REFUGEE CAMPS AS BEHAVIOR SETTINGS:

THE CASE OF GAZA REFUGEE CAMP IN JORDAN

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ABSTRACT

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MDes, Design Studies Master's Program

Advisor: Prof. Dr. Deniz Hasırcı

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This research study aims to understand how the built environment shapes behavior in protracted refugee camps as behavior settings. Often permanently occupied, the "temporary" mentality in designing such spaces may promote inappropriate shelter solutions. Studies of protracted refugee camps and behavior settings of families in private residences are limited, and also not included in Roger Barker's (1968) studies, the founder of behavior settings theory, or studies that follow. The research is carried out in Gaza refugee camp in Jerash, Jordan for a period of three years. Along with observation and questionnaire methods, the behavior settings survey was used as a primary research tool with the contribution of the study findings, in which there were 58 participants. Comparative analyses were produced in different time periods of the research within the same behavior settings regarding the architectural components of the residential environment and the patterns of behavior, using behavior setting survey and behavioral mapping instruments. Findings showed that, although the settings demonstrated the flexibility to be spatially redefined and serve for multifunctional

purposes, occupants greatly restrict their behaviors to conform to the settings they occupy. Meanwhile, with the absence of alternative living options, refugees had to remain within unsatisfying settings, and the settings had to sustain occupants with incompatible behaviors that are a result of excessive control and disciplinary power by outsider authorities. This contradicts Barker's (1968) and Wicker's (1979) proposal of regulation systems in behavior settings. The results of this research have also indicated a psychological dimension in the behavior setting, which had not been adequately considered at the previous applications of the behavior settings survey. The contributions presented in this research along with the use of the behavior settings survey provided a potential mechanism to compose behavioral changes or to detect problems that threaten the existence of the setting and its essential components. These findings contribute to existing research and the field, and could be utilized to improve the living quality of refugees all over the world.

KEYWORDS: Behavior Settings Theory, Behavioral Mapping, Residential Environments, Refugees, Refugee Camps, Gaza Refugee Camp, Jordan.

ÖZET

Davranış Ortamları Olarak Mülteci Kampları:
Ürdün'de Gaza Mülteci Kampı Vaka İncelemesi

Alawamleh, Zaid

Yüksek Lisans, Tasarım Çalışmaları Yüksek Lisans Programı

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Bu araştırma çalışması, yapılı çevrenin uzun süreli kalınan mülteci kamplarındaki insanların davranışları üstündeki etkilerini anlamayı amaçlamaktadır. Genellikle, uzun süreli kalınan bu yerlerin tasarımındaki "geçici" zihniyet, uygun olmayan barınma çözümlerine sebep olmaktadır. Uzun süreli kalınan mülteci kampları ve ailelerin özel konutlarındaki davranış ortamlarını ele alan çalışmalar kısıtlıdır, ayrıca davranış ortamı kuramının kurucusu Roger Barker'in (1968) çalışmalarına ve izleyen çalışmalara da bu tür ortamlar dahil edilmemiştir. Araştırma, Ürdün'ün Ceraş kentinde bulunan Gazze mülteci kampında üç yıllık bir süreçte gerçekleşmiştir. 58 katılımcının olduğu çalışmada, gözlem ve anket yöntemlerinin yanı sıra davranış ortamı anketi, çalışma bulgularının da katkılarıyla birlikte ana araştırma yöntemi olarak kullanılmıştır. Araştırmanın farklı zaman aralıklarında konut ortamının mimari bileşenleri, davranış ortamı anketi ve davranışsal haritalama aracı kullanılarak davranış kalıpları ile ilgili karşılaştırmalı analizler yapılmıştır. Bulgular, her ne kadar ortamların, mekansal olarak yeniden tanımlanma ve çok amaçlı işlerde kullanılma esnekliğini gösterse de, konut sakinlerinin işgal ettikleri alanın düzenine uyum sağlamak için büyük ölçüde davranışlarını kısıtladığını göstermektedir. Bu sırada, alternative yaşam olanaklarının yokluğunda, mülteciler memnun olmadıkları

ortamlarda barınmaya devam etmek zorunda kalmıştır ve bu ortamlar, konut sakinlerinin yabancı otoritelerin yoğun kontrolü ve disiplin baskısından kaynaklanan uyumsuz davranışlarına tahammül etmek durumunda kalmıştır. Bu durum, Barker'ın (1968) ve Wicker'ın (1979) öne sürdüğü davranış ortamlarının düzenleme sistemleriyle çelişki göstermektedir. Bu araştırmanın sonuçları ayrıca, geçmişte yapılmış davranış ortamı çalışmalarının yeterince üzerinde durmadığı davranış ortamının psikolojik boyutunu gözler önüne sermektedir. Bu araştırmada, davranış ortamı çalışması ile sunulan katkılar, davranışsal değişiklikleri oluşturmak veya ortamın ve temel unsurlarının varlığını tehdit eden sorunları tespit etmek adına olası bir yöntem sağlamaktadır. Bu bulgular, halihazırda var olan araştırma ve alana katkıda bulunabilir ve tüm dünyadaki mültecilerin yaşam kalitesini iyileştirmek için kullanılabilecektir.

KEYWORDS: Davranış Ortamları Kuramı, Davranışsal Haritalama, Konut Çevreleri, Mülteciler, Mülteci Kampları, Gaza Mülteci Kampı, Ürdün.

TO REFUGEES AROUND THE WORLD

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This thesis represents not only my work at the keyboard, it is a milestone in nearly a decade of volunteering at SAIB | Society for Aid Improvement and Bridging, nonprofit organization, (*Basmitak Hatallim*) and specifically managing the project of Gaza Refugee Camp Rehabilitation, GRCR. A journey that began with a rejected proposal of a bachelor's degree graduation project, to an officially registered nonprofit organization, and finally to an academic contribution in the field of environment-behavior research. I present this effort with a hope that it will be utilized to enhance the life of all those who suffer displacement of all kinds.

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CHAPTER 1: INTRODUCTION

1.1 Aim and Scope

Designed environments are not restricted to the aesthetics and decoration of a particular space, all designed environments serve a purpose. These environments are where we spend all our time, as we move from one to another, following a program of activities that are called behavior settings. Thus, the programs of the behavior settings that are to occur within designed spaces are supposed to be a primary concern of designers and planners of any environment. Additionally, while behavior settings can be viewed as components of communities, systematic research of each setting would enhance the understanding of how they are linked with one another. Refugee camps are also behavior settings, and their long existence made them part of the larger community of their host countries acquiring a new appearance, closer to housing, that combines shelter design with social spaces and services as essential parts of the camp.

To that end, this research is about understanding how the built environment of refugee camps, as behavior settings, shapes the behavior of its occupants, while the debate of how to plan and design compatible settings and emergency accommodations has gained a new momentum with the increase of refugee movements since 2014 in Europe, the Middle East, and many other regions around the world.

The behavior settings theory by Roger Barker (1968), connects strongly and consistently behavior and physical features of the environment within a program of activities bounded with restricted rules in temporal-spatial coordinates. The concept of the behavior setting has been carefully defined and examined throughout a series of publications such as Barker, (1960, 1968); Barker & Schoggen, (1973); Barker & Wright, (1955); Wicker, (1979); Schoggen, (1989); Wicker, (2002).

Meanwhile, the theory of behavior settings intently participated in filling the gap between conceptualizing the theoretical reasoning and the empirical research across the interdisciplinary fields of the environment-behavior sciences (Stokols, 2000; Wicker, 1987; Wicker, 2002). The empirical applications of this theory, currently known as '*Behavior Settings Survey'*, were developed by Barker and Wright, (1955),

in the Midwest Psychological Field Station in Oskaloosa, Kansas, and later by Barker and his former student and colleague, Phill Schoggen in 1973 by comparing Midwest to Yoredale towns, reported in a book that called *qualities of community life.* The survey was later used in the built environment and design fields as a research tool examining the relationship between behavior and physical environment by those who were involved in the architecture and design fields, such as Bechtel (1977), and Cotterell (1998).

The objectives of this research could be congregated by answering the question of how protracted refugee camps, as behavior settings, are shaping the behavior of its occupants from a spatial point of view. For this purpose, a field study was conducted to observe the physical environment of Gaza refugee camp in Jordan, in relation to the refugee's patterns of behavior at their residential environments, in hand with an empirical project that allowed the researcher to build comparative analyses of the standing behavior patterns and the behavioral maps before and after an architectural intrusion to one of the camp's residential settings.

1.2 Significance and Originality

Within the fields of the physical sciences on one side and the behavioral sciences on the other, the research world lacks sciences that combine phenomena of behavioral attributes, and phenomena of physical things and conditions as essential elements (Barker, 1968). Behavior settings are such phenomena that consist of constantly connected behaviors and objects within a specific environment.

The key finding of Barker and Wright's (1951) research, was that the occupants of any space greatly restrict their behavior to adapt to the setting they occupy. Allan Wicker (1979, 2002), who is a great contributor to Barker's theory of behavior settings, believed that the users of any setting are used to experience spaces the way they are, and take the relations of its physical features and the practiced behavior occurring at the setting, so much for granted, that they only notice its significant existence when it does not occur. In his opinion, considering the possibility of changing the settings we occupy, could contribute to changing the unsatisfied aspects of our lives.

In her TED talk (2015), Val Curtis, who is a behavioral scientist and a developer of interventions to change behavior, in the contribution of Barker's behavior settings theory, said that the characteristics of individuals are incapable to intervene with the behavior of people. In fact, analyzing a behavior setting along with its features and understanding the role that an individual plays in a certain behavior setting, would construct a behavioral prediction, for year by year, with 90% accuracy.

