Rightful landscape

A response to an unexpectedly long stay in the Zaatari camp

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Preface

At the end of 2013 I finalized an internship at a landscape architectural firm in Amsterdam. During the time I was an intern, there was much discussion in the news relating to my profession. A headline in Het Financiële Dagblad (The Financial Newspaper) on September 7th, 2013 read: In woestijn Jordanië verrijzen Syrische steden (Krol, 2013). I was extremely intrigued to read more and soon after, I was introduced by one of my former colleagues to DRO-Amsterdam. DRO provides expertise to the Zaatari refugee camp. Before I knew it, I had visited the camp, convinced the department of Landscape architecture of an thesis assignment in this semi-arid desert, and had done fieldwork in one of the most draining but extraordinary environments anyone could imagine.

I would like to thank my supervisor Dr. Ir. Ingrid Duchhart for keeping confidence in this topic and stimulating me to investigate this landscape architectural assignment. This topic was unfamiliar to Dr Duchhart and the chair, but Dr Duchhart gave me inspiring and significant supervision during my thesis to explore this fundamental field.

Besides my supervisor I would like to thank Hans van der Made, senior urban planner at DRO-Amsterdam. He made it possible to visit the camp. His network gave me access to meet with the most senior officials of the camp. As a master's student I was very fortunate, knowing that hundreds of students from all over the world applied for a research project in one of the biggest refugee camps in the world, and even though the limited selection, I was given this opportunity.

Hereby I also thank Tom Corcordan, the UNHCR environmental advisor. He was my mentor in the camp during my fieldwork. His experiences with refugees, and the tremendous technical and environmental knowledge he had acquired from travel around the world helped me immensely.

I would like to thank Ahmed Bawaneh, the director of IMC Jordan. His interest in my topic gave me access to the right people in the camp and I was very grateful for all of the areas I explored in Zaatari.

Furthermore, I thank the people in Zaatari camp who contributed to this thesis. Sobia Rabat, UNHCR coordinator, made it possible to use UN transport. Ruba Jad (IMC) helped me to translate the workshops during my sessions at IMC.

Executive summary

Today there are a greater number of refugees than at anytime since the Second World War. Currently, there are 51.2 million refugees worldwide, who are victims of conflicts caused by violence, racial discrimination, natural disasters, and/or social identity issues. The Syrian Civil War is one of the worst of its time, creating over 3 million refugees. 15% of the Syrian refugees have arrived in refugee camps. The United Nations High Commissioner for Refugees (UNHCR) is taking control in order to manage the influx of the large groups of people.

The UNHCR has developed a Handbook for Emergencies. This handbook indicates how a camp should be built and how aid should be provided to refugees based on the levels of severity. Camps are typically designed for a temporary period of time. Unfortunately, in most cases, they last for a longer period. The average time of a refugee emergency is 17 years. The first problem is that during the development and design of the camp, there is limited thought given to environmental aspects. Mass displacement can have a negative effect on the environment quality. The second problem is that the camp operations are mostly organized from the outside and therefore the residents' input in what they call "their temporary land" is very low. Both these problems lead to a limited focus on the significant social and natural contexts. As a result, the chances of a solution mismatch are high and the assistance from humanitarian services can easily miss their target and/ or cause undesirable side effects.

This research focuses on the second largest refugee camp in the world, located in Zaatari in Jordan. Due to inadequate infrastructure, the camp and inhabitants and villages around Zaatari suffer from negatively impacts on the environmental quality. In addition to the landscape analysis, this research uses the Green Town Workshop method designed by Duchhart. This method allowed me to identify the problems, needs and wishes of people who are dependent on external aid. The method does not stop by identifying needs and wishes. Instead, it is a transformative approach, where I aim to empower the participants to find local, adaptable, solutions that can be implemented by the refugees themselves. The results indicated that people are able to recognize and transform their problems into desirable wishes.

Because of the transformative approach to the data generated in Zaatari, it was crucial for further design options to be strongly enhanced with the desire and capability to be executed by the refugees. The design options of this thesis are open-ended. The design options involve the implementation of grey water gardens, creating swales, and developing orchards. This will have a direct positive result on the camp and surrounding area, both in the short- and long-term. The solutions are flexible due to the numerous uncer-

tainties, which include: an increase or decrease of refugees; the level of service provided by aid agencies; and the extent of permanent settlements in Zaatari.

The first outcome of this bottom-up approach can lead to changes in policy for camps that exist in the developmental phase. The second outcome is creating practical solutions that are applicable to similar camps around the world located in semi-desert areas.

Thesis outline

Chapter 1 explains the phenomena of camps that are a direct result from mass displacement often caused by war. It introduces the effect of a long duration of displacement whereby camps evolve into so called "cities." It focuses on the research notion and scope.

Chapter 2 describes the literature review on the phenomena of refugee camps in relation to landscape architecture. It gives an overview of how refugee camps can be perceived in terms of environmental, cultural, and human aspects.

Chapter 3 shows the knowledge gap in this research. The gap defines the research objective and raises the notion of using a transformative worldview in this extraordinary environment by working together with refugees.

Chapter 4 describes the methodology. An explorative method is used in order to execute this research design. Taking a transformative worldview combined with action research allows this research design to work with this vulnerable aid-recipient population.

Chapter 5 describes the physical conditions of Zaatari. Zaatari is an unforseen, and fast developed camp, designed by the UN guidelines and positioned in a harsh environment. Zaatari appears to be a densely packed island located in a desert.

Chapter 6 describes the workshops carried out in Zaatari. The workshops investigated the problems, needs and wishes of the Syrian refugees living there. The workshops intertwined with the use of Green Town Workshops that sought "the voice of the community." The workshops were followed up by action days that aimed to test local applicable solutions in the field.

Chapter 7 describes the Zaatari issues that came up after the fieldwork. The issues are evaluated to find the bridge between the collected data and the proposed design options shown in chapter 8.

Chapter 8 portrays the possible future situation of Zaatari. Due to the highly unpredictable layout of the camp, open ended design options were chosen that match with the current conditions. The refugees are able to execute each of these design solutions themselves. The design is not highly technical or elaborate, but corresponds to the current phase with possible benefits for the long term in whatever capacity Zaatari evolves.

Finally, in the conclusion and discussion section (chapter 9), the findings described from chapter 1 through 8 are summarized and discussed. Furthermore, methodological considerations, limitations, and directions for future research are addressed.

Chapter 1 - Introduction

1.1   Refugee camps

Refugee
The UN's Geneva Convention of 1951 defined the status of a refugee as follows: "A refugee is someone who is unable or unwilling to return to their country of origin owing to well-founded fear of being persecuted for reasons of race, religion, nationality, membership of a particular social group, or political opinion" (UNHCR, 2014b). People abandon their homes and flee from their own country or community when they are confronted with serious threat to their life and liberty.

Camp
The United Nations High Commission for Refugees (UNHCR), founded in 1951, creates the conditions for a space of recognition and speech, by guaranteeing (physical and legal) protection and respect for human rights. Camps are constructed to protect and save lives (Herz, 2013). Camps are a basis of humanitarian and host state responses to an influx of displaced people (Peteet, 2005). Camps are designed to provide shelter, sustenance, and protection; they symbolize multiple functions and meanings. The camps are not necessarily spaces of passivity in which refugees wait hopelessly. They are socially constructed by a dynamic confluence of external forces, structural constrains, and human agency. A camp should be seen as a built environment, as everyday abodes, and as places where possibilities for the future have emerged (Peteet, 2005).

UNHCR Principles of Site Selection, Planning and Shelter
In 1982, the UNHCR created an official handbook that describes how refugee camps should be built. The Handbook for Emergencies is a guideline with levels of indications to design and construct camps, see figure 1.1. This research design uses the UN handbook in the analysis. The handbook addresses the needs and requirements for a complete response in an emergency situation. The layout of the camps is based on the rational needs of humans. Whether someone arrives in Ethiopia or Jordan as a refugee, everyone with a refugee status receives similar aid (UNHCR, 2007). The 595-page handbook (shown on figure 1.2) includes exactly 20 pages about 'site selection, planning and shelter' (UNHCR, 2007). The handbook describes the planning principles related to environmental protection as follows: 1. Planning should take into consideration the long-term provision services even if the situation is expected to be temporary. 2. Avoid high population density. 3. Avoid very large settlements. 4. Camp planning is incredibly difficult to reverse, so carefully consider implementation at the start. What is noticeable in the guidance is the perspective of the camp as a modernist space, planned from above both literally and figuratively. 'The guideline presents a uniform and relatively inflexible framework: plots are identically sized, streets are gridded, and only uses are spatially planned for at the block level' (Sutton, 2011).

From Camp to City
People arrive in large groups into a new country, mostly having escaped from war to seek safety. They need support to survive, and fortunately the UNHCR has the capacity to meet people's basic needs in the first critical phase. Where people are placed depends upon the criteria they meet and according to the UN handbook.
Unfortunately, most refugee operations last much longer than initially anticipated (Herz, 2013). According to the UNHCR, the average duration of a refugee crisis has increased from nine years in 1993 to seventeen years in 2003 (UNHCR, 2004). It is often been said that refugee camps should be built as ordinary cities. However, refugee camps are different from regular cities. Ordinary cities develop over time, and have time for strategic development (Herz, 2013).

Unlike ordinary cities, refugee camps have an extreme development speed and sudden high number of people. The spatial quality of refugee camps is mostly deficit, so the living conditions are often poor. Jansen states, "a refugee camp is similar to a slum because it has the same poor physical appearance" (Jansen, 2011). A camp, evolving into a city, has been built on an improvised structure. According to Jansen you don't have to guide the unintended consequences of the transformation, as people will do it by themselves anyway. However, the comparison between camp and slum is not entirely correct. Sometimes there is more attention for educating the people residing in a camp, healthcare is provided, and human rights exist in a camp. A slum often lacks each of those aspects as well as a lack of government (Jansen, 2011).

Imagine that the civil war in Syria does not stop within the next five years. Imagine that the war is over, but the refugees do not want to go back because they have nothing left at

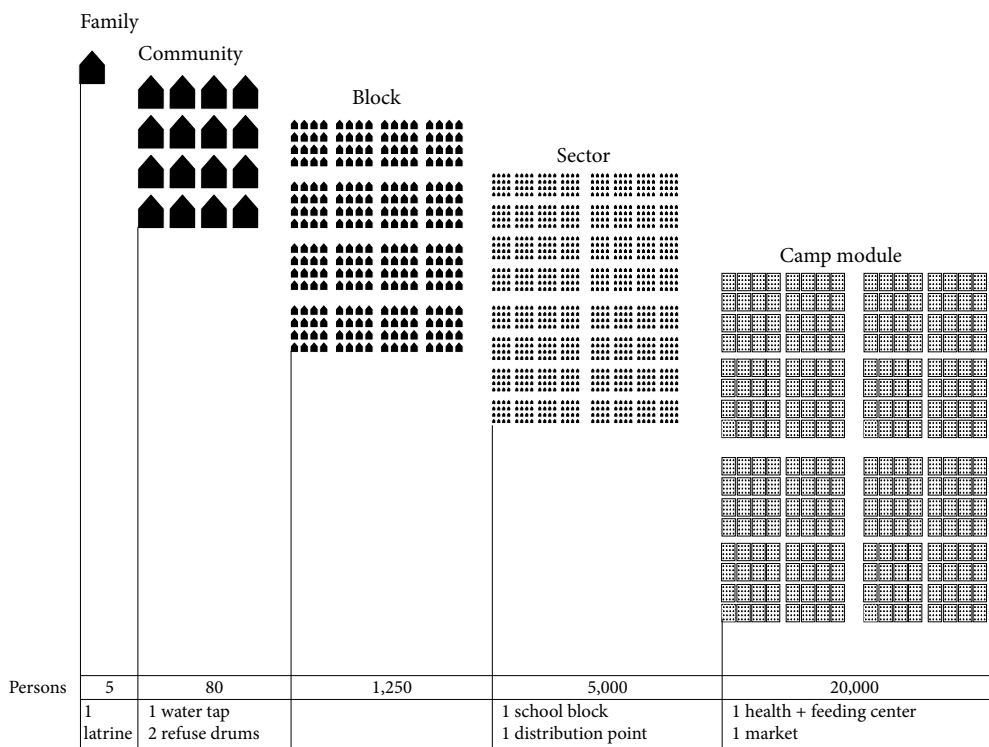| Persons	5	80	1,250	5,000	20,000
	1 latrine	1 water tap 2 refuse drums		1 school block 1 distribution point	1 health + feeding center 1 market

figure 1.1: 'the organization of capacities and resources to meet threats to the lives and well-being of refugees'. (UNHCR, 2007)
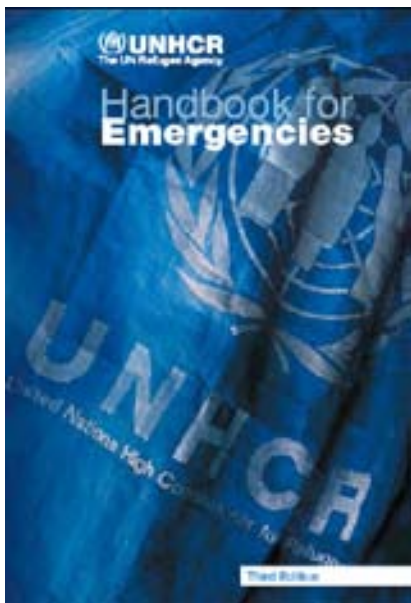

figure 1.2: UN Handbook for Emergencies, third edition. (UNHCR, 2007)

home. Does the camp evolve into a permanent city? Unfortunately there is no answer for that. The Handbook for Emergencies anticipates this by stating: "Most refugee operations last much longer than initially anticipated therefore, site selection, camp planning and provision of assistance should take this into consideration as well as bearing in mind the exit strategy from the start" (UNHCR, 2007). Anticipating on a longer stay for refugees in a camp is also a paradox. Jansen says, "If we can think 20 years ahead, we should immediately start repatriation, or integrate refugees into their 'new land' " (Jansen, 2012).

Environmental issues

Large-scale population movements can badly affect the environment of host countries. There is evidence that demonstrates that large-scale dislocation of people has a negative environmental impact (Martin, 2005). The scale and unexpectedness of refugee camps can rapidly change the environment. Deforestation tends to be the most apparent negative environmental feature of refugee situations (Martin, 2005). Other major impacts are soil erosion, loss of wildlife, and loss of biodiversity.

In an emergency, environmental considerations tend to be put aside. Refugees deal with safety, health, and education first. Cook states that it is understandable that international aid workers focus on the more visible suffering of the refugees, but they should not forget the environmental impact (Cook, 2013).

1.2   An ongoing conflict

A human catastrophe

Pro-democracy demonstrations in Daraa, a province in southern Syria, began in March 2011. The original intention of these protests was to conduct peaceful demonstrations against President Bashar al-Assad. It soon became a rapid and widespread protest, and as a result, the Syrian government answered with cruel repression (Slackman, 2011). Arresting, torturing or killing Syrians.

More than one third of Syria's 23 million people have fled their homes since the beginning of the civil war in 2011 (UN, 2014). Over 3 million people have left the country. This is one of the largest refugee exoduses in recent history, with no end yet in sight. It is estimated that by the end of 2014, 3.5 million refugees will have left Syria (UN, 2014). The prolonged conflict in Syria is a serious concern, with growing domestic, regional, and international consequences. This conflict, which is now in its fourth year, consists of insecurities and violence, while persecutions continue to force the people of Syria to seek safety elsewhere. The situation is notable because there is no direct prospect for peace in sight (Guterres, 2014).The reality is that this ongoing battle appears to have no end, to such a large extent that humanitarian organizations call the people affected a "lost generation".

As of April 30, 2014, 191,000 deaths had been recorded since the start of the protest. Now, 6.5 million people are internally displaced and 12 million Syrians are in need of assistance (MercyCorps, 2014).
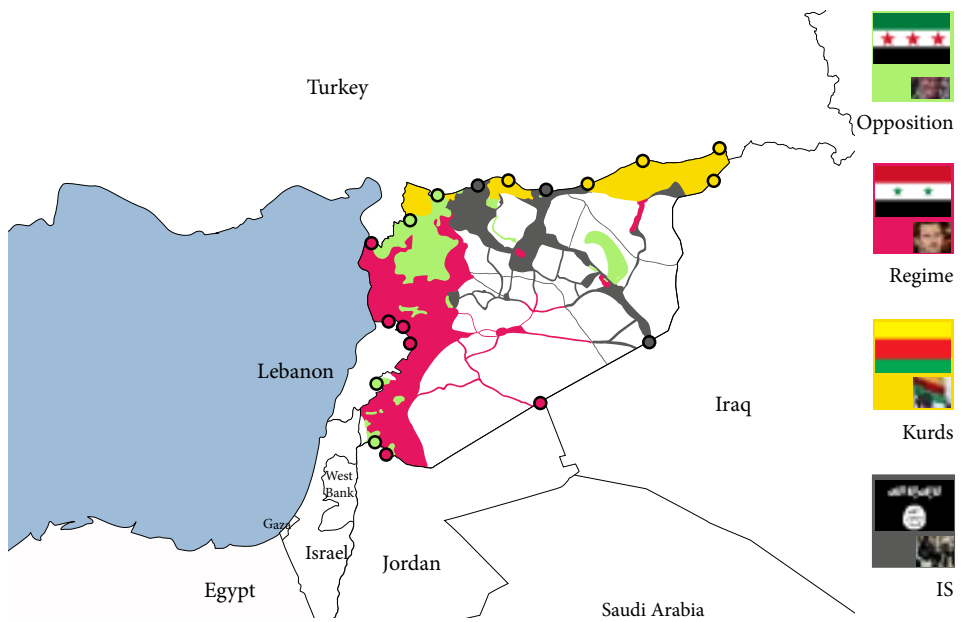
figure 1.3: Syrian civil war - areas of control 6 June 2014. (LiveLeak, 2014)

2,902,646
Syrian refugees

15%

Camp
non-camp

Refugee camp

Syrian refugees population density

Less than 569
569 - 1,861
1,861 - 9,510
9,510 - 28,884
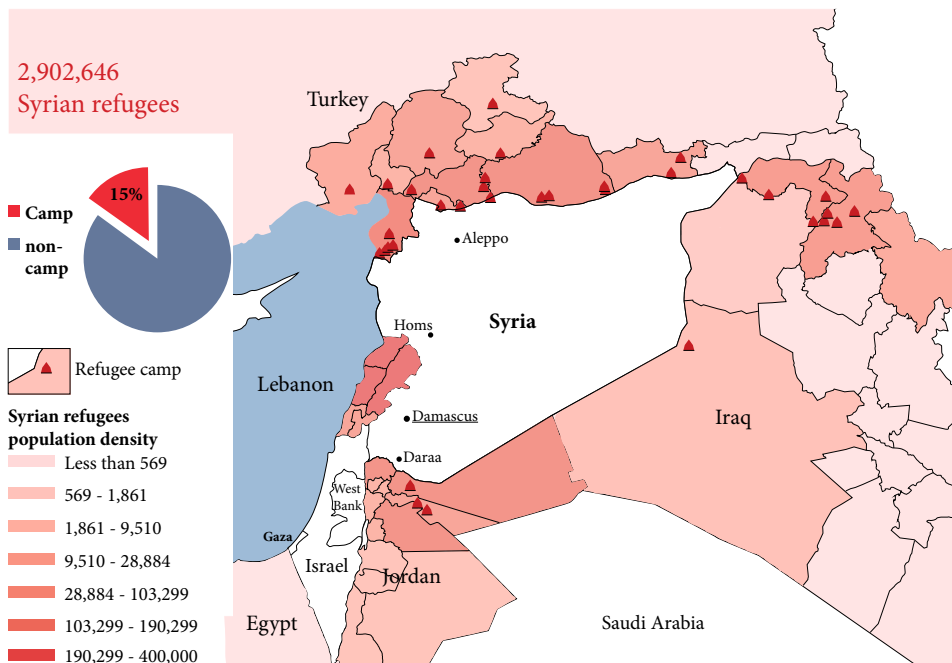28,884 - 103,299
103,299 - 190,299
190,299 - 400,000

figure 1.4: Syrian refugees in the region August 1st 2014 (UNHCR, 2014e)

1.3   Jordan, a refugee heaven: stability ensures attraction

Jordan has been a fortress of stability in an unstable region for much of its modern history. Since 1950, there have been massive influxes of Palestinian refugees into Jordan. In 2002, Iraqis sought refuge throughout the country. Now over 600,000 Syrian refugees reside in Jordan (Snap, 2014).

Jordan is a neighboring country of Syria, trying to manage the influx of Syrian refugees. This region of the Middle East is considered turmoil and yet Jordan has remained a consistent and stable land for several neighboring countries. The Jordan authorities aim to maintain a strong, stable position in the region. At the same time, they're developing a safe haven for refugees. According to Na'lawi, it is remarkable how Jordan can maintain stability given the circumstances in the region (Na'lawi, 2014)

Jordan is a relatively moderate country in comparison to the neighboring countries. King Abdulla II, is very involved with, and focused towards, the Western world (Na'lawi, 2014). Jordan is officially a democratic country, although the King holds a lot of power. The government and King Abdulla II limit the freedom of expression of people in Jordan in order to keep the country stable.

Of the 600,000 refugees entering Jordan, 85% of them reside in urban and rural areas, increasing the pressure on public services and infrastructures of Jordanian municipalities (Centre, 2013). Jordan is a country with few natural resources and therefore it is dependent on external aid. The influx of refugees puts pressure on the public facilities. Jordan has always had a noticeable water shortage and now, with more than an estimated one million Syrians (600,000 registered) living in Jordan, there is high demand and extreme pressure on the water supply. House and land prices have gone up because there is an increase and high demand due to all of the refugees living in this country. Overall, the country's basic needs have increased in price due to the massive influx of Syrian residents (Snap, 2014).

1.4   Scope of the thesis

To conclude, Jordan is facing a massive influx in the urban settlements, which cause pressure on public facilities and scarce natural resources. This thesis focus on Zaatari refugee camp. There are currently 80,000+ Syrians living in camp Zaatari in Jordan. Zaatari is a settlement transforming into something more permanent. The camp has now existed for almost three years. It was originally developed with the belief of existing for six weeks; nowadays it is called an "overcrowded city in the desert."

Up to now, Zaatari is still officially a refugee camp, and so defined as a temporary settlement. However, that does not prevent the UNHCR from investigating how the camp can be improved. Currently, DRO Amsterdam and VNG International provide expertise
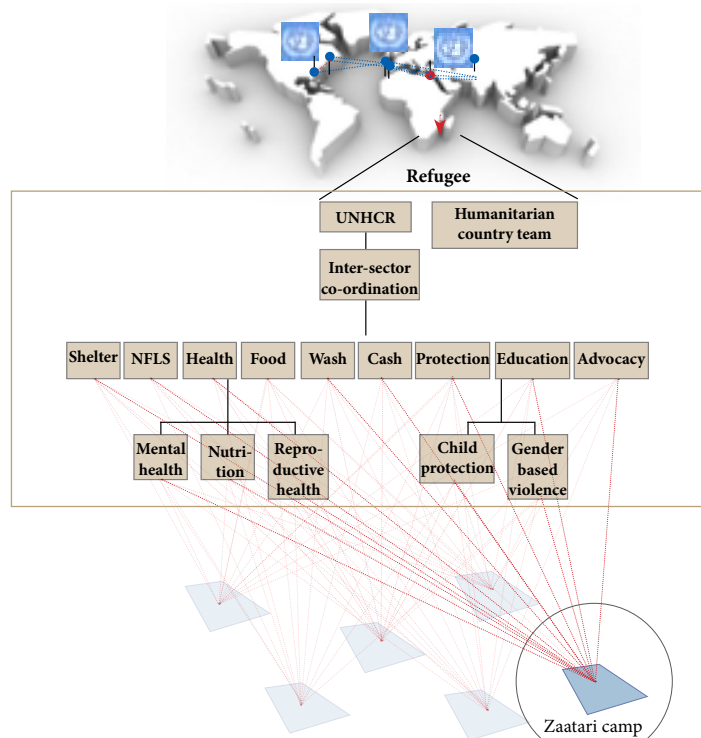
figure 1.5: Coordination structure Jordan Syrian response (UNHCR, 2014d)
The coordination structure above shows how a conflict is managed from UN until camp level. Wherever in the world a conflict occurs, the UN gets involved. When a conflict results in refugees, the UNHCR is in charge of managing the influx in the concerned country. In each country the coordination structure is slightly different. However, the assistance and approach almost always follows the UN Handbook. The gridded structure in Zaatari camp shown below is very recognizable and is a direct result of the mathematical approach by the UN.

to the UNHCR and the Jordanian authorities, aiming to improve the living conditions within camp Zaatari and its surrounded villages. According to Minister Ploumen, "this support is not providing the traditional form of relief, but exploring ways to stimulate how refugees can live independently as soon as possible" (Rijksoverheid, 2014).

This research design is in line with what the Minister encourages, namely to let the refugees operate more independently. This will be elaborated in chapter 3. Unofficially I was able to use the network and running operations by DRO-Amsterdam in Zaatari, as will be described in the research context in chapter 4.

figure 1.6: Zaatari September 2011 - Zaatari April 2014

Chapter 2

Theoretical context

2.1   The landscape architect

The theoretical notions of this research design draw on the concept of ecosystem services. 'Ecological design is characterized by a holistic view of the human-environment and by an evolutionary and open-ended view of culture' (Koh, 2005). Landscape is a culturally grounded idea and practice; both culture and landscape are symbolic representations as much as physical and cognitive adaptations. According to Koh, design not only has an ecological value, but also offers a holistic expansionist view of the world.

'A landscape architect adapts [a] new development to that which already exist and creates new forms required for new types of use' (Vroom, 1986). Design for space plays an important role. According to Duchhart, 'in the design, spatial form and ecological processes are two major ingredients' (Duchhart, 2007). Spirn calls for a framework with 'deep structure' of a place that expresses both natural and cultural processes. 'The result should be a dynamic, coherent whole that can continue to evolve in changing needs and desires and that also connect the present with the past' (sprin, 1988). Kerkstra and Vrijlandt talk of landscape morphology, where soil and vegetation types as well as water flow are major principles guiding land use Besides the ecological process, 'landscape is a reality that integrates between sociocultural and ecological processes' (Duchhart, 2007)

2.2   Ecosystem services

'A major challenge of the twenty-first century is ensuring an adequate and reliable flow of essential ecosystem services to meet the needs of a burgeoning world population'(Biggs et al. 2012). Ecosystem services provide systems for humans and nature. Ecosystem services are classified into four main domains. Firstly. It is a productive system, e.g., freshwater, crops, and meat. Productive systems work when an area is disturbed for a while in order to generate natural products. Secondly, ecosystem services have a regulating function, e.g., climate regulation. Regulating services perform optimally in "intact" ecosystems. In general, 'regulating services are believed to decrease with increased use intensity' (De Groot et al. 2010). Thirdly, it provides services for habitat objectives, e.g. improving the natural biodiversity. Finally, it provides cultural services like recreation (De Groot et al. 2010).

In general it can be said that the level of an ecosystem service decreases when there is a shift from natural to urban environment. This means less available space for production, more human disturbance of natural processes and more land use areas built up with concrete and asphalt, 'where production of natural ecosystem goods approaches zero.' (De Groot et al. 2010).

'At the landscape level, the main challenge is how to decide on the optimal allocation and management of the many different land use options' (De Groot et al. 2010). The growing worldwide population causes 'disproportionate' impact on the environment (Ehrlich and Holdren, 1971). Ecosystem functions are the intermediate between ecosystem processes and services and can be defined as the: "capacity of ecosystems to provide goods and services that satisfy human needs, directly and indirectly."
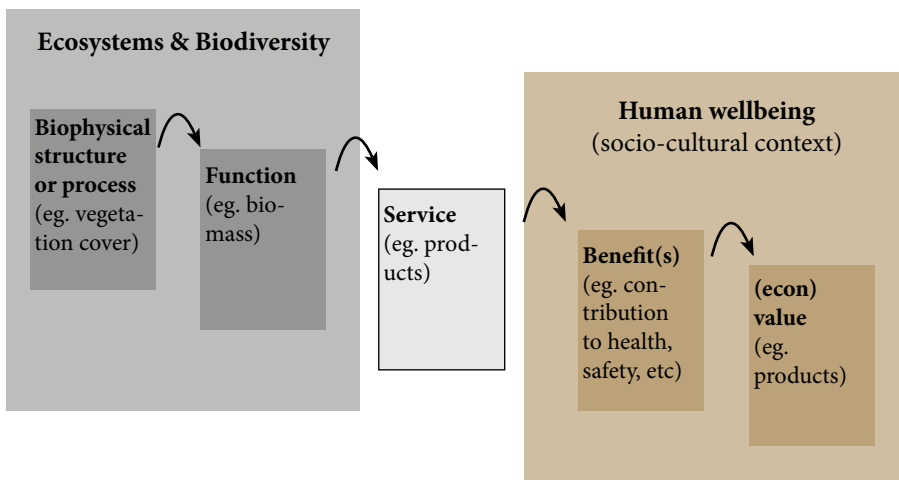

figure 2.2: Framework for linking ecosystems to human wellbeing (adapted from Haines-Young and Potschin, in press).

2.3   Landscape architecture and refugee camps

As described in chapter 1, wherever in the world the UNHCR constructs camps, it places refugees in a strict gridded physical order for a limited duration. The distribution system determines camp morphology. The camps are ordered into blocks that corral residents to facilitate administration and distribution of food and supplies.

Refugee camps are set up for a temporary establishment. Designing spaces for temporary purpose is traditionally uncommon for landscape architects, as 'especially landscape architecture is concerned with taking into account the time scales, including the long term' (Van den Toorn and Guney, 2011). Landscape architects work within the interaction between natural and cultural process and design space that is available. 'The landscape where we live is the result of many change-production actions resulting from the activity of various stakeholders in territorial processes in highly varied ways on a different scale of time and space' (Makhzoumi et al. 2011). However, in camps, a long- lasting growth does not occur. Camps do not grow organically but are projected onto a site in a very short period of time (Kennedy, 2008).

