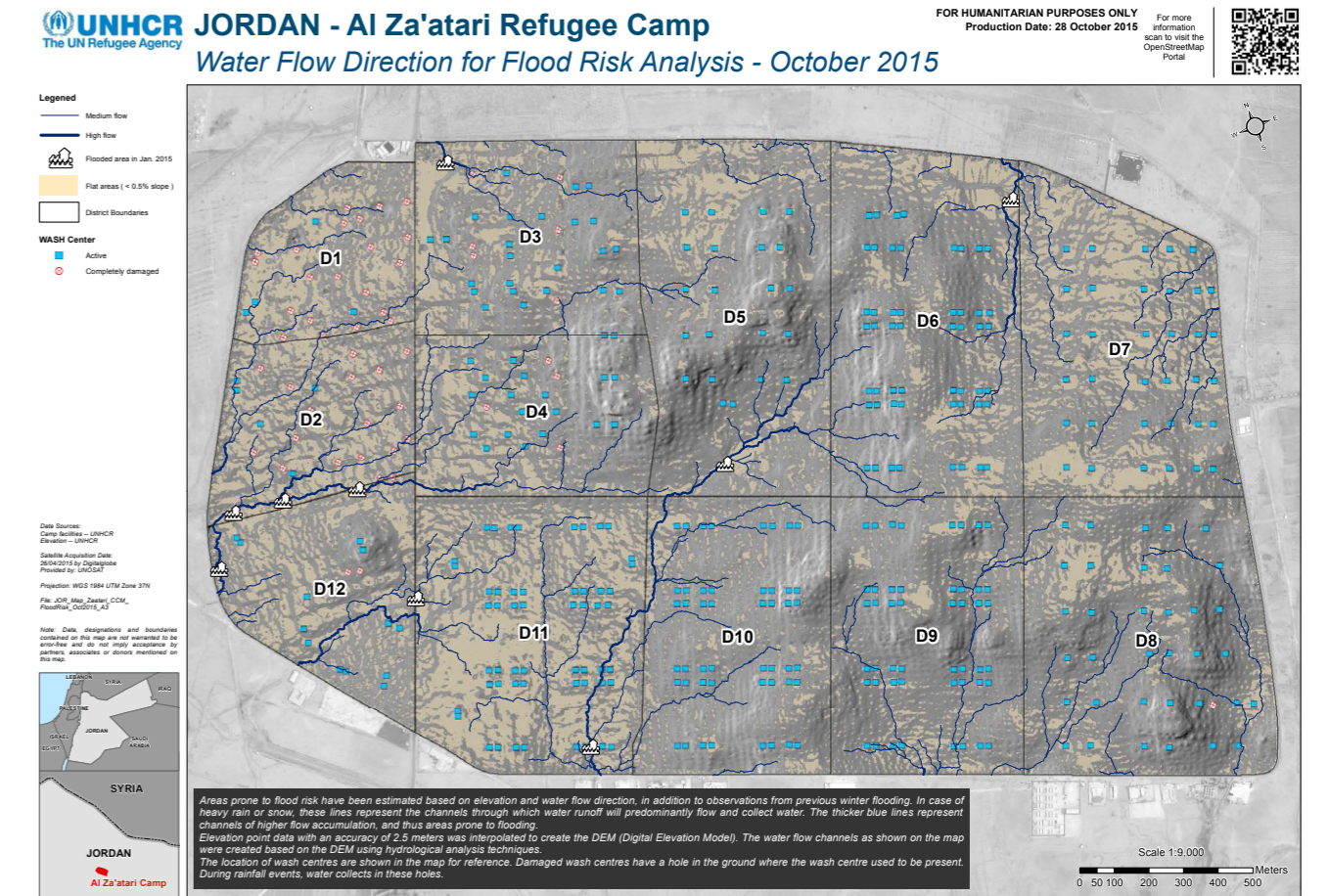
Elevation map of Za'atari.  
Darkest colours = low laying areas.

## Water flow

One good argument for a comprehensive green infrastructure in the camp is a better treatment of rainwater and greywater (household wastewater not from toilets). As shown in the analysis made by the UNHCR to the right, there are several general high flow routes the water takes in the event of heavy rainfall. One especially large one goes from the center of the camp (district 5), to the southern edge of the camp. In general, the heaviest populated parts of the camp, to the west of Al Souq street, drain towards the west, where a creek (*wadi* - see other parts of the landscape analysis) runs south.

Using these waterways to structure the green infrastructure is not only a good way of getting run off water out of the camp, but built in a correct way it is also a good source for sparse water for plants in the camp. Reusing and collecting the runoff water in the camp will ease the stress on water services quite fundamentally, and provide a durable, more sustainable solution for watering greenery.

Today, the water runoff is not properly treated, and a lot of households dispose of the water in holes they have dug outside their caravans (Kruijt, 2014). Some places, trenches and other runoff measures has been dug as well, to keep the water out of the streets. This resource could be utilized to make Za'atari green.





## Mafraq landscape

The landscape of the Mafraq region is a semi-arid landscape on the border between the Hauran plateau, a plateau stretching from north of Damascus in Syria to northern Jordan, and the Jordanian desert, part of the greater Arab and Syrian deserts. The Hauran plateau is more humid and has good soil for agriculture, at least compared to the desert. The area has been inhabited since neolithic times, and has very many archeological sites from antiquity and forward, due to the long-lasting basalt found in the region.

Due to its semi-arid climate, the landscape around Za'atari is quite barren, almost devoid of trees, with only bushes and grassland (Kruijt, 2014). The trees and larger green structures present is connected to agriculture, especially the olive orchards found around the camp.

### Climate

The Mafraq areas is categorized as a warm semi-arid (BSh) climate on the Köppen Climate Classification Scale (Peel et. al., 2007), meaning the area has very little precipitation and on average relatively high temperatures. The region has a hot summer, heating up to an average high of 33°C in August, to January when average daily high is 14°C. The rainy season runs from November to March, and brings around 135 mm of rain a year (climate data: Meteoblue, 2018)



## Map of surrounding landscape

As seen in the map above, the surrounding areas of Za'atari mainly consist of olive orchards, villages and the arid landscape of Mafraq region.

One very important feature of the landscape is the seasonal creek running to the west of the camp, with drainage to the south. This *wadi* (arabic for 'valley'), is the main rainwater collector for the area. It provides lots of water

when wet, and temporarily changes the arid area into a wetter region.

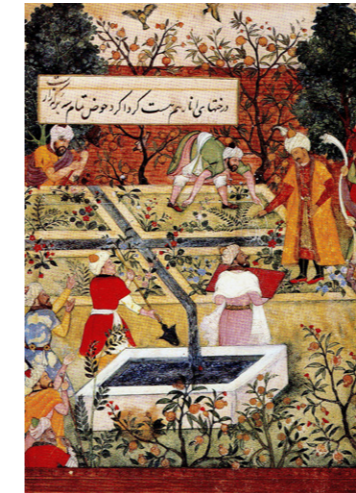
This creek is an important landscape feature of the region (and in the Middle East in general), and is a good opportunity for green infrastructure, also within the camp. Smaller wadis exist and can be created along the rainwater routes in the camp.