Studying behavior settings could also contribute effectively in the architecture and design fields, because the bounds of any built environment and the user's behavior, connect strongly and consistently. However, this connection is still not adequately considered in the practical applications of the built environment.

This research stands out in two ways. Firstly, in considering 'refugee camps' the site of the study which contributes to the behavior settings theory that has never expanded its attributes in such context, and secondly, in concentrating on the residential environments of its occupants when the original work of Barker and Wright (1955), and Schoggen (1973), of developing behavior settings methods and surveys, did not include any family settings occurring in private residences.

1.3 Research Questions (RQ)

RQ 1. In reference to the behavior settings theory, what are the essential features of the behavior settings occurring at refugee residences?

RQ 2. How does living in a refugee camp affect the daily routine of its occupants?

RQ 2.a. What kind of patterns of behavior is the camp setting cultivating in a residential built environment context?

RQ 2.b. How does the design of their residential spaces, reflect on their patterns of behavior?

RQ 2.c. How are these spaces utilized throughout their daily program?

RQ 3. What is the effect of creating an intervention in any of the features of the behavior setting?

RQ 2.a. How could an intervention affect the standing patterns of behavior?

RQ 2.b. How does this intervention affect the use of their residential spaces?

RQ 2.c. Can this intervention develop a tool for enhancing refugee camps behavior settings?

1.4 Structure of the Thesis

Chapter One draws an outline of the research. It includes a brief explanation of the research background and provides a rationale for the selection of the research area. This chapter contains an explanation of the research aim and scope, clarify its significance and originality, and introduce its structure.

Chapter Two constitutes a literature review of behavior settings, and accordingly, provides an analysis of models and theoretical frameworks that have been previously introduced to this research area. This chapter identifies the essential features of behavior settings and explains the practical usage of its theory. Viewpoints of other involved researchers regarding the research area in general, and its relationship with the built environment in particular, have been presented in a logical manner in this chapter.

Chapter Three introduces the concept of refugee camps from the designers and planners' point of view. It identifies the protracted refugee camps, in particular, appointing the standards and guidelines that have been used throughout the design process of such emergency response. For the objectives of the research, this chapter focuses on planning residential environments of refugee camps; its standards and challenges.

Chapter Four plays a critical role in the achievement of research aim and objectives by addressing methodology, findings, and discussions. The chapter explains the field study process and addresses the issues of research philosophy. Moreover, the field study chapter contains an explanation of the empirical project and the choice and implementation of data collection instruments. Presentation of the collected data through the diagnostic physical observation, behavior setting survey, and behavioral mapping, is also included in this chapter, followed by in-depth discussions and analyses in relation to each individual research objective.

Chapter Five concludes the work and summarizes the extent of accomplishment of the research objectives. The chapter contains an acknowledgment of limitations of the study and highlights the scope for future studies within the same research area.

CHAPTER 2: BEHAVIOR SETTINGS

2.1 Introduction

The behavioral sciences can assist to understand the present and what the trends in societies are. They can guide researchers to predict the outcomes of design proposals for the future in more compatible ways in comparison to what has been already presented. Because the needs of humans are broad and dynamic, it is crucial that designers be informed about the relationship of the people with their built environment (Lang, 1987). The understanding of this mutual relationship between humans and their surroundings is the focal point of behavioral sciences (Dent, 1998). This relationship encourages the architect to design a built environment that caters to the needs of its users while their behaviors towards the environment are studied (Bonnes & Secchiaroli, 1995).

Environment – behavior studies is the field that examines the relationships between behaviors and experiences of a person and his/her built environment. By observing the historical background, the topic under that label includes a wide range of perceptions in theory, cognition, social and anthropological psychology, the study of social relationships and the study of culture (Lang, 1987).

Gifford, in his book, *Environmental psychology: principles and practice*, defines Environment – behavior studies as the study of transactions between individuals and their physical settings (Gifford, 2002). While inquiring about the definitions of the field – of previously called environmental psychology, recently, environment behavior studies – it is important to emphasize that it is included within the person-environment theory and embodied under the topic of behavioral sciences (Gifford, 2002; Bonnes & Secchiaroli, 1995; Land, 1987). The researcher who works in this field, whom called ecological psychologist, is concerned to understand the arrangement of interactions that link the perceptions, decisions, and actions of people with non-psychological events that occur in settings. Moreover, while psychologists believe that people's behavior is based on individuals and their prior experiences rather than the environment, ecological psychologists such as Roger Barker, the founder of behavior settings theory, posited that the content and structure of a person's psychological world

or life-space are entirely determined by the occupied behavior setting. The behavior of people and their environments are firmly connected, rather than independent, and people are essential components of a larger setting system.

2.2 Definition of Behavior Settings

The concept of the behavior setting has been formalized, and a great number of publications for the sake of identifying its properties have been published (Barker, 1960, 1968; Barker & Schoggen, 1973; Barker & Wright, 1955; Wicker, 1979; Schoggen, 1989). The recent tilt towards the study of cognition has concluded the idea of a behavior setting, which presume fixed patterns of behaviors (Price, 1990). Behavior setting theory fills the gap between conceptualizing the theoretical reasoning and the empirical research across the interdisciplinary sciences involved in the environment-behavior field, (Stokols, 2000; Wicker, 1987; Wicker, 2002).

Kurt Lewin (1944), has published a paper on *'psychological psychology'* and proposed that the first step in order to understand the behavior of individuals or a certain group of people is to observe what their environments had offered. He demonstrated this proposition in the concept of "life space" in relation with behavior, personality, and environment and proposed the basic formula of "$B = f(PE)$ or behavior (B) being a function (f) of the interaction of personality and other individual factors (P), and the perceived environment of the individual (E)".

Yet, Barker went beyond his teacher Lewin, presenting his theory, that the behaviors of individuals can be precisely predicted according to the situation in which they are located, rather than on their personal characteristics (Popov & Chompalov, 2012). The stability and order of that environment are not, he argues, simply the result of the perceiver's information processing. Barker stresses that, just as we cannot understand the working of an engine by knowing how one of its parts works, neither can we understand behavior setting operations simply by knowing the psychology of persons (Wicker, 1979). After all, the actions of individuals are strongly connected to their surroundings. In other words, the person is ever positioned in some empty Cartesian space—although it is how psychology eventually conceives it (Heft, et al., 2014). However, behaviors are always situated, and they always occur within the frame of

space and time. Remarkably, an essential feature of the context is a dynamic, although, a standing pattern of activities initiated by the joint participation of a group of participants with the intentional support of the setting (“milieu”). These ecological structures are called behavior settings by Roger (Heft, et al., 2014).

Moreover, behavior settings are 'real' while some concepts in psychology, like attitudes and motives, are convenient fictions or abstractions that psychologists are formulated. In contrast, behavior settings are tangible. Their time and place boundaries can be pointed out precisely (Wicker, 1979). “It consists of bounded and internally patterned units that are frequently arranged in precisely ordered arrays and sequences” (Barker, 1968, p.72).

In fact, Barker stated that it is much more practical to go to the setting where the activities of the behaviors are occurring than trying to pull information out of the user’s head. Professional psychologists have had great hassle acknowledging it. Up to now, the majority of psychologists stand in a position that the origin of all behavior occurs in the head. Yet, Skinner was opposing his fellow psychologists as his point of view went in line with Barker believing that behavior was "shaped" by the environment. He said: “People are extraordinarily different in different places, and possibly just because of the places" (Skinner, 1972, p. 185). Although, a very limited number of his companions agreed on this radical position (Bechtel, 2000).

Substantially, the analyses show that the evolution of Barker's theory initiates by emphasizing the spatial and temporal elements (Barker, 1963), and consistently shifts to emphasizing behavior. The result of the occurrence of understaffing on the behavior and experience of the inhabitants itself guided Barker to develop behavior setting theory (Barker, 1960). Barker believed that his predictions are attained from principles about how certain individuals function rather than how certain individuals behave. He stresses that people tend to behave closely similarly in similar environments no matter what their individual differences are (Walsh, 1973).

As Barker and Wright were the first to emphasize the environmental dimension of behavior, their original definition of a behavior setting is, "A standing pattern of behavior and a part of the milieu which are synomorphic and in which the milieu is circumjacent to the behavior" (Barker & Wright, 1955). In other words, this standing

pattern of behavior, which is a repeated routine of actions, is part of the stream of behavior at the same time it is surrounded by it, while Place and behavior are all tied together and inseparable.

2.3 Essential Features of Behavior Settings

While the approach to understanding people in their community or an organization is to identify and describe the behavior settings that occur within it (Wicker, 1979), generally speaking, the repeated pattern of behavior and the physical layout of the setting, are likely two sources of information that point out the identity of a behavior setting (Heft, et al., 2014). Each behavior setting has its own flow of events during the time it is in operation. Each has an orderly pattern of behavior that followed a program— a prescribed sequence of interactions between people and objects in the sitting.

2.3.1 Defining Properties

According to the practical nature of this research, three main books —those have discussed behavior settings theory— were selected as primary sources about the theory and its attributes; Barker, (1968), and his famous book *'Ecological Psychology'*, Wicker, (1979) *'Introduction of Ecological Psychology'*, and Schoggen, (1983) *'Behavior Settings'*.(See figure 2.1). In technical words, the "behavior-milieu interface" is called the synomorph, and the 'milieu' is circumjacent and 'synomorphic' to the 'behavior'.

