

THE IMPACT OF PHYSICAL ENVIRONMENTAL DESIGN ON USERS'  
SENSE OF SAFETY IN OPEN SPACES: INCREASING PALESTINIAN  
REFUGEES' SENSE OF SAFETY IN OPEN SPACES IN BAQA'A CAMP IN  
JORDAN

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REFUGEES' SENSE OF SAFETY IN OPEN SPACES IN BAQA'A CAMP  
IN JORDAN**

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## **ABSTRACT**

### **THE IMPACT OF PHYSICAL ENVIRONMENTAL DESIGN ON USERS' SENSE OF SAFETY IN OPEN SPACES: INCREASING PALESTINIAN REFUGEES' SENSE OF SAFETY IN OPEN SPACES IN BAQA'A CAMP IN JORDAN**

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Since the Israeli-Palestinian conflict in 1948, thousands of Palestinians have been forced to leave their home and be displaced to poor urban settlements. The High Commissioner for Refugees (UNHCR) recognized that safety issues in camp areas might affect refugees' experience in open spaces. Baqa'a refugee camp in Jordan is one of the largest Palestinian refugee camps in the middle east, with a high proportion of refugees, so it provides research context for open spaces in permanent refugee camps. This study will study the case of the Baqa'a Palestinian refugee camp to understand the physical environmental design of open spaces affects the users' sense of safety and experience in open spaces in the context of refugee camps. Qualitative research approaches were used to examine the research questions and acquire the study's aims. The methodological approach is designed to understand how physical and non-physical factors of open spaces in refugee camps influence the level of sense of safety of refugees. This study will draw urban designers' and planners' attention to understanding the impact of the physical environmental design of open spaces on users' sense of safety in poor communities like refugee camps.

Keywords: Sustainable urbanism, Open spaces, Sense of safety, Human experience.

## ÖZ

# FİZİKSEL ÇEVRE TASARIMININ AÇIK ALAN KULLANICILARININ GÜVENİK HİSSİNE ETKİSİ: FİLİSTİNLİ MÜLTECİLERİN ÜRDÜN'DE BAQA'A KAMPINDAKİ AÇIK ALANLarda GÜVENLİK HİSLERİNİN ARTTIRILMASI

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1948'deki İsrail-Filistin ihtilafından bu yana, binlerce Filistinli evlerini terk etmeye ve yoksul kentsel yerleşimlere taşınmaya zorlandı. UNHCR kamp alanlarındaki güvenlik sorunlarının mültecilerin açık alanlardaki deneyimlerini etkileyebileceğini kabul etti. Ürdün'deki Baqa'a mülteci kampı, yüksek oranda mülteci barındıran orta doğudaki en büyük Filistin mülteci kamplarından biridir, bu nedenle kalıcı mülteci kamplarındaki açık alanlar için araştırma bağlamı sağlar. Bu çalışma, açık alanların fiziksel çevresel tasarımının, mülteci kampları bağlamında kullanıcıların güvenlik duygusunu ve açık alanlardaki deneyimlerini etkilediğini anlamak için Baqa'a Filistin mülteci kampı örneğini inceleyecektir. Araştırma sorularını incelemek ve çalışmanın amaçlarına ulaşmak için nitel araştırma yaklaşımları kullanılmıştır. Metodolojik yaklaşım, mülteci kamplarındaki açık alanların fiziksel ve fiziksel olmayan faktörlerinin mültecilerin güvenlik duygusu seviyesini nasıl etkilediğini anlamak için tasarlanmıştır. Bu çalışma, açık alanların fiziksel çevresel tasarımının, mülteci kampları gibi yoksul topluluklarda kullanıcıların güvenlik duygusu üzerindeki etkisini anlamaya yönelik şehircilerin dikkatini çekecektir.

Anahtar Kelimeler: Açık alanlar, Güvenlik, İnsan deneyimi, Mülteci kampları.



To My Parents

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## TABLE OF CONTENTS

ABSTRACT .....	v
ÖZ.....	vi
ACKNOWLEDGMENTS.....	ix
TABLE OF CONTENTS .....	x
LIST OF TABLES .....	xiii
LIST OF FIGURES .....	xiv
1 INTRODUCTION.....	1
1.1 Problem Statement.....	2
1.2 Research Questions and the Aim of the Study .....	4
1.3 Gap in Theory and Literature .....	5
1.4 Assumptions of the Study.....	11
1.5 Structure of the Thesis.....	12
2 THEORITICAL FRAMEWORK.....	15
2.1 The Urbanization of Refugee Camps .....	17
2.1.1 What is a Refugee Camp? .....	17
2.1.2 Transformation of Refugee Camps to Urban Settlements.....	19
2.1.3 Typologies of Refugee Camps .....	22
2.2 Open Spaces in Refugee Camps.....	28
2.2.1 The Concept of Open Space .....	28
2.2.2 Types of Open Spaces .....	31
2.3 Security in Refugee Camp.....	40

2.3.1	The Concept of Security in Refugee Camp .....	40
2.3.2	Types of Security Threats in Refugee Camps.....	41
2.4	Sense of Safety in Open Spaces in Refugee Camps .....	42
2.4.1	The Concept of Sense of Safety in Open Spaces.....	42
2.4.2	Sense of Safety in Public Spaces .....	45
2.4.3	Factors That Affect the Sense of Safety in Open Spaces.....	47
2.4.4	Broken Windows Theory and Sense of Safety .....	61
2.4.5	The impact of fear of crime on residents' behavior and well-being .....	62
2.4.6	Measurements of Sense of Safety in Refugees Camps' Open Spaces....	66
2.4.7	Designing Safer Spaces Through CPTED Principles .....	69
2.5	Concluding Remarks.....	77
3	RESEARCH METHODOLOGY .....	81
3.1	Research Approach .....	82
3.2	Site Selection .....	83
3.2.1	Historical Context of the Baqa'a Refugee Camps .....	83
3.2.2	Contextual Characteristics of Baqa'a Refugee Camp.....	87
3.2.3	Socio- Demographic Context of Baqa'a Refugee Camp .....	97
3.3	Selections of the Participants .....	99
3.4	Data Collection .....	100
3.5	Data Analysis .....	108
4	RESEARCH FINDINGS .....	113
4.1	Safety Threats Experienced by Refugee in the Open Spaces of Baqa'a Refugee Camp.....	113

4.2	Open Spaces in Baqa'a Camp .....	114
4.2.1	Typologies of Open Spaces in Baqa'a Camp .....	117
4.2.2	Open Spaces' Physical Characteristics in Baqa'a Camp.....	124
4.2.3	The Link Between the Type of Open Space and Criminal Activities in Baqa'a Camp .....	126
4.3	Factors That Affect the Sense of Safety in Open Spaces in Baqa'a Camp	133
4.3.1	Individual Factors.....	133
4.3.2	Economic Factors .....	134
4.3.3	Social and Cultural Factors .....	135
4.3.4	Physical Environmental Factors .....	137
4.4	The Impact of Open Spaces Physical Environment on Sense of Safety ...	145
4.5	How Users' Sense of Safety Influences Their Behaviors and Experience in Open Spaces in Baqa'a Camp .....	146
5	CHAPTER 5 .....	149
	REFERENCES .....	163
	<b>APPENDICES</b>	
A.	Security Terms Defined.....	189
B.	Types of Migrants.....	190
C.	Research Questions and Sub-Questions' Research Tools .....	191
D.	Interviews' maps of safe and spaces in Baqa'a camp .....	197

## LIST OF TABLES

### *TABLES*

Table 1.1(continued) Review of the literature on safety in open spaces and refugee camps .....	7
Table 2.1 Parameters of the study .....	16
Table 2.2 (continued) Comparing Permanent to Temporary Camps' Urban Characters .....	25
Table 2.3 Urban open spaces transdisciplinary typology .....	32
Table 2.4 Public open spaces categories .....	34
Table 2.5 (continued) Types of open spaces.....	35
Table 2.6 Perception of safety, crime and substance abuse in people's residential area. Comparison of Palestinian refugees outside and inside camps. Percentage of randomly selected individuals aged 15 and above.....	53
Table 2.7 Research on the relationship between street types and burglary .....	59
Table 2.8 Feeling of safety at home and close to home. Comparison of Palestinian refugees outside and inside camps. Percentage of randomly selected individuals aged 15 and above.....	68
Table 3.1 Contextual characteristics of Baqa'a refugee camp.....	88
Table 3.2 Population of official Palestinian refugee camps in Jordan.....	97
Table 3.3 Research methods of research questions .....	107
Table 3.4 Research methods of the study. ....	111
Table 4.1 (continued) Typologies of open spaces in Baqa'a refugee camps.....	122
Table 5.1 CPTED design principles and policies in refugee camps .....	161

## LIST OF FIGURES

### FIGURES

Figure 2.1 photograph dated 1954 shows tents and prefabricated shelters in a refugee camp in Jordan.....	19
Figure 2.2 An aerial picture shows a section of the Hagadera camp in Dadaab near the Kenya Somalia border, May 8, 2015 .....	20
Figure 2.3 Marka camp in Jordan.....	21
Figure 2.4 Students line up in Marka Camp, Jordan, 1969 .....	21
Figure 2.5 Types of urban displacement settings .....	23
Figure 2.6 From space to place.....	29
Figure 2.7 The percentage of open spaces inside and outside the Palestinian refugee camps .....	39
Figure 2.8 The fear of crime matrix .....	44
Figure 2.9 How light can be an incentive for people to leave their shelters at night .....	54
Figure 2.10 Mean number of crimes reported per building with different amounts of vegetation .....	56
Figure 2.11 Street design patterns .....	58
Figure 2.12 The cycle of the broken windows hypothesis, highlighting the role of fear of crime .....	62
Figure 2.13 The cycle of fear based on the concept of opportunities.....	64
Figure 2.14 The relationship between physical features of environment and walking behavior .....	65
Figure 2.15 The impact of migration traumatic events on refugee trauma .....	66
Figure 2.16 Two approaches about surveillance in cities.....	72
Figure 2.17 Hierarchy of space from public plazas to private space of residences.	74
Figure 2.18 Section showing transition zone from public to private space.....	75
Figure 2.19 Concluding remarks of literature review .....	79
Figure 3.1 Showing the Palestinian Resolution in 11th December 1948 .....	84

Figure 3.2 Map shows the locations of Palestinian refugee camps in Jordan with their populations.....	86
Figure 3.3 Map of Jordan with Palestinian refugee camps .....	90
Figure 3.4 Transformation of Baqa'a camp layout from 1948 to present .....	93
Figure 3.5 Aerial view of Baqa'a refugee camp .....	94
Figure 3.6 Map shows an Arial view of Baqa'a refugee camps with newly opened streets (in blue).....	95
Figure 3.7 Demonstrating the use of space in Baqa'a camp during clashes with Jordanian gendarmes.....	96
Figure 3.8 The region of four-meter tension defined by the refugees. ....	96
Figure 3.9 Mean household size for each of the Palestinian refugee camps (n= 39,336) .....	98
Figure 4.1 Safety threats experienced by refugees in the open spaces of Baqa'a camp .....	114
Figure 4.2 Transformations of ‘pavements’ into outdoor living rooms in Baqa'a camp taken by Samar Maqusi in 2014 .....	115
Figure 4.3 A small hair salon is being established by intruding on the pathway .	116
Figure 4.4 Examples of public and semi-public open spaces in the Baqa'a camp	118
Figure 4.5 Passive and active open spaces in Baqa'a refugee camp.....	119
Figure 4.6 Open spaces typologies in Baqa'a camp .....	120
Figure 4.7 Types of open spaces in Baqa'a camp.....	121
Figure 4.8 Ayeds' picture in front of his family's house in Al-Baqa'a camp in the year 1986, when the roofs of the houses were of “zinc” and the streets were muddy and unpaved .....	124
Figure 4.9 Poor draining system in Baqa'a camp .....	125
Figure 4.10 Map NO1: A map of Baqa'a camp represents safe and unsafe spaces .....	127
Figure 4.11 Safe and unsafe open spaces in the Baqa'a camp and their typologies, Maps 1-6 .....	128

Figure 4.12 Safe and unsafe open spaces in the Baqa'a camp and their typologies, Maps 7-12 .....	129
Figure 4.13 An example of narrow alleys and path corners in Baqa'a camp.....	130
Figure 4.14 Baqa'a graveyard .....	131
Figure 4.15 Common criminal activities that affect residents' sense.....	132
Figure 4.16 The relationship between age and risk of violence in open spaces in Baqa'a camp .....	133
Figure 4.17 The economic factors that affect sense of safety in Baqa'a camp ....	135
Figure 4.18 lighting feathers (in yellow) in Baqa'a camp Pathways .....	138
Figure 4.19 The poor landscape design and use of barriers Baqa'a camp's pathways .....	139
Figure 4.20 Baqa'a camp Layout .....	140
Figure 4.21 Bushes and bins on a pathway in Baqa'a camp .....	141
Figure 4.22 Poorly designed pedestrian lines along pathways in Baqa'a camp....	142
Figure 4.23 Mind maps shows the factors that affect sense of safety in Baqa'a camp's open space .....	143
Figure 4.24 The main physical factors that affect sense of safety in open spaces in Baqa'a camp .....	144
Figure 4.25 Daily activities in open spaces in Baqa'a camp.....	147
Figure 5.1CPTED design application in Baqa'a camp .....	162





## **CHAPTER 1**

### **INTRODUCTION**

The relationship between human behavior and the physical environment has attracted the attention of researchers from many disciplines for decades (Carr et al., 1992). This study places the debate in the broader context of the relationships between human behavior, urban design, and other social factors that influence the level of security, sense of safety, and user experiences in the open spaces of refugee camps. Refugee camps have been chosen in this study according to the increasing numbers of refugee camps around the world after the Second World War. Refugee camps are temporary shelters for host people (refugees) who have been forced to leave their home country because of conflict, violence, or war (UNHCR, 2021b).

The urban crisis of Palestinian refugee camps started when Palestinian refugees could not return to their home country and were forced to stay in refugee camps in their host country for an unknown period. By the time permanent shelters replaced the temporary ones, the unplanned and informal development of temporary camps into permanent settlements caused some urban challenges to refugees and the host county (UNRWA, 2021a; Dorai, 2010). This study examines the sense of safety in open spaces in Palestinian refugee camps in Jordan from an urbanist point of view. It will focus on understanding the factors that affect refugees' sense of safety and the relationship between the physical design of open spaces in refugee camps and refugees' perception of safety. In this chapter, the author will briefly explain the problem statement and goal of the study and state the study's research questions and assumptions regarding gaps in the literature. This chapter concludes with a discussion of the structure of the thesis.

## **1.1 Problem Statement**

By the end of 2019, the total number of forcibly displaced people worldwide reached 79.5 million, around 26 million of which are refugees (UNHCR, 2020). Many refugees were forced to stay in camps and build a new life in their adopted city since they could not return to their home country because of conflict or insecurity. About 40% of all refugees live in camps partly because they have no other choices (UNHCR, 2014a). With the increasing number of refugee camps across the globe, The United Nations High Commissioner for Refugees (UNHCR) recognized that camps could have negative environmental and economic impacts on their residents and surroundings.

Isolation from the host society, poverty, overcrowded shelters, and protection risks (such as sexual and gender-based violence, child protection, and trafficking) (UNHCR, 2014b; Fazel et al., 2012). Dunn (2015) argues that "camps keep refugees alive but prevent them from living." UNHCR (2003) observed several types of crimes in refugee camps: petty theft, physical violence, domestic violence, corporal punishment, drunkenness, substance abuse, gambling, vandalism, civil disputes, modest exploitative and abusive behavior, child abuse, rape, sexual assault, robbery, fraud, murder, manslaughter, forced prostitution, forced marriage, smuggling, trafficking, and drug trafficking. Security problems in camp areas can affect refugees' mental health, behavior, and well-being (Walter et al., 2020; Stathopoulou et al., 2019; Papadimos et al., 2020; UNHCR, 2019). The continuity of camp areas as permanent settlements exacerbates such social problems.

Sheath et al. (2020) assert that refugees' physiological, psychological, and social health is essential for societies' healthy growth and development. UNHCR's programs aim to improve refugees' quality of life, including promoting their mental health and well-being (UNHCR, 2019). Papadimos et al. (2020: 12) argue that "refugees' well-being requires physical safety, food security, shelter, and the possibility of reintegration into a safe society." They add that events such as sexual assault, physical assault, shipwreck, and robbery in refugee camps can affect not only refugees' sense of safety, but also the sense of fear among residents living outside refugee camps (Walter et al., 2020; Papadimos et al., 2020; Yudikaitis, n.d.; Hale, 1996). Studies suggest that increasing the security of open spaces in refugee camps can promote social interaction, physical activity, and development among refugees (Hale, 1996; Brands et al., 2020; Shehayeb, 2008).

Abouradme (2014) explains the importance of open spaces in refugee camps in the refugees' daily life. Various studies support this argument by showing how excessive control, management, natural surveillance and the physical design of urban public spaces affect the level of crime and user behavior (see, e.g., Newman, 1992, Hall, 1966; Jacobs, 1961). A healthy and safe physical environment can reduce the fear of crime and improve the quality of life in the space (Crowe, 2000b). Yudikaitis (n.d.) mentioned the direct impact of physical environments on mental health. He cited, "It is proven that poor environments increase stress while reducing empowerment and a sense of control" Yudikaitis (n.d.: 1). He added that substandard housing impacts socio-emotional development, psychological distress, and behavioral problems. The design and spatial planning of refugee camps can be one factor that affects the level of crime in refugee camps. Creating safe and livable spaces within refugee camps would support refugees' health, well-being, and quality of life (Vincent & Whitworth, n.d.).

This study focuses on the relationship between refugees' sense of safety and the physical design of open spaces in refugee camps. This study also seeks to address crime prevention through environmental design (CPTED) strategies to increase feelings of safety and improve refugees' experiences in open spaces.

## **1.2 Research Questions and the Aim of the Study**

Since the Israeli-Palestinian conflict in 1948, thousands of Palestinians have been forced to leave their home and be displaced to surrounding Arab states. Most of these people have been living in refugee camps. Over time, some of the temporary camps turned into permanent settlements for refugees.

This study focuses on the Baqa'a Palestinian refugee camp in Jordan to understand how the physical environmental features of the open spaces in these settings hinder or promote the sense of safety of its users. By doing so, it aims to identify urban design and crime prevention principles that can control crime and increase the feeling of safety in the Baqaa camp's open spaces. This study aims to increase the sense of safety of refugees in open spaces in refugee camps.

This thesis aims to answer how the physical environmental design of open spaces in refugee camps affects the users' sense of safety and experience in open spaces?. Some questions are posed in the study to understand the main aim of the study; these questions are:

- What is the relationship between open space typology and level of safety? More specifically, do some open spaces invite more criminal activities than others?
- What are the physical and non-physical environmental factors that affect the sense of safety in open spaces in refugee camps?
- How can the physical design of open spaces within refugees' camps affect refugees' sense of safety in the camps?
- How does refugees' sense of safety influence their behavior and experience in open spaces?
- How can CPTED strategies be used to increase the sense of safety in open spaces in the context of refugee camps?

### **1.3 Gap in Theory and Literature**

UNHCR (2006) emphasized the importance of ensuring physical and personal security in refugee camps to support refugees' right to live safely. As noted earlier, the literature has examined security issues and identified types of crimes and security threats (see appendix A). Studies have also discussed the importance of fear of crime on people's behavior, experiences, and preferences regarding their living environment (Minneapolis-St Paul Metropolitan Council, 1997; Newman, 1972; Shehayeb, 2008).

Studies of safety in open spaces (see, e.g., Shehayeb, 2008; Willson & Kelling, 1982; Newman, 1973b; Matlovičová, Mocák & Kolesárová, 2016; Ceccato, 2012; Grabosky, 1995) indicate that fear may have a more significant influence on behavior and use of spaces than the experience of crime. On the other hand, as mentioned in the literature, the studies have a shortcoming in examining the direct effects of the environment on society (Shehayeb, 2008).

Furthermore, a review of the literature reveals that, in general, planners and designers have been paying little attention to crime issues and the harmful effects of these issues on poor communities like the ones in refugee camps (Vincent & Whitworth, n.d; Jaffe, 2019; Davies, 2004; Shehayeb, 2008). Table 1 illustrates studies that examine safety issues in open spaces and the factors that affect users' sense of safety in open spaces. Shehayeb (2008) and Machielse (2015) addressed that individual characteristic of users (e.g., their exposure to criminal activities in the past, gender, age and disability) and their social, cultural and physical environment affect users' sense of safety in open spaces.

Multiple studies have examined the effects of physical environmental factors in public spaces (e.g., lighting, guarding, and maintenance) on anxiety and limit people's mobility (Machielse, 2015; Newman and Frank, 1979; Ceccato, 2012). In addition, many quantitative studies have examined the relationships between urban and physical environmental design and other social factors that may affect safety

levels in public spaces, as well as the role of urban planners in using CPTED principles to increase users' feelings of safety in open spaces (Shaftoe, 2008; Schneider and Kitchen, 2002; Iqbal and Ceccato, 2016).

Regarding users' feelings of safety in open spaces in refugee camps, we know little about the factors that influence refugees' feelings of safety in open spaces. As Table 1 shows, there are few quantitative studies on this topic. The National Crime Prevention Council (1998) addressed issues facing refugee communities, including fear, and highlighted effective partnership programs to increase refugees' sense of safety in the community. A study on Rhino camp focused on the impact of street lighting; the study found that good lighting increased refugees' sense of safety and religious and social activities in the community in the camp (UNHCR, 2017B). Jaffe (2019) mentioned some crime prevention strategies in refugee communities. He argued that CPTED offers less costly solutions that are more suitable for the camp setting.

This study aims to contribute to the knowledge in the existing literature by investigating the direct impact of the built environment on the perception of safety of users of open spaces. In this way, it aims to help understand the relationship between the design of the environment and perceptions of safety, and to show how open spaces in camping areas influence the behavior of users in these environments. Qualitative data on feelings of safety in camps are not publicly available-an issue that may have prompted researchers to conduct related qualitative studies to understand the relationship between the design of open spaces in refugee camps and refugees' feelings of safety.

Table 1.1(continued) Review of the literature on safety in open spaces and refugee camps

Source	Aim of study research question	Type of Research	Context	Key finding
<b>Nalla and Ceccato (2020)</b>	Illustrate the patterns of crime and fear of crime in public places	Mixed-method approach	1-The environment 2- People's daily routines (The movement) 3- The users' perspective of safety in public spaces 4- "the methodological challenges and advancements in the analysis of crime and fear (The Metrics)" (Nalla & Ceccato, 2020: 4) 5- (The intervention) practices that promote safety in the community	1-Individuals' activities could affect patterns of crime  2- Individuals' perception of safety (fear of crime) is often reflected by previous experience (e.g., being a victim of crime) and media stores or others' experience, gender, age and disability.  3-Environmental factors in public spaces (e.g., Dark environment, poor guardianship, lack of maintenance, physical and social disorder)
<b>Iqbal and Ceccato (2016)</b>	Evaluating the use of CPTED principles to enhance safety in urban parks.	Mixed-method approach	Crime, perceived safety and physical environment in the context of green parks	1-Crime rates are affected by visibility, topography, park layout, surroundings and land use.  2-maintenance, the image of place and illuminations affect perceived safety in place.
<b>UNHCR (2017B)</b>	How can street lighting increase community's safety at night?	Mixed-method approach	The impact of street lighting on refugees (a case study of Rhino camp)	1-Refugees are victims in bad-lit locations.  2- Refugees feel safer in lit areas.  3-Lights increase community social activity.

<b>Shehayeb (2008)</b>	<p>“Clarify the mediating factors that influence feelings of safety and security in public space” (Shehayeb, 2008: 107) and illustrate factors that affect users’ feeling of safety.</p>	Qualitative	The sense of safety among people in public spaces	<p>1-Users’ sense of safety is the result of the interaction between an individual (psychological, social, and cultural characteristics of users and the physical characteristics of the physical environment.</p> <p>2-Studies have a “shortcoming of examining the direct effect of isolated quantifiable physical conditions, ignoring the multi-dimensional nature of the surrounding environment in its socio-physical totality” (Shehayeb, 2008: 112).</p>
<b>Machielse (2015)</b>	<p>The study looks into the perceptions of the safety of public spaces among young adults in Stockholm. Also, the study aims to find how young adults’ perceptions of safety affect their use of public spaces?</p>	Qualitative	Perceived safety	<p>1-Season based on daylight affects users’ feeling of safety; for instance, women feel safer in public spaces during the summer.</p> <p>2- “younger people tend to feel safer than older people, and men tend to feel safer than women” (Machielse, 2015: 48).</p>
<b>National crime prevention council (199)</b>	<p>Address problems faced by communities across the nation, especially communities needing to overcome barriers, fear, and mistrust. Also, the study aims to increase</p>	Qualitative	Crime prevention strategies in refugees’ communities	<p>1- Refugees usually fear and mistrust people in uniform because of traumatic experiences in their homelands and during their escapes.</p> <p>2-Powerful Partnerships offers programs, ideas,</p>

	refugee participation in civic activity and their feeling of safety in the community.			techniques, and models to help create a successful law enforcement-refugee partnerships community.  3-Law enforcement officers can help refugee community members feel safe in their new homes.
<b>Newman and Frank (1979)</b>	Examine the role of physical factors in determining the levels of crime, fear and instability	Qualitative	Crime prevention, crime and perceived safety in urban houses	1-personal crime and fear of crime are affected by low-income, building size and accessibility  2.the more accessible buildings and apartments are and the higher ratio ratios of teenagers to adults, the higher burglary rate. P.15.  3-larger buildings with greater accessibility have greater community instability.
<b>Ceccato (2012)</b>	“Provide a theoretical and empirical discussion of security issues in the urban context based on different research traditions” (Ceccato, 2012: 3)	Qualitative	The urban fabric of crime and fear (crime and fear of crime in an urban context)	1-Urban fabric, including the social aspect of the city (people, network, interconnectivity), has an impact on crime and fear  2-highlighting the environment and people’s agency in improving the collective efficiency and residents’ safety in the neighborhood.

<b>Jaffe (2019)</b>	Put CPTED principles to practice in refugee camps and looks at how the social and built environment influences a potential offender's decision to take criminal action.	Qualitative	CPTED as a passive crime prevention strategy in the context of refugee camps	1- CPTED offers less expensive solutions to the camp setting  2- CPTED solutions can be applied to camp environments, but their real potential lies in their use during the initial design of camps
<b>Schneider and Kitchen (2002)</b>	Encourage planners to pay more attention to the relationship between crime prevention and the design of the built environment	Qualitative	The relationship between crime, fear of crime and the built environment is a major matter affecting the quality of life	1-Fear of crime can shape people's preferences in their living environment.  2-improving crime prevention in localities can make big difference to the quality of life.
<b>Shaftoe (2008)</b>	Covers the principles that influence designing and managing public spaces	Qualitative	The link between urban design, human behavior and other social factors that may affect levels of safety in the public realm	1-People's feeling of safety in public spaces influences them to use or avoid the space.  2-Level crime and sense of safety are affected by the design of the urban realm, socio-economic, cultural, socialization and geographical factor.  3- you can design out of crime through CPTED principles and applications, including challenging applications (design of physical environment) and soft applications (natural surveillance)

## **1.4 Assumptions of the Study**

The study assumes that refugees in refugee camps are at high risk of crime and violence in public places because refugee camps are characterized as poor settlements, overcrowded, poorly managed, and unsecured areas (ICPC, 2010). The study believes that the feeling of safety or fear of crime is an essential factor affecting a person's health, well-being, stress, and physiological behavior. The study considers that various factors such as location, size, age and gender of users, economic status, lighting, and maintenance can affect the level of safety in open spaces. This study categorizes these factors into three main groups, which are discussed in Section 2.4.3. These groups are physical environmental factors, social factors, and individual factors.

The study assumes that the physical characteristics of the built environment of open spaces play an essential role in controlling criminal behavior and increasing the sense of safety in open spaces. For instance, the study supposes that adequate lighting in open spaces can improve visibility and natural surveillance, increasing the feeling of safety in that space. In addition, the study believes that the proper use of physical elements of open space, such as barriers and street furniture, can facilitate the control of space and the control of offenders and criminal activity.

Following CPTED theory and principles, this paper considers several principles and management applications that can increase the sense of safety by limiting the possibility of crime in open spaces, particularly streets. These principles include improving lighting, natural surveillance, delineating areas (transition zones), increasing activity in the space, designing mixed-use spaces, and maintenance. This research strongly believes in the impact of maintenance on crime levels. Referring to Wilson and Kelling's (1982) "broken window theory," the study found that poorly maintained spaces can break down spatial control and increase the likelihood of violent crime in open spaces.

## 1.5 Structure of the Thesis

**Chapter One:** This chapter introduces the study's basic concept, themes, and goals. This chapter also addresses a vacuum in the literature about the impact of physical design on safety in open areas in refugee camps and its role in influencing users' perceptions of safety.

**Chapter Two:** Introduces the literature review, which identifies and defines basic theoretical settings for the study's subject. This research is based on findings from various overlapping fields that assess urban open spaces, safety, and the perception of safety in open spaces.

**Chapter Three:** Explain the methodological approach of the study. It defines data collections; sampling size and survey methods used in the research and describes observations and interview structure as well as the analysis techniques used in the research context. This chapter also introduces the context of the study and represents the geographical, urban and social context of the Baqa'a camp.

**Chapter Four:** This chapter introduces the research findings from observing open spaces, interviews, literature review and mapping of the Baqa'a camp. It also describes open spaces, typologies and physical environmental characteristics and analyzes the factors that affect the sense of safety in open spaces in the Baqa'a camp.

**Chapter Five:** The study's findings are discussed in this chapter. According to the findings, this chapter delves into the essence of the research objectives. It relates the results to the literature review, suggesting how the findings might be applied to improve the sense of safety in open spaces in Jordan's Baqa'a camp. In addition, the key results in this chapter are presented in connection to adopting CPTED tactics to promote the perception of safety in open places in refugee camps.





## **CHAPTER 2**

### **THEORITICAL FRAMEWORK**

This chapter aims to provide a theoretical framework for understanding the relationship between the design of open spaces and the perception of safety among users of open spaces in the context of refugee camps. Since the study focuses on permanent refugee camps in urban areas, it examines the parameters of safety for urban spaces and links them to the context of permanent refugee camps. Table 2.1 summarizes the key parameters and sub-parameters of the study.

The first parameter of the study aims to identify the types of refugee camps. This study focuses on examining refugee camps according to freedom of movement, temporary and permanent nature, population density, shape and layout, as well as the location of the camp in the city and the degree of integration. The second parameter focuses on defining open spaces according to the degree of publicity, geometric form, degree of accessibility, and physical form of open spaces.

The factors affecting the level of safety in open spaces can be divided into physical and non-physical elements. The non-physical sub-parameters that affect the perception of safety in open spaces include economic, individual, socio-cultural, criminal activity, maintenance, and management applications. The non-physical factors examine the physical environmental factors that affect the surveillance and access control of the space (e.g., barriers, lighting, placement of windows, etc.), as well as the physical environmental design of the space, e.g., street layout and landscaping.

This study also aims to examine the relationship between the level of safety in open spaces and users' experiences in those spaces. The study examines how users' feelings of safety in open spaces affect their social interactions and activities in open spaces.

Table 2.1 Parameters of the study

Research parameters and sub-parameters		
Parameters	Sub-parameters	
Types of Refugee camps	Freedom of movements	
	Temporariness and permanency	
	Population size and density	
	Form and layout	
	Location and level of integration	
Types of open spaces	Publicness	
	Geometric shape	
	Accessibility	
	Physical form	
Factors that affect level of safety in open spaces	Non – physical factors	Criminal activities
		Individual factors
		Social and cultural factors
		Economic factors
		Maintenance and management
	Physical factors	Surveillance
		Access control
		Physical environmental design
Human experience in open spaces	Social interaction	
	Users' activities in open spaces	

(Source: the author)

The chapter begins with a brief definition of the term "refugee camp," identifying the typologies of refugee camps and their characteristics. The second section provides a clear description of open space categories and typologies. It then presents security issues in refugee camps, gives examples of security threats refugees face, and highlights security issues related to camp planning and environmental design.

This chapter introduces the sense of security in the open spaces of refugee camps and discusses individual, physical, environmental, cultural, and social factors that influence refugees' sense of security. Broken window theory and the effects of fear of crime on refugee behavior and well-being are presented. The chapter concludes with ways to measure an individual's sense of safety in open spaces and discusses how CPTED principles can be used to design safer open spaces for refugees in refugee camps.

## **2.1 The Urbanization of Refugee Camps**

### **2.1.1 What is a Refugee Camp?**

In the dictionary, camps mean "a place where people stay overnight in tents or other temporary structures" (Cambridge Dictionary, 2021). The term "camp" originally comes from the Latin word "campus" meaning "level ground" (Hailey, 2009). Often, camp residents are asylum seekers who have been forced to flee their place of origin to a place of safety; they are also referred to as "refugees." The roots of the term "refugee" come directly from the French "réfugié" with a very specific meaning: it referred to Protestants who fled France after the revocation of the Edict of Nantes in 1685" (Merriam-webster, 2021: 2).

In 1950, in response to the large number of asylums that had fled to Europe after the Second World War, the office of the United Nations High Commissioner for

Refugees (UNHCR) was created (UNHCR, 2001-2021a). UNHCR found the modern definition of a refugee. The UNHCR 1951 Convention and Protocol Relating to the Status of Refugees (also called the UN 1951 Convention) defines “refugee” in Article 1 as “someone unable or unwilling to return to their country of origin owing to a well-founded fear of being persecuted for reasons of race, religion, nationality, membership of a particular social group, or political opinion” (UNHCR, 2010: 3).

In general, refugee camps are defined by UNHCR as "temporary facilities built to provide immediate protection and assistance to people who have been forced to flee because of conflict, violence, or persecution" (UNHCR, 2021b: 1). Refugee camps provide a temporary solution for refugees by offering them a safe place and essential services while they are housed. According to UNHCR, only 40% of refugees worldwide live in camps, while the other 60% of the refugee population lives in cities. This percentage has remained stable since 2014 (UNHCR, 2021c).

Many displaced persons were housed in camps in host cities and urban shelters, and many of them lived in refugee camps for years or even decades. Cooper's Camp in West Bengal, India, is one of the oldest camps in the world. It was established in 1947 when Muslim East Bengalis fled across the border and still housed about 7,000 people (Finch, 2015). Palestinian refugee camps are also considered among the oldest refugee camps in the world. Palestinian refugees have lived in camps in the West Bank since the late 1940s.

On the other hand, the Dadaab refugee complex is described by UNHCR as one of the largest refugee settlements in the world. The Dadaab Refugee Complex in the southeast of Kakuma houses Somali refugees who came from the civil war in Somalia in 1991. Another large and new camp is the Za'atari camp in Jordan. Za'atari opened in 2012 when thousands of Syrian refugees began fleeing to Jordan after the war in Syria. Today, the Za'atari refugee camp is the largest Syrian refugee camp in the world. It hosts more than 76,000 refugees (UNHCR, 2021a).

### **2.1.2 Transformation of Refugee Camps to Urban Settlements**

Refugee camps are emergency shelters for housing displaced persons. These places are often considered temporary settlements. The camp's land belongs to the host country, meaning that refugees do not own the land on which the camp is built, but can only use it for a "temporary" period (UNRWA, 2021a).

Refugee camps are usually built to provide temporary, quick, and inexpensive shelter for displaced persons. Therefore, tents have been the most common shelter structures used by relief organizations. However, there are indications that refugees have begun to replace their tents with permanent structures to cope with adverse weather conditions. See figure 2.1. In the Palestinian refugee camps, for example, UNRWA began gradually replacing tents with prefabricated shelters or brick houses in 1955, six years after the first refugee camp was established (UNRWA, 2021a).



Figure 2.1 photograph dated 1954 shows tents and prefabricated shelters in a refugee camp in Jordan

(Source: UNRWA, 2021'a)

In many cases (particularly in Jordan, Lebanon, and the West Bank), Palestinian refugees have not been able to return to their homes and are forced to remain in camps for an unknown period of time. Consequently, UNRWA began replacing the tents with suitable housing units; it took ten years (1951-1961) for the tents to be replaced with permanent housing made of more durable materials. These housing units were built of mud and concrete blocks and covered with zinc roofs (UNRWA, 1961). Although the camps were still considered temporary sites, they were gradually surrounded by community facilities such as health centers, schools, stores, etc. (Al-Husseini, n.d.). See Figure 2.3 and Figure 2.4.

Another example is Kenya's Dadaab camps (Dagahaley, Ifo, and Hagadera). Dadaab camp was established in 1991 and was once the largest refugee camp in the world. The Dadaab camps house refugees who fled the civil war in Somalia. The Dadaab camps have grown into towns and become commercial centers linking northeastern Kenya with southern Somalia (UNHCR, 2001-2021b). See Figure 2.2.



Figure 2.2 An aerial picture shows a section of the Hagadera camp in Dadaab near the Kenya Somalia border, May 8, 2015

Source: (REUTERS/Thomas Mukoya)



Figure 2.3 Marka camp in Jordan

Source (UNRWA, 2013, Photo by Hannington Muyenje)



Figure 2.4 Students line up in Marka Camp, Jordan, 1969

Source (Birzeit university digital Palestinian archive)

Some refugee camps have developed into informal urban areas as "slums" or cities. Officially, refugee settlements are camps in their administration; at the same time, they become urban neighborhoods in terms of their materiality (Oesch, 2020). Refugee camps have been characterized as "poor, informal" settlements of "pervasive temporariness," and informality has become a point of attraction for poor families and migrants in the host country. Today, for example, more than 50% of registered Palestinian refugees in Lebanon still live in UNRWA camps and face the challenges of the dichotomy between urban refugees and camp residents (Dorai, 2010).

Some refugee camps may become part of the urban area, while others retain their boundaries and turn into informal urban settlements (slums). And over time, in some cases, stable infrastructures take the place of temporary ones. Michel Agier argued that refugee camps are located between humanitarian areas and cities because of the complexity of their urbanity (Agier, 2002). This depends on their demographic weight and the diversity of activities developed, such as socio-economic activities, political decision-making centers, and the central role in Palestinian society in exile. In some specific cases, the categorization depends on the institution in charge of the refugees (Dorai, 2010).

### **2.1.3 Typologies of Refugee Camps**

Classification of camps provides planners and researchers with a framework for analyzing results in terms of the level of commitment and a basis for comparing site plans and their relationship to the operation of a camp (Cuny, n.d.).

The typological approach describes the general characters of camps' spaces to highlight the physical environmental factors of the space (Grabace, 2013). In the policy note "Cities of Refuge in the Middle East" by the World Bank Group, urban displacement settings were categorized into four types: cities with localized

displacement impact, cities under widespread stress from displacement, and cities and towns heavily affected by conflict damage and urbanizing camps. The assessment made the categorization of the following four factors:

1. Urban spatial patterns (the size of the city or town and patterns of urban immigration)
2. Urban populations, including the forcibly displaced and the host communities
3. Urban services and infrastructure
4. Urban governance.

(The World Bank Group, 2017)

Figure 2.5 shows types of urban displacement settings with giving examples from middle east.