# WADI IN THE ARAB LANDSCAPE

## Islamic representation of wadis

As mentioned earlier, the wadi, west of the camp is a creek, mostly waterfilled in the rainy seasons. The wadi's intermittent character, generally dry except after rain, is what differentiates the wadi from other river valleys. In Arabic landscapes, wadis in general, are located in parts of the desert where the landscape is gently sloping, as is the case of the wadi carved between Za'atari refugee camp and Za'atari village.

In Islamic religious texts gardens, water and wadis are function as a representation of paradise. The Quran mentions Paradise consisting of four rivers, one consisting of



*Babur's Garden: Paradise garden with waterflows painted ca.1590 (V&AMuseum,2018).*

milk, the other one of honey the third one of wine and the fourth one of water (Ansari, 2011) making water and wadis essential aspects of paradise for the righteous:

*"Allah has promised the believing men and believing women gardens beneath which rivers flow, wherein they abide eternally, and pleasant dwellings in gardens of perpetual residence (...)*

(Qur'an 9:72.)

## Utilizing the wadi in Za'atari

The wadi functions as common ground, but is a neglected and abandoned area for garbage waste as seen in the picture. and functions today more as a landscape boundary. Eventough, the wadi represents something organic unlike the ringroad and fence around the camp, elements that separate the camp from the village. Today the wadi functions



*A wadi as neglected area only for garbage waste (Lodewikj Baljon, 2018)*

as a gap between the village and the camp, but

by utilizing the wadi as a lively green space for people from the refugee community and the village to meet, the wadi may function as a connection between the camp and the village by shared experience of landscape and recreation.

## Wadis as recreational facilities

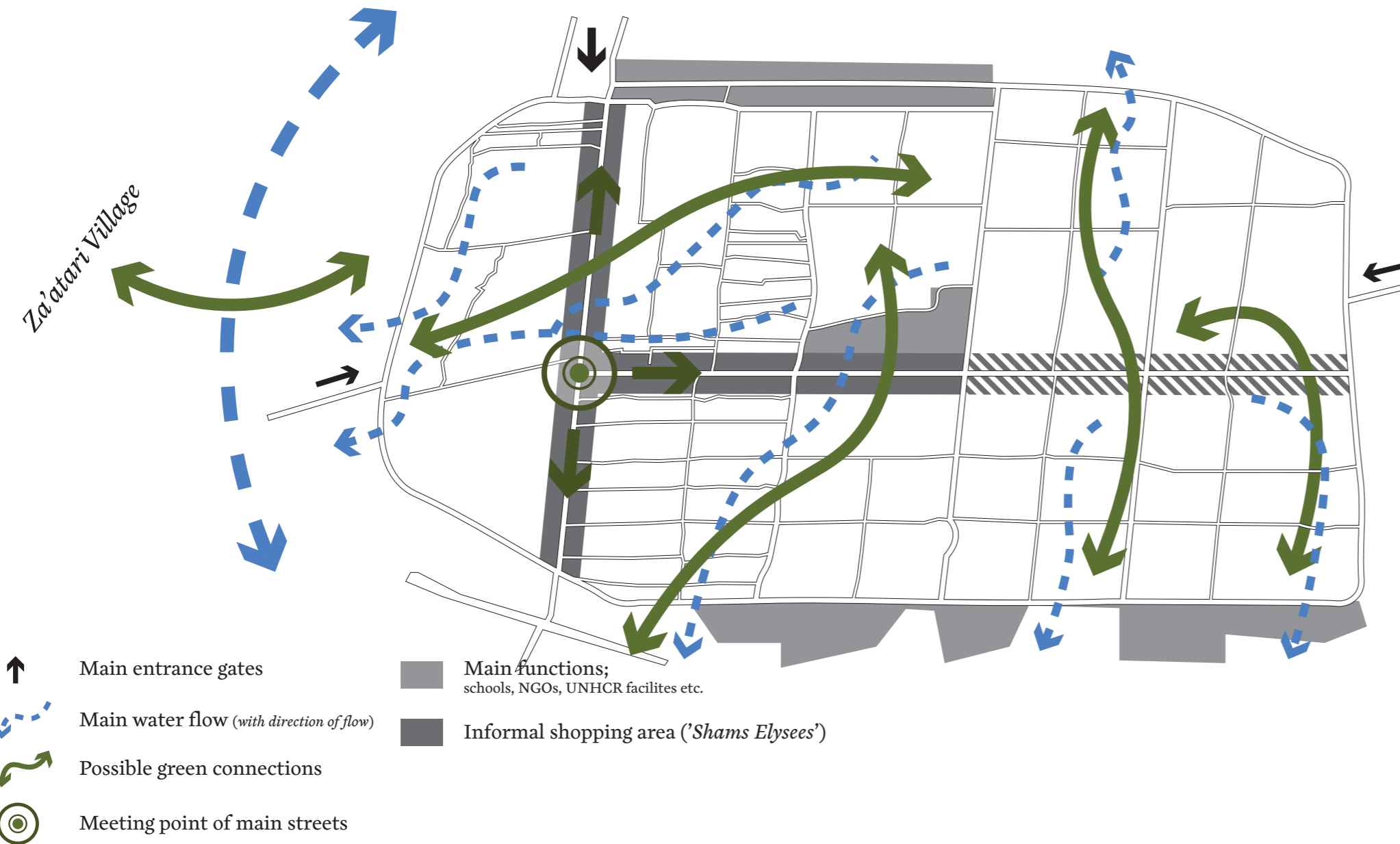
There are successful projects of utilizing wadis redesigned as living public spaces. The Wadi Hanifa Wetlands located in Riyadh is one example. The wadi now functions as the capital's environmental sustainability. The most visually compelling design features is the safe use of the river as well as water reclamation (Michler, 2010). The redesign of the wadi is meeting the challenges of water quality by storing and reuse upstream water and waste water to benefit the community. The Wadi Hanifa Wetland is also a park providing areas for people to interact with the water environment and functioning as a recreational facility.



*Wadi Hanifa Wetland. The Wadi redesigned as recreational area (InHabitat, 2010)*



# SYNOPTIC ANALYSIS



# CHALLENGES AND OPPORTUNITIES

The main challenges identified through the analysis of Za'atari are:

- lack of green spaces
- enhancing water supply
- decentralizing
- connecting the camp to its regional surroundings

The map of synoptic analysis (left) shows main roads, main functions and possible green connections intertwined in the refugee camp.

The existing physical structure of the camp has been created by spontaneous, refugee-driven development as well as a planned effort from camp management. The entrepreneurial spirit of the refugees show that the camp has great potential for refugee-driven development.