Patterns of behavior are the main components of any behavior setting. The standing pattern of behavior —or what is called in sociology; *role*— is a discrete behavior entity with specific temporal-spatial coordinates to carry out an ordered sequence of events called the setting program. The difference between the terminology of "Role" in sociology and the "Standing pattern of behavior" in behavior settings theory, is that a role does not have such temporal-spatial coordinates. Roles, composed of human and nonhuman components in a behavior setting, have a feature of sustainability. They are

replaceable and interchangeable components, as long as each essential task is covered (Barker, 1968; Wicker, 1979; Schoggen, 1983).

In any behavior setting, there is a minimum and a maximum number of roles to carry out the setting program. This feature falls under the theory of staffing that will be discussed in the next section.

The standing pattern of behavior is surrounded by both manufactured parts —like furniture, buildings and streets— and natural features, like hills and lakes. They are basically any physical components of a behavior setting, (*Milieu*). Moreover, the behavior and the physical components of a behavior setting have fundamental various types of relationships. There is an essential fittingness between them rather than being independently arranged, (*Synomorph*).

1. Boundaries of:
   a) *Time; (occurrence & duration)*
   b) *Space*

2. Program; *an orderly pattern of behavior followed by a program*

3. Roles; *Composed of: human and nonhuman components.*
   These components have the following features:
   a) Sustainability of components
   b) Level of interdependence, (staffing); *minimum/maximum number of persons to carry out the setting program*

4. Rules; *self-regulating systems that impose the program of activities on the persons and objects within them.*

Figure 2.1: The defining properties of a behavior setting. Adapted from Barker, (1968) 'Ecological Psychology', Wicker, (1979) 'Introduction of Ecological Psychology', and Schoggen, (1983) 'Behavior Settings'.

2.3.2 Regulation Systems in Behavior Settings

As previously described, behavior settings are bounded, self-regulated and ordered systems composed of replaceable roles and objects those interact in a compatible relation to carry out a pattern of behavior called the setting program (Wicker, 1979).

This program is imposed on the setting's roles and objects, and at the same time, it depends on them. "Each system in this nesting arrangement booth constrains and is constrained by the outside unit that surrounds it and by the inside units it surrounds" (Barker, 1968, p.155).

According to Barker, (1968) and Wicker, (1979), within any behavior setting, there are several specialized mechanisms responsible to assure that the essential activities of the setting are carried out smoothly and without any threat to their existence or to the satisfaction of its participants. In addition, as people usually tend to adapt to their environments (Croll & Parkin, 2002), such threats and the regulations that prevent them to develop, may not be visible to the people in them, but they may be obvious from distance and to a less involved observer. People nevertheless are likely to pay attention if the mechanism does not operate successfully.

To that end, three main mechanisms work continually for the sustainability of the behavior setting, were noted throughout the survey field station in the Midwest of Barker and Wright's research in 1955 and re-presented in Wicker's book in 1979; Sensing mechanism, executive mechanism, and maintenance mechanism (Figure2.2).

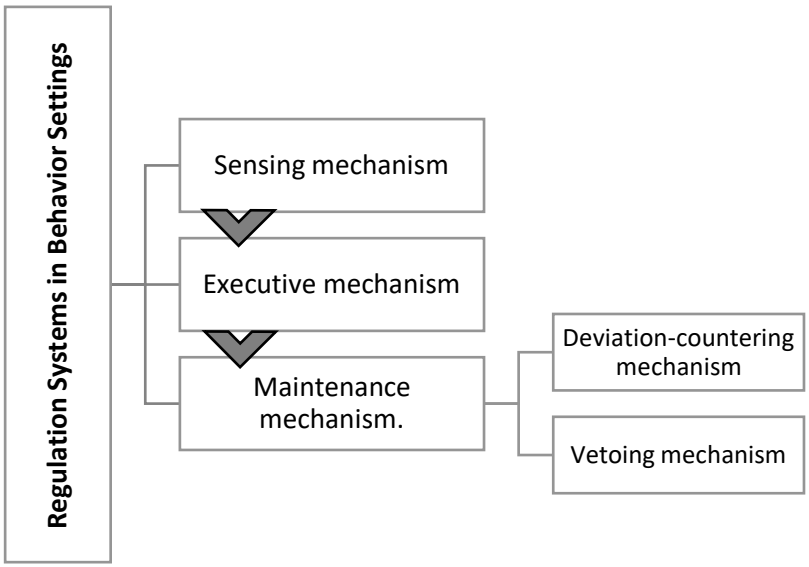

Figure 2.2: Regulation systems in behavior settings, adapted from Wicker, A. (1979). An introduction to ecological psychology. Monterey, California: Brooks/Cole.

The sensing mechanism that involves the human senses or any other alternative technologies that serve to sense the environment, act as first and consistent receptors of information about the setting (Kandel, et al., 2013). The indicators of the environment depend on the occupant's perception of space (Newman, 1972; Gifford, 1997). The information they receive is examined of appropriateness or threateningness to the setting by the executive mechanism, which is defined as the human brain's cognitive processes that involve selecting and monitoring behaviors and resolving competing tasks (Nestler, et al., 2015). Executive mechanisms could also be carried out through technological alternatives such as sensors and detectors when they detect that the room temperature is too warm for instance.

However, if the executive mechanism detected any possible threats to the setting program or the wellbeing and satisfaction of its participants, the maintenance mechanism takeover by the occupants themselves or whoever in control, in order to return the setting to normal. The maintenance mechanism offers two ways to deal with a problem/threat in the setting according to Barker (1968). Either the source of the problem changed, corrected, or modified in some way *(deviation-countering mechanism)*, or the person or object responsible for the problem is simply removed from the setting *(a vetoing mechanism)*.

Deviation-countering and vetoing mechanisms can also be practiced by the occupants of the setting against themselves if they did not cope with their attributes. They may voluntarily eliminate themselves out of the setting or avoid the participation of one of its activities. This situation usually appears when the setting is facing problems regarding the level of fit that is described in the next section.

2.3.3 Staffing Theory

One of the important features of behavior settings, as mentioned earlier, is their dependence on a minimum and a maximum number of 'roles' to execute the setting program. Barker (1968), considered these roles as the 'instruments' of the behavior

setting system; that is tied to the role they play in the setting rather than their input as individuals.

Staffing theory was originally developed by Barker and Gump's (1964) work, *Big School, Small School*. Their research studied the relation of multiple school environments in Northeast Kansas and the student's behavior, concentrating on the effect of the size of the school and the level of participation of students in its activities that led to forming their theory of staffing (Gump & Friesen, 1964). Following the example of Roger Barker and Paul Gump, Allan Wicker as well, contributed to the staffing theory on his work, studying the relation between educational behavior settings and the level of participation in them (Wicker, 1968).

The term staffing theory —that was previously known as manning theory— explores the effects of filling the essential roles in a behavior setting; that they either are understaffed, optimally staffed or overstaffed (Wicker, 1979). Understaffing, refers to a lack of participants filling the essential roles in a setting program, whereas optimal staffing, represents the adequate number of participants that maintains an effective performance of the setting program. The overstaffing case in a behavior setting occurs when the setting is accommodating extra participants than the program requires.

The rationale behind this theory is that understaffed settings put more pressure than optimally staffed or overstaffed settings on their participants to be enrolled in the setting program and its maintenance mechanisms (Schoggen, 1983). This means that more deviation-countering mechanisms are expected to occur in the understaffed settings. The theory's expectancy of the participants of understaffed settings, that they will take positions of leadership and responsibility more often than those in optimally staffed or overstaffed settings (Gump & Friesen, 1964). Accordingly, the behaviors of the participants in the range of staffing will differ (Weiss & Hoegl, 2015).

The participants of understaffed settings swing between feeling important to their settings and responsible for their duties, and on the other side, insecure about the sustainability of their setting. This is due to the nature of their roles in the setting that challenge their abilities to work hard, on a variety of tasks sometimes, and being recruited on tasks that are beyond their abilities (Wicker, 1979).

To summaries the substance of this theory, a behavior setting can achieve its best performance if it provides a balance between the number of its occupants and the number of the required roles to pursue with the setting program. If the overstaffing increases, the number of individual responsibilities decreases (Weiss & Hoegl, 2015). Too many roles or too many participants in the behavior setting would tie up its program and its maintenance mechanisms in multiple categories. On the contrary, if the understaffing increases, the participants depend more on one another, the level of communication between them increases and their behaviors can thus have a circular, cumulative effect, although, burnouts of energies and motivations would occur as a consequence (Wicker, 1979).

2.4 Behavior Settings Theory in-Use

In this section, the behavior settings are discussed from a perspective of instrumental methodologies that have been useful in providing information on designed environments.

Since the behavior settings theory is constructed on inductive reasoning and due to its empirical base, it can aptly be presented as "grounded" (Barker, 1968). In parallel to other grounded theories, behavior settings theory dwell on description instead of explanation and construct a methodological foundation of the behavior setting survey (Popov & Chompalov, 2012). Hence, the theory can be identified as a "grounded theory of behavior settings" with its superstructure that Barker presented in Ecological Psychology (1968).

Behavior settings theory combines interdisciplinary subjects from some very abstract philosophical principles such as Lewin’s (1951), and from the empirical observations and field research which contributes to the influence of philosophy on research design and how field data may serve to produce highly abstract theories. To that end, the theory is quite capable of guiding research and evolving through a feedback loop process.

In order to establish the theory of behavior settings, Barker and his colleagues conducted a survey in Midwest and Yordale that described all the behavior settings in

the town and its institutions which later has been introduced as the behavior setting survey.

