

## ABSTRACT

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INDIVIDUAL SURVIVAL TO COMMUNITY  
ENGAGEMENT

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Preservation

Refugee camps, imagined and planned as temporary, most often become permanent over time. This thesis researches and proposes a refugee camp based on the assumption that the initial plan for such a camp presumes permanence and applies and illustrates this approach to the real situation of Syrian refugees at a specific site in Jordan.

THE REFUGEE EXPERIENCE  
INDIVIDUAL SURVIVAL TO COMMUNITY ENGAGEMENT

by

Lubna Chaudhry

Thesis submitted to the Faculty of the Graduate School of the  
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## PREFACE /

As the world population expands with no reduction in conflict, there has been a rapid increase in the numbers of refugees. With such a massive increase in refugees, it is important to review the built environment that these people inhabit. A refugee camp is supposed to be a temporary settlement built to receive people who no longer feel safe because their lives are threatened in the country of their citizenship. Whether planned or impromptu it is meant to meet basic human needs for a short period of time. In reality, these temporary settlements end up being populated for long periods of time, mimicking the physical organizations seen in small towns and cities. Such places should no longer be seen as short term transitional population centers but permanent settlements. In this thesis I will explore the long-term planning of refugee camps with a critical look at: how refugee camps evolve over time; the strategies people use to make these spaces their own as the camp evolves; whether camp plans relate to the cultural living patterns of the refugees; how camps might be planned to reduce dependence on the host country; and how the design of the camps might be guided by an understanding of these factors.

## DEDICATION /

This thesis is dedicated to the millions of refugees displaced within and outside their countries of origin, hoping to find dignity and better life for their families. Their stories were a constant reminder of the true importance of the need for architects and designers to pay attention to the built environment in that these people inhabit.

## ACKNOWLEDGEMENTS /

I would like to thank my family, especially my parents, for always supporting my love for architecture and design. For instilling in me the importance of education and its role in giving back to people in need.

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## Table of Contents

Preface.....	ii
Dedication.....	iv
Acknowledgements.....	v
Table of Contents.....	vi
List of Figures.....	viii
CHAPTER 1: INTRODUCTION: EXPERIENCE OF A REFUGEE .....	1
Definitions .....	2
Timeline: Destruction to Confinement.....	10
CHAPTER 2: EXISTING GUIDELINES: UNHCR.....	13
CHAPTER 3: THE CONFLICT: SYRIAN CIVIL WAR.....	24
CHAPTER 4: REGIONAL ANALYSIS.....	28
CHAPTER 5: PRECEDENT.....	34
Zaatari.....	35
Urban Scale	
Cluster Scale	
Shelter Scale	
Lessons Learned	
CHAPTER 6: DESIGN PROPOSAL.....	49
Tent + Plot	
The Cluster: Module	
Community Spaces	
CHAPTER 7: CONCLUSIONS.....	63
Bibliography	

## List of Figures

Figure 1.1: Diagram, fleeing with-in country	07
Figure 1.2: Diagram: flee outside of country	09
Figure 1.3: Timeline / Destruction to Confinement	10
Figure 2.1: Water usage on a daily basis in a 20,000 camp module (Source: UNHCR Handbook for Emergencies)	16
Figure 2.2: UNHCR camp checklist (Source: UNHCR Handbook for Emergencies)	18
Figure 2.3: Camp Module: Number of persons (Source: UNHCR Handbook for Emergencies)	20
Figure 2.4: Camp Organization: Family	21
Figure 2.5: Complete module of 20,000 people	21
Figure 2.6: Self-contained community module (Source: UNHCR Handbook for Emergencies)	22
Figure 2.7: Services and infrastructure (Source: UNHCR Handbook for Emergencies)	22
Figure 2.8: Diagram of UNHCR Guidelines	23
Figure 3.1: One in Eight Syrians have fled across the border	24
Figure 3.2: Map of conflict region	26
Figure 3.3: Syria / Jordan Map	26
Figure 3.4: Refugee populations in Syrian region	26
Figure 3.5: Areas of conflict: Syria	27
Figure 4.1: Elevation Map: Jordan	33
Figure 4.2: Map of Jordan: Groundwater basin yield	34
Figure 4.3: Average monthly rainfall in Jordan	34
Figure 4.4: Regional Analysis Overlapped	35
Figure 4.5: Location of camps in context	
Figure 4.6: Zoomed in Site location	36
Figure 4.7: Distances of current camps to cities	36
Figure 4.8: Site Parameters	37
Figure 5.1: Refugee Camp Locations in Jordan	37
Figure 5.2: Location of Zaatari	37
Figure 5.3: Growth of Zaatari Camp	38
Figure 5.4: Program map of Al-Zaatari	39
Figure 5.5: Zaatari: Household Density	40
Figure 5.6: Zaatari: Type of Tent	41
Figure 5.7: Zaatari: Communal Kitchens	42
Figure 5.8: Zaatari: Electrical Connections	42
Figure 5.9: Zaatari: Districts	42
Figure 5.10: Zaatari: Figure Ground Study	43
Figure 5.11: Changes in Cluster over time	44
Figure 5.12: Shelter formations in Al-Zaatari	45
Figure 5.13: Program Analysis	46
Figure 5.14: Growth of Al-Azraq	49
Figure 5.15: Azraq program (Source: UNICEF)	50
Figure 5.16: Images from Al-Azraq (Source:UNICEF)	50
Figure 6.1: Design Proposal	52
Figure 6.2: Shelter Transformation on plot	53
Figure 6.3: Cluster transformation	54
Figure 6.4: New Shelter Structure	55
Figure 6.5: Examples of shelter transformation	56
Figure 6.6: The Cluster	57
Figure 6.7: The Water Tower	58
Figure 6.8: The Cluster Module	59
Figure 6.9: The cluster: inner courtyard	60

Figure 6.10: The Block: Perspective	61
Figure 6.11: Community space within District	62
Figure 6.12: The Camp: Market Street	63
Figure 7.1: Aerial of Camp in the making	64

## Chapter 1: INTRODUCTION

“If there’s anyone qualified to consider the long-term when rebuilding in post-disaster situations, its architects. And if there’s anyone with a moral obligation to provide safe, affordable, and sustainable shelter, it’s most definitely architects.”<sup>1</sup>

In today’s world, there are fifty million people who have fled war and violence only to find themselves squatting at the edge, marginalized. These people represent different continents, nationalities, religions and languages and are usually displaced for very long periods of time. The United Nations High Commissioner of Refugees (UNHCR) qualifies fifty million people as ‘victims of forced displacement.’ These ‘victims’ are in different stages of this process, some are forced outside of their country of origin while others are internally displaced within their country. Fifty million people could populate a whole country where the common feature would be the humanitarian description of ‘victim: A population whose sole objective is to stay alive while they are stationed in places of waiting, they are labeled as human beings that have become both victims and undesirables.

In the world of refugees, there are no definable borders, people live in marginal zones and transit camps, experiencing uncertain relationships to the laws in both the states that expelled them as well as those that have accepted them. It is important to recognize the identity of these people as more than just victims, but people who are looking to reclaim their humanity through a

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<sup>1</sup> Allen, Katherine. "Beyond the Tent: Why Refugee Camps Need Architects (Now More than Ever)." *ArchDaily*. N.p., 14 Oct. 2013. Web. 06 Nov. 2014.

new social space that comes about through collective action. In this thesis, I will explore the concept of a planned refugee camp, one that takes into account the city-like characteristics of refugee camps. I will demonstrate what a camp would be like if the planning took an approach that took into account the permanent nature of such settlements for a specific set of people.

Through the thesis, I will establish a process or method that brings about a new way of thinking about the problem of displacement by providing a counter proposal to what already exists, one that allows camps to become more efficient and resilient through the use of infrastructure that is flexible and promotes community spaces at different scales.

## EXPERIENCE OF A REFUGEE

### *What is a refugee camp?*

A refugee camp can be defined as a temporary settlement built to receive refugees. Generally set up in an impromptu fashion, they are designed to meet the basic needs of people in despair for a short amount of time. Due to crowding and lack of infrastructure, some refugee camps are unhygienic, leading to a high incidence of infectious diseases, including epidemics. If the return of refugees is prevented (often by civil war), a humanitarian crisis can result. A refugee camp typically describes a settlement of people who have escaped war in their home country and have fled to a country of first asylum, but some camps also house environmental migrants and economic refugees. The average time a refugee may spend in a camp is 8 years, so while these camps are supposed to be temporary solutions, in reality they become permanent camps over time. These settlements are usually built and run by a government, the United Nations, or international organizations, such as the UNHCR (United Nations High Commissioner for Refugees) partnered with other NGO's.

### *What is the role of the UNHCR?*

As mentioned, the UNHCR stands for United Nations High Commissioner for Refugees. It was established by the United Nations General Assembly in 1950. “This agency is the main humanitarian agent when it comes to refugees. It is mandated to lead and coordinate international action to protect and address refugee problems worldwide. Its primary purpose is to safeguard the rights and well-being of refugees”.<sup>2</sup>

While the UNHCR helps run refugee camps, they are also responsible for taking care of the refugees when it comes time for them to leave the camp. The refugees can choose to return to their country, integrate into the local community, or seek asylum in another country. These options are also known as repatriation, local integration and resettlement.

#### *Repatriation /*

For most refugees, *repatriation* is the best solution to ending their displacement. It is important for us to note, that in order for this to work, the country of origin has to be a willing partner in reintegrating its' citizens. In order to encourage this option, the UNHCR puts forth “go and see” visits and provides updated information about the region in conflict. It also engages in “peace and reconciliation activities; promotes housing and

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<sup>2</sup> "What We Do." *UNHCR News*. Web. 06 Nov. 2014.

property restitution; and provides return assistance and legal aid to returnees”<sup>3</sup>

### *Local Integration /*

When return to the original country of origin is not an option, local integration is another solution to starting a new life for refugees. *Integration* of refugees in the host community may allow refugees to live in dignity and peace. Local integration is a complex and gradual process which comprises distinct but related legal, economic, social and cultural dimensions and imposes considerable demands on both the individual and the receiving society. In many cases, acquiring the nationality of the country of asylum is the culmination of this process.

### *Resettlement /*

The third option, *resettlement*, is provided for those who can neither go home for fear of continued persecution nor have their needs met in the host country. In these cases, UNHCR helps refugees find a new home in a third country. This option is rarely used, “of the 10.5 million refugees of concern to UNHCR around the world, only about 1 percent are submitted for resettlement.”<sup>4</sup>

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<sup>3</sup> "Voluntary Repatriation." *UNHCR News*. Web. 07 Nov. 2014.

<sup>4</sup> "Resettlement." *UNHCR News*. Web. 06 Nov. 2014.

Resettlement provides the refugee with legal and physical protection, including access to civil, political, economic, social and cultural rights similar to those enjoyed by the nationals. The end result should be for the refugees to become naturalized citizens.

### *Who are refugees?*

The 1951 Refugee Convention defined a refugee as someone who "...owing to a well-founded fear of being persecuted for reasons of race, religion, nationality, membership of a particular social group or political opinion, is outside the country of his nationality, and is unable to, or owing to such fear, is unwilling to avail himself of the protection of that country." <sup>5</sup>

A refugee, in laymen's terms, is a person who has been forced to leave their country in order to escape war persecution, or natural disaster. The suddenness of this unwanted migration causes people to lose their sense of home, their social ties and their ability to participate in the socio-political and economic structure of the host country; all ideas that make up a person's idea of self. These exoduses are triggered by human, material and environmental destruction. There is a loss of place to which the people had attached characteristics of their identity, relationships and memories, consequently giving them a collective identity of undesirables when they travel to their new environment. When a refugee makes the decision to flee their home, they

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<sup>5</sup> "Refugees." *UNHCR News.Web*. 05 Nov. 2014.

sometimes have the option to flee either within their country or find refuge in another country.

*A. Flee within country*

When a refugee makes a decision to flee with-in the country, they are called an internally displaced person (IDP). These people have not crossed any international borders, but have remained inside their country of origin. IDP's have legal and human rights within their country, even though they may be fleeing from their own government.

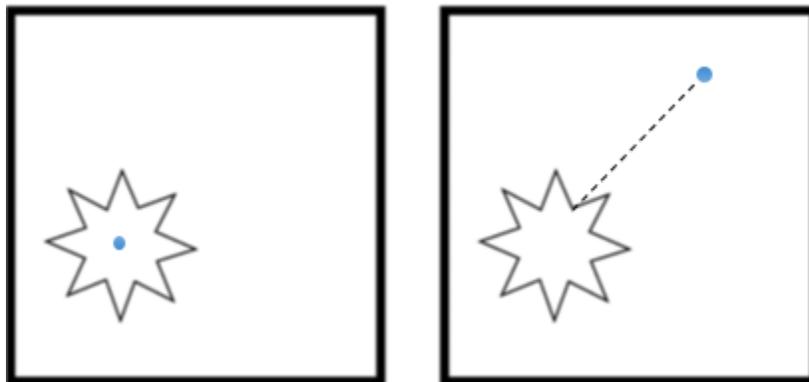


Figure 1.1 : Diagram: flee with-in country

*B. Flee to another country*

When fleeing to another country, a refugee is faced with very a very different situation. When traveling to another country, refugees become stateless, as they lose rights to their home and do not gain citizenship in another country. The decision to make this journey can lead one to different types of environments.

## Spaces of flight and refuge

There are many kinds of spaces one encounters when fleeing in hopes of finding refuge. First, there is self-refuge. This includes cross border points, informal campgrounds, grey zones and squats. These spaces are seen as hiding places with provisional shelters. Most are illegal sites of waiting or resting between two border posts. They tend to be very informal, and are unclassifiable from the standpoint of national and international humanitarian and governmental organizations. Such places are often dangerous and unstable because there is no aide available other than what individuals have brought with them.

Sorting centers are another type of space that refugees may encounter. These can be transit centers, holding centers and waiting zones. Sorting centers are under the direct control of the national administration of the host country. Here, the human flow is closely controlled because these are run by police institutions. People are usually sent to refugee camps from these sorting centers.

Finally, there are spaces of confinement such as refugee camps, and UNHCR settlements. These spaces are not completely visible in everyday life because they are usually located in an out of the way location. The access in and out is supervised because the refugees are not legal residents of the country. Camps are

interesting because they start out as temporary solutions, but as time passes, gradual improvements are made. These improvements often include the addition of roads, systems of water, latrines, septic tanks and public buildings such as clinics and schools. In the case of a refugee emergency, there are some advantages to a planned camp. Services can be provided to a large group of people in a centralized and efficient way. Because the population is in one place, it is easier to identify and communicate with the entire population.

The existence of these camps is paradoxical because refugee camps, which are conceived as temporary, become permanent. Over time, the camp is transformed because the occupants appropriate it to be able to live in it. In this thesis, I will explore this paradox and how one can plan for the changes the built environment could go through from spaces (camps) built for both temporariness and permanence. Camps that would accommodate unintended change to permanence.

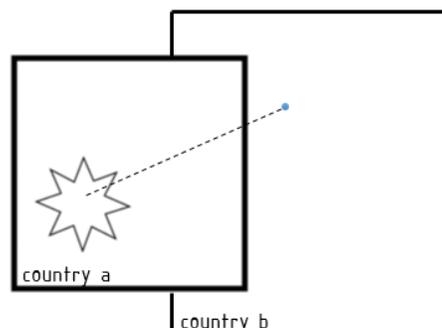


Figure 1.2 : Diagram: flee outside of country

## Timeline / Destruction to Confinement

For the purpose of this thesis, I will be exploring the timeline of people who make the decision to travel to another country and make the refugee camp their final destination. In this process there are social, economic as well as spatial implications for these people. This timeline consists of many different components, but three main phases include destruction, confinement and a final space of ambiguity. Destruction relates to the start of a conflict that forces people to flee for their lives. Between destruction and confinement is when the people go through the trauma of displacement.