Figure 2.5 Types of urban displacement settings

(Source: cities of refuge in the middle east,2017)

Agier (2002) compared the Dadaab camp in Kenya to the Shalita camp in Lebanon based on the population and size, layout and pattern, and physical characteristics of the camps. Generally, however, the literature identifies refugee camps according to the following considerations: Freedom of movement, mode of assistance, mode of governance, temporariness vs. permanency, population size and density (Idris,2017). In addition to the mentioned factors, the level of integration with the host community can also be used to categorize refugee camps since the level of integration with the host community is different from one camp to another (Martin, Minca & Katz,2019).

This study will classify refugee camps based on temporariness and permanency as major classification factors. Permanent and temporary camps will be compared according to the following urban characteristics (See Table 2.2):

- The form of the camp
- The location of the camp and its relation to the city (in/out of the city)
- The layout of the camp
- Camp's population / density
- Level of integration/ isolation
- Freedom of movement/accessibility (open vs. Gated camps)
- Mode of governance and control
- Mode and level of assistance
- Urban services
- Physical characters

Table 2.2 (continued) Comparing Permanent to Temporary Camps' Urban Characters

Characters		Permanent or	Temporary camps
Semi-permanent camps			
<b>Form</b>		<ul style="list-style-type: none"> <li>-institutional camps with informal spaces (Martin, Minca &amp; Katz,2019)</li> <li>-poor and un-planned settlements (slums)</li> </ul>	<ul style="list-style-type: none"> <li>-institutional camps in the form of:           <ul style="list-style-type: none"> <li>• Refugee camps</li> <li>• Hispidity camps</li> <li>• Deletion camps</li> <li>• Transit camps</li> <li>• Reception camps (Martin, Minca &amp; Katz,2019)</li> </ul> </li> <li>-planned and formal camps</li> </ul>
<b>Location (In or out of the city)</b>		-in the city or out of the city (Cities of refuge in the middle east,2017)	<ul style="list-style-type: none"> <li>-far from the city (isolated camps) (Martin, Minca &amp; Katz,2019)</li> </ul>
<b>Layout</b>		<ul style="list-style-type: none"> <li>-the internal organization of urban elements of the permanent camps has a chaotic layout</li> </ul>	<ul style="list-style-type: none"> <li>-blocks are organized in a grid or similar rational layout (Ordered layout) (cities of refuge in the middle east,2017)</li> </ul>
<b>Camps' population/ density</b>		<ul style="list-style-type: none"> <li>-permanent camps population consists of refugees and locals</li> <li>-permanent camps' density is higher than temporary camps (Martin, Minca &amp; Katz,2019)</li> </ul>	<ul style="list-style-type: none"> <li>-permanent camps population consists of only refugees</li> <li>-most of the temporary camps have not high density (Martin, Minca &amp; Katz,2019)</li> </ul>
<b>Level of integration/ isolation</b>		<ul style="list-style-type: none"> <li>-Camps population is blended into the existing urban population</li> <li>-Level of integration with the host community is different from one camp to another (Martin, Minca &amp; Katz,2019)</li> </ul>	<ul style="list-style-type: none"> <li>-Temporary camps are exist isolated areas (Martin, Minca &amp; Katz,2019)</li> </ul>

<b>Freedom of movement/ accessibility</b>  <b>(Open vs gated camps)</b>	<p>-Permanent camps can be classified based on accessibility to two types gated and open camps</p> <p>-In open camps, residents can move in and out of the camp, but sometimes the movement requires permits.</p> <p>-In closed “gated camps” are inaccessible, and the movement in and out is restricted by the government (cities of refuge in the middle east,2017)</p> <p>-There are two kinds of gated camps; “gated in” where the entry is blocked and the exit is free, and “gated out” where the entry is free and the exit is blocked. (Diken,2004)</p>	<p>-Temporary camps are closed “gated “camps and refugees are restricted in camps. (Cities of refuge in the middle east,2017)</p>
<b>Mode of governance and control</b>	<p>-permanent camps are controlled or self-administered temporary or semi-permanent spatializations of care and control (cities of refuge in the middle east,2017)</p> <p>-In permanent settlements, refugees often have much more voice in terms of decision-making and politics of settlements</p>	<p>-Temporary camps are created and controlled by international humanitarian agencies such as (UNHCR) and national governments. (Cities of refuge in the middle east,2017)</p> <p>-Camps are often run by aid agencies, and refugees have far less of a position as part governance of the camp</p>
<b>Mode and level of assistance</b>	<p>-Permanent camps tend to be more integrated into local economy (Schmidt, n.d &amp; Jacobsen, 2003)</p>	<p>-The assistance is based on relief handouts and food distribution, with little possibility for refugees to engage in income-generating activities (Jacobsen, 2003)</p>

<b>Urban services</b>	-Poor infrastructure (sewage system, electricity, roads, etc.) (Dorai, 2010)	-Basic temporary infrastructure
<b>Physical characters</b>	<p>-They have more permanent shelters than temporary camps.</p> <ul style="list-style-type: none"> <li>- For example, the Palestine camps' buildings are irregular (Dorai, 2010).</li> <li>- Peetet describes her experiences in the Shatila camp, a small, physically isolated area carved out of a vibrant postwar urban center: " <i>Donkeys pulled carts through what remained of the few narrow roads once used by cars and trucks. Chickens roamed the alleys and pecked aimlessly in the dirt. Bombed and burned-out buildings in a state of perpetual suspension gave the impression that any forceful movement could bring the whole pile tumbling down</i> " (Grbac, 2013 from Peteet, 2005:13)</li> </ul>	-Housing units are tents, shipping containers, hurts and pre-fabricated unites

(Source: the author)

In examining the "urbanity of the camps", Agier (2002) argued that some refugee camps have grown in size, density, and complexity to the point where they can be compared to cities or towns. Buonocore and Cutini (2017: 144.3) also mentioned that refugee camps could be seen as a city,

*"Its space, that is the organization of shelters, the streets along with them and their mutual intersections, the open spaces- not only responds to the need to collect and shelter people but intrinsically expresses (or should express) the way the host community is expected to live and socially interact- what a configurational approach can reveal and make to emerge."*

## 2.2 Open Spaces in Refugee Camps

### 2.2.1 The Concept of Open Space

Space is an environment that influences social interaction and users' behavior. Stravrides (2016: 260) argues that "space is an active form of social relations, a constituent aspect of social relations and a set of relations. " Yi-fu Tuan (1977: 51) adds that space: "is a geometrical unit (area or volume); it is a measurable and unambiguous quantity."

Space is also mentioned as "a product nor a thing but rather includes the production of these products and things, encompasses their interrelationships, and discerns (relative) order from (relatives) disorder" (Grbac, 2013 from Lefebvre 1996:73). Yi-fu Tuan describes architectural space as a "simple hut surrounded by a clear ground that can define such sensations and render them vivid" (Tuan, 1977: 102).

The Cultural Courier (2019) differentiates between space and place. They describe space as location, physical space, and physical geography, while place "is what gives a space meaning, 'personality' and a connection to cultural or personal identity. It is the culturally ascribed meaning given to space. It is the 'vibe' you get from a certain space, and it exists for a reason" (The Cultural Courier, 2019: 1).

Objects define space and give it a geometric personality, and the place is a type of object. For instance, a neighborhood to new residents is a blurred space; creating an image of the area requires the identification of objects of neighborhood space such as street corners and architectural landmarks (Tuan, 1977).

Tuan (1977) describes how space can change into place. At first, space lies beyond recognized entry points. By the time objects like landmarks and paths are identified. In the end, space will consist of familiar landmarks and paths, called a place (see Figure 2.6).

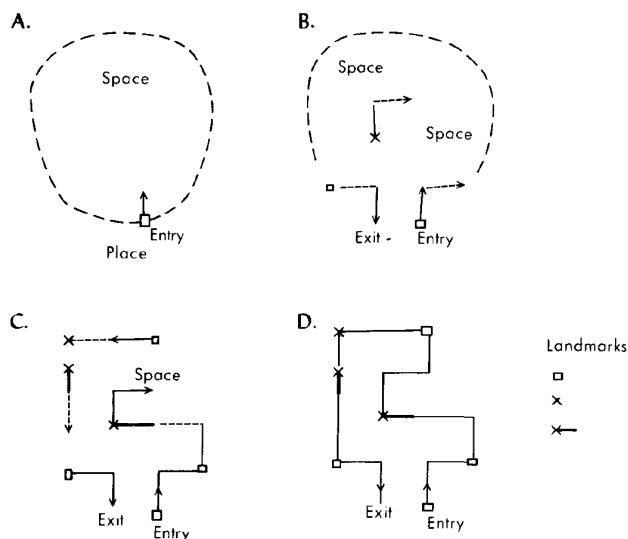


Figure 2.6 From space to place

(Source: Tuan, 1977: 71)

The Cultural Courier (2019) adds that there are many agents to define space as a place, including history, cultural memory, and character of the people who inhabit a space serves to create ideas of place.

Spaces can be classified as internal-external spaces. In terms of function and form, they follow very similar characteristics. Internal space or indoor space is a shielded space from weather and the environment (closed space), such as shopping malls,

theaters, and closed play areas. It is also a symbol of privacy. On the contrary, external space (outdoor space) is an open space for movement in the open air with public, semi-public, and private zones (Krier, 1979). Open spaces in city planning may refer to "grounds for sports and games, large areas in public or quasi-public ownership, unbuilt land, natural areas, voids which are open to view, and assembly outdoor places" (Lynch, 1995: 396). From the behavioral perspective, open space is defined as "a space is open if it allows people to act freely" (Lynch, 1995: 396).

In the dictionary, open space is defined as "land, especially in a town, that has no buildings on it" (Cambridge Dictionary, 2021). According to Lynch (1995: 396), open space is "an outdoor area in the metropolitan region which is open to the freely chosen and spontaneous activity, movement, or visual exploration of a significant number of city people." He also described open spaces from the behavioral perspective as spaces that allows people to act freely. The Council of Europe (1986) describes open space as a public living room for the locality. While the SuDS Manual, CIRIA C753 (2015: 789), defines 'public open space' as:

*"Any land laid out as a public garden or used for public recreation. This means a space that has unimpeded public access and that is of a suitable size and nature for sport, active or passive recreation, or children and teenagers' play. Private or shared amenity areas, for example in the development of flats or buffer landscape areas are not included as public open space."*

Open space is the site that gives meaning to lives and reflects the image of a city. The quality of open spaces in a settlement system affects visitors' impressions of that environment. Open spaces shape the residents, users, and community in cities; they are places for interaction that impact the quality of the urban environment (Pacheco, 2017).

## **2.2.2 Types of Open Spaces**

A review of the literature shows that open spaces can be categorized based on the following characteristics of these settings: publicness or privacy (e.g., public open space, semi-public, semi-private and private open space) (Newman,1972), communality (e.g., community open space or public open space) (Paxon et al., 1984), activeness (e.g., active open space and passive open space) (CIRIA, 2022), location (e.g., urban open space, inner-city open space, suburban open space, and rural open space)(Carmona,2008) , mindedness (e.g., single-minded space and open-minded space) (Walzer,1986), accessibility (e.g., open, limited , highly limited and closed spaces) (Kit Campbell Associates, 2001), physical form (e.g., green open spaces and gray space or civic open spaces) (Al-Hagla,2008) (see Table 2.3) development (e.g., naturally developed open spaces and planned open spaces) (Carr et all., 1992), geometric shape (e.g., street and square) (e.g., Krier,1979), and spatial scale continuum (e.g., city-wide, intermediate, and individuals buildings) (Stanley et al., 2012). Table 2.5. summarize open spaces types and definitions.

City scales open spaces refer to open spaces oriented to large population segments. In contrast, intermediate-scale open spaces refer to localized areas of the city that serve multiple residential settlements, such as a district or neighborhood. (Stanley et al., 2012). See Table 2.3.

Table 2.3 Urban open spaces transdisciplinary typology

	<b>Transport Facilities</b>	<b>Streets</b>	<b>Plazas</b>	<b>Recreational Space</b>	<b>Incidental Space</b>	<b>Parks and Garden</b>	<b>Food Production</b>
<b>CITY</b>	Harbours, airport and Train Station Parking	Central Boulevards	Large Formal Plazas	Stadiums, Greenbelts, Beaches	Natural features and Semi-Wild Areas	Major Formal Park and garden Space	Orchards, Agricultural Fields
<b>INTERMEDIATE</b>	Transit Stations and City Gate Area	Street Space	Smaller neighbourhood Plazas	Sports Facilities, Playgrounds	Empty Lots, Transit Borders	Institutional Gardens, Small Parks, Cemeteries	Grazing, Commons, Community Gardens
<b>RESIDENCE</b>	Driveways, Parking Areas	Pedestrian Alleys, Paths	Interior Courtyards	House yard Playspace	Marginalised Space Between Buildings	Household Gardens	Kitchen Gardens, Small horticulture

 Grey Space     Grey-Green Space     Green Space

(Source: Stanley et al., 2012; Re-drawn by Soetikno, 2019)

UN-habitat categorizes public open spaces based on their size and coverage area into four broad levels. These levels are pocket, neighborhood, district (city open space), regional open space (larger city parks), and national/ metropolitan open public spaces (UN-Habitat, 2018). Vasconcelos & Menezes (2009) identified open spaces based on their main characteristics from the social, geographical, physical, and urban points of view.

Based on open spaces' physical characteristics, Alves (2014) classifies open spaces into 4 types:

- Circulation spaces (streets or squares)
- Spaces for leisure and recreation (parks and gardens)
- Spaces for contemplation (waterfall)
- Spaces for preservation or conservation (ecological reserve or national parks)

All public spaces have two main characteristics: They have to be accessible to the public (everyone) and must be used for public use (Allies, n.d). Consequently, considering urban spaces (open spaces) in refugee camps as public spaces does not make sense since most refugee camps are gated communities. Hence, their open spaces are not freely accessible to the public (Diken,2004).

The charter of public space in the UN defines public space as "all places publicly owned or of public use, accessible and enjoyable by all for free and without a profit motive" (UN-Habitat, 2018: 9). The charter added that "public open space" refers to undeveloped open land with no built structure and access to the public.

On the other hand, Rayan (2006: 17) considered public spaces as "flexible spaces to change and can accommodate multiple activities." Grabac (2013) argued that the created environment structured through the users' practices and use of the space is more important than open access in defining public space. Table 2.4 summarizes hierarchies of public open spaces based on size, coverage area, accessibility, publicness, physical forum, activeness and usage.

Table 2.4 Public open spaces categories

Open spaces typologies	Open space (size and coverage area)						Accessibility		Activeness	
	Name	pocket	neighborhood	District	Regional (Larger city parks)	Metropolitan				
	Area range	< 400 m min walk	0.03-0.04 hectares	0.04-10 Hectares	10-50 Hectares	50-200 Hectares				
	Usage	recreation purposes	accommodate a variety of activities, such as recreation, sporting, and natural features conservation	designed to provide for organized formal sport (Includes substantial areas and nature spaces)	organized sport, play, social interaction, relaxation and enjoyment of nature	contain services as recreational, sporting, and basic amenities	open (free access to every one)	Limited (access is free but managed)	Highly limited (access is restricted)	closed (access is not possible)
<b>Publicness</b>										
<b>Private open spaces</b>										
<b>Individual gardens</b>										
<b>Home garden</b>										
<b>Semi- private open spaces</b>										
<b>Courtyard to houses or flats</b>										
<b>Communal gardens and play spaces</b>										
<b>Semi- public open spaces</b>										
<b>School play ground</b>										
<b>Public open spaces</b>										
<b>Connection spaces /Streets (residential street, commercial street, civic boulevards)</b>										
<b>Green corridor and linear system (sidewalk, path, bikeway trails)</b>										
<b>Outdoor sport Recreation facilities (playground, sport field)</b>										
<b>Parks and gardens</b>										
<b>Squares (civic square, market square, plaza)</b>										
<b>Camp ground and picnic areas</b>										
<b>Conservation areas/ pocket areas</b>										
<b>Natural/ semi- natural green areas (woodland, grassland, cannels, wetlands)</b>										

(Sources: Sandalack, 2010; Carr et all., 1992; UN-Habitat, 2018;

Newman,1972; Al-Hagla,2008)

Table 2.5 (continued) Types of open spaces

Classification characters	Types	Definitions
Publicness	Public open space	-Public space: "open, publicly accessible places" (Carr et al., 1992: 50). "Is space where we share with strangers, people who aren't our relatives, friends, or work associates. It is space for politics, religion, commerce, sport; space for peaceful coexistence and impersonal encounter, its character expresses and also conditions our public life, civic culture, everyday discourse" (Walzer, 1986: 470).
	Semi- public open space	Are "publicly accessible spaces to limited number of residences" such as school playgrounds (Gehl, 1987: 59).
	Private open space	<i>"Open space that is not publicly accessible or is available only to limited users and is not available to the public on a regular or constant basis is defined as private"</i> (CEQR, 2014: 7-2)
	Semi private open space	
Community	Community Open Spaces	<i>"Is any green place designed, developed, or managed by local residents for the use and enjoyment of those in the community"</i> (Paxon et al, 1984: 1)
	Public open space	
Location	Urban open spaces	
	Inner-city open spaces	
	Suburban open spaces	
	Natural open spaces	
Activeness	Active open spaces	"Include sports, exercise, or active play. Recreational facilities such as playground equipment, playing fields and/or courts, beach areas, pools, skating rinks, and multipurpose play areas may be found within an active open space area" (CIRIA, 2022: 1).

	Passive open spaces	“areas for enjoying views of scenery and can also include for example places for young people to meet” (CIRIA, 2022: 1) Plazas or medians with seating, portions of beach areas, picnic areas, trails, and strolling areas may all be found within a passive open space area.
Mindedness	Single-minded open space	“A space designed by planners or entrepreneurs who have only one thing in mind, and used by similarly single-minded citizens. Entering space of this sort we are characteristically in a hurry” (Walzer,1986: 470).
	Open-minded open space	“a space designed for a variety of uses, including unforeseen and unforeseeable uses, and used by citizens who do different things and are prepared to tolerate, even take an interest in, things they don't do” (Walzer,1986: 470).
Accessibility	Open spaces	
	Limited open spaces	
	Highly limited open spaces	
	Closed open spaces	
Physical form	Green open spaces	A subset of open space conforming to any vegetated land, structure, water, or geological point within civic areas (Kit Campbell Associates, 2001). Green open spaces include; Parks and gardens, amenity greenspace, children's play areas, sports facilities, green corridors, natural/semi-natural greenspace and another functional greenspace.
	Gray open spaces	a subset of open space, conforming to civic places, request places and other paved or hard landscaped areas with a communal function, similar to communal places, request places, rambler thoroughfares, malls, and see fronts (Kit Campbell Associates, 2001).
	Civic open spaces	

Development	Naturally development spaces	"Places that have developed naturally in an hoc way without deliberate planning, through appropriation, by repeated use in a particular way, or by the concentration of people because of an attraction" (Carr et al., 1992: 50).
	Planned open spaces	"Planned spaces emerge from the offices of city planners, architects, and landscape architects, commissioned by public or private clients" (Carr et al., 1992: 51).
Geometric shape & physical characteristics	Circulation spaces (streets, roundabout & plaza)	<p><b>Streets:</b> "thoroughfares that are based inside towns, cities and neighborhoods; and are commonly lined with houses or buildings and offer an essential urban function for both pedestrians and vehicles-mobility" (UN-Habitat, 2018: 9)</p> <p><b>The commercial unilateral street:</b> "is a linear walking space for commercial and leisure activities, formed by the road unilaterally setback, retaining the traffic function of the motor vehicle" (Yang et al., 2018: 4)</p> <p><b>The Roundabout:</b> "The Roundabout is an urban space part of the road system, regularly in circular form in plan, designed to facilitate the transit in a point of intersection of two or more tracks. The roundabouts can be composed of various elements such as planters, esplanades, sources, monuments, etc., elements that seek to highlight the image of the site as a nodal point within the city" (diseño, n.d: 10).</p> <p><b>Squares and plazas:</b> are open spaces created because of building agglomeration around an open area (Krier, 1979)</p> <p><b>The commercial square:</b> "has the main functions of commercial entertainment, located on the partial setback of large buildings or the street where the roads meet "(Yang et al., 2018: 4).</p> <p><b>Courtyard:</b> a court or enclosure adjacent to a building (such as a house or palace). (Merriam-webster, 2022)</p>

	spaces for leisure and recreation (parks and gardens)	<b>Parks:</b> “open spaces inside a municipal territory, their objective is to provide free air recreation and contact with nature. Their principal characteristic is a significant proportion of green area. In many parts of the world, parks are also used for a diversity of cultural events and activities” (UN-Habitat, 2018:12)
	spaces for contemplation (water fall)	
	spaces for preservation or conservation (ecological reserve or national parks)	
spatial scale continuum	city-wide spaces	
	Intermediate spaces	
	Individuals' buildings	

(Source: the author)

Since refugee camps are gated or semi-gated communities, refugee camps spaces are not sites under the public category, because public spaces should be freely accessible to the public. In literature, researchers find that the term “common spaces” (or “communal spaces”) can describe open spaces in gated communities such as refugee camps. The term “common” in defining spaces refers to its Latin origin “communion”. “Commune” is composed of com “together” and moinis “obliged to participate” (Petti & Hilal, n.d). Alves describes “urban common space” from two viewpoints, physical and political. From the physical viewpoint of urbanism is urban spaces belong to the public authority or society and it is used for public use. From the political viewpoint, common urban spaces are public spaces for political freedom and allow social representation (Alves, 2014).

Kusumawijaya (2014) differentiates common spaces from public spaces. He sees common spaces as a fundamental property of the community as a body, which is different from public space. Public space falls under the state’s authority, and individuals perform as citizens (Kusumawijaya, 2014).

Common space is a set of spatial relations between a social group produced by communing activities, use, and practices and is defined through the acts of spatial enclosure. They may be organized as “semi-private” spaces (ex., The outdoor spaces of gated communities) or as “public spaces” (Stravrides, 2016)

Allies (n.d.) added that gated communities have common spaces, highlighting the vital role of common spaces in gated communities as a valuable component of the urban environments. Common spaces such as courtyards and gardens are rarely available inside refugee camps as the limited spaces inside the camp. UNRWA studied Palestinian refugees in Jordan and compared the availability of open spaces inside and outside the camps. The study shows that the percentage of open space outside the camps is higher than inside the camps. Also, we can significantly recognize the limitation of spaces as the increased use of roof areas as open space.

See Figure 2.7.

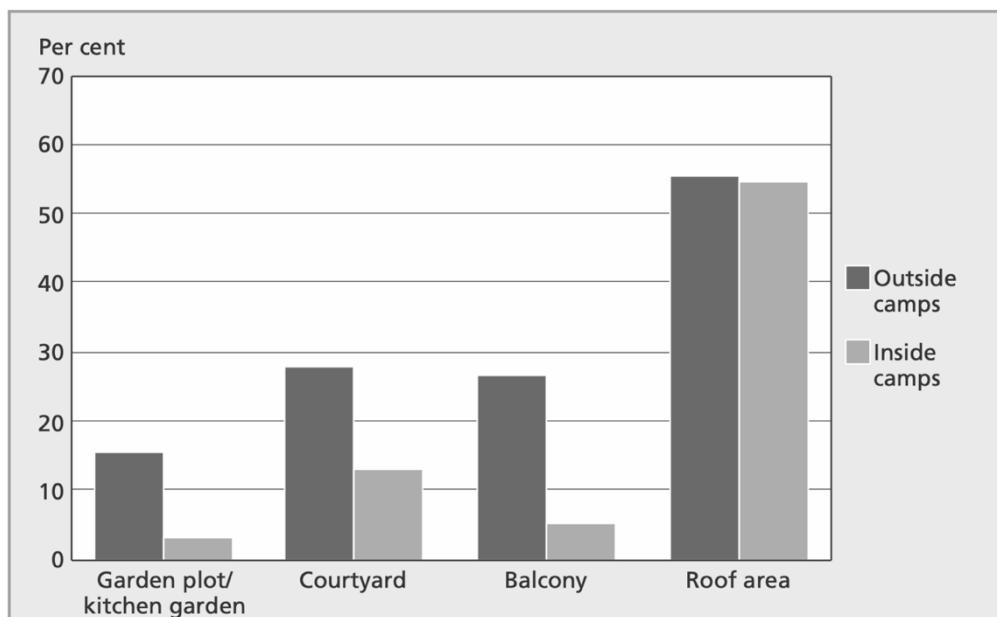


Figure 2.7 The percentage of open spaces inside and outside the Palestinian refugee camps

(Source: Zhang & Tiltne, 2013)

## **2.3 Security in Refugee Camp**

### **2.3.1 The Concept of Security in Refugee Camp**

UNHCR (2006: 38) defines security as "freedom from the threat of violence, coercion or deliberate deprivation." Ensuring refugees' personal and physical security in camps is an essential element of international protection. Like all people, camp residents have the right to live in a safe environment that supports the human right to live, liberty, and a person's security (UNHCR, 2006).

The international and local community, local authorities, UNHCR, and camps management agencies (NGOs) are obliged to ensure physical security in refugee camps (UNHCR, 2003). UNHCR recommends providing refugees with specific needs, including strengthening community-based protection (UNHCR, 2014). Such recommendations and humanitarian interventions can achieve positive protection outcomes for refugees and internally displaced people (IDPs) (Boano, 2011).

The design of refugee shelters and settlements should also respond to the needs of refugees. Architects and urban designers are engaged in architectural protection. Refugee camps are poor-quality development settlements often characterized as poor sanitation, overcrowding, and un-secure places (ICPC, 2010; Davies, 2004).

### **2.3.2 Types of Security Threats in Refugee Camps**

Around the world, the human rights of refugees are violated (Kuttikat,2010). Violence and crimes are social and economic threats in refugee camps that affect the safety of thousands of refugees. Some groups like women and children are more vulnerable to crime than others. The resulting feeling of insecurity and fear of crime can restrict people's freedom of movement and prevent them from participating in the community (CPTED guidebook, 2003).

Tamil refugees are an example of refugees who have experienced violence. “These refugees have experienced and continue to experience extreme violence, the grievous loss of close family members, loss of identity, and poor health conditions as a result of the Sri Lankan war” (Kuttikat, 2010: 379).

Security problems in refugee camps may take many forms. As mentioned previously, safety threats can range from theft, violence, physical assault, forced marriage, vandalism, child abuse, rape, sexual assault, fraud, arson, forgery, forced proceed prostitution, drug trafficking, robbery, and arson to murder (UNHCR, 2003, 2006). Again, a study on Palestinian refugee camps in Jordan shows that crime, violence, and alcohol and drug abuse are greater inside than outside the camp (Zhang & Tiltnes,2013). Drug and alcohol consumption directly impacts increasing abuse, crime, deviant behavior, and insecurity in settlements (ICPC, 2010).

In refugee camps, gender-based violence is the most common crime. Refugees, women and girls, are often subjected to specific forms of violence, including physical abuse, such as rape, abduction, sexual trafficking, and assault. Young girls are at greater risk of sexual exploitation, violence, and abuse (UNHCR,2006). See Appendix A for security terms definitions.

## **2.4 Sense of Safety in Open Spaces in Refugee Camps**

### **2.4.1 The Concept of Sense of Safety in Open Spaces**

The sense of safety is a concept based on subjective experiences; it is related to a person's feeling of freedom from danger and risks (Cambridge dictionary, 2021; Tandogan & Ilhan, 2016). On the other hand, security refers to the statical risk of criminal acts in one place (UN-Habitat, 2007-2012). The subjective experience of safety reflects society's perception of safety and encompasses fear of crime by actual or presumed crimes (Iqbal, 2021; Ruijsbroek et al., 2014; Shehayeb, 2008). Fear of crime can be described as fear and insecurity and refers to the personal feeling of being a victim of a crime (Iqbal, 2021; Tandogan & Ilhan, 2016).

A literature review discussed the importance of fear of crime on people's behavior, experience, and preferences towards their living environment (Minneapolis-St Paul Metropolitan Council, 1997; Newman, 1972; Shehayeb, 2008; Iqbal, 2021; Whitzman & Wekerle, 1995). Chadee (2015: 4) defines the fear of crime as "a feeling or emotion experienced and evaluated by an individual and is generally referred to as fear of crime or feeling of unsafety." Deven Country Council (2000) adds that public safety focuses on levels of crime and fear of crime, including fear of theft and fear of physical assault.

Fear of crime is an important issue that affects residents' quality of life and social well-being. Fear of crime phenomena is directly linked to the "eyes on the street" concept and CPTED theory, which points out that the aesthetic elements of space's physical environment are the potential to reduce certain forms of criminal behavior (Matlovičová, Mocák & Kolesárová, 2016).

Fear of crime occurs on three levels, individual, neighborhood, and social macro level. Usually, individuals' fear of crime results from previous experience of crime, while at the neighborhood level, it is a function of what people experience in their living area. At the macro level, fear is a social phenomenon shaped by media (Ceccato, 2018).

Research on safety sought that there is not always a connection between feeling unsafe and the actual crime risk. Even if crime does not happen in a particular public place, it is possible for individuals to feel unsafe in that place and avoid it at specific times of the day or altogether (Nalla & Ceccato, 2020; Iqbal, 2021; Schneider & Kitchen, 2007). The fear of crime matrix has been developed in the United Kingdom to illustrate the relationship between the level of crime and fear of crime. The matrix has four sets of circumstances; under each quadrant of the matrix, the small boxes give examples of policy responses that may be appropriate to both fear of crime and crime (See Figure 2.8).

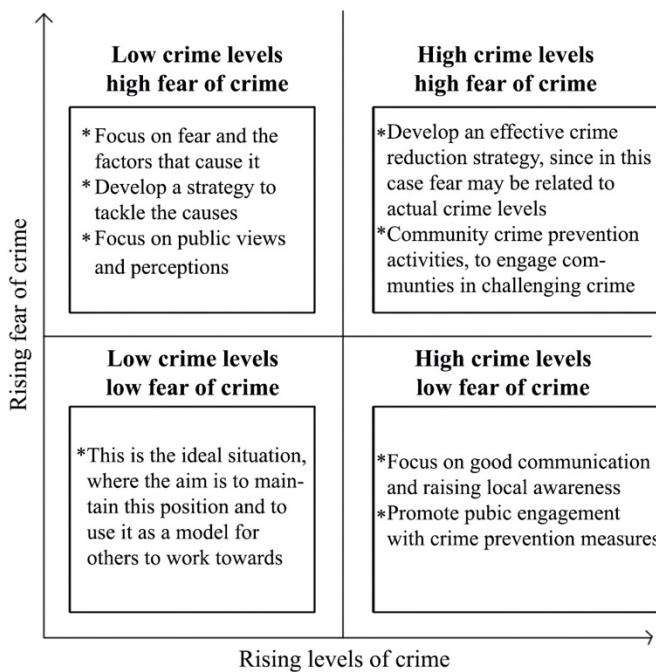


Figure 2.8 The fear of crime matrix

(Source: Schneider & Kitchen, 2007 adapted from the material on UK government's crime reduction website, at [www.crimreduction.gov.uk/fearofcrime0216.htm](http://www.crimreduction.gov.uk/fearofcrime0216.htm))

The term safety is used in the urban context and is considered the quality of the environment and is described with individuals' or groups' sense of safety in an urban area (Iqbal, 2017). The New Urban Agenda also highlights the need to promote safety in cities and human settlements enabling residents "to live, work and participate in urban life without fear of violence and intimidation, taking into consideration that women and girls, children and youth, and persons in vulnerable situations are often particularly affected" (UN-Habitat, 2017: paragraph 39).

#### **2.4.2 Sense of Safety in Public Spaces**

Public spaces play an essential role in reflecting the meaning of urban life and discovering crime and fear of crime patterns in the city environment. The international research on environmental criminology and place-based crime prevention highlighted how particular conditions of public places could affect crime and citizens' perceived safety (Nalla & Ceccato, 2020).

According to UN-Habitat (2007), safety is one of the main concerns regarding public spaces. It covers a wide range of concepts that range "from basic needs, such as food, health, and shelter, to protection from crime and the effects of technological and natural hazards, and collective security needs, such as protection from urban terrorism" (New Urban Agenda, 2017: 41).

Ensuring access to safe and affordable public spaces is one of the central principles of safe cities (Iqbal, 2017). Several environmental characteristics affect the safety level in public spaces (see section 2.4.3.3). Therefore, the design and planning of cities and public spaces significantly impact an individual's safety (Nalla & Ceccato, 2020). The idea of "safe space" is influenced by Newman's "defensible space theory," which focuses on identifying specific characteristics of physical space to control crimes and create a safe place for users. The theory highlighted the role of natural surveillance in public space safety (Newman, 1972; Shehayeb, 2008).

Creating a safe public space supports communities' health and well-being, and the image of the space influences individuals' behavior and usage of the space (Iqbal, 2021). The sense of safety determines whether people will use or avoid urban public spaces. For instance, when individuals have a positive and safe image, in other words, "feel safe" in a space, they are more likely to use the space and experience a more significant social interaction (city of port Phillip community safety plan, 2019-2023).

Also, the opportunity to walk on the street, play, and stop to spend time and interact with other people increases with a safe, clean and healthy environment (Matlovičová, Mocák & Kolesárová, 2016). Whitzman and Wekerle (1995: 3) claim that "Fear of crime keeps people off the streets, especially after dark, and out of parks, plazas, and public transits."

Public open spaces such as parks, public squares, and streets are the places that provide opportunities for social interactions within the communities. While some studies show that parks have a positive impact on human health and well-being (Chiesura, 2004; Iqbal, 2017; Nalla & Ceccato, 2020), others have shown that parks can affect human life negatively and be a reason for stress and anxiety (Jeffery, 1975; Iqbal, 2021).

Jeffery (1975) illustrates that occupied parks during the day are left deserted at night and become havens for social deviants. Jacobs (1961) highlighted the streets' role in perceiving city safety. He claims that "to keep the city safe is a fundamental task of a city's streets and its sidewalks" (Jacobs, 1961: 34). On the other hand, Jeffery (1975) has shown that Subway systems can be described as dangerous places because of their isolation and anonymity.

### **2.4.3 Factors That Affect the Sense of Safety in Open Spaces**

Bronfenbrenner's ecological systems theory in studying individual development considers the dynamic interactions between a developing child's influencing factors (individual, relationship, community, and societal factors). Bronfenbrenner argues that five interrelated systems influence a child's development: the Microsystem, the Mesosystem, the Exosystem, the Macrosystem and the Chronosystem (Evans, 2020).

The first level of Bronfenbrenner's theory is The Microsystem, which includes the factors that directly touch the child in his immediate environment, such as parents, siblings, teachers and school peers. The mesosystem contains the relationships between the child's microsystems, for example, the interaction between the child's parents and teachers). The exosystem incorporates the social factors that indirectly influence the microsystems, such as the neighborhood, parents' workplaces and mass media. The macrosystem in Bronfenbrenner's ecological systems theory focuses on studying the cultural factors that influence a child's development, including socioeconomic status, wealth, and poverty. The final level of Bronfenbrenner's ecological systems theory is the chronosystem which looks into the environmental changes in a child's life and influences his development, including significant life transitions and historical events (Evans, 2020).

Fear is often related to how people feel about a place. In literature, fear of crime and the sense of safety is affected by many different factors. Bronfenbrenner's social-ecological model allows understanding the factors that influence people's sense of safety and experience in open spaces and the relationships between these factors. Based on Bronfenbrenner's social-ecological model, the factors that affect the feeling of safety can be more easily understood in their individual, physical, environmental, cultural and social contexts.

According to Nalla and Ceccato (2020), the sense of safety in open spaces is affected by the design of the physical environment as a backdrop for crime and fear (The environment), the dynamic of individuals' activities and daily routine or habits (The movement), previous safety experience (e.g. being a victim of crime) and media stores or others' experience (The users' perspective), the methodological challenges in the analysis of crime and fear (The Metrics), and the examples of current practices in promoting safety for different groups of society, both by academics and practitioners (The intervention).

Individual factors include age (children and elder people feel greater fear than youths), gender (women are more fearful than men), individuals' education level, sense of belonging to the place of residence, previous experience of victimization (victims experience a higher level of fear), perceptions of risk (individuals tend to be more fearful from being a victim of violence more than theft) and income. Environmental considerations (physical and social aspects of one's neighborhood can contribute to the feeling of safety), poor surveillance and lighting, keeping infrastructure without maintenance, and damaged property are examples of physical environmental factors (Iqbal,2021& 2017; Wilson & Kelling; 1982). Social, cultural and economic factors may be represented in the following forms: media exposure (news about crimes may increase or decrease fear feelings), alcohol and drug consumption in public, unsafe riding behavior, social integration, religion and neighborhood change (communities with rapid economic and population change shows a higher level of insecurity) (Wilson & Kelling; 1982; Ceccato, 2018; city of port Phillip community safety pan, 2019-2023; Tandogan & Ilhan, 2016; Iqbal,2021; Wilson & Kelling; 1982; Sutton, Cherney & White, 2008).

#### **2.4.3.1 Individual Factors**

According to Ceccato (2012), the sense of safety is shaped by an individual's actions and interventions in everyday life. Individuals' fear of crime or feeling unsafe in space is based on subjective experiences linked to various other contexts such as age, gender, level of education, traumatic experience, socioeconomic status, and emotional responses to worry or anxiety (Iqbal, 2021). Gender and age are significant personal factors affecting fear of crime (Hilinski et al., 2011; Nalla & Ceccato, 2020; Iqbal, 2021; Whitzman and Wekerle, 1995).

Many researchers approve of the effect of gender on the fear of crime. Women express a greater fear of crime than men since women's fear is often associated with concerns about sexual assault (Madge, 1997; Iqbal, 2017; Schneider & Kitchen, 2007). Referring to Grabosky's (1995) study on fear of crime, gender is the most consistent factor. He explained why women report a greater perceived risk of crime than men; since women fear sexual assault and physical violence from home or public spaces, women's fear may also reflect their perceived risk of abuse. Whyte's perception of environmental socio-pathologies supports the idea that crimes affect women more than men (Whyte, 1980). Women's fear of harassment in public spaces encourages them to avoid being in these spaces. Also, fear of crime creates a separation between women and men in public spaces (Iqbal, 2021).

Age is another variable affecting an individual's sense of safety. Evidence shows that young people between (16-24) and older adults report the highest fear of crime (Scogan, 1995; Mac Carel et al., 1997; Taylor and Hall, 1986 cited by Schefer et al., 2006; Rezvani & Sadra, n.d). According to (Hilinski et al., 2011), young women are at higher risk for sexual assault and rape.

Individuals' economic status is another important factor affecting fear of crime. Pain (2000) explains that individuals with a lower socioeconomic status, poorer health, or an ethnic minority are more likely to be afraid of crimes. The fear of crime and urban safety is often correlated with alcohol and drug consumption and traumatic life events (Iqbal, 2017; Iqbal,2021; Wilson & Kelling; 1982; Wilson & Kelling; 1982).

#### **2.4.3.2 Social and Cultural Factors**

Security problems arise due to the breakdown in social and cultural structure and norms, the population density of camps, limited privacy available, proliferation of small arms in conflicts, the separation from and loss of family members and community's support and the level of war crimes or crimes against humanity (UNHCR,2006). Also, poverty, poor living conditions, and unemployment inside the camps affect the camp's security (Zhang & Tiltne,2013).