'Shams-Elysees', the main shopping streets, located along Al Souq and Al Yasmin streets, form a central downtown - a main attraction for the refugees. This creates a natural focal point for further development. The ring road around the camp limits further development naturally, and the population of the different districts in the camp may be redistributed to allow for a more consistent urban fabric.

As the camp now more and more develops toward higher quality housing through caravans rather than tents, and the continued

efforts of management to reorganize housing into smaller clusters creates a better structure more in thread with what the refugees themselves want. This allows for better connections throughout the camp and more structured developments, increasing both housing quality and sense of place.

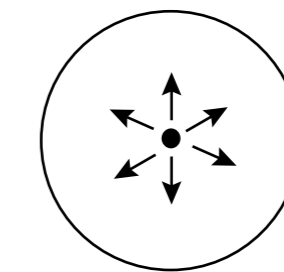
Through the landscape analysis, several potential waterways have been located. These may be a foundation for a green infrastructure, as well as pose a solution to water needs for planting. The semi-arid climate of the Mafraq region necessitates smart water solutions, as shown by the water management traditionally present in the Arab world. Delaying water runoff and keeping more of the rainwater in the area for a longer time will be able to ease the pressure on water supplies.

A green infrastructure plan in Al Za'atari needs to be comprehensive and encourage green mobility within the camp. The way

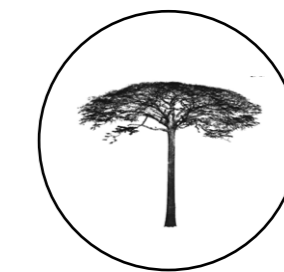
## Challenges in Zaatari



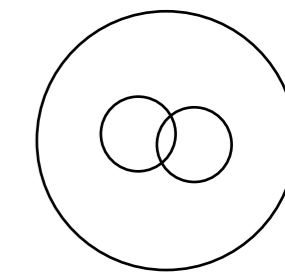
Enhance water supply



Decentralizing



Green spaces



Connecting with the region

the refugees use recreation facilities today can be combined with a green infrastructure - whether it be community centres or sports facilities.

A better connection to Za'atari village may also ease tensions between the local population and the refugee population, as shown by the wadi park plan made by LOGOReP (see plan critique chapter). This park however, needs to be further connected to the camp through pathways and greenways that encourage movement and usage in the camp, considering the sheer size of the camp.

Za'atari has enormous potential in its population. A greener camp may also help ease health issues, both physical and mental, caused by the extreme situation most refugees live in. A healthier and happier refugee population is sustainable for Jordan, and essential for the refugees.





## CHAPTER 5:

# GREEN INFRASTRUCTURE PLAN

The following chapter presents our green infrastructure plan for Al Za'atri. This plan is in no way a comprehensible or detailed plan for Al Za'atari, but it shows a possible green network and coherent green structure, aimed at providing access to greenspace for all camp residents and districts. We hope it can inspire discussion of the future development of the camp.

Some of the major interventions done in this plan is to fragmentize and break up the monotonous physical structure. By using water flows the terrain is utilized at water collector and retainer, which allows for water reuse for plants. Another major development in this plan is to establish public spaces throughout the

camp, both as camp identity markers, meeting points and landmarks.

By establishing a network of greenways we hope to also establish safe, green and revitalizing spaces for living.

Due to the challenges posed by the climate, water access and funding, many of these green structures will be less green than in other places and situations. Nevertheless, with the right plants, utilization of water and a sense of commitment from the community, it should be possible to make Za'atari a more green and liveable city camp.



# OVERVIEW

## Background and assumptions

Assuming a continuing conflict in Syria and therefore a continued stream of refugees from the North, Al Za'atari will exist even in several years. Even with a more stable Syria, many refugees may not want to return or may fear return, depending on the end result of the war. It may be a need for the camp even then. With this in mind, investing in the green infrastructure of Za'atari is essential to increase life quality and decrease issues within the camp.

Some physical development is assumed and built upon in the green infrastructure plan:

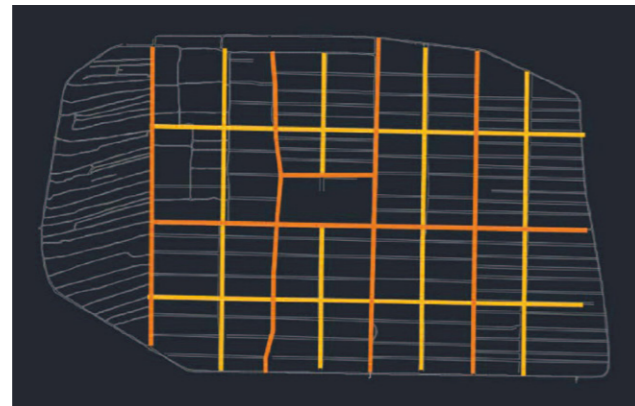
- A reorganizing of the street grid into larger, major streets - as proposed by LOGOReP
- A better distribution of residents in the districts and a continued upgrading of housing and building structures
- Main facilities with placement much like today (but with possible relocation towards the main streets and close to public spaces)

This plan can be followed without much alterations should there be other developments in the surrounding region. For instance, should the wadi park be built between the camp and village, greenways withing the camp will increase it's accesibility.

## About the plan

In general, the plan breaks up the grid structure of the camp and establishes a green infrastructure network on top of the existing street structure, as well as a permeable greening of housing areas with private, semi-private and possibly public gardens.

Using waterways in the terrain, collecting and retaining rainwater in small wadis is the backbone of the plan. It is upon these waterways the greenways are placed, with connections to public spaces and major facilities. Public spaces are set up at crossroads and adjacent to major facilities, and may be used for a variety of public activities. Some may be adjacent to a mosque, and work as a social meeting point - others may be next to a school and be a playground or sports field for the pupils.