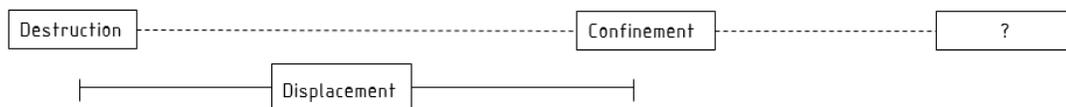


Figure 1.3 :Timeline / Destruction to Confinement

### A. Destruction

When a conflict begins, it is amplified by the destruction of land and systems that make a society stable. People who are forced into displacement are socially uprooted. There is a loss of family and a loss of sense of community. This begins the erasure of identity for people because they lose the things that define their personhood. In an economic context, because of the destruction of land and resources there is a loss of livelihood because people are not able to sell goods or provide services.

## B. Confinement

When refugees get to a place of confinement, i.e. refugee camps controlled by UNHCR settlements they enter another phase of displacement. They enter what is for them a completely unprecedented social context. While the UNHCR provides protection, camps represent an insecure environment where there is little sense of community. The camps represent a transit zone, therefore there is little social stability. This is amplified because there is a lack of economic opportunities. With no access to jobs, income and little to no savings, people have little access to cash and credit. At the same time, there is a mass influx of humanitarian aid that camps receive in order to help people in need. This aid does not last forever, eventually there is a need for people to create a way to make money on their own.

Spatially, the camps exist in isolated environments, on the margins and edges in of cites. The architecture consists of security checkpoints, harsh walls or fences covered with barbed wire and usually a barren landscape. There is little to no community space and the shelter usually consists of basic tent structures.

### C. Evolving City

As time passes by, inhabitants of camps begin to create a new social systems. These systems are based on the new shared culture of many different types of people that are confined in these spaces. Since refugees are not allowed work permits, small scale labor markets pop-up with people trading things they own, including food and goods received from humanitarian aid. As the social and economic structure of the camps change, so does the built environment. Shared spaces come about in the camps as people change the make-shift encampment into a space of improvisation. Changes are made to the shelters, tents are replaced with pre-fab structures that create a stronger sense of permanence. At this point in the timeline of displacement, an interesting phenomena begins. Temporary characteristics of the camps start to change such that they begin to resemble more permanent settlements.

“Bare space has been populated; social, cultural and political relationships have developed within a space that is delimited if not closed”<sup>6</sup>

In this way, refugee camps can be seen as hybrid organisms, spaces that change with time. Spaces that grow from informal settlements to towns in the making.

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<sup>6</sup> Managing the undesirables, Michel Agier

## CHAPTER 2 / EXISTING PLANNING RESEARCH

### Site Selection: UNHCR Guidelines

The UNHCR defines a refugee emergency as follows:

‘Any situation in which the life or well- being of refugees will be threatened unless immediate and appropriate action is taken and which demands an extraordinary response and exceptional measure’<sup>7</sup>

One exceptional measure includes the creation of camps and site selection as an important aspect of this process. In the best situation, the camps would be planned prior to the arrival of the refugees, but contingency plans change as scale, nature, timing or direction of the movement of the refugees changes.<sup>8</sup>

Generally, the initial location of camps should involve the local authorities, government and communities. It is important to plan for the long term provision of services even if the camp is planned to be temporary.<sup>9</sup> According to the UNHCR guidelines for emergency, it is suggested to involve the refugees at all phases of the settlement process encouraging a bottom-up planning approach. There needs to be a development of a comprehensive master plan with a layout that reflects the needsof open community forms, community services such as water points, latrines, showers, clothing washing facilities and

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<sup>7</sup> UNHCR Handbook for Emergencies

<sup>8</sup> UNHCR Handbook for Emergencies

<sup>9</sup> UNHCR Handbook for Emergencies

services that promote ownership.<sup>10</sup> It is important to note, that some of this cannot be done until after the refugees arrive.

### *Initial Assessment*

Site selection starts with an initial assessment of possible site areas and the initial assessment of a possible site includes the following criterion before a site can be determined. This is a responsibility of the government which provides public land for refugee camps. The government also takes the lead in negotiating and buying land that is privately owned.

### Size:

According to most guidelines, the rule of thumb for a good size planned camp is 20,000 people. The recommended minimum surface area per person is 45m<sup>2</sup> when planning a refugee camp, but should not be less than 30m<sup>2</sup>. This bare minimum includes the area needed for roads, foot paths, educational facilities, sanitation, security, firebreaks, administration, water storage, distribution, markets, relief item storage and plots for shelter.<sup>11</sup> The size of the camp can be calculated with the following equation:

$$20,000 \times 45m^2 = 900,000 m^2$$

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<sup>10</sup>

<sup>11</sup> UNHCR Handbook for Emergencies, pg 210

There should be a significant distance between camps so as to avoid conflicts between social groups and conflicts between resources that service the camps. Finally, there should be a potential for expansion as the flow of refugees increases.

*Accessibility:*

The site should be accessible year round in all seasons, close to sources of necessary supplies needed to run the camp, for example, cooking fuel and shelter material. A close proximity to a town or city center is also suggested, so that the resources such as referral hospitals can be reached. This proximity needs to be balanced so that there is no conflict with the host community.

*Security:*

The camp should be set-up at a reasonable distance from international borders and military installations in order to protect displaced populations. A camp should be located at least 50 km away from any security threats and natural hazards such as front lines, borders, mined areas, hostile communities, etc.

*Availability of Resources:*

One of the single most important and problematic criterion is the availability of water. There should be a large, sufficient and accessible quantity of water year round. Before the site is selected, calculating the daily water usage is suggested. The following chart calculates the need for water on a daily bases.<sup>12</sup>

20,000 people x 15 litres/person/day =	300,000 litres/day
20,000 people x 1% out-patients/day = 200 out-patients/day x 5 litres/out-patient/day =	1,000 litres/day
20,000 people x 0.05% in-patients/day = 10 in-patients/day x 60 litres/in-patient/day =	600 litres/day
20,000 people x 20% under the age of 5 x 3% acute malnutrition rate = 120 feeding centre in-patients/day x 30 litres/in-patient/day =	3,600 litres/day
120 caregivers x 15 litres/caregiver/day =	1,800 litres/day
20,000 people x 35% pupils = 7,000 pupils x 3 litres/pupil/day =	21,000 litres/day
Total =	328,000 litres per day
Please note that this is only the start of such a calculation. See Sphere for more guidance on cholera centres, mosques and livestock needs.	

Fig. 2.1 Daily water usage in a camp

If fuel wood is the most prevalent source of fuel used for heating and cooking, there must be a survey of the expected needs of the displaced population. Approximate fuel wood use per person per day is .6-2.8 kilograms depending on the climate, food sources and culture.<sup>13</sup> It should be noted that wood is not the most sustainable and wood saving practices

<sup>12</sup> Camp Management Toolkit , SPHERE 2004

<sup>13</sup> Camp Management Toolkit, 197

should be introduced into the camp. It is also important to assess the ability to gather construction materials. 'It must be determined what traditional materials are used, their availability at the new site, and if those materials are not available, what the options are.'<sup>14</sup> It is important to take into account the environmental impact of creating building material locally. There is also an option to get aid from the local community, through a sustainable manufacturer.

#### *Topography, Geological Conditions:*

The site should be located away and above any flood prone areas, avoiding areas that are likely to become marshy or waterlogged during an especially rainy season. The soil should allow for swift water absorption, subsoil should allow good infiltration, avoiding rocky or impermeable surfaces that would cause problems when constructing vegetable gardens and small scale agriculture<sup>15</sup> Water absorption is important to the usefulness of latrines. A 2-6% slope would allow for good drainage and possible agricultural possibilities.

#### *Vegetation*

The site should have good ground cover with trees, bushes and grass. This reduces erosion and provides shade.

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<sup>14</sup> Toolkit 197

<sup>15</sup> UNHCR Emergency Guidelines

When the site is being prepared, it is important to not cause damage to the existing vegetation and top soil. The site should also not be located near areas that are environmentally protected.

The chart below is a more detailed example of a checklist from the UNHCR Emergency Guidelines that goes through different aspects of site selection.

**Annex Sites Criteria**

<b>Sites Criteria</b>		<b>Site # (name):</b>
<b>1. Potential Beneficiaries</b>		
a	Numbers	
b	Type or categories	
<b>2. Location</b>		
a	Distance from major towns	
b	Distance from the border	
c	Security and protection	
d	Local health and other risks	
e	Distance From the protected areas	
<b>3. Basic Characteristics of the Site</b>		
a	Area, expansion possibility	
b	Land use and land rights	
c	Topography	
d	Elevation	
e	Soil condition	
f	Water availability	
g	Drainage	
h	Sanitation possibilities	
i	Climatic condition	
j	Vegetation/ other environmental condition	
<b>4. Complementary/Supportive Points</b>		
a	Nearby villages/communities	
b	Accessibility	
c	Proximity to National services	
	- Health	
	- Education	
d	Electricity & distance to Overhead High Voltage source	
e	e. Proximity to economical centres	
f	f. Proximity the IG/Agriculture	
g	g. Harvesting of the wood for construction	
h	h. Collection of fuel firewood for fuel	
<b>5. Observation / Recommendation</b>		

Fig. 2.2 UNHCR Site Selection Guidelines

## Master Plan

Overall, there should be a master plan that shows the surroundings of a site including characteristics such as natural and existing features, contours, rivers, forests, farmland, electrical power grids, shelter areas and potential expansion areas, roads, environmental sanitation plan, etc. <sup>16</sup> The planning should start from the smallest scale of the tent all the way up to the ideal camp module of 20,000 people. As seen in Figure 2.3, 16 families create 1 community, 16 communities create a block, 4 blocks make up a sector and 4 sectors complete a module of 20,000 people in a camp. Figure 2.6<sup>17</sup> shows the design of an ideal community, one that has ample space for a common area, but it is important to note, this is an ideal formation that is never achieved in the cases of emergencies.

Module	Consisting of	Aprox. No. of persons
Family	1 family	4 - 6 persons
1 community	16 families	80 persons
1 block	16 communities	1,250 persons
1 sector	4 blocks	5,000 persons
1 camp module	4 sectors	20,000 persons

Fig 2.3: Camp organization: Number of persons

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<sup>16</sup> UNHCR Emergency Guidelines

<sup>17</sup> UNHCR Emergency Guidelines

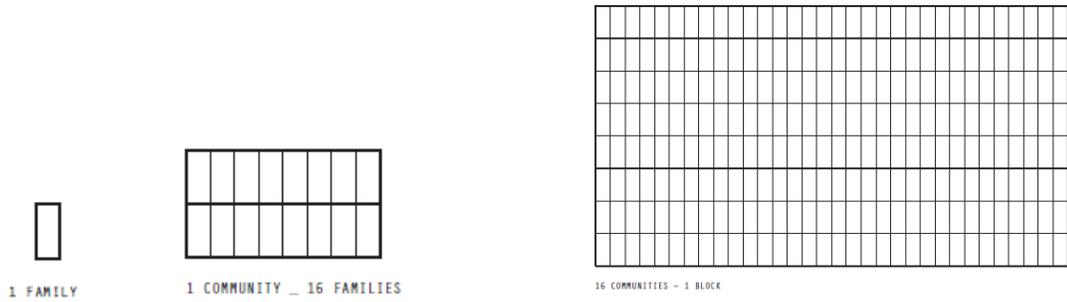


Fig 2.4: Camp organization: small scale

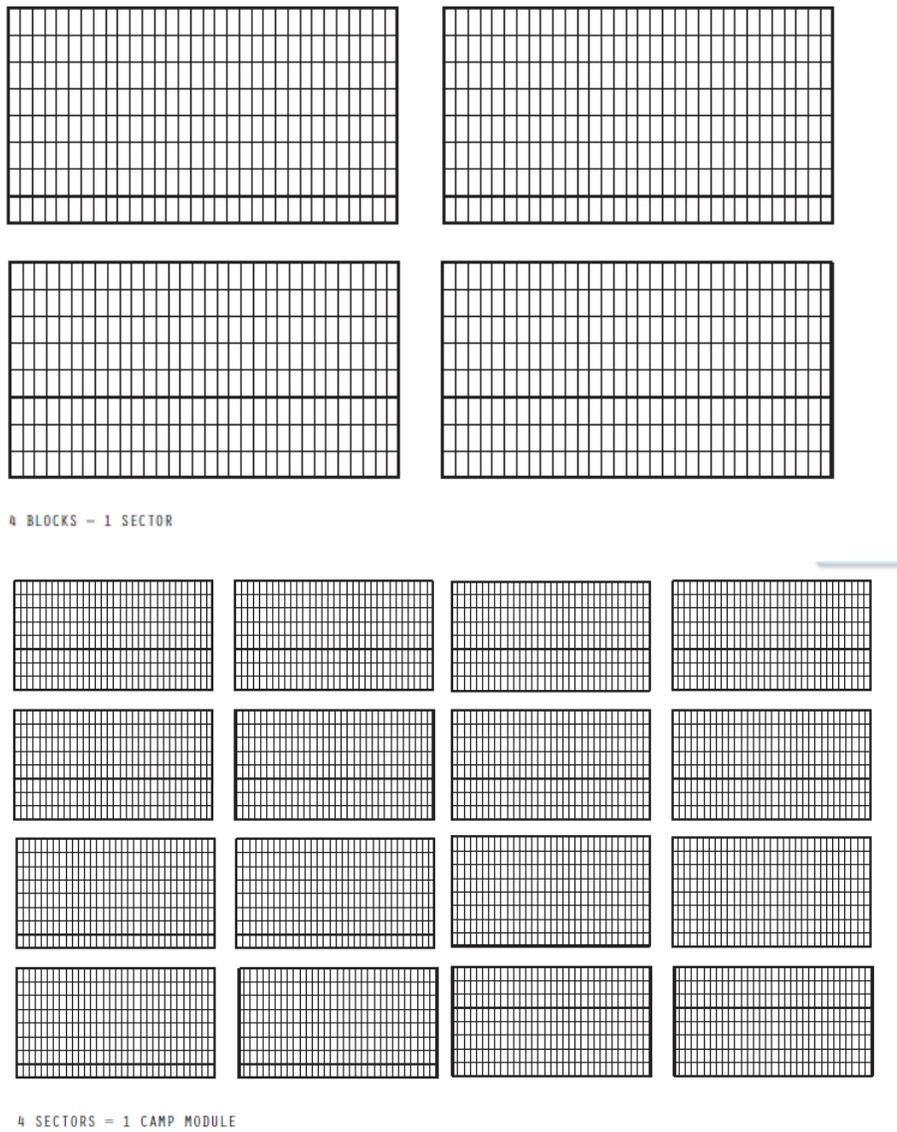
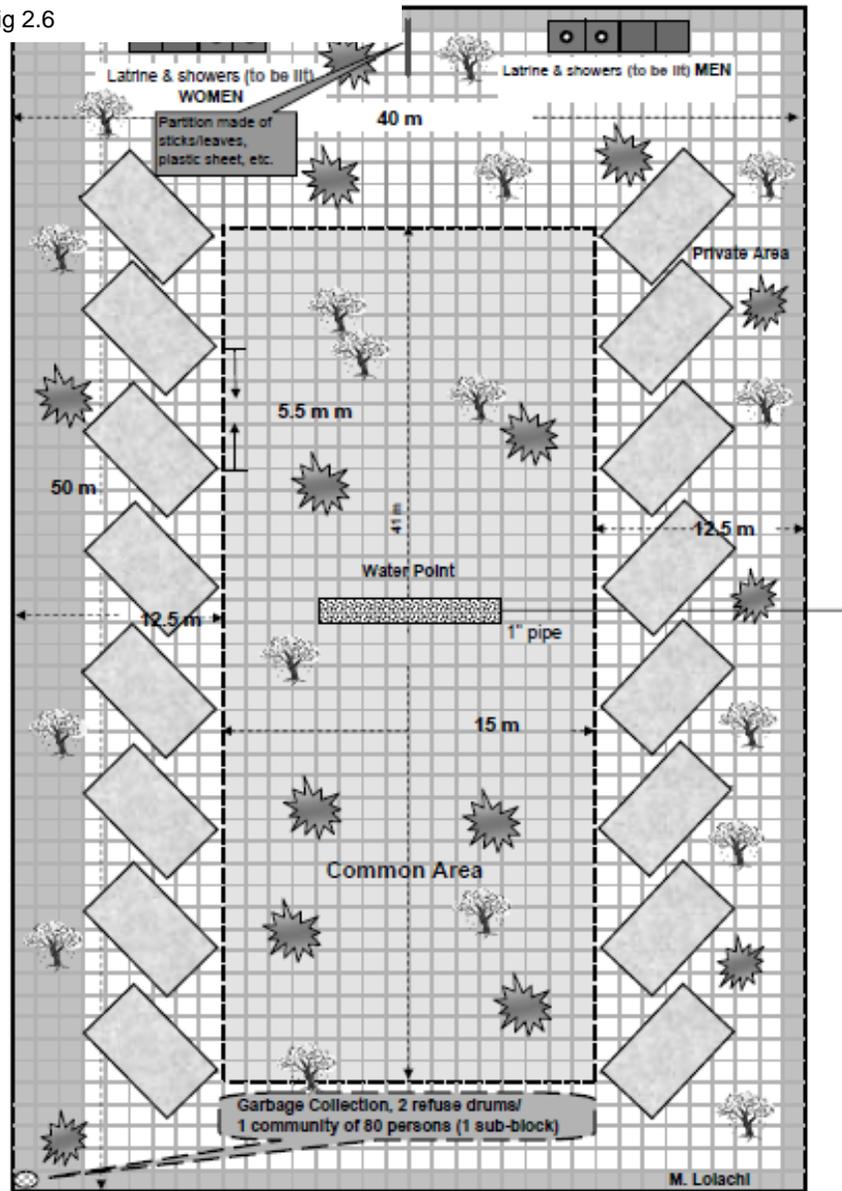