Asifa Iqbal highlighted the essential role of promoting social integration in creating socially sustainable, cohesive, and resilient public spaces, reducing the fear of crime, and increasing perceived safety. He adds, "The interaction between society's complex infrastructures and human behavior has a great role in interconnecting all three forms of sustainability that are social, physical and ecological" (Iqbal,2021:7).

#### **2.4.3.3 Physical Environmental Factors**

Designing safe environments is essential to communities' success and should be central to planning and delivering new development. A well-designed place where people feel safe and secure improves the quality of life. Understanding the physical features of "physical crime generators" that could attract offenders and raise the risk of crime in place might help improve the safety level in place.

Physical factors that are interdependent to achieve perceived safety in space refer to the design characteristics of the physical environment of public spaces. These factors include design layouts, mixed land use, street patterns, street furniture and materials, barriers, lighting, accessibility, landscape design and colors, music and sounds (Iqbal, 2021; Schneider & Kitchen, 2007).

Ceccato (2012) compared two high-crime neighborhoods, one in London and the other in Rio de Janeiro, Brazil. He found that both the two cities share some common characteristics, such as a neglected built environment, poor maintenance, lack of services or public facilities, lack of natural hazards, and drug dealing (Ceccato, 2012). Crowe added that "the physical environment can be manipulated to produce behavioral effects that will reduce the incidence and fear of crime, thereby improving the quality of life" (Crowe, 2000b: 34).

### ***Lighting***

Light is defined as "something that makes things visible and provides illumination" (dictionary website). In the protection and security equation, light is used to make security threats visible to prevent risk, while inadequate lighting can hide security threats and increase security risks (Perkins, 2015). Research shows the positive impact of good lighting on improving security and reducing crimes such as physical assault or sexual violence at night (Iqbal, 2021; Ceccato & Nalla, 2020; UNHCR, 2017b; CPTED Guide, 2003). In refugee camps, good lighting reduces the risk of Social and Gender-Based Violence (SGBV). This relationship is supported by the natural logic that people feel safer when a street is lit (Perkins, 2015).

Lighting in open spaces plays a crucial role in human experience in space and their sense of safety. Adequate lighting of parks and public open spaces can make spaces more inviting and help create visual experiences. On the other hand, good lighting increases visibility and natural surveillance in open spaces that help in reducing crime and, crucially, the fear of crime (Schneider & Kitchen, 2007; Wekerle & Whitzman,

1995). Also, when illumination is being increased in open spaces at night, it will suggest a more welcoming space for users to use, which will increase the eyes upon the street's "natural surveillance" (Crowe, 2013).

Lighting factor is linked to surveillance Jacobs explains this relation by giving the following example "Horrifying public crimes can, and do, occur in well-lighted subway stations when no effective eyes are present. They visually never occur in darkened theaters where many people and eyes are present. Street lights can be like that famous stone that falls in the desert where there are no ears to hear" (Jacobs, 1961: 41). Tandogan and Ilhan (2016) also add that fear of crime is highly perceived in dark subways, long alleyways, deserted areas, and silent-isolated streets.

Fear of crime and personal violence is reported after dark. Poorly designed open spaces with poor lighting offer opportunities for crime to occur in those spaces. Wekerle and Whitzman recommended in their guidelines for planning, design and management that the level of lighting at night should make users able to identify a face 15 meters away (Wekerle & Whitzman, 1995).

The level of fear related to darkness factors may differ from place to place. At a different administrative level in Britain, The Bradford audit notes that: "The most common places that people avoid after dark are town/city centers (36%), poorly lit areas (16%), secluded/quiet streets (15%) and parks/woods (13%). The locations most commonly mentioned as places that are avoided during the day are secluded/quiet streets (23%), subways (21%) and parks/woods (20%) "(Schneider & Kitchen, 2002:18).

Zhang and Tiltne (2013) studied Palestine refugee camps in Jordan to examine the relationship between darkness and the level of safety inside and outside the camps. The study shows that the residential area inside the camp is considered safe for most of the camp's residents during the day and less safe at night (See Table 2.6). The survey asked separately about the safety of children, women, and men, and they were asked to consider the situation in daylight and dark the night. The observations show that while men's safety is affected modestly by the change of light from day to night,

safety for children and women is highly influenced by the darkness of space factor, especially inside camps. For instance, only 30 percent believe it is safe for women to be out in the dark, and 18 percent consider it safe for children.

Table 2.6 Perception of safety, crime and substance abuse in people's residential area. Comparison of Palestinian refugees outside and inside camps. Percentage of randomly selected individuals aged 15 and above

	Outside camps	Inside camps
In general, it is safe to go out in daytime		
For children	82	76
For women	94	84
For men	98	96
In general, it is safe to go out after dark		
For children	30	18
For women	51	30
For men	97	90
Crime and/or violence constitute a problem	24	78
Alcohol abuse is a problem	26	83
Drug abuse is a problem	23	78

(Source: Zhang and Tiltner, 2013)

Lighting could be used to influence refugees' behavior and activities in their settlements at night. People avoid leaving their homes at night when there is no lighting on the streets in camps (Perkins, 2015). Figure 2.9 illustrates how light can guide people to leave their shelters at night. In Rhino Camp, Kenya, productive activity has increased in villages with lights compared to those villages without community lighting. Productive activities include adults socializing and distributing food, children playing outside, and more teenagers reading and studying under the light (UNHCR, 2017b).

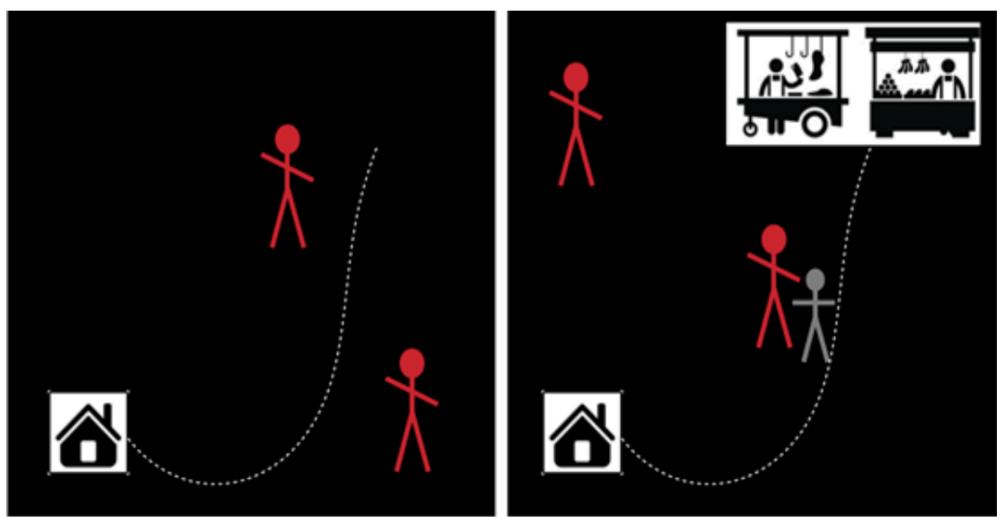


Figure 2.9 How light can be an incentive for people to leave their shelters at night

(Source: Perkins, 2015)

Different communities comment differently on the impact of light on their lives. For instance, in Damak, Nepal, refugees highlighted that light reduces vandalism and theft. While in Azraq, Jordan, refugees do not feel safe going out at night without a light. Refugees in Dollo Ado, Ethiopia state that household and neighborhood lights play a role in exposing snakes, wild dogs, and hyenas (Perkins, 2015). In Rhino Camp, Kenya, refugees believe that nighttime lighting increases the sense of safety, controls criminal behavior such as violence and theft and prevents encounters with wild animals (UNHCR, 2017b).

### ***Sound and music***

Cornish and Clarke (2003) also identified “soothing music and muted lights” as an intervention strategy to reduce stress and frustration as one of their situational crime prevention techniques (Schneider & Kitchen, 2007). Timberg (2005) noticed the relationship between music and the level of crime. He found that classical music could work in reducing crime in public spaces.

In Australia, Britain, Canada, and the United States, various authorities use classical music for crime control as a deterrent to reduce hooliganism and ward off undesirables, including the homeless. These countries also use classical music in the government and business sectors to repel and control teens, their activities and accompanying noise (Hirsch, n.d). Evidence shows that in the United States, food companies like McDonalds use classical music to exclude homeless people from their stores since many homeless people in the US are composed of blacks and Latinos. They usually dislike listening to classical music (Moffitt, 2020).

### ***Accessibility***

Accessibility is another critical factor affecting the safety level in open spaces. Accessible places are more likely to experience high crime levels, especially with poor surveillance. Weisburd, Bernasco and Bruinsma (2009: 200) argue that "If a place is easily accessible, because of its position in the urban street network example, a lot of people will visit that place, which increases the risk of offenders and targets converging."

### ***Vegetation***

Vegetation is an important physical element that helps feel safe in an urban environment. Vegetation is a soft physical element that creates symbolic barriers to define a space's territory and control access to public places (Gehl, 2001). The importance of landscape and Vegetation is not limited to Residents' well-being, environmental and aesthetic values. Researchers found that there is a relationship between Vegetation and perceived safety (Lis & Iwankowski, 2021; Wolf, 2010).

Evidence shows that residents who lived in buildings with more vegetation areas reported a greater sense of safety than those living in relatively barren settings (Wolf, 2010; Kuo et al., 1998; Kaplan & Talbot, 1988; Lis et al., 2019). Wolf (2010) also claims that vegetation is one of Crime Prevention Through Environmental Design (CPTED) which can be used to create a reassuring environment, reduce fear, and increase citizen surveillance and defensible space.

Studies show that reported violence was significantly lower in green, landscaped open spaces with vegetation barriers, including trees and grass, compared with unlandscaped spaces (Brunson, 1999; Kuo & Sullivan, 2001). During a survey of Chicago public housing units, residents reported less graffiti, vandalism, and littering in outdoor spaces containing trees and grass compared to empty spaces (Brunson, 1999). Kuo & Sullivan's study (as cited in Wolf, 2010) on the property and violent crimes within public housing communities of inner-city Chicago has compared buildings with different levels of vegetation to the level of crime. The study illustrates that higher levels of vegetation recorded 52% fewer total crimes, 48% fewer property crimes, and 56% fewer violent crimes than buildings with low levels of vegetation (See Figure 2.10).

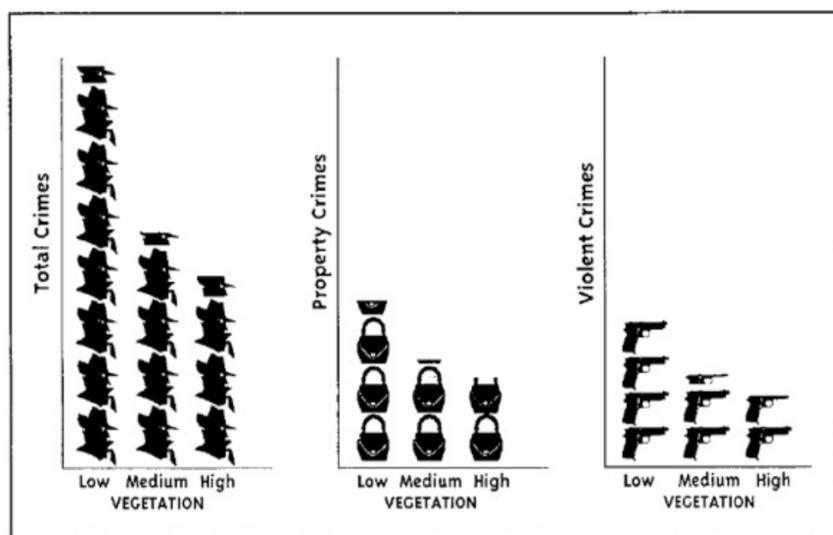


Figure 2.10 Mean number of crimes reported per building with different amounts of vegetation

(Source: Wolf, 2010)

### ***Street design***

Jane Jacobs's *The Death and Life of Great American Cities* (1961) identified safety and security as significant elements of a well-functioning city. Jacobs (1961: 30-35) argues that "the bedrock attribute of a successful city district is that a person must feel personally safe and secure on the street."

Yang's multi-layer research (2006) on environmental factors that influence burglary in residential areas studies the relationship between street patterns and crime, especially burglary. Using geographical information system (GIS), He identified street patterns and then defined the following variables:

- “Distance to closet major arteries
- street layout patterns
- street types around parcels
- distance to public transportation
- corner location
- block length
- connectivity index (a ratio of roadway segments to intersections or cul-de-sac)”

(Schneider & Kitchen, 2007: 47)

Schneider and Kitchen summarize Yang's statistical analysis as the following:

*"Within the city study area, the incidence of first-time burglaries is highly correlated with permeable street patterns. Indeed, the street pattern most statistically associated with burglarized residences is the gridiron layout. the relationships between fragmented parallels, warped parallels, loops and lollipops, and lollipops on a stick design are not statistically significant."*

(Schneider & Kitchen, 2007: 48-49) (See Figure 2.11).

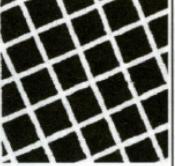
	Gridiron (c. 1900)	Fragmented parallel (c. 1950)	Warped parallel (c. 1960)	Loops and lollipops (c. 1970)	Lollipops on a stick (c. 1980)
Street patterns					

Figure 2.11 Street design patterns

(Source: Southworth and Owens, 1993 cited in Schneider & Kitchen, 2007, p.49)

A clear definition between vehicular traffic and pedestrian traffic enhances pedestrians' sense of street safety. Oscar Newman (1973) found that traffic could reduce crime by increasing surveillance. He claims that "vehicular access provides a form of continuous natural surveillance, as well as an opportunity for formal patrol authority" (Newman, 1973: 60). Also, natural surveillance can be achieved by creating street-based activities along the streets or paths (e.g., Shopping, sitting, playing, etc.) (Beavon et al.). Table 2.7 summarizes Schneider & Kitchen (2007) research conclusions on the relationship between street types and burglary.

Street furniture is a significant physical factor that affects the sense of safety in an urban environment. The placement of garbage bins and seating arrangements in a public space are examples of street furniture. For instance, the accurate placement of park furniture such as seats, food sales, the presence of water, and movable chairs was identified as other significant elements in attracting people to squares and parks and allowing for social interaction, and automatically generating perceived safety (Iqbal,2021).In street design, "parking should be visible and should be designed to be overlooked from streets and occupied buildings" (City of Gosnells, 2001: 17). Parking should be located toward building windows or in front of stores with good landscaping to ensure good visibility (natural surveillance) to parking and to improve perceptions of safe access for users and protection of vehicles (Newman, 1973; Jeffrey, 1971).

Table 2.7 Research on the relationship between street types and burglary

Street type(s)	Conclusion(s)	Source
Traditional street pattern (grid) or hierarchical street pattern	A strong correlation between layout type and crime: traditional street patterns the best and the most “modern” hierarchical layouts the worst.	Hillier (2004)
Through street, cul-de-sac, integrated (more movement potential) or segregated (less movement potential)	Culs-de-sac may be preferred by burglars, as they deter passers-by and reduce natural surveillance.	Hillier and Shu (1999)
Culs-de-sac, quiet residential street, commercial street, busy residential street, back road/ local traffic	The most victimized locations are houses located on a busy residential street or on a back road with local traffic only.	Rengert and Hakim (1998)
Major throughfare or small neighbourhood street	Low- crime neighbourhoods were more likely to have small one-way and two-lane neighbourhood streets.	Greenberg and Rohe (1984)
Major or minor streets	There were higher rates of commercial burglaries in facilities along major streets.	Nasar (1981)
Dead-end, culs de sac, “L” type, “T” type, and through-traffic streets	There is a noticeable pattern of lower residential burglary rates in housing located on blocks with lower accessibility.	Bevis and Nutter (1977)

(Source: Schneider & Kitchen, 2007, p. 48)

### ***Mixed use spaces***

Various researchers, architects, and urban planners have studied how different types of places relate to crime distributions and how the characteristics of the built environment and human activities can determine opportunities for crime. For instance, mixed-use spaces show both positive and negative effects on the level of safety and crime opportunities. It has been argued that mixed land use spaces such as large parks generate more activities throughout the day and have lower crime levels. Also, large parks with a significant number of users and different activities contribute to natural surveillance that increases the feeling of safety (Groff & McCord, 2012; Iqbal, 2021).

Urbanists and planners support the role of mixing land uses in reducing crimes (Jacobs, 1961; Newman, 1973; Wekerle & Whitzman, 1995; Schneider & Kitchen, 2007). Jacobs (1961) argues that mixing land use creates more active spaces during the day and the night, which will increase natural surveillance through having “more eyes on the street” and thereby makes public spaces safer. Newman (1973) also supports the idea that mixed land uses mean decreasing the isolation of residential areas and increasing natural surveillance. He claimed that “the area’s most usually identified as safe are heavily trafficked public streets and arteries combining both intense vehicular and pedestrian movement; commercial retailing areas during shopping hours; intuitional area; and government offices” (Newman, 1072: 108-109).

On the other hand, Ceccato (2012) found that areas with mixed land use, such as city centers, open spaces, and transport nodes, are often more criminogenic than residential areas. He also introduced the "routine actives theory" by Cohen and Felson (1979). The theory suggests that individuals' activities in space affect the opportunities for crime. For instance, if people spend a considerable time outdoors, there will be a greater risk of victimization because of increased contact with others.

#### **2.4.4 Broken Windows Theory and Sense of Safety**

In the paper " Broken windows," Wilson & Kelling (1982) outlined the negative environment and chaos do not only lead to fear of crime but also affect the opportunities for criminal acts. They used the symbol of "Broken window" to refer to all types of disorders." The Broken Windows" hypothesis is based on the assumption that if a window is broken and left without maintenance or unrepairs, more windows will be broken. In other words, unrepaired windows (intended disorderly behavior) may damage the community's control (Wilson & Kelling, 1982; Burgess & Doran,2011).

In the case of public spaces, when public or common areas are vandalized and poorly maintained, users get the message that the space is not controlled. Consequently, the chances of the act of violence in such spaces might increase (Wekerle & Whitzman, 1995). Burgess and Doran (2011) described the cycle of broken window hypotheses. The lack of control of disorderly behavior creates social and physical incivilities and increases residents' fear of these uncontrolled spaces. As a result, an influx of criminal behavior will be grown (see Figure 2.12).

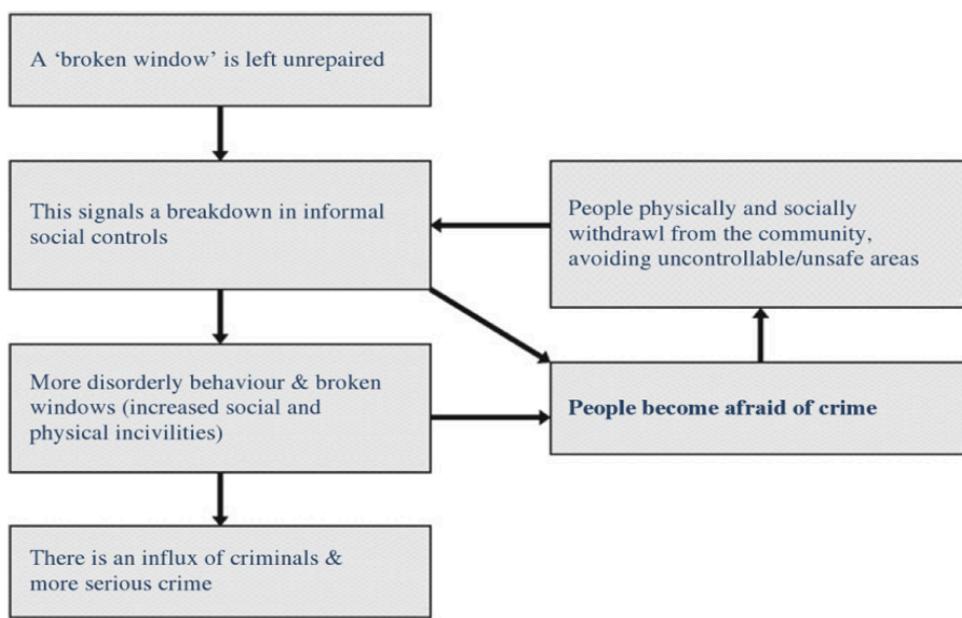


Figure 2.12 The cycle of the broken windows hypothesis, highlighting the role of fear of crime

(Source: Burgess & Doran, 2011)

#### 2.4.5 The impact of fear of crime on residents' behavior and well-being

Public spaces perform a critical role in human beings' psychological and mental health. They provide places for relaxation and social interaction, and social engagement (Thompson, 1998; Lynch, 1992; Carr et al., 1992; Council of Europe, 1986). Green and open public spaces play a role in improving the environment and adding aesthetic quality to the city (UN-habitat, 2018; Carr et al., 1992; Thompson, 1998).

Architects and criminologists support the concept that the sense of safety or fear of crime in urban spaces has a significant effect on human behavior in a space (Hall, 1959; Lynch, 1960; Jacobs, 1961; Newman, 1973b; Ceccato, 2012; Ewing and Handy, 2009; Shehayeb, 2008; Iqbal, 2021). Fear of crime can be described as a phenomenon that leads to direct and indirect negative outcomes in the daily life of

city residents. Fear of crime can harm individuals' anxiety, stress, insecurity, incompatibility, alienation, and psychological disorders. (Tandogan & Ilhan, 2016). For instance, if citizens perceive a space as unsafe, they might avoid using it (Hilborn, 2009; Iqbal, 2017).

According to Newman (1972), the image of the space influences the residents' relation and attitude to space. For instance, the positive image bolsters residents' sense of pertinence to their environment. In contrast, the negative image of space increases a sense of fear and discourages residents from spending time in their environment (Reynald & Ellfers, 2009). Newman argues that "if urban areas, streets or paths are organized as being safe, adjoining areas benefit from the safety in a real sense and also by association" (Newman, 1972: 108). Concerning residents' sense of "pride to place," the maintenance and the "image of place" can be the main impact on qualifying the area (CPTED guidebook, 2003).

Physiologists are working on involving Newman's theory of defensible space and how the perceptions of environmental design affect residents' territorial behavior and feeling of safety (Reynald & Ellfers, 2009). Later on, based on "Newman's theory of defensible space" studies created an atheoretical basis for shaping an urban concept of (CPTED), which focuses on design elements of the physical environment as a potential tool to understand criminal behavior and to reducing forms of criminality (Matlovičová, Mocák & Kolesárová, 2016). Crowe (2000) argues that the CPTED aims to achieve a proper design that effectively uses the built environment to reduce crime and fear of crime and improve the quality of life.

In Shehayeb and Eid's words (2007: 110), "(place) use was seen as an initiator of feelings of safety, yet it is an indicator that people feel safe enough to use a place. Thus, the relationship between use and feelings of safety is best described as cyclic".

See Figure 2.13

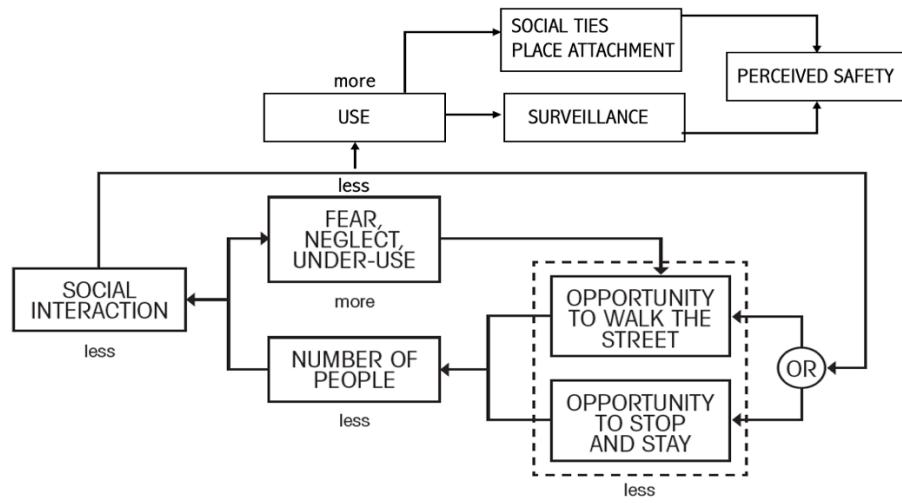


Figure 2.13 The cycle of fear based on the concept of opportunities

(Source: Shehayeb & Eid, 2007; Shehayeb, 2008)

Shehayeb (2008:110) discussed that “fear of crime is more widespread than the crime itself and impacts people’s behavior and decisions to use space or avoid it”. She also argues that “there are still studies that suffer the shortcoming of examining the direct effect of isolated quantifiable physical conditions, ignoring the multi-dimensional nature of the surrounding environment in its socio-physical totality. And, the negative effects of modern planning principles are still being applied to new cities and urban renewal projects; local character is destroyed and heritage blurring, to promote tourism and increase national income” (Shehayeb, 2008:110).

Ewing and Handy (2009) examined the role of perceptions between physical features of the environment and walking behavior. They found that the physical features, urban qualities, and individual reactions may influence individuals’ behavior, level of interest, sense of comfort, and sense of safety (See Figure 2.14).

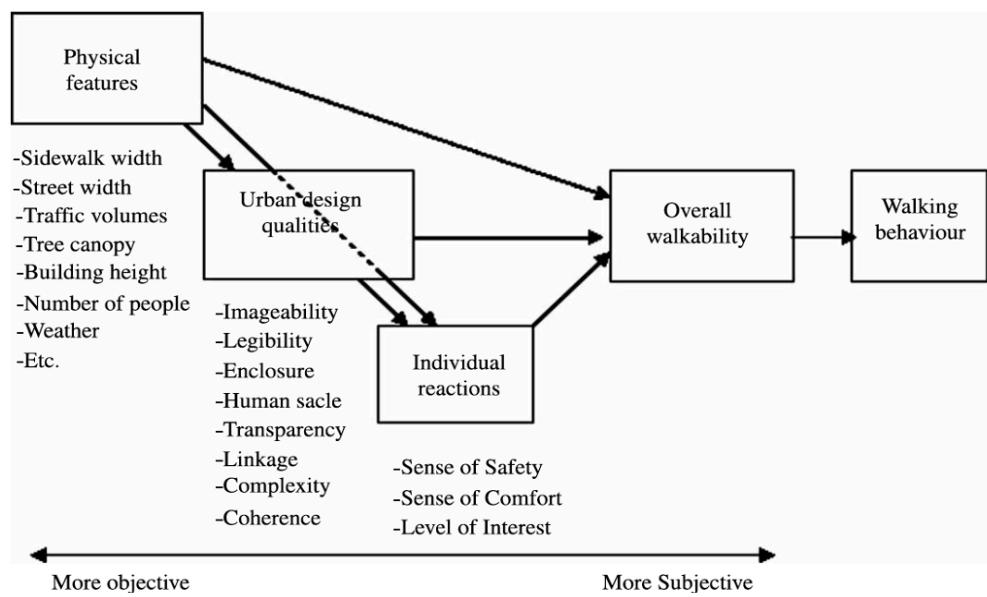


Figure 2.14 The relationship between physical features of environment and walking behavior

(Source: wing and Handy, 2009)

The architect Karina Landman illustrates how crime and fear of crime impose changes in the dynamic dimension of the urban fabric. She indicates that:

*“...crime and fear significantly change the nature of the built environment in South Africa. Fortification influenced the materiality of the city in two ways, namely changing the form and structure of cities from a fine-grained pattern to a coarse grain through the increase of fortified enclaves and through the new aesthetic of fear symbolized by physical elements such as burglar bars, boom gates and electric fences. These changes in the urban fabric also change the way people use and experience space and adapt their lifestyles to avoid public open space. A new social order is thus facilitated through the establishment of a new spatial order in the urban landscape. Given these relationships between crime, urban fortification and the modification of and interaction with the urban fabric, one cannot look at urban fortification in isolation, but must also consider the causes and consequences from a systemic viewpoint.”* (Ceccato, 2012: 8)

## 2.4.6 Measurements of Sense of Safety in Refugees Camps' Open Spaces

When considering refugee experiences that contribute to psychological problems such as a sense of safety, it is essential to consider the pre-migration traumatic events in their home countries and post-migration traumatic events in their host countries. Post-migration and pre-migration traumatic events are moderated by a group of factors, including the typology of refugee (i.e., voluntary migrants, refugees, asylum seekers, asylee, parolee) (Walker et al., 2016), typology of refugee settlement (i.e., cities with localized displacement impact, cities under widespread stress from displacement, cities and towns heavily affected by conflict damage and urbanizing camps (See section 2.1.3), gender, and host country status (Kuttikat, 2010). Figure 2.15. a conceptual framework for understanding the impact of traumatic migration events on refugee trauma. See Appendix B for types of migrant definitions.

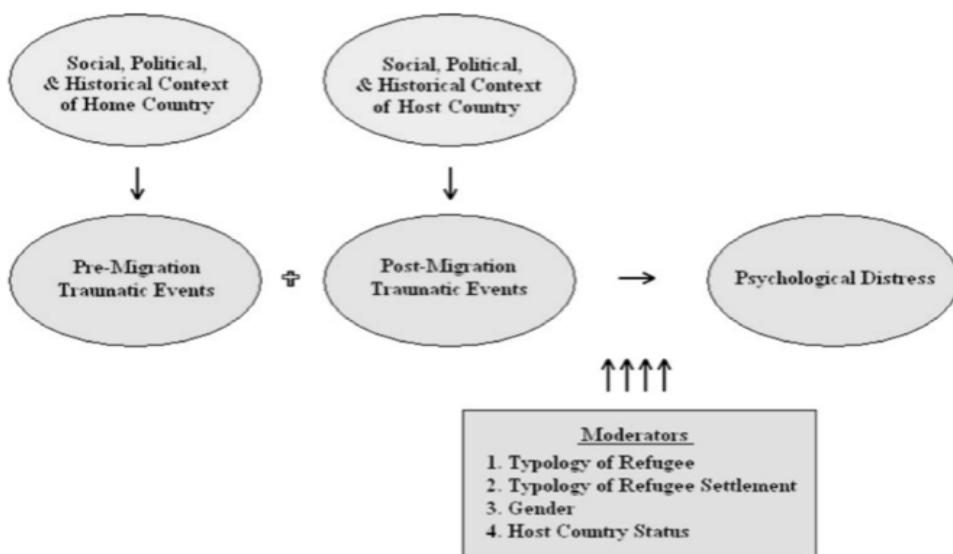


Figure 2.15 The impact of migration traumatic events on refugee trauma

(Source: Kuttikat, 2010)

Settlement planning and design can promote community cohesion, mitigate disaster risks (flooding and disease), and enhance living environments and quality of life (UNHCR, 2021c). The physical layout, capacity, size, and design of the camp can contribute to the maintenance and security in refugee camps (UNHCR, 2003 & 2021c). The location and plan of a camp can significantly impact the protection of residents and their access to assistance. Suitable, well-selected, safe, and adequate distance from border areas with appropriate infrastructure is essential to ensure a safe environment for refugees. The site plan of refugee camps should consider topography, land use, climate, soils, geology, hydrology, vegetation, infrastructure, and critical natural and cultural resources (UNHCR, 2021c).

Accessibility to essential infrastructure in refugee camps significantly impacts the safety of its residents. Basic infrastructure includes water, sanitation, food distribution, health, education, community services, and income-generating activities. The global community of water, sanitation, and hygiene (WASH), researchers, practitioners, and policymakers have addressed the challenges of accessibility to water; poor quality and quantity of water services can increase vulnerability to violence (Sommer et al., 2014; UNHCR, 2021c; Bruijn, 2009). Refugees can live in harsh environments that could obstruct access to WASH. Refugees who live in households without safe access to adequate water and sanitation facilities must spend long distances to find water sources (UNHCR, 2001-2021c).

Girls and women reported being more likely to experience violence concerning WASH. In some contexts, far, un-accessible and dark at night water services are identified as sites of anxiety and fear, and the journey can be dangerous since women can be exposed to physical injury (from carrying water), sexual, psychological, or physical violence. (Sommer et al., 2014; UNHCR, 2001-2021c).

UNHCR recommends that the capacity should not exceed 200 persons per water tap. Access to water should be less than 200 meters away from households, preventing women and children from traveling long distances to collect water for their families. Unfortunately, many refugee camps do not meet this standard. For example, refugees in Uganda have poor access to a water supply; only 43% of the population has access to water taps within 200 meters with a capacity of 450 people per water tap (Bruijn, 2009).

As mentioned, Zahang and Tiltne's (2013) study on (feeling of safety at home and close to home) in Palestinian refugee camps in Jordan showed camp residents feel safer outside the camp. And the risk of crime, violence, and substance abuse is much higher inside camps. They also found that poverty, dissatisfaction with living conditions, unemployment, and alcohol consumption are the factors that may contribute to a higher incidence of crimes and violence problems (See Table 2.8).

Table 2.8 Feeling of safety at home and close to home. Comparison of Palestinian refugees outside and inside camps. Percentage of randomly selected individuals aged 15 and above

		Outside camps	Inside camps
Feeling of safety in own home	Always safe	87	82
	Most of the time safe	11	15
	Sometimes unsafe	1	3
	Most of the time unsafe	0	1
	Total	100	100
	n	3,101	3,650
Feeling of safety in own home and its immediate surroundings compared to 3 years ago	More secure now	42	38
	Less secure now	12	24
	No difference	46	38
	Total	100	100
	n	3,093	3,629

(Source: Zahang and Tiltne's, 2013)

Early evidence shows a high-level criminal behavior in refugee camps, including assault, child marriage, domestic abuse, and organized crime such as human trafficking (Vincent & Whitworth, n.d; Jaffe, 2019). In the case of the Balata / Askar refugee camp in Nablus, evidence suggests that sexual violence and domestic violence are regular occurrences, with the victims often being women and children (Jaffe, 2019). Crime Prevention Through Environmental Design (CPTED) as a passive crime prevention strategy could be used in urban refugee camps to control criminal activities. CPTED also offers affordable solutions suited to the camp's environment and conditions (Jaffe, 2019). In their story about improving the refugee camps for children, Alice Vincent and Eleanor Whitworth (YEAR) suggest a set of methods based on CPTED theory. These methods are the Creation of community spaces and territoriality, livable spaces, natural surveillance, connectivity, and target hardenings.

#### **2.4.7 Designing Safer Spaces Through CPTED Principles**

Crime Prevention Through Environmental Design (CPTED) is an international movement to prevent crime through urban design. CPTED focuses on the relationships between residents and the surrounding built environment. In addition, CPTED draws on the behavioral psychology of residents and how physical design and management can influence people's behavior and reaction to an environment. The initial idea back to 1961 when the journalist Jane Jacobs argued in his landmark book *The Death and Life of Great American Cities* (1961) that land-use fragmentation into isolated and concentrated zones helped expose cities to the risk of crime. He also highlighted how city planning, physical design features, and environmental capacity for natural surveillance could promote safety or encourage criminal behavior.

The CPTED name itself was initially created by Professor C. Ray Jeffery (1971) and later expanded by the American Architect and city planner Oscar Newman. Oscar Newman studied the relationship between the physical environmental design of space and the opportunities for crimes in space. He published his findings as *Defensible Space: Crime Prevention through Urban Design* in 1972 & 1973 (Cozen & Love, 2015). In 1982, Wilson & Kelling proposed the Broken windows theory, published in their book (*Broken windows: The police and neighborhood safety*), further advancing the theory that the environment affects crime. (*Broken Windows*) used as a metaphor for disorder within neighborhoods. It refers to the impact of urban chaos and vandalism on crime and antisocial behavior (Wilson & Kelling, 1982).

There have been great attempts to use certain aspects of the built environment to reduce fear of crime and prevent crimes. According to the literature, well-planned public spaces with a clear vision, high natural surveillance, good lighting, human-scale entrance doors design, easy visibility windows, and regular maintenance enhance users' sense of safety in the public spaces (Newman, 1972; Hall, 1966; Wilson & Killings, 1982; Grabosky, 1995).

A strand of literature focuses on the privatization of public spaces. They show the importance of installing gates, fences, and electronic measures to create a safe environment (Iqbal, 2017). Jacobs (1961) has identified three elements to create perceived street safety. These elements are a clear division between public and private spaces, eyes upon streets (windows facing towards streets), and a continuous flow of people that makes the street space come alive. *Defensible Space* by Oscar Newman (1972) outlines those high-rise apartments had a much higher crime rate than low-rise ones due to the isolation from surveillance of public use units such as lobbies, elevators, stairwells, roofs, and corridors (Newman, 1972; Jeffery, 1975).

According to literature (Newman, 1972; Atlas, 2013; Cozen, 2007; Grabosky, 1995; Wilson & Killing, 1982), the built environment of open space should be designed so that users can feel a sense of ownership and recognize offenders. Planners and urban designers have a significant role in designing crime-free cities by developing and enforcing landscape regulations and crafting guidelines based on crime prevention through environmental design (CPTED). CPTED overlapping strategies can control criminal behavior in public spaces and reduce fear of crime, including territorial definition, natural access control, maintenance, management, natural surveillance, and territorial reinforcement (Cozen, 2007; Crowe 1991&2013).

### *Natural surveillance strategies*

Natural surveillance aims to keep "eyes on the street" to control criminal behavior in the space by putting "the offenders under threat of being observed" (Walls & Ford, 1980, p.12). Newman (1972: 78) defines natural surveillance as "the capacity of physical design to provide surveillance opportunities for residents and their agents." Jane Jacobs referred to natural surveillance as "eyes on the street" since it aims to keep intruders under observation and control. He claims that more activities on the streets can increase "eyes on streets" or, in other words, "natural surveillance" (CPTED guidebook, 2003, Jacobs, 1961). On the other hand, Soomeren (2013) argues that more activities can attract more people and more offenders to the space, resulting in more feelings of insecurity (See Figure 2.16).

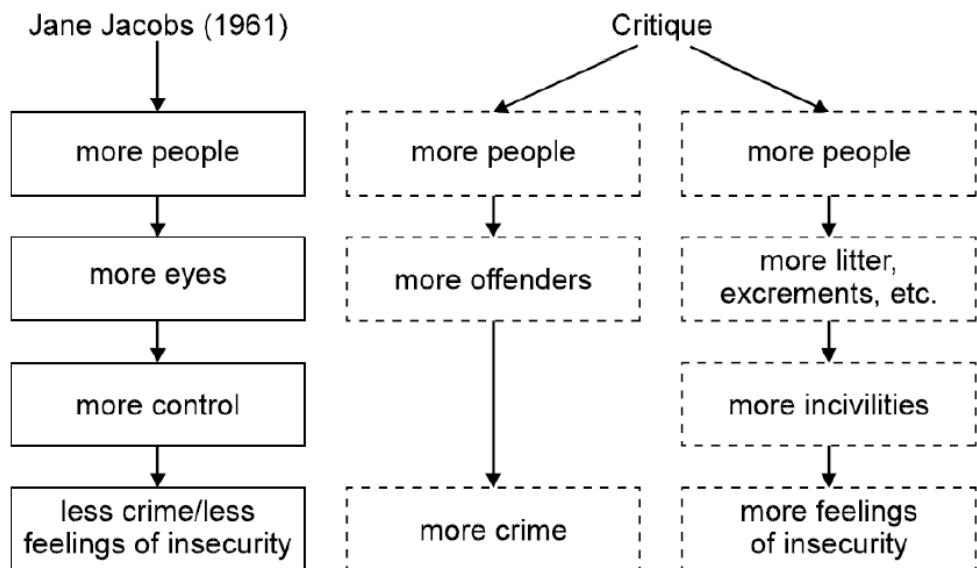


Figure 2.16 Two approaches about surveillance in cities

(Source: Paul van Soomeren, 2013)

According to Cohen and Felson's "Routine Activity Theory," spaces' with poor informal "natural" surveillance are more exposed to the risk of criminal behavior. "Routine Activity Theory" also examines the relationship between crime volumes and space's form on which nodes, paths and edges could shape the local level of crimes. The theory argues that nodes and paths are exposed to a higher crime risk because of their routine activities, which became target areas for offenders.