A behavior settings survey involves three operations: identifying and listing all potential behavior settings, which are the exoskeletons of behavior-milieu synomorphs, as described by Barker (1968); eliminate items from the initial inventory that do not fit the definition of a behavior setting of having a certain activity bounded in a time and space frame; and lastly, describing the behavior setting in a way that serves the research objectives.

Behavior settings have also been utilized in measuring the impact of certain programs in the community in which they are located (Ragle, et al., 1978). It has been extensively used as a research tool by many researchers as (Tisot & Thurman, 2002), the research of (Cotterell, 1998) on behavior in urban environment, and the work of (Bechtel, 1977).

Bechtel (1977), as the most active user and promoter of behavior settings survey, has extensively used Barker's theory in his architecture works, believing that Barker's techniques are especially appropriate for examining the relationship between behavior and physical environment. He believed that designers and careful planners are the creators of 'behavioral focal points' which are the hub of activity and informal communication among occupants. Additionally, behavior settings surveys can provide useful information on any designed environment. Robert Bechtel and his associates have used the survey as a tool to evaluate the features of the designed spaces such as room layouts, furniture arrangements, and placement of buildings, walls, fences, and sidewalks in residential areas, public-housing projects, and residential facilities on military bases.

Bechtel substantiates emerging behavior settings survey in his work mainly for two reasons; First, because the behavior settings survey does not concentrate on the unobservable events as feelings, attitudes, and beliefs. In fact, it examines directly observable behaviors those are closely linked with the physical environment rather than people's internal reaction.

For example, such design features as designing fast-food restaurants with a low number or uncomfortable chairs, on purpose, will have more immediate implications

for what people do in these settings than for how they might feel. The user of such a restaurant will subconsciously finish the meal and leave the place for another user that initially would increase the owner's profits (Whitaker, 2012).

The second reason in Bechtel's proposition is that using the behavior settings survey helps ensure that essential elements will not be missed, due to the fact that the researchers who conduct behavior setting surveys generally collect a wide net of data and variables of the environment and behavior, in a manner that won't bother or affect the occupants of the observed space.

CHAPTER 3: REFUGEE CAMPS: FROM EMERGENCY RESPONSE TO PERMANENT SETTLEMENTS

A refugee is defined as someone who has been forcibly displaced away from his or her country of origin because of oppression, war or violence. A refugee usually suffers from a fear of persecution for reasons of race, religion, nationality, political opinion or associateship in a particular group. Most likely, they are not able or afraid to return home. War and ethnicity, tribal and religious violence are leading purposes of refugees' displacement (UNHCR, 2019).

Agamben (1998), in his influential writings, described the refugee camp as the "the absolute, pure, impassable bio-political space", where life threats can be practiced. The over control and disciplinary power that can occur in a refugee camp are politicly evoked from the concept of otherness where unwelcomed refugees are entering another country as, undesirable guests (Agier, 2011). Indeed, the perception of the camp as "other space" is strongly connected with nationalism. Hence, the camp becomes a space for those who have "no right to have rights" (Arendt, 1951, p. 64–78).

The world has recently recorded the highest levels of displacement than any other time. At the end of 2018, an unprecedented 70.8 million people around the world have been obliged to leave home due to conflict and persecution. About 30 million of them are under the age of 18. Millions of refugees, likewise, were not given a nationality to where they are living while access to basic rights such as education, healthcare, employment and freedom of movement was denied (UNHCR, 2019).

This chapter will introduce the protracted refugee camps, its definitions and the way they are designed and planned.

3.1 Protracted Refugee Camps

3.1.1 Definition of Protracted Refugee Camps

While refugee camps were originally conceived as a temporary response to an emergency situation, studies show that the average stay in a refugee camp is seventeen years (D'Ettorre, 2016). That means, that a whole generation has grown up there. Protracted refugee situations, defined by the United Nations High Commissioner for Refugees (UNHCR) as the situation where refugees find themselves in a long-lasting and high state of uncertainty, where refugees are deported for five years or more after their initial displacement, without expectations for durable solutions. Their lives may not be at risk, however, their basic needs of education, healthcare and rights, and essential economic, social and psychological needs remain unfulfilled after years of displacement. A refugee in this situation is often unable to unbind from enforced dependence on external assistance. Such situations can be found across the globe, for example in North and sub-Saharan Africa, Asia, and Latin America — where returning home is not a safe option for refugees (Schall , 2013).

A definition of protracted refugee situations should be considering the humanitarian perspective together with the political and strategic aspects of the phenomenon. In addition, it must recognize that countries of origin, host countries, and the international community are all responsible for causing protracted refugee situations. Refugees communities in protracted situations have exceeded the emergency phase of saving their lives, but practical solutions are unexpectable in the near future. These communities are mostly aggregated in a certain geographic area and may include camp-based and urban-refugee populations (Loescher & Milner, 2006).

3.1.2 A Global Overview of Protracted Refugee Camps

Recently, the topic of refugees and refugee camps have gained significance globally. Indeed, the majority of them are living in protracted refugee camps those are the result of the failure to find solutions to their underlying political crises (UNRWA, 2010). The number of refugees increases every day, but the response in providing essential aid has been the same since the Second World War (Kleinschmidt, 2015).

In addition to the Palestinian refugees, displaced persons from Afghanistan, Angola, Bhutan, Burma, Burundi, Congo/DRC, Eritrea, Somalia, Sudan, Tibet, and Western Sahara, were also registers as descending generational refugees by the UNHCR.

A massive growth in the global population of forced displacements was recorded during the past decade has seen substantial growth. The year of 2017 had been identified with multiple ongoing displacement crises according to the UNHCR, 2018 report. Consequently, the global population of refugees increased to 68.5 million, in comparison to 65.6 million in 2016. In 2007, this population exceeded 42.7 million; over the last 10 years, which is over a 50 percent increase. Recently, 1 out of every 110 people in the world is displaced, compared with 1 in 157 a decade ago (UNHCR, 2018). Most of the refugees have lived in exile for long periods of time, restricted to camps or in challenging existence in urban centers throughout countries with low and middle income (Loescher & Milner, 2006). In the Middle East, for instance, refugee camps and storage facilities were established, while the refugees were building cities (Kleinschmidt, 2015).

The international community has switched attention and concentrated largely on refugee emergencies since the early 1990s. These attentions have offered humanitarian assistance to war-affected communities and supported massive reconstruction initiatives in high-profile areas such as the Balkans, the Great Lakes region of Africa, Darfur, and Chad. Nevertheless, more than 60% of today's refugees are exposed to difficult situations out of the international attention.

Often recognized as protracted—stretching to decades for some refugees—these circumstances take part mostly at all continents in a range of environments including camps, rural settlements, and urban centers. The immense majority are to be found among the third-world countries in the world's most difficult situations regions and are usually the result of disregardance by the world active leaders. Refugees confined in these challenging circumstances usually confront serios restrictions on their rights while their presence raises political and security concerns among host governments and neighboring counties in the region. As such, protracted refugee situations represent a significant challenge both to human rights and security (Loescher & Milner, 2006).

3.2 Planning Refugee Camps

Refugees tend to settle in the host countries in three types of settlements. Dispersed settlement/host families, mass shelter —public buildings and community facilities—, and spontaneous or planned camps.

For the objectives of this research of studying the residential environments of long periods of refugee camps those were created specifically to accommodate refugees, only the 'spontaneous and planned camps' types of settlements are discussed.

3.2.1 Spontaneous and Planned Camps, Type of Settlements

Spontaneous camps are established without advanced arrangements and planning inconsequence of delivering immediate needs. Despite of forming an unfavorable environment, the tendency of providing the necessary services may become a burden and overpriced. They generally are problematic as the processes of re-location or re-designing the refugee camp could be a continuous process along with the settlement of refugees, while conflicts with the local community may appear. A major disadvantage of spontaneous camps is the high density of populations. According to the UNHCR (2007), this is the most unfavorable option for refugee settlements and an unbearable burden on local services. Although, due to the decisions of the host country or the lack of adequate land this would be the only possible and available option.

On the contrary, planned camps are the type of settlements where refugees are hosted at intentionally built sites and adequate services. Accordingly, it is expected to provide services to a large population efficiently. However, camps that are of considerable size and high population concentrations would put the refugee's safety at risks in addition of the possibility of providing a space and support for persons other than refugees who would benefit from the provided services and assistance (UNHCR, 2007). Planned camps usually cause more challenges in various levels than refugee settlements in open situations due to its overcrowding and less possibility that basic facilities, such as water supply and health care services, will be available when refugees first arrive (Harrell-Bond & Leopold, 1993).

3.2.2 Standards and Guidelines for Planning Refugee Camps

3.2.2.1 Background History

With the escalation of the refugees displacement operations since 2014 in Europe and the Middle East, the argument of planning appropriate residential areas and emergency shelters has been globally a highlighted topic. Despite the issue of saving lives, providing proper accommodation is primitive in consonance with human rights. This matter has gained its significance by the fact that the layout, infrastructure, and residential spaces of a camp will play a major role in the safety and well-being of its occupants (UNHCR, 2007).

The objectives of highlighting the planning stage and its consequences are not only to asserting that planning is power and influential (Flyvbjerg & Richardson, 2002); but that it could be abused to impose control over refugees (Dalal , et al., 2018), which will initially reflect on their behavior. Accordingly, the spatial boundary of a camp could be seen as a consequence of planning, designing, organizing, managing, and controlling the daily lives of refugees.

The relation of space and how it could control its occupant's behavior is presented in more detail in the next chapter and discussed thoroughly in the discussion section of chapter four.