Figure 2.5 Complete module of 20,000

Self-contained Community

Fig 2.6



Sub-Block - Modular Design Concept, NTS



: Shelters, 16/sub-block, 1 shelter/family.  
 16x 5 = 80 refugees/sub-block, each shelter area=3x6=18 m2  
 Gabled (truss) frame/ ridged roof structure and/or tent

Technical Support Section, TSS

Fig. 2.6: Ideal self-contained community according to UNHCR Guidelines

## Program: Services and Infrastructure

Each camp module has a standard of services and infrastructure that must be provided. These services include water taps, latrines, health centers, referral hospitals, schools, distribution points, a market, a feeding center and refuse drums. So when looking at the program distribution, it is important to place these services throughout the camp. Figure 2.7 <sup>18</sup>shows the number of people that relate to the number of persons that have to use these services.

1 water tap	per	1 community (80 – 100 persons)
1 latrine	per	1 family (6 – 10 persons)
1 health centre	per	1 site (20,000 persons)
1 referral hospital	per	10 sites (200,000 persons)
1 school block	per	1 sector (5,000 persons)
4 distribution points	per	1 site (20,000 persons)
1 market	per	1 site (20,000 persons)
1 feeding centre	per	1 site (20,000 persons)
2 refuse drums	per	1 community (80 – 100 persons)

Figure 2.7 Services and Infrastructure

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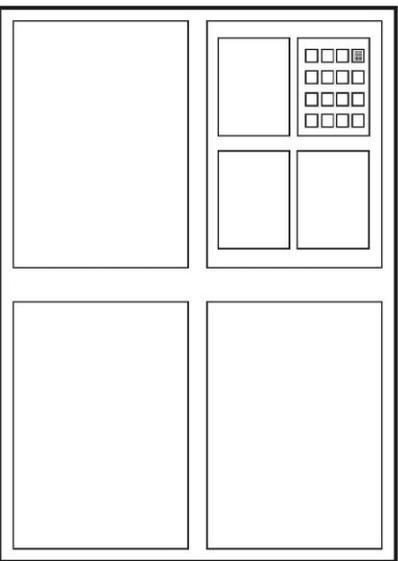
<sup>18</sup> UNHCR Emergency Guidelines

# UNITED NATIONS HIGH COMMISSIONER FOR REFUGEES REGULATIONS

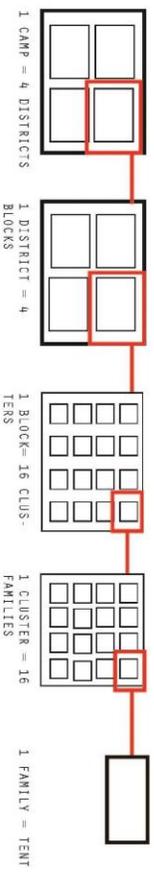
1 CAMP MODULE

- SECURITY
- REGISTRATION
- NGO OFFICE
- HEALTH CENTER (2)
- MARKET STREET (1)
- 1 DISTRICT = 4 BLOCKS
- SCHOOL (1)
- RELIGIOUS SPACE (2)
- RECREATION
- DISTRIBUTION CENTER
- DISTRICT COMPOUND
- 1 BLOCK = 16 CLUSTERS
- PLAYGROUND
- KINDERGARTEN
- COMMUNITY CENTERS
- 1 CLUSTER = 16 FAMILIES
- WATER
- LATRINE
- KITCHENS

UNHCR / 1 CAMP MODULE : 20,000 PEOPLE



- NUMBER OF PEOPLE
- 5000 PER DISTRICT
- 1250 PER BLOCK
- 80 PEOPLE PER CLUSTER
- 16 FAMILIES PER CLUSTER
- 1 FAMILY = 4-6 PEOPLE



## CHAPTER 3: CONFLICT AT HAND / SYRIAN CIVIL WAR

### History

The Syrian Crisis began on March 15<sup>th</sup> 2011 as a peaceful protest against the government of the Syrian Arab Republic. The protests were started against the reigning president Bashar Al Assad and his government at the time of the Arab spring protests. The conflict began to escalate to very high levels of violence mid-2012. In 2013 the number of people fleeing to neighboring countries increased markedly. Over the past three years, people have been displaced within Syria and to Iraq, Lebanon, Turkey, Egypt and Jordan.



Figure 3.1: One in Eight Syrians have fled across the border

### Refugee Status

As the Syrian conflict continues, it has created a mass population of refugees in the region. There is an estimated three million refugees who have travelled outside of the country and an estimated six and a half million internally displaced persons. Figure 3.2 relates the numbers of people who have travelled outside of Syria into neighboring countries. As the

map illustrates, the numbers are grave and demonstrate the urgency to find a

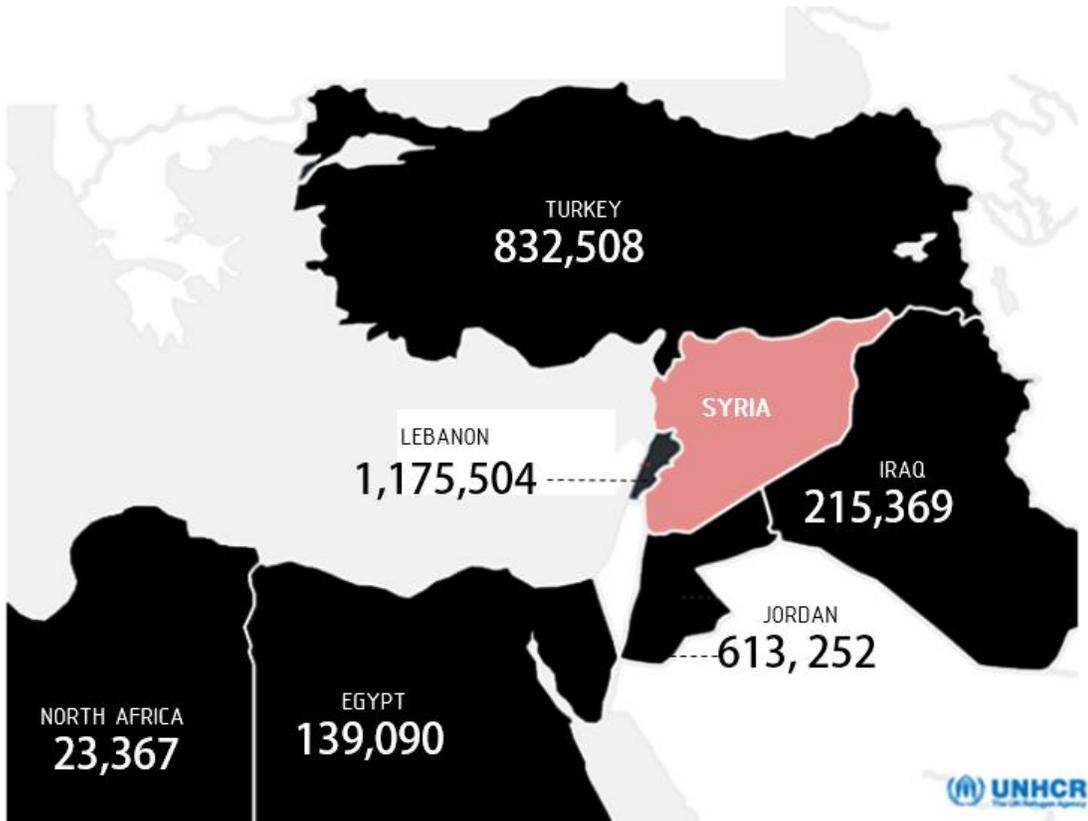


Figure 3.2: Regional displacement into neighboring countries

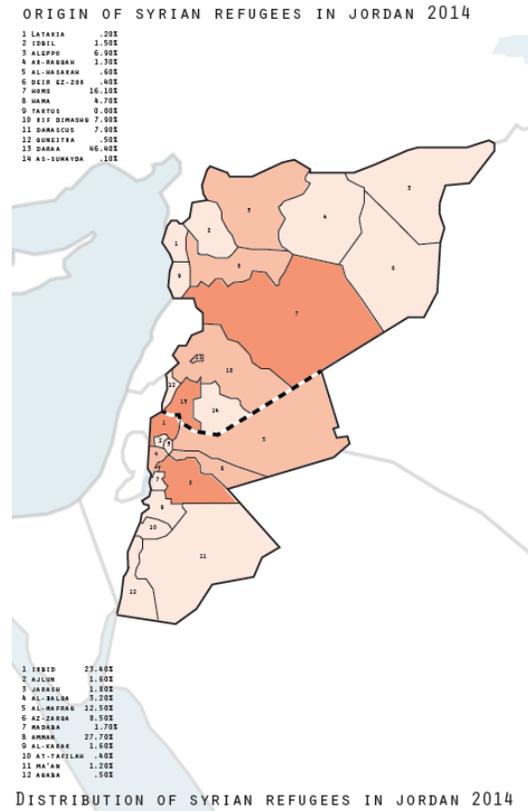
lasting solution.

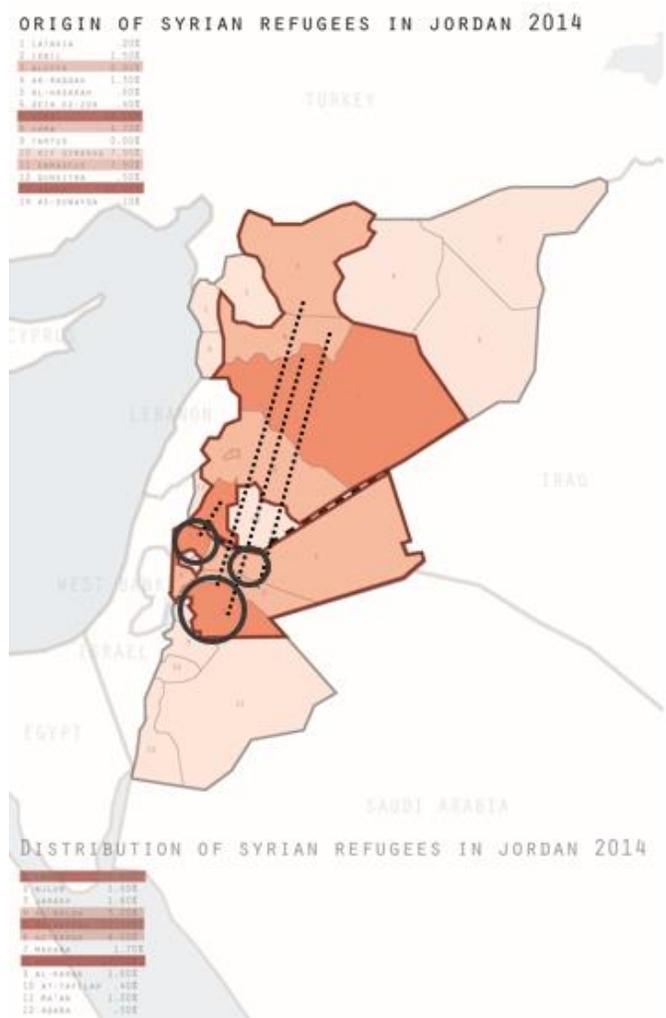
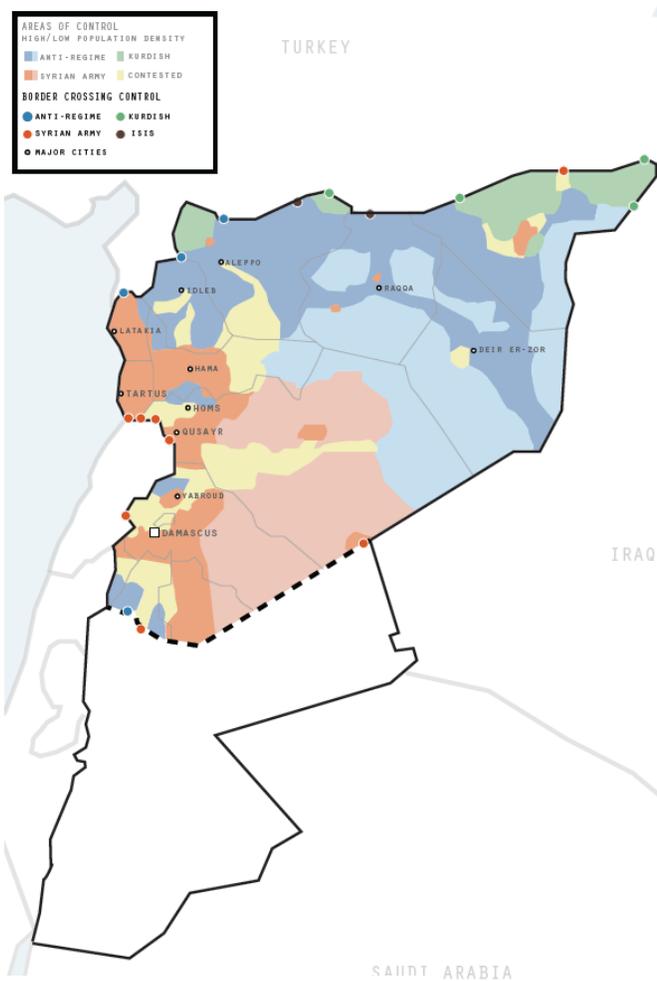
### Jordan /

As refugees travel into Jordan, they are received and assisted at the border by the Jordanian Armed Forces. The JAF transfers the refugees to a screening center at Rabaa Al-Sarhan, before transport to the UNHCR refugee camps. When refugees arrive at the camps, they are registered and receive medical treatment. They are also assisted with food and shelter, they are provided access to water and sanitation. In the best possible scenario, they are provided with education and psycho-social services.



Figure 3.2 Syria/Jordan Map  
 Figure 3.3 Governorates of Syria / Jordan  
 Figure 3.4 Movement of people from Syria into Jordan





4

As Figure 3.5 shows, the conflict in Syria is spread across the country, with concentrations along the western border. If you compare the maps of where people are migrating from with the conflict map, it is easy to see the connection between the contested areas and the migration of people from Syria.

## Chapter 4 / Regional Analysis / Jordan

In order to select a site, there are a couple categories of site analysis that need to be researched. Some of these categories include topography, availability of water, rainfall, and soil type. Figures 4.1-4.4 describe some of the conditions that exist within the country of Jordan. Topographically, Jordan has Highlands in the North east and South east, with the lowest lying areas in the governorates of Mafraq and Azraq. These governorates also yield the most water in their groundwater basins. Finally, as seen in Figure 4.5, the majority of the country is desert, with a concentration of vegetation in the northwest. Based on this site analysis, the northwestern parts of the country would serve the refugee camp in the best manner. This matches the locations of the precedent camps Al-Zaatari and Al-Azraq.