According to criminologists Derek Cornish and Ronald Clarke (2003), surveillance applications can be grouped into three types: formal, natural, and place managers. Formal surveillance aims to produce a "deterrent threat to potential offenders" (Clarke, 1997: 20). Formal surveillance can be applied in the space by having security guards or mechanical applications such as cameras for subway systems, parking facilities, and CCTV systems (Clarke, 1997).

Place managers include employed persons (bus drivers, parking lot attendants, and train conductors) who perform secondary surveillance functions. Natural surveillance also aims to make users under control and decrease criminal acts by keeping offenders under the watch and "placing eyes on the street" (Atlas, 2013; Jacobs, 1961) through environmental design. Environmental design applications that can prevent crime and ensure natural surveillance "CPTED applications" on open spaces include improved lighting, designated paths, proper placement of windows, and removing obstructions to enhance sightlines (Atlas, 2013; Newman, 1972). Surveillance applications and strategies can also be occurred simultaneously to increase space surveillance.

Surveillance can be enhanced by the appropriate architecture and site design, proper placement of windows, careful planting and landscape design, proper use of materials and colors, and the correct placement of buildings. Also, car parks can achieve natural surveillance and contribute to a safer built environment (Schneider & Kitchen, 2002; Shaftoe, 2008; Walls & Ford, 1980).

### ***Define transition zones (natural territorial reinforcement) strategies***

Natural territorial reinforcement aims to establish a sense of ownership in open space to signal offenders that they do not belong there and can be easily seen and identified. Newman (1973b) suggested that the physical design and layout of space contribute to a secure environment through four principles: creating recognizable areas that residents control and defend (territoriality), providing opportunities for residents to keep their housing environment under surveillance (natural surveillance), ensuring that the physical attributes of streets, spaces have a positive make it defensible (image), and by locating the residential areas to be adjacent to areas with safe activities (milieu).

Natural access control and surveillance enhance the sense of territoriality and encourage users to protect their turf. In the defensible space theory, space's territory can be performed using a space hierarchy by defining transition zones between public, semi-public, semi-private and private spaces (Newman, 1972; Atlas, 2013) (See figure 2.17).

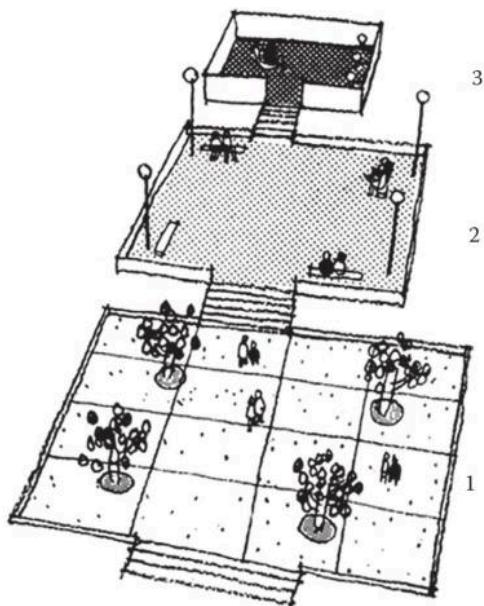


Figure 2.17 Hierarchy of space from public plazas to private space of residences

(Source: Atlas, 2013)

Space's territorial reinforcement strategies include fences, walls, planting and landscaping barriers such as berms, mechanical territorial techniques such as fence systems, and interior motion sensors. According to Oscar Newman, "these boundary definers are interruptions in the sequence of movement along access paths and serve to create perceptible zones of transition from public to private spaces" (Newman, 1973: 63).

### **Natural access control strategies**

Access control "is a design concept directed at reducing the ease of opportunity for crime" (Atlas, 2013: 70). The control zones are created by using physical and symbolic barriers between spaces (public, semi-public, semi-private and private). Physical barriers include fencing, hedges, gateways, burglar-proofing, locks, and walls. Planting and landscape elements around spaces can obtain symbolic barriers. Symbolic and physical barriers create "zones of transitions" that make it easier for residents to control their area and keep outsiders out (Crowe, 2000; Newman, 1996). Figure 2.18 shows a section of territorial layering from the public (street) to private (residential) space.

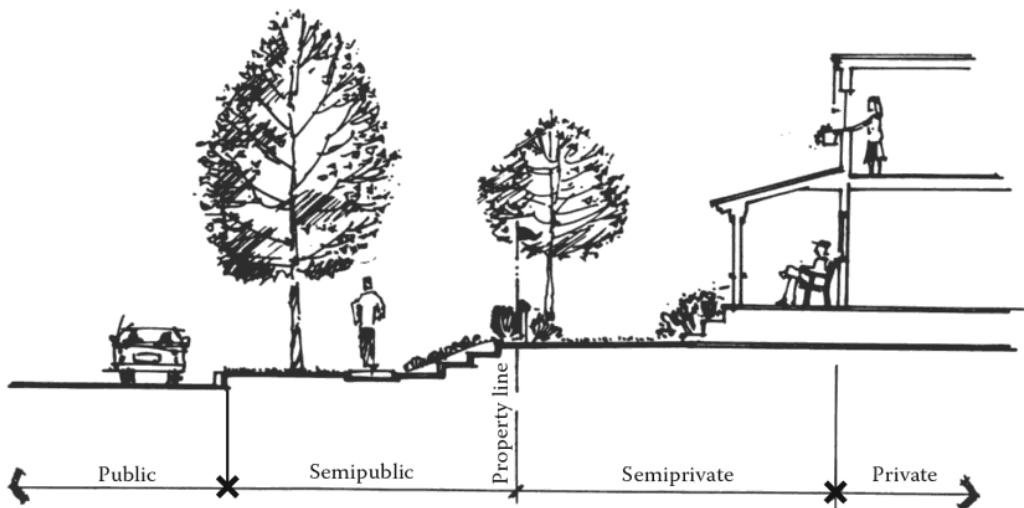


Figure 2.18 Section showing transition zone from public to private space

(Source: Courtesy of city of Vancouver planning department,  
Vancouver, British Columbia, Canada cited in Atlas, 2013)

Access control in open spaces aims to control offenders' accessibility to the space and create a sense of turf. Access control can be obtained through the use of mechanical strategies (e.g., electronic gates, electronic access for cars, locks), organized strategies (e.g., security officers), and natural strategies (e.g., employing barriers such as doors, traffic schemes, walls, fences and shrubbery). Access control limits access to space and reduce escape routes for offenders (Schneider & Kitchen, 2002; Shaftoe, 2008; Atlas, 2013; Clarke, 1997; Crowe, 2013).

### ***Maintenance and Management***

The effect of poor maintenance on the level of safety in public spaces has been highlighted by several researchers (Newman, 1972; Hall, 1966, Wilson & Kelling, 1982; Grabosky, 1995). CPTED and the "Broken Window Theory" suggest that neglected and poorly maintained properties are breeding grounds for criminal activity. Based on CPTED theory, the maintenance and management plan help preserve property value and make it a safer place (CPTED guidebook, 2003) (See section 2.4.4).

The "Broken Window" theory (Wilson, 1982) suggests that repair (maintenance) of broken or damaged items in space is critical for advertising to offenders that there is someone responsible for the supervision and control of the space. Management is a critical step in crime prevention to keep space under control. Crowe (2013: 45) claims that "proper maintenance protects the public health, safety, and welfare in all existing premises by establishing minimum requirements and acceptable standers."

Management policies are essential to ensure that space is well-maintained, users are screened and offenders are evicted (Atlas, 2013; Wilson, 1982). Walls & Ford (1980: 13) argued that “management practices can influence the crime-opportunity structure by changing the number of people who use the setting at a certain period.” Crime management policies constitute criminal justice by legal institutions of the Law system that are designed to confine offenders and prevent criminal behavior in open spaces.

Grabosky (1995) submitted a set of management solutions to reduce the fear of crime. Management applications include alcohol-free public places, public, and street policing (police control of vagrant, drunk, and rowdy youth), co-production of safety (organizing residents in the community programs and activities), and environmental design. CPTED has applications at the micro (building security), miso (street/neighborhood), and macro (town/city) levels. Cozen (2007) mentioned that we could use CPTED principles in the design stage of public spaces and modify existing urban environments to improve the quality of life, criminal control behavior in public spaces, and reduce fear of crime (Crowe, 1991).

## 2.5 Concluding Remarks

Figure 2.19 summarizes the theoretical framework of the study. The study focuses on studying the fear of crime in open spaces and understanding the factors that affect users' sense of safety in open spaces in refugee camps. The diagram explains the direct relationships between factors that affect the feeling of safety in open spaces and their human experience and activities in open spaces.

Factors that affect the sense of safety in refugee camps' open spaces are classified as physical and non-physical factors. Non-physical factors include criminal activities (ex., theft, sexual assault, murder, alcohol, and drug abuse), individual factors (ex.,

age, gender and level of education), social and cultural factors (ex., social integration, religion and media exposure), economic factors (ex., poverty and unemployment), level of maintenance and management applications.

The physical factors influencing users' feeling of safety in open spaces include the type of open spaces, level of surveillance, access control to open spaces and the physical environmental design. Open spaces typologies in refugee camps are classified according to their publicness, accessibility, physical form and geometric shape. The type of open spaces is also affected by the type of refugee camps; for instance, spaces in gated or semi-gated communities cannot be called public spaces. The level of surveillance in open spaces aims to keep "eyes on the street" to control criminal behavior and increase the sense of safety in the space by using CCTV, sufficient lighting and proper placement of windows.

On the other hand, access control aims to control the offenders' access to the space by using symbolic and physical barriers and vegetation landscape elements. Other physical environmental design elements such as street patterns and layout, landscape design, street furniture, sound and music also affect the safety level in refugee camps in open spaces. The level of perceived safety in open spaces shapes users' interactions with the surrounding environment, impacting their social interaction and activities in these spaces.

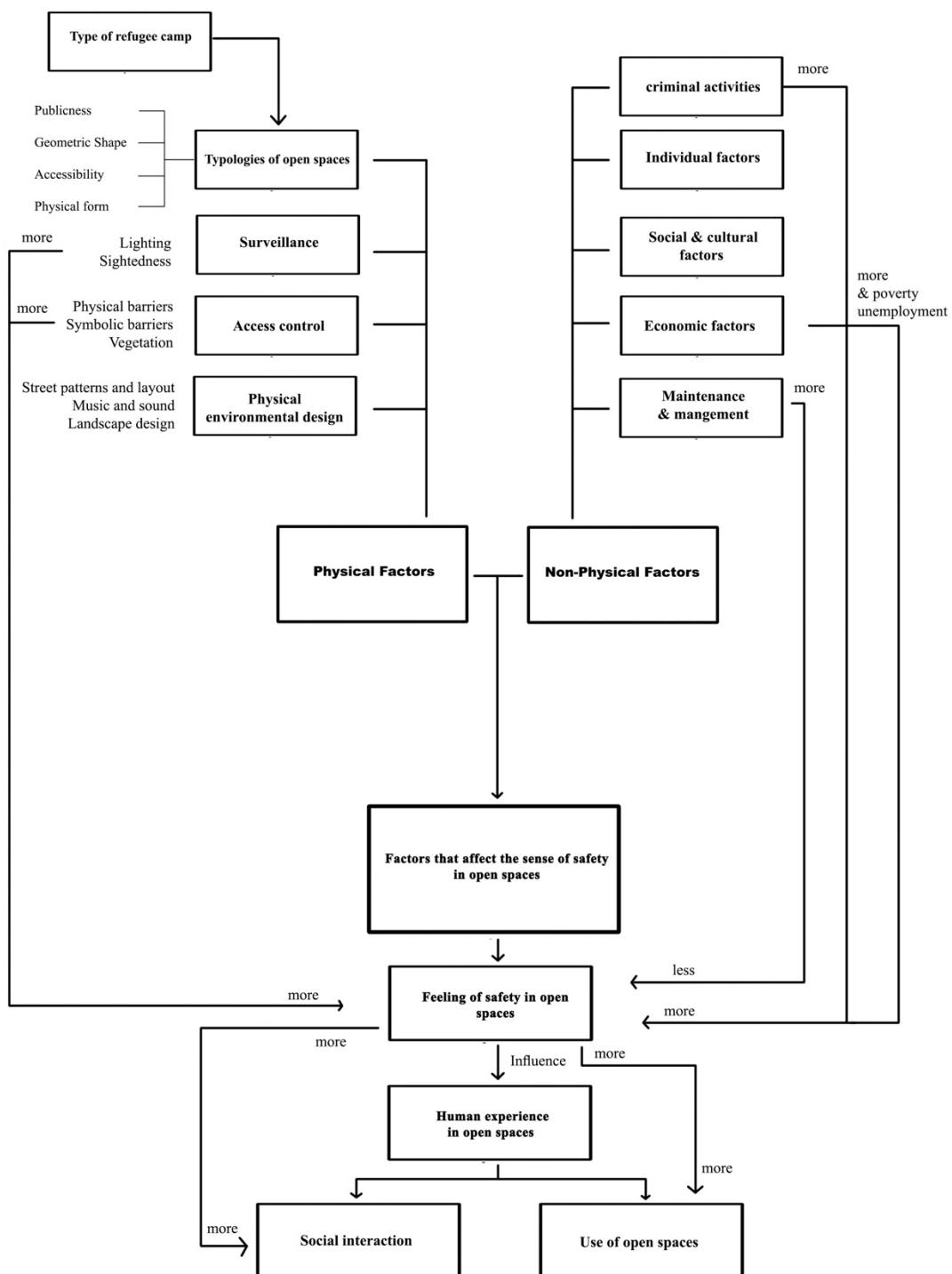


Figure 2.19 Concluding remarks of literature review

(Source: the author)



## **CHAPTER 3**

### **RESEARCH METHODOLOGY**

This research aims to investigate the link between open spaces design in refugee camps and the sense of safety of the users. More specifically, it questions how the physical environmental factors affect refugees' sense of safety in the outdoor spaces of refugee camps, the role of open spaces in crime prevention and whether some open spaces in refugee camps invite more criminal activities than others.

The methodological approach is designed by analyzing the parameters and sub-parameters of the study to understand how physical and non-physical factors of open spaces in refugee camps influence the level of sense of safety of refugees. Multiple data collection tools, including interviews, site observations, photography and mapping, are used to achieve the aims of this study and help the researcher better understand the context.

In this study, the suitability of potential research methods will help the author analyze the physical environmental characteristics of open spaces that affect the sense of safety in the Baqa'a refugee camp in Jordan. The study will also examine how the physical environmental design of open spaces in the camp affects residents' feeling of safety and experience in open spaces.

This chapter introduces the methodological approaches, site selection, sampling, data collection and analysis methods.

### **3.1 Research Approach**

The methodological approach for this research is structured on the findings from the literature review and the study's parameters. Studying the sense of safety in open spaces in refugee camps requires a research methodology that defines the types of refugee camps, open spaces typologies, and physical design and non-physical factors that influence users' sense of safety in open spaces. The research methods of this study should provide the researcher with insightful details about refugees' perceptions of safety and their experiences in open spaces to understand how the design of open spaces in refugee camps affects the refugees' sense of safety in open spaces.

Qualitative research methods are used to answer the research questions of the study. According to Gorman and Clayton (2005), qualitative research enables the collection of contextual data which can describe, explain and represent how people experience and interact with open urban spaces.

The study's methodological approach would ensure that research methods would be effective in treating the study's aims: understanding how the physical environmental features of the common open spaces in these settings hinder or promote the sense of safety of its users. Table 3.4 summarizes the research approach, data collection and analysis methods used throughout the study to answer the research questions.

### **3.2 Site Selection**

Baq'a refugee camp in Jordan is selected for this study. Baqa'a camp is the largest of the ten official camps in Jordan in size and spatial area. Baqa'a camp hosts around 28% of Palestinian refugees in official Palestinian refugee camps (Jordan Department of Palestinian Refugees, 2008; Alnsour & Meaton, 2013). The Baqa'a camp is perhaps the largest Palestinian refugee camp in terms of the population inside and outside Palestine, making it worthy of being called the "capital of the Palestinian diaspora" (Ayed, 2020) (See Figure 3.2 and Table 3.2).

Baq'a camp is selected for its large population, size, and plot area to allow studying different types of spaces and physical characteristics and understanding the impact of physical characteristics of open spaces on users' sense of safety. Also, some of the Palestinian refugees in the Jordan refugee camps are fully-fledged Jordanian citizens, and refugee camps in Jordan settings are more similar to permanent low-income housing settlements. Consequently, the urban characteristics of open spaces in Palestinian refugee camps in Jordan can be compared to open spaces characteristics in low-income housing settlements. The study results on the sense of safety in refugee camps in Jordan can be generalized to low-income housing settlements.

#### **3.2.1 Historical Context of the Baqa'a Refugee Camps**

The story of Palestine refugees goes back to the first of the twentieth century. On the 29th of November, 1947, the United Nations adopted "the partition plan" which sought to divide Palestine's territory into Arab (Palestinian) and Jewish states. After this date, the Zionist forces began coordinating with the British forces talking about field procedures to evacuate the Arabs from the areas designed for Jews (Israeli-Palestinian conflict, 2021). In 1948, the state of Israel was created along with the first Arab-Israeli War, and more than 700,000 Palestinians were forcibly displaced by the end of the war in 1949 (UNRWA, 2021).



Figure 3.1 Showing the Palestinian Resolution in 11th December 1948

(Source: UNRWA, 2021)

In response to the high number of Palestinian refugees who have become homeless, UNRWA was established by United Nations General Assembly Resolution 302(IV) in 1949 to protect Palestinian refugees. In 1950 the United Nations Relief and Work Agency for Palestine refugees in the near east (UNRWA) started to help them by saving them with basic life needs from shelters, food, primary medical care, and other essential services.

Since 1950 UNRWA has been responding to Palestine refugees' needs. UNRWA defines Palestine refugees as "persons whose normal place of residence was Palestine during the period 1 June 1946 to 15 May 1948, and who lost both home and means of livelihood as a result of the 1948 conflict." (UNRWA, 2021b:1). Palestine refugee camp is defined as "a plot of land placed at the disposal of UNRWA by the host government to accommodate Palestine refugees and set up facilities to cater to their needs. Areas not designated as such and are not recognized as camps" (UNRWA, 2021b: 1).

About 5.5 million registered Palestinian refugees (total Palestinian refugees "1950-present", 2021). Around 1.5 million live in 58 official Palestinian refugee camps in Jordan, Lebanon, Syria, the Gaza strip, the west bank, and East Jerusalem. UNRWA is responsible for ten camps in Jordan, nineteen in the West Bank, eight in the Gaza Strip, twelve in Lebanon, and nine in Syria (UNRWA, 2021a).

In some countries, refugees do not have to live in camp areas because of the national laws. For example, Palestinian refugees have a different experience in Jordan since Jordan had granted "any person who, not being Jewish, possessed Palestinian nationality before 15 May 1948 and was a regular resident in [Jordan] between 20 December 1949 and 16 February 1954" the Jordanian nationality (UNRWA, 2021c: 1). Therefore, unlike other Palestinian refugees in host Arab states, most Palestinian refugees in Jordan are fully-fledged Jordanian citizens, which gives them the right and the free opportunity to settle outside the camps. This "citizen/refugee" status has given them the means to guarantee their integration within Jordan's society while preserving their right of return (Al- Husseini, n.d.).

In Jordan, thirteen Palestinian refugee camps have evolved over decades from temporary shelters provided by tents to brick houses that have been built in haphazard piece-meal manners. Figure 3.2. shows the distributions of Palestinian refugee camps in Jordan. Over time, Palestinian refugees' camps in Jordan became more like permanent low-income housing settlements (Alnsour & Meaton, 2013; UNRWA, 2021a). Ten of these refugee camps are regarded as official refugee camps and managed by UNRWA. In contrast, the further three camps are not considered official refugee camps and are managed by the Jordan government instead of UNRWA (Department of Palestinian refugees in Jordan, 2008). Table 3.2. shows some basic information about the ten official camps in Jordan.

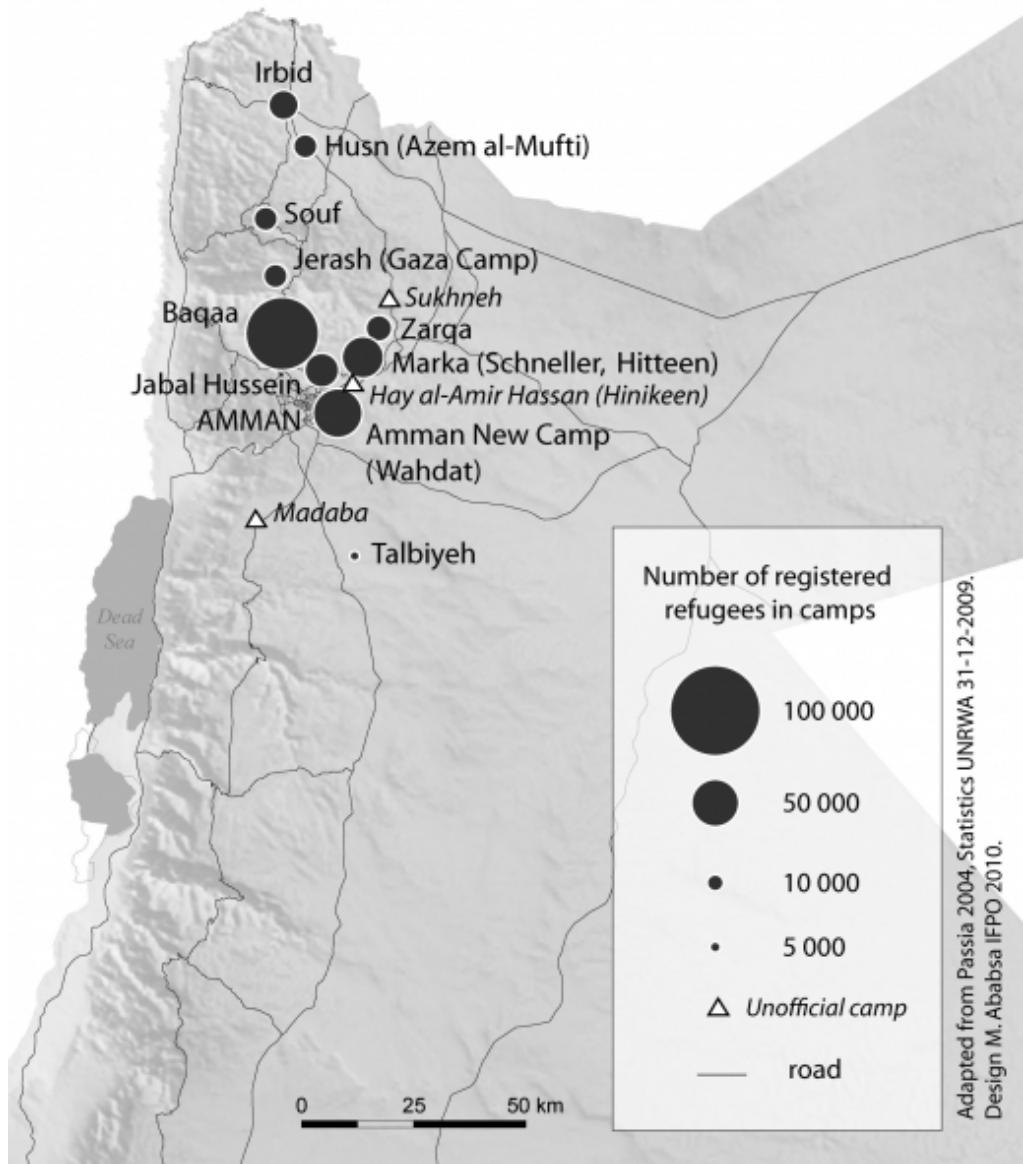


Figure 3.2 Map shows the locations of Palestinian refugee camps in Jordan with their populations

(Source: Al-Husseini, n.d)

### **3.2.2 Contextual Characteristics of Baqa'a Refugee Camp**

As mentioned in the previous section, the Baqa'a refugee camp was found as an emergency " temporary" shelter to house refugees and displaced people from Palestine between June 1967 and February 1968. Baqa'a has often been considered a "temporary" settlement to accommodate Palestine refugees for a limited time in the Jordan Valley (UNRWA, 2021a & 2022b). As in many cases (like in Jordan, Lebanon, and the West Bank in particular), Palestine refugees are forced to stay in Baqa'a camp for an unknown period, and they have started to replace temporary tents with housing units that are made of more permanent materials (UNRWA, 1961).

Today, the Baqa'a camp can be perceived as a "permeant temporariness" settlement since it officially remains a camp according to its administration (Aburamadan et al., 2020; Oesch, 2020; UNRWA, 2021a). Considering the spatial characteristics of the Baqa'a camp, this camp can also be regarded as an informal urban settlement (slum) (Agier, 2002). In this study, the characteristics of Baqa'a camp will be described based on the following categories: the form, the location of the camp and its relation to the city (in/out of the city), the urban layout, camp's density, level of integration, freedom of movement, mode of governance, mode and level of assistance, urban services and physical characters. Table 3.1 summarizes the general urban settings of the Baqa'a refugee camp.

Table 3.1 Contextual characteristics of Baqa'a refugee camp

Contextual characteristics	
The form	Informal settlements (slum)
Camp's location	In the city, located in Balqa city, 13km north of the capital Amman
The urban layout	the internal organization of urban elements of the camp have a chaotic layout
Camp's density	high population (more than 100000 registered refugees)
Level of integration	Camp's population is blended into the existing urban population
Freedom of movement	Baqa'a camp is an open camp, where residents can move in and out of the camp
Mode of governance	Baqa'a camp is managed and administered by UNRWA (UNRWA, 2022b)
Mode of assistance	Economically assistant by UNRWA (UNRWA, 2022b)
Urban services	Poor infrastructure and health system
Physical characters	permanent traditional housing units called " dar"

(Source: The author)

### **3.2.2.1**

### **Geographical Context**

Baq'a refugee camp was established in 1968 to accommodate Palestine refugees and displaced people who were displaced between 1967 and February 1968 from the West Bank, including East Jerusalem and Gaza. Baqa'a refugee camp is considered the largest in Jordan in area and population; it hosts more than 128,586 registered Palestinian refugees (DPA, 2021) and lies over an area of 1.4 square kilometers (UNRWA, 2022b; Namrouqa, 2014). Baqa'a refugee camp is located in Balqa, 13km north of Amman and sits along the South-North Highway, which connects Amman to the northern cities of Jordan (See Figure 3.3).



Figure 3.3 Map of Jordan with Palestinian refugee camps

(Source: Tiltner & Zhang, 2013: 14)

### **3.2.2.2**

### **Urban Patterns of Baqa'a Camp**

Baq'a refugee camp was not planned to exist for more than 70 years. It was designed as a transitional space to control and manage refugees (Malkki, 1992,1994). Still, Palestinian refugees were forced to stay in refugee camps in the host counties because of the Zionist occupation of their lands in their homelands (Qasmiyah, 2020). Baqa'a camp was already a large camp in its early years (in the 1968s), with 5,000 tents (which were provided by the International Committee of the Red Cross (ICRC) for 26,000 refugees). Between 1969 and 1971, UNRWA replaced the tents with pre-fabricated shelters, which led to the establishment of more complex social and political structures. The camp is now developed from a temporary shelter into a permanent low-income housing settlement, more accurately described as a slum (UNRWA, 2022b; Qasmiyah, 2020).

Figure 3.4. illustrates the transformation of the Baqa'a camp layout from 1948 to the present. The Baqa'a camp layout from 1948 shows the random distribution of tents corresponding to groups of refugees arranged by kinship or villages in the vanguard. Within a few years of the camp's establishment in the 1950s, UNRWA has subdivided the camp into 96-100 m<sup>2</sup> refugee plots made of prefabricated asbestos sheets and zinc roofs. Each property is granted as a personal "right-of-use" to each refugee family to live in. The 1960s Baqa'a camp layout represents the re-alignment of plots as acts of 'spatial violations' and the brick fence additions inside the UNRWA plots to provide internal amenities for refugee families.

In the 1970s, plots were filled with concrete rooms and Attabat ("doorsteps"), which were used as outdoor social spaces. After 70 years of displacement and continued building up of needed space for increased population, the camp has started to expand vertically.

The illustration of the 1980s-90s shows the saturated horizontal layout of the Baqa'a camp. Figure 3.4 shows the adaptation of architectural elements to allow for vertical expansion (light metal stairs on the left that gradually morphed into solid, concrete stairs as shown on the right). The last photograph in this figure shows the current layout of the Baqa'a camp, which has become a 'Palestinian-political' space (Qasmiyah, 2020; Maqusi, 2021).

Most of the camp households in the Baqa'a camp reside in traditional houses called "dar". Dar can be described as "a long-standing house and typically used to comprise two to four rooms on the ground floor plus some outdoor space adjacent to it" (Tiltnes & Zhang, 2013: 50). Over time, dar has vertically expanded to multi-story structures and apartment buildings. The land of dwelling units "is provided for free by the Jordanian government, which either owns the land or has long-term leasing agreements with private landowners" (Tiltnes & Zhang, 2013: 52). Consequently, although camp dwellers formally own the dwelling itself, they do not own the land, they only have the 'right of use' of the associated plot.

Today, in Baqa'a camp, there are more than 11500 dwelling units made of poor-quality cement and corrugated metal plates roofs, eight schools (males and females) affiliated with the International Relief Agency that operates on a double-shift system, four government schools affiliated with the Ministry of Education and two social clubs (DPA, 2021). Figure 3.5 shows an Arial view of the Baqa'a refugee camp, which illustrates the density of dwellings and buildings in the camp with its surroundings.

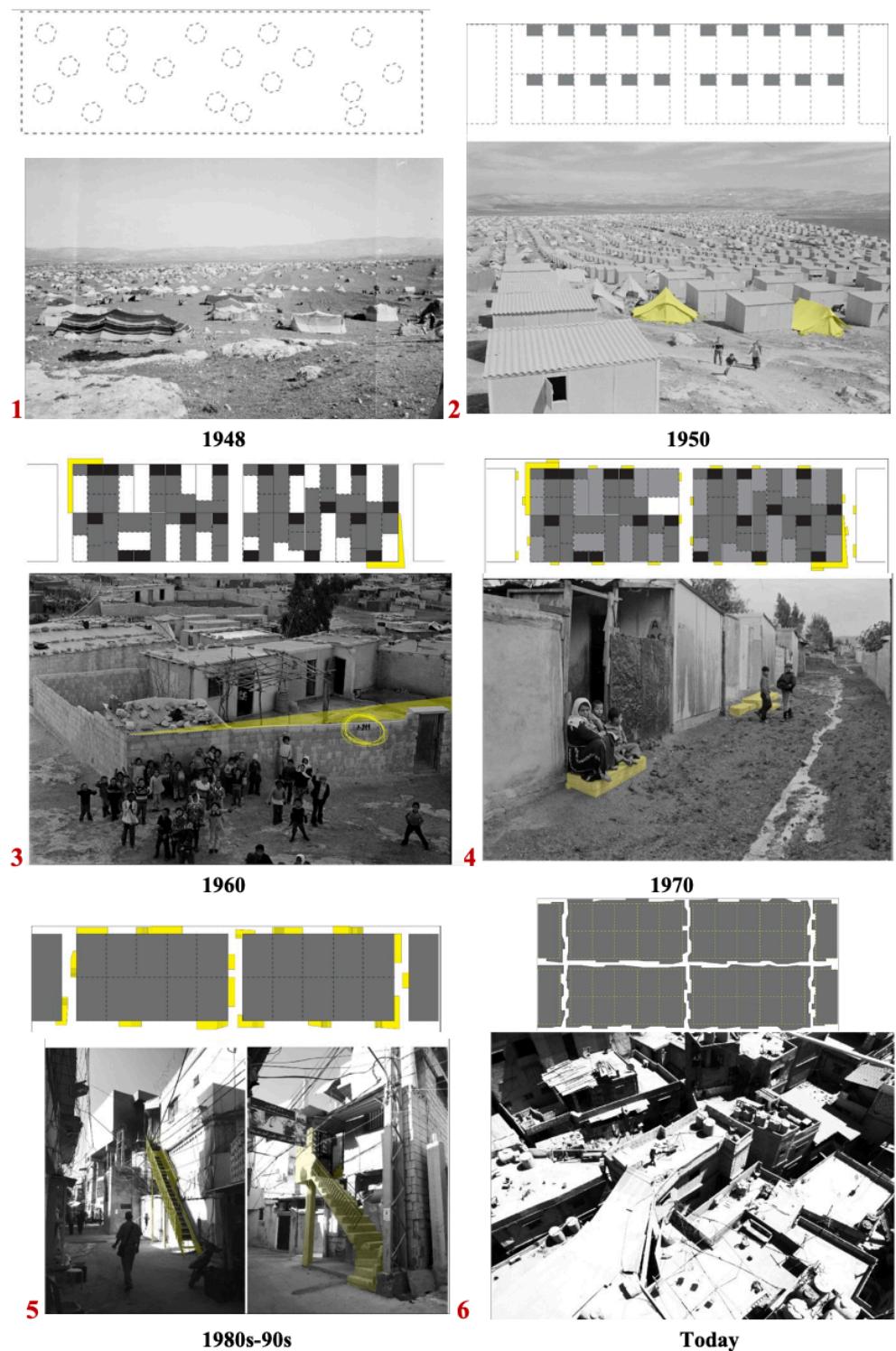


Figure 3.4 Transformation of Baqa'a camp layout from 1948 to present

(Source: Courtesy of UNRWA-ICIP Archives + drawing Maqusi,2021)

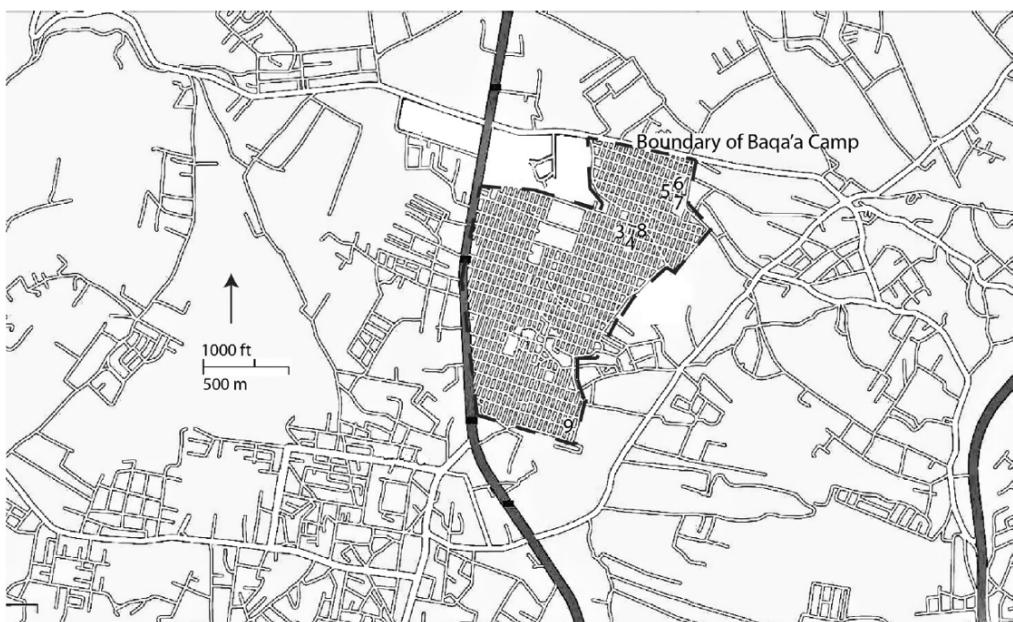


Figure 3.5 Aerial view of Baqa'a refugee camp

(Source: maps.google.co.uk, adapted from <http://goo.gl/maps/zlkwH>.)

In the Baqa'a camp, the Jordanian government has been rescaling the Palestinian camp by widening existing streets to disrupt the contiguity of the camp to allow Jordanian government gendarmes tanks to enter the camp and provide better lighting and ventilation to the camp (Qasmiyah, 2020). The new "wide streets" have bifurcated the camp fabric into two distinct parts that allow quick access for police and tanks into the camp (Maqusi, 2021). Figure 3.6 shows a closer map of Baqa'a camp with streets and newly opened streets (in blue).

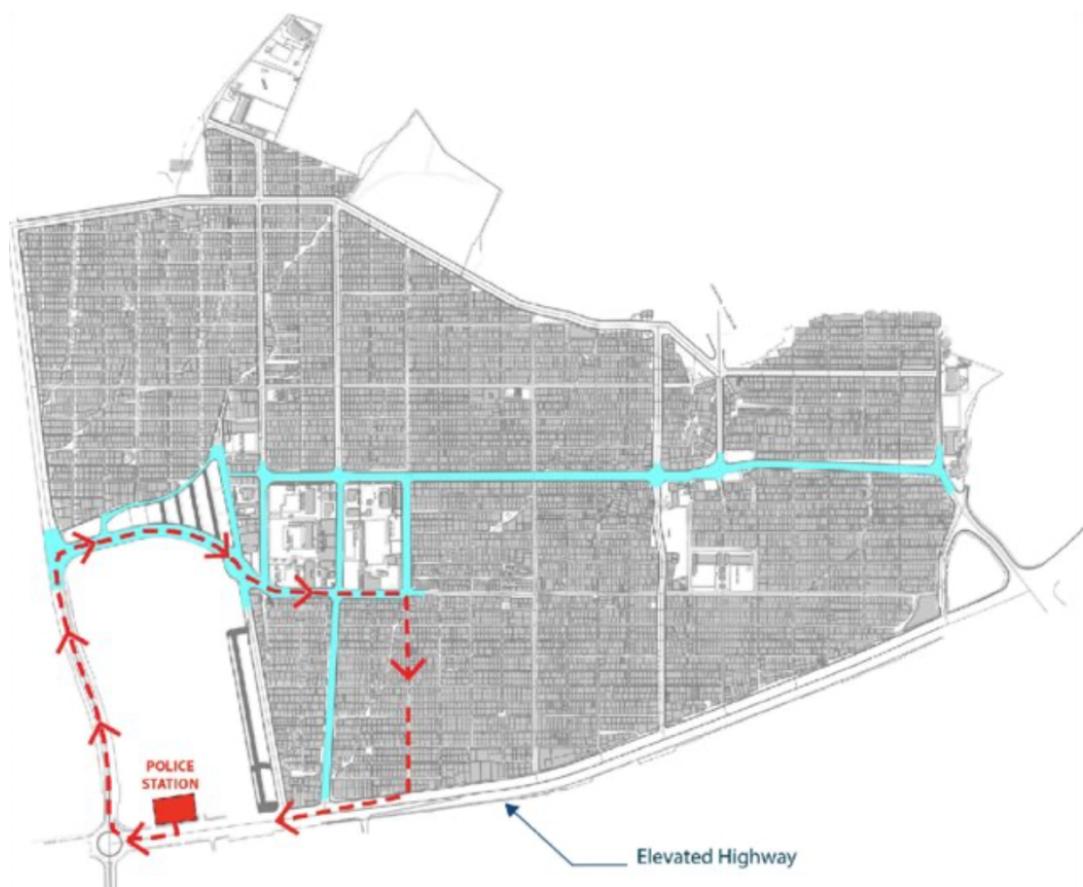


Figure 3.6 Map shows an Arial view of Baqa'a refugee camps with newly opened streets (in blue)

(Source: Maqusi,2021, p.20)

A violent of stone-throwing (from the refugees' side) and tear gas canisters (from the gendarmes' side) would take place within this four-meter tension space, lasting until one side collapses from fatigue. Despite this, gendarmes were hesitant to enter the camp due to the thick fabric/scale (of space) that refugees continuously produced beyond the (UN) demarcations. Jordanian gendarmes felt disadvantaged inside the camp due to their lack of familiarity with the camp's spatial fabric, rendering arrest attempts futile (Maqusi, 2017,2021) (See Figure 3.7 and Figure 3.8).