*New grid as proposed by LOGOReP.  
Basis for this plan.  
(LOGOReP, 2016)*

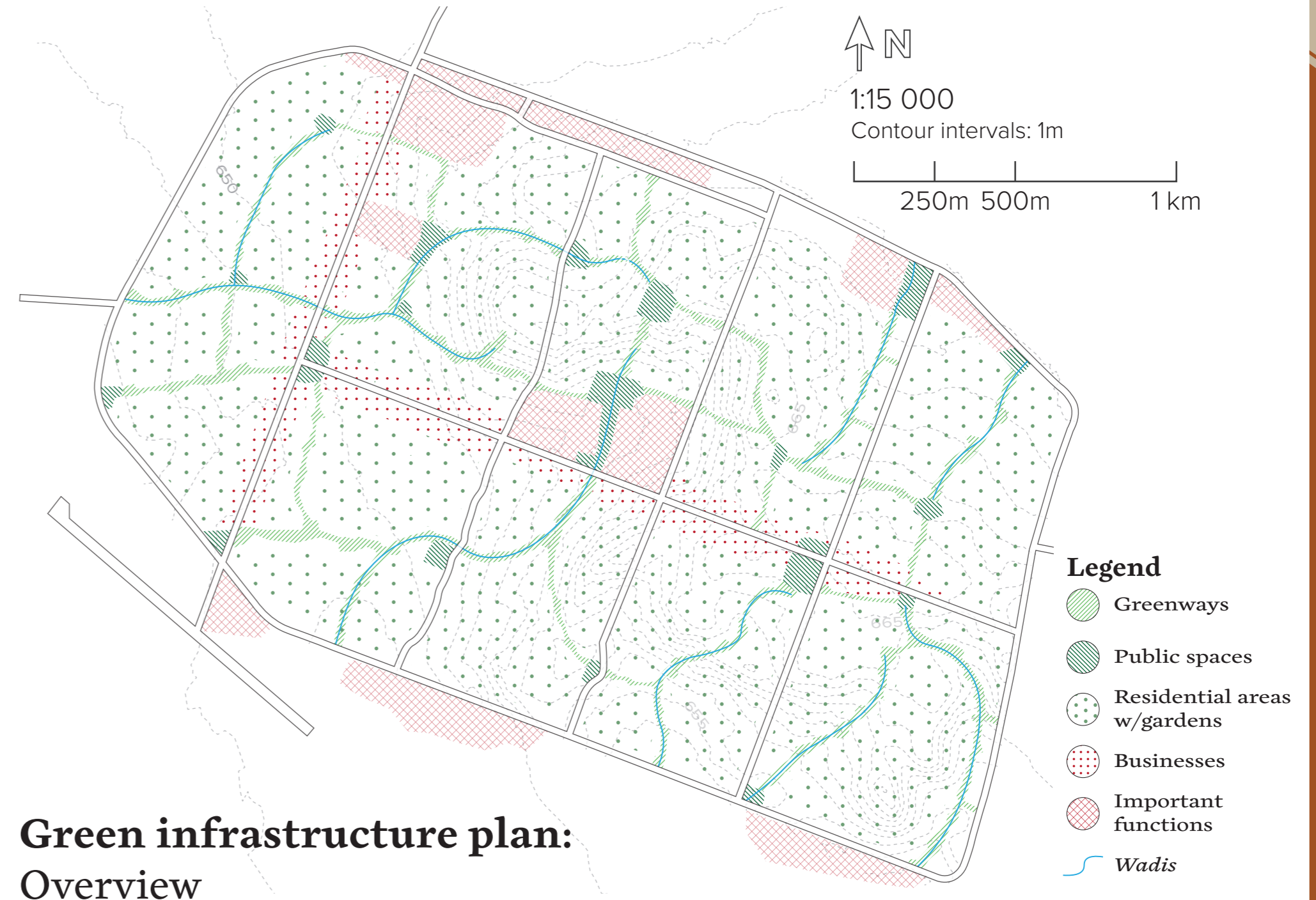
The network is confined to the area inside the ring road. Due to Jordanian policy to wall in the camp, developments outside the camp fences is deemed less probable (as for now). Future developments may very well change this, and the green infrastructure proposed may be connected with expansions and possible gates.

Some of the public spaces are situated along the major roads, and some within the major grids. They are often placed where there is a natural junction between greenways and streets, or close to minor facilities. Along the major roads, most notably Al Souq and Al Yasmin streets, the public places function as meeting points and landmarks, breaking up an intense urban environment.

All in all, three main types of greenspace is established:

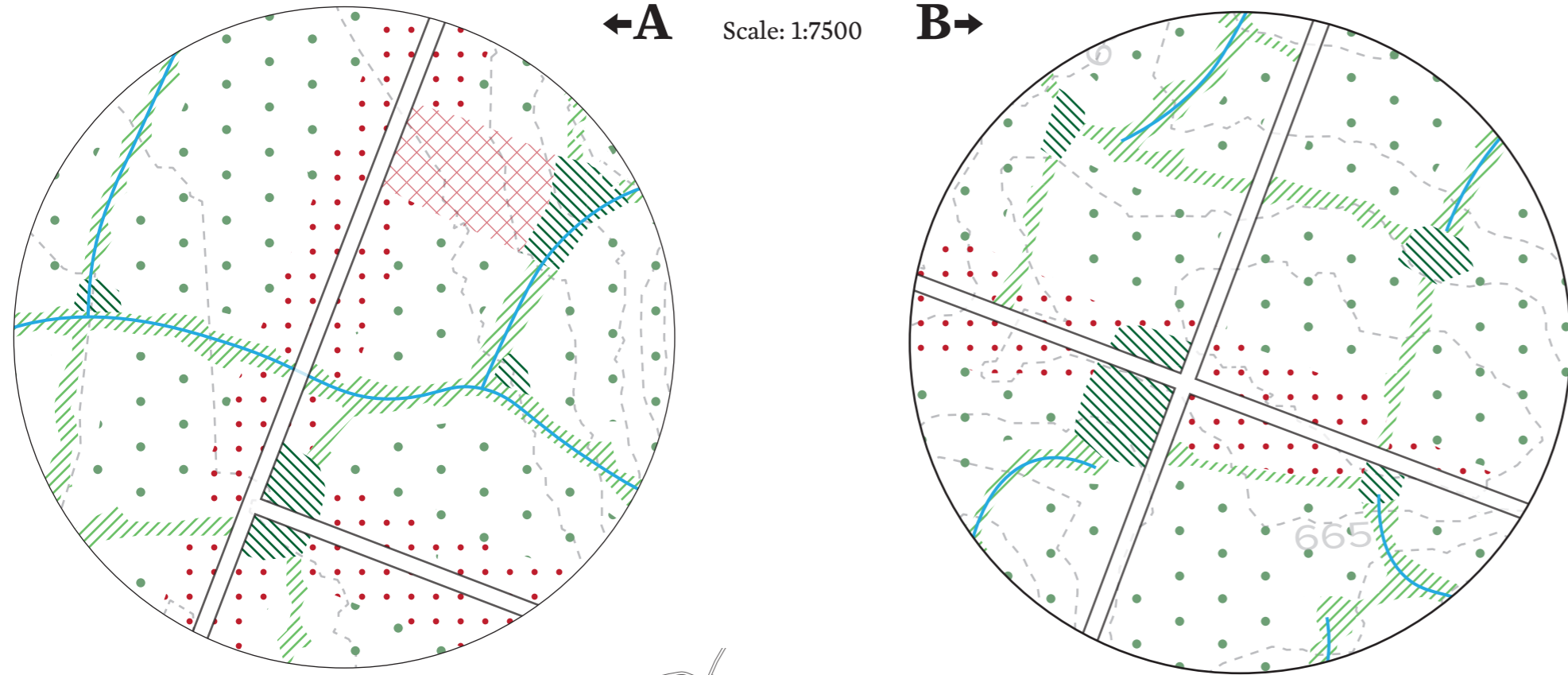
- Greenways
- Public spaces
- Gardens

The detailed design and exact placement of these green structures is not explored in depth in this plan. First of all, they should be subject to participation and community work, and given a local cultural frame. This plan is a mere suggestion to how a future green infrastructure system may look like, and a reminder that it is possible.