The landscape processes and ecological systems are not part of the primary needs, so are not provided during the emergency phase, according to the UN Handbook. Aid workers focus on the more visible suffering of the refugees (Cook, 2013). However, the environmental degradation caused by the mass influx in camps desperately demands more care than it is getting. It is understandable that aid workers focus more on the visible suffering in the emergency phase to save lives. However, according to Cook: 'aid workers should not ignore this factor because environmental degradation of the area in camps directly contributes to suffering to those living in the camps' (Cook, 2013). In current camp operations there is almost no interface between the existing natural layout of the terrain and the occupation layer. 'Camp management supports neither the pre-existing ecological systems of camp terrain.'(Makhzoumi et al. 2011).

In recent years, the notion of refugee camp has gained prominence and even notoriety in the field of spatial studies (Herz, 2013). There is a greater interest in camps in books, texts and discourses for architectural studies. However, in the field of landscape architecture, there is still very limited notice for this topic. In practice, aid agencies hire engineers for reconstruction in refugee camps, but not landscape architects (Christensen, 2002). 'This is not because a landscape architect is not qualified to fill the positions, but simply because the human resource people do not know that landscape architect do more than design and plant gardens.' Landscape architects can assist in international aid through emergency disaster relief, flood and sanitation control, community development, agriculture, reforestation, and agroforestry (Christensen, 2002).

2.4   Land and landscape: the right to landscape

All refugees, as indeed all people, have human rights. Refugees officially have the right to freedom of movement. However, it is recognized that, particularly in cases of mass influx, security considerations and the rights of the local population may dictate restrictions (UNHCR, 2007). As soon as a refugee passes the gates and finds him or herself in the camp they enter a situation of exception. 'They have no right to move freely or work in the countries where the UNHCR camps are located' (Peteet, 2005). Refugee camps are governed by international law, humanitarian law and other human rights (Peteet, 2005). Human rights is further specified to landscape in the European Landscape Convention, adopted in 2000 (Europe, 2000). 'The convention defines "landscape" as "an area, as perceived by people, whose character is the result of the action and interaction of natural and/or human factors'. The convention aims: 'To recognize landscapes in law as essential components of people's surroundings, an expression of the diversity of their shared cultural and natural heritage, and a foundation of their identity'. The notion of 'sustainable development' is understood as fully integrating the environmental, cultural, social and economic dimensions in an overall and integrated territory.

There are circumstances, as in refugee camps, where it is relevant to consider the rights to landscape. The right to landscape according to Sheely Egoz is the right to diversity of landscape, not just to the landscape of property's uniform space, but also the use right to a common landscape shared space (Makhzoumi et al. 2011). The UN Handbook states that 'It should ensure that persons that have access to safe territory continue to remain protected and that their human rights are respected. They should be able to live in an environment that promotes safety, dignity, and self-sufficiency when they are uprooted.'
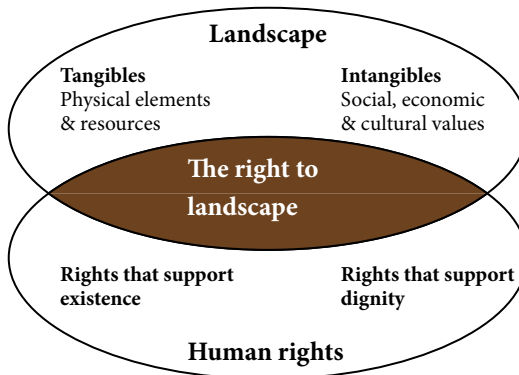

figure 2.2: Conceptual diagram: The overlap between landscape and human rights (Makhzoumi et al. 2011).

2.5   Cultural identity and displaced people

Humanitarian aid organizations working with staff from all over the world have to engage with cultures with which they are unfamiliar most of the time (Rowling, 2014). According to UNESCO, one must: 'Raise awareness of the need to incorporate traditional cultural knowledge as a vital dimension of humanitarian programs design at supporting refugees in camps' (Fouéré, 2003). According to Nyers: 'All over the world continually emphasize that the provision of, say, pen and paper and the postal system is as fundamental a "human right" as is the provision of food and shelter. That this demand for a life that is not merely a "bare life" comes from refugees is significant for it underscores a basic reality that often goes unnoticed: in the shift from citizen-subject to refugee-human, refugees do not lose their capacity to sing, to recite poetry, to dance. In fact, they continue to engage in these cultural performances in spite of their fear and harsh environment. Traditional knowledge and skills concerning nature and society constitute the core of cultural living (Nyers 2013)'. Because refugees are vulnerable people they suffer from loss of opportunities, including a breakdown of cultural possibilities.

2.6   Participation

Participation and designing refugee camps
According to the UN Handbook, the aim of the camps is to: 'Work with refugees through a community-based approach and promote self-reliance.' In the same paragraph of the handbook, however, there is a contradiction, namely the sentence which says that: 'the pressures of an emergency often make it easier to organize an operation from the outside for, rather than with, those whom it is to benefit. In emergencies, refugees are often regarded as helpless and passive recipients of external assistance.'

The research context of this thesis is a camp that has existed for almost three years. Kleinschmidt contends that: 'Zaatari is not in an emergency anymore'. At camp management level there is a need to explore and work together with the people in the camp. Oberg (UNHCR official) says: 'We have to find out what the people want'. According to Herz, as: 'Camps are often inhabited by tens of thousands of people, and there are hundreds of them all over the world, they deserve to be taken seriously as settlements. And even if only intended to exist temporarily.' In addition to that, approaching a camp with a theoretical approach, there is a risk of remaining blind to the physical manifestation in the camp (Herz, 2013). Duchhart states: 'Landscape architects are good at combining local and 'desk' knowledge into a well-structured framework.' Besides that, landscape architects can inter-link between relevant scales, starting at an individual level using a participatory approach in order to zoom out to find common threads (Duchhart, 2003).

'Active involvement of citizens in the design of human settlements has become very common during the past half-century in 'tradition' urban development' (Manzo and Perkins, 2006). However, 'Refugee camps are unique for of human habitation, temporary spaces

create 'between war and city"(Agier, 2002). In focusing on the protection and survival of inhabitants, the international agencies that run camps rarely empower residents to act as citizens of them (Katarzyna Grabska, 2006). When it comes to physical space: 'it has been widely noted that if not exerting any real influence over their space, inhabitants will behave quite passively in the camp, as though it is a place not formed by them but rather that happens to them, a place they must adapt themselves in order to access services and meet their needs' (Sutton, 2011). No matter how contrived or ephemeral the settlements may be, the dynamic between residents and their physical environment will shape behaviors and outcomes within and beyond the confines of the camps (Sutton, 2011). Theories around participatory planning reference the fact that people will have a greater sense of ownership of parts of the built environment that they control or feel part of (Sutton, 2011).

2.5 Conclusion

To conclude, it is understandable when mass displacement takes places that organizations work from the outside to provide optimum logistical assistance. Due to time pressure, the UN uses a top-down approach. Natural environment is put aside because it is not part of the primary need of an emergency phase. Therefore engagement with the current terrain/environment is very limited.

However, in general camps exist longer than expected. During the transformation from an emergency situation towards a more permanent city there is little notion of the people's voice. Refugees have lost some of their rights by being displaced. Being displaced can last for many years, but that doesn't mean, even if it's temporary, that you can or should prevent people from living true to their cultural background.

Participation, especially in relation to landscape architecture, is an unexplored field in the context of refugee camps. In my point of view, it would be challenging but rewarding to work together with refugees to improve the human and environmental quality of camps.

Chapter 3

Problem framework

3.1   Knowledge gap

Chapter 1 describes how the UNHCR uses The Handbook for Emergencies as a design guideline to construct camps. The mathematical layout of the camps is based on the basic needs of humans. When you arrive in a refugee camp anywhere in the world, everyone with a refugee status will receive similar aid (UNHCR, 2007). The knowledge gap is firstly the missing link between the ecological approach in the Handbook. Secondly, the aid focuses merely from the outside and on emergency.

In the UN handbook there is little notion of integration of any ecosystems and landscape structures during construction of refugee camps (Makhzoumi et al. 2011). Missing an ecological approach can have serious consequences for humans and environment, and it can thus aggravate suffering in both the short and long term (Cook, 2013). The minimum focus on environmental issues in the UN Handbook and the lack of attention by aid people exacerbate this. As the handbook acknowledges, it is difficult to reverse the initial layout of the camp when it evolves into a more permanent structure (UNHCR, 2007).

After analyzing the participation in refugee camps, which is written in the theoretical framework, there is criticism towards large organizations who offer the assistance in camps. Institutions often focus too much on the emergency phase and providing assistance merely from the outside (Herz, 2013). The current model to aid these refugees has only created more reliance within the refugees upon external agencies, and has not stimulated enough self-dependence (Katarzyna Grabska, 2006).

3.2   Problem statement

From the knowledge gap the problem statement became clear:

The handbook places emphasis on the emergency phase and is not a guideline to develop camps over a long period of time. The average duration of people staying in camps, as mentioned in section 1.1, shows that camps have evolved more and more into permanent physical structures like cities and slums.

The problem is that a lack of ecological approach causes environmental degradation. This has a negative influence on the already suffering population living in refugee camps. In addition, refugees often stay in camps much longer than was anticipated. Over this longer stay there is insufficient engagement with refugees because of the top down approach by humanitarian organisations. Refugees often remain dependent on aid and are not adequately stimulated to live independently.

3.3   Research Objectives

The research revolves around one central research question as follows: **What actions, based on an ecosystem approach, are needed to create more self-reliance and a sustainable environment in the development phase of Zaatari?**

In order to answer this research question, the following sub research questions will be answered.

• Which landscape problems occured after creating Zaatari by following the UN Handbook for Emergencies guidelines?
• Are there landscape processes constructed in the temporarily designed Zaatari camp?
• What are the needs and wishes of the refugees residing in Zaatari to improve their (temporary) land?
• How do you create more self-reliance in the Zaatari refugee camp to anticipate on a longer stay and reducing aid?

Research for IMC (International Medical Corps)
This thesis was done in cooperation with an NGO called the International Medical Corps (IMC). IMC provides psychological and physical assistance for refugees in camp Zaatari (Unicef, 2013). IMC works with psychologists to cope with children between twelve and eighteen years old who have a trauma. Additionally, they run two clinics in the camp where they provide medical assistance. To be able to conduct my study in this

refugee camp, I needed approval and a proper introduction from an international NGO. This meant that I needed to be given the right to enter Zaatari. After reading my proposal, IMC was willing to host me because they saw the urgent need to improve the environmental conditions in the camp. The physically unhealthy situation in Zaatari - its harsh climate consisting of dust, sand, and wind - makes it a depressing area. IMC saw these conditions as vital areas that need improvement and they let me do research for them.

3.4 Conclusion

To conclude, the ecological approach is hardly integrated in the Handbook for Emergencies. IMC underlines the notion that human suffering is correlated to environmental degradation/desolation in the Zaatari camp. In addition, the current relief approach is mainly focused on crisis situation and thus doesnt contributes to stimulate self-reliance to anticipate on a longer stay; refugees continue to be aid recipients. The research questions stated in this chapter will be answered by the chosen method explained in chapter.

Chapter 4

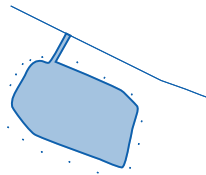# Research design

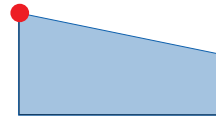figure 4.1: Aid recipients   figure 4.2: Physical restrictions   figure 4.3: Aid decreases   figure 4.4: Refugee crisis takes almost a generation

4.1   Philosophical assumptions

Transformative framework

This research used the framework of a transformative worldview. The dependant vulnerable population (aid recipients, fig. 4.1) in Zaatari fits into this worldview. 'Transformative is a framework for advancing the needs of underrepresented or marginalized populations. [It involves] being sensitive to the needs of the population and recommending specific changes as a result of the research to improve social justice for the population under study' (Creswell, 2009). The purpose of a transformative design is to empower individuals and communities, identify power imbalances and seeks for social justice. Living in Zaatari means living with restrictions, see fig. 4.2 (Amnesty, 2013). Refugees often face significant restrictions on their rights. Essential economic, social and psychosocial needs remained unfulfilled afters years in exile. 'A refugee is often unable to break free from enforced reliance on external assistance' (Beswick and Jackson, 2013).

'Often, the researcher helps to 'voice' the (often marginalized or disenfranchised) participants of the research. The aim of this kind of research is – next to generating new insights – to bring about changes in the actual situation and raise awareness of participants' (Lenzholzer et al. 2013). It is necessary to carry out this fieldwork together with the people who live in Zaatari, to allow them to think and work on their environment and come up with solutions.

4.2   Methodology

Exploratory research
The research described in this thesis is based solely on qualitative research methods. This research requires a flexible and iterative approach because it is unknown area of research. During the research process, different methods and techniques were used to gather the right data. Exploratory research is used to get a better understanding of the phenomena (Creswell, 2011). It isn't designed to come up with final answers and solutions. This research design focused on an undiscovered area for landscape architects. Therefore, during the process it allowed me to modify the originally chosen method presented in the research proposal. The exploratory research examined the environmental and health impact on humans and the landscape in refugee camp Zaatari, as there was little known about the problem in this case.

This research used a variety of methods in order to achieve triangulation, to increase the validity of the results. Because of the transformative worldview and need for participation, a large part of this study was done during my field research in Zaatari shown in figure 4.6.

The motivation to choose a participatory approach in this research design was grounded in two reasons. Firstly, as is stated in the theoretical background, there is in practice too little attention for the voice of the people in constructing camps. However, international agencies and researcher emphasize the need of a process including the people who live there. Working together with a community-based approach and creating more self-reliance is an issue but is too little done in practice.

Secondly, after the exploratory mission to Zaatari camp in March 2014 together with DRO-Amsterdam, one of key conclusions was that the camp has symptoms of a 'quasi-prison'. Refugees are very rarely allowed to go in and out the camp. Jordanian soldiers guard the camp border. According to Acted, an NGO, 'it is difficult to accept what they have become in this miserable situation'. Oberg, from the UNHCR, says: 'We give them things without asking'. As aid agencies you have to understand the situation of the people to receive trust and commitment. That's why this research design uses participation as a research method in order to get an understanding of the people, as NGOs recognize a gap between aid workers and refugees.

The field research made use of the Green Town Workshops as a method to identify the needs and wishes of the people. Executing problem and wishes was done by organizing workshops, Photoshop session, fieldtrips and action days. For further validation, the local solutions, identified by the participants, were verified by the stakeholders in the camp, the UNHCR and international NGOs. The methodology is explained in detail in section 6.1. Besides the workshops, a landscape analysis was carried out on the environmental and physical conditions in and around the camp.

| Define topic | Desk study | Problem orientation | Problem statement | Landscape architectural topic | Knowledge gap | Research questions |

Preliminary field research Jordan

Content | Environmental exploration | Spatial exploration | Phenomena Refugee camp | Cultural study

Fieldwork in Jordan

Landscape analysis | Participation | Action research

Observation
Explorative field trips
Map analysis

Workshop — Children / Adults
Photo-shop — Children / Adults
Design options

Individual test days
community test days
Monitor/verify test days
Field strategy

Desk study ← Synthesis ← Interpretations ← Organising results

Design options

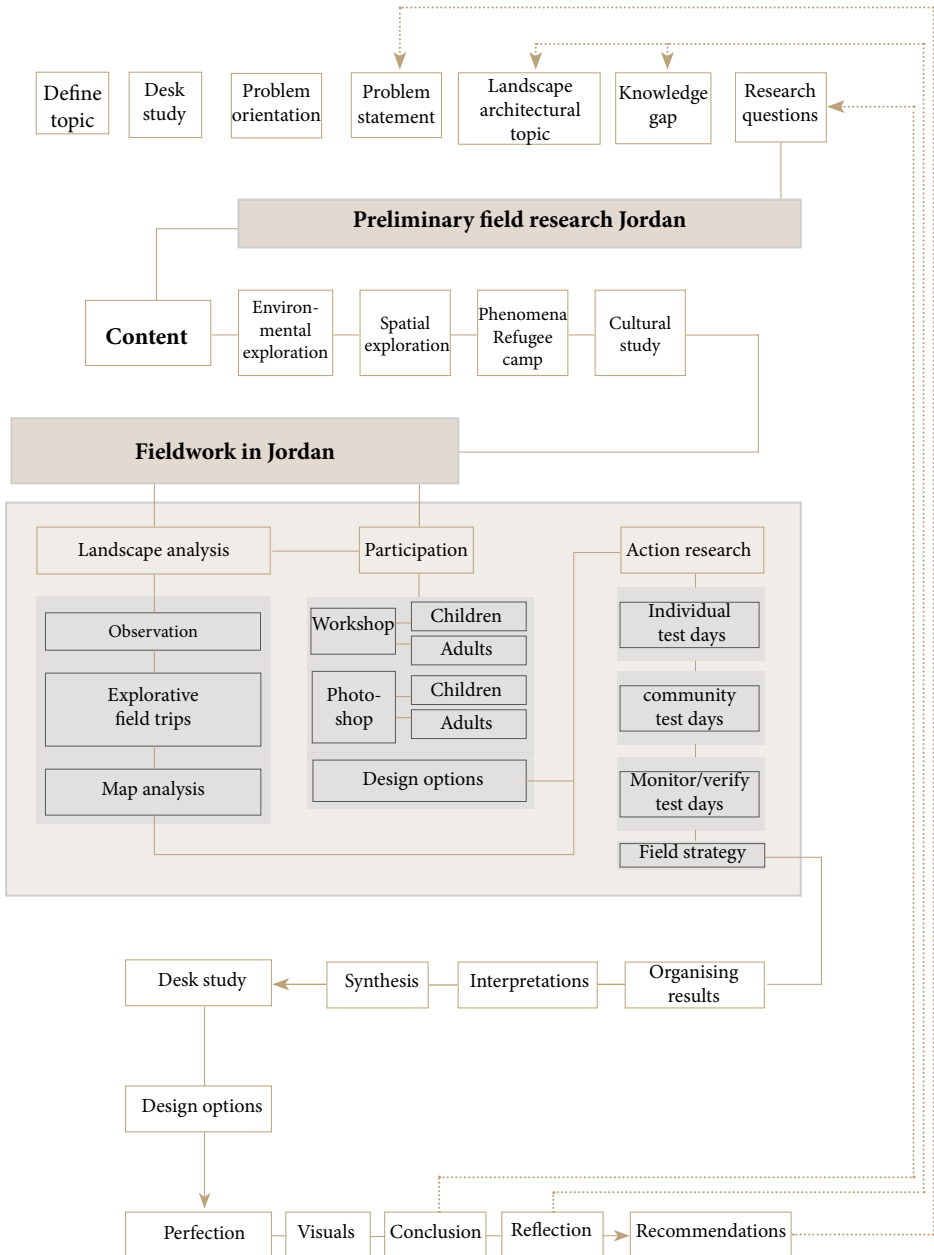Perfection | Visuals | Conclusion | Reflection → Recommendations

figure 4.5: Flow chart

23

Significance

As described in chapter 2, when a refugee camp is constructed, little attention is paid on creating a sustainable area because of its temporary nature. Landscape architects often work on long-term sustainable landscapes and aren't very experienced with the phenomena of refugee camps. As a landscape architect, in this research context, I aim to close the gap between temporary unsustainable constructed spaces and long-term sustainable environments. By sustainable I mean: 'A stable and productive ecosystem that conserves the physical and biological processes occurring on the landscape. Designed and managed sustainable landscapes maintain hydrological function, plant and animal diversity and biomass, soil integrity, and contribute to human wellness' (Sona, 2014).

This research involves a significant endeavor of exploring the field of refugee camps in relation to the field of landscape architecture. It is beneficial for humanitarian agencies that construct and manage refugee camps. Recommendations will be put forward from the lessons learned in refugee camp Zaatari in order to reflect on the UN Handbook. Besides the humanitarian organizations, other institutions such as private companies and governmental institutions can learn lessons from this research. There is a growing interest in the private sector to get involved in the humanitarian business. It is an iteresting development because some multinational companies have similar global reach to the UN (Made, 2014).

4.3   Research context and data collection

Research context

In order to conduct my research with the right data I used the network of DRO-Amsterdam, in particular urban planner Van der Made. After an exploratory mission in March 2014, together with DRO-Amsterdam, the landscape architectural assignment for my proposal became clear. The fieldwork in April and May 2014 provided a clear view of the issues and needs of the refugees in the camp.

This research design uses a transformative framework, and so it is important to collect data in the field from local participants. The Green Town Workshops program is used in order to extract local knowledge. Relevant data is extracted in the field by organizing workshops. Surprisingly, even though the camp has only existed for a relatively short period of time, there is a lot of information about the camp, both physically and demographically. NGOs make information available about the development of the camp. Due to the rapid growth of Zaatari it is important to work with updated data. Through the DRO network I received the right data and contacts to get a better understanding of the development of the camp.
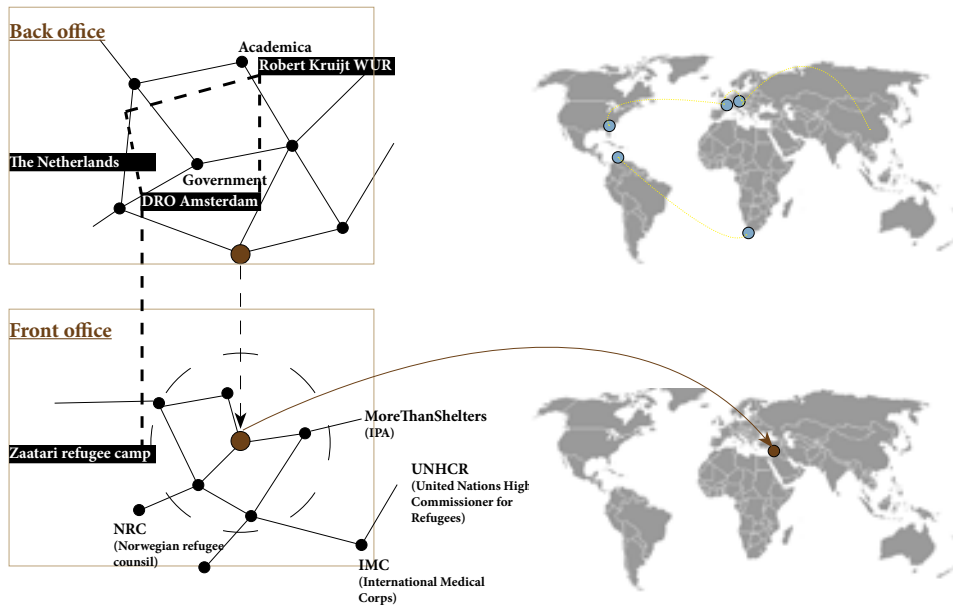
figure 4.6: Research network. Onofficially I worked together some parties of the Innovation Planning Agency (IPA) set up by Killian Kleinschmidt. (Kleinschmidt, 2014)

figure 4.6: Data collection.

4.4 Research phase

This research has been done on the transition phase between emergency and development. Kleinschmidt states that: 'A camp has an emergency status when it is open for new arrivals'. Zaatari officially closed for new arrivals on 30th April 2014 (Knell, 2014). Azraq, a new camp in Jordan, opened on 1st May 2014 to receive new arrivals crossing the Syrian-Jordanian border.

figure 4.7: Zaatari refugee camp

figure 4.8:Azraq refugee camp
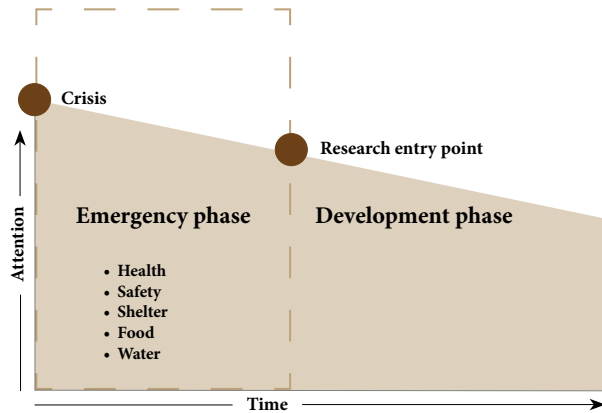
figure 4.9: Research entry point

4.5 Conclusion

This research design uses a transformative approach to explore the voice and wishes of the people. It strives to raise problem awareness by involving participants in the design process, so that they look at and work towards the development of 'their' (temporary) land. Part of the approach is action research. Thereby local adaptable solutions are tested in order to discover people's opinions.

The process of this exploratory research design is a more important outcome than a blueprint design. In a rapidly changing environment, such as this refugee camp, the final layout is highly unpredictable. Therefore, the design outcomes will be in line with the current 'transformation' phase of the camp. The bottom-up approach can raise a discussion for current UN, NGO and IPA organisations who deal with camp management all over the world. This is discussed in chapter 9.

Chapter 5

Zaatari camp

In this chapter the environment in and around the Zaatari refugee camp will be analyzed. The research questions are:

- What landscape problems occurred after creating Zaatari by following the UN Handbook for Emergencies guidelines?
- Are there landscape processes constructed in the temporarily designed Zaatari camp?

The retrieved data for this research question was collected between 1st-10th March 2014 and 13th April to 1st June 2014 in Zaatari Jordan,

During the landscape analysis, I observed the visible aspects of the landscape. Because of the "artificial" situation of the camp, due to its rapid growth, it is interesting to discover whether there are connections between the existing landscape and the camp development. Duchhart wrote in her dissertation that relationships between landscape units are both horizontal and vertical. "The vertical relationship results from the inter-linkage among plants, animals, air, water, and soil within a relatively homogenous spatial unit, which we call here landscape units" (Duchhart, 2007). As a landscape architectural student, it is important to get an understanding of the landscape.

Creating a "new city" in the form of shelters and cabins for more than 100,000 people is constructed according to a mathematical logistic system followed by the guidelines of the UN Handbook. Therefore, it is very interesting to explore, by following these two research questions, whether there was a landscape notion in the development of this temporary space.

The landscape analysis is divided into two scales. During the first visit with DRO-Amsterdam it became clear that the camp has an impact on a regional scale. First, an analysis has been made on a regional level to explore the impact of the camp on a larger scale. Second, the camp itself has been analyzed. The purpose of the first visit to Zaatari in March 2014 was to collect the available data of the camp. Despite the short existence of the camp, there is sufficient data available both in the Zaatari camp as well as on public sources on the Internet.

The methods I used for this analysis were talks with representatives of NGOs and refugees. Together with NGO hosts we made field trips, sometimes on foot but mostly in a vehicle. A map analysis is made of the camp and its surrounded context.

5.1   Conditions in semi-arid-desert landscape in northern Mafraq

Mafraq border area

The province of Mafraq covers the second largest area in Jordan but has the second smallest population density. Since the Syrian conflict began, the population in Mafraq has almost doubled, to 600,000 inhabitants (MercyCorps, 2013).

Prior to the Syrian influx of refugees, residents of Mafraq struggled with poverty and water shortage. Thus Mafraq has been unable to meet the additional demands for basic goods and services places on the community by the surge in population. One of the biggest problems is the current confrontation between the local population of north Jordan and the Syrian refugees (MercyCorps, 2013).

Water and climate

Jordan has limited land and water resources. The demand for water is increasing to meet the needs of modern irrigated agriculture, with rapidly growing population and expanding economy. Jordan can be divided into four groups in terms of climate. The desert areas in Jordan cover more than 90% of the total land area. In the desert areas the average rainfall is very low, less than 100 mm. More than 90% of Jordan's land is unusable for agriculture or intense grazing. Only very sparse vegetation grows in these harsh circumstances. The Mafraq region where Zaatari is located is defined as a semi-arid zone. The characteristics of the semi-arid zones are at least 200 mm rainfall a year. Most of the rainfall occurs between November, and March. The fact that the rain only occurs during winter, together with low temperatures (below or at zero degrees Celsius), makes the living conditions harsh, especially for refugees living in tents and other vulnerable housing conditions. The region where Zaatari is located is classified as steppe vegetation. This vegetation is confined to the Irano-Turanian region. Low shrubs and dense bush cover dominate the vegetation. There are hardly any trees as natural vegetation cover in the area.
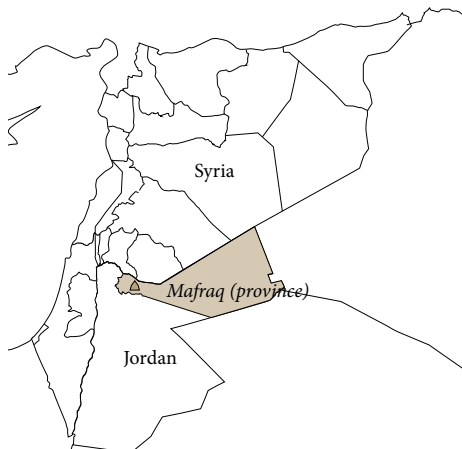
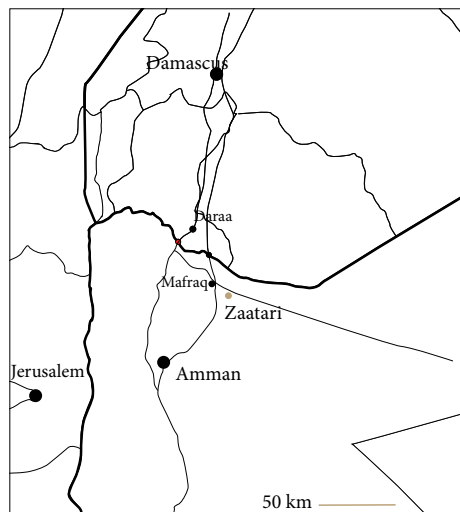figure 5.1: The outlined province, Mafraq.