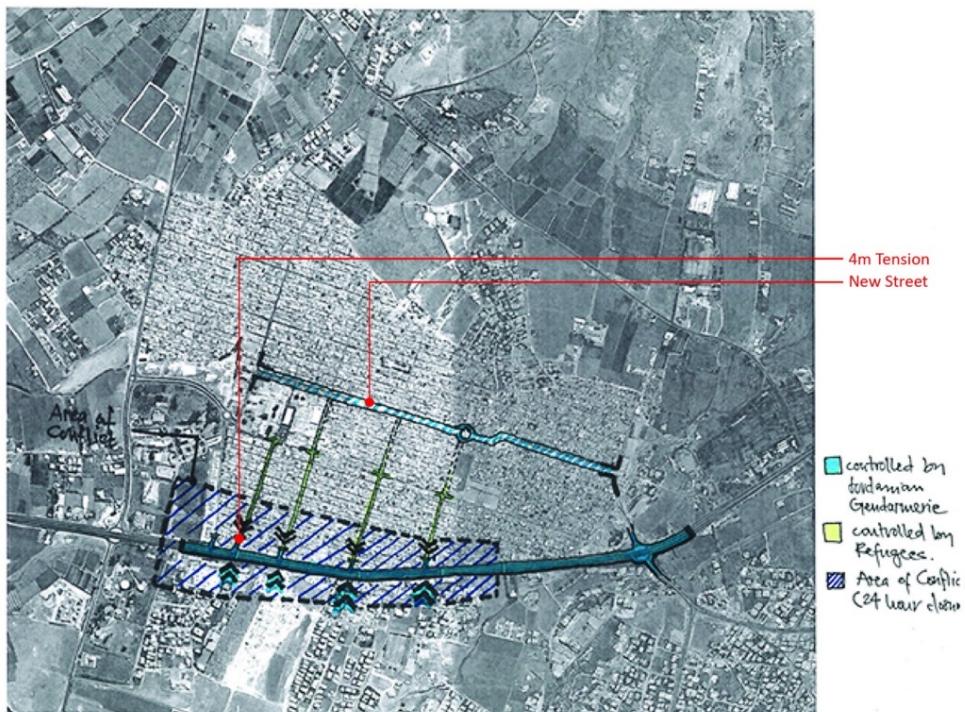


Figure 3.7 Demonstrating the use of space in Baqa'a camp during clashes with Jordanian gendarmes.

The gendarmes maintain their confining position along the main road (in solid blue), while the refugees close camp entrances along the main road by placing burning tires, thereby creating an unintruded area, while engaging in a verbal and stone-throwing scuffle with the gendarmes within an un-intruded four-meter space toward the camp (Source: Maqusi, 2017)

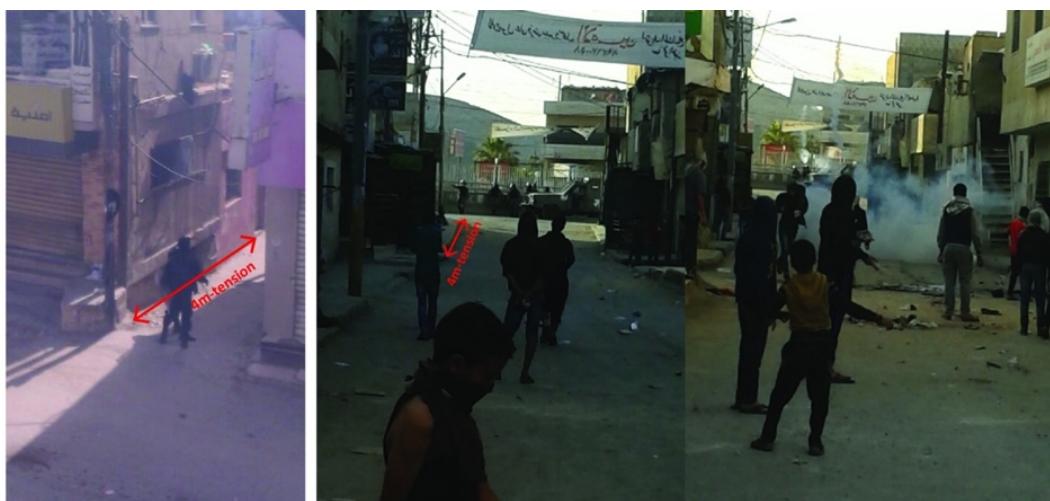


Figure 3.8 The region of four-meter tension defined by the refugees. refugees (center, right) and maintained by the gendarmes (left) as the space of conflict toward an eventual negotiation

(Source: Maqusi, 2017)

### 3.2.3 Socio- Demographic Context of Baqa'a Refugee Camp

The original inhabitants of the Baqa'a camp are Palestinian refugees who are overwhelming "second-time" refugees and have come to Jordan from the refugee camps established in Jericho in 1948 to house refugees fleeing the 1948 Arab-Israeli war. After a short time after they arrived in Jordan, they opted to build up the camp and develop economic means to ensure basic needs for their families (Maqusi, 2016; UNRWA, 2022a). Baqa'a, like many other Jordanian and Lebanese refugee camps, has also seen an inflow of Syrian refugees and Palestinian refugees from Syria seeking shelter and jobs after 2011 (Maqusi, 2016).

The population density of the Al-Baqa'a camp is considered the highest population compared to Palestinian official camps in Jordan. Table 3.2. shows the initial population, and the population of Baqa'a refugee camps in the mid-2000s in comparison with other official Palestinian refugee camps in Jordan. According to data from the Palestinian Return Center, after 2020, the population of the Baqa'a camp reached about 120,000 people (distributed among about 13,800 families), 70% of which were under the age of 30 (Aljazeera.net, 2022).

Table 3.2 Population of official Palestinian refugee camps in Jordan

Name of camp	Year of established	Initial population	Population (mid 2000s)	Area km2	Number of shelters
Amman new camp (Wihsdat)	1955	5000	51443	0.48	2660
Jarash (Gaza)	1968	11500	27600	0.75	2000
<b>Baqa'a</b>	<b>1968</b>	<b>26000</b>	<b>93916</b>	<b>1.40</b>	<b>8000</b>
Marka (Heteen, Schneller)	1968	15000	45593	0.92	
Husn	1968	12500	22194	0.77	2990
<b>Souf</b>	1967	Unknown	20142	0.50	1650
Irbid	1951	4000	25250	0.24	
Talbieh	1968	5000	6970	0.13	
Zarqa	1949	8000	18509	0.18	

(Source: UNRWA, 2022a; Alnsour & Meaton, 2013)

The mean size of refugee households in Baqa'a is 5.2 members per household (Tiltnes & Zhang, 2013). Figure 3.9 comprise the size of refugee households in Palestinian refugee camps in Jordan.

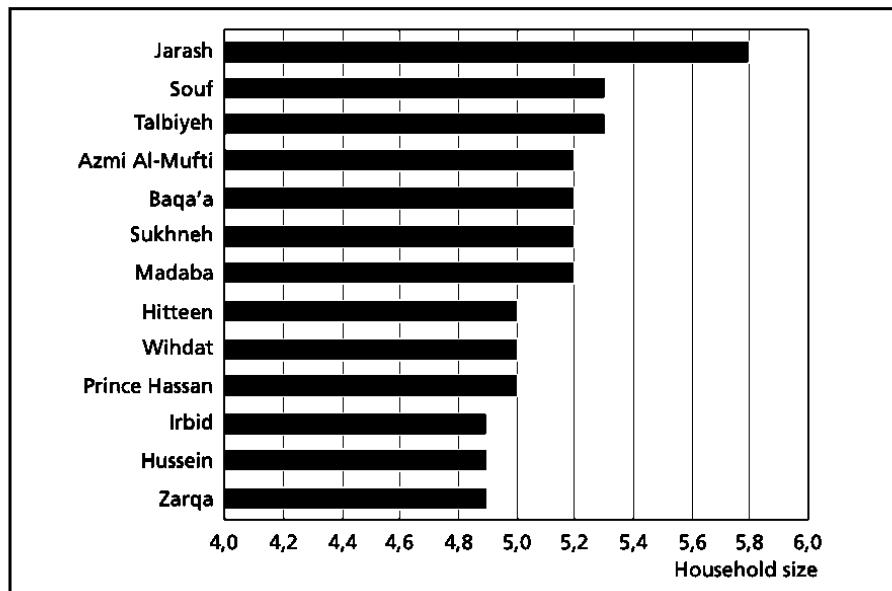


Figure 3.9 Mean household size for each of the Palestinian refugee camps (n= 39,336)

(Source: Tiltnes & Zhang, 2013, p.44)

The residents of Baqa'a camp belong mainly to the working class (unskilled workers, artisans, low-wage employees, shopkeepers and the unemployed). The identity of Baqa'a camp's residents is a combination of Palestinian, Jordanian, Arabic and Islamic cultures (Ayed, 2020). Baqa'a camp is one of the desperate "pockets of poverty" in Jordan; according to UNRWA, poverty and high unemployment are significant challenges facing the residents of Baqa'a camp. Baqa'a camp is ranked third of the ten camps in Jordan in poverty and second of the ten in unemployment, with 17 % of camp residents being unemployed (UNRWA, 2022b). The Fafo Foundation report (2013) confirms that around 32% of the camp's residents were below the national poverty line of 814 dinars per month per family.

Camp schools suffer from a severe deterioration in the quality of education due to the unsupportive home environment, overcrowded classrooms, and lack of laboratories, libraries, etc. This results in a high dropout and unemployment rate, in addition to a sense of marginalization and isolation, which leads to various forms of social violence (Ayed, 2020).

### **3.3 Selections of the Participants**

As part of this research, a comprehensive survey was conducted with the participants in the Baqa'a Palestinian refugee camp. Personal in-depth interviews were conducted with adults (age 18 and above) to examine the Baqa'a camp residents' sense of safety in the camp's open spaces. The research sample included 12 participants (six females and six males) who were haphazardly selected from inside Baqa'a refugee camp clusters. The semi-structured open-ended interviews aimed to involve a significant group of participants from inside the camp, including camps households and inhabitants working as teachers, grocers, taxi-riders, doctors, etc.

This study was conducted during the COVID-19 pandemic. The interview respondents consisted of two groups. The first group (5 participants) was contacted by distance interview (using zoom meetings and WhatsApp calls) to increase the participation rate during the pandemic, while the second group (7 participants) was interviewed face-to-face. The fieldwork of this study lasted from 15 January to 15 February 2022.

The author accessed the first group of participants via the Baqa'a camp Facebook group and friends. They have been invited to participate in the online interviews through WhatsApp messages. Zoom interviews have been scheduled with the participants. The second group was haphazardly selected while site visits by meeting shop owners and asking them to join interviews and introduce people to interviews.

To enhance the efficiency of the interviews, participants were asked a number of direct close-ended questions and open-ended questions about their perceptions of safety and factors that affect their sense of safety in open spaces. The interview was integrated with a drawing and mapping activity. The survey included questions about the socio-cultural, individual conditions of refugee households and physical characteristics of open spaces.

### **3.4 Data Collection**

The research carried out in the Baqa'a refugee camp is based on qualitative data collection techniques to examine the study's parameters and understand the role of the physical environment on refugees' sense of safety in the context of the Baqa'a camp. During the study and site visits, the author used a set of qualitative data collection methods, including literature review, semi-structured open-ended interviews, mapping and visual techniques to obtain the study's aims. Also, the author recorded the physical traces of the context by using site observation, photography and satellite imagery to enhance the urban and architectural context of the study.

Defining the types of open spaces in Baqa'a camps is based on a clear understanding of the literature on refugee camps typology. Freedom of movement, temporariness and permanency, population size, density, physical form, location and integration parameters are used to define Baqa'a camp urban characteristics. Site observation has also played a fundamental role in identifying the urban aspects of Baqa'a refugee camps.

A literature review on perceived safety in open spaces has addressed factors influencing the users of space's feeling of safety. To determine the factors that affect the sense of safety in open spaces in the context of Baqa'a camp, a set of close-ended and open-ended questions were asked to a group of participants from Baqa'a camps residents.

Semi-structured interviews with the camp's residents included open-ended questions to obtain relevant answers to research questions concerning participants' privacy. To this end, participants were informed that their names and any other identifying information would not be shared with others. The interviews were integrated with participatory mapping as a participative process to get an insight into the current situation in the Baqa'a camp. Participatory mapping as a data collection method allows the author to study and recognize spatial relationships between factors affecting users' feelings of safety and open space physical characteristics in the study context.

Visual data collection techniques (including site observation, photography and satellite photography) aimed to draw refugees' experience and interaction with physical elements of open spaces (the concrete experience of people). During January and February 2022, the author used the site observations method to understand Baqa'a camp open spaces and observe the physical environmental features of open spaces. During these observations, the author looked through the eye of an urbanist and searched for the already existing spatial elements that may have a specific effect on the refugees' sense of safety.

Site observations were made to examine the physical factors that may impact the refugees' sense of safety in open spaces and how refugees use these spaces. Alongside observing the relationship between the physical environmental design of the open space and the sense of safety, it was also essential to identify the typologies of the open spaces and their main geographical, environmental and physical-architectural characteristics. A satellite photography (Google earth) map is used as a base map to identify open space typologies based on their physical characteristics and to guide the author through site visits. The author has visited the site several times between the 15th of January and the 10th of February 2022.

Open spaces were marked on a printed satellite map. This map was used during site visits to examine these open spaces' physical urban elements and characteristics. The author covered all types of open spaces in his study during his site observation by

walking in these open spaces and observing urban elements, physical environmental characteristics and users' activities in visited open spaces. Open spaces' physical urban and architectural elements (e.g., landscape, lighting, balconies, windows) were recorded using notes on the map and photography taken by personal mobile.

Along with observations and mapping, drawings and hand sketches of the observed open space and its physical elements and characteristics (e.g., barriers, trees, landscape elements, vegetation, lighting elements, transition zones, broken or damaged features, windows) were used to help the author to identify and analyze the physical design factors that affect the sense of safety.

Satellite photography (Google earth) is also used to identify the typologies of open spaces and draw the base maps for the mapping process. Mapping as a qualitative technique was used in this study to analyze the open space typologies their physical factors that affect users' sense of safety. Urban mapping as a methodological tool "allows the extraction of valuable data that need to be collected in a citizen participation process as extensive as this one whilst being replicable and enriching proposals of other (possible) urban interventions" (Gómez and Armenteros, 2017: 1).

In this study, urban mapping allows people to categorize and understand safety perceptions. Mapping involves participatory mapping where a group of local people (Interviews participants) were asked to represent the factors that affect their sense of safety in open spaces in the Baqa'a camp on a map with writing, drawings, or using colored pins.

The well-design of the interview process was one of the main reasons for the success of the field research and obtaining the required information. A semi-structured interview has followed the following procedure:

(1) The author met individually with the first group of participants through a scheduled online zoom meeting for a 40-minute semi-structured open-ended interview. The second group of participants was also invited individually to participate face-to-face interview in a silent place space where the author and his participants could feel comfortable engaging in a 40-minute participatory mapping integrated in-depth interview. In this study, these places were cafes inside or close to the camp, the camp services office and the Department of Palestinian Affairs (DPA) office at Baqa'a camp.

(2) The objectives of the research and brief information about the data collection process were introduced to the interviewers.

(3) Participants have given a 50x70cm poster that shows them a satellite image of their refugee camp. Using a colored pencil, crayons and stickers, they were asked to indicate the open spaces in their refugee camp which they commonly use and the places they do not prefer to use for safety reasons. Participants used one color (or particular stickers) for the spaces that were associated with a poor sense of safety (e.g., crime). A different color (or some other types of stickers) for the places that were associated with a high sense of safety (e.g., no crime), and each space was coded with a number.

The second mapping step involved colored pins, which the participants pinned into a printed poster. This mapping links the factors that affect the sense of safety with the space by using coded color pins (one color represents feelings of safe and the other represents feelings of fear). Codes represent the factors that affect the sense of safety (e.g., L=day light, D= dark, PM= poor maintenance, PS= poor surveillance, etc.). Participants used as many pins as they wished. They can use several pins in the exact location to create easily visible hotspots and also produce a 3D effect on the map. When pins are used, each color represents different feelings and codes link these feelings with the factors that affect their feelings of safety.

(4) Next, for each of the coded open spaces, participants were asked close-ended questions related to the non-physical and physical environmental characteristics of the space like ( lightening, crowdedness, presence of commercial functions, and leisure spaces where people can easily surveil the open spaces, barriers, music and sounds, neglected built environment or poor maintenance, vegetation and landscape design, security guide, sense of belonging to the place, safe access to public transportation, proper placement of windows, mechanical and formal security system).

(5) After that, each interview begins with an open-ended question to capture the independent variables you have not listed in the previous question, encouraging participants to continue from their perspectives and tell their experiences (see Appendix C).

(6) Participants were asked to rate their sense of safety in each place from 1 to 5; 1 refers to no sense of safety at all, and five refers to feeling highly safe in the open space. Their answers were recorded by taking notes on the maps.

\* Steps 4 to 6 were repeated for each of the coded places.

(7) Participants have questioned a set of close-ended questions generally related to the factors that affect the sense of safety (see Appendix C). Questions include, but are not limited to, Level of illumination in the camp, darkness, maintenance and access control management.

(8) On the map, participants were asked to use a sticker to show the places where criminal activities occur. The author asked them to use a different color to symbolize various illegal activities. By the end of the study, each participant was required to fill out one map. This map showed the places where they felt safe and unsafe and the location of the criminal activities they had experienced or knew.

(9) Finally, participants were asked about their sociodemographic characteristics — gender, age, length of residency, occupation and level of education.

The interviews were carried out in Arabic and English based on the interviewees' preferences and language skills. All interviews were documented and notes on the emphasis of the wording were made during the interview to avoid loss of meaning.

To answer the first question, "What is the relationship between open space typology and level of safety?" and find how some open spaces invite more criminal activities than others? It was essential to ensure reliable data collection to document the types of crimes in open spaces, determine typologies and forms of open spaces in the camp, and decide what types of open spaces were most commonly used in a Baqa'a refugee camp. The author used mapping techniques with interviews to identify open spaces' typologies in the Baqa'a refugee camp and draw their general physical characteristics.

The second and third questions (What are the environmental, physical, and non-physical factors that affect the sense of safety in open spaces in refugee camps?" and "How does the physical design of open spaces within refugees' camps affect refugees' sense of safety in the camps?" require an understanding the relationship between open space's physical design and the sense of safety.

Understanding the relationship between refugees' feelings of safety and the open space environment could be critiqued within an understanding of their cultural and social background and individual characteristics. This determines a need to adopt a storytelling approach (semi-structured interviews with open-ended questions) to collect information from users that would notice more details about the factors that affect their sense of safety in open spaces.

In addition to interview methods, site observations, mapping and photography assisted the author in gaining a clear understanding of how the physical design of open spaces influences users' sense of safety and their interaction with others and with the open spaces.

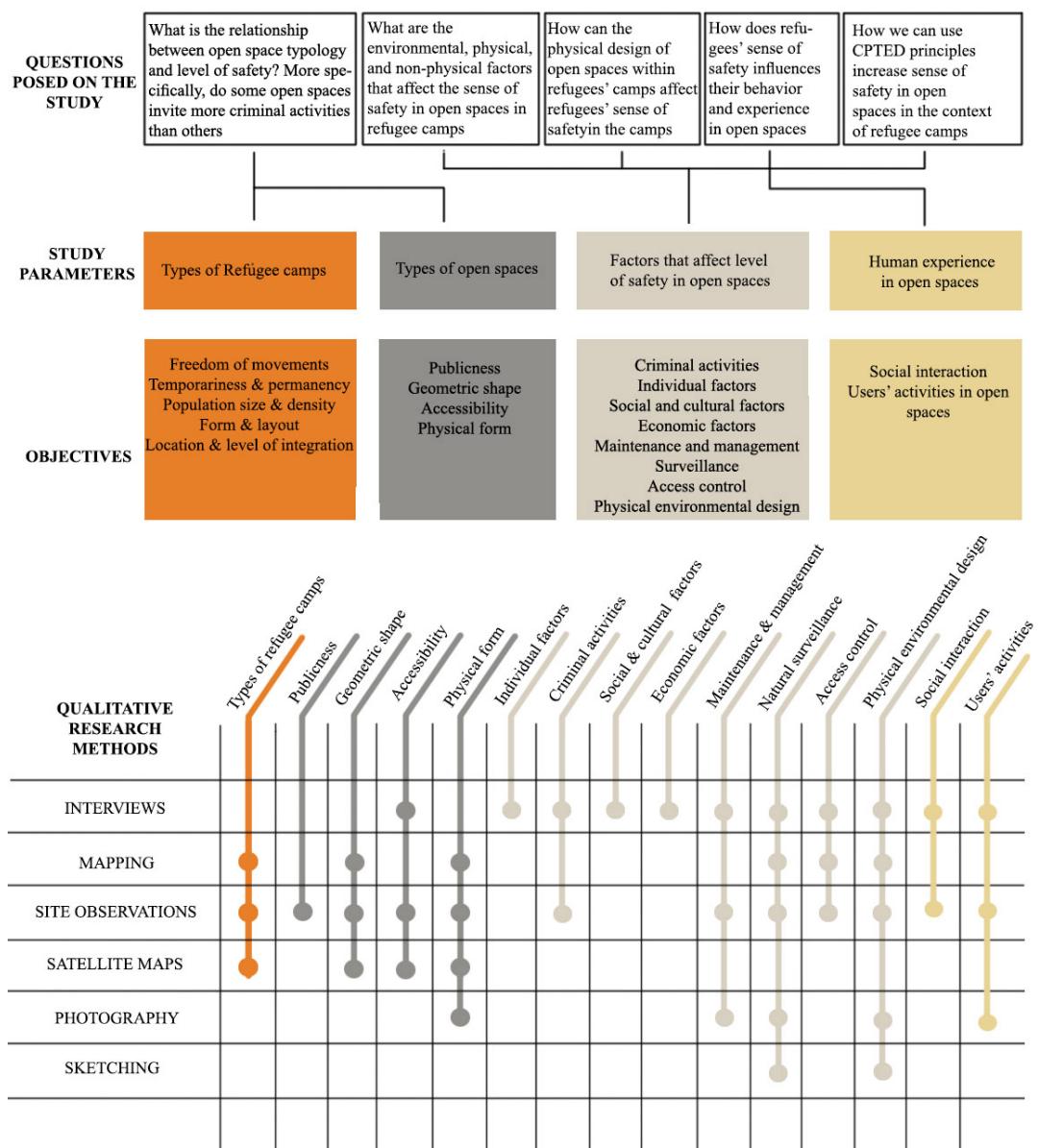
To achieve the last objective of the study, "use CPTED principles to increase the sense of safety in open spaces in the context of refugee camps," the author tried to use urban mapping as an applied method to apply the CPTED principle in the context of refugee camps.

The researcher proposed a conventional cartographic mapping of the studied open spaces and a system of stickers. Size of A1 map for each explored open space and small circular-colored stickers were prepared. The small colored circular stickers have indicated new possible CPTED interventions (e.g., add a green area, playing space (kids), street furniture, fountains, lights, maintain broken items, improve pedestrian lines, define the transition between public and private spaces, add cameras, etc.).

The author placed these colored circular stickers (interventions) on the map by linking the literature with given information from site observations. In the end, the overlapping stickers in space showed the demand for improvement in that open space. For instance, if a specific place were overlapping numerous stickers, we can deduce that there is a considerable demand for improvement.

Table 3.3 summarizes the data collection methods used to obtain the study's parameters and answer the posed questions in the study for questions that have been asked during the interviews and site observations to answer each of the sub-RQs (see Appendix C).

Table 3.3 Research methods of research questions



(Source: the author)

### **3.5 Data Analysis**

Understanding, analyzing, and extracting collected conclusions is a primary driver of study success. Also, using proper analysis methods helps in reaching valuable findings that meet the research aims.

The analysis of qualitative data requires a systematic procedure that is guided by the study objectives. Qualitative data were analyzed using diagrams, charts, computer graphics, and thematic analysis. Observations are translated into drawings, sketches, maps and charts to understand the relationships between a sense of safety and the physical environment.

This study used thematic analysis as a qualitative method for identifying, analyzing, organizing, describing, and reporting themes in nonnumerical data (Braun & Clarke, 2006; Boyatzis, 1998). The thematic analysis allowed the researcher to identify meaningful patterns across qualitative data (interview transcripts, observations, focus groups, texts, documents, and photographs) and find the relationships between this data and the research question.

Produced maps while interviews were analyzed through mapping by layering maps above each other using Photoshop to overlays safe and unsafe open spaces in the camp and the physical factors that affect the sense of safety in marked spaces. This process makes it easier to identify unsafe spaces in the Baqa'a camp and understand the most important physical factors that affect users' sense of safety in unsafe spaces.

The taken photos of open spaces during site observations in Baqa'a camp were analyzed through computer graphics using Photoshop to highlight the physical elements (e.g., barriers, landscape elements, lighting feathers, poorly maintained streets) to draw a clear visual picture of the physical environment of open spaces in the Baqa'a camp.

The thematic analysis includes a systematic process to understand participants' views, opinions, knowledge, experiences and perspectives about challenging

research issues and achieve the study's aims. The thematic analysis includes a six-step process: familiarization, coding, generating themes, reviewing themes, defining and naming themes, and writing up.

### Step 1: Familiarization

The first step was looking into the collected data before the author started analyzing individual items. This step involved transcribing audio, reading through the text, taking initial notes, and looking through the data to get familiar with it.

### Step 2: Coding

In the coding process, some sections of the texts, and phrases in the interview were highlighted and came up with shorthand labels or “codes” to describe their content. After collating all the data into groups identified by code, these codes allowed the researcher to gain a brief overview of the main points and common meanings that repeat throughout the data.

In this study, each code referred to a single factor that could affect the sense of safety (e.g., darkness, broken items, lack of surveillance, no security, etc.) or interventions that could increase the importance of safety in place (e.g., adding lighting, place windows toward streets, add cameras, etc.).

The surveyed data were transferred to Excel tables for the creation of charts. Also, collected data and surveys were coded to explore the relationship between the data and the variables. Tables summarize the data and describe statics and variables in conjunction with coding.

### Step 3: Generating themes

In this step, patterns were identified for all the codes the author had created and started coming up with themes. Every single theme contained several codes. At this stage, all codes were evaluated according to what the author was trying to find out, and some codes can be discarded. This phase aims to come up with potential themes that tell us something helpful about the data for our purposes.

All coded data were classified into general themes; themes of factors that affect the sense of safety (social, cultural, individual, and physical factors), and interventions that could increase the sense of safety (Natural surveillance, Define transition zones, Natural access control, Maintenance and Management).

#### Step 4: Reviewing themes

After being sure that all themes were accurate representations of the data, all themes were compared again with the data set to find if there were any missed data and if the author could improve themes according to the data.

#### Step 5: Defining and naming themes

After Reviewing, all themes were named and defined. Defining themes involves formulating exactly what the author meant by each theme and figuring out how it helps us understand the data.

#### Step 6: Writing up

Finally, all the analyses were written in academic format describing how the author collected the data (e.g., through semi-structured interviews or open-ended survey questions) and explaining how the author conducted the thematic analysis. The results or findings addressed each theme, describing how often the themes come up and what they mean, including examples from the data as evidence.

Table 3.4 Research methods of the study. summarize research questions, research approach, data collection methods and data analysis methods for each question. Further details of each research question, sub-questions and research objectives can be found in the appendix

RESEARCH QUESTION	RESEARCH APPROACH	DATA GATHERING METHODS	DATA ANALYSIS METHODS
<b>what is the the relationship between open space typology and level of safety? More specifically, do some open spaces invite more criminal activities than others?</b>	Qualitative Approach	In-depth interviewing Field observations Photography and mapping	Thematic analysis
<b>What are the environmental, physical, and non-physical factors that affect the sense of safety in open spaces in refugee camps?</b>	Qualitative Approach	In-depth interviewing Photography, sketching & mapping	Thematic analysis Mapping Computer graphics
<b>How can the physical design of open spaces within refugees' camps affect refugees' sense of safety in the camps?</b>	Qualitative Approach	In-depth interviewing Field observations Photography, sketching & mapping	Thematic analysis
<b>How does refugees' sense of safety influence their behavior and experience in open spaces?</b>	Qualitative Approach	In-depth interviewing Field observations	Thematic analysis
<b>How can CPTED strategies be used to increase the sense of safety in open spaces in the context of refugee camps?</b>	Qualitative Approach	Literature review Field observations Photography, sketching & mapping	Thematic analysis Mapping

(Source: The author)



## **CHAPTER 4**

### **RESEARCH FINDINGS**

#### **4.1 Safety Threats Experienced by Refugee in the Open Spaces of Baqa'a Refugee Camp**

Figure 4.1 illustrates the threats that affect the camp's residents' security and sense of safety in open spaces. Among 12 interviews, drug abuse was mentioned as the most common criminal activity that has been encountered by the refugees in the open spaces of the Baqa'a camp. Eight participants stated that theft was widespread, especially in crowded areas. Seven participants added that they feel fear for their children because of the recent incidents of kidnapping of children in the camp.

Camp residents mentioned quarrels or conflicts as criminal activities which widely affect their safety in open spaces, especially at the bus stop and shopping centers. The interviewers classified murder crimes as the least common crime in open places. One of the subjects (V.H, a woman) stated that: "I remembered around five years ago, in the bus station in the early morning, a young boy was killed after being sexually assaulted, and his body was left on the road".

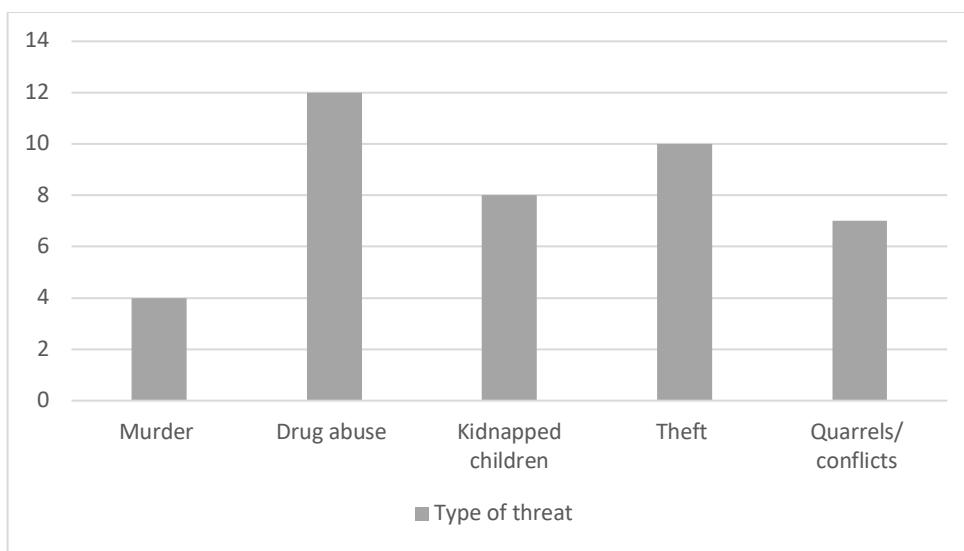


Figure 4.1 Safety threats experienced by refugees in the open spaces of Baqa'a camp

(Source: The author)

## 4.2 Open Spaces in Baqa'a Camp

The architectural design of open spaces inside refugee camps is not built to be social spaces. Open spaces in the refugee camp were haphazardly formed by informal urban expansion and replacing temporary shelters with pre-fabricated and brick housing units (Qasmiyah, 2020). Due to a shortage of common open space, refugees have resorted to imaginatively adapting their 'pavements' into outdoor living rooms (see Figure 4.1).



Figure 4.2 Transformations of 'pavements' into outdoor living rooms in Baqa'a camp taken by Samar Maqusi in 2014

(Source: Maqusi, 2016)

Although Baqa'a is Jordan's largest camp, it suffers from high spatial densities owing to severe Jordanian building rules enforced on the camp and its population (Maqusi, 2016). As a result of the lack of both space and stable economic resources, refugees' families have expanded their buildings into pathways (see Figure 4.3).



Figure 4.3 A small hair salon is being established by intruding on the pathway. Encroachments like these, are common in the Baqa'a camp, especially when refugee households lack both space and stable economic means. Taken by Samar Maqusi in 2014

(Source: Maqusi, 2016)

#### **4.2.1 Typologies of Open Spaces in Baqa'a Camp**

As mentioned in section 2.2.2, open spaces could be classified according to the following characteristics: publicness, communality, activeness, location, mindedness, accessibility, physical form, development, and geometric shape (Newman,1972; Paxon et al., 1984; Carmona,2008; Walzer,1986; Kit Campbell Associates, 2001; Al-Hagla,2008; Carr et al., 1992; Krier,1979).

Baqa'a camp is considered an open camp in an urban area, where it is open to strangers and residents who can go freely in and out of the camp without any restrictions. Consequently, open spaces in Baqa'a camp can be public, semi-public, semi-private and private open spaces. According to the researcher's observations in Baqa'a camp, she found that the transition zones between spaces are not identified because of the lack of barriers, poor landscaping buildings density and shortage of open spaces. Figure 4.4 shows an example of public and semi-public open spaces in the Baqa'a camp. Figure 4.4.a shows the Hiteen secondary school playground, which is classified under semi-public open spaces, while Figure 4.4.b shows Baqa'a main street as an example of public open space.

Open spaces in the Baqa'a camp could be active or passive open spaces. Figure 4.5 compares passive with active open spaces in the Baqa'a refugee camp, it also indicates the shortage of active open spaces in the camp. Due to the shortage of active open spaces in the camp, passive spaces such as a green median in the middle of a road (Alshoun circle) are used as an active space for setting.



A

B

Figure 4.4 Examples of public and semi-public open spaces in the Baqa'a camp

(Source: the author)

Based on open spaces' functional and geometric characteristics, open spaces in Baqa'a camps are classified into circulation spaces (including streets, alleys, pathways, courtyards, transport facilities, and the roundabout), commercial spaces (commercial squares, unilateral commercial streets), spaces for leisure and recreation (parks and playgrounds) and green spaces (agricultural fields, graveyard). (Yang et al., 2018; Alves, 2014, Stanley et al., 2012). Figure 4.6 illustrates the types of open spaces in Baqa'a refugee camps based on their functional and geometric characteristics.