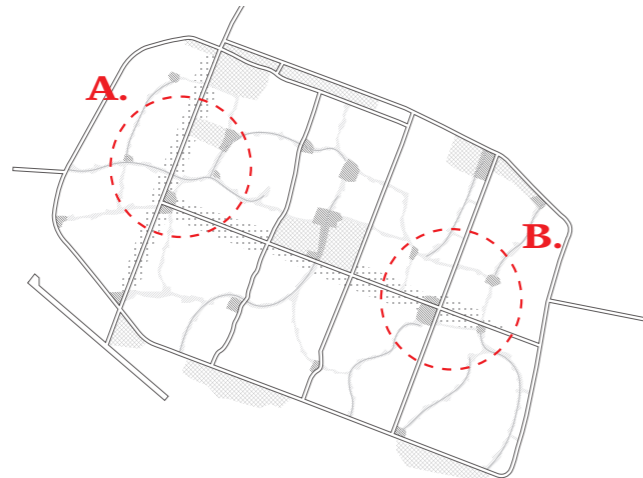
## Green infrastructure plan: Overview





**CLOSER LOOK:**

Looking closer at the crossing between Al Souq and Al Yasmin streets - the heart of Shams-Elysees. Public space established in the crossing - an important meeting point in the camp. Greenways connected along the wadis to facilities and public spaces both near the main streets, but also in the middle of the districts.



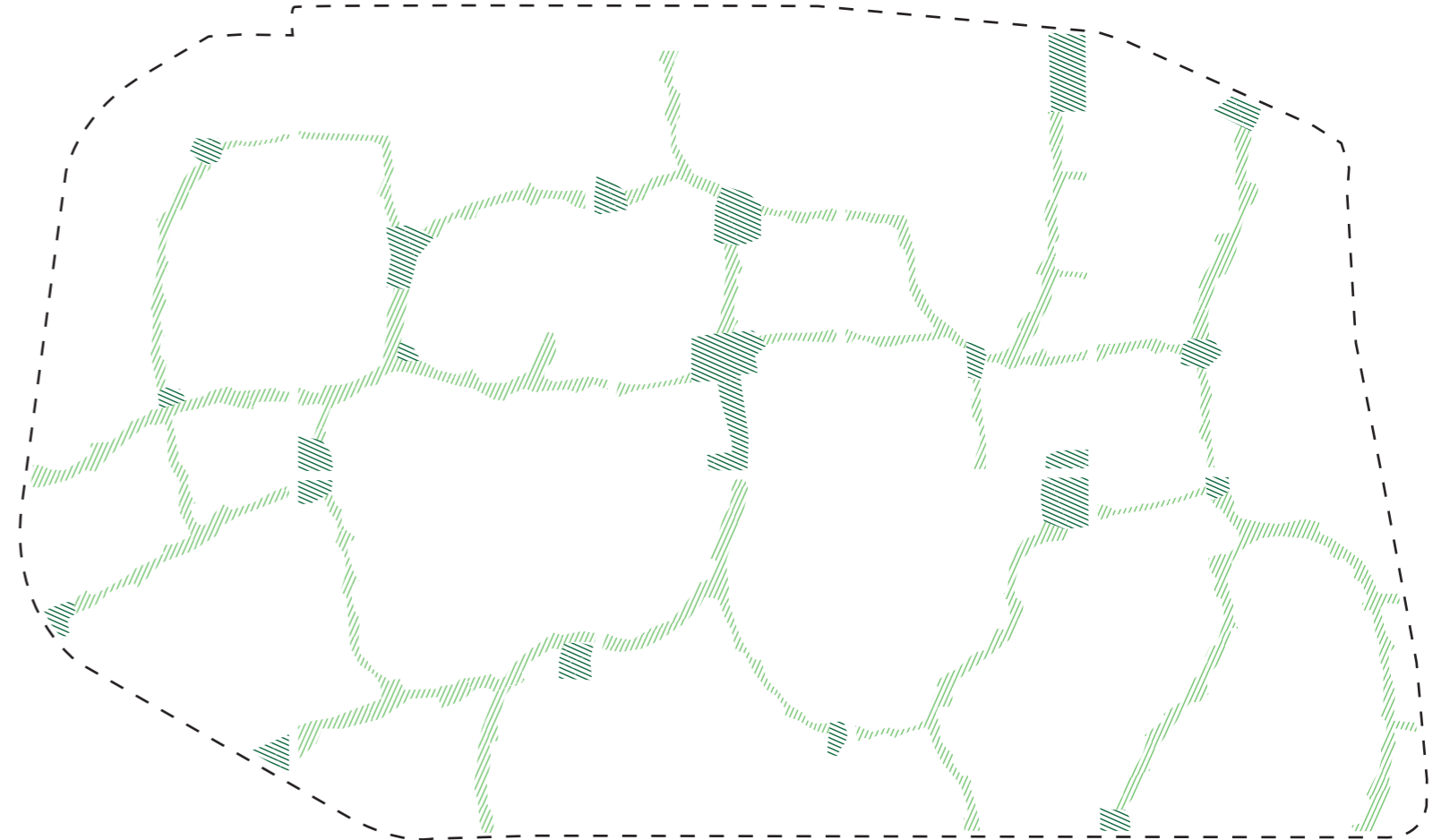
**CLOSER LOOK:**

In the eastern part of the camp, the business areas along Al Yasmin street is expanded further to the east to decentralize some of the important functions in the camp. At the crossroads a central public space for this part of the camp. Where the terrain do not allow for wadis, greenways connect the public places, main streets and residential areas.

# GREEN NETWORK

Making a green network, connected throughout the camp is a major part of the proposal. Connected to public spaces with varying content, a network of greenways connects residents and important locations of the camp.

Shown under is the greenspace in the plan without other structures. With a larger grid network, as proposed by LOGOReP, there is an increased need to break up the large structures. This green network does not follow the existing street grid, and creates new and different routes for movement and recreation.