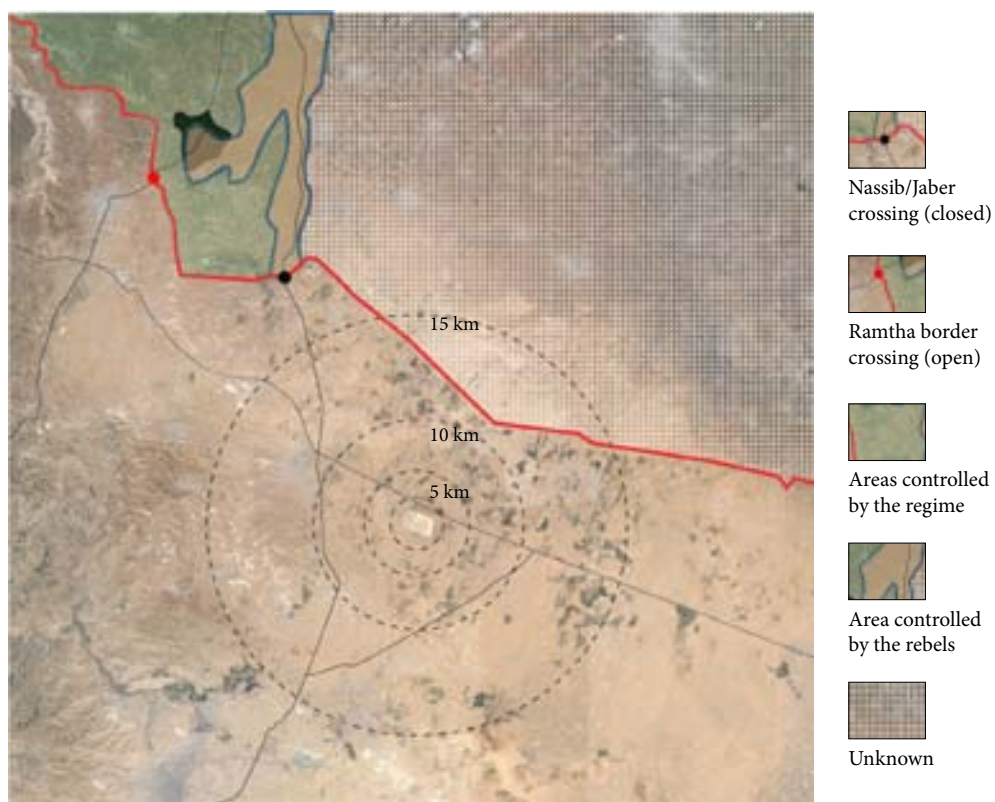figure 5.2: Postition of the camp among the border.

figure 5.3: Battle of Daraa, 31 May 2014. Camp location and war activities in Syria during this research (Clifford, 2014).

5.2   Zaatari refugee camp

Motivation for development of the camp where it is currently situated.
Four reasons explain why the camp has been developed and situated in its current location. First, the camp has to be positioned as close as possible to the Syrian border to optimize logistics regarding the transportation of refugees. Second, electricity must be present. There is a high-voltage cable running over the area. Third, access to the ground water is necessary. In this location the aquifer is relatively shallow compared to the water level in the region. The fourth reason is the need for a safe space. The UNCHR uses an existing military base to ensure safety (Ledwith, 2014).

Inhabitants

As indicated above, 90% of the population from the neighboring Syrian province Daraa reside in Zaatari. 58.2% of them are under the age of 18 (data UNHCR Zaatari). The residents from Daraa are a conservative and devout Sunni population (Shmulovich, 2014). When you look at the household situation, what it striking is that there are 42% of the heads of households are female. In most of these cases, the men are still fighting or they died at the front in Syria (Shmulovich, 2014). Many of these residents have experienced an awful event that has left them traumatized, and they carry incredible stories of violence. In April 2013, Zaatari hosted its maximum number of registered refugees: 202,993. During the fieldwork in April and May 2013 there were around 120,000 refugees living there.

Some numbers describe the extraordinary space in this desert:

530	hectares
17,000	caravans
8,000	tents
90	percent of the refugees are from the province Daraa
3,000	total small shops
680	shops that employ children
65 %	employment
360	water trucks arrivals per day
1,500	offered NGO jobs
120	mosques
3	Hospitals
200	children born per month
5	Schools
300 km	of illegal electrical wire
500,000	pita breads distributed per day
700,000	dollar bill of electricity per month
500,000	dollar to run the camp per day

(Ledwith, 2014)
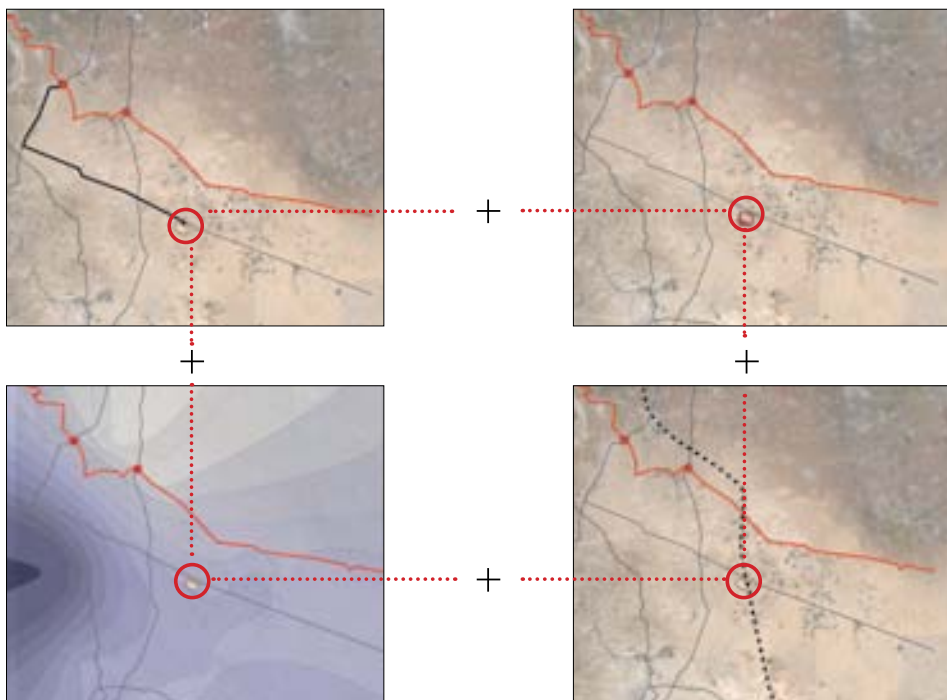
figure 5.4: Motivation for development. Left above: *infrastructure*. Right above: *security*. Left under: *groundwater level*. Right under: *electricity*.

figure 5.5: Zaatari camp on Google Earth from 27 February 2013.

Growth of Zaatari

Zaatari has been developed from scratch since July 2012 and now hosts 100,000 people. Between 2012 and 2013 Zaatari received an average of 3,000 to 4,000 refugees each night. In April 2013 Zaatari hosted over 200,000 Syrian refugees. According to Khaled Abidl, a UNHCR representative, "Zaatari is an exceptional camp in comparison with other camps in the world due to its rapid growth." The camp developed very quickly and now has indications of an ordinary city. The camp has reached about five times its maximum capacity according to the UN Handbook and the development has been incredibly difficult and strenuous.

Existing layout/size of the camp

Growing Zaatari camp

Start Zaatari camp

Zaatari village

Existing road to Zaatari runaway
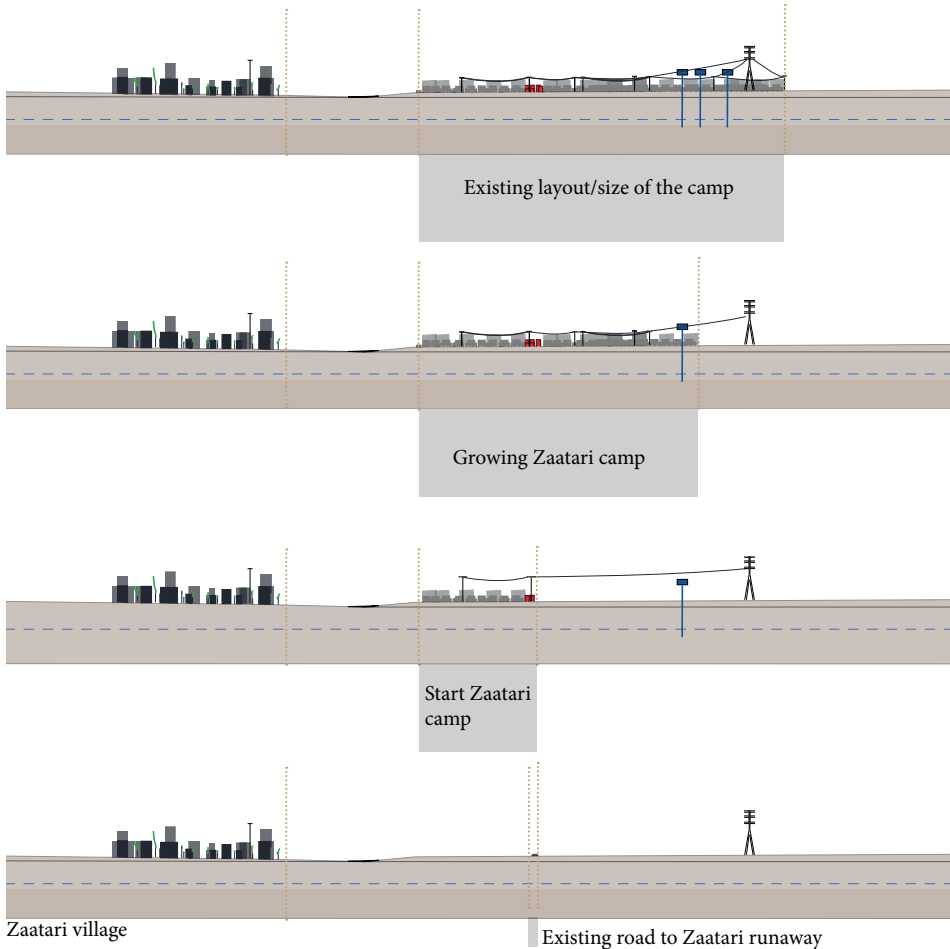
figure 5.6: Cross-section shows the growth of Zaatari in relation to the existing neighboring village.

March
2013

2 km   3 km

Feb
2013

Sept
2012

July
2012
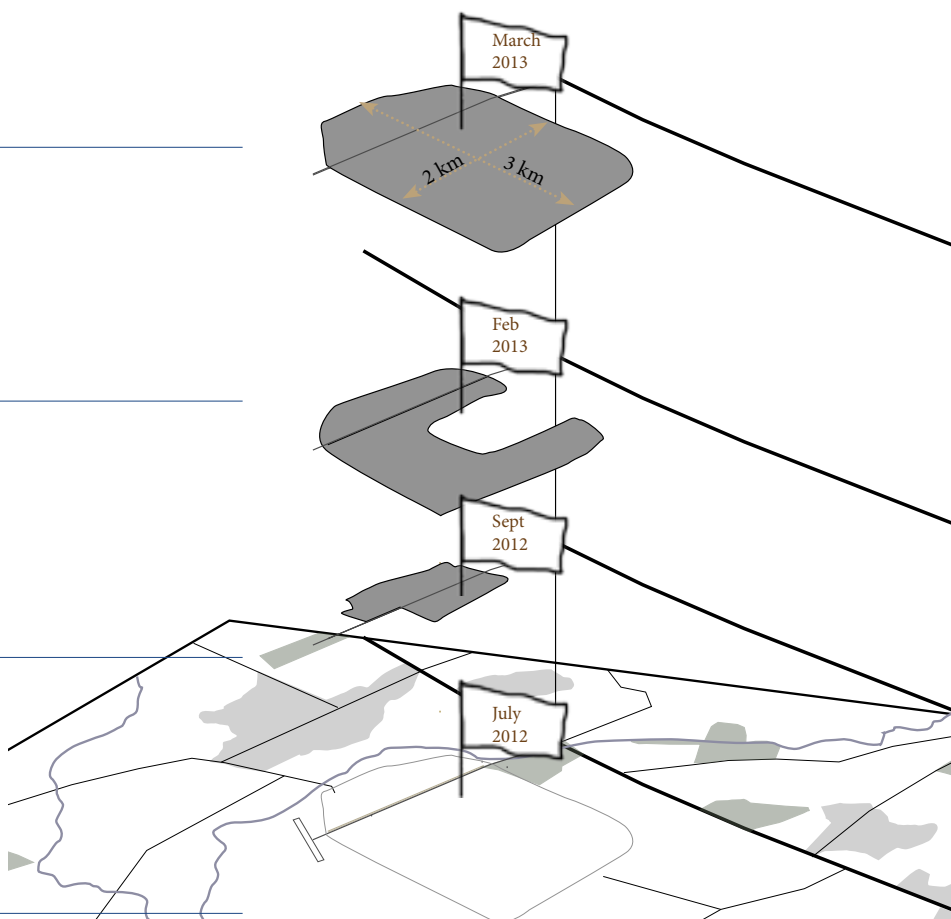
figure 5.7: Zaatari rapid growth

Zaatari's regional impact

Arrivals

Refugees from Syria arrive at the border crossing Ramtha. Currently, the new camp refugees are transported to the refugee camp Azraq. Until April 30, 2014 refugees arrived in the Zaatari camp. 15% of the refugees became camp refugees and the remaining 85% lived in urban settlements (Response, 2014). Refugees go to Amman, the capital of Jordan, or stay in urban settlements in the border of northern Jordan. The influx of refugees in urban settlements brings negative pressure on real estate, food prices, the wedding market, jobs, and schools (Reach, 2014).
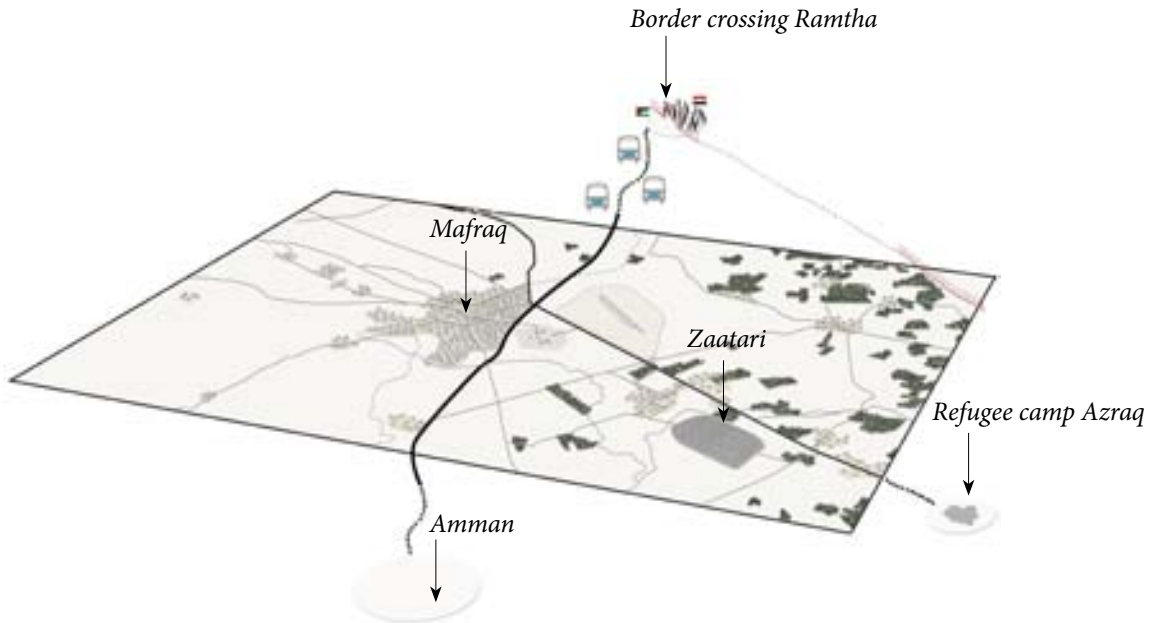
figure 5.8: Influx of refugees from border crossing Ramtha to urban and camp settlements.

Relationship with the surroundings

Although the camp is isolated from the outside world, there is a connection with the city of Mafraq and other villages around the camp shown on figure 5.10. There is a trading industry in goods, marriages, and food. In addition, the dotted line indicates the smuggling routes with Syria. "Trade between Zaatari and the outside, including the smuggling of goods, is flourishing" (Onishi, 2013).
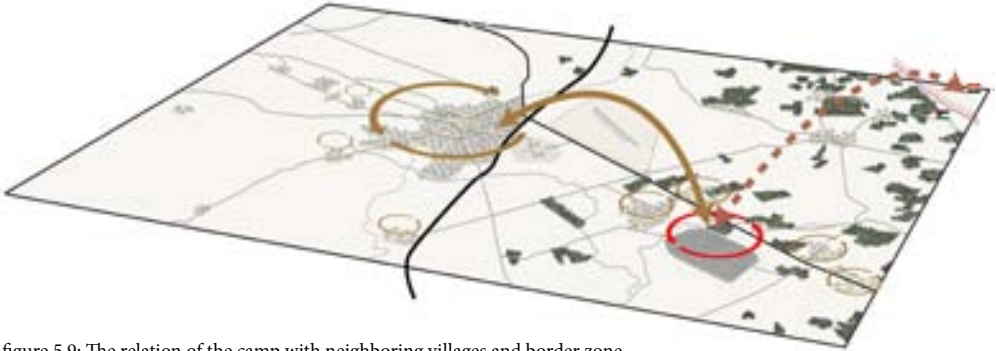
figure 5.9: The relation of the camp with neighboring villages and border zone.

Physical impact

The impact of the camp is not confined to the camp itself. Due to the 100,000 people there, several physical aspects of the camp have a negative impact on the regional scale. Solid waste produced in Zaatari is handled in Mafraq and puts serious pressure on the existing regional solid waste treatment (Centre, 2013). Wastewater produced in Zaatari is partly trucked out from the camp to treatment plantations. Some waste increases the pressure on existing waste treatment infrastructure (Ledwith, 2014). In Zaatari, there is no internal waste management system. Therefore this causes enormous pressure on the regional infrastructure.

The lack of a sewage system is a problem that arises within the camp and can have a serious threat on a regional scale. The wastewater partly drips into the soil and is a serious threat to the reservoir. Zaatari is located on one of the most important freshwater wells in the country (Ledwith, 2014). According to a study carried out by the UN, the Jordan Ministry of Planning, and an international cooperation, "there is a concern that the aquifer may become polluted without proper wastewater management practice" (The Hashemite Kingdom of Jordan, 2013). Until now there is no evidence that the aquifer is polluted due to the impact of Zaatari. However, the lack of a sewage system could be a serious threat for the future (Namrouqa, 2014).

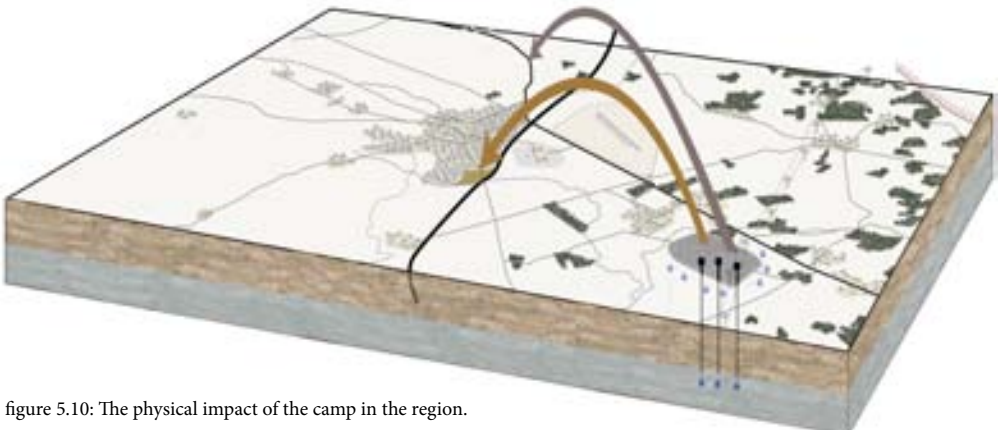figure 5.10: The physical impact of the camp in the region.

figure 5.11: Waste accumulates in and around the borders of the camp.

figure 5.12: Syrian's settle in neighboring villages and make use of the goods provided in the camp.

figure 5.13: Water trucks pump up fresh water to deliver in the camp.

figure 5.14: New roads from and off the camp are constructed due to increasing traffic around Zaatari.

Landscape structures

Within the boundaries of Zaatari there are hardly any landscape structures. The main reason is because of its heavily urban development of tents, caravans, and temporary infrastructure. There was hardly any attention given to this area and opportunities for landscape features were lost due to the extremely fast development of the camp. For example, the Jordanian government banned trees until February 2014, when the trees were finally given to the camp. The ban was because of the government fearing permanent land use by the refugees. This was difficult for the UNHCR to accept "Why is a tree considered a threat?" asks camp leader Kleinschmidt.

Around the camp, some landscape structures are recognizable. The creek (see figure 5.17) that runs along the camp with a recognizable olive orchard is the most present in this predominantly open landscape. During rainy season, from October until March, there is water flowing in the creek. Figure 5.15 shows this widespread, barren landscape. These two photos shown underneath were taken within a wide span of 5 kilometers.

The main occupation around Zaatari is housing and agriculture. Furthermore, it is a barren and empty landscape. The camp has a white, reflective appearance in the area. It is like a pancake in the landscape; a city without any high-rise buildings to accommodate the 100,000 refugees.

figure 5.15: Zaatari situated in a semi-desert landscape. Existing power lines dominate the landscape.
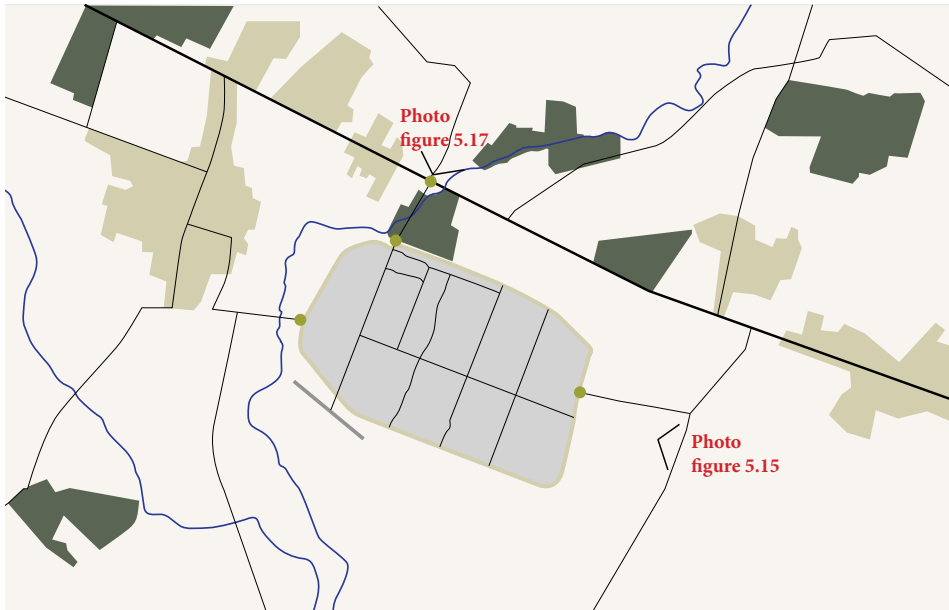
figure 5.16: Occupation around Zaatari camp.

	Desert		Olive orchard		Creek
	Existing village		Zaatari entrances		Zaatari camp
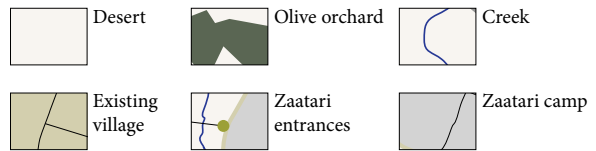
figure 5.17: The creek surrounded by olive orchards.

Zaatari development

According to UNHCR urban planner Fertilla, Zaatari is overpopulated and completely full. The camp has developed extremely quickly, which has resulted in a gridded system divided into 12 districts. The originally space between tents and caravans as shown in the first figure is designed to accommodate vehicles, guard against fire, and promote hygiene (Ledwith, 2014). Within the camp, NGOs have space for their activities. An important area is the border around the ring road. This open area is a military zone, an open no-go area. Mr. Fertilla complains about the dense situation, which leads to no open spaces for public goods.

When the camp was established, all refugees lived in tents supplied by the UNCHR. They are made of beige canvas, almost the colour of the desert sand. The tents provide shelter for a family (4-6 people). Considering the difficult environmental conditions, it is not pleasant to live in tents. The UNHCR stated therefore that one of their targets was to provide every family a caravan by the end of 2013. It was a personal wish of Kleinschmidt to transform this camp into a more comfortable place by introducing caravans (Rudoren, 2013). Nowadays there are two types of buildings in Zaatari: the caravan and the tent. Donors, primarily Saudi Arabian, have spend 75 million dollar to construct 24,000 caravans (Ledwith, 2014).

figure 5.18: Current layout of the camp divided into 12 districts.

January 2013
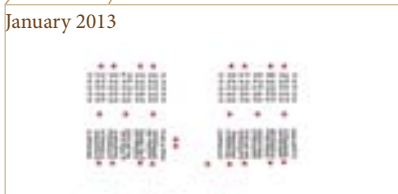
figure 5.19: Recognizable gridded structure during the start of the development.

February 2013
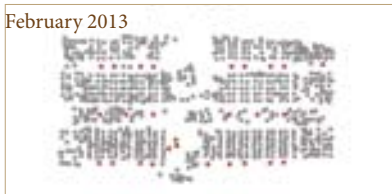
figure 5.20: Due to the influx of more refugees, they tend to settle around the current tents.

March 2013

figure 5.21: Camp is more and more densified.

May 2013

figure 5.22: Due to the growth of the camp is there is limited open space.

Projection of tent/caravan structure on terrain.

figure 5.23: Zaatari consists of 23.000 households and many NGO sites.

UN Handbook camp projection

Debris layer

Existing landscape

figure 5.24: Abstract projection of the camp on the landscape.

The abstract cross-section above shows how the tent structure is projected on the site. A layer of debris is spread out over the camp as seen in figure 5.31. Due to the layer of debris potential natural development is blocked.

Developed camp

Debris layer

Existing landscape

figure 5.25: Effect by the projection on the landscape.

The temporary projection of the tent structure leads to an undesirable mix of waste within the landscape. The camp is negatively connected to the soil formation due to a lack of infrastructure. Waste, such as contaminated water, flows into the landscape shown in figure 5.29.

figure 5.26: Private wastewater pit of a bakery situated at the back of the "Champs-Elysees".

figure 5.27: Public sanitation block. Insufficient working because black water is flowing over the surface.

figure 5.28: Households drain their waste water by the trenches.

figure 5.29: The storm water channel is filled-up with contaminated water.

figure 5.30: Debris layer with on top UNHCR tents for new arrivals.

figure 5.31: Debris is constructed on top of the existing landscape to prevent floods and softening dust problems.

Projection of 'permanent' infrastructure on terrain.

water treatment plant (opened October 2014)

Pipe storm water channel

Storm water channel
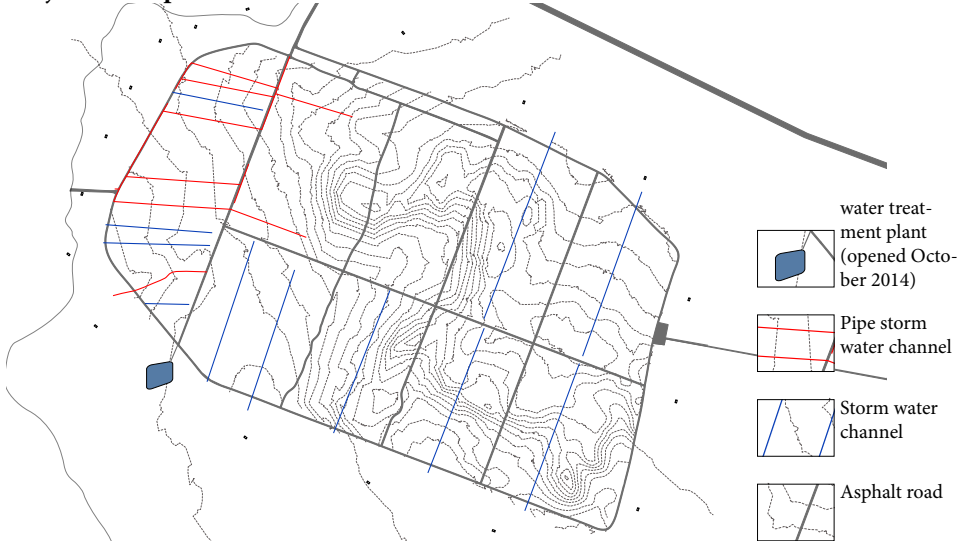
Asphalt road

figure 5.32: Layout of the storm water prevention.

UN Handbook camp projection
Debris layer

Existing landscape
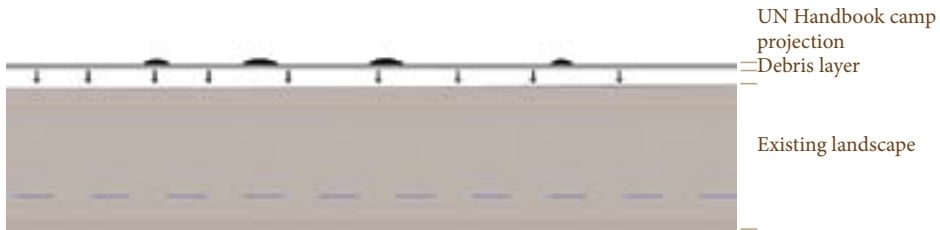
figure 5.33: Abstract situation of the projection of roads on the landscape

The roads are orderly designed. Asphalt roads surround the district layout of the camp. There has been no attention paid to relief or other issues to ensure wastewater can be managed. The roads are increased by a package of debris and asphalt, thereby creating small dikes in the camp as is shown in figure 5.35.

Developed camp
Debris layer

Existing landscape

figure 5.34: Effect by the projection on the landscape due to ignoring relief

The dike formations within the camp create stagnant water. This results in unhygienic places. Wastewater cannot flow away and accumulates in areas where people live. Refugees solve this personally by breaking up the roads, as shown in figure 5.37. Due to a missing sewage system are primitive waste water holes made by refugees. Trucks dislodge the waste water (see figure 5.38).

figure 5.35: Roads cause stagnant water along the sides.

figure 5.37: Refugees dig channels through the roads to facilitate drainage.

figure 5.36: Roads block water runoff in the camp.

figure 5.38: Storm water channels hold contaminated water.

1

figure 5.39: Each family or individual receives a tent on arrival at the camp.

2

figure 5.40: Families receive a caravan to counter the difficult climate.

3

figure 5.41: Refugees improve their own household by buying more caravans on the informal market.