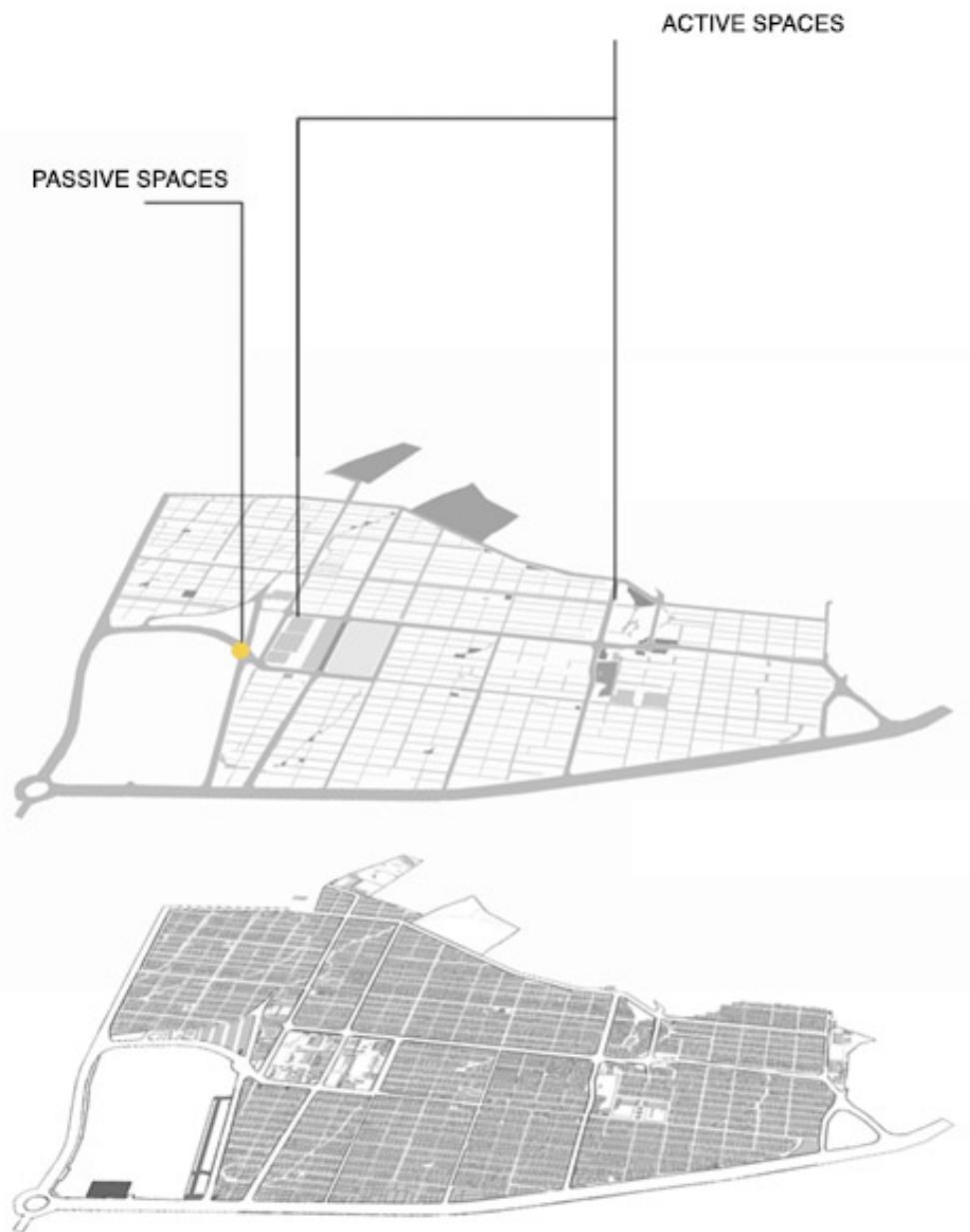


Figure 4.5 Passive and active open spaces in Baqa'a refugee camp

(Source: the author)

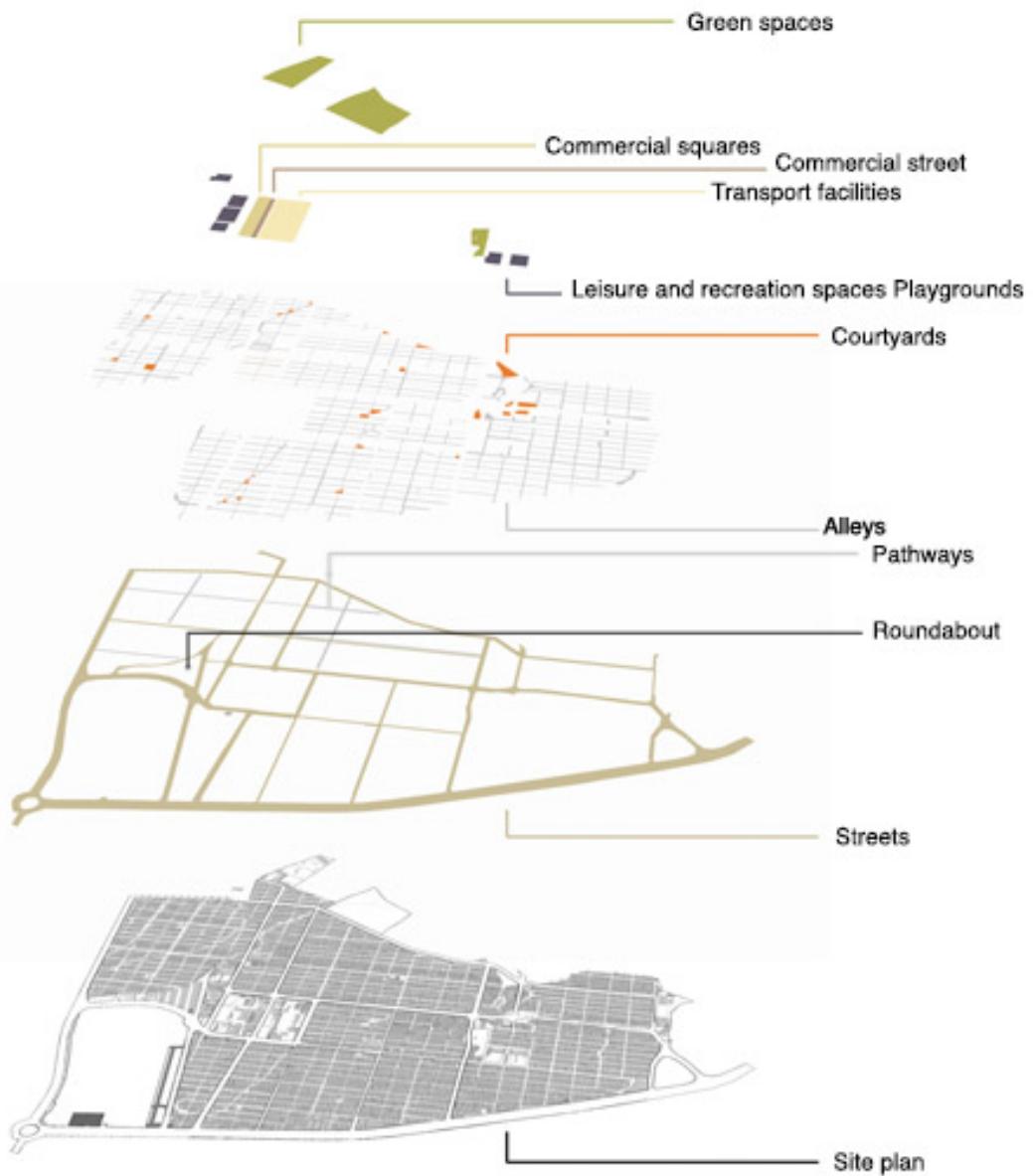


Figure 4.6 Open spaces typologies in Baqa'a camp

(Source: the author)

This study focuses on open spaces' functional and geometric characteristics to study open spaces typologies and understand the relationship between the type of open spaces and the sense of safety. In other words, how some open spaces invite more criminal activities based on their physical geometric characteristics. Table 4.1 summarize open spaces typologies in Baqa'a refugee camps. Figure 4.7 shows examples of different open space types in the Baqa'a camp.



Figure 4.7 Types of open spaces in Baqa'a camp

(Source: the author)

Table 4.1 (continued) Typologies of open spaces in Baqa'a refugee camps

Term of classification	Open space types	Examples in Baqa'a camp	Descriptions and general characteristics
Publicness	Public spaces	Baqa'a main street	Open to strangers and people who aren't residents of the camp
	Semi-public spaces	Hiteen secondary school playground	limited opening times to the public and mostly accessed and used by particular groups (students)
	Semi-private spaces	Homes' pavements	
	Private spaces	Homes' yard	Not publicly accessible and available only to limited users (home's family and their friends)
Accessibility	Open spaces	Streets, alleys	Free access to every one
	Limited spaces	Hiteen secondary school playground	Access to school playground is free users at working time and managed by the school
communality	Public open space	Baqa'a main street	managed by local authorities for the use and enjoyment of camps' residents
Activeness	Active open space	Hiteen secondary school playground	Schools' playground includes activities such as sports, exercise and active play
	Passive open space	Alshoun circle	pavements used for sitting and alleys is used for strolling
	Active-passive open spaces	Pathways	Used for activities, sitting and strolling
location	urban open space	Open spaces in Baqa'a camp	Baqa'a camp is located within an urban area
	inner-city open space	-	
	suburban open space	-	
	rural open space	-	
spatial scale continuum	city-wide	-	
	neighborhood	Baqa'a graveyard Baqa'a bus station	open areas within neighborhood scale
	home	Pedestrian pathways and alleys	pedestrian and individuals buildings' scale

physical form	green open	Natural agriculture research center	Agriculture, ecological green area
	Green-gray open spaces	Hiteen secondary school playground, pedestrian pathways and alleys	Only accessed by pedestrians
	Gray open spaces	Streets	Have a vehicle access
mindedness	single-minded space	-	
	open-minded space	Streets, playground, pathways	designed for different uses and used by different users
Geometric shape	Streets	Baq'a main road	lined with houses and commercial buildings and offer an urban function for both pedestrians and vehicles
	Pathways		Paths for walk and cycling
	Alleys	Alleys between homes	"a narrow road or path between buildings" Cambridge dictionary
	Courtyard	Courtyard	An enclosure shared space surrounded by homes for common use or inside a property for private use
	Playground	Hiteen secondary school playground	Open space used for play and sport activities
	transport facilities	Baq'a bus station	Offers transport facilities
	The Roundabout	Alshoun circle	part of the road system, with a circular form in plant, facilitates the transit in a point of intersection of more than two tracks.
	commercial squares	Baq'a shopping center	Has commercial entertainment on streets. Interactions
	commercial unilateral streets	Al Hezam Road	linear walking space used for commercial activities
	Green spaces	Natural agriculture research center and graveyard	offering natural open areas

(Source: the author)

#### **4.2.2 Open Spaces' Physical Characteristics in Baqa'a Camp**

Most of the local streets inside the camp are narrow and meandering pathways. The surface of these pathways is often unpaved and poorly illuminated. Figure 4.8 shows the muddy and unpaved streets in Baqa'a camp.



Figure 4.8 Ayeds' picture in front of his family's house in Al-Baqa'a camp in the year 1986, when the roofs of the houses were of "zinc" and the streets were muddy and unpaved

(Source: Ayed, 2020)

Most of the concrete roads are dilapidated and filled with potholes. The poor water networks and leakage of the drains are a reason for the destruction of public streets. Figure 4.9 shows a poor draining system in a pathway between houses in the Baqa'a camp. Baqa'a camp is also suffering from poor infrastructure, including water networks and draining systems, maintenance, waste management and lighting system.



Figure 4.9 Poor draining system in Baqa'a camp

(Source: The author)

#### **4.2.3 The Link Between the Type of Open Space and Criminal Activities in Baqa'a Camp**

During the open-ended interviews with the camp's residents, 12 interviewers were asked to highlight the spaces where they feel safe or unsafe on a map of the camp by using colored stickers (red stickers represent unsafe spaces and blue stickers represent safe spaces). They were then asked to put coded-colored pins on marked spaces; these pins represent the physical environmental factors that make the space safe or unsafe from their point of view.

Figure 4.10 shows one of the created maps by the interviewers. This figure shows a satellite map of Baqa'a camp with six highlighted spaces (safe spaces are labeled by blue stickers while red ones are used to labeling unsafe spaces). The colored pins on marked spaces indicate the physical elements that make this space safe or not; each pin is coded with one or two letters, as can be seen in the map's legend on the right bottom; these codes represent the main factors that affect the sense of safety in the space. For all of the maps that the 12 respondents created, please see Appendix D.

The collected maps were analyzed by mapping and layering techniques using photoshop. The author found that some open spaces invite more criminal actions than others. It also presents the common physical elements that affect the sense of safety in selected open spaces in the camp (See Figure 4.15). Most participants have mentioned feeling unsafe in alleys, bus stations, graveyards, commercial centers and abounded areas. One of the participants highlighted the school playground as an unsafe space. On the other hand, most of the participants agreed that the affairs Department circle and main streets are safe.

Figure 4.11. and Figure 4.12 illustrate the safe and unsafe open spaces in the Baqa'a camp and their typologies. As illustrated in Figure 4.11 and Figure 4.12, the author found that alleys, transport facilities, commercial squares, green spaces and playground invites criminal activities more than other spaces such as streets and roundabouts.

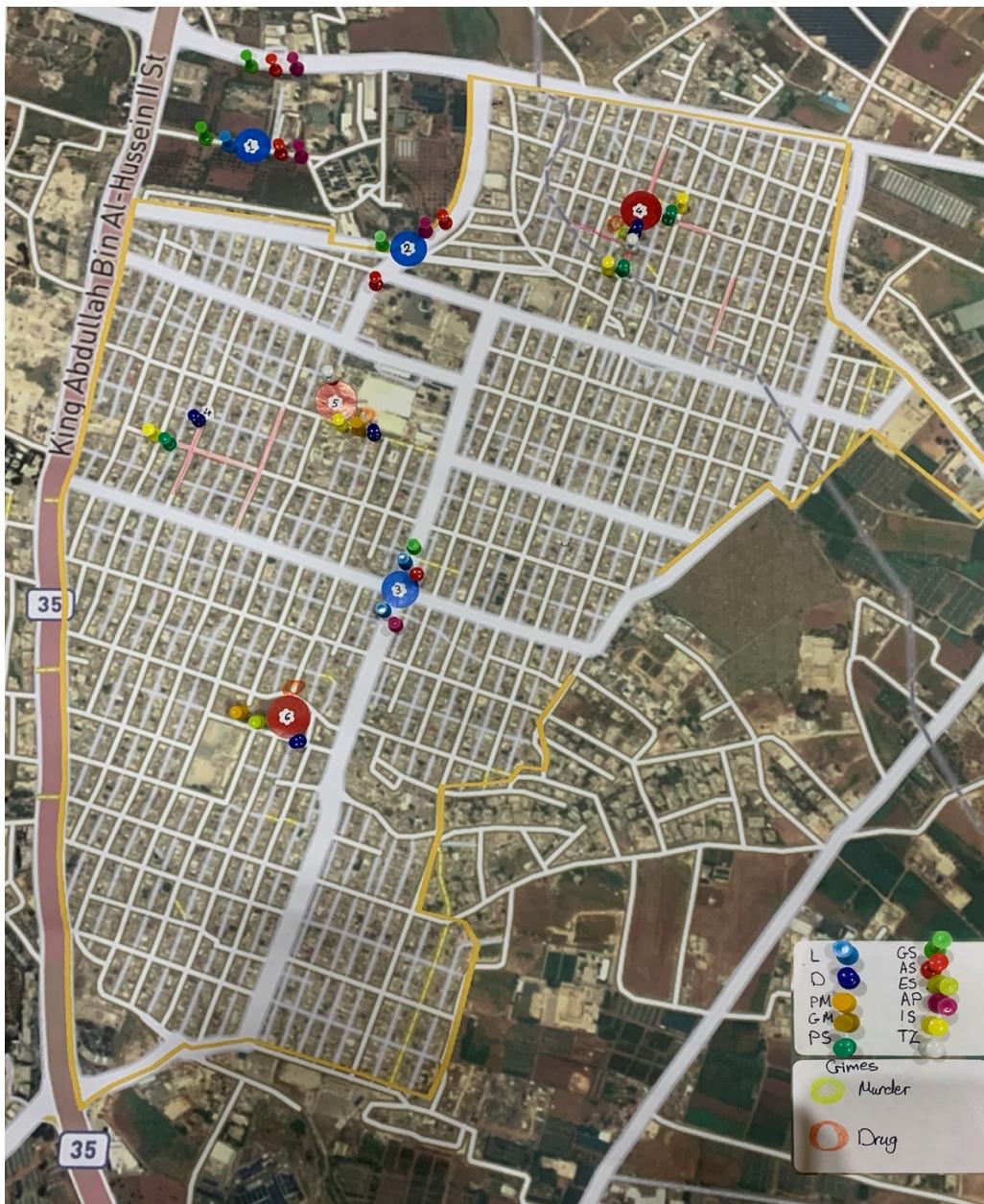


Figure 4.10 Map NO1: A map of Baqa'a camp represents safe and unsafe spaces (Red stickers= unsafe spaces, blue stickers=safe spaces). The coded-colored pins illustrate the physical elements that affect the sense of safety in the space (L= good lighting, D= poor lighting or dark, PM=poor maintenance, GM= good maintenance, PS= poor surveillance, GS= good surveillance, AS= Accessibility, ES= empty space, AP= active spaces, IS= uncontrolled space/ poor access control, TZ= poor transition between zones)

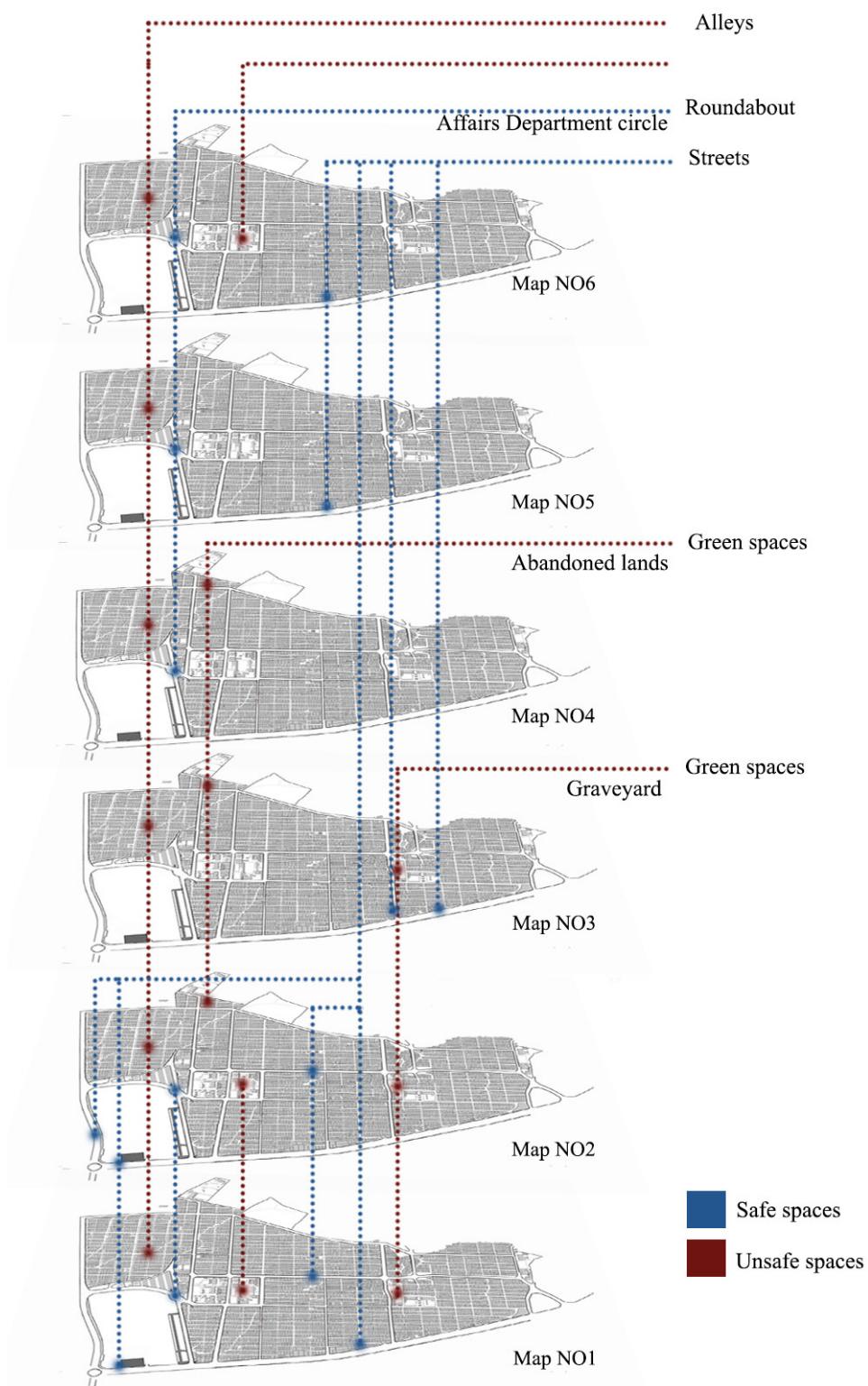


Figure 4.11 Safe and unsafe open spaces in the Baqa'a camp and their typologies, Maps 1-6

(Source: the author)

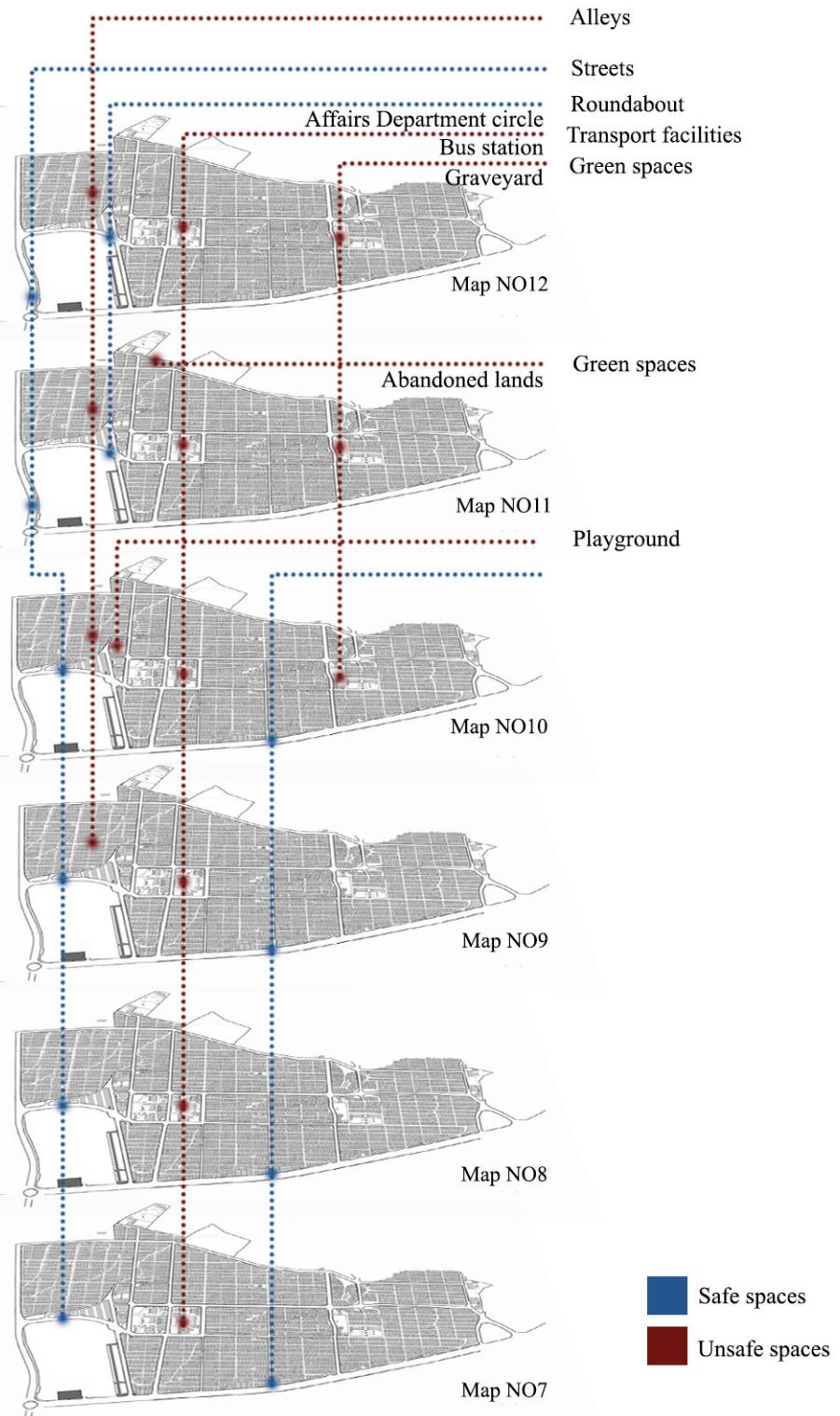


Figure 4.12 Safe and unsafe open spaces in the Baqa'a camp and their typologies, Maps 7-12

(Source: the author)

The safe spaces in the camp have some common characteristics. They are active spaces with good lighting and maintenance. Furthermore, the access to these spaces is controlled. Good lighting, sightedness and activeness were essential in increasing natural surveillance in these spaces. The good natural surveillance in Baqa'a main street (streets) and Affairs Department circle (the roundabout) keeps users under eyes and increases the sense of safety in the space.

The poor natural surveillance, darkness, lacking access control, and poor maintenance are the main features of unsafe open spaces in the Baqa'a camp. Residents have reported feeling unsafe in pathways between homes (alleys), especially when they are empty in the early morning or dark at night. They have also added that the narrow paths and hidden corners between closed homes make it easier for offenders to hide from their eyes.

Figure 4.13 shows the narrow-hidden corners between dwellings. The fences, bushes, waste bines in pathways, improper placement of windows, and lacking balconies towards pathways decrease the natural surveillance and the sense of safety.



Figure 4.13 An example of narrow alleys and path corners in Baqa'a camp

(Source: the author)

Residents have used to experience fear-felling in the Baqa'a bus station (transport facilities) and commercial squares in the shopping centers. The poor maintenance and shortage of access control applications such as gates, security guards, and barriers increase the chaos and safety problems in these spaces such as the conflicts between youths. Crowdedness in these spaces plays a role in increasing theft since it is easier for items/goods to be stolen in crowded spaces than in un-crowded spaces.

On the other hand, participants see green spaces (Baqa'a graveyard and abandoned rear lands) in the Baqa'a camp as the most dangerous spaces since they are poorly controlled and watched. Poor maintenance, emptiness, darkness, shortage of access control, lacking surveillance are the primary tools that make green spaces an attractive environment for criminal actions. The broken- poor maintenance elements, broken fences, damaged barriers, and poor infrastructure can be easily observed around the Baqa'a graveyard in Figure 4.14.



Figure 4.14 Baqa'a graveyard

(Source: the author)

Some participants described Hiteen secondary school playground as an unsafe space at night, since the poor access control and lack of surveillance attract drug and alcohol addicts. Figure 4.14 summarizes the common criminal activities and behaviors that affect residents' sense of safety in open spaces in the Baqa'a camp.

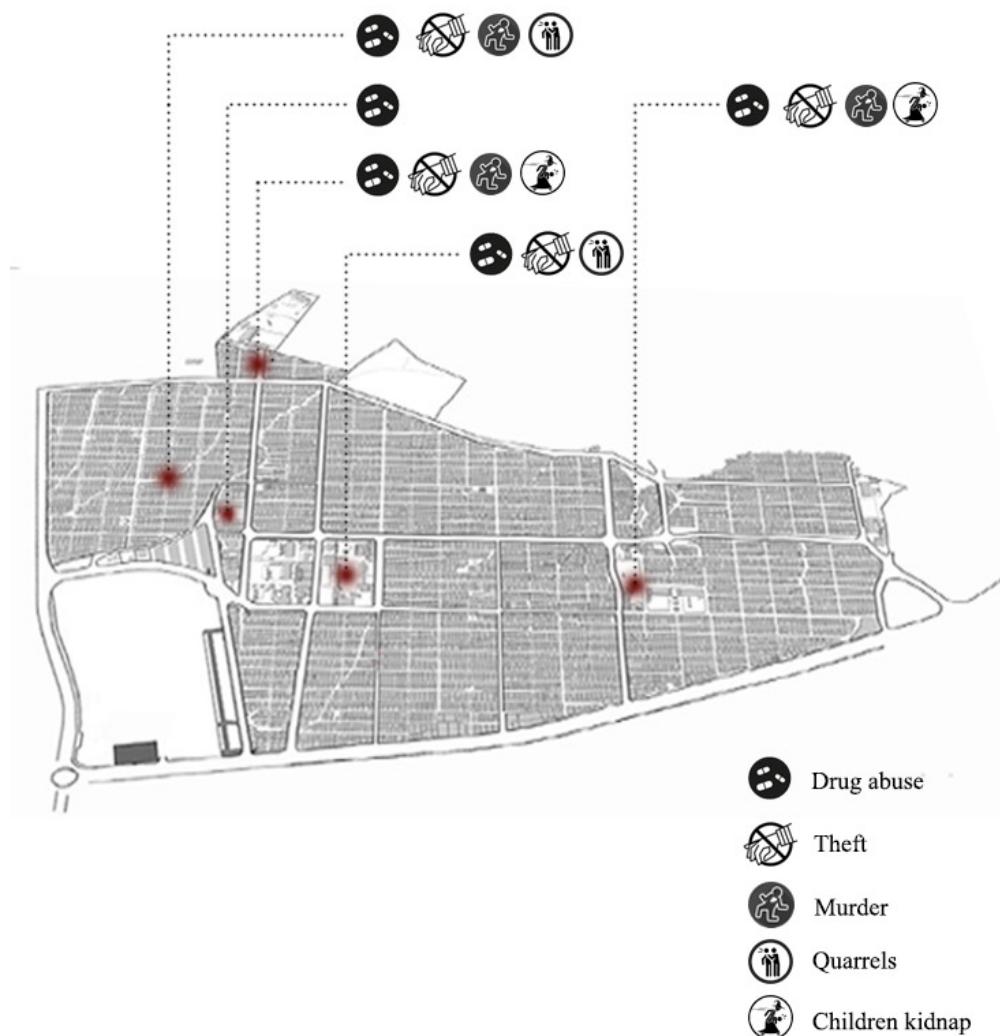


Figure 4.15 Common criminal activities that affect residents' sense  
of safety in open spaces in Baqa'a camp

(Source: the author)

### **4.3 Factors That Affect the Sense of Safety in Open Spaces in Baqa'a Camp**

Figure 4.23 shows a mind map of themes, codes and sub-codes of factors that affect the sense of safety in the Baqa'a camp.

#### **4.3.1 Individual Factors**

According to the survey, participants have highlighted the main individual aspects influencing users' perceptions of safety in their living environment. Participants have strongly agreed that the age factor plays a fundamental role in controlling users feeling in the space. They have mentioned that children, especially between 12 and 18, are the most vulnerable group to assault. They added that the reason back to the children's kidnapping accidents is the inability of children to fend for themselves. Some participants also find that youth are at higher risk of violence because they are exposed to fraud and exploitation to carry out criminal acts without awareness and control. Figure 4.16 compares the risk of being violent and age factors from data gathered from 12 semi-structured interviews.

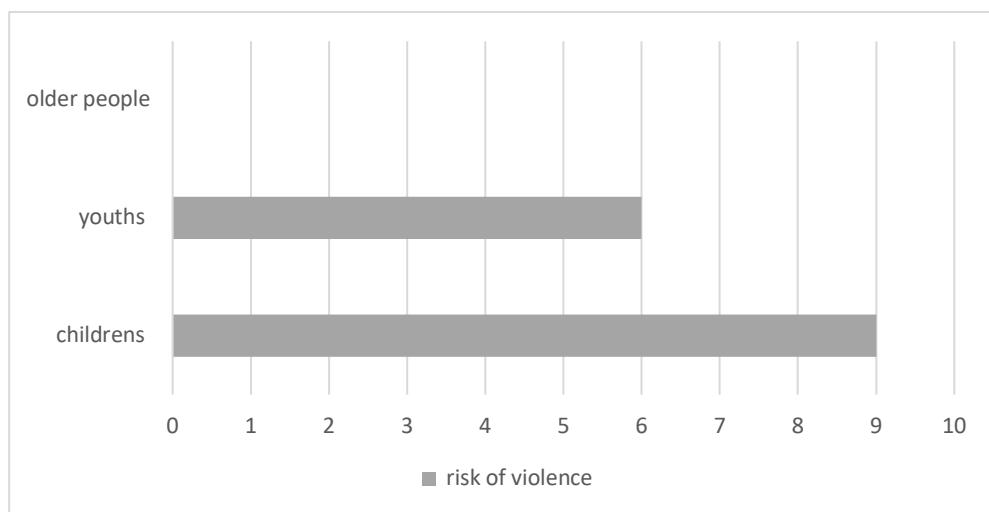


Figure 4.16 The relationship between age and risk of violence in open spaces in Baqa'a camp

(Source: the author)

For the gender factor, there was a convergence of opinions among participants, a group of them saw open spaces in the Baqa'a camp as safe for women to walk and spend them in. In contrast, most participants find that women could be at risk of being victims since they do not have the physical ability or they could be shy to defend themselves, especially in public. They also added that women are often associated with the fear of sexual assault. One of the participants (S.H, a woman) said: "The culture in Baqa'a camp, as most of the eastern cultures, believes in defective culture; it is considered a shame for a woman to respond to the harassment that she may be exposed to, especially in public areas."

One participant only mentioned the level of education factor. He argued that the education level of individuals reflects on their thought and actions; usually, educated people are away from criminal activity boundaries.

#### **4.3.2 Economic Factors**

Along with the interviews, interviewees were asked to identify the economic challenges that may affect criminal behavior in their environment. As seen in Figure 4.17, most participants have addressed unemployment as the most significant economic challenge in shaping criminal actions in the Baqa'a camp. Four of the participants have highlighted poverty factors with unemployment as economic reasons for criminal behavior in the camp.

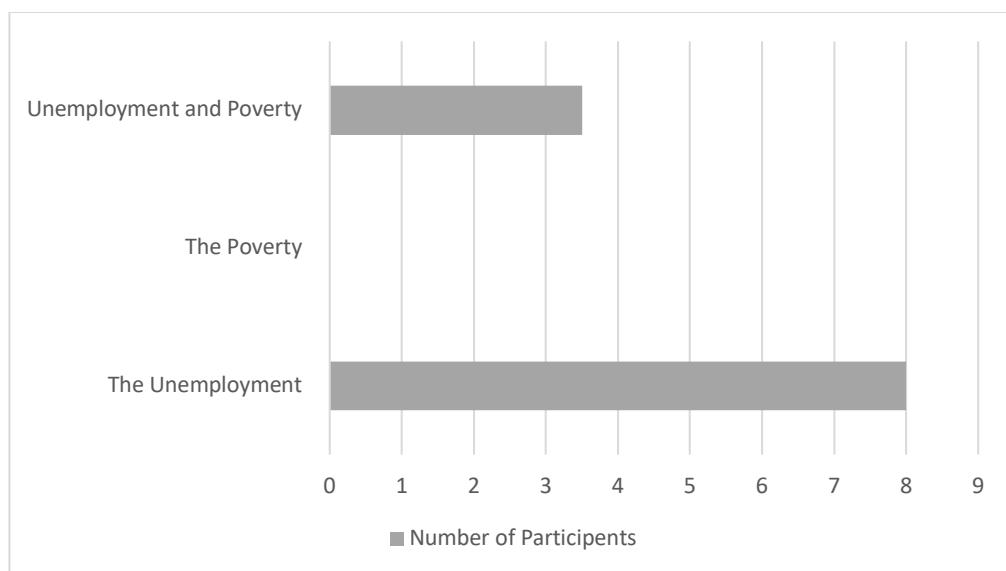


Figure 4.17 The economic factors that affect sense of safety in Baqa'a camp

(Source: the author)

Participants find that unemployment increases the void in people's lives, especially among youths, due to the lack of jobs, making them feel that they are useless in society; this may affect their psychological well-being and push them to illegal activities such as trading and abusing drugs and alcohol.

The high population is another factor that impacts the camp's residents' sense of safety. A high population can be considered under economic factors since a high population increases the demand in the economic sector.

### 4.3.3 Social and Cultural Factors

Participants have mentioned various factors related to their social and cultural environment that affect their safety in the open spaces of the camp. These factors include media exposure, alcohol and drug consumption in the community, unsafe riding behavior and social integration.

Awareness and culture have a significant role in affecting the level of safety. Culture affects natural surveillance. For instance, residents' privacy culture prevents them from opening windows toward streets and paths. The culture also influences criminal behavior towards women. Society considers women easy and weak victims, and culture of defect prevents women from defending themselves.

"Dawaween" culture is separated among the young group in the camp. "Dawaween" is a popular term in Jordan that refers to people who are usually take part in criminal actions. "Dawaween" blinds along with the thought of youths that they do not feel afraid and can do whatever they want.

Alcohol and drug abuse are widely spread in open spaces in Baqa'a camps. Residents have complained about this issue for many years. Alcohol and drug abuse problems widely affect residents' safety and feel of fear in open spaces.

A group of participants has also highlighted the role of family relationships and social integration in raising generations with healthy mental health. Rising in a close-knit family offers children a healthy psychological environment for growth and social integration with their surroundings, making the society stronger and able to face social problems that may lead to conflicts that undermine the sense of safety.

Most of the participants agreed that news about crimes in a space might increase feelings of fear in that space. One of the participants argued that "if I have heard that space is dangerous or criminal actions frequently occur there, I will not try to visit that space" (A.S, 25-year-old male). Another participant noted that " media exposure may have a higher impact on foreigners' sense of safety than camp's residents since they believe in news and do not know the real situation of the camp's open spaces" (A. B 28- year-old male). Participants have also reported that unsafe riding behavior in the camp affects pedestrian safety since there are no pedestrian lines in the streets.

#### **4.3.4 Physical Environmental Factors**

After analyzing the collected data from interviews, mapping and observations, the researcher found that natural surveillance, access control, lighting and maintenance are the main factors that affect the sense of safety in the open space in the camp. The study analysis has also underlined activeness, territorial reinforcement, landscape design, sightedness and street layout patterns as essential elements in influencing open spaces' users' sense of safety. Figure 4.24 summarizes the main physical factors that affect refugees' sense of safety in the open spaces of the Baqa'a camp.

The level of illumination in open spaces in Baqa'a camp has a critical role in influencing residents' sense of safety and daily experience in open spaces. The investigation of Baqa'a camp finds that open spaces inside the camp are not sufficiently illuminated at night, and the inappropriate placement of lighting feathers along pathways results in the level of illumination on pathways; pedestrian pathways are poorly lighted in most of the camp. However, poorly designed open spaces with poor lighting offer opportunities for crime to occur in open spaces. Figure 4. 18 shows the erroneously placed and damaged lighting feathers (in yellow) in Baqa'a camp Pathways.

Fear of crime is highly reported in the early morning and late night due to the lack of surveillance and darkness. Residents find open spaces dangerous when they are empty, especially at off-hour between 12:00 to 7:00 am. They also reported that empty unactive rooms with poor lighting offer a great opportunity for offenders to commit a crime out of the eyes of others.



Figure 4.18 lighting feathers (in yellow) in Baqa'a camp Pathways

(Source: the author)

According to what has been mentioned in earlier sections, natural surveillance is one of the significant elements that impacts the level of safety of open spaces. By analyzing the open spaces in the Baqa'a camp from design and urban perspectives, the author found that several physical design elements affect the spaces' natural surveillance, including landscape design, barriers, street patterns and lighting. Figure 4.19 shows the poor landscape design and use of barriers in different locations in the Baqa'a camp.



Figure 4.19 The poor landscape design and use of barriers Baqa'a camp's pathways

(Source: the author)

Baq'a camp layout is formed by small blocks (residential blocks) and a grid of streets (gridiron street pattern or modern hierarchical layout streets) interspersed with loops and lollipops alleys. As illustrated in Figure 4.11. main straight streets were defined as safe spaces; the continuous straight streets increase the monitoring and natural surveillance at the street level. On the other hand, alleys were marked as unsafe spaces and attraction points for offenders since the windy alleys obstruct natural surveillance and access control. Figure 4. 20 shows the Baqa'a camp layout and streets grid.

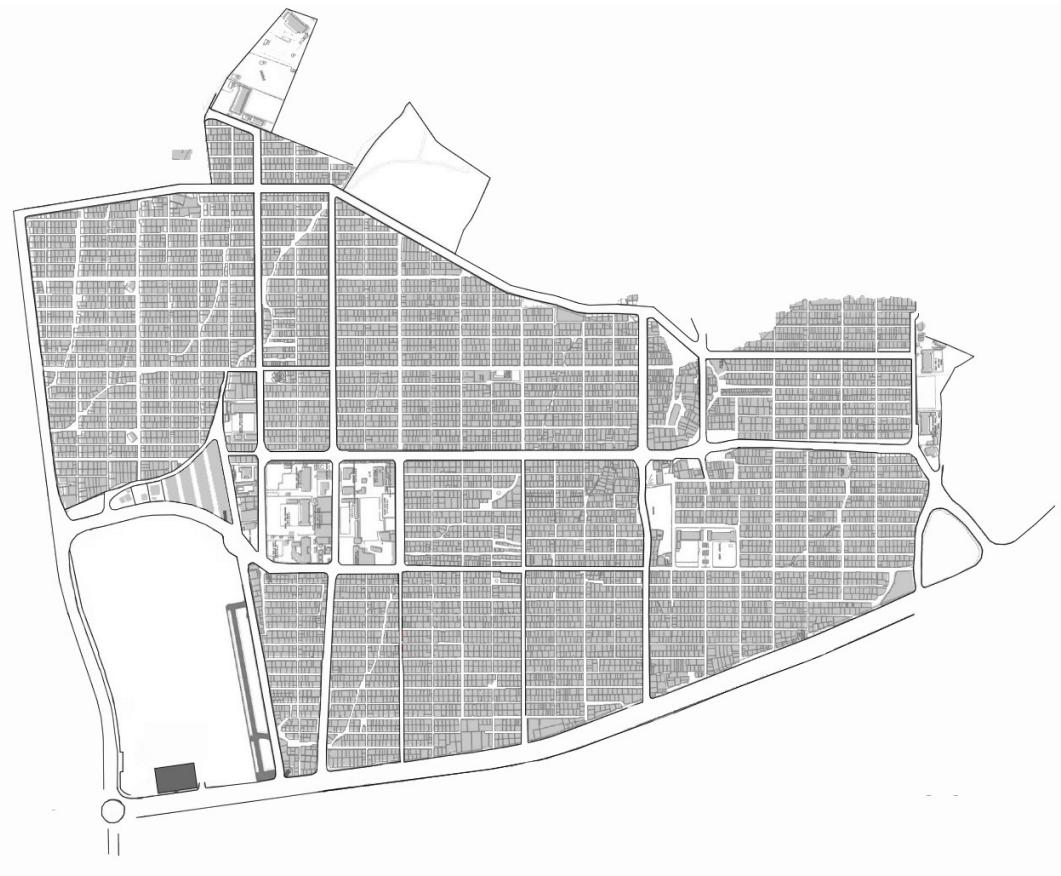


Figure 4.20 Baqa'a camp Layout

(Source: Maqusi,2021, edited by the author)

The open spaces in the camp are poorly landscaped; bushes and waste bins along pathways could obstruct the sight and decrease the surveillance along with the view. Unplanned and poorly designed barriers, fences and street corners can also hide the view and offer an attractive environment for offenders to easily hide from people's eyes. Figure 4.21 shows the bushes and bins that obstruct the sightedness along the alley.