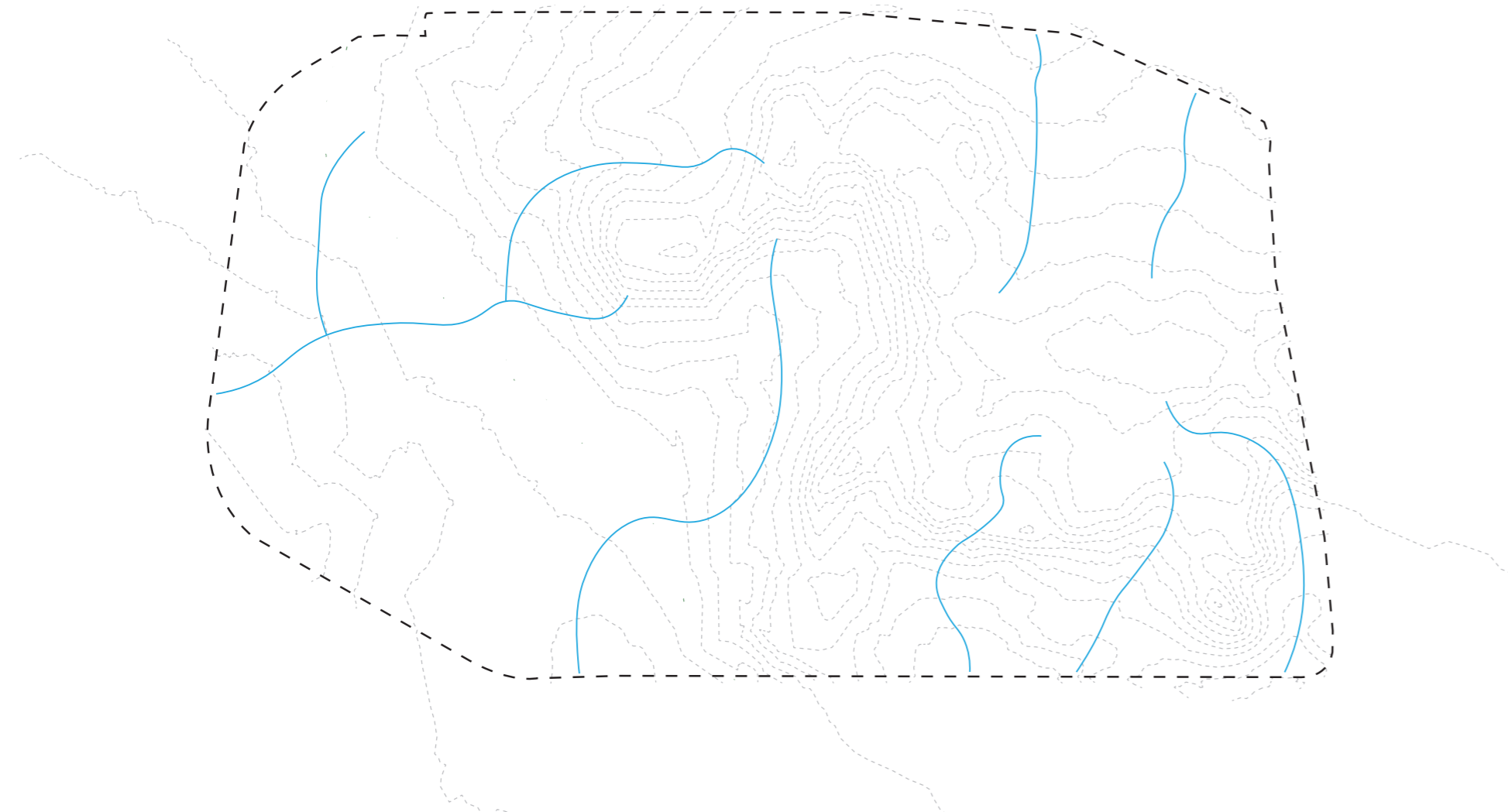


## WATERWAYS (WADIS)

Waterflows is very important for this plan. The arid landscape Za'atari is situated in needs smart water solutions to be able to support a green network.

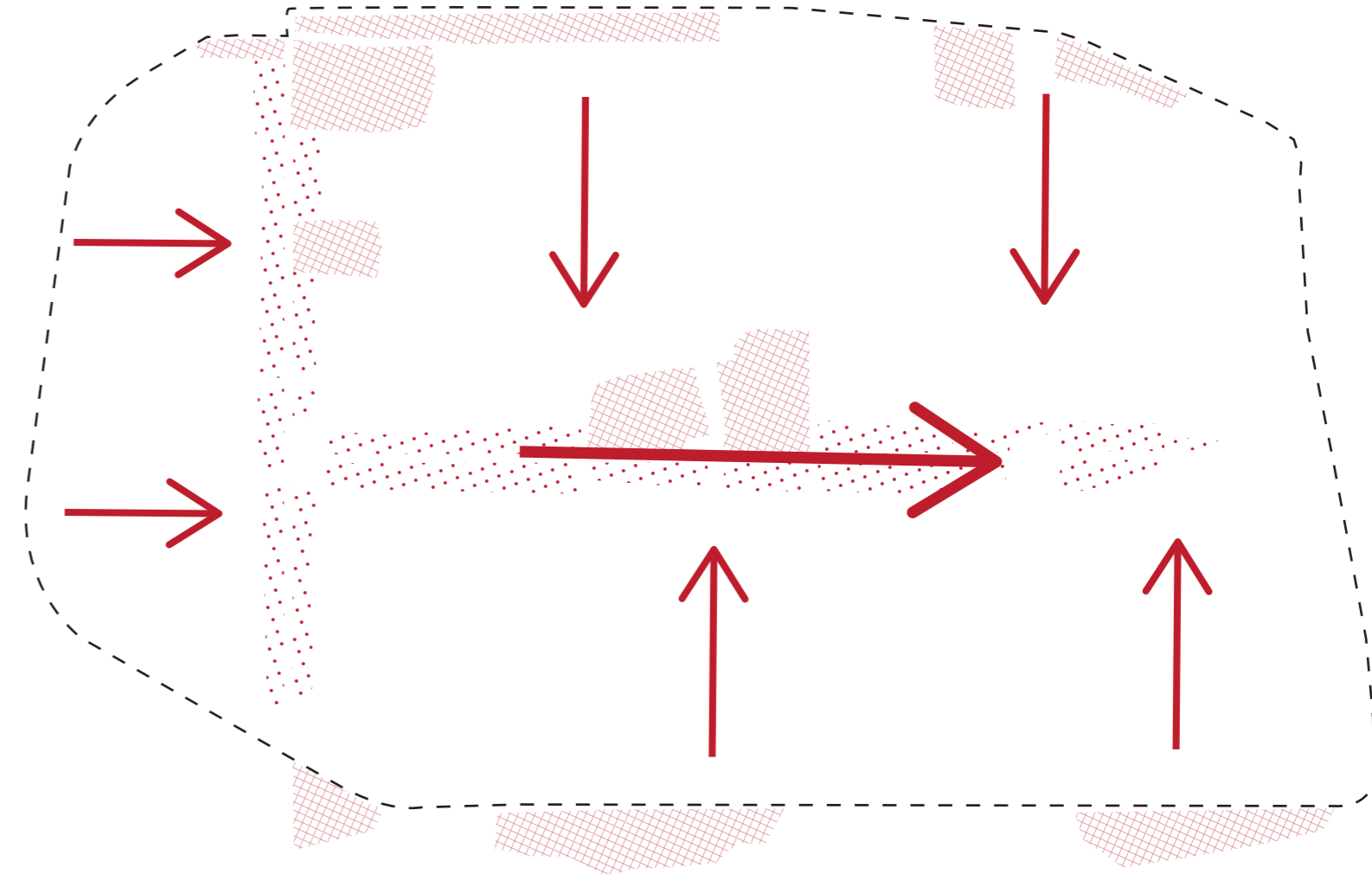
The waterways here establishe largely follows the waterways found by the UNHCR in their analysis.