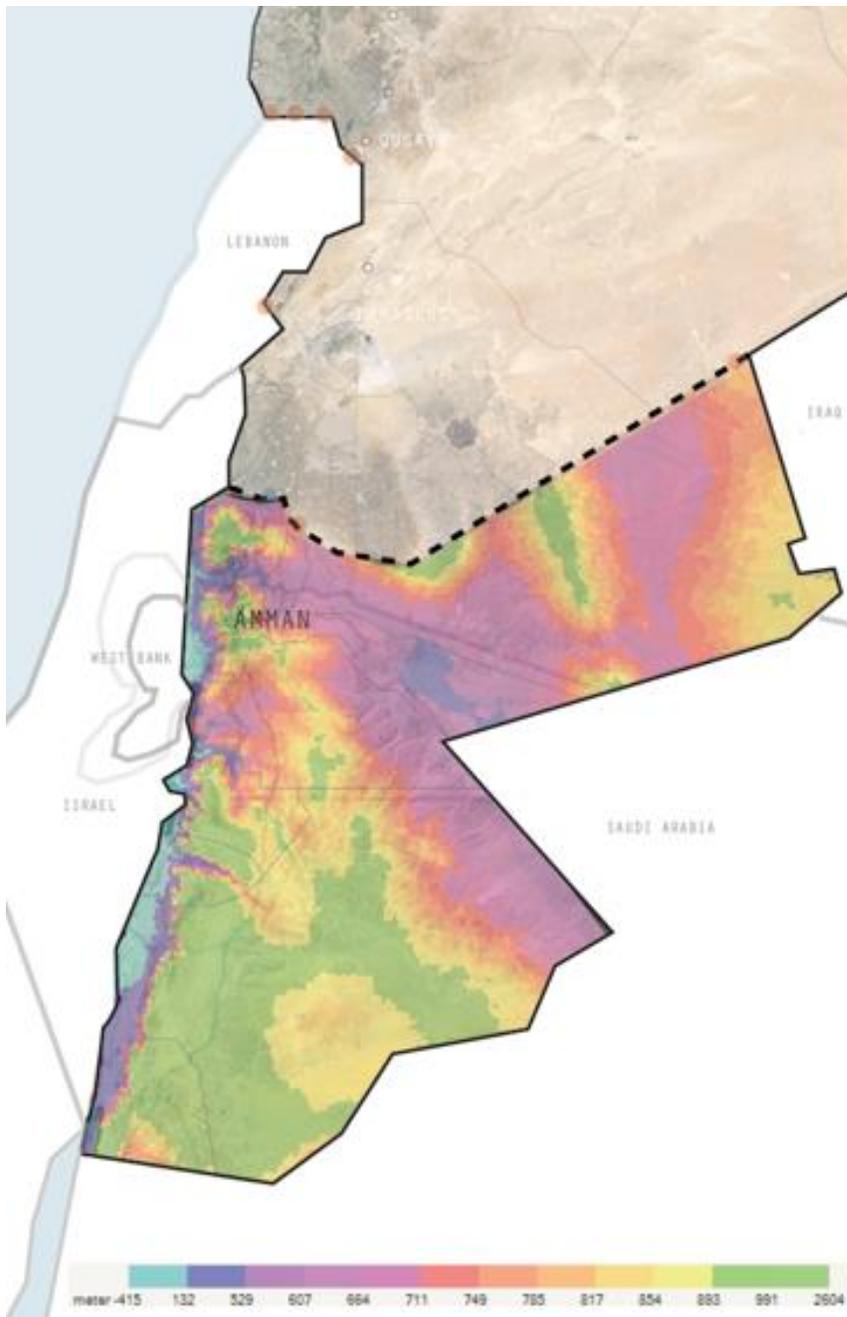


Figure 4.1 Jordan: Elevation Map

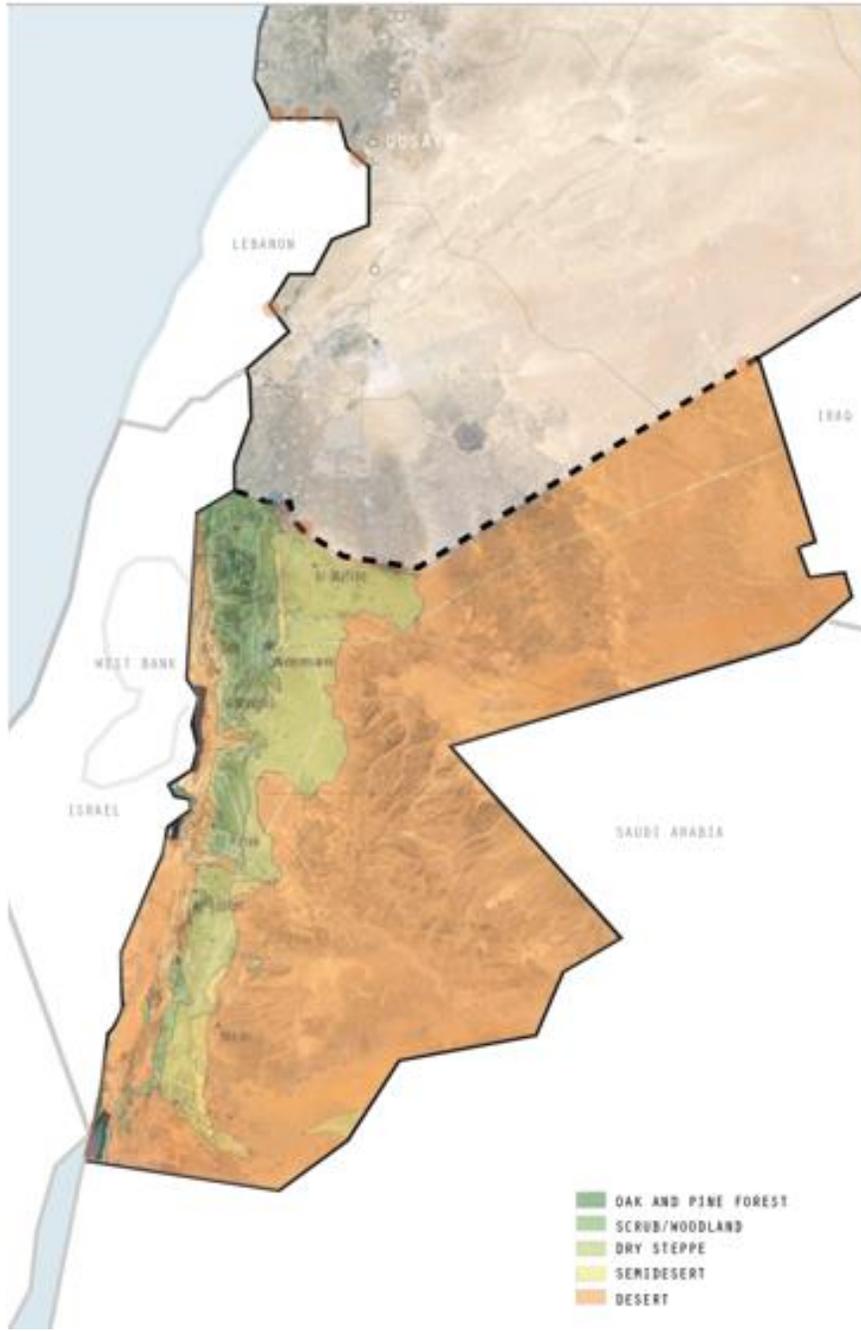


Fig.4.5: Vegetation

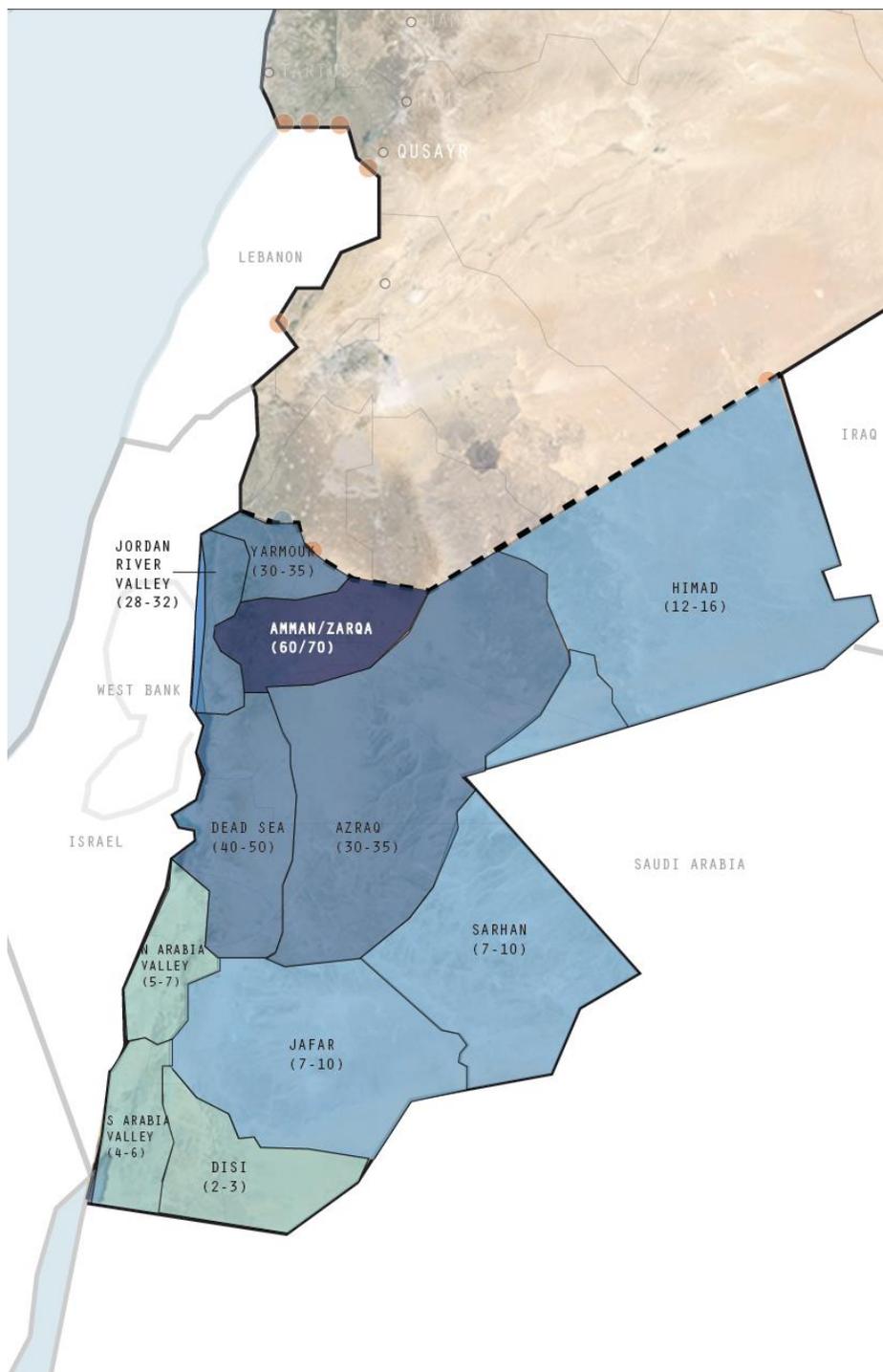


Fig 4.3: Groundwater basins in Jordan and their annual safe yield in million cubic meters

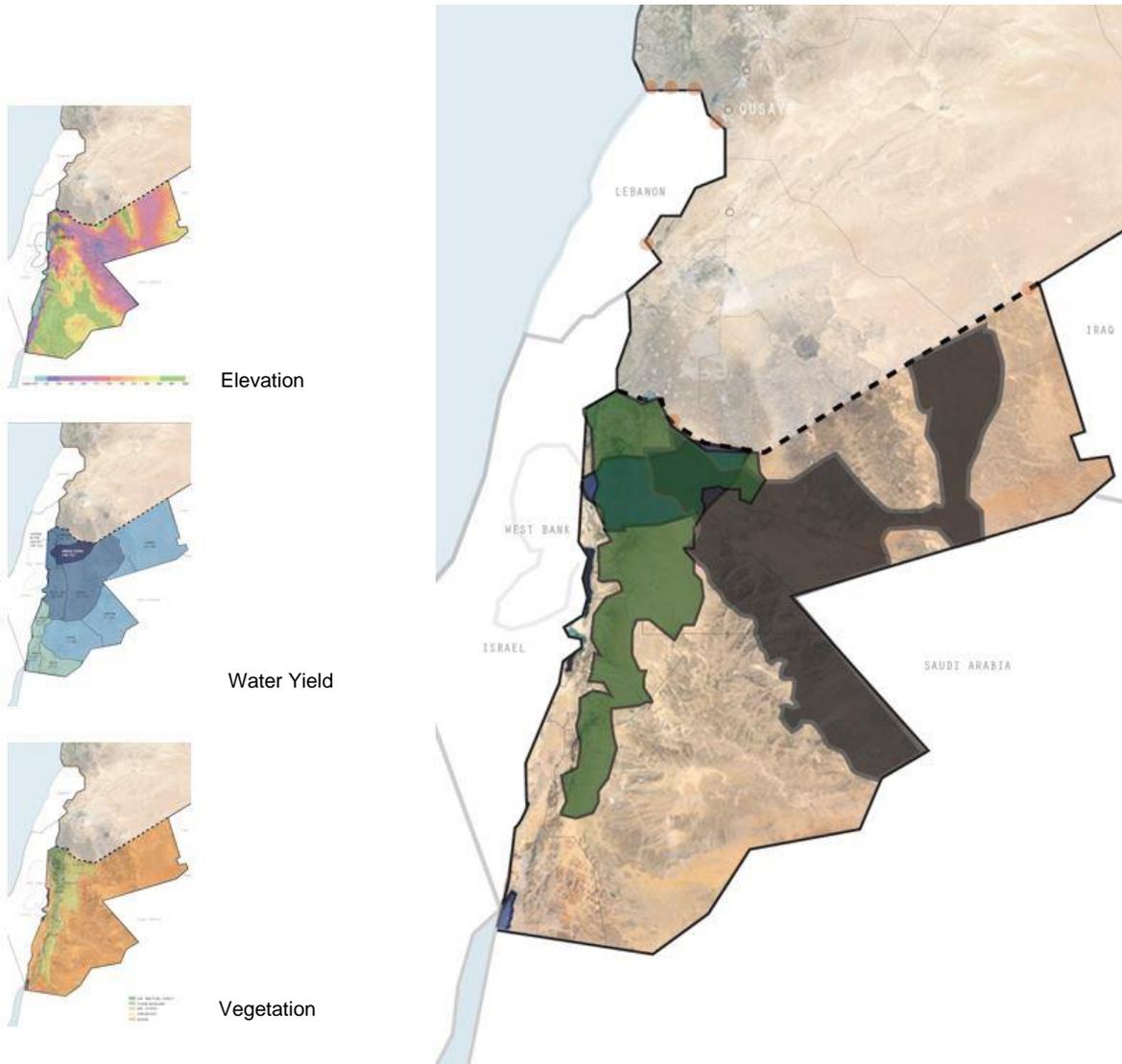


Fig.4.4 Regional Analysis

In order to narrow down on a region, the data for lowest elevation, highest water yield and land most suitable for vegetation were overlapped.