Back in 1971, a team of engineers and planners gathered for the aim of studying and analyzing refugee camps. The team was mainly concerned about finding how they are operating and to provide practical methodologies for enhancing their management operations. The research focused on social, economic and health problems, in addition to the administrative and organizational aspects that affect the management of camps. The results of the studies emphasized that refugee camps are manageable. If properly designed, problems can be considerably reduced. The total expenses of designing and implementing a proper living environment in a refugee camp are less than the continuing operational costs of a poorly designed camp.

Furthermore, good physical layouts or plans can save lives. Designs which consider the occupants health encourage refugee organization to reduce the incidence of disease

and promote participation by the inhabitants of the camp in activities which ultimately lead to their looking after their own well-being (Rooij, et al., 2016).

Each camp is a complete system and each operation affects the other. The problems faced in refugee camps in Frederick Cuny's contribution of planning refugee camps, fall into three general categories: overall camp planning; sewage and waste disposal; and housing. In his opinion, the overall effort in physical operations has been insufficient in all the refugee operations. The major problem has been mostly organizational where large scale work parties with specialized tasks to carry out necessary operations are poorly managed (Cuny, 1974).

In 2007, Michel Foucault, in his lectures at the College du France, described how camps are planned on a disciplinary basis. He said; "A town is built where previously there was nothing. How is it built? The famous form of the Roman camp is used, which, along with the military institution, was being reutilized at that time as a fundamental instrument of discipline...In the case of towns constructed in the form of the camp, we can say that the town is not thought of on the basis of the larger territory, but on the basis of a smaller, geometrical figure, which is a kind of architectural module, namely the square or rectangle, which is in turn subdivided into other squares or rectangles" (Foucault, 2007, p. 31). In spite of the similarities with urban contexts, planning a refugee camp has its specialty regarding the practiced design approaches that lack experienced professionals in designing such places (D'Ettorre, 2016).

3.2.2.2 Site Selection

Even though refugee camps are emergency response, allocating space and properly designing it, is an essential task that needs to be achieved ahead of the arrival of the refugees. A well-prepared site will positively affect the provision of other assistance. While these decisions are being made, cooperation between specialists and refugees is beneficial for the quality of the end result. Gould & Joyce (2011), have described this integration saying that good design is a consequence of multidisciplinary collaboration. By bringing together all parties, the traditional barriers between design and construction will initially dissolve. The aim is to combine the knowledge and skills

of all participants and allow them to establish a better understanding of the project (Day, 2016).

The needed information for a site selection process will often be available in the form of maps, reports, surveys, aerial photographs, satellite images, special geographic databases, and other data collection tools. This data is collected by including local authorities and communities, government offices, educational institutions and any governmental or nongovernmental organizations involved in the camp.

The social and cultural fabric of the refugees, as well as physical planning, accommodation, and climatic conditions, are important factors to consider in site selection. The seasonal variation could also affect the classification and cost of housing units, infrastructure, and heating energy. As much as the situation offers the flexibility of choice, refugees need to be hosted in an area where the climate is slightly similar to their countries of origin. However, a very few suitable options, where even minimum standards are met, will be available in many circumstances (UNHCR, 2007).

3.2.2.3 Site Planning

The objective of establishing any refugee camp according to the standards and guidelines of UNHCR's official *Handbook for Emergencies* (UNHCR, 2007), is to provide suitable sites and shelter, in order to accommodate refugees in emergencies. However, sites those were planned to accommodate refugees temporarily, have a high probability to be transformed into protracted camps, where community services, such as water points and garbage collection, will be provided for longer terms. While in reality, some compromises are expected to occur in consideration off all the compatible elements. However, these considerations are developed in a master plan that considers open community forms for them to assist ownership and provide maintenance. Avoiding high population density congestion while planning the camp, would contribute to providing the needed services for the refugees and would determine the size and layout of the site.

According to the handbook, in the early stages of planning the refugee camp, standard calculations of its size are taken into consideration. Ideally, a minimum surface area

of 45 m^2 per person is recommended. This area includes the kitchen and small gardening space. yet, the surface area dedicated to each person apart from the gardening space, should not be less than 30 m^2. The least fulfilling average of 30 m^2 surface area per person includes the fundamental area for roads, footpaths, educational facilities, sanitation, security, firebreaks, administration, water storage, distribution, markets, relief item storage and, of course, plots for shelter. However, this number excludes any land for significant agricultural activities or livestock. Even though cultivation practices are not usually a priority during emergencies, the site plan needs to include a small kitchen gardening area of 15 m^2 per person.

Planners are also required to take into consideration that refugee camps would expand due to natural increases or new arrivals. The population could grow as fast as 3 to 4% per year due to excess of births over deaths.

Accessibility to the camp is one of the key features to consider while planning and designing the site. The site must be accessible and close to sources of necessary supplies such as food, energy, and transportation. A close distance to services is desirable, particularly health care services. Arterial streets need to be clearly distinguished and in good shape that provides year-round access. With expectations of friction between local inhabitants and refugees, having a site close to an inhibited town may be an advantage. Local streets that provide short access to connect the main road with the site can be constructed as part of the camp development, while the site is expected to provide easy access to the internal arterial streets and pathways connecting the various areas and facilities. According to the standards, all built-up areas should be set back approximately 5 - 7 m from roads to provide adequate visibility for pedestrians and vehicles.

When it comes to site planning, the *Handbook of Emergencies* (UNHCR, 2007), suggests adopting a decentralized community-based approach, with a concentration on family, community or other social groups, regarding the overall physical layout of the camp's plot. This could be utilized by a participatory assessment using the bottom-up approach focusing on the characteristics and needs of the individual families and reflect the wishes of the community as much as possible.

Regarding services and infrastructure, the UNHCR has set numerical standards as a reference when preparing the master plan. The standards have dedicated, for instance, one latrine for each family that consists of six to ten members, one health center and one market per 20,000 persons, and one school per 5000 persons.

3.2.2.3.1 Grid Layout System

Forming a camp module, however, should start by planning the physical organization from the smallest module, and then building up to larger units, starting by the family, to the community, to block, to the sector, and finally camp module. The concept of modular planning should not necessarily restrict planners and designers to use a grid layout for the site. The linear system, or grid layout, using a modular of square or rectangular zones, separated by parallel streets, has often been used for its simplicity of design, ease, and speed of implementation.

In many times, a grid of roads defines the plots where the residential zones, or services, administrative facilities, and communal areas are located. This methodology is useful as it considers maximizing space, order, and security, while efforts of meeting an individual's needs are not adequately considered. In fact, each family plot is accessible through the grid and can be organized following the hollow square design layout. The advantage of applying the grid layout is that it also guarantees control and accountability for the organizations managing the camp. However, families would experience privacy limitations since all housing units face the streets. It also reduces the sense of community because every dwelling is separated by its neighboring one from the road system. Meanwhile, this approach can be easily and quickly marked out and this is considered very functional when it comes to emergencies which is one of the reasons why it is often applied (D'Ettorre, 2016).

To sum-up what was discussed before, it is highly recommended to avoid rigid grid designs of refugee camps. These layouts do not initiate interactions between the community. Indeed, they form difficulties in locating community-based locations services. Grid design clearly lacks to promote ownership of services, which is crucial for proper usage, cleaning, and maintenance. Furthermore, it undermines the security

concerns such as the long distances that refugees have to walk for essential services and susceptibility to violations (UNHCR, 2007).

3.2.2.3.2 Cluster Layout System

On the contrary, the cluster planning approach is defined as a design technique or zoning strategy that involves grouping housing units on smaller plots in one area while utilizing the remaining land on the site of the camp for other activities such as, greeneries or social open spaces (Greco, 2003).

This planning approach offers a hierarchy of roads identified by different sizes shaped like branches of a tree that is compatible with irregular topography where public areas are located at the center of radial road systems. The objective of such an approach is to offer privacy to the individual while it also encourages shared activities and enhances relationships among inhabitants (D'Ettorre, 2016). Substantially, whatever layout system is used for planning a refugee camp, the natural features of the site and the identity of the inhabitants, are essential features that shape any design approach.

3.2.2.4 Planning Residential Areas

The individual refugee household is the focal point of this stage of planning which begins by considering the needs of the individual family. An important point to address regarding the form of the camp and particularly where the residential areas are distributed, that to ensure communities are not congregated in a closed-form layout, as square-shaped, but resembling more of an H-shape, where both sides are open for better interaction with other communities. Yet, on the highly dynamic situation on the ground, this strategy could be unrealistic if the expected number of refugees increased dramatically. Accordingly, as shown in the example of figure 3.1, the refugees will shape camp spaces according to their own needs between and inside the planned residential units, in schools or any available public buildings, around markets, and they will use all available resources including communal infrastructure and electricity, rather than filling up the prescribed living spaces (Dalal, 2014).

Figure 3.1: The subversion of a refugee camp's plan through daily urban practices initiated by refugees. Source: Dalal (2014), based on Google Earth.

The camp's residential environment is the place where it is culturally and socially propitious and familiar. Privacy, psychological comfort, and emotional safety are necessary considerations while designing and planning the housing units where each family should always be accommodated in an individual housing unit. As much as possible, the design of the residences should provide the flexibility of modification by its occupants to suit their individual needs. A minimum standard for floor space is 4.5 m2 to 5.5 m2 per person in urban situations, including the kitchen and bathing facilities according to the standards and guidelines of the handbook of emergencies (UNHCR, 2007).

Ideally, the number of housing units in the residential areas is compatible with the number of the refugee’s family members. The key to adequate shelter is the provision of roofing material while acknowledging the climatic conditions and living habits of the refugees. Roofing material is a priority, as the skeleton of the housing unit can usually be made of earth or other materials found on-site or available locally.