These waterways is called *wadi* and will only flow with water in the rainy season. They replace the current water catchment system, largely consisting of holes and trenches along roads. Not all of the wadis will have much water, but they can still make important features in the green network. The greenways largely follows these waterways.



## FACILITIES

Not proposing huge alterations to the placement of facilities and businesses, the plan nevertheless expect a more decentralized development of businesses, and a possible relocation of facilities towards the main streets. Al Souq and Al Yasmin streets remain the major business area, with more development towards the east.





# TYPES OF GREENSPACE

## Gardens

The element of gardens built on the inherent craftsmanship and entrepreneurial spirit among the refugees in Za'atari to make gardens and spaces for agriculture, to revitalize their surroundings and make a sense of place in state of exception.

Gardens are the continuous fabric of green infrastructure in the camp in our proposal, consisting of small entities of green all over the camp in connection to the refugees' living space.

These small fabrics of gardens consist of private gardens both agricultural and non-agricultural. Both olive trees, fig trees, and pomegranate trees grow in the area among with vegetables and herbs that together may form a kitchen garden. These gardens will form a green network and strengthen the neighbouring community.

Other gardens are for public use connected to the greenways. We do this distinction between private gardens and gardens as public facility as we find it to be a need for both privacy as well as public, green meeting places.

## Public green space

The second element of green infrastructure is public green space. We have divided public green space in 2 sub categories based on the needs in Za'atari for recreation- and leisure areas.

The only green public space available in the camp today are sports arenas among the small gardens that have been established between the caravans. Therefore, there is a need for public green space as social meeting areas for refugees to interact in livable surroundings throughout the camp. In our proposal these green public spaces are established in connection to the wadis and consist of local flora, trees and sitting areas for recreation, leisure and social interaction.

Secondly, the sports arenas available today are few, therefore public green space also include space for sport activities and playgrounds for children.

Small markets, shops and businesses may be established where people gather. Offering public facilities in this new network of public green space may help decentralize the refugee camp.

## Greenways

Greenways is an element of green infrastructure figuring as a constant green connection of trees and local flora along new pedestrian roads throughout the camp. The greenways are connected to the wadis making new places to detain as well as the greenways integrate the smaller fabrics of the gardens in connection with the refugees' living space, into a green network as seen in the section of greenways.

The greenways inside the refugee camp also connect to the wadi outside the camp transforming the landscape boundary of the wadi into a combined green/blue infrastructure for shared experiences between the refugee community and the host community in Za'atari village, should the camp be opened and not fenced in in the future. Connecting, then the refugee community and the host community together by landscape means.

## Possible vegetation

The Mafraq region being a dry area still has a wide range of vegetation. Although our plan is a conceptual and based on existing vegetation in Mafraq, these are some possible plants:



*Zatar origanum syriacum*



Fig tree  
*Ficus carica*



Olive trees  
*Olea europaea*



Pomegranate  
*Punica granatum*

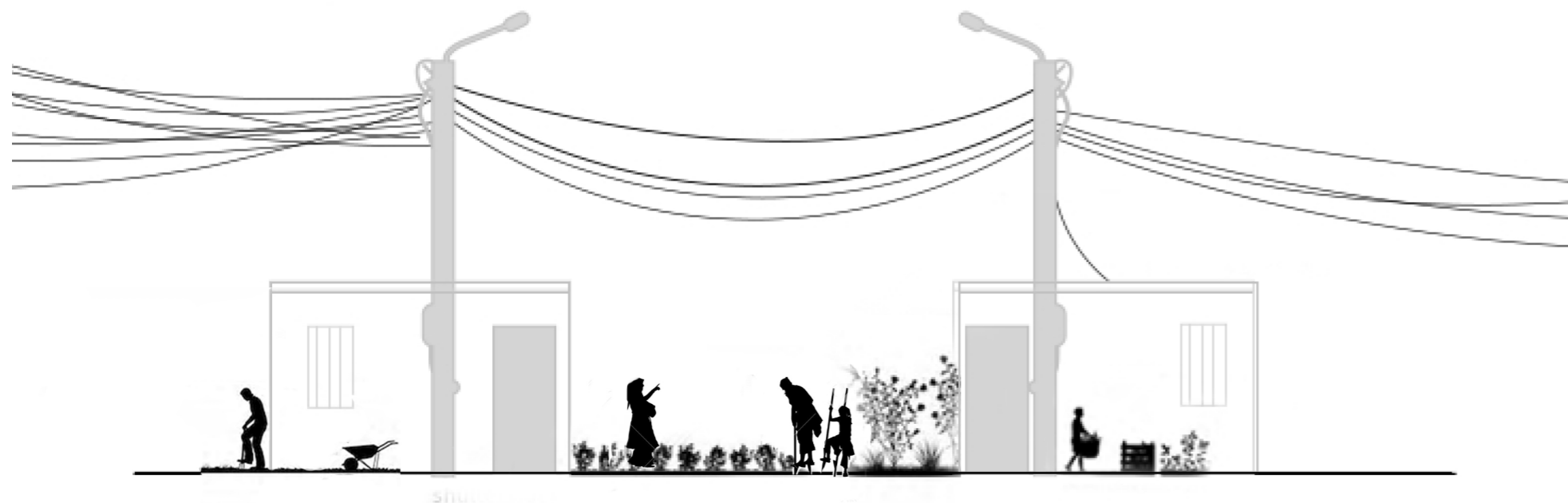


Poppy anemone  
*Anemone coronaria*

*Gardens between caravans is one of three elements in the plan of green infrastructure*