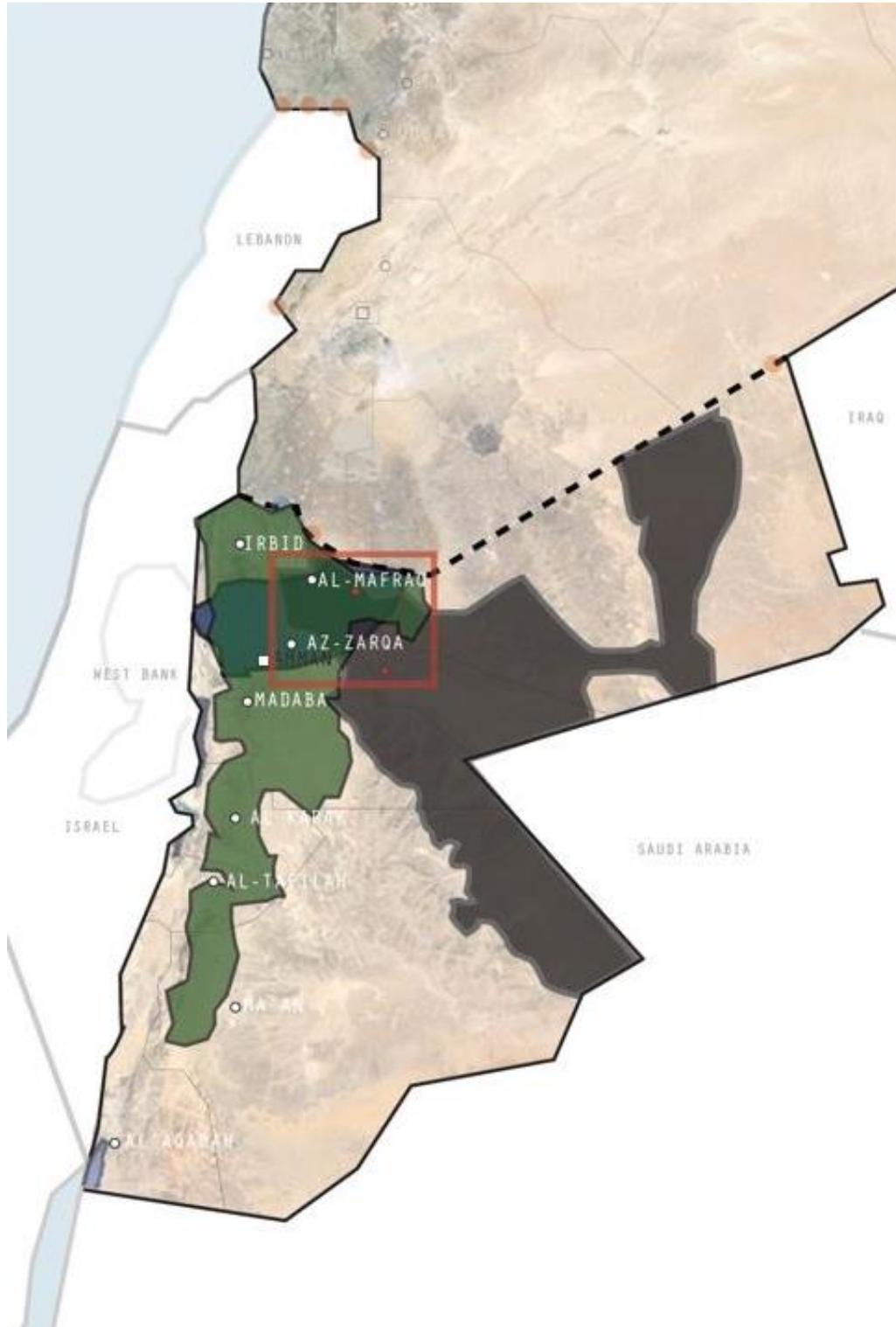


Fig.4.5 Regional Analysis



Fig.4.6: Zoomed in Site



Fig.4.7 Regional Analysis

### Site Parameters:

When picking a site, I chose to look at accessibility to surrounding Areas of high density. In this case, the new site is with-in 12 miles of Az-zarqa, Al- Thugra, and Al-Mafraq. It is connected to main roadways, an airport and is in close vicinity to a railway. It is also in close vicinity to major resources such a hospitals and educational institutions located in nearby cities.

### Site Parameters:

Accessibility: Major cities, Roadways, Mafraq Airport, Hijaz Railway

Resources: Water, Hospitals, Infrastructure, Education

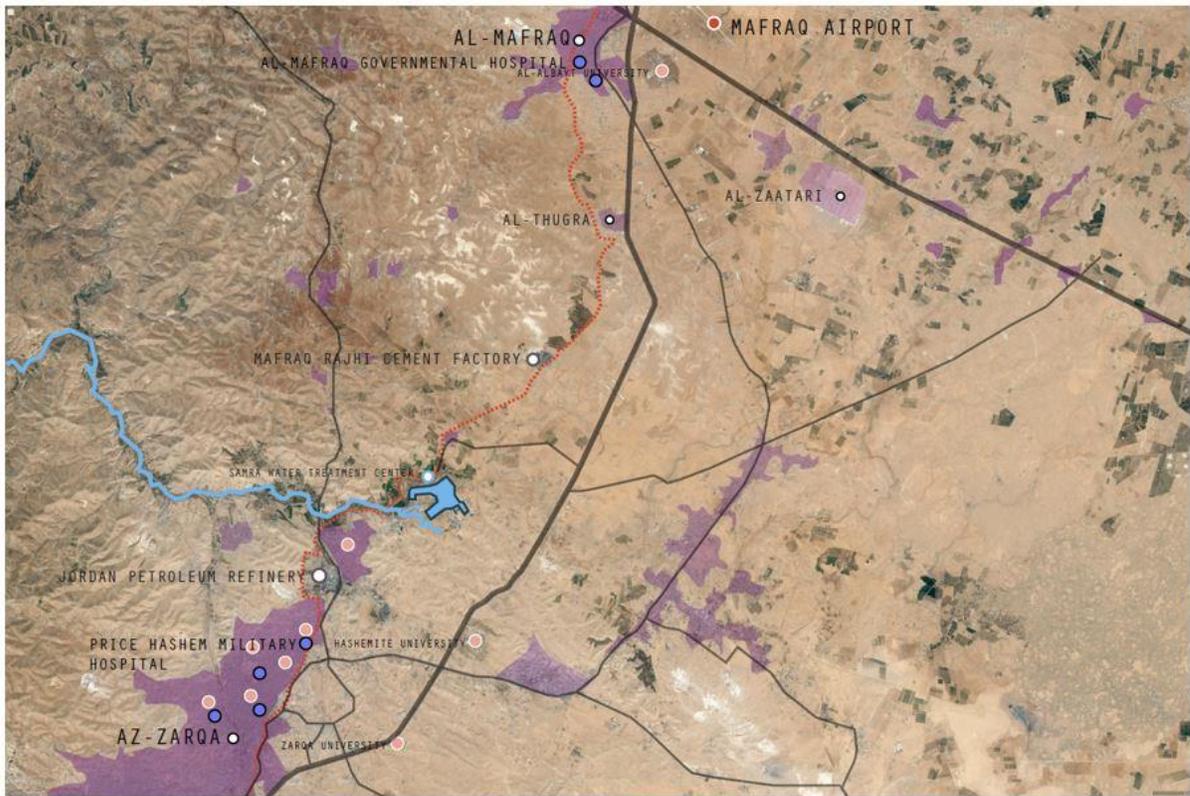


Fig.4.8: Site Parameters

## CHAPTER 5 / PRECEDENTS

As the migration of Syrians into Jordan has grown, the need for refugee camps has increased. The map below shows some of the refugee camps that have been established in Jordan since the conflict began. In the case of this thesis, it was important to note the existing conditions within refugee camps. Two camps that were studied were Al- Zaatari and Al-Azraq Camp. Both camps are located in northern Jordan.

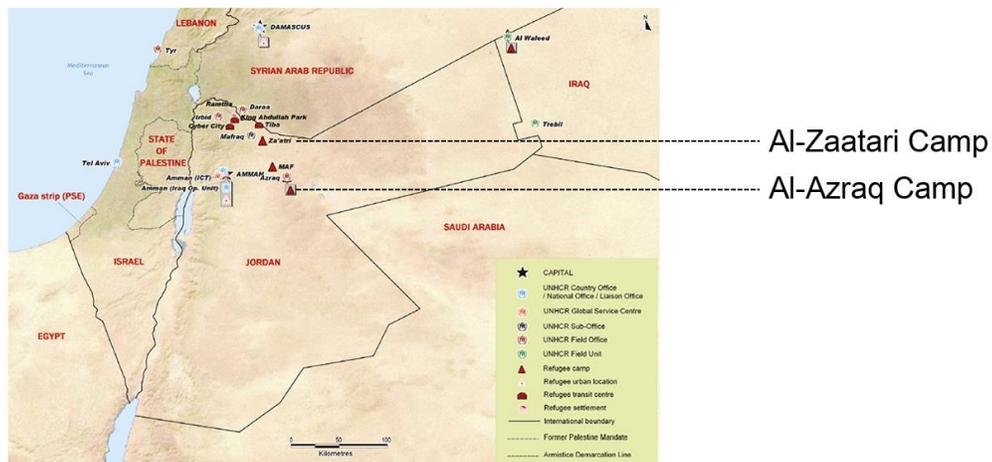


Fig 5.1: Refugee Camps in Jordan

Precedent: Al- Zaatari:



Zaatari is a Syrian refugee camp located 13 km east of Mafraq, a city in northern Jordan, 10 km from the Syrian border. It sits between the Syrian Desert and volcanic Hauran plateau, therefore experiencing a desert climate. It was established on July 28th 2012 for Syrians fleeing the violence of the Syrian civil war. The camp is jointly run by the UNHCR and the Jordanian government. This desert camp has slowly transformed into a make-shift city housing over 100,000 people. It is made up of 30,000 shelters and administration buildings, 3 hospitals, 3 schools and even a market street dubbed the Champs Elysees. Figure 4.4 shows the locations of some of these amenities.

There is a taxi service, children's playgrounds and football pitches. While they are not in the best conditions, there is an effort to create public space that encourages the sense of community.

Zaatari is divided into 12 districts, districts 1 and 2 have been surnamed the Old City, and while it benefits from the best access to services it is also has the highest density. As the camp grows, the biggest problem facing the refugees is security. Zaatari is a camp that started out as a temporary solution for 100 families, built only in nine days, but over the last 2 years it has grown into a more permanent settlement. Zaatari showcases a *possible* process that would allow refugees to become an asset to the host country while creating a better environment for people to live in after experiencing the trauma of war.



Nov 2012



Jan 2013



Feb 2013



Apr 2013

Fig 5.3 Growth of Zaatari camp

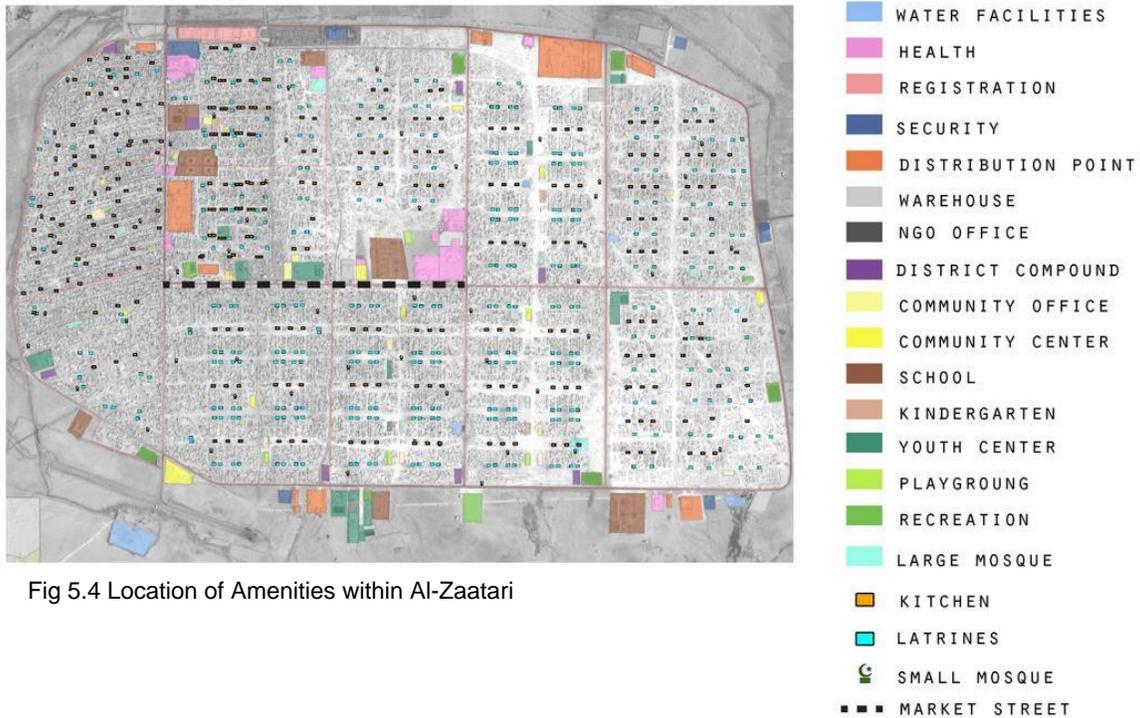


Fig 5.4 Location of Amenities within Al-Zaatari

Figure 4.4 shows the location of major amenities with in the camp. In general, the amenities are located haphazardly throughout the camp, some are central, some are on the boundaries of the camp, and there is no general organization that relates to the amount of people using the facilities. There is a lack of community spaces, many times existing on the fringes of the camp. While there are designated spaces for mosques, they are very far away for certain districts, in turn, there are smaller spaces marked as mosques within each district. There is also a main market street that is central to the camp as a whole, where people have set up an impromptu shops selling anything from fruits to wedding dresses.

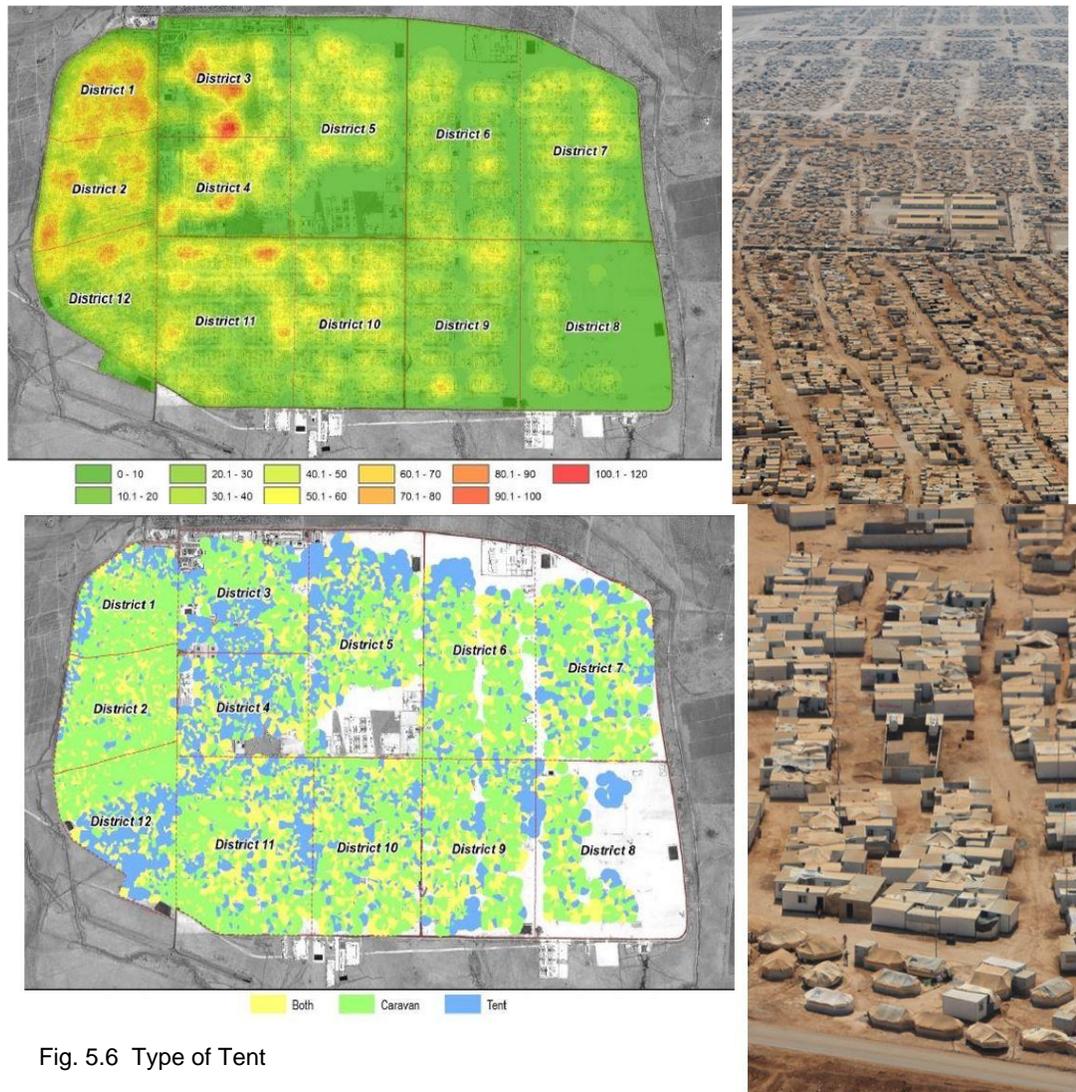


Fig. 5.6 Type of Tent

There are two types of shelters that can be found in Al-Zaatari, one is the tent, and the other is the caravan, families receive one or the other based on when they arrive at the camp, the state of emergency each family is in, etc. Over time, people begin to transform their shelters by making additions and changing the form of the shelter to better accommodate each family. In the oldest part of the camp, there seems to be a move of shelters into clusters around resources such as the water towers and latrines.