The UNRWA's recommendation of building housing units, in harmony with many socially active architects, such as Christopher Day & Rosie Parnell (2003), is to engage the refugees as much as possible in constructing their own houses, with the fundamental technical, organizational and material support. This engagement would help meet their needs, create a sense of ownership and responsibility, and to a certain extent, lower the expenses and construction time. Lightweight emergency tents are usually the first, fast option to consider in any emergency camp. However, due to the fact that most of the refugee camps are protracted camps, the emergency tents need to be replaced with proper and well-designed living spaces which are structurally stable and sufficient to withstand different weather conditions.

CHAPTER 4: THE FIELD STUDY

4.1 Scope of the Field Study

While this research is about understanding how the built environment shapes behavior in protracted refugee camps, the field study was the mean of confirming this relation by analysis of first, architecture; second, patterns of behavior, and finally, conducting an empirical project to examine and compare the relationships between behavior and physical environment.

This chapter aims at presenting the rationale for the field study, its structure within its aims and scope, a background of the site and a description of the setting, the research participants, instruments and techniques, and ultimately discussing and analyzing the results of the field study.

The filed study proceeds in ten stages (Figure 4.1). Each stage had its tasks with dedicated participants and events that took place during the three years of the research period. The ten stages will be described separately in the instruments and the empirical project sections.

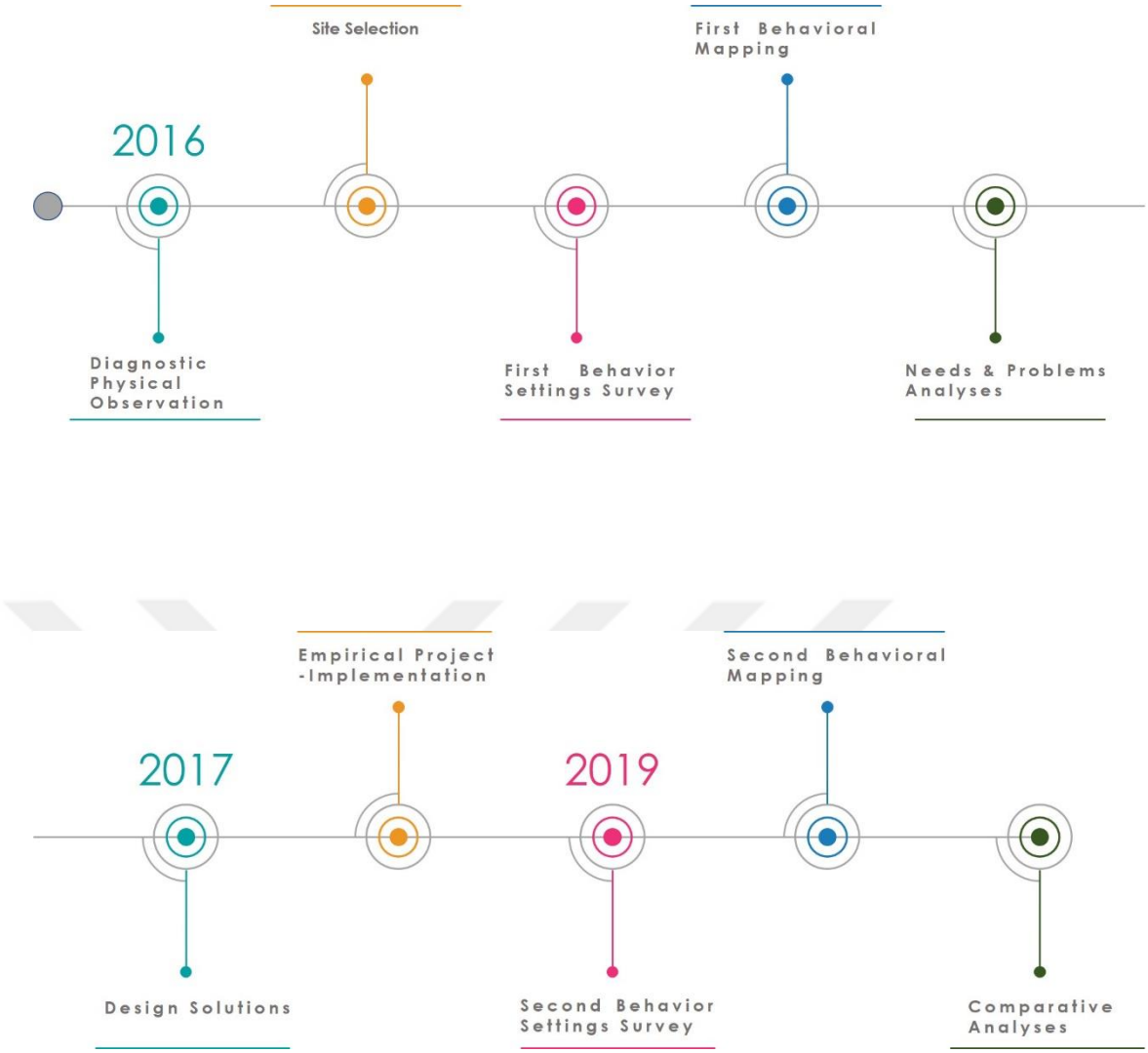

Figure 4.1: Field Study Stages and Timeline

4.2 Methodology

4.2.1 The Site

Jordan is a country that has been long affected by migratory movements. It has the highest ratio of refugees to the indigenous population of any country. Since its establishment, Jordan has received various waves of refugees from different countries. Distributed in ten refugee camps around the country, Jordan is hosting the largest number of Palestinian refugees than any other country in the world (Chatelard, 2010).

In a consequence of the unsettled hassle over the recognition of an independent Palestinian state west of the Jordan River, Palestinians situation is recognized as the longest-standing refugee caseload in the world (Chatelard, 2010). Palestinians, unlike most of the refugees around the world, are not under the responsibility of UNHCR and are therefore rarely included in statistics on worldwide refugee trends and caseloads. This lack of recognition could also be derived by the fact that the majority of the Palestinian refugees in Jordan were given the Jordanian nationality with the exception of 300,000 Palestinians mainly were displaced from the Gaza Strip in 1967.

After 1967, UNRWA set up facilities for food aid, sanitation, health services, and education. In order to withstand the harsh winters, the original 1,500 tents were replaced with prefabricated shelters. Between 1968 and 1971, 2,000 shelters were built with support from an emergency donation. 65% of the roofs, however, are still made of corrugated zinc and asbestos sheets which can cause diseases such as cancer. Asbestos, according to the (NCI, 2017), has been classified as a known human carcinogen; a substance that causes cancer, by the International Agency for Research on Cancer (IARC), the U.S. Department of Health and Human Services (HHS), and the U.S. Environmental Protection Agency (EPA).

One of the major problems in the camp is its unsuitable shelters for accommodations. In fact, 3 in 4 shelters are not suitable for accommodation (UNRWA, 2017).

According to Fafo Institute for Labor and Social Research report published in 2013, Jerash camp is the poorest among the ten Palestine refugee camps in Jordan, with 52.7 % of Palestine refugees having an income below the national poverty line. Jerash camp

also has the highest number of Palestine refugees who don't have health insurance, with 88 %of refugees not covered by any health insurance. The absence of a social security number for these refugees poses enormous difficulties for a life outside the camp. Unlike most of the Palestinian refugees in Jordan, 97.19% of Gaza refugee camp inhabitants were not given a Jordanian national security number. The absence of a social security number for these refugees poses enormous difficulties in finding jobs, education, and healthcare outside the camp.

As for UNRWA, they have their own battles to fight, as of January 2018, the USA decided to hold back $65m from its $125m aid to the organization which effected all of the organization's responsibilities in the camp (Dowling, 2018)

There are currently more than 30,000 registered refugees in the camp who are living under hard and stressful living conditions. There has been little attention given to the Jerash refugee camp in particular in the past years. The Jerash refugee camp unlike other camps in Jordan was not supported by international donors and organization which also left the camp refugees living in continual stressful conditions.

The empirical study of this research is taking place in Jerash camp in Jordan, known as the Gaza refugee camp. According to The United Nations Relief and Works Agency for Palestine Refugees in the Near East (UNRWA), the camp was set up in 1968 as an emergency camp to accommodate 11, 500 Palestinian refugees and displaces persons who left the Gaza strip as a result of the 1967 Arab-Israeli war. The camp covers an area of 0.75 square kilometers and is situated 5 kilometers from the famous Roman ruins of Jerash.

4.2.2 Setting of the Field Study

Following Barker's (1955) lead, Richard Prince and Roger Blashfield (1975), said that it ought to be possible to select a representative sample from all the settings that occur within the boundaries of a town and then study only the sample. Hence, the research study is carried out in a residential environment of Gaza refugee camp.

A residential environment is recognized as a system of settings. Within this system, a group of activities is occurring and forming a subsystem of the environment. A

housing unit is a subsystem of the residential environment which is the core fundamental environment for an individual (Benjamin, et al., 1955). In (Schneller, 2002) interpretation however the built environment created and inhabited by people is not only the physical container of social life (housing) but the "inherited form of human behavior", which in its interpretation necessarily react upon the system of human behavior and community activities as for example, the quality of urban residential environment is the mirror and the shaper of the community using it. He defined the built environment accordingly, as the concrete form of human existential space.

The relationship between residential environments and their inhabitants is mutual. Residential environments afford functions and communicate meanings to people through the ways in which they are shaped, and human beings design functions and attach meanings to residential environments through their everyday life and activities.

In this study, a residence owned by a family of seven members was selected for an in-depth study stage and for an empirical project

4.2.3 Participants of the Field Study

The participants of this study are divided into two groups. The refugees, and the research team. 58 participants in total participated through various methods in different stages of the study.