4

figure 5.42: Private sanitation is constructed; therefore refugees are no longer dependent on public facilities.

5

figure 5.43: Due to illegal appropriation of public water tanks, some refugees become more and more comfortable, but at the expense of others.

Growth from tent to household

Syrians arrive alone or in families, but still Zaatari is not (yet) a community, according to Fertilla. They receive a tent as you can see in figure 5.42. As you can see from the other following figures, the accommodation has been improved whereby most of the families now have an improvised kitchen, tearoom, sleeping room and bathroom. Ideally, a household in Zaatari is made out of four caravans and tents. The four caravans ensure safety and privacy. This informal layout arose after residents received caravans. The residents re-positioned the caravans in "little compounds" (Ledwith, 2014). Besides the 'luxury' of having caravans they use improvised building materials to improve the households.

figure 5.44: The different stages of households captured in one picture.

Days with a refugee

To get a better understanding on how people live in Zaatari, I came into contact with a refugee, who in this paper will remain anonymous. This man, who fled with his family from Daraa, has a high position among the informal social structure in Zaatari.

I stayed for three days with this man and his family. The conversations about life in Syria were very intense. Before the war, he was a shop owner, and educated as an agricultural engineer. He has one son and five daughters. Two of the daughters don't live in Zaatari anymore. They both married Jordanian men and reside in a surrounding village. He hopes they will have good future.

He misses Syria enormously. He said his hometown, Daraa, is completely destroyed. Despite his heartbreak over his destroyed hometown, when the situation is safe enough he will return to rebuild his life. He looks like he's relatively well settled in Zaatari, as you can see in the photos. He emphasized that he has a relatively good life here, compared to other families. "But my heart bleeds, like any other Syrian here. This means I live well because I work hard, just like any other Syrian living here. We all put our efforts into making Zaatari a new home."

1. Fridge. Bought at the Champs Elysee.
2. Food storage. He buys his food at the shops and receives dry/tin food and bread from the WFP.
3. Tea and sleeping room. Here he chats with friends and sleeps.
4. Every day he gets updates about the situation in Syria.
5. A washing machine bought at the Champs Elysee.
6. Buckets with water collected at the public water tanks.
7. The kitchen.
8. Entrance of the house with a concrete floor.
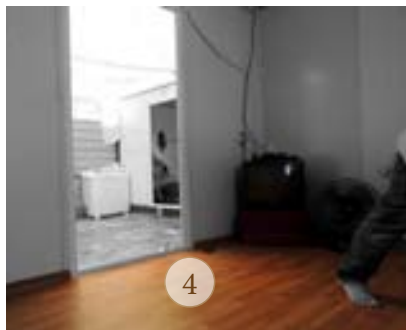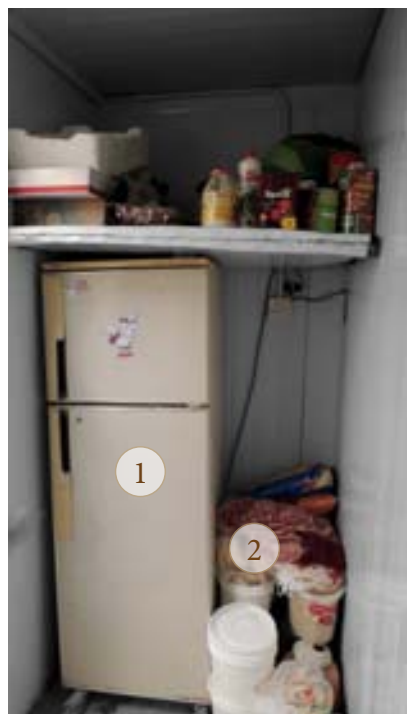
Daily life for children

A number of programs have been set up by NGOs for children. Their intentions are to provide them with education and play activities. There are five schools in the camp and many child-friendly places. For the 60,000+ children in the camp, it is important to keep them away from child labor and ensure that they can go to school (Shmulovich, 2014). Unfortunately, child labor is common, and therefore a serious concern for NGOs. Families sometimes arrive without a father in the camp, as the father has died or is still fighting at the frontline as is explained above. Therefore, young boys have to do work in the market to raise money. As a result, they are breadwinners and don't go to school (Shmulovich, 2014).

5.46.1   A young boy working in a falafel restaurant.
5.46.2   Children attending activities at a child friendly space.
5.46.3   Children working and offering transportation is very common in Zaatari.
5.46.4   NGOs offer different programs like art and drama.
5.46.5   An agricultural class is offered by an NGO.
5.46.6   Children "playing" outside.
5.46.7   Children working for money.
5.46.8   Girls attend school in the morning, boys in the afternoon

5.46.1

5.46.2

5.46.3

5.46.4

School

Child friendly spaces

Football field
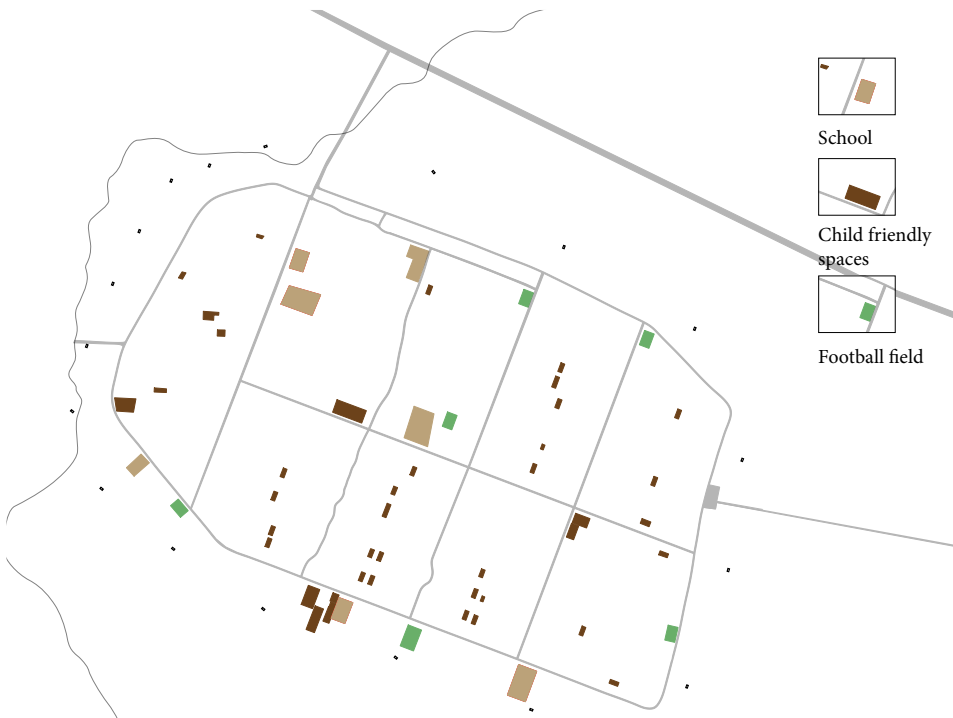
figure 5.45: Formal activities for refugees who are under age.

5.46.5

5.46.6

5.46.7

5.46.8

figure 5.46: Photos displaying the formal and informal activities the children attend.

Daily (in)formal economic activities within the camp

"Syrian refugees aren't used to ask help from the international community. They are skilled, entrepreneurial people," according to Khaled Fadil, a UNHCR representative. Within the camp there are 3000 little shops with a monthly economic value of 10 million dollars (Rettman, 2014). Within a few months, the oldest street in the camp was renamed "Champs-Elysees". On this street, many shops arose, from bridal shops, to Internet shops and everything in between. Another source of income is the goods provided by the aid agencies. For example, the tents offered in the camp are sometimes sold within one day to Jordanians around the camp. Smuggling occurs daily (al-Omari, 2013). The electricity system in the camp is totally out of control. There are 370 electricians in the camp who control all the cables and provide electricity for shops, tents, and caravans. It is estimated that there is 300 kilometers of illegal electrical wire in the camp (UNHCR, 2014a).

5.48.1   Fresh food smuggled into the Zaatari camp.
5.48.2   Men and woman work for NGOs.
5.48.3   Trading goods at the entrance of the camp.
5.48.4   The "Champs Elysees".
5.48.5   Illegal electricity network. The network is dangerous and unreliable.
5.48.6   Tent distribution, a place where refugees can work for the UNHCR.
5.48.7   Construction work done by refugees that was ordered by the aid agencies.
5.48.8   Children offer transportation work in order to make money.

5.48.1

5.48.2

5.48.3

5.48.4

figure 5.47: Locations of the formal and informal economy in Zaatari.
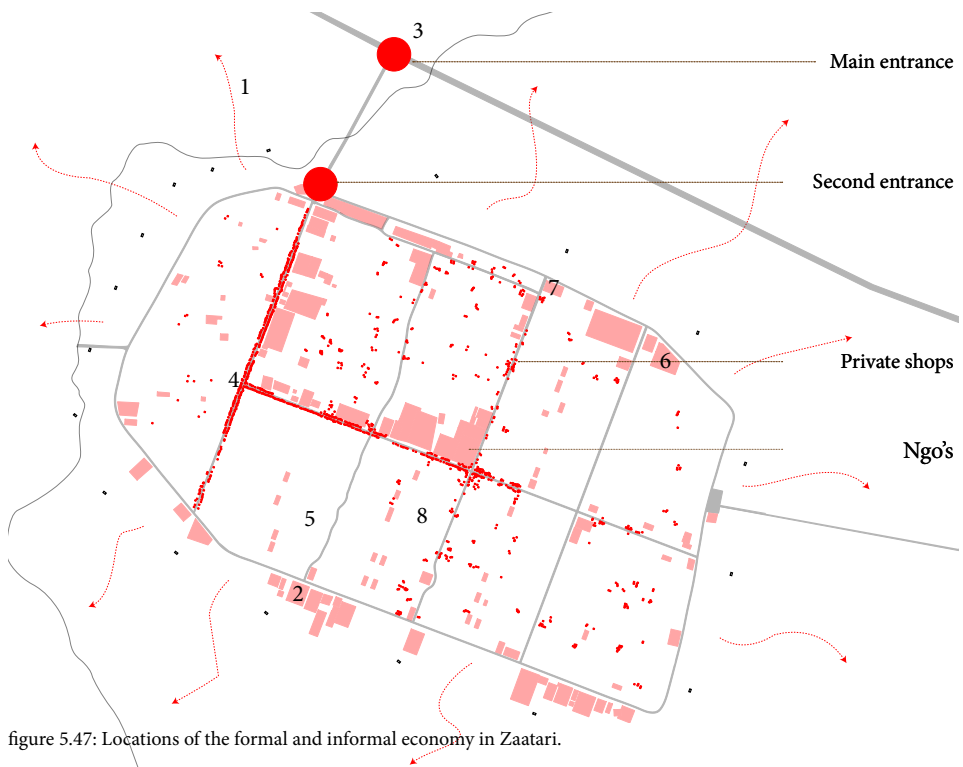
5.48.5

5.48.6

5.48.7

5.48.8

figure 5.48: Photoshop display of the daily activities of both children and adults in Zaatari.

Daily support for refugees by humanitarian organizations

There are around 70 active organizations inside the camp that provide all sorts of aid (Ledwith 2014). The numbers of refugees increased enormously during the first year of the camp. The physical space therefore expanded enormously. The surface area covers 5 square kilometers. In order to reduce the travelling distance for refugees, the NGOs spread out their activities.

The current building typology for schools, hospitals, and distribution centers show temporary structures, seen by the tent constructions. Some of the kitchens and sanitation buildings have permanent characteristics.

5.50.1   Demolished public toilets. Refugees take the bricks from them for their own purposes.
5.50.2   Public kitchen building.
5.50.3   Temporary sanitation facility.
5.50.4   Public sanitation building.
5.50.5   Bread distribution center run by the World Food Program.
5.50.6   Morocco hospital.
5.50.7   The foundations of a new school.
5.50.8   Water distribution to try to fill up the public tanks.

5.50.1

5.50.2

5.50.3

5.50.4

Saniation and
kitchen blocks

Administration

School

Clinics

Food distribution

Well

Football field

Water treat-
ment plant
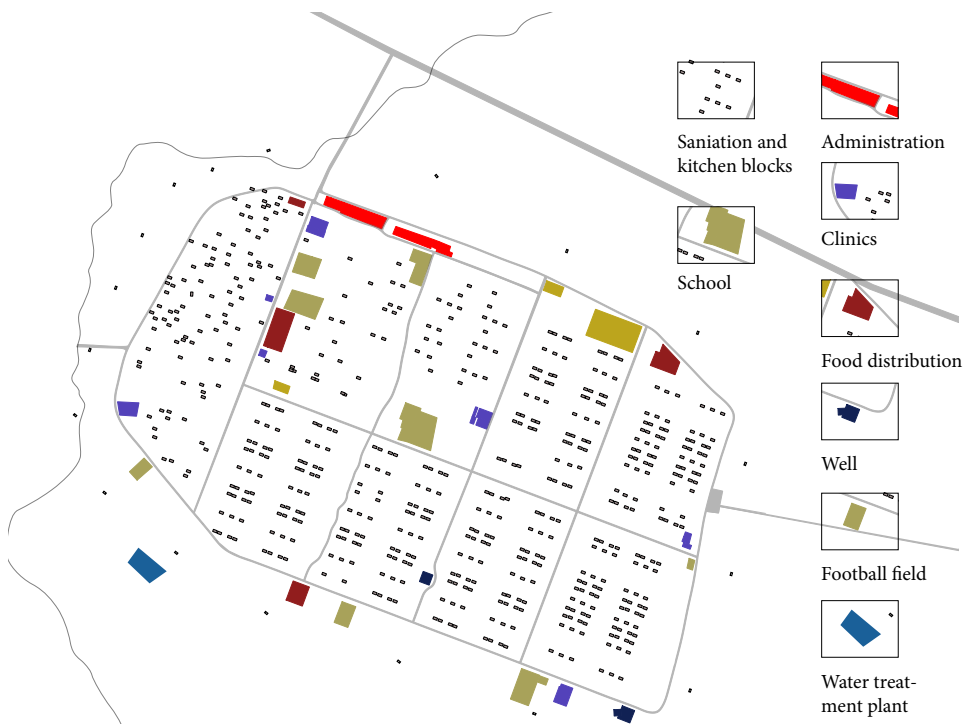
figure 5.49: Humanitarian infrastructure

5.50.5

5.50.6

5.50.7

5.50.8

figure 5.50: The photos show the daily support for refugees by the aid agencies.

Living within boundaries

Zaatari is separated with the outside by a cordon of armored vehicles. The authorities have also made ditches to prevent refugees from smuggling. Within the camp, there are prohibited areas in which the refugees are not allowed. These places are used by the NGOs to work safely. While living in the camp you are rarely allowed to go outside for a visit to relatives or neighboring villages. The only official way to permanently leave the camp is to be so-called "bailed-out". That means a Jordanian citizen, in most cases a relative, pays for you to leave the camp. A bail-out is a final choice; there is no return Ramsey, 2014).

5.52.1   Physical separation between aid workers and refugees.
5.52.2   An armed vehicle controls the camp.
5.52.3   Jordan army controlling tension and violence within the camp.
5.52.4   Fights sometimes lead to tense situations in the camp.
5.52.5   International agencies work behind a compound.
5.52.6   Trench with rocks and sand blocks prevent smuggling.
5.52.7   Gate for the hospital within the camp.
5.52.8   Food distribution center.

5.52.1

5.52.2

5.52.3

5.52.4
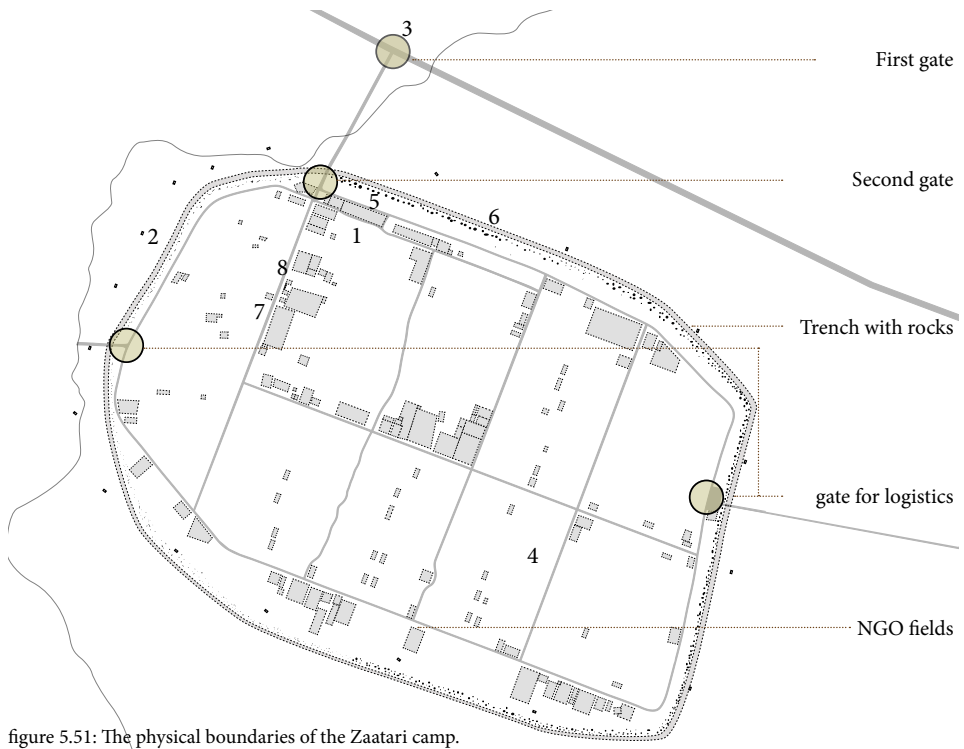
figure 5.51: The physical boundaries of the Zaatari camp.

First gate

Second gate

Trench with rocks

gate for logistics

NGO fields

5.52.5

5.52.6

5.52.7

5.52.8

figure 5.52: Photos show the physical structure that refugee's interact with on a daily basis.

5.3   Conclusion

The development of the camp is not foreseen in the UN Handbook, which assumes that the accommodation will be temporary This causes all kind of problems. There is no adequate infrastructure for treating waste water, leading to pollution in the camp and pressure on water treatment plants. Zaatari is built on top of an aquifer. The camp and the northern part of Jordan depend on the aquifer. Thus the waste water forms a serious threat.

The landscape analysis answered the sub research questions stated in the first paragraph of this chapter. The findings will be used in the design chapter where design options are given

Chapter 6

Zaatari people

6.1   Introduction Green Town Workshops

Through the visit to Zaatari with DRO/VNG in March 2014 it has become clear that there is a lot of focus on the problems and opportunities on a large scale in the camp and regionally. According to the UNHCR, "what locals think and what their wishes are is not entirely clear." Non-Governmental Organizations (NGOs) and DRO/VNG admit that communication with the refugees is lacking.

For that reason, I made use of the participation method created by Dr. Ir. Duchhart called Green Town Project. The main objective of the Green Towns Project is: "To introduce sustainable integration of environmental considerations into urban development, in order to achieve a healthy and attractive living environment which provides inhabitants with basic needs, such as water, food, energy, and shelter" (Duchhart, 2007).

There is a difference between the developed environment over time in Kenya (where the manual was written) and camp Zaatari. Referring to the theoretical context, "a place for refugees is not formed by them but rather what happens to them." There is hardly any history of interaction between humans and the landscape in Zaatari. Therefore, the initial program of the workshop was slightly adjusted to the conditions of the camp, keeping in mind the very short historical knowledge of Zaatari and the vulnerable inhabitants.

The original workshops were designed to be a three-day program. Given the conditions of Zaatari, it was not possible to work for three full days with the participants.

IMC, the host of my research, warned me about the vulnerability of the participants. According to IMC, it was irrational to discuss the problems and future of Zaatari for three days. People were angry, felt defeated and disappointed, and did not want to live there. IMC advised me to spread out the sessions over a month. During that month, IMC gave me the opportunity to work with the participants to carefully discuss the topics of my research. In that month, I participated as a volunteer by assisting in the daily activities that IMC offers. I organized soccer matches, and helped with computers and agriculture classes. Therefore, I was able to gain trust among the participants and thus create a strong rapport needed to conduct the workshops.

The nine sessions of the Duchhart workshop method are divided into three days. In this thesis, the sessions of day 1 & 2 are done in collaboration with IMC. The sessions shown in day 3 are done in collaboration with the UNHCR, which can be found below.

Day 1:
Among the participants, discussions about the problems within the camp arose. In addition, there were discussions about the life of a refugee. From intense and elaborate conversations with the participants, I was able to gain a strong understanding as a researcher of how life is as a refugee. From this, I then connected with the participants in this extraordinary environment on a deeper level.

Day 2:
Day Two of the manual is about the relationship between man and nature. In Zaatari there is no historical relationship between man and nature. However, during the sessions, questions were raised about how the participants currently interact with the landscape. Throughout these sessions, we also explored their cultural background to discover what the relationship between man and nature was in their homeland, Syria. This is translated into a design ideas in the context of Zaatari.

Day 3:
Day Three stimulated action of the proposed solutions. In the second part of this chapter the results of the action research are described.

Day 1:

Session 1: Who Cares?
Session 2: making of the
problem map
Session 3: "A workshop at
work"

Day 2:

Session 4:Man and Nature
– Inter-Linkages
Session 5: Inter-Linkages
between solutions

Day 3:

Session 6:Make your town
a green town
Session 7: Planning for real
Session 8: Election of a
voluntary action group
Session 9: Evaluation and
closing of the workshop

figure 6.1: Original program of the Green Town Workshops set up by Duchhart.
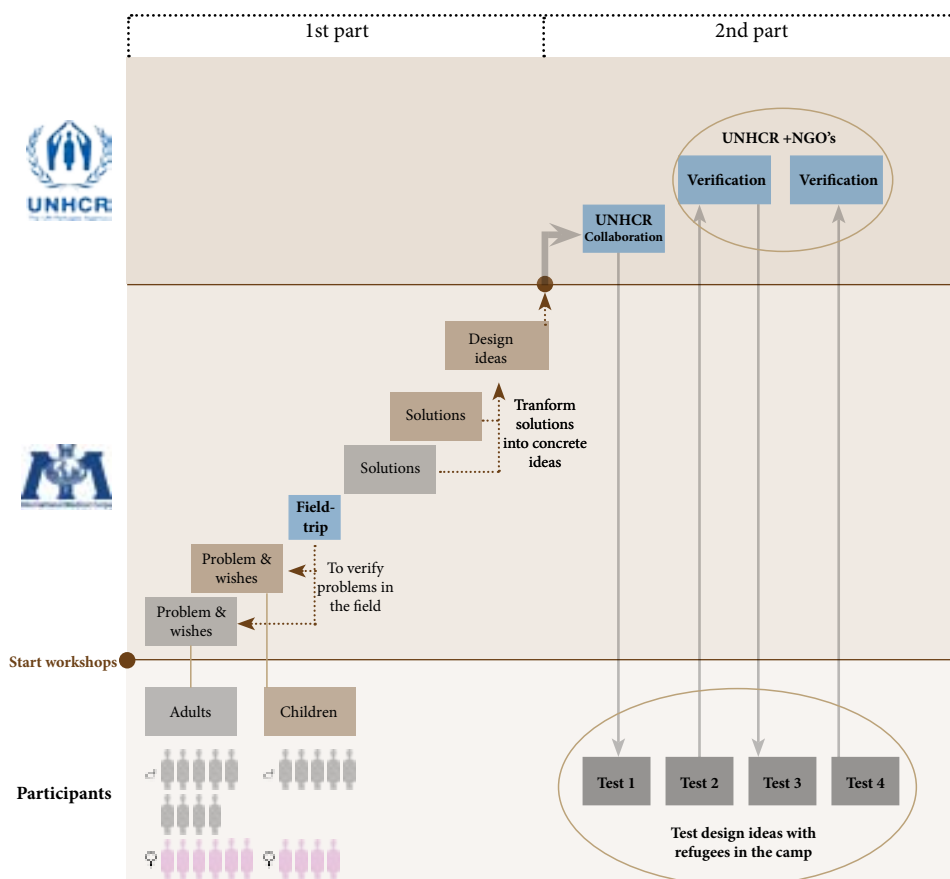
figure 6.2: Process of the first part of the fieldwork in Zaatari.

Facilitator 1st part of the fieldwork:

IMC – International Medical Corps
The International Medical Corps was willing to host me, which facilitated my research. The IMC is a global, humanitarian, non-profit organization dedicated to saving lives and relieving suffering through health care training, relief, and development programs (IMC 2014). IMC provides assistance within the camp; it provides daily activities for children and runs two medical clinics. During my four weeks with IMC, several workshops were carried out. IMC was pleased to host my research because they saw the need and potential of "greening Zaatari". Hosting involved four aspects. First they provided entrance to the camp. Secondly, they gave me a contact person in the camp, Ahmad Jaran; he is called the camp "focal point." Third, they gave me access to and use of the facilities given by the IMC, including a Jordanian interpreter who speaks Arabic and English. And lastly, they gave me a safe environment to conduct my workshops because IMC has its own fenced areas in the camp.

Workshop participants

Adults:
The adult group is Syrian refugees between 20 and 40 years old. The male: female ratio among participants is 65:35. Initially it was not possible to involve women in the workshops, but after consultation with IMC they approved me to working with women. The participants who attended the workshop lived for a minimum of four months and with a maximum of 2.5 years in the camp. Most of the participants came from the Daraa province. The adults are official volunteers for IMC, there to work with the vulnerable children.

1st part of the fieldwork:

IMC protection site

figure 6.3: Location of the workshops.

2nd part of the fieldwork:

UNHCR base camp

figure 6.4: Collaboration with the UNHCR which meant I could work on camp level.

Children:
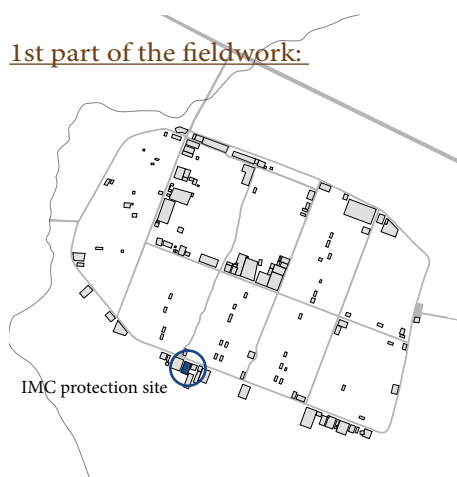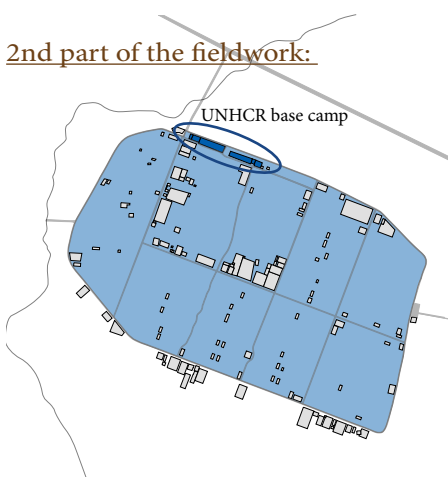The selected children are between 12-18 years old. They are all born in Syria and have lived in the Zaatari camp between two months and three years.

Facilitator 2nd part of the fieldwork:

UNHCR – United Nations High Commissioner for Refugees
An UNHCR official allowed working within their organization to elaborate my own research. UNHCR was interested in my approach because they recognized a gap in communication between aid workers and refugees. The UNHCR facilitated practical needs for this thesis, they allowed me to work in the camp, and they brought me into contact with the experts. Oberg, UNHCR representative, mentioned, "The refugees and the aid don't know the "voice" of Zaatari".

6.2   Preparation cultural issues: facing a culture shock

General rules to abide by in Jordan:
In contrast with its neighboring countries, Jordan is a freely accessible country for foreigners. It is a relatively stable country in terms of security. I prepared myself for two possible cultural clashes: (1) encountering an Arab country with its own culture and background, which was was new to me; and (2) working together with Syrian refugees living in refugee camp Zaatari.

In terms of preparation, I spoke to a former Dutch diplomat, Alwin Von Raesfeld. He is married to a Jordanian woman. Mr. Von Raesfeld worked for decades in several Palestinian refugee camps for important NGOs and gave me vital information about his experiences. Mrs. Von Raesfeld gave me insight into the Arab culture, and the "dos and don'ts" about how to behave in Jordan. In Jordan, Mrs. Al-Sharif from the Dutch embassy was my contact person. She gave different perspectives about the national and local political situation of Jordan.

General rules to abide by in Jordan:
It is very important to treat the Jordanian authorities with respect. The Jordanian authorities have a strong presence in the country. As a foreigner, one must make sure to treat all authoritative figures with respect in order to avoid any problems. One should always behave politely and honestly.
In Western culture is it normal that men approach woman. Besides the gender issues, there are three other important issues to be aware of, according to Mr. Von Raesfeld: religion, the monarchy, and politics. Talking about these three topics can escalate easily. It is very disrespectful to be critical of these issues in public.
During my research period in Jordan, I spent most of my time alone. Being alone raised questions by many people and the authorities. Because of this, I was advised by experts to always communicate clearly and to show what exactly I was doing in their country.

General rules of conduct in a refugee camp:

I was advised to approach all refugees as a professional. I represented Wageningen University during my fieldwork and had to keep in mind that my statements might affect the university. It was important for me to behave diplomatically and not get involved too much in the poor living conditions of the refugees. No promises should be made to any refugees. During my time in the camp I only focused on my research topic. Von Raesveld: "Try not to get involved in issues where you can't change the outcome such as illness, medicine, dreams of travel, or poverty. Encountering an environment of misery and poverty can be shocking." He continued, "Don't pull the pettiness of the people too much as you cannot solve all the problems in the world." This sounds harsh, but from previous experiences that Mr. Von Raesveld has had, he knows that "your emotions can lead you to difficult circumstances."

Access, security and ethical issues

The faculty of Disaster Studies in Wageningen instructed me how I could operate in hazardous and risky areas. This manual 'Fieldwork in Hazardous Areas', written by Prof. Dr. ir. Dorothea Hilhorst and Dr. Bram Jansen instructed me on the "dos and don'ts". Additionally, the UNHCR insisted that I was always aware of the dos and don'ts in the camp. Since the summer of 2013, Zaatari has been a relatively quiet camp. Before that, there were frequent riots, including violence against aid workers.