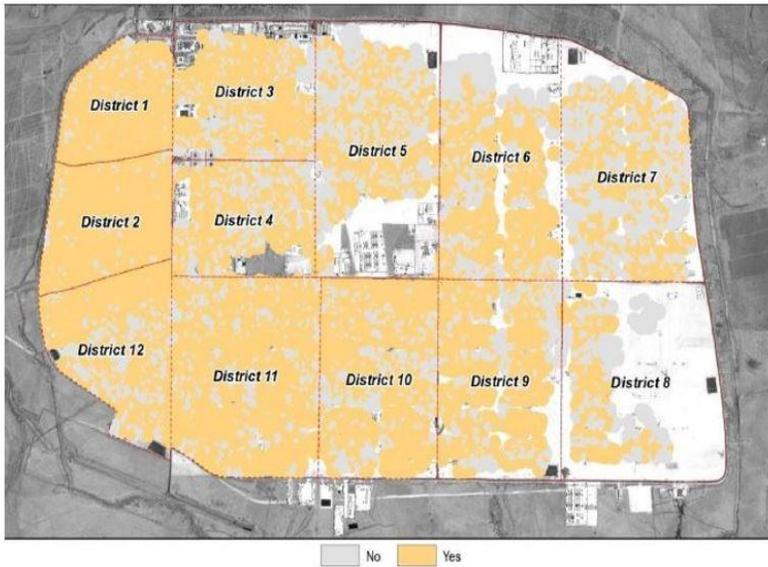
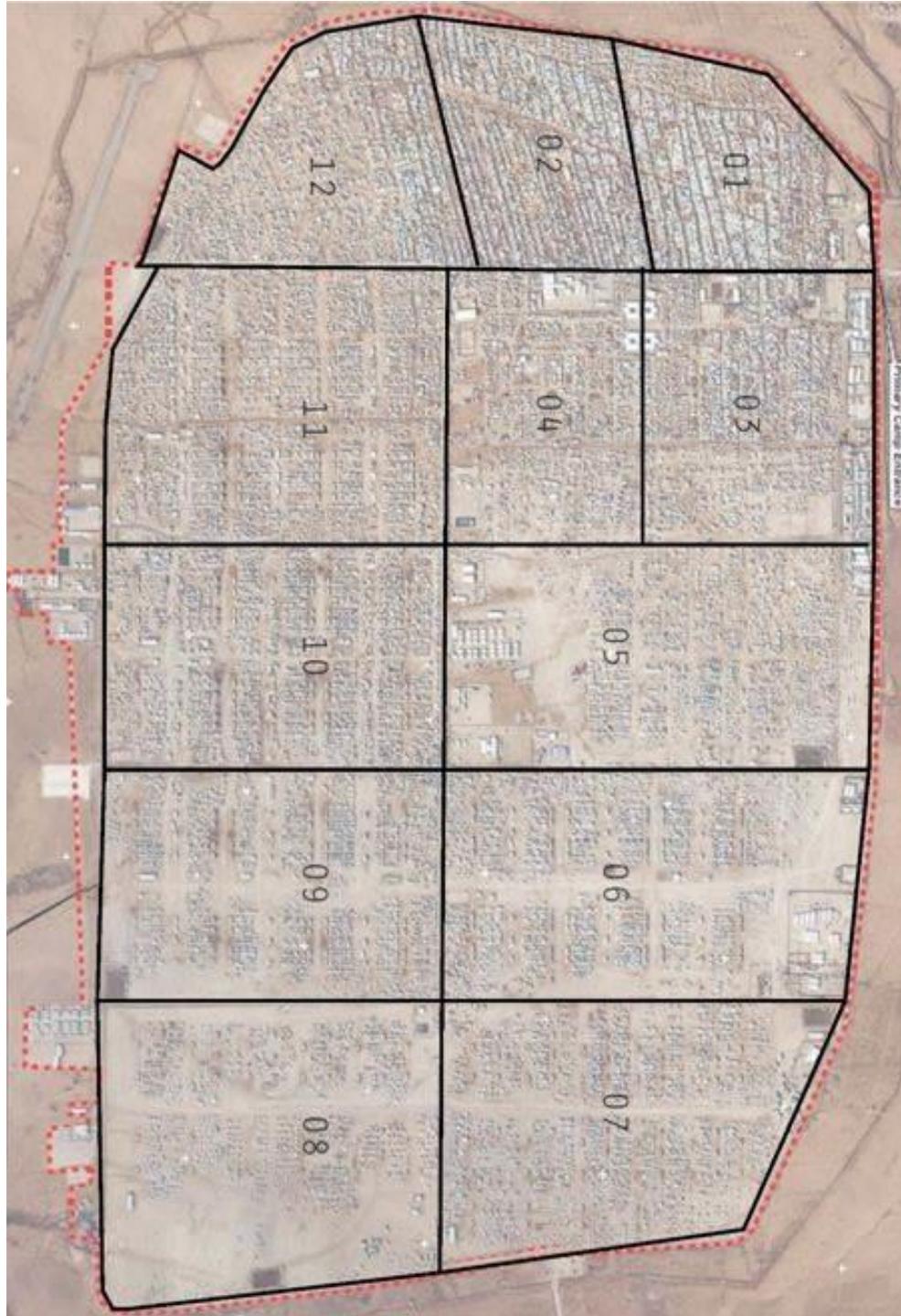


Fig. 5.7 Households with Electricity



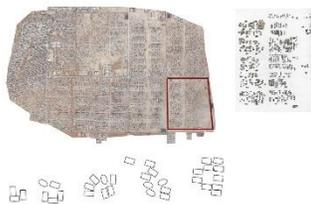
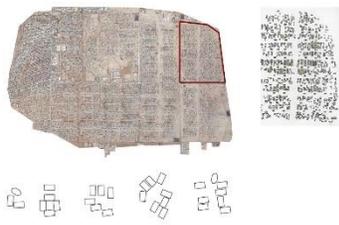
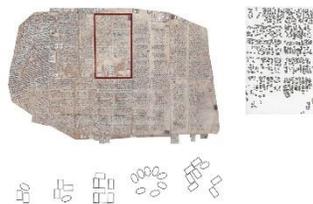
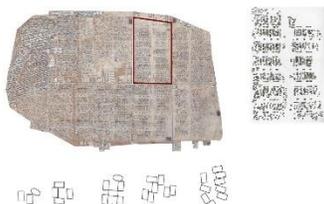
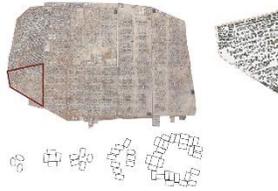
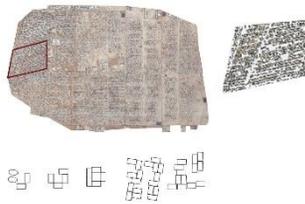
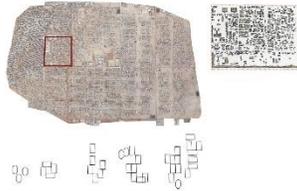
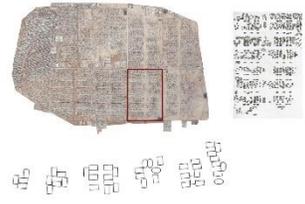
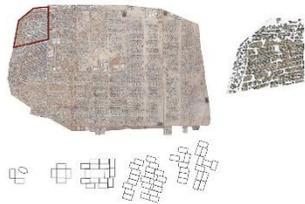
Figure 4.12 show the distribution of services such as kitchens and electricity. Since shelters do not have connections to electricity, refugees started tapping into the camp's electricity grid illegally posing safety problems.

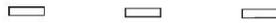
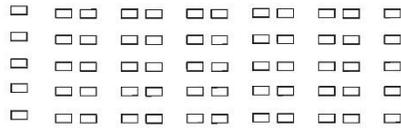
Al-



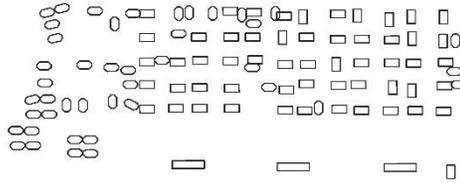
Zaatari: Figure Ground Study

Figure 5.8 Al-Zaatari: Districts

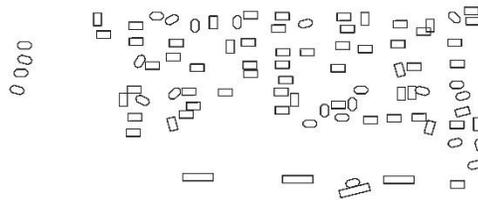




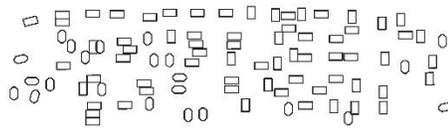
JANUARY 2013



MARCH 2013



JULY 2013



JANUARY 2014

Fig. 5.9 Changes in Clusters over time

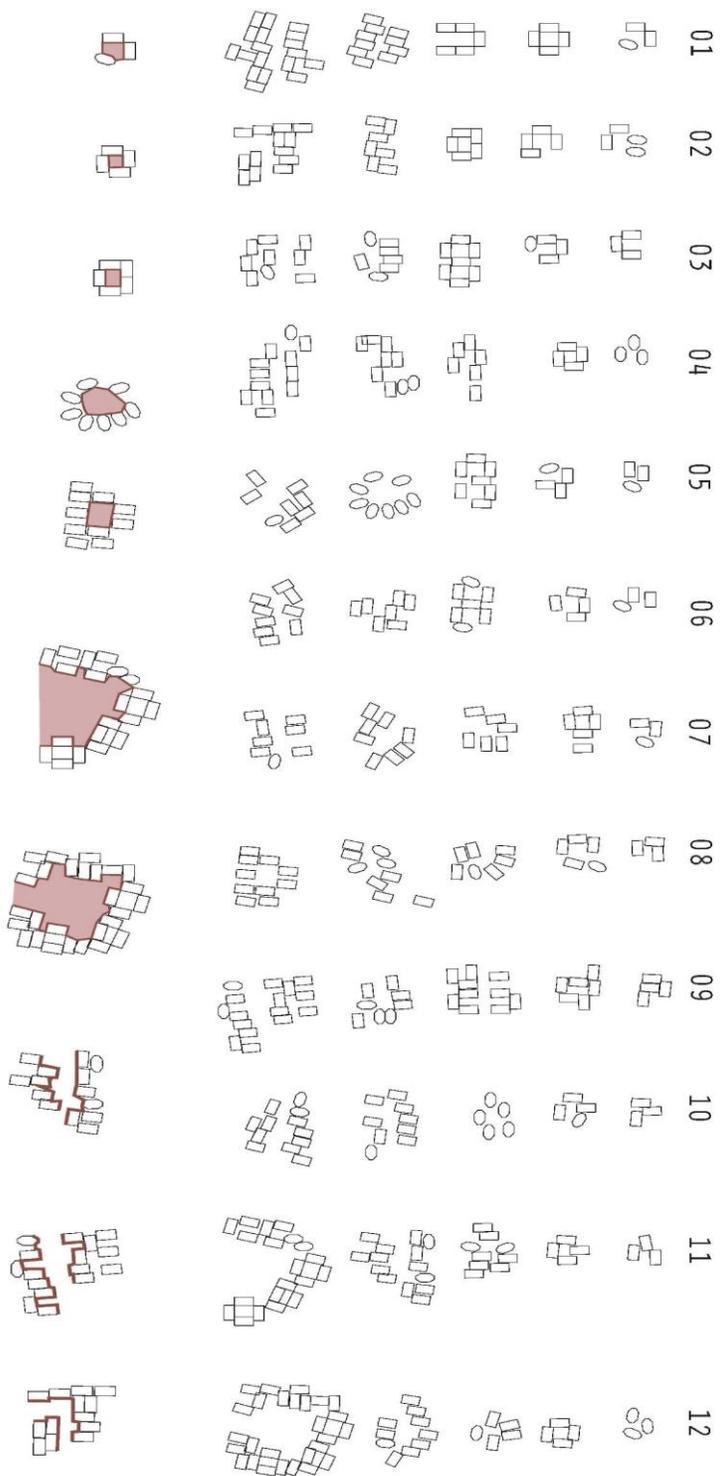


Fig. 5.10 Tent formations in Al-Zaatari

When looking at the smaller scale of the shelter, there are many different formations that people have created as time has passed. People have added caravans and tents to their own household. The initial grid-like set up of the organizers of the camp is changed according to the needs of the refugees. In the transformation, there is a cluster like organization that appears in different districts.

As the diagram of Zaatari shows, the older part of the camp has a higher number of households with kitchens with-in the household. The newer districts show a more organized set up of communal kitchens and consequently a decrease in the number of kitchens within the household. Providing more communal kitchens to smaller communities could help organize the delivery of resources within the camp. In areas of high density, providing resources becomes more difficult, especially in case of emergencies.

## Lessons Learned / Critique

### Urban Scale:



- The diagram above shows the program divided into different sub-categories that should be considered when planning out adjacencies. These adjacencies start to mimic the structure of cities with areas for political, economic, religious, social and educational services.
- Since water and sanitation resources are not close to the housing, people would steal parts to bring them closer to their own house. Therefore, water, kitchen, and sanitation facilities need to be brought closer to smaller communities within the block.
- In Zaatari most of the services are centralized, serving more than one district. Instead, each block should have its own

community center, playground, health facilities, mosques and friendly spaces.

- Schools, grocery stores and market streets should be accessed and shared by several blocks
- Electricity should be produced using solar power. It can be placed on water towers as well as on the shelters.

#### Shelter Scale

- Shelter should be designed to be modifiable so that people can make changes as needed to the façades and grow their original shelter in a way that allows for the growth of a household

## Precedent: Azraq Camp



Early 2013



May 2013



June 2013



Dec 2013

Fig. 5.16 Growth of Azraq

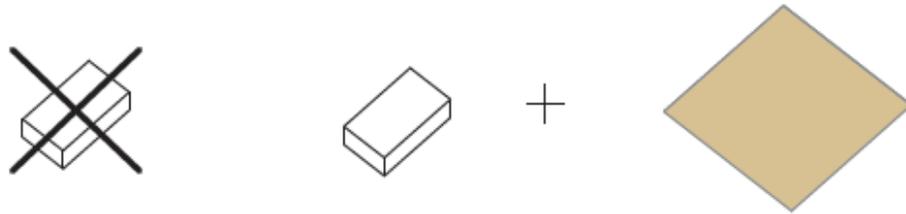
The Azraq camp is located in Northern Jordan, in the Zarqa governorate. It is 60 miles from Amman, Jordan's capital and about 50 miles from the Zaatari camp. This camp was established in order to control the overflow from Al-Zaatri. It can hold up to 130,000 people, and it currently occupied by 12,000 people. In order to have more of an organized planning system, the camp was divided into eight districts that serve about 10,000 to 15,000 people each. At the smaller scale, the shelters were organized into groups of twelve to increase security. Like Zaatari, the camp provides amenities such as clinics,

playgrounds, two schools, a central hospital, a supermarket as well as a mosque.