Figure 4.21 Bushes and bins on a pathway in Baqa'a camp

(Source: the author)

The shortage of opportunities for natural surveillance devices on the street, such as porches, balconies, proper placement of windows, small convenience stores, and community gardens, affects the level of surveillance and decreases eyes on the streets. Also, the camp's design lacks a monitor or surveillance system, including formal, natural, and mechanical systems. Baqa'a camp is missing a security management application like police stations inside camps, especially in crowded shopping centers and bus stations. The mechanical surveillance application shortage also affects users' sense of safety in open spaces.

The lack of an access control system in the Baqa'a camp offers offenders and strangers easy access to open spaces in the camp. Insufficient use and design of barriers, fences and gates open the access to open spaces and increase escaping routes for offenders. Baqa'a camp's residents are complaining about the poor maintenance in their residential area. From interviews with the residents, we recognize that most of the marked open spaces as unsafe spaces were poorly maintained.

Interviewers have also complained about poor pedestrian lines, lack of speed control, poor crosswalks and pedestrian lines design, and deficiency of bollards that separate traffic and pedestrians affect walking quality and pedestrian safety in streets and pathways. Figure 4.22 shows the poorly designed pedestrian lines in the Baqa'a camp.



Figure 4.22 Poorly designed pedestrian lines along pathways in Baqa'a camp

(Source: the author)

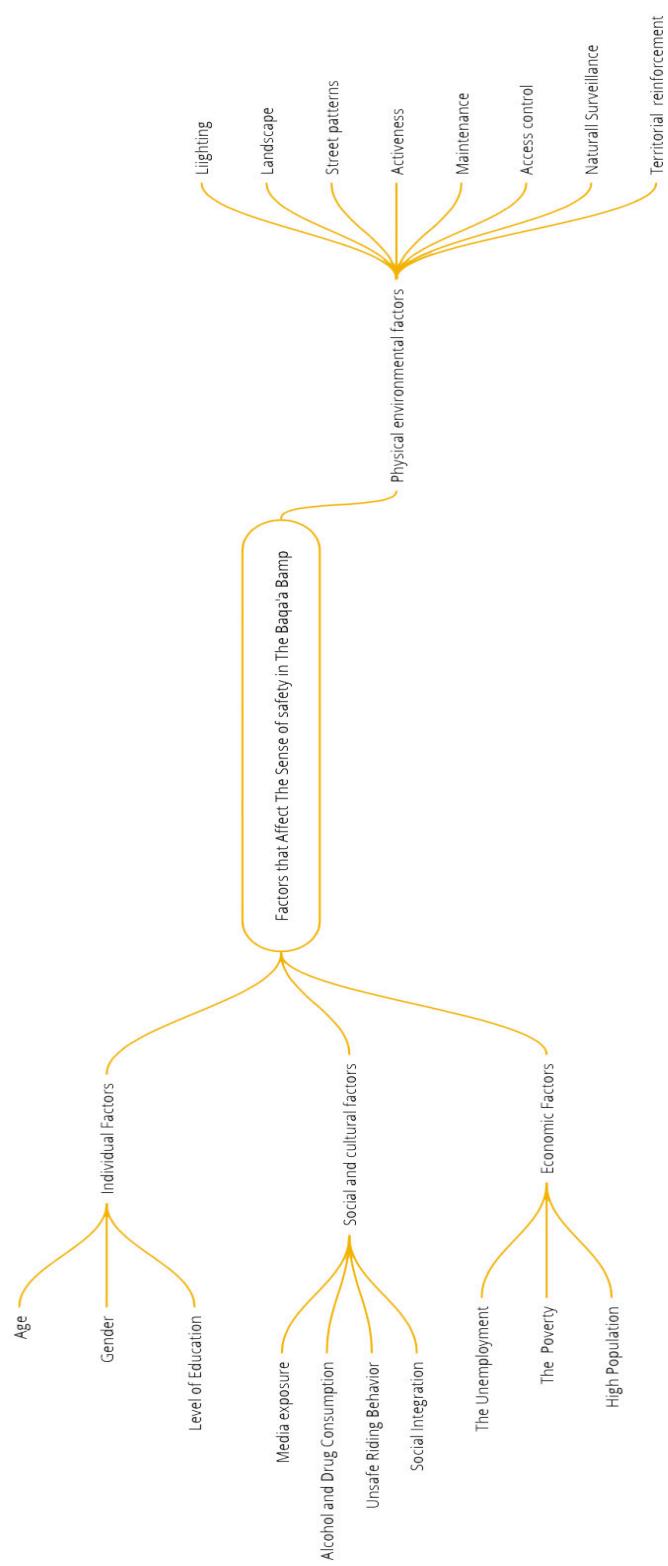


Figure 4.23 Mind maps shows the factors that affect sense of safety in Baqa'a camp's open space

(Source: the author)

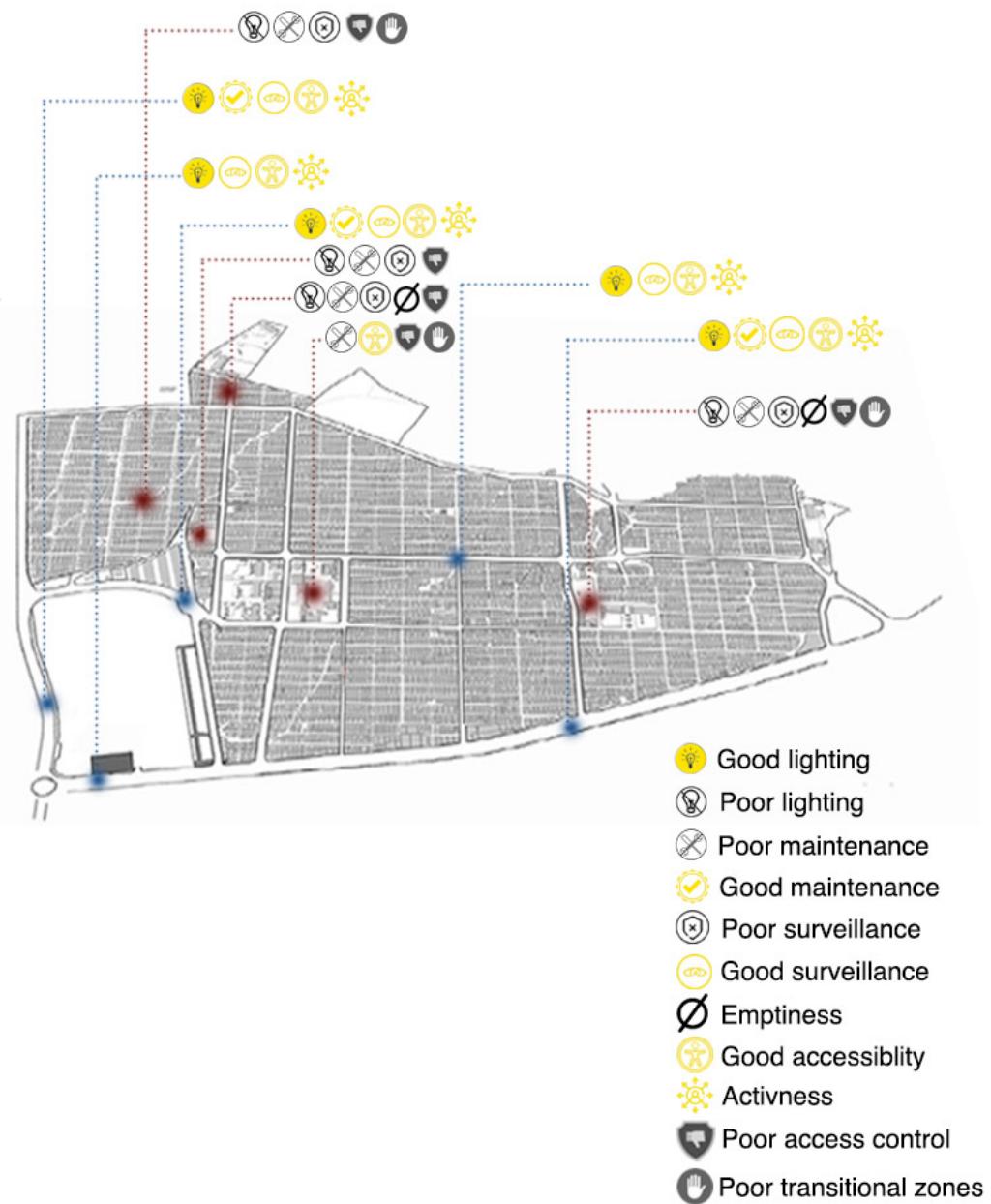


Figure 4.24 The main physical factors that affect sense of safety in open spaces in Baqa'a camp

(Source: the author)

#### **4.4 The Impact of Open Spaces Physical Environment on Sense of Safety**

Poor lighting, improper placement of windows, utility sheds on pathways and unfitting fences and bushes along pathways decrease the visibility and eyes upon the street (natural surveillance). The poor capacity of physical design elements in the Baqa'a camp that provide surveillance opportunities for residents increases their feelings of fear in open spaces. Also, the layout and narrow streets in the camp deliver many invisible street corners, which offers an attractive environment for offenders to hide and out of sight.

The grid layout of the Baqa'a camp increases the accessibility to open spaces and decreases access control opportunities. Accessible spaces are more likely to experience high crime levels, especially when they are poorly watched. The poor access control applications, including (gates, security guards, walls, fences and barriers) increase the opportunity for outsiders, including offenders, to utilize and use the space, which means a higher chance for victimization.

As mentioned in the literature, territorial reinforcement controls residents' feelings in open spaces. It determines the legitimate users of a space and their acts to protect against illegitimate use (Newman,1972). Territorial reinforcement aims to create a sense of belonging to the space by defining the transition zones between spaces' territory "defensible space" to make it easier for residents to control their area and keep outsiders out.

The shortage of symbolic and physical barriers to define transition zones between spaces makes it hard to identify the space's territory and create a sense of belonging to the space. Poor territorial reinforcement between territories in the Baqa'a camp affects the control of space and creates a dispute around the ownership of space between residents. Camp residents have complained that the camp has become accustomed to quarrels between the owners of the commercial stands over the ownership of their commercial stands' space, which would undermine the sense of safety in the shopping center.

According to what has been mentioned in earlier sections, maintenance of the major elements that affect the opportunities for criminal acts and the sense of safety in open spaces. Interviews with residents and observations performed in the Baqa'a camp determined that the vandalized and poorly maintained spaces send the message to users that the space is not controlled. The analyses of interviews found that damaged and poorly maintained spaces in Baqa'a experience higher chances of criminal acts, increasing fear in these spaces.

#### **4.5 How Users' Sense of Safety Influences Their Behaviors and Experience in Open Spaces in Baqa'a Camp**

A review of the literature has examined the impact of fear of crime on people's behavior and experience in open spaces (Newman, 1972; Shehayeb, 2008; Iqbal, 2021; Whitzman & Wekerle, 1995). Throughout the interviews with a group of residents in the Baqa'a camp, the researcher has looked into exploring the relationship between residents' feelings of fear and their daily experience in open spaces. Interviews respondents proved that criminal activities in open spaces affect their level of sense of safety in the space which influences their experience and daily activities.

The residents of Baqa'a camp claimed that activities in open spaces are limited due to the shortage of outdoor open spaces in the camp, generally, residents use streets as an outdoor open space for sitting, playing and walking. As seen in Figure 4.25 refugees are using pavements on pathways for sitting and streets as a playground for children. Baqa'a camps' inhabitants feel unsatisfied with the level of safety in open spaces in the camp. A woman from the camp argued that " sometimes she cannot even walk around the area because of sexual assault and poling". They have also argued that they avoid being in some open spaces because they do not feel safe in them.

Results show that the feeling of fear is higher than the actual risk of crime in the space. For instance, among 12 interviewers, only five stated that they had experienced assault in open spaces, but all reported feeling unsafe in open spaces. Interviews respondents have also claimed that creating safe open spaces supports their community's social interaction. They added that they need safe spaces to provide a suitable environment where activities can take place and groups can go where they will feel secure.



Figure 4.25 Daily activities in open spaces in Baqa'a camp

(Source: 2- Hermant, 2018; 3-Bouman, 2018; 4-Christoff, 2003)



## **CHAPTER 5**

### **CONCLUSION**

It has been argued throughout this study that the increasing numbers of refugee camps around the world give attention to The United Nations High Commissioner for Refugees (UNHCR), urban designers and planners to highlight the challenging issues facing refugee camps in terms of urban planning and design. Unlike migrants who moved a country by their decision temporarily or permanently for different reasons such as working and studying (United Nations, 2018), Refugees were forced to leave their home country because of violence, racial or political reasons for an unknown time (Walker et al., 2016).

In some cases, Reguees are forced to stay in refugee camps in the host country for decades, such as Palestinian refugees in the diaspora, and the temporary refugee camps become unable to meet the population's basic needs. The poor condition, lack of basic infrastructure, informal planning and poor management in refugee camps became an attraction point for criminal behavior. Within the border of the urban design context of the refugee camps, this study has highlighted the factors that affect refugees' sense of safety in open spaces in refugee camps. In particular, I demonstrated the relationship between the physical environmental design of open spaces and a refugee's sense of safety.

This research aimed to identify the physical environmental design of open spaces in refugee camps in Jordan and understand how these factors affect refugees' sense of safety and experience in open spaces. To acquire the aim of the study, the author has asked the following research questions:

- What is the relationship between open space typology and level of safety? More specifically, do some open spaces invite more criminal activities than others?
- What are the physical and non-physical environmental factors that affect the sense of safety in open spaces in refugee camps?
- How can the physical design of open spaces within refugees' camps affect refugees' sense of safety in the camps?
- How does refugees' sense of safety influence their behavior and experience in open spaces?
- How can CPTED strategies be used to increase the sense of safety in open spaces in the context of refugee camps?

Qualitative research approaches were used to examine the research questions and acquire the study's aims. Semi-structured open-ended interviews with a haphazardly select group of refugees from Baqa'a camp examined the factors that affect refugees' sense of safety in open spaces and how the sense of safety influences their daily experiences and activities in open spaces. Site observations, mapping, photography and drawings observed the physical environmental characteristics of open spaces that affect the sense of safety in the Baqa'a refugee camp. Based on the literature review, the author identified open space typologies in the Baqa'a refugee camp using satellite photography and mapping techniques to understand the relationship between open space typology and the level of safety in the space.

Qualitative data from interviews have been analyzed using thematic analysis to identify, analyze, organize and report general themes. Computer graphics and mapping techniques translate site observations, photography and map into sketches, diagrams and charts to understand the relationships between a sense of safety and the physical environment..

Baqa'a refugee camp in Jordan was selected for this study to explore the relationship between the physical environmental design of open spaces in refugee camps and users' sense of safety. Baqa'a camp is one of the emergency camps established in 1968 to accommodate Palestine refugees by the 1948 and 1967 Arab-Israeli wars. UNRWA defines Palestine refugees as "persons whose normal place of residence was Palestine from 1 June 1946 to 15 May 1948, and who lost both home and means of livelihood as a result of the 1948 conflict" (UNRWA, 2021b:1).

Palestinian refugees in the Baqa'a camp face poor infrastructure, rehabilitation, health, economic and safety challenges (UNRAWA, 2022b). The Baqa'a camp has been chosen as a case study for the Palestinian refugee camp due to its population, size, and plot area. It is one of the largest Palestinian refugees camp in the middle east area and the largest camp in Jordan.

By analyzing open spaces typologies and their physical characteristics in the Baqa'a refugee camp, this thesis has shown that green spaces (abandoned spaces and graveyards) and alleys have been reported as unsafe spaces for Baqa'a camps residents. Based on quantitative research analysis of open spaces' physical characteristics, it can be concluded that natural surveillance, lighting, access control, maintenance and activeness are the major physical elements that affect the sense of safety in the open space in Baqa'a camp. The results indicate that inadequate natural surveillance, lacking access control, darkness and poor maintenance are the main characteristics of unsafe open spaces in the camp.

Examining the non-physical factors that affect the level of safety in open spaces in the Baqa'a refugee camp has found that gender and age are the main individual factors that impact users' feeling of safety. For instance, the results show that women and children experience higher fear in open spaces. The study has also found that economic challenges such as poverty, unemployment and socio-cultural factors such as defective culture influence the level of safety in open areas in the Baqa'a camp.

By understanding the "socio-ecological model" (the Ecology of Human Development) by psychologist Urie Bronfenbrenner, we find that individuals affect and are influenced by a range of individual, social, and cultural influences and nested environmental interactions. The research findings illustrate that the "sense of safety" as the individual's internal feelings or perceptions of safety results from the intersection of the non-physical factors (individual, social, cultural and economic factors) with the surrounding physical environment. These factors can also impact people's sense of safety in open spaces in the Baqa'a camp differently, based on cumulative and intersectional experiences.

In the Baqa'a refugee camp, a group of actors, including physical and non-physical actors, influence users' sense of safety in open spaces. These actors are refugees, the culture, level of awareness, spatial planning of the camp, physical environmental elements and the entities responsible for managing the camp, including UNRWA, Al-Baqa'a camp services committee and the Jordanian government.

This thesis demonstrates how the level of safety in open spaces in the Baqa'a camp impacts users' sense of safety and influences their behavior and experience in the open space. It found that camp residents avoid being and using open spaces due to the lack of feeling of safety. Results have also shown that the sense of fear is higher than the actual risk of crime in the open spaces in the Baqa'a camp.

## **Discussion**

This study outlines the importance of ensuring safe spaces in refugee camps for their inhabitants and surrounding community. Addressing safety in refugee camps is one of the main concerns of UNHCR and its partners. In the late 1990s, UN Security Council resolutions paid more attention to the arising security issues from refugee movements and camps. The United Nations recognized that the massive population of refugees could threaten regional and international peace and stability (UNHCR, n.d.).

Poor planning conditions, insufficient infrastructure, lacking management applications and economic challenges result in the level of safety in refugee camps. Pre-migration traumatic events in refugees' home countries and post-migration traumatic events in their host countries impact the level of safety in refugee camps (Kuttikat, 2010). Also, the high population of refugees in refugee camps increases economic problems, political uncertainty, social tensions and security issues.

While previous studies on the sense of safety in open spaces have focused on modern and civilized cities, this study has focused on applying the theoretical framework on the sense of safety and CPTED in open spaces in the context of refugee camps to understand the impact of physical environmental design of open spaces in users' sense of safety on poor communities like refugee camps.

Although safety challenges could be found in similar contexts, such as slums and poor settlements, this study focuses on "permanent" refugee camps for various motivations. A group of actors participated in camp management, including international organizations and the host country. UNHCR highlighted the demand to address the security concerns in refugee assistance. It argues that establishing programs to secure the camps in significant refugee populations impacts refugees' surrounding environment and reduces potential conflicts with the local population (UNHCR, n.d.). In the refugee camps context, there is a greater demand for urban and design implications to control criminal activities and increase the feeling of safety in

open spaces than in poor settlements or slums. Because, in most cases, the host country cannot provide refugees with new lands or newly planned settlements to accommodate the increase in population and needs.

When we look at similar studies, we do not find such examples of using participatory mapping to address people's perceptions of safety in open spaces. This study uses participatory mapping as a qualitative data collection method to represent the viewpoint of the people and their perception of safety in open spaces and draw a visual representation of safety issues in the area. Integrated open-ended interviews with participatory mapping develop reliable information based on geographical and physical features to understand the relationship between the level of safety, open space typology and physical environmental characteristics.

In line with the assumption that the level of crime and violence in open spaces in refugee camps is affected by overcrowding, poorly managed and designed spaces. The study demonstrates the relationship between physical environmental design and urban quality of open spaces and the level of crime. The analysis of factors that affect the level of safety in open spaces in the Baqa'a refugee camp has shown that overcrowding spaces reported higher levels of theft crimes. On the other hand, poorly designed, maintained and managed open spaces give more opportunities for offenders to commit crimes in these spaces.

The analysis of the factors that affect the sense of safety in open spaces in the Baqa'a refugee camp supports the inference that physical environmental characteristics of open spaces (e.g., lighting, barriers, maintenance, street patterns, street furniture and materials, landscape elements) play a major role in influencing the sense of safety in open space. Results support the author's belief that effective lighting in open spaces improves natural surveillance and increases the sense of safety in the space. It also supports that the proper use of physical barriers and street furniture limits offenders' access control to open spaces, enhances access control, enforces spaces' territorial definition and increases the level of safety in the space.

The study outcomes agree that the sense of safety in open spaces is also influenced by age and gender, economic challenges, and socio-cultural factors. The results also approve that fear in open spaces in the Baqa'a camp impacts residents' activities and experiences in these spaces.

The analysis of open spaces sittings in the Baqa'a camp finds an opportunity to apply CPTED theory principles and applications in the urban camp context. The study findings agree that improving lighting, enhancing natural surveillance, defining territory (transition zones), developing maintenance and management system, controlling access to open spaces and improving streets and infrastructure could limit criminal activities and increase the sense of safety in open spaces. Contrary to the assumption that increasing activity in space can increase the feeling of safety in space, the results have shown that crowdedness in open spaces can be a chance for criminal activities like theft, especially in poorly surveilled spaces.

The study reported drug abuse, theft, quarrels, children's kidnapping and murder as the most common criminal activity in the open spaces of the Baqa'a camp. These results build on existing evidence from the 2000s to the present. In 2009, the headquarters of the Jordanian General Intelligence in the Baqa'a area was subjected to a failed attack attempt. Seven years later, an attack on the security office near Al Baqa'a refugee camp in 2016 killed five Jordanian intelligence officers (Aljazeera.net, 2016). Five years later, in 2014, five members of the police force and some civilians were injured in a big fight between members of two families in the Al-Baqa'a camp(Alghad, 2014). In 2019, the Baqa'a camp witnessed the murder of a 15-year-old child, where the security forces found the victim's body buried under the dirt inside a farm in Al-Baqa'a camp( Addustour, 2019).

In recent years, Camps residents have complained to the director of security that the security situation in the Baqa'a camp complex no longer accepts the silence about it. The thugs who drink alcohol and addicts to narcotic pills spread corruption in this compound, from vulgar words that one refuses to listen to, to almost daily quarrels (Qerasanews, 2022).

The study shows that Baqa'a camps are suffering a shortage of open spaces, resulting in residents' adaptation of their 'pavements' into outdoor living rooms. These findings confirm the outcomes of Zhang and Tiltne's (2013) study on open spaces in Palestinian refugee camps in Jordan that house roof areas in refugee camps are used as open spaces due to the limitation of open spaces inside camps.

The findings agree with Jaffe (2019) that gender and age are the most variable individual factors that affect the sense of safety in open spaces since he argued that women and children are at higher risk of sexual violence. Grabosky's (1995) study on fear of crime also agrees that females report a greater level of fear, although males tend to be at a higher risk of victimization.

The findings of the analysis of economic challenges that affect the sense of safety in the Baqa'a camp are supported by the UNRWA argument that poverty and high unemployment are significant economic challenges facing the residents of the Baqa'a camp (UNRWA, 2022B). According to the Fofo Foundation Report (2013), 32 % of Palestine refugees in the camp reportedly have an income below the national poverty line of JD 814 (Zhang and Tiltne, 2013). Baqa'a camp is also ranked second of the ten camps in unemployment. The number of unemployed refugees living in the camp reached 17% (UNRWA, 2022b).

The results of studying the effect of lighting on the sense of safety in open spaces fit with Schneider and Kitchen's (2007) theory that good lighting increases visibility and natural surveillance in open spaces, increasing users' sense of safety. The study strongly agrees with Bernasco and Bruinsma's (2009) argument that more accessible spaces are more likely to experience high levels of crimes, especially when they have poor surveillance and control.

The results do not fit with Yang's multi-layer theory (2006) that gridiron street patterns are more likely to associate with burglarized residences. The study provides new insights into the relationship between street design patterns and the level of safety; it extends that loops or lollipops paths and narrow alleys are more likely to experience a higher level of victimization than gridiron streets. On the other hand,

the study findings coordinated with Hillier and Shu (1999) in Schneider and Kitchen's (2007) findings that burglars may prefer cul-de-sacs and including integrated streets (e.g., winding alleys) as they deter passers-by and reduce natural surveillance.

The study findings illustrate that poor natural surveillance, lacking access control, and inadequate maintenance are the main features of unsafe open spaces in the Baqa'a camp. These results build on existing pieces of evidence and studies, including Oscar Newman's defensible space theory (1992), Wilson & Killing's "broken window theory" (1982), and criticism of Jan Jacobs for urban planning policy in the 1950s in his book "The death of American cities" in 1961, and C. Ray Jeffery (1971) study on the relationship between the physical environmental design of space and the opportunities for crimes in space.

The results agree with the claims of Shehayeb and Eid (2007) that the relationship between the use of space and users' feelings of safety can be described as cyclic; the more users feel safe in space, the more they use that space. The study also agrees with Shehayeb's (2008) argument that fear of crime impacts users' behavior and decisions to use the open space or avoid it than the actual level of crimes.

The study on the sense of safety in open spaces in Baqa'a refugee camps provides new insight into the relationship between open space typology and level of safety. It illustrates how open spaces like alleys, transport facilities, commercial squares, green spaces and playgrounds invite more criminal activities than other spaces such as streets and roundabouts.

Due to the shortage of data on Sound and music elements in studying the physical factors that affect the sense of safety in open spaces, the results cannot confirm the relationship between music and the level of crime. Also, the lack of vegetation elements like trees and grass in Baqa'a camp and poor landscaped open spaces objects the author from examining how vegetation can increase users' sense of safety in open spaces within the camp.

The validity of the results factors that affect the sense of safety in open spaces in refugee camps is impacted by the urban settings of Palestinian refugee camps in Jordan, specifically the Baqa'a camp. The results of the impact of open spaces' typologies and their physical environmental features on users' perceived safety in open spaces in the Baqa'a camp can be generalized to permanent low-income poor housing settlements since urban and physical environmental characteristics of the Baqa'a camp can be compared to informal poor urban settlements (slums).

To better understand the relationship between the sense of safety and open spaces' physical environmental design in poor settlements, future studies could address the physical factors that affect users' sense of safety in open spaces and examine CPTED principles in the context of poor urban settlements like refugee camps. Further research is needed to establish the impact of the level of safety in open spaces on users' experience and behavior in the urban public realm.

## **Using CPTED strategies in open spaces to increase the sense of safety in Baqa'a camp**

As mentioned in previous sections, the physical environmental design influences users' sense of safety in public spaces. Studies focusing on studying the perceived safety in urban public spaces illustrate that the application of crime prevention through environmental design (CPTED) strategies in open spaces enhances the sense of safety in space (Newman, 1972; Hall, 1966; Wilson & Killing, 1982).

Throughout the site observations, mapping and analysis of the perception of the sense of safety in open spaces in the Baqa'a camp from urban and architectural perspectives; the author came out with environmental and physical design strategies that can be applied in the context of the refugee camp to control criminal behavior in open spaces and reduce fear of crime. However, the results of the study might suggest a group of design and management applications to increase the sense of safety in open spaces in refugee camps based on the findings of similar studies on crime prevention through environmental design (CPTED), including natural access control, maintenance, management, natural surveillance, and territorial reinforcement.

Along with the analysis of the physical factors that influence the sense of safety in Baqa'a camp, poor access control was a major factor in increasing criminal behavior in the camp, mainly at the bus station and commercial squares. Developing a proper access control system including electronic gates, security officers, and proper use of barriers, walls, fences and shrubbery will limit offenders' access to open spaces and increase the supervision of the space.

Increasing natural surveillance would increase visibility and eyes on the streets, which will result in reducing the level of crime and increase the level of safety in open spaces. Proper placement of windows towards alleys, removing obstructions from pathways to enhance sightlines, and adequate lighting of open spaces can make

spaces more inviting and visible and help in creating visual experiences. These applications fit with the existing claim of Tiltne and Zhang (2013: 73) that “wide streets and lighting are conducive for a feeling of safety, while narrow, dark alleyways have the opposite effect on people.”

Partnerships with the public sector to improve the maintenance management system would enhance the sense of safety in the camp in open spaces in refugee camps. These applications include introducing alcohol-free public places, developing community programs and activities, and improving infrastructure.

Table 5.1 summarizes a set of design principles and policies that could be applied in the context of refugee camps to increase the sense of safety in open spaces. These applications are coded under natural surveillance (N.S), territorial reinforcement (T.R), access control (A.C), maintenance (M) and management (A) categorize. Figure 5.1 illustrates the relationship between recommended CPTED applications and open spaces typologies; it shows where we can use these design policy codes in the Baqa'a camp.

Table 5.1 CPTED design principles and policies in refugee camps

Application principles	Design policy codes
Natural surveillance (N.S)	N.S.1 Proper placement of windows towards streets and pathways
	N.S.2 Removing obstructions from pathways
	N.S.3 Improve lighting
	N.S.4 Illuminate dark spaces
	N.S.5 Upgrade CCTV surveillance system
	N.S.6 Raising new gardens and playgrounds to allow natural surveillance
Territorial reinforcement (T.R)	T.R.1 Define transition zones using soft and hardscape barriers
	T.R.2 Use landscape elements to define pedestrian lines
Access control (A.C)	A.C.1 Develop access control system including electronic gates, security officers
	A.C.2 Proper use of barriers, walls, fences and shrubbery
Maintenance (M)	M.1 Improve a practical cleaning and maintenance system
	M.2 Landscaping
Management (A)	A.1 Introducing alcohol-free public places
	A.2 Developing community programs and activities
	A.3 Improving infrastructure

(Source: the author)

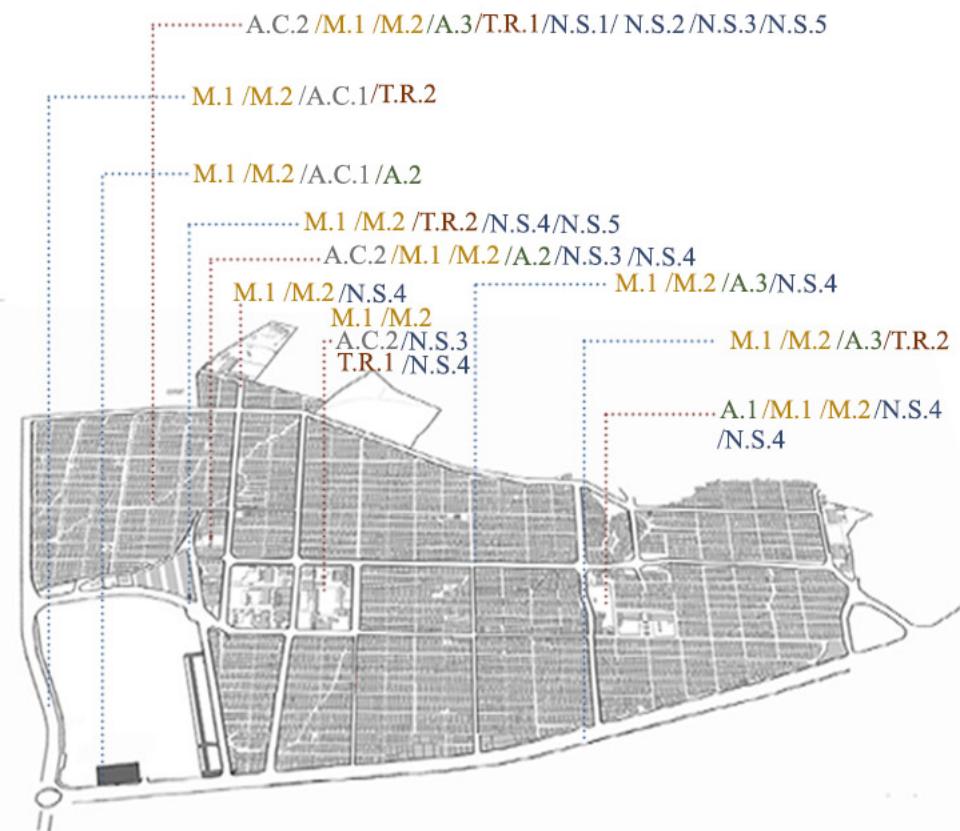


Figure 5.1CPTED design application in Baqa'a camp

(Source: the author)

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## APPENDICES

### **A. Security Terms Defined**

Threat: “a danger to a camp population, to camp staff, to the Camp Management Agency or to assets and property” (International Organization for Migration et al., 2015: 171)

Vulnerability: “the level of exposure to, or ability to contend with, a particular threat” (International Organization for Migration et al., 2015: 171)

Impact: “the level of harm caused by an identified threat Likelihood: the probability that a threat will occur Risk: the impact and likelihood of encountering a threat (risk = impact x likelihood).” (International Organization for Migration et al., 2015: 171)

Crime: “Threats arising from a general break-down in law and order may include, individual and/or collective criminal acts. This may include the threat of physical, mental, sexual or other harm or suffering, which may result in injury, death, physical or mental disability or deprivation.” (International Organization for Migration et al., 2015: 171)

Hazards: “Threats categorized as hazards are generally safety related or linked to natural conditions. A threat that is described as a hazard is essentially one in which there is no deliberate intention to harm. For the purposes of this toolkit this will generally mean fire and disease.” (International Organization for Migration et al., 2015: 171)

Armed conflict: “Threats arising in the context of armed conflict, for example at the hands of, or as a result of, the activities of armed forces and groups who are parties to a conflict” (International Organization for Migration et al., 2015: 171)

## B. Types of Migrants

Migrant: “a person who moves away from his or her place of usual residence, whether within a country or across an international border, temporarily or permanently, and for a variety of reasons. The term includes a number of well-defined legal categories of people, such as migrant workers; persons whose particular types of movements are legally-defined, such as smuggled migrants; as well as those whose status or means of movement are not specifically defined under international law, such as international students” ((International Organization for Migration, 2019: 132)

*Voluntary migrants:* People who have a regular visa leave their country seeking more extensive opportunities, a better job, or an education (Walker, et all., 2016).

*Refugee:* ” are people who have been forced to leave their country of origin due to a fear of persecution, conflict, violence or other circumstances which have seriously disturbed public order, often with life threatening consequences” (UNHCR, 2016:1)

*Asylum seekers:* “people who seek to become refugees and waiting to be accepted in a foreign country” (Lotfi et al., 2020 from Walker, et all., 2016:2)

*Asylee:* “A person who has been granted asylum” (Lotfi et al., 2020 from Walker, et all., 2016:2)

*Parolee:* “A person who is temporarily accepted in a country for urgent humanitarian reasons” (Lotfi et al., 2020 from Walker, et all., 2016:2)

### C. Research Questions and Sub-Questions' Research Tools

What is the relationship between open space typology and level of safety? More specifically, do some open spaces invite more criminal activities than others?		
Sub-questions	Research Tools	Respondents
What types of open spaces can we see in Baqa'a camp?	Site observations	Space users
What types of activities can we see in open spaces in Baqa'a camp?	Mapping	Households
What type of spaces are more dangerous (streets, bus stops, squares)?	Literature review	The author
In which spaces do you spend your time (streets, bus stops, squares)?	Interviews	
Define the users of the space? (Gender & Age)		
How much risk does the offender perceive when and how can we contemplating a particular crime heighten that perceived risk and deter the offender – e.g., by increasing natural or other forms of surveillance, and empowering preventers to identify and challenge potential offenders?		
What resources does the offender have for committing a crime (tools, weapons, modus operandi, time) - and how can we deny access or use of those resources (for example by restricting the availability of tools, or designing security features to standards which anticipate their misuse)?		

What are the environmental, physical, and non-physical factors that affect the sense of safety in open spaces in refugee camps?		
Sub-questions	Research Tools	Respondents
Nonphysical factors	close and open-ended questions Interviews	space users
Individuals	Are women/ children at high risk of violence in open spaces?  Does level of education affect individuals' sense of safety? Could you please explain your response?  Do you have previous experience of victimization? If yes, could you please explain how this experience affects your sense of safety?	
Socio-Cultural	Are there public drinking activities in open spaces? If yes, do these drinking activities affect your sense of safety? Could you	close and open-ended questions Interviews  Households space users

		<p>please explain your response?</p> <p>Do you think that the sense of safety in the open spaces of Baqa'a is affected by cultural factors? If yes, could you please explain how?"</p> <p>Does media exposure affect your sense of safety? If yes, could you please explain how?"</p> <p>Does social integration affect your sense of safety? If yes, could you please explain how?"</p> <p>Does sense of community affect your sense of safety? If yes, could you please explain how?"</p> <p>Does traditional believes (ex. Culture of defect) affect your sense of safety? If yes, could you please explain how?"</p> <p>Are there other social and cultural factors affecting your sense of safety in the open spaces of Baqa'a camp? If yes, please explain these factors and how they affect sense of safety in the camp?</p>		
	Economic	What are economic challenges (ex., Poverty, unemployment, economic change) that may affect criminal behavior? Could you please explain how it affect your sense of safety?"	open-ended questions Interviews	Households space users
Physical factors	Landscape	<p>Define the landscape elements in open spaces in Baqa'a camp?</p> <p>Are there any trees, barriers that obstructs</p>	Site observations Photography Close-ended questions	the author space users

		surveillance in pathways, alleys and streets? Are landscaping elements chosen and maintained so that they do not block the light?	Interviews	
Street/Path design and Elements		Do you feel safely separated from road traffic? Do paths have good quality for walking? / Are there well-designed crosswalks and pedestrian lines? Are there barriers on paths? Are there enough bollards to separate traffic and pedestrians? Are there signs on paths? Is the lighting sufficient for the sidewalk as well as the street? Are entrances to alleys or laneways well-lit and clearly visible from the street?		
		Is there enough lighting at night time?	Mapping Site observations close and open-ended questions Interviews	Households space users The author
		If the space (park, square, etc.) is intended for night use, are the paths and potential entrapment areas lit to street level?		
		At bus stops: Is the area adjacent to transit stops well-lit so that passersby and passing automobiles can discern faces of people waiting?		
	Lighting (Proper placement of lighting)	Does lighting take into account vegetation, including mature trees, and other potential blocks?		
		Can store owners be persuaded to mount lights on stores to increase pedestrian - level street lighting?		