In this section, the general profile of these participants and their relations with each stage are explained.

4.2.3.1 The Refugees.

20 refugees participated in the study. The number of participants provided the opportunity to investigate their lives, behaviors, and needs of more focused and in-depth surveys and observations.

The refugees group participated in tow research instruments;

a. The In-depth Study

The in-depth study stage contains a survey and an observation of their daily patterns of behavior occurring at the family's residence. This stage required the main researcher to live with the family as a participant-observer.

Activities and patterns of the family's behavior were observed and surveyed separately for each member of the family for 24 hours in working/school and off days for a period of 7 days. This stage was repeated twice to initiate a comparison of the family's behavior before and after the empirical study described later in a separate section.

The family is composed of seven members, a father and a mother of four sons and a daughter. Four members of the family participated in this stage as the daughter is married and is living in another house with her own family, and one of the sons works outside the camp (Table 4.1). The family's eldest son, who was the main source of income for his family, has passed away during the research period in a car accident. The father's health condition is unstable. He works irregularly in construction site labor works. The mother is a housewife and a volunteer manager of women's and children's educational center in the camp. The first son works in a hospital as a housekeeper, the second has finished school and is seeking a job for the past three years, and the youngest son is a student in the UNRWA's schools.

Table 4.1: Refugee's family general profile of the (in-depth) study participants

Participant	Gender	Age	Occupation	Family Role
1	Male	14	Student	Son
2	Male	23	Jobseeker	Son
3	Female	48	House wife/ Volunteer	Mother
4	Male	53	Worker	Father

b. The Focus Group

A group of 16 participants of different ages was selected randomly. This group has participated in a behavior setting survey and a group discussion for open-ended responses conveying thoughts and suggesting solutions.

4.2.3.2 Research Team

In order to assemble the team, a nonprofit organization was registered at the Ministry of Industry, Trade and Supply in Jordan, under the name of SAIB, Society for Aid, Improvement, and Bridging. The author's role besides managing this research project is a member in the board of directors and a shareholder in the organization. Highly qualified team members were selected from various backgrounds for the interest of the project and were officially registered as members in the organization. All members were voluntarily investing their time and efforts in weekly meetings and site visits to set the project's aims and objectives. (Check Appendix D for the project's team members)

Unlike the linear conventional research process, that involves all parties of the project only when essential, the field study stage of the research is the result of a multidisciplinary collaboration of 38 volunteers from various backgrounds with the supervision of the main researcher/author.

This integration of all parties overtook the traditional barriers between the research team themselves and with the camp's community. Bringing all the key participants together in the early stages of research allowed them to develop a better understanding of the study.

The research team consists of five groups. The design team, documentation and site analyses team, media and crowdfunding team, the local committee, and the participant-observer (Figure 4.2).

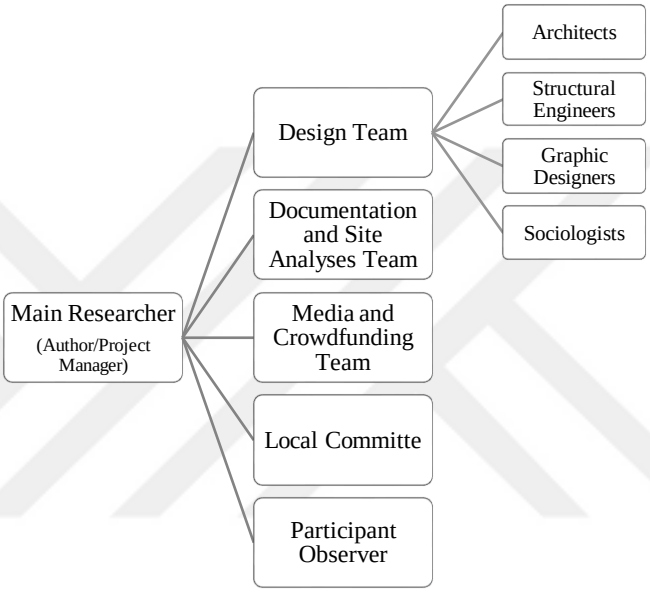

Figure 4.2: The Research Team

In this section, the general scope of work of these participants and their relations with each stage is explained.

a. Design Team

This team of design-related professions and academia consists of four groups. Architects, structure engineers, graphic designers, and sociologists.

The interdisciplinary backgrounds had enriched the research discussions within its workshops and brainstorming sessions.

The team had a weekly meeting with the main researcher to follow-up with the assigned tasks for each group and to discuss if any issues arise. An online team planner was utilized for proactive communication and collaboration within the team members to confirm if the assigned tasks are proceeding within the constraints of scope, quality, and time.

This team was involved in the diagnostic physical observations, site and participants' selection, the architectural observations, and the design phase.

b. Documentation and Site Analyses Team

This team had the responsibility of doing the general site analyses in addition to documenting and digitalizing the paperwork of the filed study. All of these team members were meant to be undergraduate students of the school of architecture and design from different universities. The purpose of including young researchers among the research team is to help to bridge the gaps between fieldwork and the outcomes of the workshop within the design team. Additionally, the research process was enriched by engaging with students, helping to overcome formalities between the whole research team. The team meets biweekly with the main researcher to flow-up on the assigned tasks and discuss the outcomes of the workshop.

c. Media and Crowdfunding Team

This team was responsible mainly for creating a crowdfunding media material. The team task was designing campaign graphics such as infographics, product shots, and two pitch videos. The crowdfunding campaign had succeeded to deliver the project with 60% of the needed budget.

d. Local Committee

As part of engaging the community in the research, starting at phase zero, a local committee of eight refugees from various backgrounds, genders, and ages were included among the research team. This engagement was important to seek to genuinely understand the community's culture. The collaborative process between the researcher and community partners was built on asking questions rather than making assumptions and listening rather than preaching. Therefore, it improved the research process and created knowledge, creative expression, and mutual trust with the community.

The local committee played an essential role during all phases of the research study and they were able to address the concerns and issues that the community might have about the research.

e. Participant Observer

Over the three years period of this research study, the researcher had participated with the community of the refugee camp in two phases. At first, the researcher started the participant observation with short, and disconnected events and activities to build trust with the community and to keep refugees from becoming overwhelmed. Yet, to peruse the aim of learning about the behavior setting by living it, later through the research period, the main researcher participated in the daily lives of the refugees. For the period of 7 days, the researcher surveyed, and observed the activities and the patterns of behavior of each member of a family for 24 hours in working/school and off days.

This technique is described in detail in the followings section.

4.2.4 Instruments

Four main instruments were used in this research (Figure 4.3). The general physical reading of the environment both on urban and architectural scales, the behavior settings survey that includes in-depth interviews, focus group technique, and participatory observation instrument, the behavioral mapping technique which analyzed the survey's collected data and lastly, the empirical project that has been used to create an intrusion in the setting in order to conduct comparative analyses before and after the intrusion.

Figure 4.3: Research Instruments

4.2.4.1 Diagnostic Physical Observation of the Environment

Together with the local committee, the research team examined the site by documenting and analyzing the physical environment of the refugee camp. The starting point was studying the camp at a macro scale using maps and satellite images before moving to the neighborhoods and suburbs of the camp. Photographs, notes, sketches, measurements in addition to the one and one encounters had helped the team have an adequate understanding of the context. The physical condition of the residential environments and the streets was the main concern throughout the observation, in addition to spending time both inside and outside, particularly where people congregate. Accordingly, ten neighborhoods with nearly fifty houses were observed using a structured observation tool (Figure 4.4).

The diagnostic physical observation went into two phases. First, the neighborhood, followed by a workshop conducted by the research team to select one neighborhood for the research project. The team produced drawings and plans of the site while photographs and observation notes in reference to the observation tool were discussed for each neighborhood separately. The interpretation and analysis of information resulted in formats that included quantitative summaries and text reports in hand with visual information in the form of sketches, diagrams and maps, photos, and videos. Accordingly, one neighborhood was selected with respect to its centrality, location, size, and the number of residents. Another factor taken into consideration is the width of the main street, the availability of empty land plots, and accessibility to the rest of the camp, and from outside the camp. Additionally, the physical condition of the houses and the streets, pinpointing the neighborhoods that are in most need of intervention.

The second phase of the observation concerned the houses of the chosen neighborhood (Figure 4.5). Along with collecting the information of the resident's names, genders, ages, and occupations, this phase concentrated on the physical conditions of the residential environment. Six items were observed and scored on a three-point scale of poor, good or excellent conditions. Additionally, the observers were asked to document each note with pictures and sketches.

While 65% of the roofs in this refugee camp are still made of corrugated zinc and asbestos sheets, which can cause diseases such as cancer, the first observed item was the condition of the roof. The observers were asked to identify the material of the roof if it is concrete, corrugated zinc, or asbestos. Despite the used material, some of the roofs were nearly new while some others have holes, severe corrosions, or disconnected sheets that allow water and sun heat into the house. Accordingly, the observers were asked to rate the overall condition of it from the scale of poor, good or excellent.

The second observed items were doors and windows, where type, material, and overall condition of them were observed. Moving to the conditions of the walls, where mainly wallcovering material, moisture, and cracks were the concern of this section. The following item was the structural condition. A group of structure engineers analyzed

the structural system of the house and its foundations before rating its overall condition.