The major critique of Al-Azraq is in its' isolation. It is about 33 miles away from any major highways that connect to other cities in Jordan. At the urban scale, the services are decentralized so that each district has its own community spaces. While it starts to solve some urban problems that were prevalent in Al-Zataari, there is still no change in the ability of the shelter to be modified. The shelters sit in a grid formation with no room for refugees to grow or expand their households.

## CHAPTER 6 / DESIGN PROPOSAL



In the proposed refugee camp, families would be given a temporary shelter, a plot of land, and a kit of parts that allows them to expand their household. Based on the research done on the nature of these camps it is evident that these camps' lives are much longer than expected, therefore it is important to give people living in these types of environment space to grow. When people are forced to stay in a place for long periods of time, they begin to make space their own, whether it is through additions to the shelter, or growing gardens in front of their tent. The right to a plot of land along with the shelter gives people the ability to expand in an organized way and gives people ownership to the space they inhabit.

When a refugee family arrives to a camp, they would go through the normal registration process, but with that, receive an orientation as to how they will be given room to build their more permanent shelter. On the plot of land, people would find a temporary shelter that is built with the same module

as the more permanent shelter. The kit of parts received with the plot of land is in a 3'x3' module. The smaller pieces used in construction of the permanent tent is this way so that even small children can be part of the construction process. If refugees are part of the construction process, it gives them a reason to be more invested in their surroundings, leaving room to create a greater sense of community.

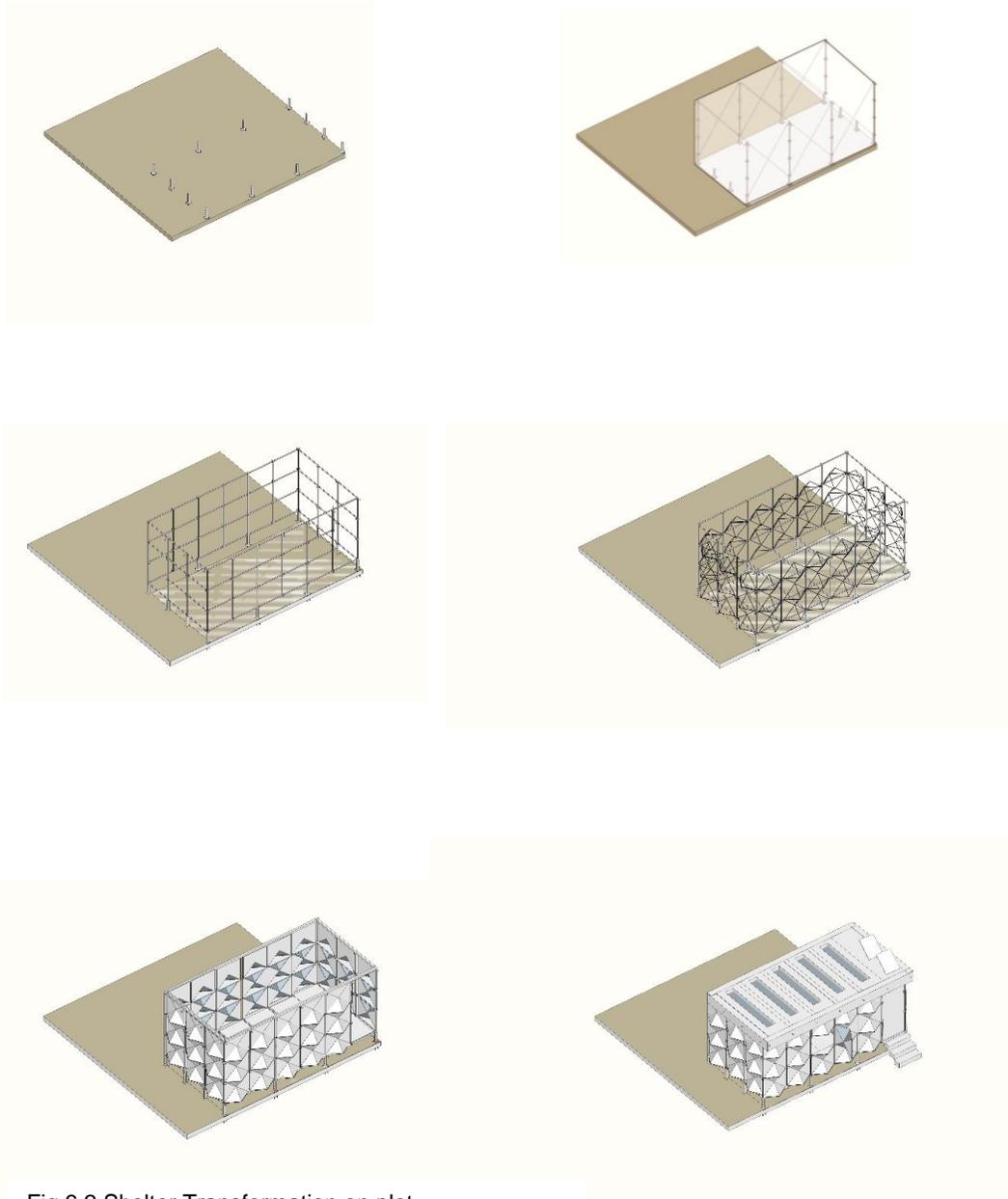


Fig 6.2 Shelter Transformation on plot

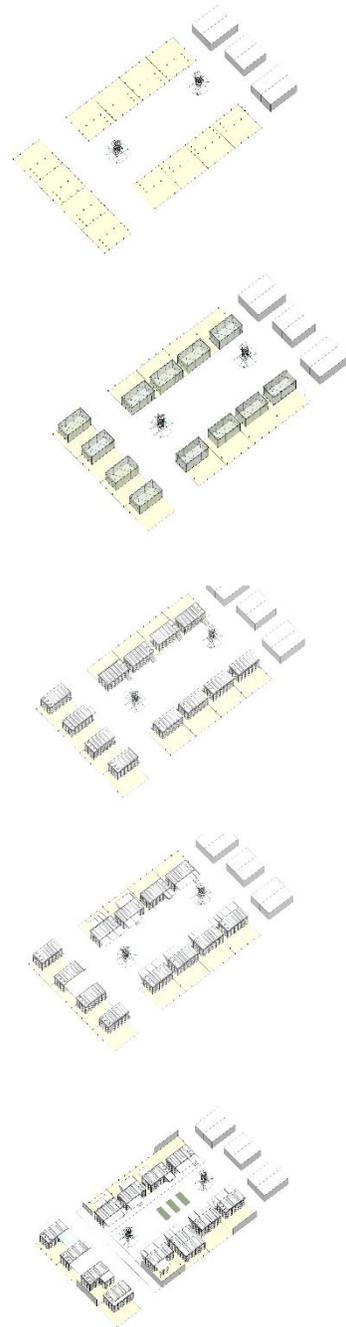


Fig 6.3 Cluster Transformation over time

## The Shelter /

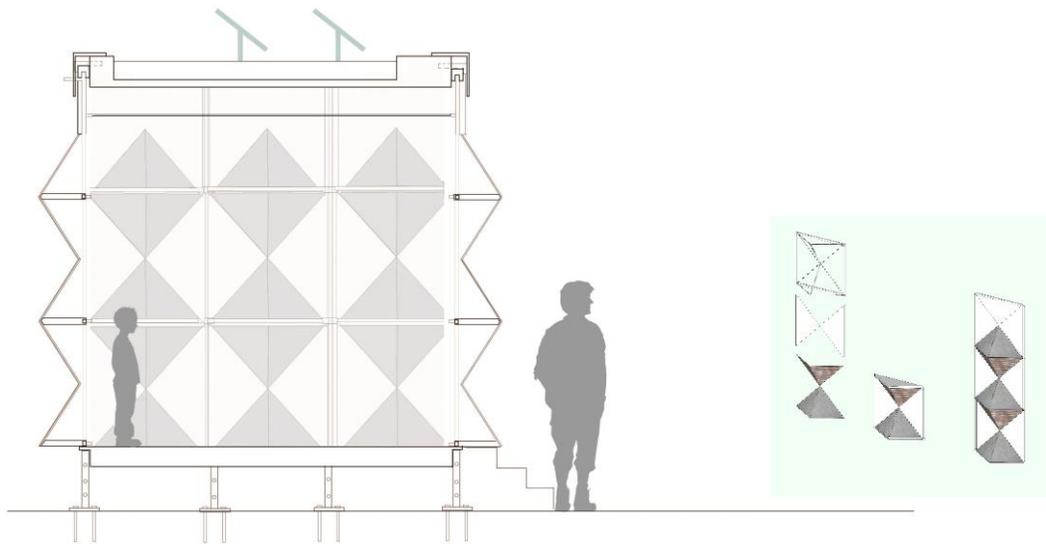


Fig 6.4 New Shelter Structure

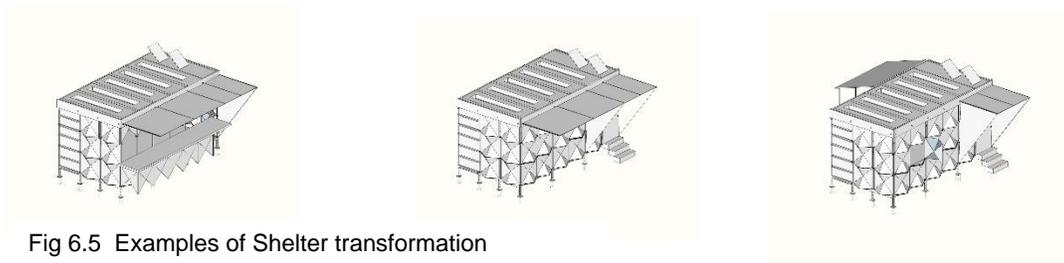


Fig 6.5 Examples of Shelter transformation

The shelter structure is modifiable so that refugees can make transformations as needed. These transformations could be as simple as adding canopies to create small public areas on the exterior of the shelters, to expanding the size of the shelter itself. The shelter module can also be transformed into a stall for the market street. Each home is equipped with solar panels to provide a source of electricity and the roof plane has space to plant small gardens. The movable parts of the shelter give people the ability to build the structure to their own needs, for example, personal placement of windows and doors.

#### The Cluster /

The module for the camp is based on the cluster of twelve plots organized around two water towers. Each cluster has wash centers as well as separate latrines for men and women. The cluster creates opportunity for a community space among a smaller group of families, giving them a closer relationship to resources such as food preparation and water. The presence of resources within the courtyard provides protection to resources shared by multiple families. The cluster also creates a sense of privacy within a

supportive environment. The community space that is created around the water tower can be used in multiple ways, including cooking, drying clothes, children's play space, etc.

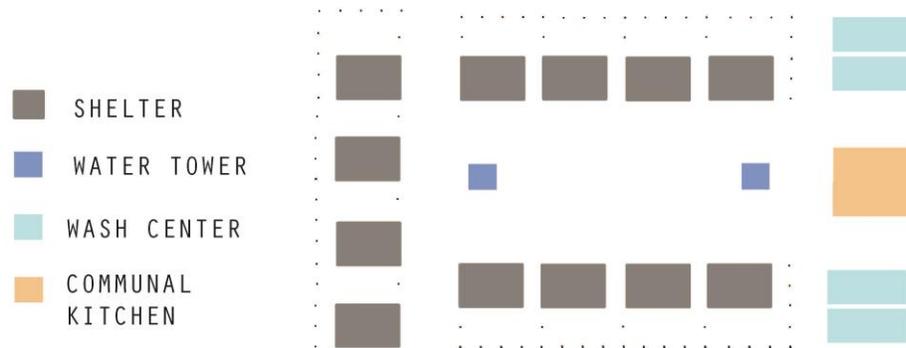
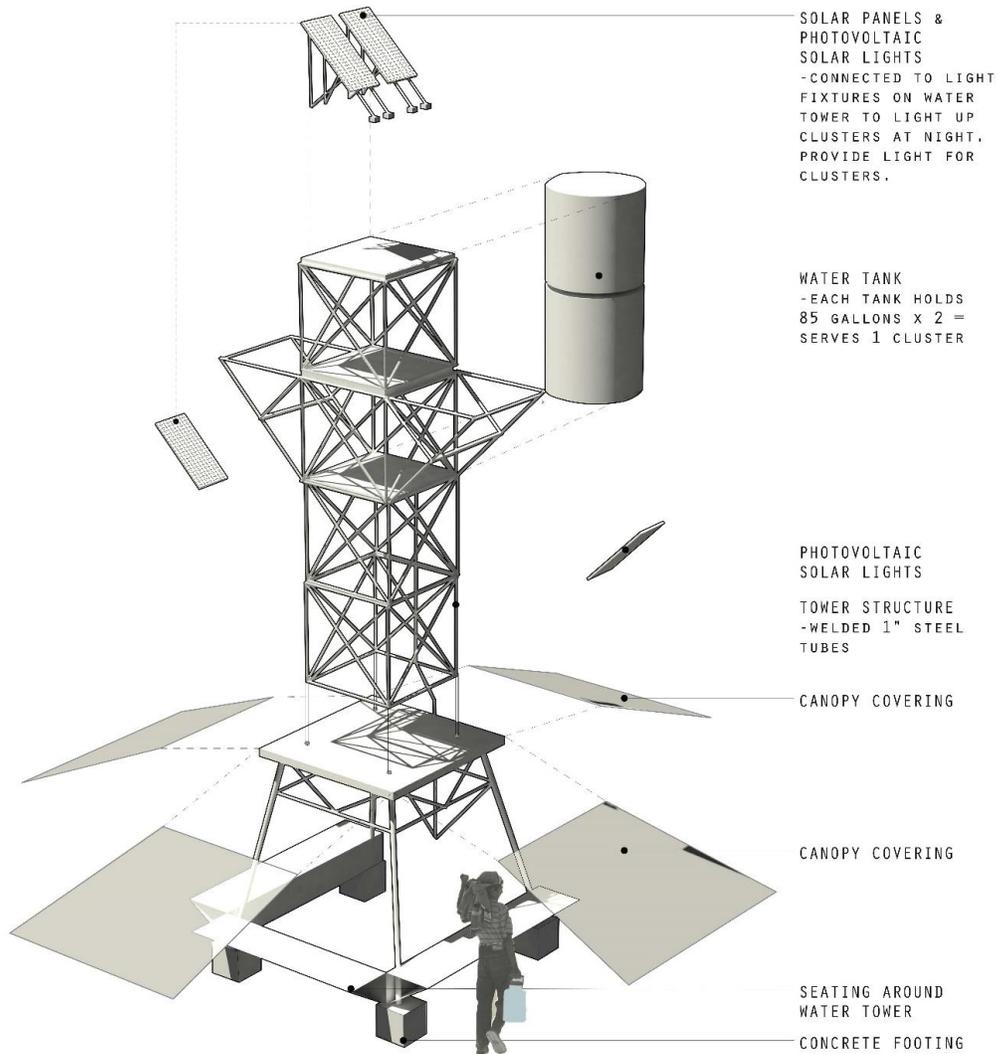


Fig 6.5 The Cluster

## The Water Tower

The clusters are designed so that two water towers are situated in the inner courtyard. These water towers start to serve as markers for each community within the camp. They can be personalized as the refugees chose throughout their time in the cluster. This part of the design stems from a big problem that existed in Zaatari camp. Because resources like water were placed at greater distances from the people who primarily used them, there was no ownership of the resources. This caused the theft and movement of the infrastructure that provided people with such an important resource. If the water towers are moved inside the cluster, the number of people using one water tower decreases, in hopes of decreasing the levels of theft because the water tower is a public amenity that is shared by a cluster.