However, to a lesser extend there is still violence. In March 2014, when the DRO-Amsterdam came to visit, there had been a lot of rainfall. The fear of circuits making contact with the rainwater caused the UN to turn off the electricity. For five days there was no electricity in the camp, leading to riots. These situations do occur, although not as frequent as before. But when they appear, they have to be taken seriously. The status of the camp during my fieldwork was relatively safe. Nevertheless, I could not walk through the camp alone. Taking photos was sometimes a sensitive issue and thus most of the pictures were taken with a phone. Therefore the quality was not always optimal.

Curiosity versus safety

During my research, I tried to collect as much data as I could. However, there were some limits related to the security situation of the camp and its tense environment. The constant question I asked myself during this thesis was, "how far am I going in terms of safety to collect the data?"

Political issues

During my time in I had to be aware of the political tension. Syrian refugees feel abandoned by the international community because there is no intervention related to these political issues. I took a neutral position in this conflict to avoid any difficult situations.

6.3   Part 1: Workshops

Workshop 1

- Problem identification Zaatari

Period: 1st part of fieldwork
Location: IMC site 2
Participants: Men: 9, Woman: 6
Age: 20-40 years old

What

The goal was initially to let the refugees make a base map of the camp, according to the method of Duchhart. After a discussion with the IMC staff, we cancelled this step. Some refugees had just arrived in Zaatari after a long journey from Syria and they, "had no idea where they were in the camp" (Saʾed, IMC location manager). So therefore I provided a base map including landmarks like the main entrance and the Champs Elysees.

Why:

The refugees were asked to indicate and express their problems of the camp on the map. Whether it was site specific or randomly chosen, it was their choice.

Conclusion:

Among the refugees there is a lot of anger and dissatisfaction about the physical conditions of Zaatari. One of the main conclusions from the workshop is that refugees have to survive in very primitive conditions. These people live in poorer conditions than they lived in in Syria. The first comments of the participants are that "everything seems to go wrong in the camp."

Result:

- There is no functioning sewage system in the camp.
- There are open ditches/pits with polluted wastewater.
- There is a terrible smell in the camp due to poor drainage.
- The camp is dirty because of a lacking garbage system.
- There are not enough bathrooms in the camp.
- The health service in the camp is very bad.
- There is not enough clean drinking water in the camp.
- There are too many flies during the days and rats that roam during the night.
- The electricity network is dangerous and sometimes there is no electricity.
- It's too hot in the summer and in the winter it is very cold.
- The roads are bad and dusty.
- There are no trees.
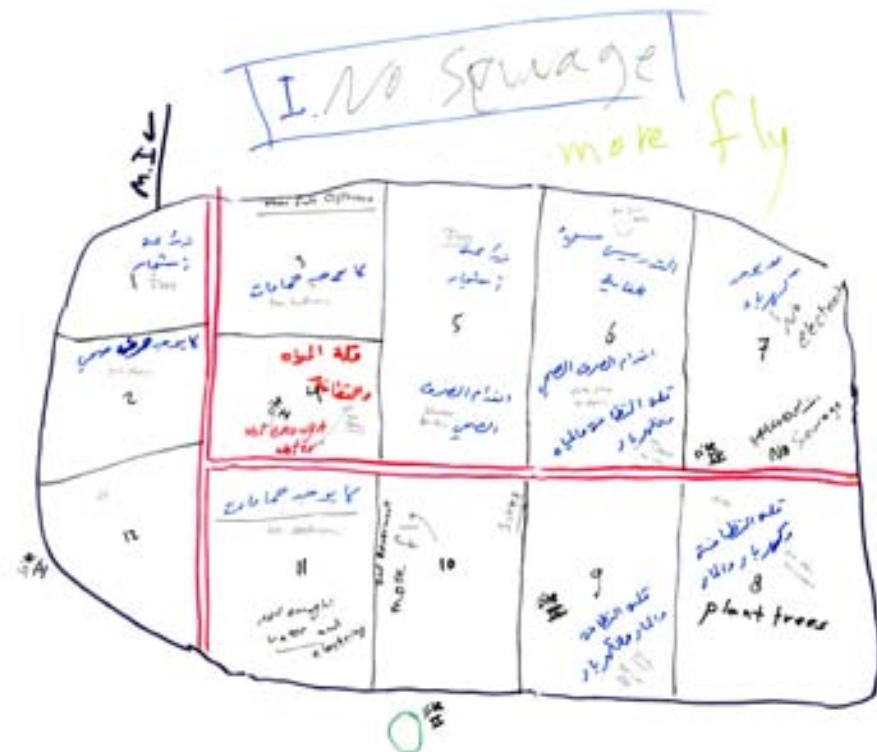
figure 6.5: One of the results drawn by the participants.

Workshop 2

- Wishes map

Period:	1st part of fieldwork
Location:	IMC district number 2
Participants:	Men: 9, Woman: 6
Age:	20-40 years old

What

In workshop one, they identified the problems. This workshop explored the wishes of the refugees. This question covers a sensitive topic, in that they wish to go back to Syria. In the first hour of the discussion the refugees explained how beautiful Syria is. All participants said that they would return to their homeland when their country was safe. None of the participants dreams about continuing a life in Zaatari; for them it is a terrible desert landscape. Their living conditions are bad, they have very few rights, and sometimes their families are torn apart. The discussion about their life in Syria was difficult to hear as well as surprising.

Conclusion:

The main conclusion is that the refugees want to return to Syria. Every response to questions about life in Zaatari was that they have no dreams there. One refugee said, "We landed on Mars, and we come from a lush green area in Syria." However, after asking about what they desire in the camp, responses arose. The following are listed as results.

Result:
- They want to have access to a pharmacy.
- They want to have a place to swim, because it is very hot in the summer.
- They desperately are waiting to be allowed to plant trees.
- They want a proper sewage system.
- They want safe playgrounds for their children.
- They wish to have electricity cables located in the air.
- They wish to have more clean drinking water.
- They want to have clean streets.

figure 6.6: Often mentioned by the participants during the workshops was the desire of returning to Syria.

figure 6.7: Results shown with some of the participants. Mostly woman didn't want to be in the photos.

figure 6.8: Participants listened to the instructions about the assignment.
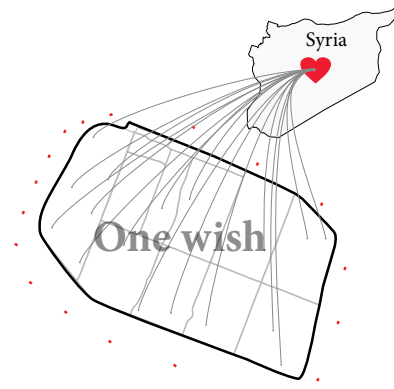

figure 6.9: One of the results drawn by the participants.

Workshop 3 & 4

- Identify problems and wishes with children

Period: 1st part of fieldwork
Location: IMC district number 2
Participants: Boys: 5, girls: 4
Age: 12-18 years old

What
Identifying the children's problems and wishes. The problems have been addressed by interviewing the children.

Conclusion
The children could explain reasonably well to the translator about what in their eyes is not good. This shows that children prefer to talk about what is fun and good than talking about what is not pleasant. In general, they miss Syria, they do not like school because the classes are too crowded, and playing in the street is dangerous in Zaatari. The current public space has a negative impact on the life and wellbeing of the children. They experience the environment as unsafe, desolate, and boring. The difference in environments compared to back in Syria is huge. Furthermore, the school facilities are inadequate.

Result:
- Green and rrees:
Children find Zaatari a barren environment and they miss the lush and green environment back home. They want to have trees along the roads, more flowers, and a tree in front of the school. In Syria, every primary school has a tree in front of the school.
- Electricity:
The children complain that electrical cables lie on the ground, which is extremely dangerous. Small children, who don't understand the danger, play with the cables. The children wish that the power lines were high above the ground.
- Sewage System:
The wastewater in Zaatari is polluted and flows over the street. Children who fall into the contaminated water or walk in it have to go to hospital. The water stinks and it has a strange colour. The streets need to be cleaned so the children can play safely.
- Cheerful places at school:
The school building looks very grey. The kids want more colours on the building to make it more fun and a place that is more exciting to attend. They explained that a nice colour can help.

-       Public lighting:
In the night it is dark and scary in the camp. There are hardly any lights on the streets, or between tents and caravans. The children wish to spend the evening feeling safe and safely playing on the streets.
-       A place to swim to cool off on hot days:
In Zaatari is can be very hot in summer (+40 degrees). Therefore the children would like a place to cool down. A nice swimming pool or public fountains would be best.
-       Better roads:
Most of the roads in the camp are now made of gravel; only some are made of asphalt. In the summer, the roads are very dusty. And in the winter, when there is too much rainfall, the roads become pure mud.
-       Improved housing facilities:
The caravans where the refugees currently live are unpleasant. The children's desire is to build a house and create a living environment similar to Syria.

Workshop 5

- 　　　Fieldtrip

Period: 1st part of fieldwork
Location: Entire camp
Participants: IMC staff (translators during the workshops)
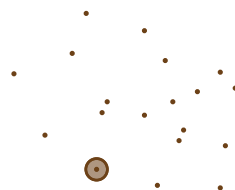
What
The field trip was facilitated by IMC and transportation was by car. IMC is responsible for their employees; they won't allow them to walk in the camp. Said Habiba and Mubarrak, and Jad drove me through the camp. Said, Jabal, and Jad were the interpreters during sessions 1,2,3, and 4. They knew what I was looking for, and recognized the mentioned problems in the camp by the participants.

Why
The objective of the field trip was to verify the refugees' problems and wishes.

Conclusion
A number of aspects indicate that physical conditions in the camp are difficult. Zaatari has a harsh environment and the refugees must reside and survive in these conditions. The complaints previously indicated by the refugees were visible during the trip. The people in Zaatari truly suffer. Mubarak, Said, and Jad (all not living in the camp) acknowledged the anger among the refugees.

Result:

Problems and consequences:
1.   No sewage system:
        Lack of a sewage system for domestic connections creates unhealthy public areas.
2.   Security:
        The streets are unsafe for children. Heavy transport (water trucks) drives too fast over these roads.
3.   Vulnerable children:
        Children are bored. They experience public space as unsafe with limited possibilities to play.
4.   Smell:
        It stinks in the camp because of the wastewater from the (privately in stalled) toilets, the bathrooms, and the kitchens.
5.   Size of the camp and location services:
        Refugees have to walk very long distances within the camp for basic ser vices.
6.   Roads:
        Most of the streets have no proper roads. The roads are dusty in the sum mer and muddy in the winter.

Causes:
1.   NGOs don't provide a proper sewage system.
2.   The parents often lack control of their children, and as a result the chil dren have a lot of freedom and can misbehave or are unsafe.
3.   Refugees move water bins into the camp and the trucks have to drive through the small roads, which is dangerous.
4.   There are not enough garbage bins. Garbage piles up all around in the camp.
5.   There are only a few service points available such as food and healthcare.
6.   Because of the temporary situation, not all the streets have proper road surfaces.

Solutions:
1.   A good sewage system connected to the households.
2.   Public transport on the main roads.
3.   A garbage collection system.
4.   More schools to educate the 58,000 children for the full day.
5.   Decentralize shops and facilities in order to reduce the long distances of travel in the camp.
6.   Create more roads to improve the infrastructure.

1.   No sewage system

4.   Bad smell

2.   Vulnerable children

5.   Enormous size of the camp

3.   Security issues

6.   Bad or no roads

Workshop 6

- Identify solutions with adults

Period: 1st part of fieldwork
Location: IMC district number 2
Participants: Men: 9, Woman: 6
Age: 20-40 years old

What
After the field trip, the refugees were asked to translate their problems into possible solutions. I faced the same issues as in the wishes workshop because refugees in Zaatari don't want solutions within Zaatari. They want a solution for the problem in Syria, which can allow them to go back to their homeland. Nevertheless, after staying patient and taking time we discussed solutions that address Zaatari.

Why:
To involve refugees in the process of how problems can be solved creates more ownership for proposed solutions (Sutton, 2011). Current solutions suggested and implemented by the UNHCR or NGOs are not always desirable in the eyes of the refugees. This has resulted in the destruction of public belongings (Ledwith, 2014).

Water
Problem: Public water tanks are insufficiently filled.
                 Street leaders and other corrupt refugees occupy public tanks.
Cause   Too much water is consumed among refugees.
                 Street leaders have too much power. The vulnerable refugees in the camp are not getting a reasonable amount of water each day.
Consequence: Inequality.
Solution: Water connections at each tent. This allows anyone to monitor his or her own water usage. It also creates a more efficient and economical water system.

Dirt
Problem: Streets are full with garbage waste.
                 Diseases spread from the debris of waste onto the streets.
                 Children play on dirty streets, which is risky.
Cause: Waste is not collected. There are an insufficient number of bins in the camp. Refugees throw their garbage on the street.
Consequence: Diseases break out from debris in the streets, and children are playing in the trash. The environment looks filthy. In some places there is garbage everywhere. According to Rud Jad, IMC officer: "Refugees treat garbage the same way in Syria."
Solution: According to the participants, several NGOs are doing a good job

to improve the waste system. However, people should be aware that waste should be in bins and collected.

Sewage
Problem: Grey and black wastewater that runs on the surface.
Cause   Lack of sewage system for tents and caravans.
Consequence: Diseases break out because refugees (mostly children) are exposed to highly polluted water. Some participants mentioned that they don't allow their children to play outside anymore because of the dirt. The stench is unbearable, especially in summer.
Solution: A sewage network that connects the tents and cabins with a clean drainage.

Housing
Problem: The caravans and tents are not resistant to the harsh climatic conditions. The cold winter and heat in the summer makes life tough. In this area, desert sandstorms occur, causing lots of sand to enter the tents/caravans.
                Little privacy.
                Pests, mainly rats, enter the tents in the camp overnight.
Cause: Tents and caravans are equipped for temporary housing and are not intended for a long stay. In caravans and tents there is no sani tation available. The tents themselves are not 100% wind resistant and provide little privacy due to overpopulation.
                The Jordanian authorities don't allow building materials into the camp. As a result of that, the participants complain that it is impossible to improve their houses.
Consequence: Refugees sleep badly due to rats in their tents. The winters are very cold with frequent flu and colds spreading from place to place. In the summer the caravans and tents are getting too hot to stay inside. There is hardly any shade available outside; it appears there's no place to go.
Solution: Allow building materials to improve the living conditions in the camp. Refugees can build their own house; 'we are skilled people.' Lack of construction materials ensures that this has not happened yet. The Jordanian government should consider letting building materials into Zaatari.

Electricity
Problem: The electricity network in the camp is very dangerous. Street leaders and a self-appointed minister of electricity run the electricity distribution. Dangerous situations in the rainy

season occur because of the cables on the ground.

Cause: Due to the overuse of electricity sometimes there's no electricity. Street leaders decide who gets access to the electricity network.

Consequence: Refugees have to pay street leaders to get access to electricity. The streets are full of disorganized power cables, which make it unsafe, especially during the rainy season; there is fear of a short circuit.

Solution: We wish to have an organized electricity network for the entire camp that hangs high above the ground. In addition, the distribution must be fair and controlled.

Vegetation

Problem: A refugee told me, "There is no green in the camp. As citizens from Daraa we miss that. Green is a sign of life. There is hardly any shade, and sometimes the wind is very strong in this open desert."

Cause: The Jordanian authorities didn't allow trees or vegetation in the camp until March 2014. The refugees were not allowed to buy and plant trees.

Consequence: People feel homesick and unhappy in the camp because of the dusty environment and lack of greenery.

Solution: The participants to be allowed to buy and plant trees in the camp.

figure 6.10: Woman discuss solutions for Zaatari.

Workshop 7

- Children – Composing the wishes

Period: 1st part of fieldwork
Location: IMC district number 2
Participants: Boys: 3, girls: 2
Age: 12-18 years old

What
Five children were chosen by IMC to translate their interview into a selected image. The children were excited to produce their ideal desired image. Through this method, the children's wish was visualized. The children created a solid image of what they wanted the camp environment to look like. This technique was also a great asset for the IMC to apply in the future.

Why:
Children had difficulties articulating their wishes during workshop 4. Therefore, I helped them to find the right footage. From the field trip, the children chose an image that they wanted to turn into a desirable image. On the next page you can find the results.

figure 6.11: The children got questioned by an interpreter.

figure 6.12: Working with the children one-on-one allowed them to translate their wishes into a collage.

"His dream was to have better houses. Now he lives in a tent which he doesn't like." He wants trees, so they can provide shade during the scorching points of the day.

His dream was that electricity cables hang up high above the ground so no one can reach it. He would like to have gardens and a place to swim because it's hot in the summer.

This boy just wants better roads in Zaatari. He wanted trees to be planted along the roads just like it was back home.

This girl misses the tree in front of the school. In Syria, every school has a tree in front of it. She wanted more colorful buildings and better roads to walk to school.

This girl wants more light in the camp because sometimes she feels unsafe.

figure 6.13: Translated wishes by children in a Photoshop collage.

Workshop 8

- Children create a movie

Period:	1st part of fieldwork
Location:	IMC district number 2
Participants:	Boys: 3, girls: 2
Age:	12-18 years old

What
During workshop 7, spatial interventions were mentioned by the children and modeled in Photoshop. Together with the children we made a movie for IMC. The movie expressed the wishes of the younger generation.

Why:
Children can show and speak about their desires of how Zaatari may look like in the future. Through a movie they can share this wish with others.

Conclusion:
The video is very effective as a communication tool to show what the children want. Children are proud of it and it gives them the attention they deserve. In the camp, almost everyone has a telephone. The movie could therefore be quickly spread online.

Result:
The children are proud of the movie. They wanted to show their parents and friends what their dream is. This movie and the messages connected with the environment, raising awareness of how important the environment is, even though it is temporary.

figure 6.14: The boys were really proud of the movie.

Workshop 9

•   Identify solutions with adults

Period: 1st part of fieldwork
Location: IMC district number 2
Participants: Men: 9, Woman: 6
Age: 20-40 years old

What
The participants designed solutions based on the indicated problems shown in workshop 6. Then they transformed their ideas into potential actions. The refugees chose three pictures from the field trip. The three pictures represent three different scale levels: household, 'community', and street.

Why:
Through this step, the refugees could experience what is needed and what changes need to be made in the camp.

Design idea 1.   Holes around the camp

The ditches in the camp are one of the biggest problems in the eyes of the refugees. The holes are very close to their tents or caravans. During the night, the refugees are afraid that their kids fall into the holes and injure themselves.
Solution created by the refugees:
Plant trees in the holes so that they can absorb the water in order to stop the water from flowing into the surface.

figure 6.15: Proposed solutions on household level were made.

Design idea 2.   Communal gardens

The public space in Zaatari is dominated with open water ditches. "In some way we are all connected to each other," according to one of the participants.
Solutions according to the participants:
Collect and bring the water to one point to make a nice garden where we can sit and drink tea. For this specific design idea, steps are visualized to let the participants understand the steps that need to be taken.
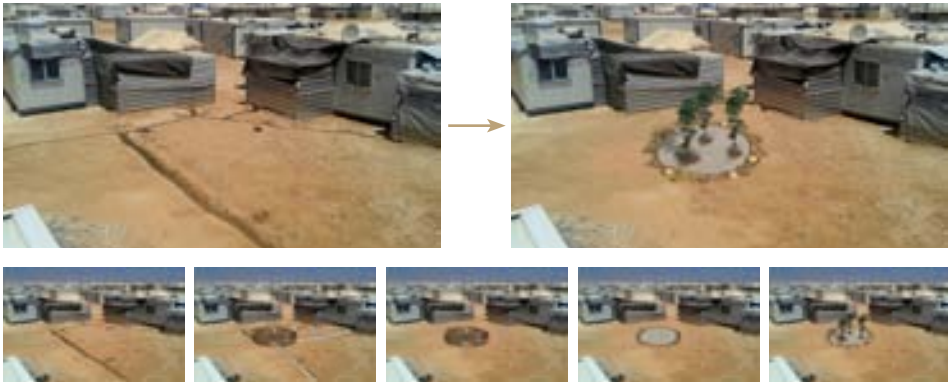

figure 6.16: Proposed solution to tackle open water ditches.

Design idea 3.   Streets

Some streets in the camp are full of wastewater. The dream of the refugees is that the water is re-used and collected for greening purposes.
Solutions according to the participants:
The participants wish to have a communal garden at the lowest point in a street. This would ensure that the contaminated water is properly absorbed and re-used for ir-rigation purposes.

figure 6.17: Proposed solution on the street level.

Result workshop

The participation workshops and field trip showed that the lack of a sewage system is one of the biggest problems in the camp. The lack of a sewage system, where human excrement gets mixed with wastewater and runs through the streets, causes a lot of diseases and frustration for the participants. They were able to mention the causes, responsible indicators, and possible solutions. During the photomontage workshops, suitable design options that can be executed by the refugees, were created.

6.4   Part 2: Action research

The following diagram shows the stage of the fieldwork. Part of the Green Town Workshops is action research. IMC only provides assistance within their compound, and won't allow staff to go into the camp. Unfortunately, therefore, I wasn't able to conduct action research in collaboration with IMC.

Consequently, I was very grateful to be able to work together with the UNHCR who allowed me do action research in the camp. The result of the workshops gave input to test the ideas in the field. The following part of this chapter will describe the process and will finish with the conclusions of Zaatari Voices.
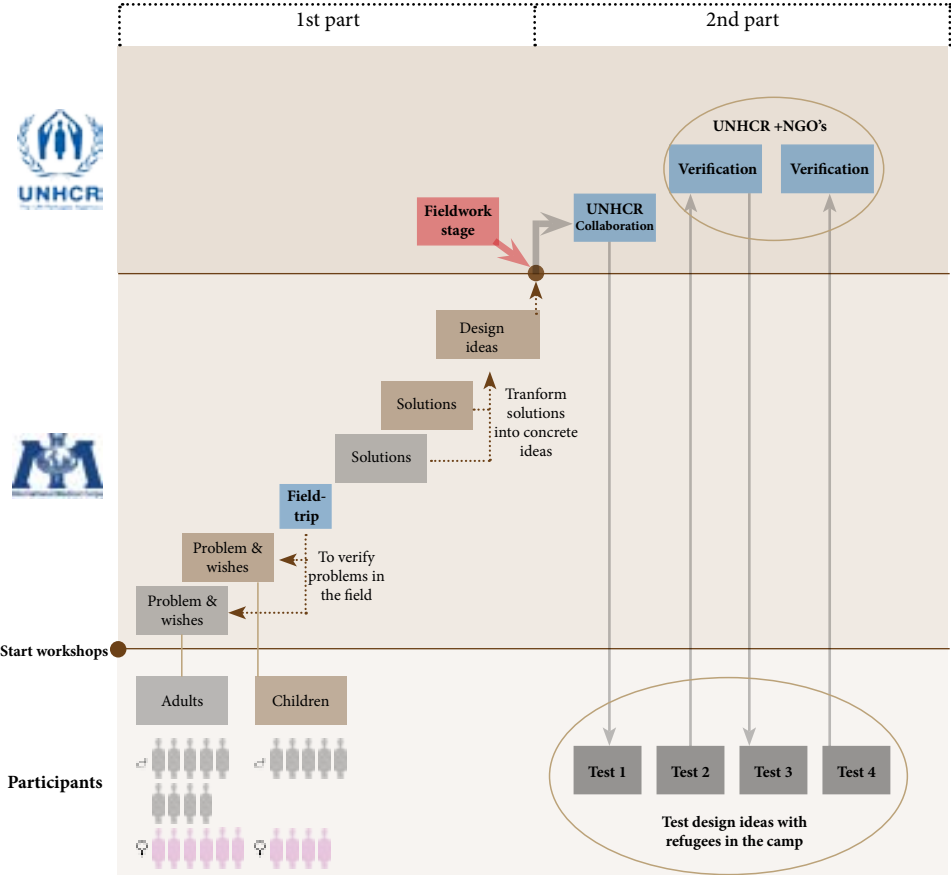

figure 6.18: The second part of the fieldwork being processed in Zaatari. The red box shows the phase of the fieldwork.

Action day 1

• Test grey water garden

Period: 2nd part of fieldwork
Location: District number 11
Participants: Family household

Starting point
When the results of the workshops were in, one of the biggest problems that was highlighted were grey water holes. For this, I used an elaborated grey water concept designed by UN advisor Corcordan. This workshop tested if a grey water garden could reduce the polluted grey water in the camp and irrigate vegetation.

Goal:
The purpose of this action day was to test whether a grey water infiltration system could contribute to eliminate the grey wastewater problem in the camp.

Learning outcomes
The refugees who participated during the day saw the implementation as real progress in the camp. This system, which is demonstrated, shows that a garden can remove the contaminated surface water that is infiltrated into a gravel bed.
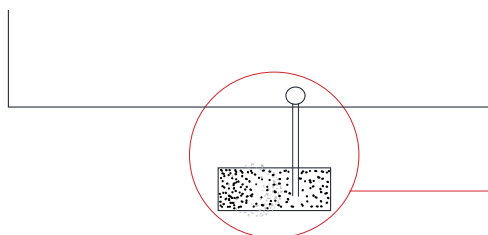
figure 6.19: Grey water garden in relation to the carvan.

Space between grey water gardens and the caravans was too far. Therefore people stole plants because nobody took ownership to take care of the garden and there was no control.

Action day 2

- Test grey water garden

Period: 2nd part of fieldwork
Location: district number 5
Participants: Family household

Goal:
The goal was to address a problem in another district and test a grey water garden. With a photo report from the first day, I tried to convince people that the actions had been successfully tested.

Learning outcomes:
Without any doubt, all the refugees who I spoke with agreed that this problem needed to be tackled. They recognized that it is one of the biggest problems in the camp. The refugees participating during test day 2 all wanted the same thing to be implemented next to their caravan or tent. The strategy was to involve as many refugees during the day to show them how the system worked. The conclusion was that refugees want a system like this, but they don't have the materials, plants, or money.

Conclusion:
Together with Tom Corcoran, Fertila, Donna Corcoran, and other UNHCR staff, the two test days were discussed. Everyone was positive towards the implementation and wanted to upscale the project. Tom Corcoran said: "The problems during the test day regarding the shortage of materials can easy be solved when new funding is generated."
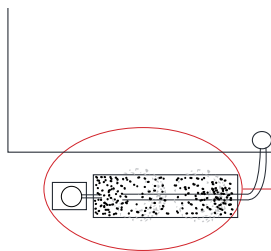

The garden was made parallel to the caravan. Therefore ownership appeared. An overflow is added to absorb extra water in case there is a lot of wastewater.

figure 6.20: Grey water garden in relation to the carvan.

Verification

- Verify solutions with stakeholders

Period: 2nd part of fieldwork
Location: UNHCR compound
Participants: Several NGO and UNHCR staff

Why

The two action days were organized to solve one of the biggest problems in the camp: contaminated surface water. The first goal was to test solutions by using a grey water filter system. Another goal was to test how the refugees would respond to these changes. Fertilla, an UNCHCR planner, states: "The refugees have to make and develop the system, not an NGO or the UNHCR." In that case, it is important to explore the response among the refugees in order to achieve the best results in the long term.

Result by Ngo's

"It is not realistic to think that all households receive a household sewage connection within a short period," according to Corcoran. However, a grey water garden is a relatively simple implementation, as can be seen during the two action days. Jertilla stated that: "It is a simple and a well-executed plan."

ACTED, an NGO that provides drinking water in Zaatari, reacted negatively to the plan because they do not believe that contaminated water and soap can be used for irrigation. They also think that residents will use scarce fresh water for irrigation. Implementing this system is also a matter of educating and informing the users and stakeholders according to Oberg of UNHCR. Oxfam said, "How will we ever find all the gravel needed for this system? Currently, gravel in the camp gets stolen by children and sold to stores. Because of this, we're going to lose more gravel." Fertilla mentioned that: "The comments on the gravel stated by Oxfam are not new. These organizations block everything that is considered new and strange." Fertilla continued: "They should not complain about the gravel issue. Does Oxfam want to keep this waste water problem in the camp until a sewage system is constructed or are we going to solve it [this problem]?"

Corcoran said, "There is a problem introducing green and trees in Zaatari. The problem is the right of ownership in the camp. In order to avoid this, we need to make the garden as close as possible to the caravan." Plant the trees close to the caravan and people feel that these plants belong to certain individuals. It will raise the ownership issue. Tom says, "Introducing this system means it will contribute to several stakeholders. We have to educate the people and NGOs about why this is important and what the positive benefits are."

	Test day 1	**Test day 2**	**Conclusion**
Techincal assistance	High	Low	The second day I let the participants do the work, I was testing to see if they were able to execute the job.
Communication strategy	Verbal communication	Visual communication	Visual proven change within the camp convinced others to do the same.
Financial support	100 % supporting	50% of the costs	Because of the stolen plants after test day 1, we let them contribute in the materials to create more ownership.
Vegetation wish	Vegetation provided by UNHCR	Their choice	The second test day the participants chose their own plants to make their gardens more their own choice.
Population sample	Random	Random	To verify if the design options given during the workshops; random sampling was chosen.
Location GW garden	Public space	'Semi' private	Public space is very vulnerable against violence in Zaatari. By making them more like semi-public makes it more resilient.

figure 6.21: Result of the test days.

Infiltrate in Zaatari structure

- Collaborate with a key person in the camp

Period: 2nd part of fieldwork
Location: District number 10
Participants: Key informal player in Zaatari

What
Testing a grey water garden in the camp together with one of the key informal players in Zaatari gave me the opportunity that allowed me to explore his opinion. In addition, it allowed me to brainstorm about the technical implementation because he was an agricultural technical engineer in Daraa, Syria.

Why
The objective was to test grey water solutions with key players in the camp. This man is well informed about the local situation in the camp. UNHCR camp management said of the informal leaders: "instead of ignoring them, use them."