		Where lighting fixture are located? Along streets? Near buildings? Attached to buildings? In parking lots?		
	Lighting (Maintenance)	Are lighting fixtures maintained in a clean condition and promptly replaced if burned out or broken?		
	surveillance	Is there a telephone, emergency telephone, or alarm and is it adequately signed? Are isolated areas covered by video cameras?		

#### How does refugees' sense of safety influence their behavior and experience in open spaces?

Sub-questions	Research Tools	Respondents
Do sense of safety in space affects types of activities in open space or space-use?	In-depth interviewing	Households Space users
Does the urban space support/increase physical activity levels?		
What makes you to avoid the space?	Site observations	
Does safe open spaces promote social interaction and exchange?		
When (at which time) do you use this space/ path?		
Is the space safe at night? Is it safe to be out at any time of day and at night considering the activities of people around?		
Do you find it safer with empty space or dark space?		
Are there active buildings that makes space safe?		
How safe do you feel on space/ street / waiting for bus? from 1 to 5		
Have you limited what you do because you don't feel safe in a space?		
Are paths, roads suitable to walk, space to stay and play?		

**How can the physical design of open spaces within refugees' camps affect refugees' sense of safety in the camps?**

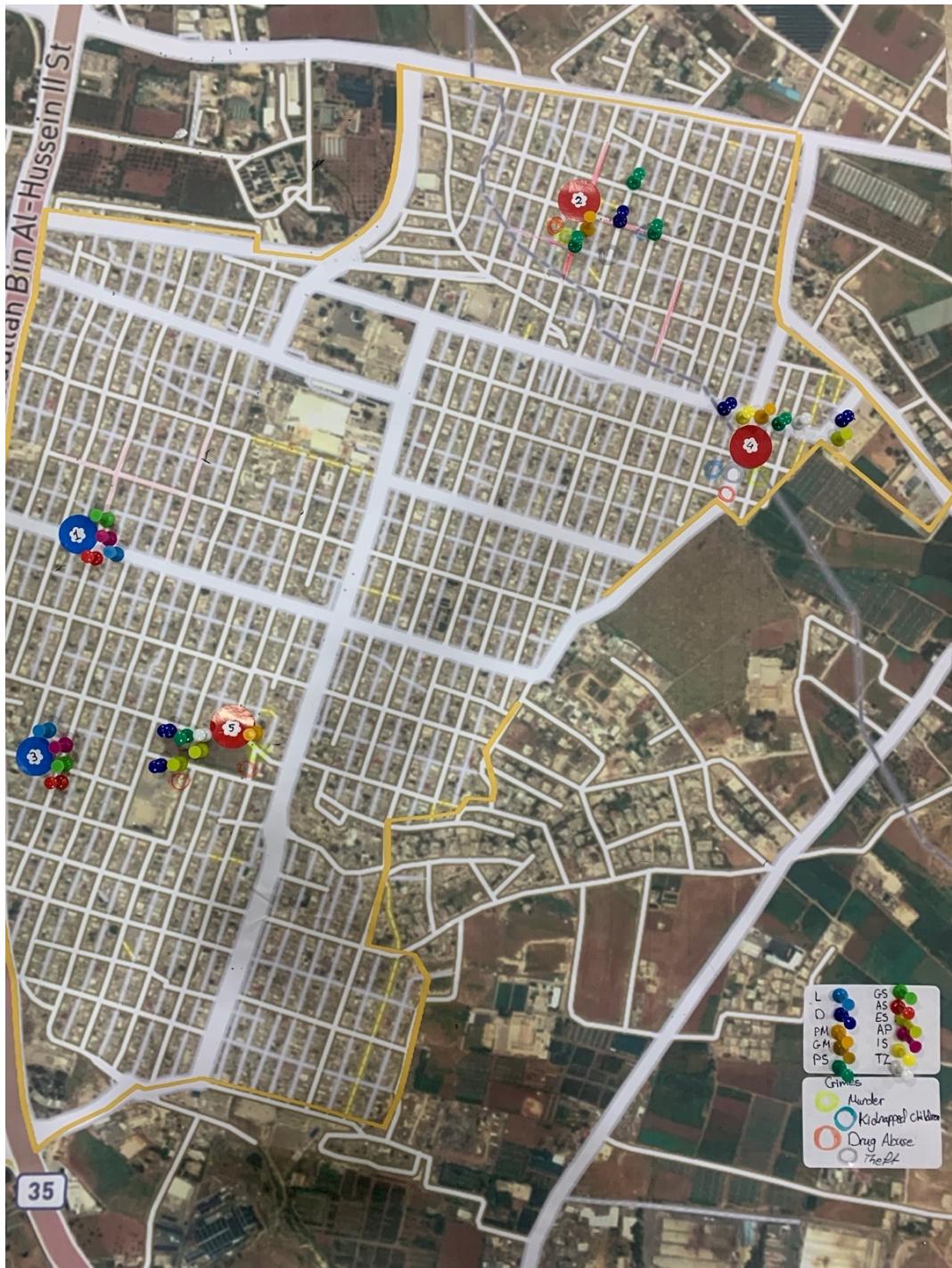
Sub- Questions		Research Tools	Respondents
Informal surveillance	<p>Do buildings windows overlook pedestrian routes?</p> <p>Are bus stops placed near areas of activity rather than in isolated areas?</p> <p>Are there opportunities for informal surveillance on the street, through the erection of porches and balconies, small convenience stores, or community gardens?</p> <p>Does the street provide opportunities for children's play areas to be visible from their homes?</p> <p>Are courtyards or enclosed spaces overlooked by residences or commercial uses?</p> <p>Explain your feelings at dark spaces?</p> <p>Do you feel safe at active spaces? when there are many people around?</p> <p>Does mechanical surveillance such as cameras in open space increase your sense of safety?</p>	Site observations close and open-ended questions Interviews	Space users The author
Sense of ownership (territoriality)	<p>Do landscape elements define the territoriality of the space?</p> <p>Does the sense of ownership in open space affect your sense of safety? If yes please explain how?</p>	Site observations close and open-ended questions Interviews	The author Space users Household
Access control	<p>Do low access control to open spaces affecting your sense of safety? If yes please explain how?</p> <p>Define access control systems in open spaces (gates, police stations, barriers)?</p>	Site observations close and open-ended questions Interviews	The author Space users Household
Maintenance	Does poor maintenance affect your sense of safety? If yes explain how?	close and open-ended questions Interviews	Space users

How we can use CPTED principles to decrease level of crime and increase sense of safety in open spaces in the context of refugee camps?			
CPTED principles	Questions	Research Tools	Respondents
Natural Surveillance	Can programming activities increase off-hours' use?	Observations Mapping Interviews Literature review	Households Space users The researcher
	If there are nearby entrapment spots created by landscaping or the built form, can they be eliminated?		
	Are there programmed nighttime activities, such as night baseball games or evening nature walks, that bring people into the space after dark?		
	Can walls, berms, bushes, hills, or solid fences that block the view be eliminated?		
	Can nighttime routes made more visible by improving sightlines to them and by giving priority to patrols? In larger parks, is there a buddy system or a jogging club to ensure the safety of joggers at off-hours?		
	Can nighttime activity nodes take advantage of nighttime activities and street life such as nearby restaurants and movie theaters?		
	What are the available opportunities to enhance natural surveillance?		
	If the bus stop is adjacent to vacant land, alleys, ravines, parking lots, or buildings set back far from the street, can it be moved?		
	Can we improve lighting? How?		
Maintenance	What are the maintenance applications that can be applied on the site?	Observations Mapping	
Define transit zones (territoriality)	Can principal access routes to nighttime activity nodes identified and is their use encouraged?		
	What are the available tools or elements that can define the space territory or ownership?		
	What are the borders of the space?		

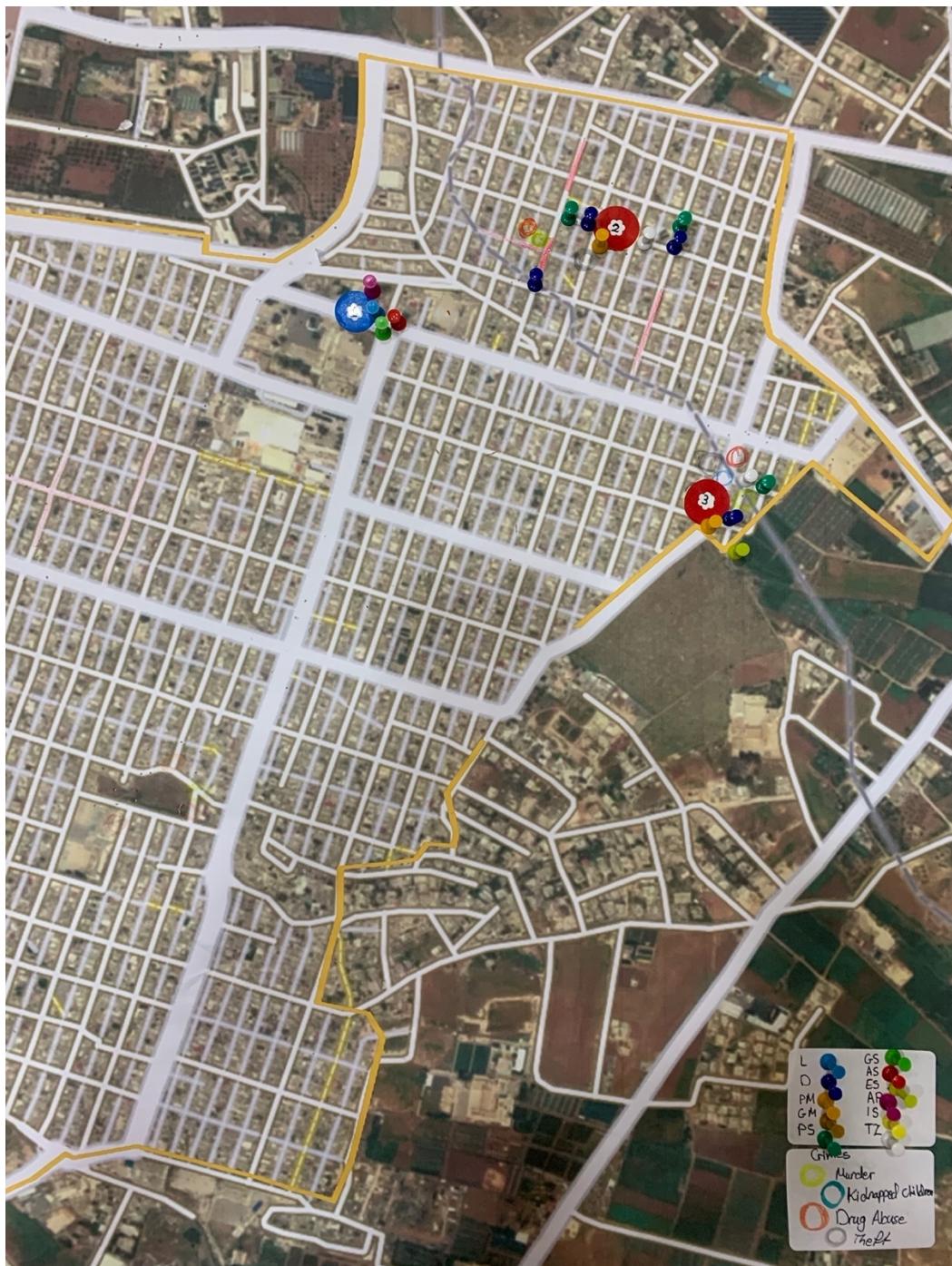
#### D. Interviews' maps of safe and spaces in Baqa'a camp



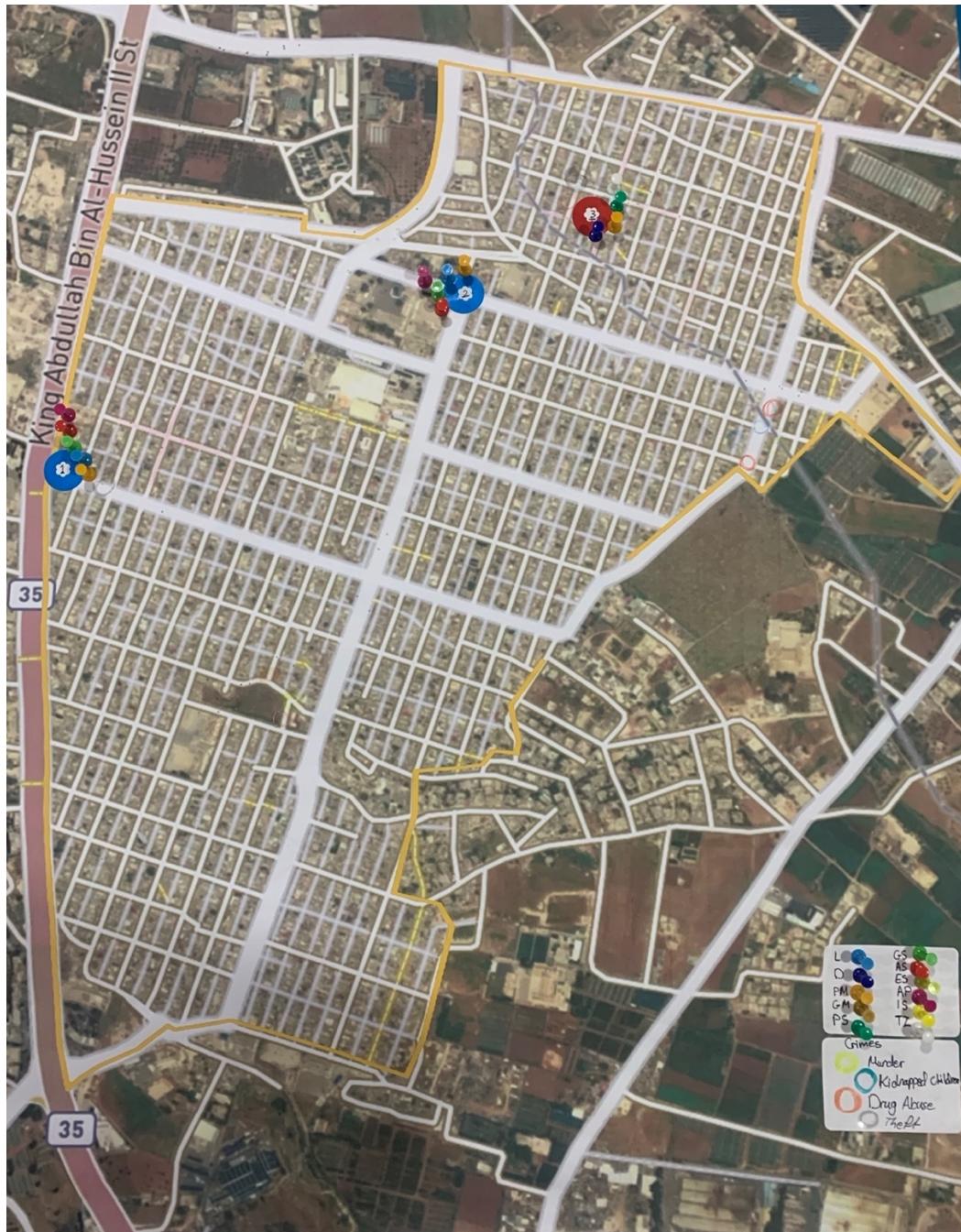
Map NO2. A map of Baqa'a camp represents safe and unsafe spaces (Red stickers= unsafe spaces, blue stickers= safe spaces). The coded-colored pins illustrate the physical elements that affect the sense of safety in the space (L= good lighting, D= poor lighting or dark, PM=poor maintenance, GM= good maintenance, PS= poor surveillance, GS=good surveillance, AS= Accessibility, ES= empty space, AP= active spaces, IS= uncontrolled space/ poor access control, TZ= poor transition between zones)



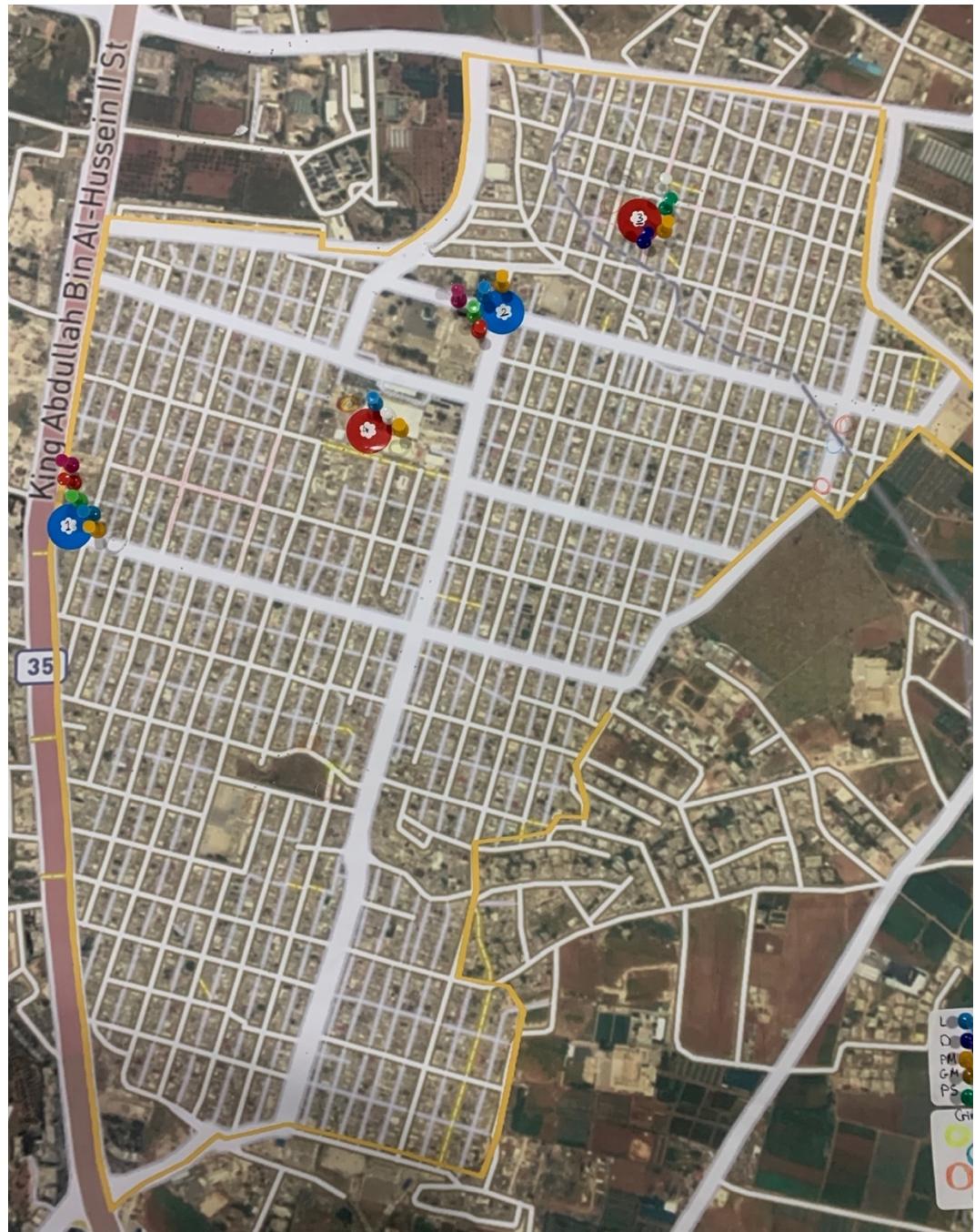
Map NO3. A map of Baqa'a camp represents safe and unsafe spaces (Red stickers= unsafe spaces, blue stickers= safe spaces). The coded-colored pins illustrate the physical elements that affect the sense of safety in the space (L= good lighting, D= poor lighting or dark, PM=poor maintenance, GM= good maintenance, PS= poor surveillance, GS=good surveillance, AS= Accessibility, ES= empty space, AP= active spaces, IS= uncontrolled space/ poor access control, TZ= poor transition between zones)



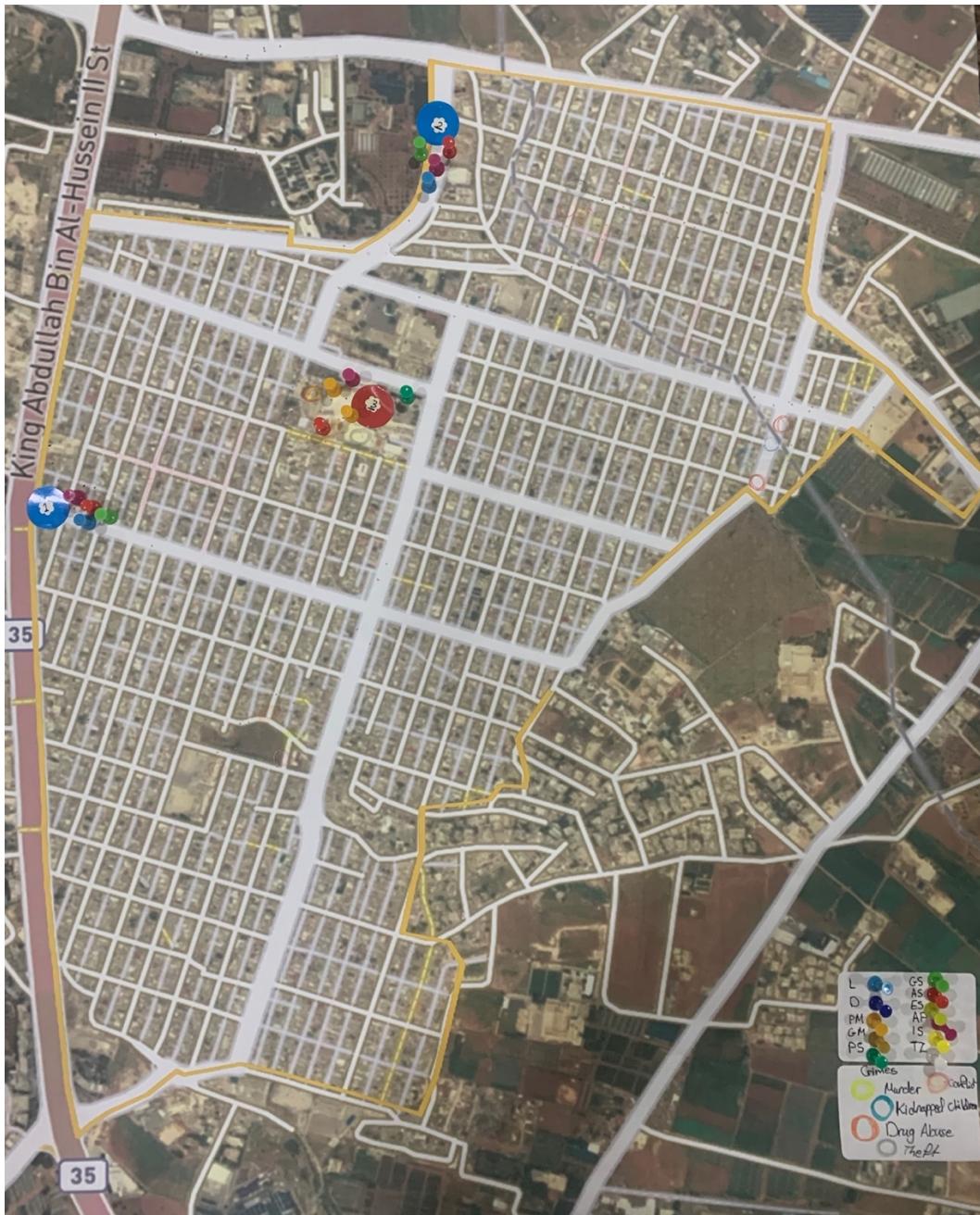
Map NO4. A map of Baqa'a camp represents safe and unsafe spaces (Red stickers= unsafe spaces, blue stickers= safe spaces). The coded-colored pins illustrate the physical elements that affect the sense of safety in the space (L= good lighting, D= poor lighting or dark, PM=poor maintenance, GM= good maintenance, PS= poor surveillance, GS=good surveillance, AS= Accessibility, ES= empty space, AP= active spaces, IS= uncontrolled space/ poor access control, TZ= poor transition between zones)



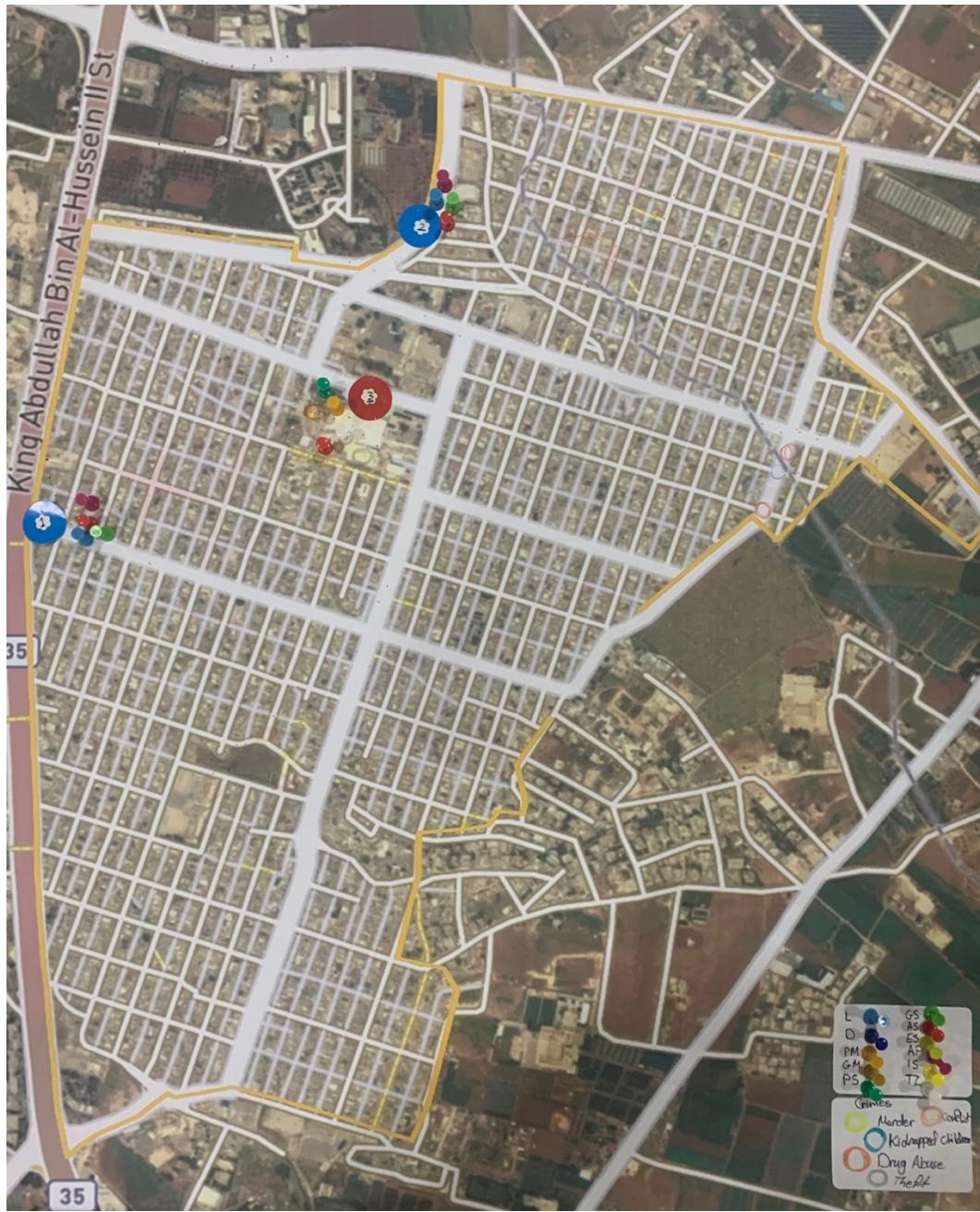
Map NO 5. A map of Baqa'a camp represents safe and unsafe spaces (Red stickers= unsafe spaces, blue stickers= safe spaces). The coded-colored pins illustrate the physical elements that affect the sense of safety in the space (L= good lighting, D= poor lighting or dark, PM=poor maintenance, GM= good maintenance, PS= poor surveillance, GS=good surveillance, AS= Accessibility, ES= empty space, AP= active spaces, IS= uncontrolled space/ poor access control, TZ= poor transition between zones)



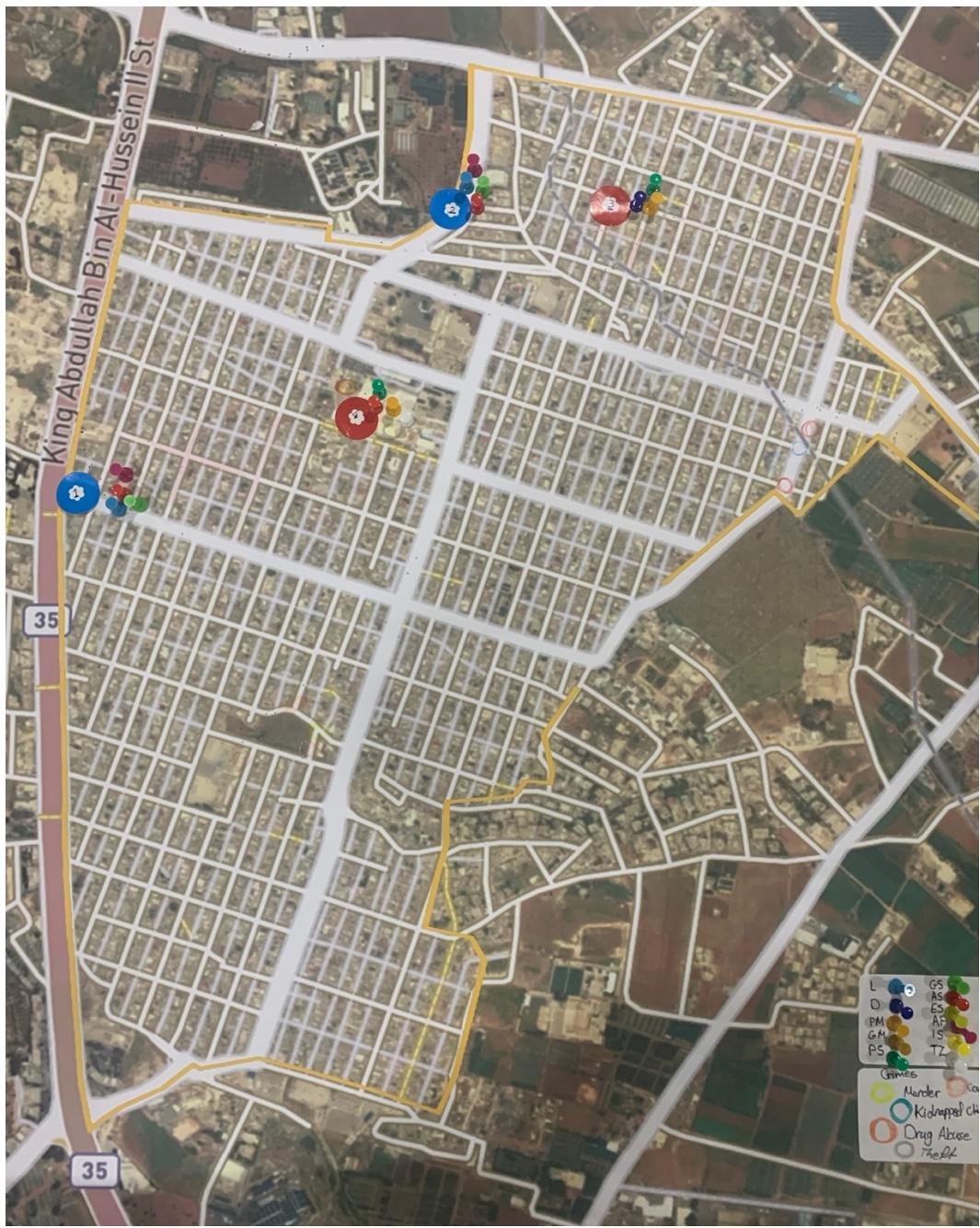
Map NO6. A map of Baqa'a camp represents safe and unsafe spaces (Red stickers= unsafe spaces, blue stickers= safe spaces). The coded-colored pins illustrate the physical elements that affect the sense of safety in the space (L= good lighting, D= poor lighting or dark, PM=poor maintenance, GM= good maintenance, PS= poor surveillance, GS=good surveillance, AS= Accessibility, ES= empty space, AP= active spaces, IS= uncontrolled space/ poor access control, TZ= poor transition between zones)



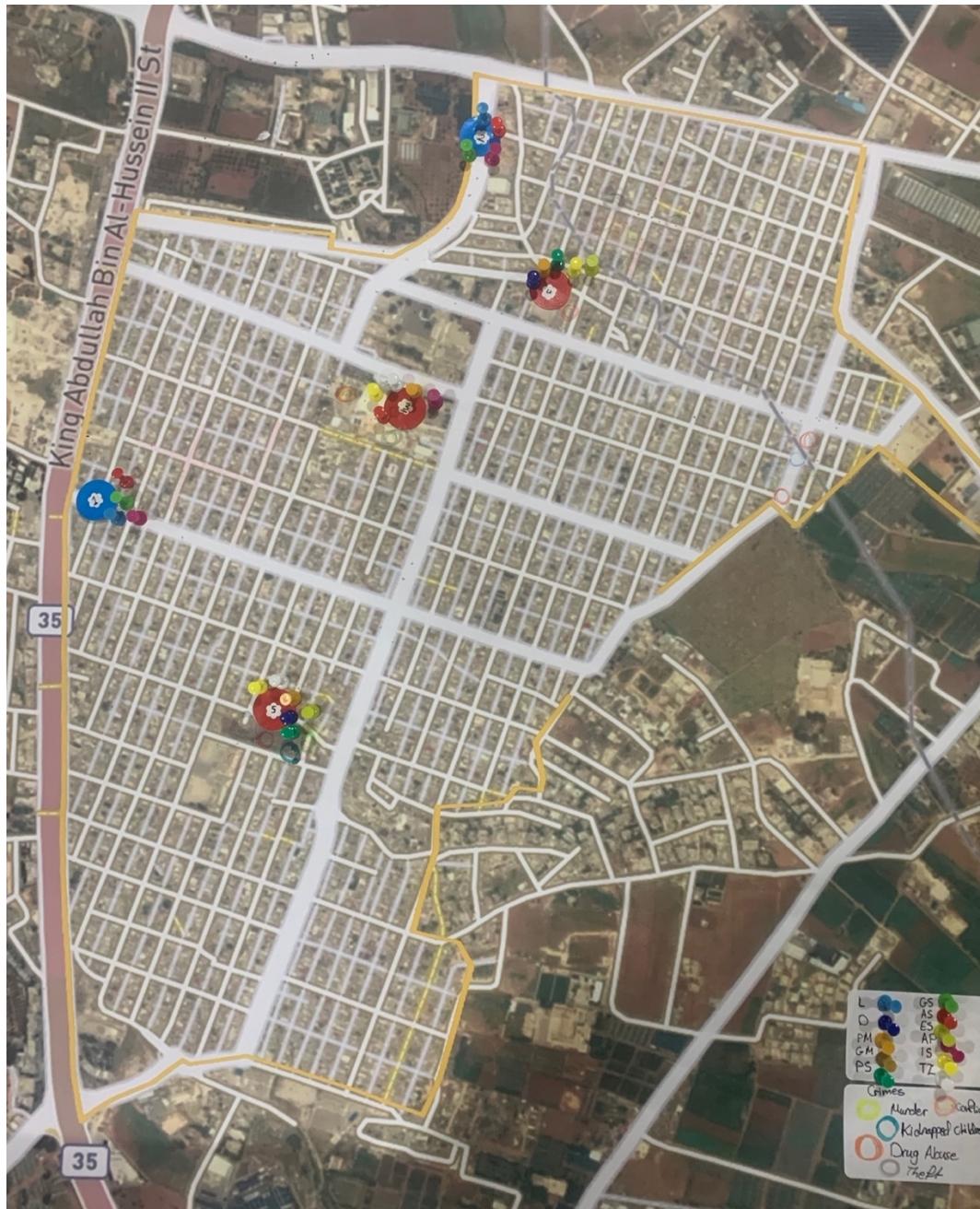
Map NO 7. A map of Baqa'a camp represents safe and unsafe spaces (Red stickers= unsafe spaces, blue stickers= safe spaces). The coded-colored pins illustrate the physical elements that affect the sense of safety in the space (L= good lighting, D= poor lighting or dark, PM=poor maintenance, GM= good maintenance, PS= poor surveillance, GS=good surveillance, AS= Accessibility, ES= empty space, AP= active spaces, IS= uncontrolled space/ poor access control, TZ= poor transition between zones)



Map NO 8. A map of Baqa'a camp represents safe and unsafe spaces (Red stickers= unsafe spaces, blue stickers= safe spaces). The coded-colored pins illustrate the physical elements that affect the sense of safety in the space (L= good lighting, D= poor lighting or dark, PM=poor maintenance, GM= good maintenance, PS= poor surveillance, GS=good surveillance, AS= Accessibility, ES= empty space, AP= active spaces, IS= uncontrolled space/ poor access control, TZ= poor transition between zones)



Map NO 9. A map of Baqa'a camp represents safe and unsafe spaces (Red stickers= unsafe spaces, blue stickers= safe spaces). The coded-colored pins illustrate the physical elements that affect the sense of safety in the space (L= good lighting, D= poor lighting or dark, PM=poor maintenance, GM= good maintenance, PS= poor surveillance, GS=good surveillance, AS= Accessibility, ES= empty space, AP= active spaces, IS= uncontrolled space/ poor access control, TZ= poor transition between zones)



Map NO 10. A map of Baqa'a camp represents safe and unsafe spaces (Red stickers= unsafe spaces, blue stickers= safe spaces). The coded-colored pins illustrate the physical elements that affect the sense of safety in the space (L= good lighting, D= poor lighting or dark, PM=poor maintenance, GM= good maintenance, PS= poor surveillance, GS=good surveillance, AS= Accessibility, ES= empty space, AP= active spaces, IS= uncontrolled space/ poor access control, TZ= poor transition between zones)



Map NO 11. A map of Baqa'a camp represents safe and unsafe spaces (Red stickers= unsafe spaces, blue stickers= safe spaces). The coded-colored pins illustrate the physical elements that affect the sense of safety in the space (L= good lighting, D= poor lighting or dark, PM=poor maintenance, GM= good maintenance, PS= poor surveillance, GS=good surveillance, AS= Accessibility, ES= empty space, AP= active spaces, IS= uncontrolled space/ poor access control, TZ= poor transition between zones)



Map NO 12. A map of Baqa'a camp represents safe and unsafe spaces (Red stickers= unsafe spaces, blue stickers= safe spaces). The coded-colored pins illustrate the physical elements that affect the sense of safety in the space (L= good lighting, D= poor lighting or dark, PM=poor maintenance, GM= good maintenance, PS= poor surveillance, GS=good surveillance, AS= Accessibility, ES= empty space, AP= active spaces, IS= uncontrolled space/ poor access control, TZ= poor transition between zone