The structure of the water tower enables canopies that provide shade within the cluster. In the future, one can even imagine people creating shaded spaced that span the two water towers. The water towers also have photovoltaic panels connected to solar lights that bring light into the clusters.



## The Cluster Module

The camp design is built through the multiplication of the cluster module. There are sixteen clusters in a block. Each block contains a community space that has areas that provide community services such as recreational areas, kindergarten, a youth center, a flexible creation space and a mosque. Four blocks create a district, each of which has a district compound, school, and grocery store. Each camp should also have an allocated space for selling goods and services i.e. market street that starts to create a retail corridor within the camp. Four districts create a new camp module, one that is built on community spaces at different scales.

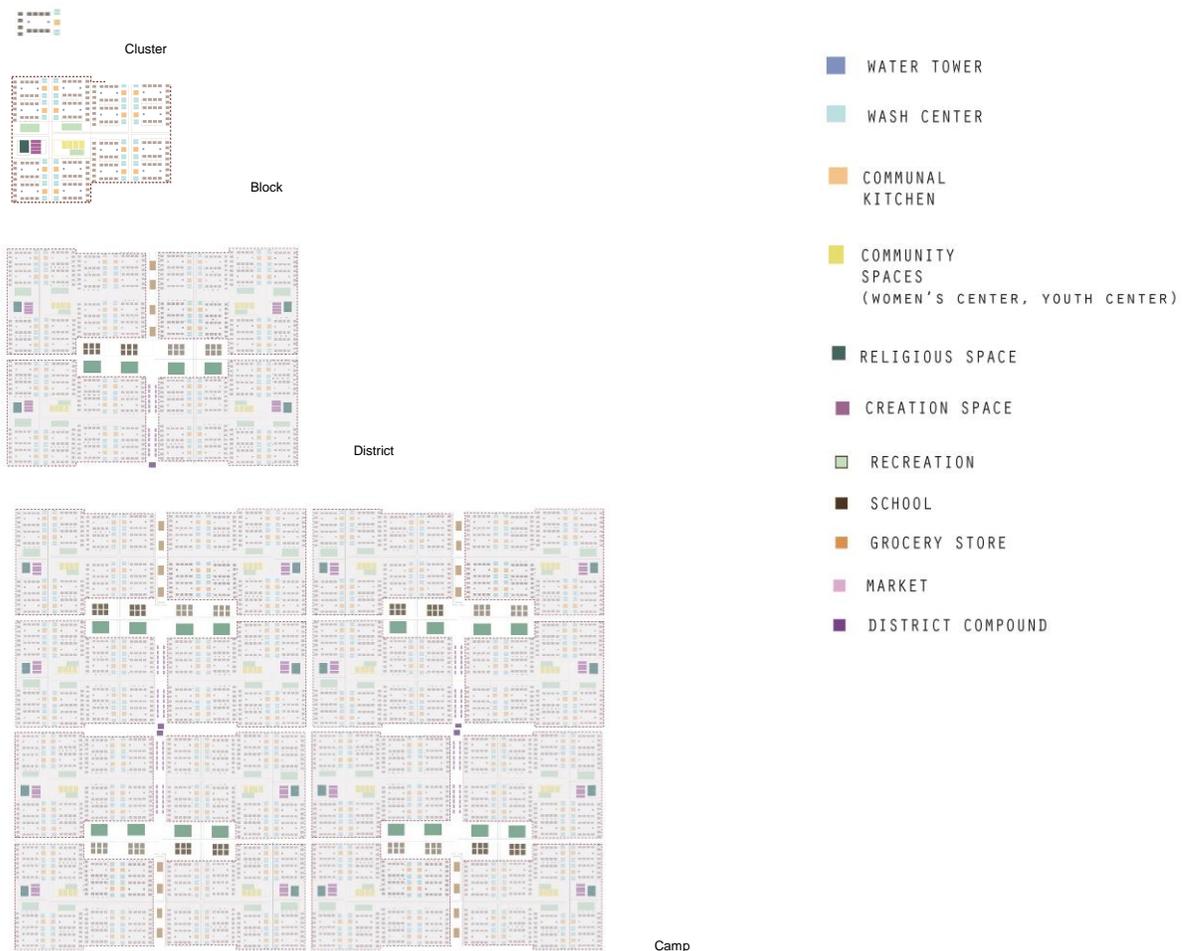


Fig 6.8 Cluster Module

## Community Spaces at Different Scale /

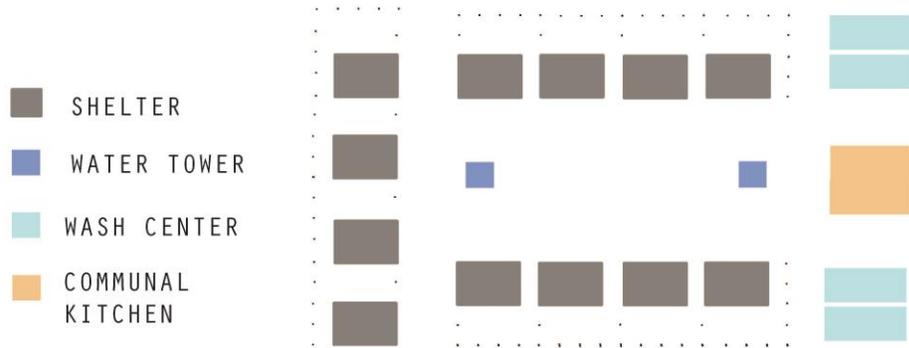


Fig 6.9 The Cluster: Inner Courtyard

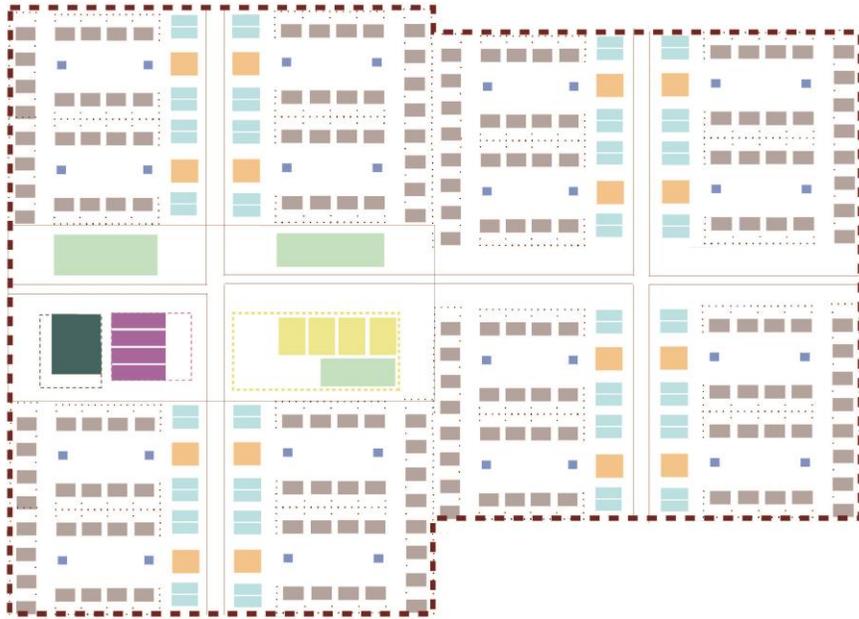


Fig 6.10 The Block: The cluster formation allows families to receive plots in close vicinity to each other. This allows extended families to combine plots and create a larger household.

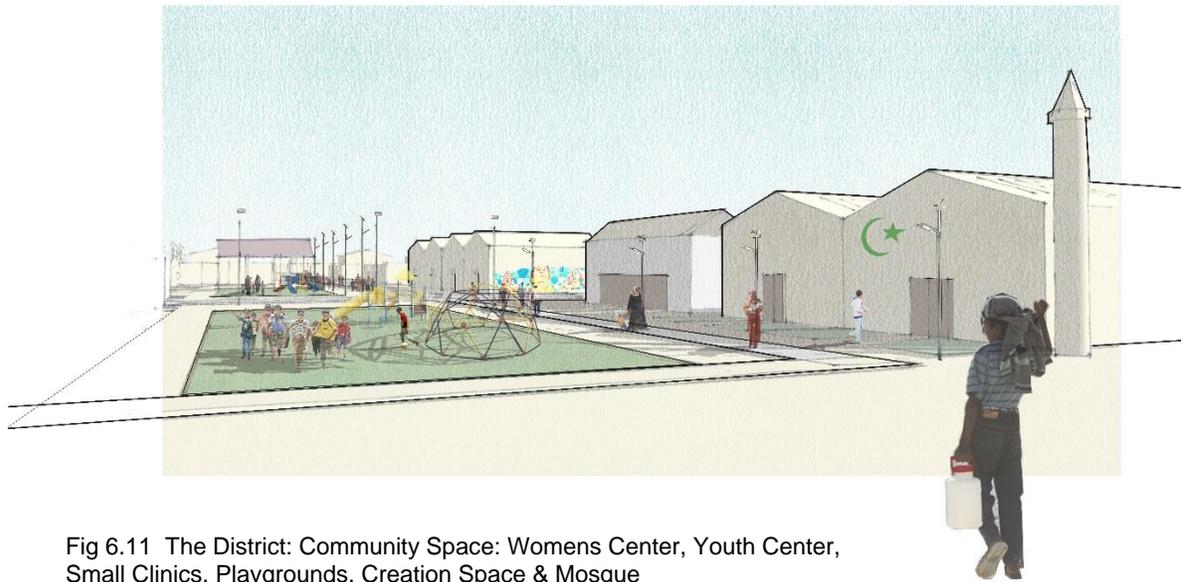
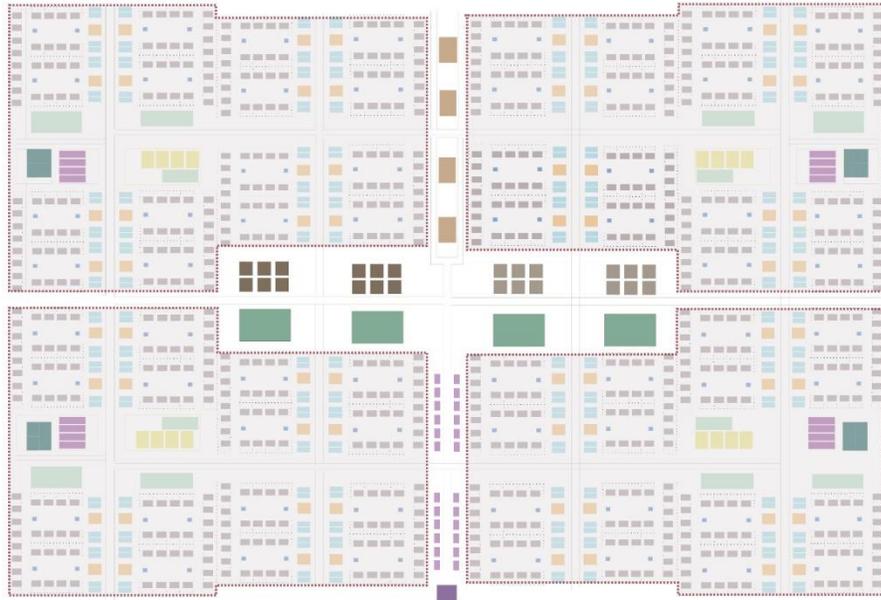


Fig 6.11 The District: Community Space: Womens Center, Youth Center, Small Clinics, Playgrounds, Creation Space & Mosque

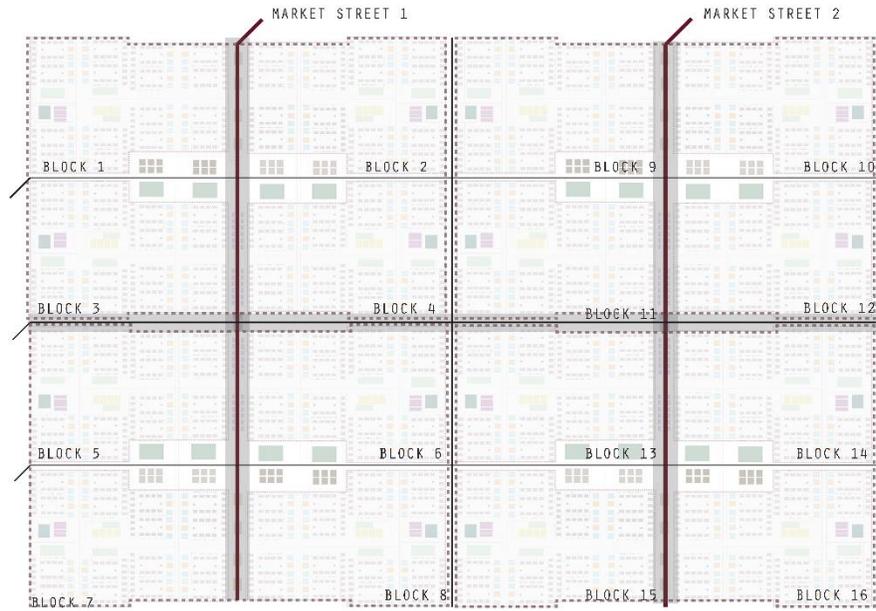
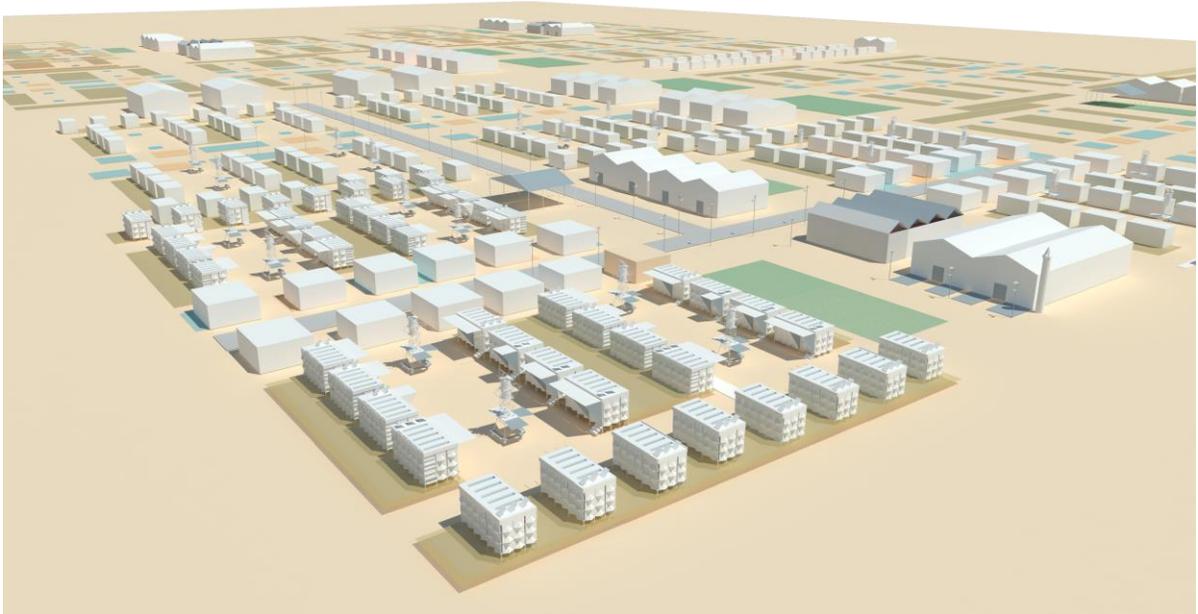


Fig 6.12 The Camp: Market Street

## CHAPTER 7: CONCLUSIONS



When thinking about refugee camps, there are three different scales that need to be considered. First, the regional. Refugee camps should be more accessible to cities, modes of transportation, educational institutions, etc. At the urban scale, the cluster module can serve as a building block for a camp that is rooted in community spaces at different scales. Spaces that start to connect at larger scales and create parallels to the way formal cities are organized. At the architectural level, the shelters should be modifiable and flexible to meet the needs of individual families. At the same time, community engagement in the construction of these shelter with-in the camp can increase investment in personal dwellings.

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