Result:
By building the grey water garden people worked together as a team. He was really positive about this implementation. He asked if he could work for the UNHCR or any other NGO to roll out these test days on a bigger scale.
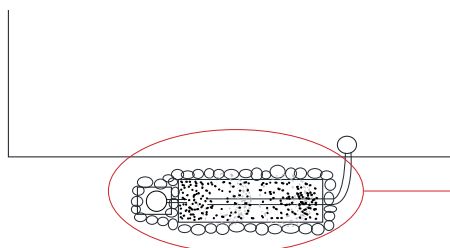

The grey water garden is situated right after the kitchen. It is decorated and contains a overflow bucket.

figure 6.22: Grey water garden in relation to the carvan.

Action week – public participation

- Create support among the 'community'

Period: 2nd part of fieldwork
Location: District number 12
Participants: Refugees in a street in district 12

Motive:
UNICEF, responsible for WASH in Zaatari, noticed a problem called the "grey water pits." Currently, UNICEF doesn't have a mid-term solution for the grey and black water waste in the camp until a technical system is developed. UNICEF asked the UNHCR (camp management) for assistance to solve this problem. For me, this was an opportunity to test how a 'community' would react to a grey water garden by using public participation.

Goal:
The purpose of this action week was to test a prototype garden in collaboration with the community to solve the grey water pits. The prototype located on a "street" in the camp can hypothetically function as a prototype garden/street for the whole camp. Corcordan: "Winning the trust of the community is essential to find changes in the population". According to Abdel-Fadil, "We have to work with the people instead of ignoring each other. The community has to do it eventually by themselves."

Network:
That week, I was a researcher working together with the UNHCR. This was important, because it was not possible to organize an action week by myself. The UNHCR introduced me to NRC (Norwegian Refugee Council) where greening ideas have been generated but haven't taken off yet. In order to ignite this project at camp level, cooperation with various NGOs needs to take place.
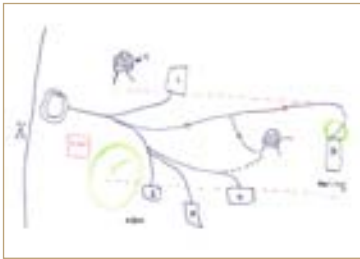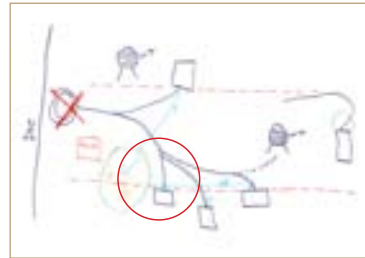

figure 6.23: UNICEF's concern.
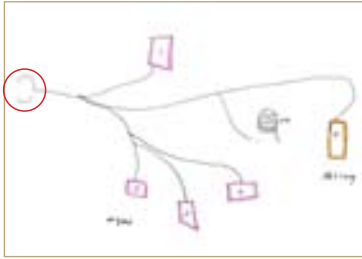
Step 1

This shows an outline of the existing situation. Ditches are connected from caravans that lead to a grey water pit.

Step 2

The first idea by the participants was to construct pipes from the caravans to a communal garden.

Step 3

The drawing shows two possible communal gardens connected by pipes.

Step 4

The drawing shows a technical plan. When I confronted the participants that a financial contribution was necessary, they stepped back. They calculated the cost of this design, which was converted to be 35 Euros. They were not convinced and so we moved on to create a cheaper design.
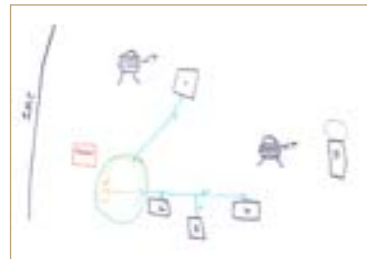
Step 5

This step shows the final result. The participants made a cheaper design that has the same result; to get rid of the grey water. The physical outlook therefore changed. Instead of a community garden, they will have private, household gardens, which cost only 2 Euros.

Result	Comments
Techincal assistance	The intensive design process contributed to the technical knowledge by the participants. They taught themselves how they can execute the gardens.
Communication strategy	I let the refugees draw the outline of all the problems. The discussion points are shown in 5 steps, (located on the page on the left) they drew each of them. Therefore they were aware of the advantages and disadvantages of each step. The final design step was drawn on a map.
Financial support	At the end of the discussion there was a disagreement about money. Luckily, being patient paid off. I came back the next day to discuss finances again. After negotiating between NGOs and the refugees, there was an agreement to contribute two Euros. The total cost of the gardens is four Euros and the UNHCR will donate 50%.
Vegetation wish	The plants were collected and chosen by the Ministry of Agriculture.
Population sample	The site was chosen by UNICEF. Therefore the participants were automatically the ones who dealt with the problem of the grey water pit. The people who participated in the design process were causing the grey water pit. Men were dominant during the design process, and women did not actively participate in discussions. However, from a distance they observed the design process. The female interpreter translated the discussions in order to discuss these issues with their husbands at home. The result was that the woman forced the men to execute and pay for the plan.
Location intervention	The gardens are all made as close as possible to the caravan. Therefore limited materials were needed to install the gardens. The locations correspond to the drawing shown in step 5.

figure 6.25: A participant draws on the site.

The initial situation of the site.

The participants were initially not convinced that they had to contribute to the solution.

The result after one week. The stream of grey water has stopped due to the gardens.

The refugees intensely participated in the design process.

The result after two weeks. The street has dried up due to the grey water constructed gardens by the participants.

Refugees conducted the work independently after the design process.

Present results to field staff

- Communicate findings to stakeholders

Period: 2nd part of fieldwork
Location: UNHCR compound
Participants: Several NGO's and UNHCR

Why
The test days in the camp were supported by the UNHCR. As stated by Fertilla, the UN-HCR and all other NGOs, they will execute this grey water initiative. This system only works when the users create these grey water gardens. And thus, a snowball effect among the refugees is needed.

Educate NGO's
Educating staff employees should happen soon after the three test days and community participation week. Corcordan had experienced that people pick up new initiatives very quickly. She said, "It's a copy-paste community." In order to prevent wrong implementations, it is necessary to educate the NGOs, so they can spread the learned ideas to the camp. Masso, a field staff member from the UNHCR, is sceptical about working together with other NGOs but content with the proposed solution. He is sceptical because he has experienced problems in the camp that the NGOs have still not solved. He has watched the problems being passed from one NGO to the next and hasn't seen solutions. He contended, "NGOs provide goods instead of changing people's mind-set that everything in Zaatari is free."

How
I visualized the process of test day three. I made a flyer with Corcoran and he distributed that among the NGO staff and refugees. Below you can see the results of the flyer to encourage more independence and stimulate action within the camp.

figure 6.26: After the 3rd test day, a flyer was made.

6.5   Conclusion Zaatari Voices

The conclusion after the workshops is that the participants have two voices. First, refugees initially didn't feel like investing in the camp at all because their wish is to return to Syria. On the other hand, they are very inventive and are willing to pick up initiatives for a better environment. This method showed how you can connect with people. The result was that they participate in improving their environment. As a researcher, you have to be patient when you want to achieve change of behavior from "a life they don't desire" into "what do you want here?"

The successful test days of the proposed solutions corresponded to the proposed options mentioned during the workshop in order to tackle wastewater. The action days proved how skilled the refugees are. Emphasis during the action days was more focused on the process rather than the end product. This was done in order to stimulate problem awareness and to recognize solutions. During the process, local knowledge was built to stimulate initiatives, which was later on supported with governmental (UNHCR) supervision.

In the discussion in chapter 9, the method during these workshops and action research will be discussed. The next chapter will explain how these proposed problems and solutions come together for implementation in chapter 8.

Chapter 7

Zaatari Issues

7.1   'Trapped' community

As is described in the fieldwork chapter 6, the Syrian population wishes to return to their home country. During the workshop the discussion about their home was an emotional and sensitive topic, as people are forced to live in a place where they don't want to be. The Syrians are homesick. "I think we'll stay in the camp for a long time. We have maybe five or ten years before we can go back to Syria now. Even if Assad leaves Syria, I think they will fight each other, the Nusra and the army" (Speri, 2014). Many Syrians were farmers in Syria and had personal attachments and positive experiences in agriculture back home (UNHCR, 2014e). People had to leave everything behind and arrive in a desert with intense heat and unfamiliar surroundings. "We want to go back to our homes. We have no dreams in Zaatari. Syria is very beautiful. Our friends, our homes, gardens, and trees are all back home."

This chapter will describe the problems shown on the next page in order to bridge the gap between the collected data and the design in chapter 8. It will focus on the issues in Zaatari to find a design focus. In 7.2 the causes of the problems are cluster divided into problem areas.

7.2   Problems in Zaatari

Infrastructure

Cause
Zaatari is designed as a temporary camp. With the exception of asphalt roads there is no permanent infrastructure. The infrastructure has been constructed to use for a limited time. The camp is overcrowded, with 100,000+ residents. The temporary infrastructure therefore is more heavily used than it actually can handle.
Problem:
• Not enough roads
• No household sewage network
• No public transport
• Dangerous and insecure electricity systems
• No functional water supply system
• Refugees steal public construction materials for private use
Effect:
- The inadequate infrastructure leads to an unhealthy environment.
- Refugees demolish infrastructure that is being constructed by NGOs for self-interest.

Social Barriers

Cause:
Zaatari has a weak social structure. NGOs and the Jordanian authorities maintain order. In a very short time, large amounts of refugees were placed as individuals in the camp. Therefore there is lack of social control. The authorities, which includes NGOs, are historically distrusted by the Syrian population. This means there is room for (organized) crime.
Problem:
• (Organized) crime in the camp.
Effect:
Refugees confronted with criminal activities causes inequality. It seems that these activities are leading towards a lifestyle of "survival of the fittest."

Health

Cause:
-Temporary design of the camp. Unsustainable and short term solutions that
  lead to a non- functioning drainage system.
- Lack of hygiene awareness
Problem:
• Unhygienic environment
• People define Zaatari as a desolate area

• Pests
• Contaminated surface water
Effect:
- Diseases
- The camp is filthy and it attracts vermin (rats, mice, and flies). People easily get sick from exposure to these pests.

NGO's (Non-Governmental Organizations)

Cause:
- There are 65 NGOs active in Zaatari. Most of the NGOs focus on relief when it comes to providing aid.
Problem:
•The NGOs give aid in a way that makes refugees dependent (remain aid-recipients).
Effect:
- Refugees are therefore not stimulated enough to take responsibility for their own lives.

Authorities

Cause:
- It is forbidden for the refugees to buy and use any construction materials and trees.
Problem:
• Illegal trade of construction materials.
• Limited development possibilities for improving housing and living conditions.
Effect:
- Illegal development by refugees on household level that is not planned or well organized.

Semi-desert Environment

Cause:
- The weather conditions are: heat and sandstorms in the summers, and cold and rain in the winters.
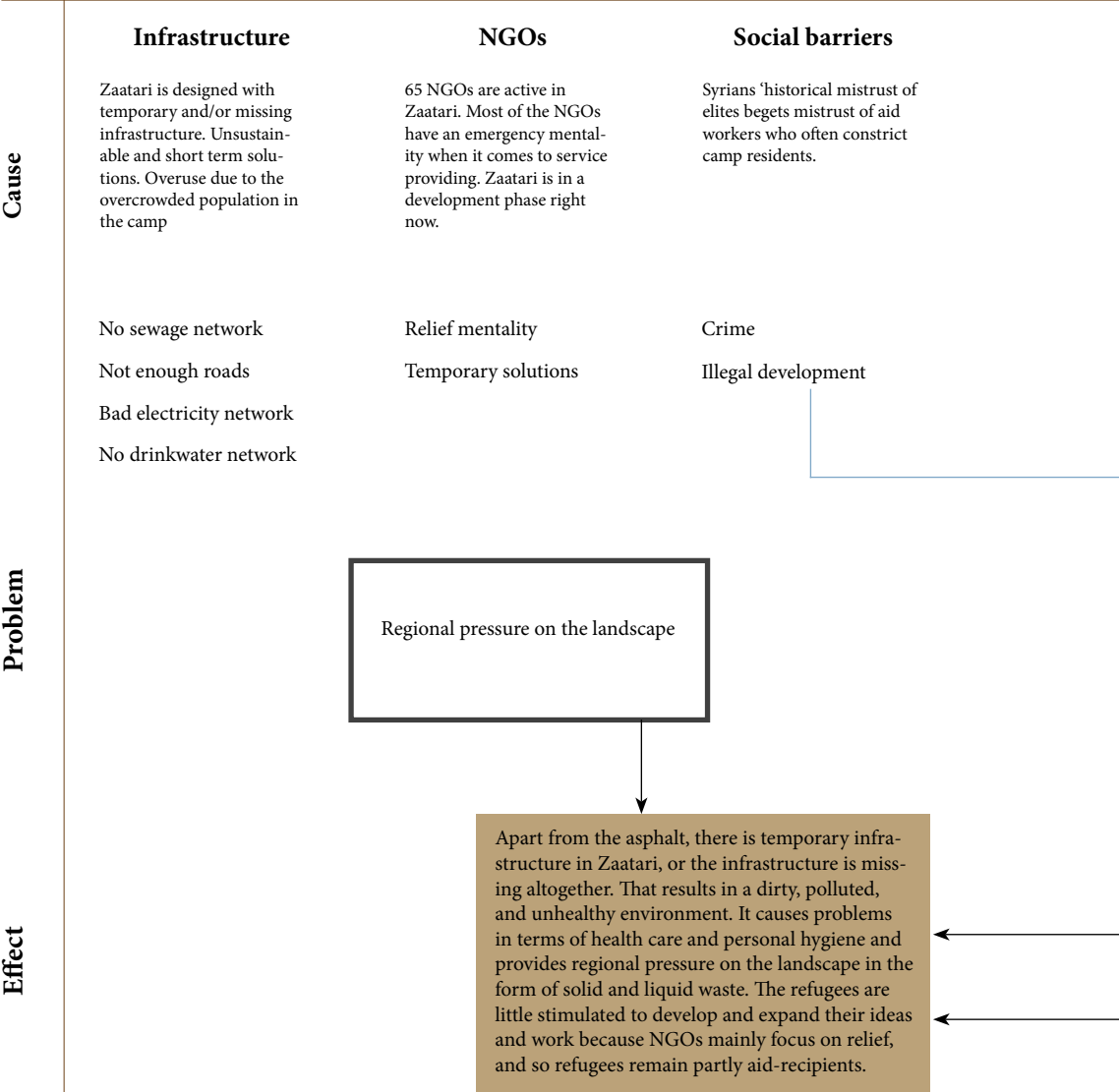**Problem:**
• The housing facilities are not sufficient to withstand the harsh climate.
Effect
- People are vulnerable given the harsh climatic conditions because they live in unplanned and unstable dwellings.

7.3   Problem tree

During the workshops and the landscape analysis there were a lot of problems mentioned covering different aspects. This overview shows the widespread problems in the camp. The problems are organized by cause and effect. This marks out where and who is responsible for the problems.
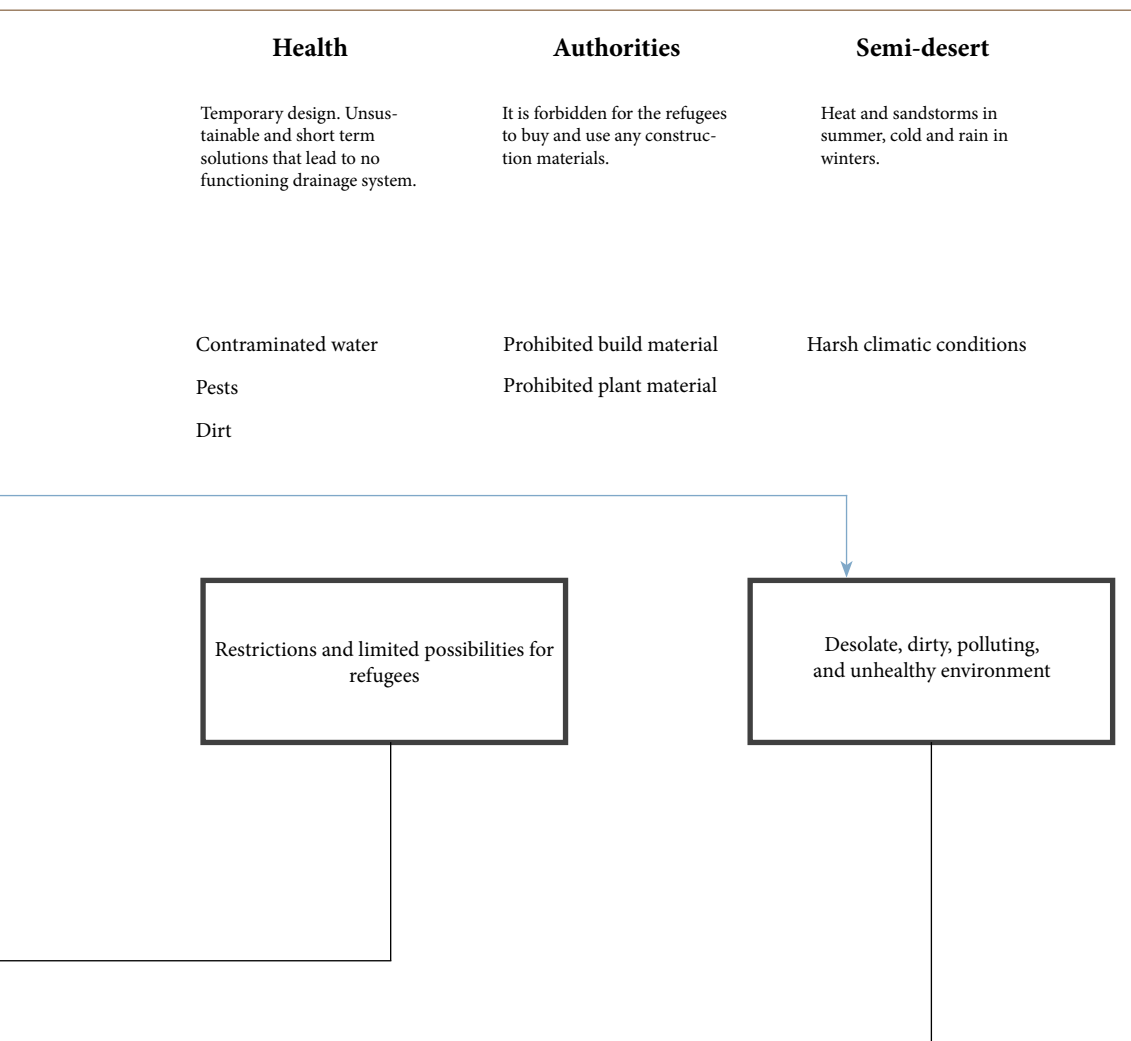
	Infrastructure	**NGOs**	**Social barriers**
Cause	Zaatari is designed with temporary and/or missing infrastructure. Unsustainable and short term solutions. Overuse due to the overcrowded population in the camp	65 NGOs are active in Zaatari. Most of the NGOs have an emergency mentality when it comes to service providing. Zaatari is in a development phase right now.	Syrians 'historical mistrust of elites begets mistrust of aid workers who often constrict camp residents.
	No sewage network	Relief mentality	Crime
	Not enough roads	Temporary solutions	Illegal development
	Bad electricity network		
	No drinkwater network		

Problem

Regional pressure on the landscape

Effect

Apart from the asphalt, there is temporary infrastructure in Zaatari, or the infrastructure is missing altogether. That results in a dirty, polluted, and unhealthy environment. It causes problems in terms of health care and personal hygiene and provides regional pressure on the landscape in the form of solid and liquid waste. The refugees are little stimulated to develop and expand their ideas and work because NGOs mainly focus on relief, and so refugees remain partly aid-recipients.

	Health	**Authorities**	**Semi-desert**
	Temporary design. Unsustainable and short term solutions that lead to no functioning drainage system.	It is forbidden for the refugees to buy and use any construction materials.	Heat and sandstorms in summer, cold and rain in winters.
	Contraminated water	Prohibited build material	Harsh climatic conditions
	Pests	Prohibited plant material	
	Dirt		

Restrictions and limited possibilities for refugees

Desolate, dirty, polluting, and unhealthy environment

figure 7.3: problem tree

7.4   Issues to solve

Problem: **- Desolate, dirty, polluting and unhealthy environment.**
Referring to chapter 2.1, "Landscape architects strive for an ecological and sustainable environment." This thesis, written with a landscape architectural lens, is using ecosystems as an approach to solve environmental problems in Jordan. The problems in the camp have been negatively affecting the people and the environmental landscape. The landscape is imbalanced. The way Zaatari currently operates means its 100,000 residents are being negatively impacted. The following is a solution to these environmental issues.
-            Response: *Create a more holistic ecosystem with less damage on humans and nature.*

Problem: **- Restrictions and limited possibilities for refugees**
Taking a transformative worldview in this thesis and using workshops to enable a community to renovate their own environment is an important approach in this research design. Solutions must be able to locally execute the issues. The willingness and skills of the community was a factor of success during the test days described in section 6.4. The problem statement declares that, "In the future, aid organizations will reduce their assistance, and more self-reliance will be seen in the camps, keeping in mind the long duration of the camps."
-            Response: *Stimulate the community to work out and recognize solutions they can implement, with limited assistance by humanitarian organizations.*

Problem: **- Regional pressure on landscape**
As described in the Objective, the main idea is to improve the living environment in a short period of time. Furthermore, proposed design options in the camp, found in the following chapter, demonstrate the benefits for the whole region. It is not only the refugees who suffer, but also the host country that has to deal with the massive influx.
-            Response: *Look for solutions that not only have the benefits for refugees but also for the Mafraq region.*

7.5   Synthesis

The field research has been carried out with participants of IMC together with the UN-HCR. The participants of the workshops gave a lot of answers that referred to individual and short-term solutions. The UNHCR pointed out that solutions on camp level must stimulate self-reliance to improve the long-term conditions and solve the urgent problems. Duchhart says that: 'the typical landscape architectural tool – the appropriate siting of small-scale landscape elements, such as trees and hedges – appeared an excellent way to achieve long-term ecological sustainability while producing individual benefits for the short-term (Ingrid, 2007). This means, for this research design, that long-term ecological and environmental objectives are linked to perceived short-term individual needs. Short and long term benefits are described in the table below.

Short term	Long term
+ Individual grey water gardens + Hold rainwater for vegetation purposes + Community compost piles + Develop agricultural activities	+ Trees for shading + Trees for well being + Trees for food production + Trees to improve the use of public space + Use composting for fertilizing the surrounded desert area

7.6   Conclusion

The problems indicated by refugees are clear and recognizable in the camp. However, the aim of the humanitarian organizations, by applying the UN Handbook for Emergencies guidelines that strives for 'healthy' camps, is a contradictory to the actual site. It is not likely that the environmental quality of the camp will improve in the short term because of reductions in funding and attention (Forster, 2013). Current illegal development doesn't contribute to a more sustainable future.

Chapter 8

Zaatari's Future

8.1   Design options

The design process started in Jordan. By using the workshop as a method, the refugees were asked to draw and write down the problems they had. Slowly this input was translated into locally applicable, technical design solutions. Field research in the camp also gave input for further thought on Zaatari's greening possibilities. Additionally, further studies provided the basis for the design options presented in section 8.2.

8.2   Design objective

Figure 8.1 shows the development from the camp to a "city". In order to anticipate a decline in aid, and to tackle environmental degradation of the public space in Zaatari, the design objective is as follows:

Introduce green structures to achieve a more sustainable way of living that can have short and long-term benefits. The design objectives cover three themes as shown in figure 8.2.
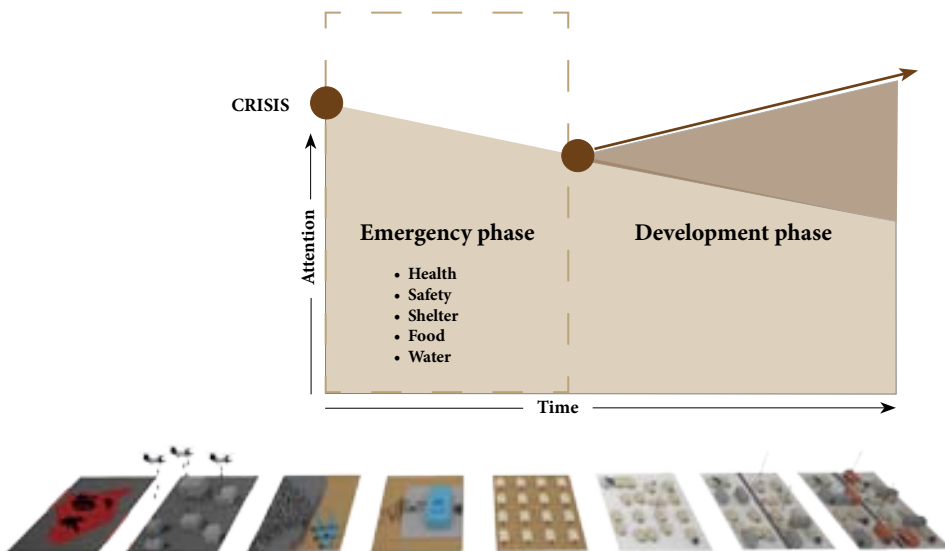
figure 8.1: Refugees stay longer in the camp than foreseen, therefore the camp has evolved into a "city".

In order to achieve this objective, this chapter will give answers to the following (sub) research questions:

- What actions, based on an ecosystem approach, are needed to create more self-reliance and a sustainable environment in the development phase of Zaatari?
- How do you create more self-reliance in the Zaatari refugee camp, anticipating a longer stay and a reduction in aid?

To be more specific on the research questions, for each design option, a small desk study was conducted in the Netherlands due to insufficient knowledge after the fieldwork. This design study covers the following aspects: cultural background, grey and black wastewater, storm water, and food production.

1.
Re-use household waste water for greening purposes.

2.
Use the relief in order to hold storm water to create green spaces.

3.
Utilize the Zaatari boundaries for agricultural activities.
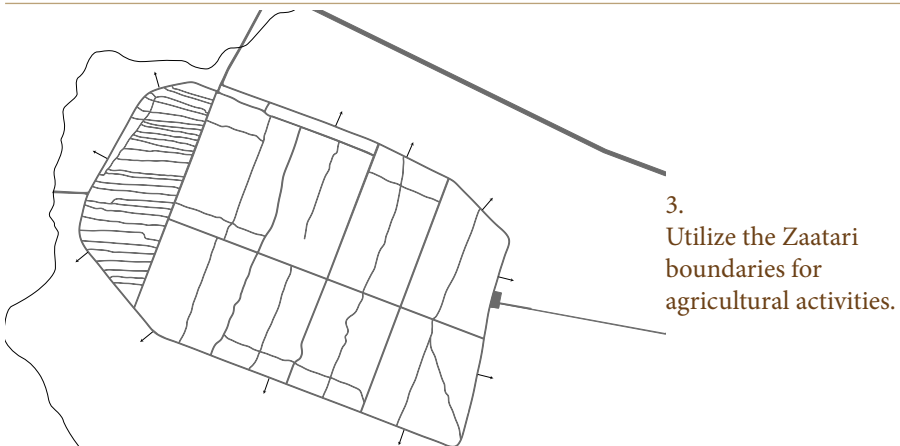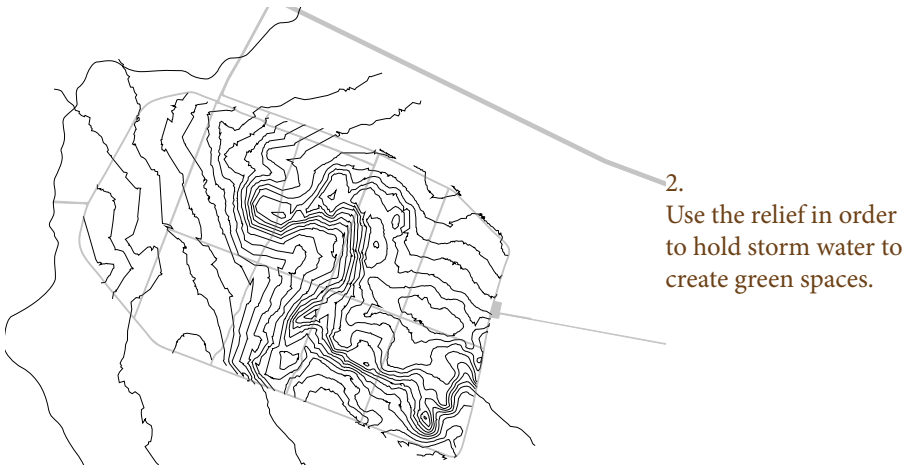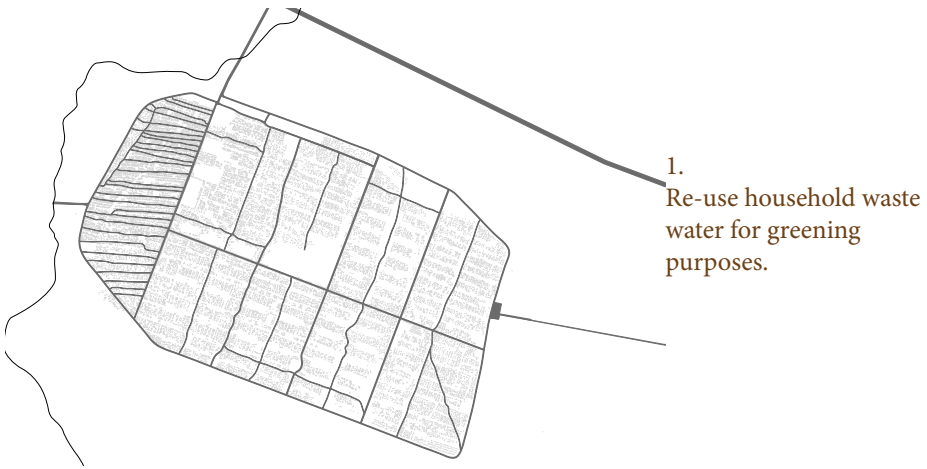
figure 8.2 Design objective

8.3   Cultural background

The theoretical framework describes displaced people as, "people who do not lose their capacity to sing, to recite poetry, or to dance. In fact, they continue to engage in these cultural performances in spite of their fear and the harsh environment." According to Kerber, Owner of MoreThanShelters, it is important to positively engage with the peoples' traffic osmoses.