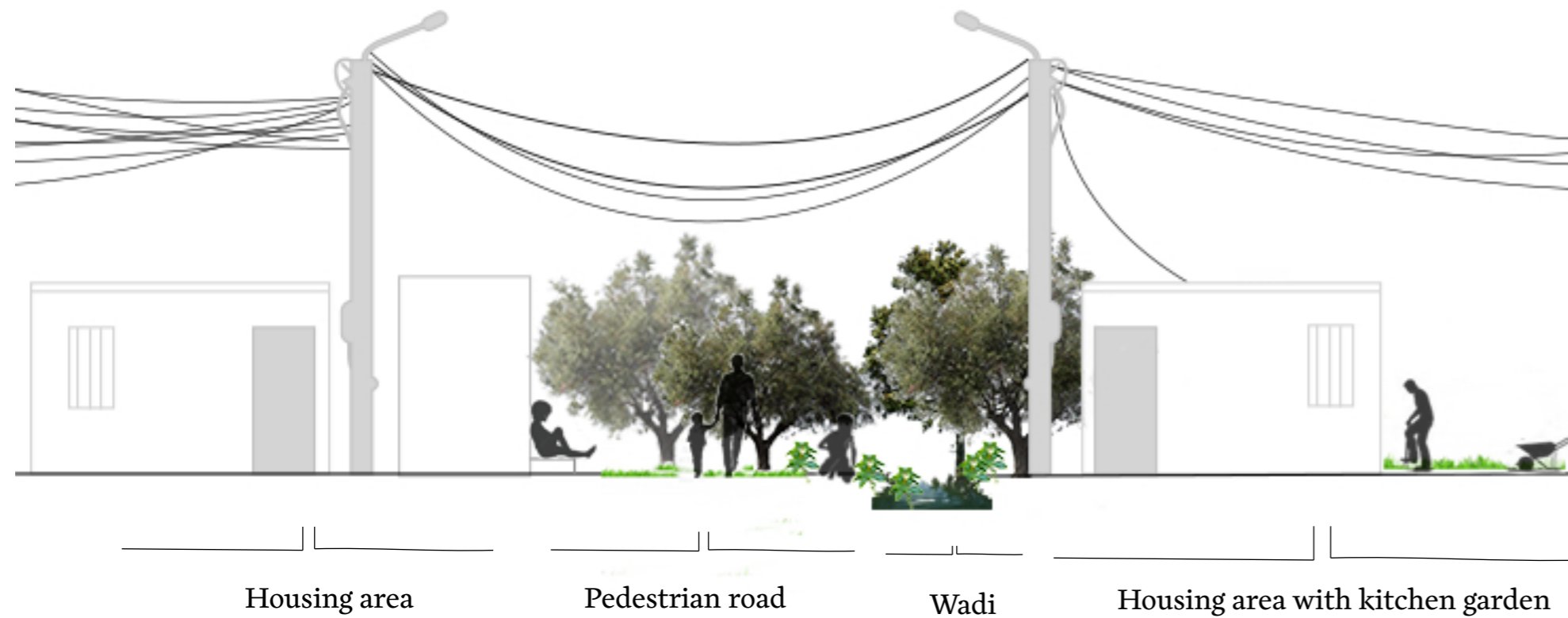
Kitchengarden  
in connection with  
housing area

Private garden with a  
smaller kitchen garden in  
connection with housing  
area

*Gardens include  
private gardens as  
above, or a shared  
kitchen garden such  
as this*







*Greenway as a connection through central areas of the refugee camp*





Housing space in connection with public green space

Public green space for recreation by the wadi. New functions, such as small shops may be established where people gather



*Children will have the opportunity to play by the wadis in connection to the greenways*



*More playgrounds and sports arenas are also included in the third element of green infrastructure, green public spaces, proposed for the camp*



CHAPTER 6:

# **CONCLUSION & BIBLIOGRAPHY**



### Our work

Our thesis has been a hard task – working with a topic that is hard to find information about, and where a lot of conclusions and assumptions must be made. It has also been difficult to see what level our thesis should be at – is it a through green infrastructure plan? Or is it more of a theoretic thesis? In the end we have ended up with a thesis that is a bit of both. Hopefully it is at least capable of giving a little insight into the topic, and at the same time give some argument to as why green infrastructure matters, also for refugees.

### Limitations

There are some quite obvious limitations to the thesis and the work we have done. First of all, we have not had the chance or resources to actually go to Al Za’atari, and without doing so, our understanding of the landscape, region and place lacks depth. There is only so much information we can get from reading and accessing information online, although what we have found has given us a good insight into the physical structure of the camp.

Not going to Jordan also means that we have not had the chance to hear anything from the refugees themselves, nor the camp management. Any landscape architecture project, big or small – should have some level of user/resident participation, and without it our project proposal lacks a solid foundation in the people it is meant for.

These limitations are difficult to do anything about, but had we had one more semester (a 60-credit master’s instead of 30) it might have been possible to arrange more contact with camp management at least. Even so, having done the things we can do from Norway, our plan proposal do not go into the design details of the green infrastructure. Acknowledging the shortcomings in our work, going into the details of the plan would have been unwise.

Other limitations, especially when it comes to theory, have limited the direct links between refugees in camps and the health benefits of green infrastructure. Even so, the assumptions made on the relevance of green infrastructure and life quality is not without foundation.

### Conclusion

Green infrastructure has a place in refugee camps. Through this thesis, we hope to show that refugees both deserve and need better access to greenspace in their everyday lives, and that these structures may produce benefits for host communities and benefactors as well. A healthier, happier refugee is, after all, a better refugee.

The refugees themselves live in such an extreme situation at the very edges of life, and has little to none resources to get this done in the camps. It is the responsibility of the host countries (in this case Jordan), the camp management and the countries providing funding to facilitate green infrastructure. In the end, it might end up saving them costs later on.

Although green infrastructure never can replace healthcare facilities or the other work done by NGOs and the UN, it can provide an added value and ease pressure on existing facilities. Green infrastructure can provide places and space for interactions generating both social capital, mental health benefits and social cohesion. In addition, the establishment and building of the greenspace may provide residents with jobs.

As said, green infrastructure has lots of benefits, also in a semi-arid Jordanian desert refugee camp.

Our plan proposal is in no means meant to be final or detailed. It is a mere argument for an increased focus on green infrastructure and refugee camps. A future, more developed plan would need to take into account the local cultural, social, political and climatic parameters.

For the host countries afraid of permanency of refugee camps and a prolonged refugee situation, a green infrastructure intervention should be welcomed. If the camp is closed in a year or two, the trees and plants left there, along with the waterways created, is not in the way of future development. The benefits of providing camps with a green infrastructure is far larger than the cost of facilitating this would be.

### Recommendations

First of all, the humanitarian sector should support and facilitate greenspace in refugee camps. It is a vital ingredient in the quality of life humans experience, and although it might seem like a nonessential element in a camp designed for, and in, an extreme situation, it might well benefit all parts of the humanitarian aid process – from food and water distribution, to health care facilities and education. Investing in green infrastructure is a good investment.

Academically, more work is needed within landscape studies on how landscapes, greenspace and the physical environment is

experienced and utilized in conflict zones. Much work is needed, especially when it comes to the experience of living in a refugee camp. These conditions must be understood from a landscape perspective as well.

Developing a green infrastructure plan as ours further, concretizing it into something that actually can be built would be a good next step also.

Environmental psychology is another academic field that should take a closer look at refugees in camps, and on the Middle East in general. There is little research from this region, and with a landscape so vastly different from how most Europeans and North Americans live, understanding more about how for instance Syrians view and understand landscape is important.

There is hope and possibility in giving access to nature and greenspace to refugees. If governments understood the importance of green infrastructure and were willing to provide funding for it, the refugee camps of the future, and their host communities, will meet a greener, brighter and more sustainable future.



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