People that have lived in Zaatari for almost three years have begun picking up their lives. Part of that is they invest in the creation of small gardens. This is a deeply rooted cultural behaviour of Syrians who have taken advantage of their cultural roots, and worked with their agricultural knowledge in Zaatari. According to Alhamidi, "Farmers who were born and raised in an agricultural environment appreciate living independently. They also live in dignity, on a piece of land where clean air and fresh food is of high quality. These necessities are always available to them and it is resulting in healthier bodies, psychologically and physically. This is why they love agriculture" (Alhamidi et al. 2003).

Refugees in Zaatari come from a rich agricultural area (Hall, 2013). Most of the people in Zaatari were farmers in and around Daraa. Agriculture, which was the main income of people in Zaatari, aligns with the Koran, which is practiced and read in Syria (Alhamidi et al. 2003). "Farmers believe agriculture to be the right means to achieve the right purpose; it should work in an environment where the ethical values and the soul of mercy have priority, compared with economic revenues."

Despite the large economic and profitable agricultural land, there are several small plots in Syria. These are usually devoted to secondary crops, mainly used to achieve self-sufficiency. "In Zaatari, there are many small vegetable gardens arising nowadays" (Elgot, 2014). A refugee in front of her vegetable garden in Zaatari noted, "Syrian cuisine is delicious and fresh greens highlight every table." Self-sufficiency is directly related to the Koran. An example of the correlation is as follows, "Agriculture either makes the farmer rich or self-sufficient, a situation described as tistor (an Arabic term which simply means there is no need for others)" (Alhamidi et al. 2003).

"Farms must be similar to a supermarket where man can find his needs and whoever has a cow will never be poor." This quote explains why agricultural practice in Syria is so diverse, consisting of cattle, trees, and smaller crops. Farmers describe their farms as gardens. A similar conception is mentioned in the Koran where a garden is depicted as a paradise on Earth. According to Alhamidi, "All farms have at least one olive tree, a fig tree, a grape tree, and a pomegranate tree." These four trees have multiple uses for family consumption (Alhamidi et al. 2003). Besides family consumption, there is also encouragement to grow these four trees in the Koran. Two trees are especially mentioned: the fig tree, because it ensures the overall bio-diversity of the Earth; and the olive tree, because they are claimed to live for hundreds of years.
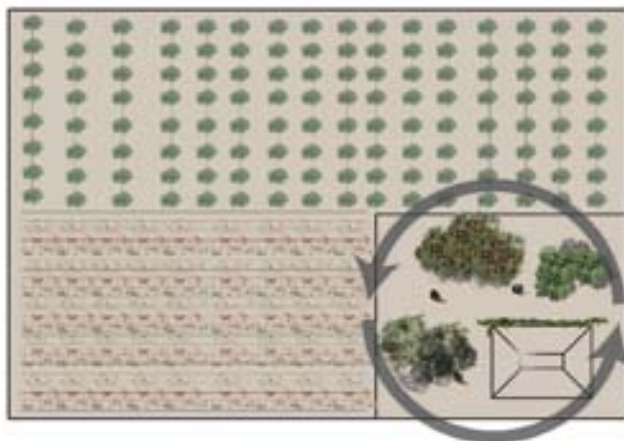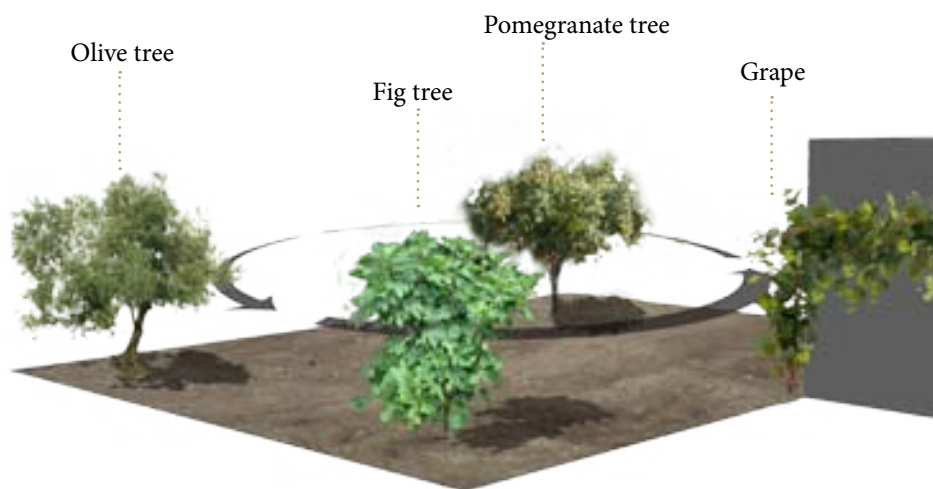
Olive tree Fig tree Pomegranate tree Grape

figure 8.3 Four species represent multiple uses for family consumption around a Syrian farm household (Alhamidi et al. 2003).

8.4   Grey and black water

The second part of the fieldwork in section 6.4 showed test days on grey water garden-ing. Grey water can be used as a solution for high water demands, especially in semi-arid zones like Zaatari. A grey water garden is a solid and predictable solution for high water demands, and it can also filter polluted wastewater (Gideon Oron and Rami Halperin 2014).

Household waste consists of two major components: black wastewater that consists of the toilet waste containing feces and urine; and grey wastewater that originates from residential clothes, washers, bathtubs, showers, bathroom sinks and washing machines (surprisingly, in Zaatari there are a lot of washing machines). The main technical differ-ence of grey water from black wastewater is as follows, "grey water contains only about a tenth of the nitrogen (ammonia, nitrite and nitrate), since it is the major urine source. The organic content of grey water decomposes more rapidly than black water and as-similation is contributed even further. Grey water biodegrades when it is reused by direct application in the root zone." Grey water is usually considered to be high in volume with a lower level of pollution, while black water is low volume with a higher level of pollution (Neal, 1996).

Black water treatment
In section 5.2 it was stated that a sewage plant has recently been built. As Zaatari is lo-cated on the most valuable aquifer in the region and it has high density per square meter, it is unsuitable to process black water in a natural way. The treatment plant made in Oc-tober 2014 only partly solved the problem because there is still no sewage system in the camp. This research design proposes a flexible community sewage network to solve the black water problem (see figure 8.5). A communal septic network is flexible because it is not connected to a network on camp level. A septic tank only connects several house-holds. Therefore, it is easy to change the connections when the physical layout in the camp changes. Refugees can execute the local, communal black water septic tanks when the materials are provided. Once they have the materials, they are able to move forward and willing to improve their environment.

Septic tanks need to be emptied by trucks and discharged at the treatment plant. The treatment plant will filter the black water, which will then be used for irrigation purpos-es. This is described in section 8.5.

Grey water treatment
Grey water has a much lower level of pollution than black water. Therefore, it is a more promising tool to use directly for irrigation purposes. Trees can absorb the contaminated water by reusing it in their root zone. Using grey water directly for grey water gardens has two major benefits. First, it saves a lot of treatment costs. Second, and more impor-tant, the water is the essential source for greening Zaatari. The next pages show the pos-sibilities of grey water gardens in Zaatari.
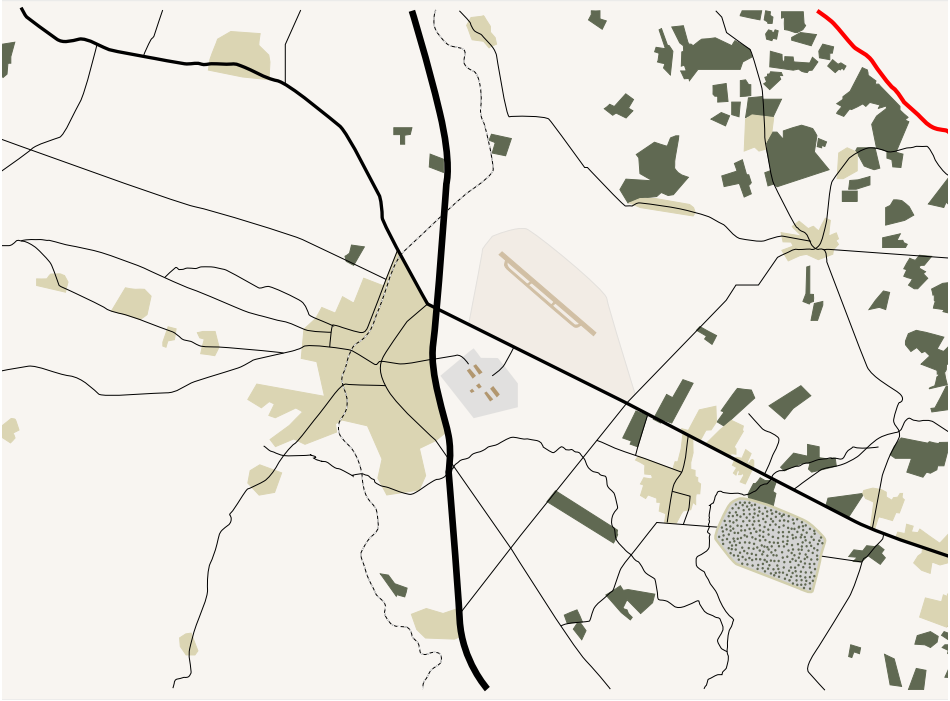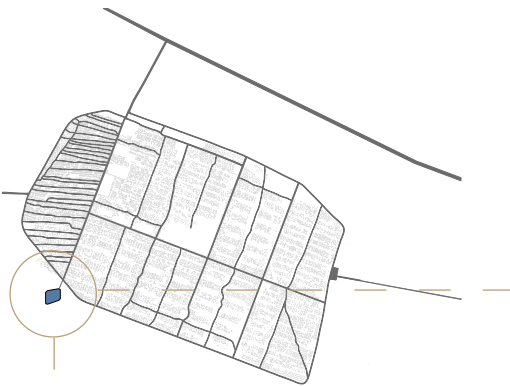
figure 8.4 Result of grey water gardens on a regional scale.

Pipelines run from the households to communal septic tanks.

Trucks will dislodge the septic tank and transport it to the treatment plant.

figure 8.5 Due to a missing sewer system, a communal black water sewage system proposed. This includes communal septic tanks that will be treated in a wastewater plant.

Household dealing with contaminated water.

-       Polluted water is running on the surface.

Grey water is collected by a hole close to the household.

-       Polluted water is collected in a hole parallel to the caravan.

Grey water hole is filled with rocks.

-       Between the rocks is space to collect the water.

figure 8.6 Transformation towards a grey water garden.

Grey water hole is filled with gravel.

- An overflow is made where the filtered water flows after it is overuse.

Trees are planted on top of the gravel bed.

- The trees suck up the polluted water for irrigation purposes.

Vegetable garden.

- The overflow delivers filtered water that can be used for veg etable gardens.

The gardens are always connected to a household, so the vegetation is always around the house as shown in the renders in the following pages.

The plan shows how Zaatari can adapt grey water gardens. Certain parts will have a higher density of grey water gardens due to higher urban density. This implementation allows residents to upgrade their own living environment.

The incentive to start implementing is party based on the result of fieldwork. The experience has shown that refugees need assistance with this, so far, unknown solution. As shown in the Zaatari Camp chapter, within the camp there are many NGOs providing assistance on a district level. Therefore, it is a strategic choice to stimulate grey water gardening within the district, to roll it out on camp level and let them do the 'copy paste' work by themselves. This will be further visualized in the following pages.
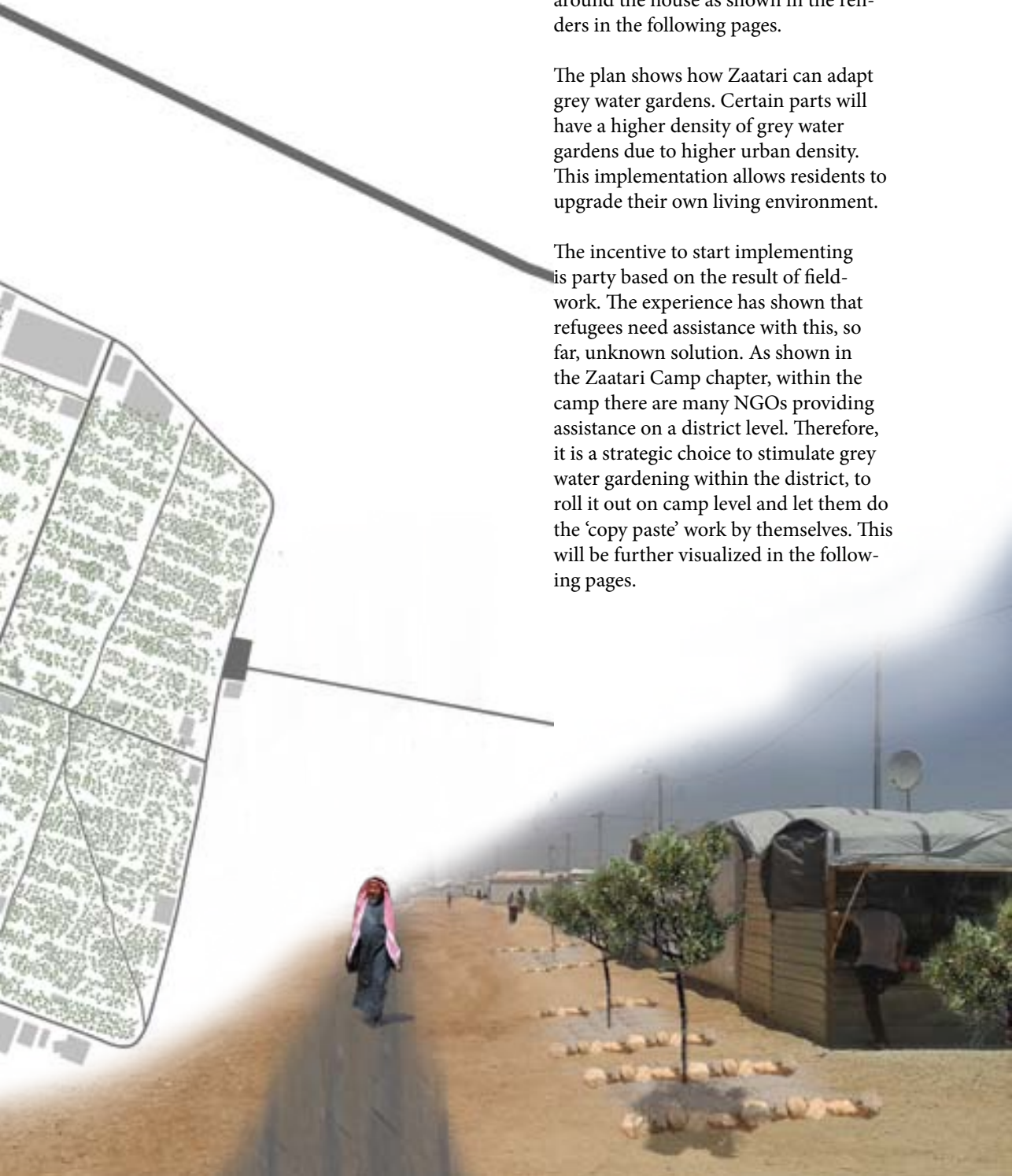
Greening potential in and around households for Zaatari. Green spaces and the ability to cultivate the land for the refugees' personal consumption.

Top view tents and caravans in Zaatari including grey water gardens around their households.

Grey water and vegetable gardens.

Greening potential in streets. Green spaces and the ability to cultivate the land on household level for the refugees' personal consumption.

Top view tents and caravans in Zaatari including grey water gardens around their households.

Grey water and vegetable gardens.

8.5   Swales

As Zaatari has a semi-desert climate, there is only limited rainfall in the winter. The average rainfall in winter is around 200 mm. To save people from floods, storm water channels have been constructed in in the camp.

The current storm water system works in terms of safety, but doesn't hold any water for other purposes. This means that the water floats aimlessly and is wasted, given the scarcity of water in this region.

To stimulate greenery in Zaatari, which can improve the environmental quality, it is possible to make use of swales. "A swale is a water-harvesting ditch cut level into the ground on the contour" (Barnes, 2007). Swales differ from storm water channels. The goal of the latter is to carry water from point A to point B. Swales, on the other hand, allow rainwater to soak in the ground slowly down through water runoff. The proposed scheme shows how a 'simple' structure can collect and hold rainwater. the height differences in the camp make it possible to hold rainwater for vegetation purposes by creating swales.
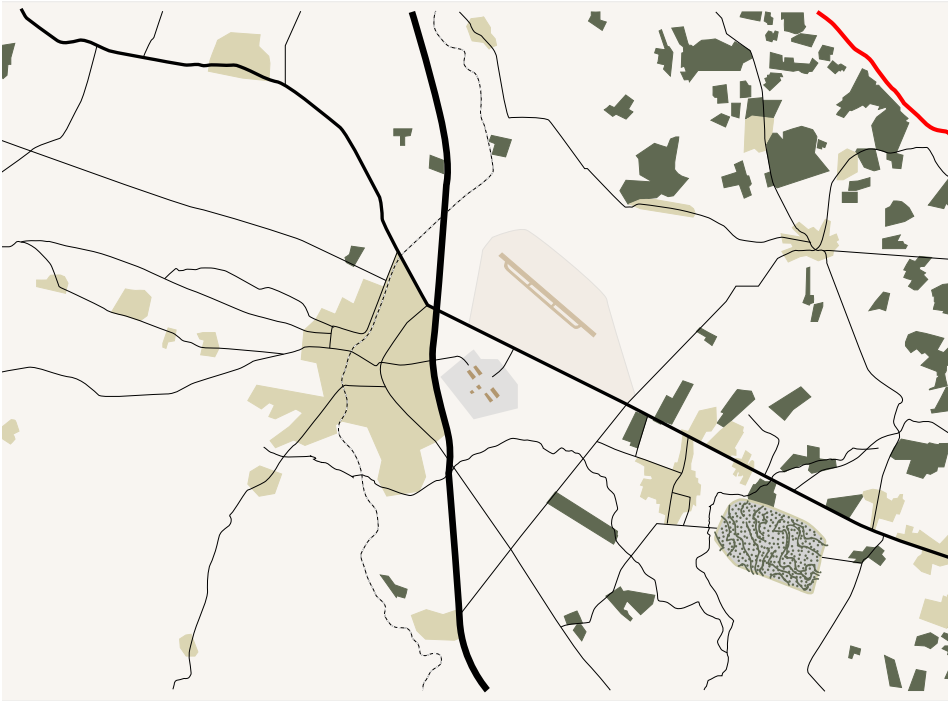
figure 8.7 Creating swales in Zaatari generates green structures within the camp shown on a regional scale.
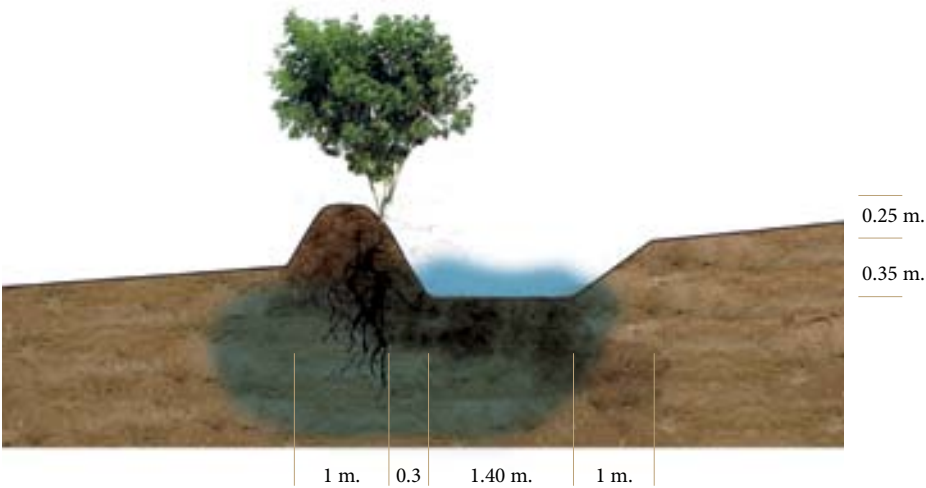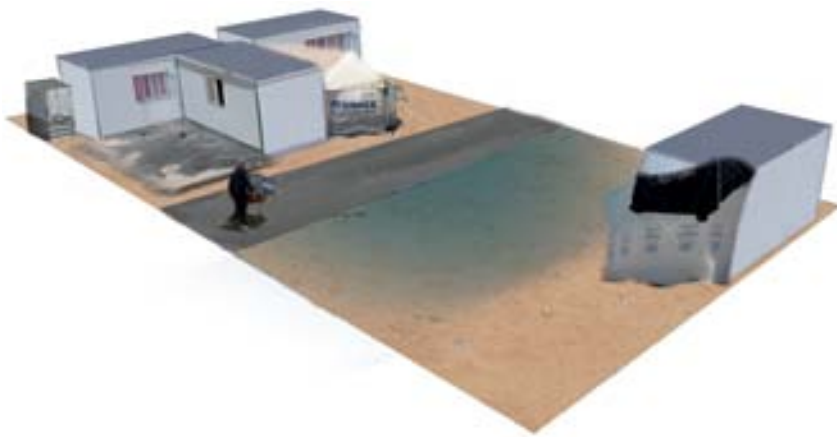

0.25 m.

0.35 m.

1 m.   0.3   1.40 m.   1 m.

figure 8.8 Cross-section of a swale (Barnes, 2007)

The current situation; where roads block the surface water.

Rainwater accumulates along the roads.

Current storm water channels tackle the accumulation of water.

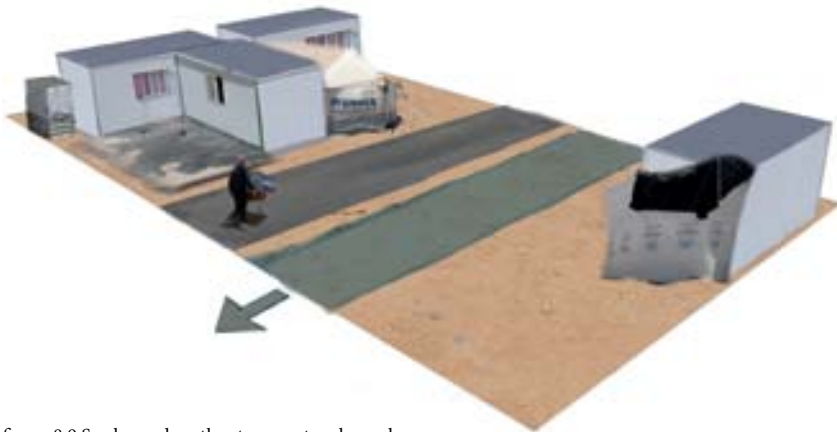Rainwater is discharged from the camp by storm water channels.

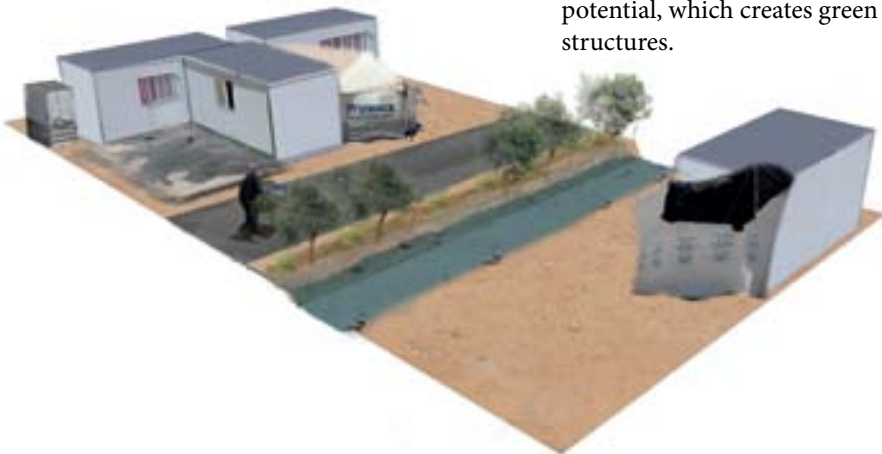figure 8.9 Swales replace the storm water channels.

Swales can hold rainwater.   -   Swales allow rainwater to be held
                                                                within the camp and it ensures
                                                                that it is stored in indicated
                                                                trenches. Swales thereby follow the
                                                                contour lines.

Swales over time   -   Rainwater will improve the soil
                                                                quality and improve the vegetation
                                                                potential, which creates green
                                                                structures.

In order to anticipate the amount of water runoff on the highest peak during rainy season, a calculation is made: Runoff area (m2) x large rainfall event (mm) x estimated runoff coefficient = runoff volume in a liter (Saad et al. 2012).

The runoff area in Zaatari is 5,542,326 square meters. The average rainfall is 11mm as a maximum per event (Climatemps, 2014). The runoff coefficient is 40% (Saad et al. 2012).

5,542,326 * 11 * 0.4 = 24,386,234 liters of water at a maximum event.

To calculate a swale size and volume, the following calculation is made: Actual length of a swale is: 22,951meters. The actual maximum amount of liters per event is 24,386,234 liters. The meters squared per swale is: 1.15m2. The profile of the swale (see figure 8.8). 22951*1.15*1000 = 26,393,650 liters

With an internal swale system it is possible to hold scarce rainwater during rainy season for vegetation purposes and control rainwater from flooding. Therefore, an internal green structure will be created within the camp. The water will be held internally within the boundaries of Zaatari. That doesn't mean that the refugees will suffer. On the contrary, they will get something in return: vegetation.

Swales are constructed to hold rainwater. The buffer stimulates plant growth.

Top view of a swale integrated in the structure of tents and caravans in Zaatari.

Swales form landscape structures following the terrain within Zaatari.
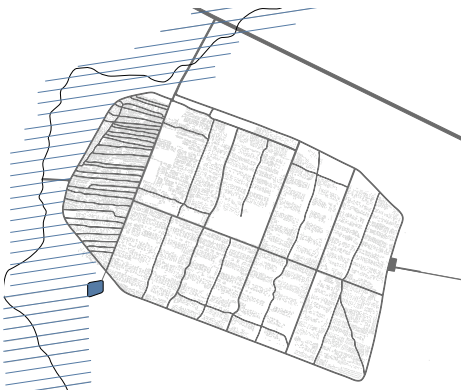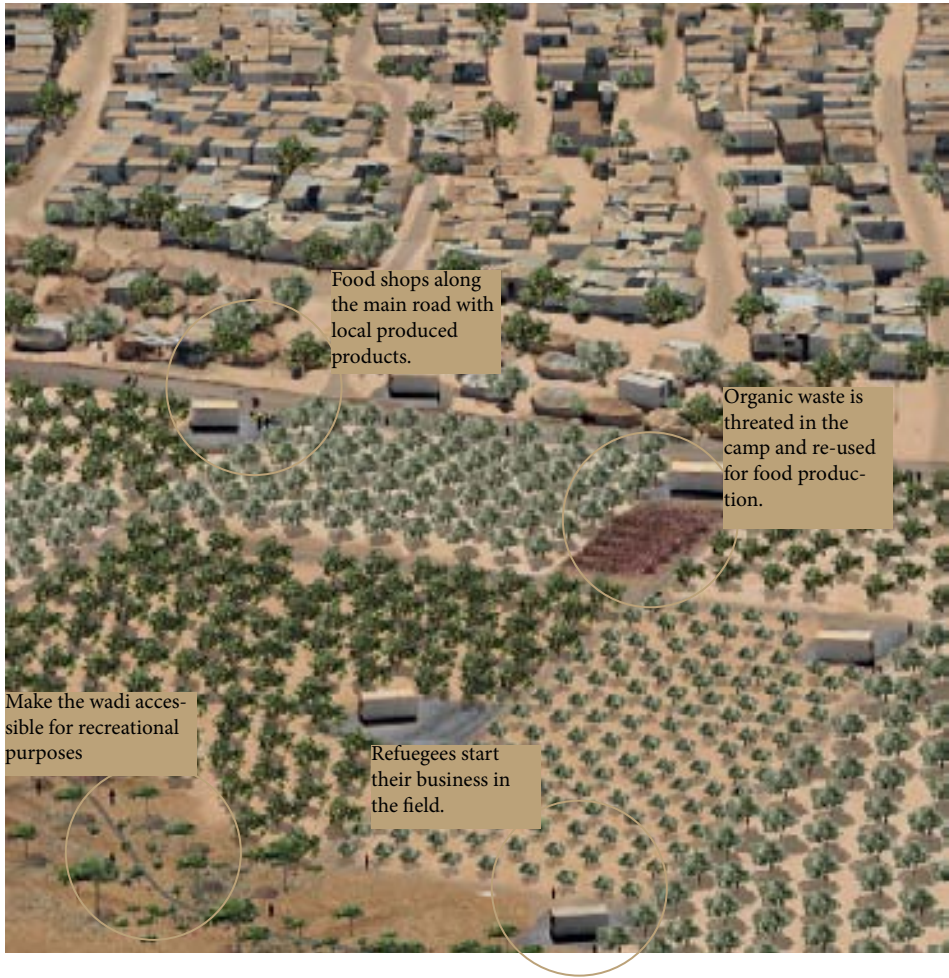
8.6 Food production

figure 8.10 Stimulation of food production along the creek just outside the camp shown on a regional scale.

As described in chapter 5, there are a few landscape structures around the camp. The most recognizable landscape structure is the creek that runs on the west side of the camp. Several orchards are located along that creek. The space on the west site of Zaatari is suitable for agricultural activities. Thus, the existing structure should be reinforced to allow refugees to work on agricultural activities, whereby orchards can make use of the water in rainy season and the environmental qualities in the region can be upgraded.

On the right page you see how the existing camp can expand into new agricultural fields. Thereby refugees could make use of areas where they could conduct small-scale agriculture.

Besides the olive orchards space should be created to make compost piles where organic waste in the camp can be composted and is re-used for agricultural purposes. This will reduce the waste effect on a regional scale.

Food shops along the main road with local produced products.

Organic waste is threated in the camp and re-used for food production.

Make the wadi accessible for recreational purposes

Refuegees start their business in the field.

The purified black water that is treated in the treatment plant shown in section 5.2 can be used for irrigation purposes in the agricultural fields.

figure 8.11 Reuse the purified water from the wastewater treatment plant.

Current camp boundary

The ring road is the physical edge of the camp.

No-go area

bump

ditch   ringroad
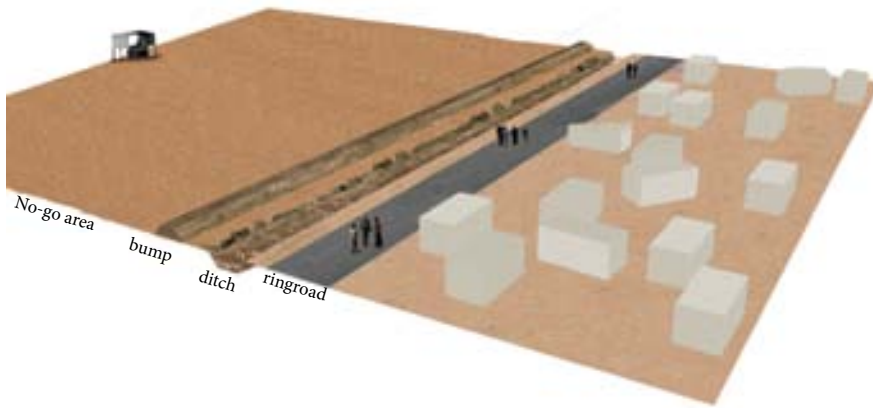
Stimulate orchards in open field

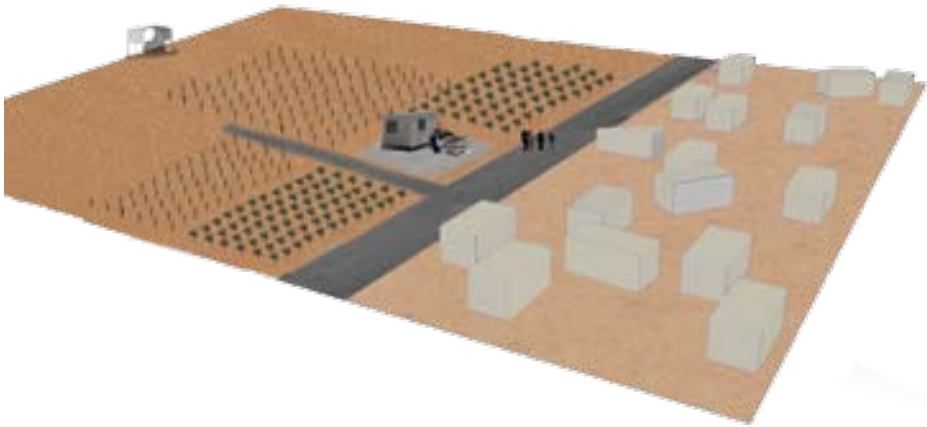Allows refugees to use the open field in order to create orchards
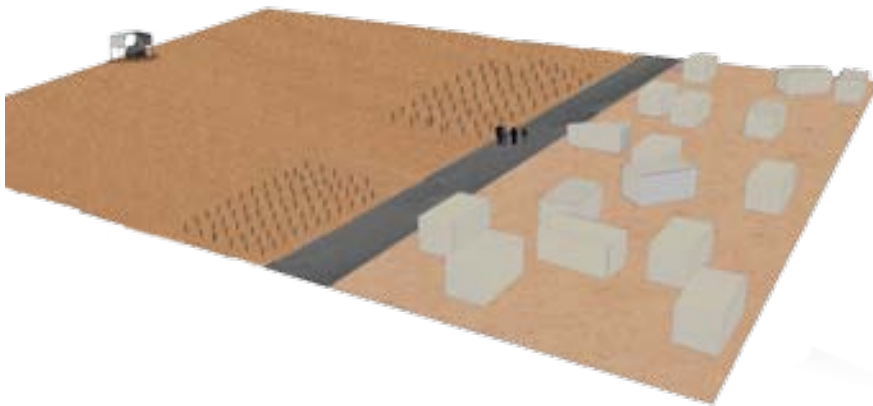
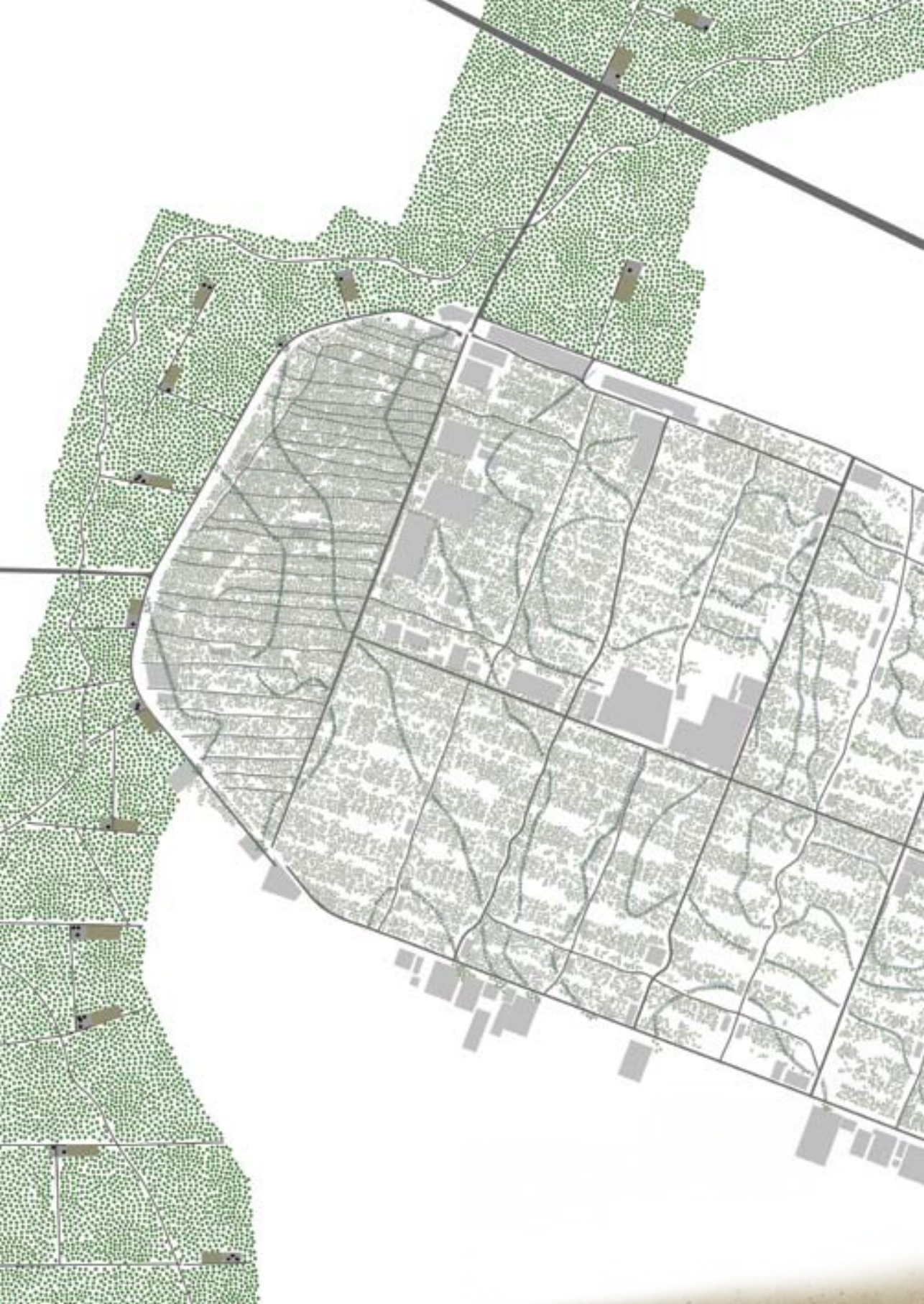figure 8.12 Stimulate agricultural activities.

Stimulate agricultural business

An orchard created over time where refugees begin to invest in growing olive trees and over time more and more evolve.


Zaatari will have its own nursery, new economic activity and space for leisure

The border of the west side of Zaatari should be turned into into an olive orchard. Small businesses sell their products in and outside the camp.

The refugees in Zaatari have an agricultural background and are deeply rooted to working on the land. By offering space for production in the camp it creates a new internal economy, and this contributes to environmental quality. It prevents erosion, contributes to the microclimates and provides local food, as well as meeting people's wishes. Although most of the refugees do not want to live in Zaatari, this intervention can accommodate a desire for a temporary (or maybe permanent) time.
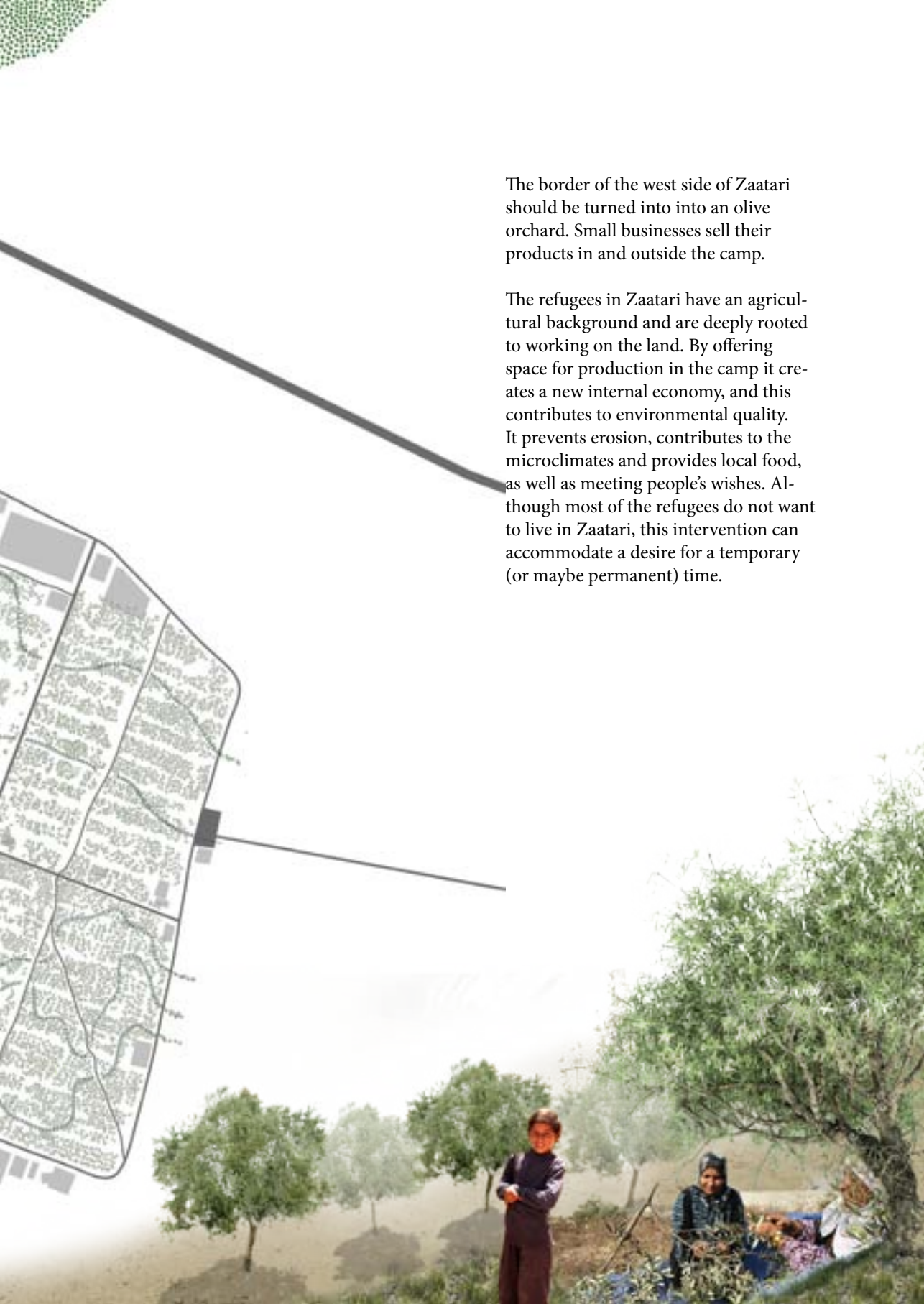
An agricultural field allows cultivation of the land for personal consumption.

Top view of a food production field on the current boundary of the camp.

Production and trading of self-produced goods on the ring road of Zaatari.

8.7   Design options over time

Organizations that can support knowledge, finance, and materials in order to enrol greening activities might leave in the coming years. Therefore, it is important not to wait with implementation. This may sound like a cliché, but in the case of Zaatari, it is of utmost importance.

figure 8.13 Possible future growth of "Green Zaatari."

As is stated in the grey water section, the grey water gardens will be stimulated from the NGO spots within the camp. The experience during the fieldwork is that Zaatari has a so-called "copy paste" community. Therefore small interventions are sometimes spread out over the camp. The maps show the evolution of greening Zaatari.
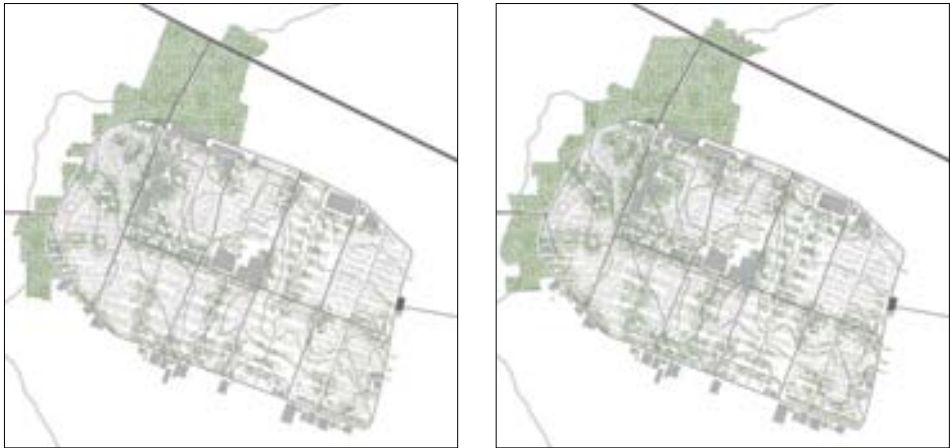
These images assume a situation where Zaatari is more or less maintains the same layout. That means that refugees continue to live here. When refugees, or in the future, maybe Jordan inhabitants, settle here permanently, is it a matter of care. The grey water gardens, the orchards, and the swales should be maintained by the current inhabitants. So, the success of a greening future depends on the engagement of the current inhabitants.

The last image below is a scenario in which Zaatari can be evaluated. The future residents will benefit from a green oasis in the desert. It is extremely important to create these long-term goals and crucial that implementation starts today. To conclude, greening the Zaatari refugee camp would provide local food, deliver a semi-sewer system, and make life in this environment more pleasant overall.

8.8   Conclusion

This chapter shows how design options can contribute to improve the landscape in and around Zaatari and so increase health conditions and the self-reliance of humans.
The options are defined in and around the camp, and the refugees form a strong basis for the proposed options. Greening activities can in the future have a regional character when the restrictions of the camp are released. The design options proposes intermediate, quickly applicable solutions:

- Create grey water gardens to solve the grey water waste problem.
- Hold rainwater by developing swales to introduce green structures within the camp.
- Use the creek structure just outside the camp for agricultural activities.
- Plant grapevines and olive, fig and pomegranate trees, which fit the cultural background of the refugees. Therefore more space for private gardening and small places for agriculture must be provided.
- Stimulate self-sufficiency: refugees can conduct work independently.
- Reduce organic waste, creating compost piles.

Chapter 9

Conclusions and recommendations

This MSc research, conducted in refugee camp Zaatari, shows that refugees live in a very harsh environment. This densely concentrated area, packed with people in a 5km span, has created an imbalance between humans and nature. The camp was designed as a system to provide optimal logistic assistance for people in an emergency situation. It was projected that on this site, there would be access to groundwater, electricity, safety, and infrastructure. Looking at this camp from a birds-eye point of view, the camp appears to be an island in the desert. The people are dealing with restrictions and boundaries and are isolated from the rest of the world. The camp ignores the natural processes and therefore creates serious damage on the landscape in the whole region. This has a negative impact on the health conditions for the residents who already live in primitive conditions and are suffering from war trauma.

The Zaatari camp is developing like a city with an internal economy. However, refugees are still dependent on services provided by humanitarian aid agencies. Their rights to act, work, and move, are restricted by the Jordanian authorities.

It has been rewarding to see that refugees in Zaatari with an agricultural background have become dwellers. These refugees have made remarkable moves. They have discovered new ways to survive. There are more than 3000 little shops set up in the camp. Refugees have managed to pick up their lives, and are probably better off than they would be in the current chaos back in Syria. Even though they have made progress, sadly, this is still not a life they desire.

As mentioned in the conclusion of chapter 7, the results of this thesis cannot predict the physical future of Zaatari. Therefore, this thesis focused primarily on short-term solutions such as improving the environmental quality. The design options mentioned in chapter 8 emphasize how short-term solutions can contribute on a long-term basis. These solutions aim to provide help for both the refugees and the inhabitants of Jordan.

In this chapter, the following sub-questions will be answered.

- **What landscape problems have occurred after creating Zaatari following the UN handbook for emergencies guidelines?**

The camp has grown very rapidly. Problems arise when time progresses and the level of different facilities or infrastructural constructions do not coincide. The lack of a sewage system and water network negatively affects the landscape. This is because households have installed private toilets and shower facilities, which are not connected to any infrastructural network. This has resulted in liquid and solid waste merging into the landscape, which is not trucked all out to a treatment plant. The landscape is littered with waste. This poses a threat to groundwater and causes soil contamination.

- **Are there landscape processes constructed in the temporary designed camp Zaatari?**

In the Handbook of Emergencies there is very little attention given to landscape structures. During the development of the camp, there was insufficient thought given to the natural environment. Some basic "morphology tools" such as terrain and surface water were not taken into account. Landscape architects traditionally form space with the intention to design for a long-term period. They also aim to promote sustainability, for humans and nature to coexist.

So the top-down designed camp has evolved into a dense and contorted space. Roads and improvised households block the surface water. Because of the gridded structure and overpopulated camp, there were floods in the early days of the camp in 2013. The flooding issues were resolved by making storm water drains. Today, the storm water drains are the only recognizable landscape structure in the camp.

- **What are the needs and wishes of the refugee population in Zaatari?**

From the workshops at IMC, the difficulties that the refugees face are prominent. The biggest wish for the refugees is to return to Syria as soon as possible. In their eyes, they have "landed on Mars."

Besides the wish to return, they wish to live for the time being in a healthy space in Zaatari. They would like a place that is clean for the ten thousand children who live there. Refugees have a strong desire for a sewage system that would help with their water system as a whole. Additionally, the authorities should allow them to grow more trees, and provide a place where trees are sold. Public lighting must be improved as well. The electricity cables that are now on the ground can cause serious injury or death.

Refugees recognize that solutions cannot only be solved by humanitarian organizations. Because of their limited rights and minimal input in the physical space of Zaatari, they feel ignored and depressed and feel they aren't doing anything productive. Therefore, their wish is that they can improve the site independently. By setting up a system of

manual labor, specifically agricultural activities, the refugees would not only thrive in this area, but it would help them to improve their lives.

- **How do you create more self-reliance in refugee camp Zaatari?**

Refugees in Zaatari are still dependent on humanitarian aid even after many years of residing in the camp. Though the UNHCR aims to support self-independence, as described in chapter 3, this is a bit of a contradiction with the current state of aid. Currently, there is still more attention paid to providing assistance than creating self-reliance.

The thousands of illegal shops and an internal economy of ten million dollars per month illustrates the skillful entrepreneurship these Zaatari residents have. In that respect, it is possible that the refugees pick up their lives independently. The refugees are motivated to move forward, but the physical and developmental restrictions reduce the possibility to create a more self-sufficient place. Steering development in the right direction, even if it is temporary, is more aligned with a sustainable future.

The problems and answers are intertwined with the policies of the higher authorities, who treat the refugees the same as when they entered Zaatari three years ago. In broad terms, the policies and approaches have not been changed so far. Literally and figuratively, more space is needed for progress; space for development and cultivation.

Reducing physical limitations will encourage more independence and therefore less dependence on NGOs. This may also have a positive effect on the whole region. A small implementation, such as planting a tree, can have a big impact in the long term. A tree grows and delivers a product. That product has, besides a positive health effect, an economic value for the benefit of an independent life. Illustrations in chapter 8 show this.

What actions, based on an ecosystem approach, are needed to create more self-reliance and a sustainable environment in the development phase of Zaatari?

The actions proposed in the conclusion section of Chapter 9 can be accomplished within a short period of time. These actions will improve the environmental quality and stimulate self-sufficiency of the refugees. For this, grey water gardens will be constructed, rainwater will be retained, and the creek zone will be used for agricultural activities. Through private gardens, planting trees and orchards, the well-being of refugees is improved. These actions should be carried out as much as possible by the refugees themselves. The development towards a greener camp is positive for the refugees for the unknown period of time that Zaatari will continue to consist. Even if the camp loses its function, the green structure would be beneficial to the region.

Academic significance

The number of conflicts and refugees around the world is growing. Now more than 50 million people are affected. This calls for a reconsideration in how to deal with displaced people.

There is a growing interest by spatial institutions to reflect on the development of refugee camps. In order to control and develop camps, private and governmental institutions are aware of this growing interest. The recently launched Innovation Planning Agency (IPA) with parties like MorethanShelters from Berlin and DRO-Amsterdam, supported by the Dutch government, discuss social and spatial levels. Manpower and funds are spent on these issues in order to develop a policy for adequate help.

Landscape architectural significance

Eventually, when the emergency phase is in recovery, institutions should also consider focusing on environmental issues. This study shows that small interventions in camps with a permanent structure can create a more sustainable and healthier way of living. The people living in the camps can avoid further suffering from environmental damage.

Specifically, I would recommend landscape architects to become more involved in the unexplored field of designing refugee camps. Landscape architects are used to developing long-term plans, and work on the interaction between humans and nature.

Social significance

This research used a participatory and transformative approach. This ensured that refugees became aware of and were confronted with the problems. They were actively involved in finding solutions and participating in the design process.

This has advantages for both NGOs and the participants. After all, the participants know more about the site and they can create design solutions that fit in their cultural background. They were challenged to turn problems into actions that they can implement by themselves. This stimulates independence and self-reliance so that aid agencies can eventually reduce their aid as the inhabitants are more self-sustainable.

Discussion and Recommendations

In the following part, a general discussion based on the findings and conclusions of this thesis is described. It focuses on the methods used during the elaborated field study in Jordan. It highlights the strengths and limitations, followed by recommendations for further research. Several suggestions about policies and practice are made concerning the relevance of these findings. These suggestions are not only for the Zaatari refugee camp but also refugee camps in general.

Position as a researcher
When I conducted research in Jordan, I dependent on the cooperation of NGOs. They controlled the area and I had to follow their rules. The freedom of movement for researchers is limited and always controlled by NGOs and the Jordan authorities. My experience during this research, in some cases, limited my capabilities for my research because occasionally there were urgent problems in the camp such as: violence, water problems, and lack of electricity. I assume there were urgent life-threatening problems in which case interactive research was impossible. I cannot imagine doing a participatory research while people have just arrived from a traumatic experience.

NGOs confirmed that conducting participatory research comes with several other issues, and thus they were reluctant to provide research possibilities in Zaatari. According to Oberg, "Zaatari is not a human lab." In order to assist you need to be very aware of the tense situation. Research should only be done when these vulnerable people are ready. To find out when they are ready as a researcher, a NGO will only give permission when they think the refugees are stable enough. Therefore sometimes I had to negotiate about the participants.

Afterwards, I realized that I had access to certain places that are nearly impossible to reach as an outsider. Without their help and permission it would have been impossible. But on the other hand my fieldwork was therefore slightly controlled/steered during the test days.

Design options
Every camp in the world is unique in terms of natural environment. A humanitarian agency should be flexible in order to create landscape structures according to the local needs and wishes. The refugees can execute the recommended implementations of chapter 8 only when the authorities allow them to. Intensive consultation with local, national and international authorities should help to implement modifications that give benefits for the host country.

The design options give an insight into how the camp can adopt new forms of land use in order to anticipate a longer stay. It is important to rethink the current physical structure and constraints of the camp. In order to carry out proposed design options, the physical restrictions must be removed. Due to the highly dense camp, there is more available

space needed in and around the camp to apply green structures. Zaatari camp is surrounded with enormous unused land where refugees would like to set up farming.

This would also be a great benefit for the development of desert into farmland for the region. Another point is that NGOs should provide funds in order to develop the proposed design options. Refugees have limited economic investment opportunities and access to building and plant materials. The test days in the camp were partly subsidized by NGOs. In order to develop the plan, more pipes, gravel, and trees are required. During the evaluation, NGOs emphasized the grey water gardens are a sustainable intervention that can last for a long period of time. This would eventually stimulate the NGOs to leave the Zaatari camp and allow the refugees to be living independently.

As a result of executing this research in a refugee camp, the design options are open-ended. The temporary design options proposed respond to the uncertainties in the future, such as an increase or decrease of refugees in the coming years, the period in which services are provided by aid agencies, and the extent to which refugees will settle permanently in Zaatari.

The factor time conducting participatory research in camps
This research design focused on improvements for the current environmental problems and focused on the short-term, whilst bearing in mind the long-term effects in anticipation of a potentially longer stay for refugees in Zaatari.

In hindsight, it can be said that this was a strategic time to execute this participatory research. The research phase was strategic because the camp has transformed into a more permanent settlement. The acute phase of offering lifesaving treatment is over.

The organization of acute care does not fit to the current situation: the prolonged stay of refugees, and new arising structures such as shopping streets and houses and caravans build by the refugees. Camp management is well aware of this. A discussion to create more permanent solutions is needed. The embedding of my approach fits well with the current development of a permanent settlement. As a result, the attention and willingness to cooperate by refugees and humanitarian organizations was noticeable. The time phase of this research study was more a coincidence than strategically planned.

Recommendations

This thesis is an eye-opener for organizations dealing with the transformation of a refugee camp into a more permanent structure. The problems and solutions are explored through a landscape architectural lens using an ecosystem-based approach.
The eco-based approach and bottom-up strategy give insights into how human and environmental problems can be tackled. Although this approach has worked in the Zaatari camp, it does not mean that these options and used methods would work in camps elsewhere in the world. Lessons can be learned from the fieldwork in Zaatari, to raise awareness of where others can make improvements in similar situations.

During the emergency phase of a camp it is logical there is limited attention on ecological processes. The focus is on life-saving issues. However, when a camp evolves this often results in ecological problems like in Zaatari. Stronger interventions in the beginning would prevent ecological degradation from becoming a larger issue later on. An important part of this thesis, which was not sufficiently elaborated upon, is the starting phase of the ecological implementations. More research should be done on the environmental entry point.

The design options mainly deal with acute problems. The solutions transform immediate problems into local, applicable changes. The proposed interventions are not lofty technical solutions that require a large investment, but can be done by local people. This makes the solutions flexible and relatively easy to implement. My proposal indicates a wide range of flexibility where changes in the future can always be made to the final structure of the camp. By creating these flexible and locally run solutions, the results are clear, progress can be seen, and changes can be made as needed.

Questions that still arise and are being asked are: Why should you look for solutions in a camp for the long-term, when the camp is a quasi-prison setting with very limited interaction with the surroundings? Why should you look for long-term solutions when the physical layout of the camp is still changing? To what extent should you invest in a place where people do not want to live and indicate they will leave from as soon as it is safe enough to return to Syria?

These proposed questions need further discussion, because the question, "Can we expect to transform a camp which consists of tents to a functioning city with benefits for the whole region?" remains alive. The flip-sided question, which is equally important, is: "Is what we have now (the gradually controlled problem), with the intermediate solutions, as a response to the war in Syria, more convenient?"

The UN is responsible for the systematic accommodation of refugees. The UN Handbook is applied in most conflict situations. There is limited focus on the natural and social context. As a result, the chance of a failure is high, where the assistance misses its target and/or causes undesirable side-effects when camp operations last longer than is expected.

The outcome of this research design can be used as input for two reasons. First, the bottom-up approach, including my experiences and lessons learned in Zaatari, can raise the discussion at an IPA level. This is shown in figure 9.1. Here it discusses the future for Zaatari or other camps in the world, reflecting on the UN Handbook.

Second, practical solutions shown in this thesis are applicable to similar situations in camps around the world. This is particularly so in those camps where refugees have been residing for a long period of time, where there is a lack of any permanent infrastructure, and where camps are located in a semi-desert environment.
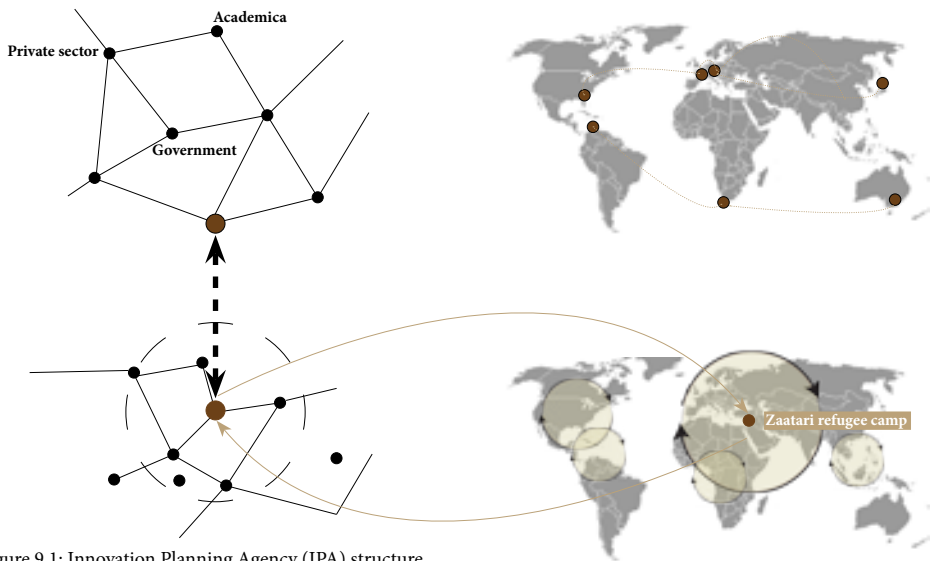
figure 9.1: Innovation Planning Agency (IPA) structure

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Appendix

- Newspaper aricle inspiration for this thesis

- Sketches and designs during the workshops

- Movie workshop children

- Fieldwork photos