The ventilation and natural lighting were the last observed item before the plumbing and drainage system. The team has observed and noted the amount of natural lighting through windows to each room of the house while the location of windows and its distribution among the house were analyzed according to the airflow that they could provide to the interior space of each room. Poor ventilation symptoms like high humidity and moisture that can cause mold to grow and can encourage dust mites were traced in the interior spaces of the house. Lastly, the team had noted the used plumbing system and observed if the house is connected to the main drainage system of the camp before rating the overall condition of the water tanks and drainage pipes.

In addition to the above diagnostic observations, the team had noted the number of stories and rooms of the house and questioned the ownership of it if it was rented or owned along with the years of occupancy.

SECTION 1: DIAGNOSTIC PHYSICAL OBSERVATION OF THE **NEIGHBORHOOD**

Date:	_____/_____/_____	**Neighborhood Name:**	
Monitor(s):		**House owner:**	
Neighborhood #:		**Reference Contact :**	

Item / Condition	Observation	Notes
The neighborhood is accessible to the main streets in the camp	□ Yes □ No	
There are manholes in the neighborhood.	□ Yes □ No	
The neighborhood has empty land plots	□ Yes □ No	
The neighborhood has an open and wide space between the different houses.	□ Yes □ No	
There is enough space to install pipes and water tanks	□ Yes □ No	
Number of houses in neighborhood	--------	
There are windows and are in proper conditions	□ Yes □ No	
There are doors and are in proper conditions	□ Yes □ No	
There are rooftops	□ Yes □ No	
If there are rooftops, please identify the overall condition. *In the notes, identify the material used*	□ Excellent condition □ Good Condition □ Bad condition □ Very bad condition	
There are cracks in the exterior and interior walls of the houses.	□ Yes □ No	
There are stairs on the entrance of the house.	□ Yes □ No	
Is the neighborhood passage to important settings? What are they?	□ Yes □ No	Settings:
Width of intersection	Dimensions:	
Width of street	Dimensions:	
Allows vehicles	□ Yes □ No	
The neighborhood tends to be populated. *Estimate the number of women, children and men.* *e.g there are many youth who are willing and would help us throughout the lifecycle of the project.*	□ Yes □ No	

Figure 4.4: Diagnostic Physical Observation of the Neighborhoods

IDENTIFYING A POSSIBLE BEHAVIOR SETTING –GENERAL | Doc. Number: .....

SECTION 2: DIAGNOSTIC PHYSICAL OBSERVATION OF THE **HOUSE**

Date:	_____/_____/_____	**Neighborhood Name:**	
Monitor(s):		**House owner:**	
Neighborhood #:		**Owners Contact info:**	

A. ROLES – DIAGNOSTIC INTERVIEW

	1	2	3	4	5
Name + FAM.NAME					
AGE					
GENDER	☐ M ☐ F	☐ M ☐ F	☐ M ☐ F	☐ M ☐ F	☐ M ☐ F
OCCUPATION					

	6	7	8	9	10
Name + FAM.NAME					
AGE					
GENDER	☐ M ☐ F	☐ M ☐ F	☐ M ☐ F	☐ M ☐ F	☐ M ☐ F
OCCUPATION					

B. SPACE – GENERAL DIAGNOSTIC OBSERVATION

GENERAL CONDITION OF HOUSE				
	Poor	Good	Excellent	**Notes:**
Roof :				Material: □ *Metal corrugated.* □ *Asbestos.* □ *Concrete*
Doors and Windows				
Walls				
Structure				
Ventilation & Natural Lighting				
plumbing and Drainage Systems				

GENERAL HOUSE INFORMATION	
Number of stories	
Number of Rooms	
House Ownership	□ Owned □ Rented
Years of Occupancy	( ) years.

GENERAL NOTES:

.....
.....
.....
.....
.....

Figure 4.5: Diagnostic Physical Observation of the Houses

4.2.4.2 Behavior Setting Survey

In the second chapter the behavior settings survey as a methodology of conducting a space inventory and description of a behavior setting was introduced.

In this section, the behavior settings survey as a primary instrument for this research project will be explained. In addition to the researcher's inputs to this survey, the procedures were adapted from Barker's (1968) book 'Ecological Psychology', and Wicker (1979) 'An Introduction to Ecological Psychology'.

There are three basic steps had been followed in the survey;

1. Identifying every possible behavior setting within the selected time/space limits.
2. Sifting through the list of possible settings to screen out those that do not meet the criteria for behavior settings.
3. Describing the remaining settings in several ways, such as how often they occurred and how long they lasted.

The identification of the possible behavior settings in this research project began by locating and listing all the behavior/environment synomorphs within the boundaries of the survey, simply, by walking the streets and halls in the area to be surveyed, noting spaces that are bounded by walls, fences, and other physical barriers. All such bounded areas are defined as the "exoskeletons of synomorphs".

The researchers looked for coordinated combinations of behaviors and physical features that occur within relatively bounded areas and specifiable times, which defined a standing pattern of behavior using maps and observations. Together with the local committee, the researchers spoke with persons familiar with the area of the survey and collected information about the organized activities that occur regularly within a certain space. While settings those do not have a combination of behaviors and physical features that occur within relatively bounded areas and specifiable times were excluded.

As previously explained in detail in chapter two, the features of a behavior setting are bounded within the limits of time and space and composed of roles that interact in a synchronized fashion to carry out order sequence of events called the setting program.

Accordingly, to compile this data in the behavior setting survey, the researcher has developed a structured data collection tool (Figure 4.7), and used it to conduct an in-depth study of standing patterns of behavior in a residential environment. The study used the approaches of informal Interviews while ordering and discussing activity cards, accompanied by a participatory observation method. Going forward, the researcher conducted a focus group session, using the same tool of documenting the daily detailed routine of activities occurring at homes of the

4.2.4.2.1 Informal interviews

The data collection tool shown in (figure 4.7), aims to elicit the normal, prototypical order of events in the everyday life of a study respondent, with emphasis on practices related to the behaviors in the residential environments. The role of the participant in reference to the related activities and its occurrence space was the focal point of the instrument. Other essential related information such as time of occurrence, used physical features (objects), and interactions with other roles were collected. The last two items which are 'Problem' that could form a threat to any of the essential features, and 'Reason' that represented the source of the threat, were popping-up naturally after analyzing the routine-oriented scripting of the previous items and discussing them together with the respondents. A more detailed illustration of the last two items is under the section of 'findings and discussions.

The researcher started by asking the respondents to describe what they did the previous day from the moment they woke up to the moment they went to bed, begin by asking "What is the first thing you do when waking up?" This prompt followed by "What do you normally do next?"

As participants spoke, the researcher wrote key words to represent the activities they describe and laid prefabricated paper picture cards in front of the participant on a surface in a row from left to right (Figure 4.6). With this overview in hand, the participants were asked to describe in more detail the parts of the routine occurring at home.

Figure 4.6: respondents using activity cards to order their daily activities

If the researcher noticed activities, which the respondents skipped or missed due to embarrassment or they were less often practiced, the researcher pointed out some random activities shown among the cards asking the respondents about anything that is obviously missing and guided the respondents to insert any additional cards into their daily routine. To gain more information about each activity of particular interest, the researcher asked who participated in this activity apart from the respondent. What did they do, who visited the house and when, who did they meet and where, what did they use and why. At the end of the interview, the respondents were introduced to their daily routine activities and asked about the best activity during the day, the worst, the most boring, the most fun, and why. Additionally, they were asked if they could change one thing about their routine, what would it be, and Why.

If the day described was a weekday, the respondents were asked to participate in another interview in order of documenting different activities they do on a typical weekend, and vice versa. For the purpose of conserving and documenting the collected data, all informal interviews were recorded upon the approval of the participants.

SECTION 3: *STANDING PATTERN OF BEHAVIOR -DOCUMINTATION*

Date:	_____/_____/_____	**Neighborhood Name:**	
Monitor(s):		**House owner:**	
Neighborhood #:		**Owners Contact info:**	

*Trace Activities occurring only at home

MAIN ROLE: ..... **NAME:** .....

ACTIVITY/ACTION Involved Behavior	**TIME**	**INTERACTION** with other Roles / B. Settings	**SPACE** Room	**OBJECTS** Involved Physical Features	**PROBLEM** Threat on Any Feature	**REASON** Source of Threat
	:					
	:					
	:					
	:					
	:					
	:					
	:					
	:					
	:					
	:					
	:					
	:					
	:					

Figure 4.7: Standing pattern of behavior documentation tool

4.2.4.2.2 Participatory Observation

The researcher didn't rely completely on the collected data through the interviews. In fact, the researcher himself participated in the maximum degree possible in the everyday life of target audience members to learn about the behavior setting by living it. Taking part in the activities occurring at home enriched the study of what kinds of constraints and facilitators are associated with the behavior of refugees in their residential environments. This part of the research requires using a shadowing technique where the researcher was following a participant closely to track their movements and behavior while punctuating the session with interview-style questions to obtain qualitative data "on the spot" about the participant's reasoning or motivations.

By using this method, the researcher was able to fill in the gaps and see the discrepancies between what people say they do, and what is actually done. In addition to keeping records of their activities, the words of those spoken to, as well as their own thoughts, feelings, and speculations.

This technique developed in anthropology for the study of unknown practices. It can involve interaction with the target population, including asking questions about the activity, but also constitutes a specialized form of learning by doing. Participatory observation is the process enabling researchers to learn about the activities of the people understudy in the natural setting through observing and participating in those activities. It provides the context for the development of sampling guidelines and interview guides (Dewalt, 2011). (Schensul, et al., 1999), define participant observation as "the process of learning through exposure to or involvement in the day-to-day or routine activities of participants in the researcher setting"

The objectives of the participatory observation involve living together with, and in the same context as, a community in the target population. The participant-observer should communicate with the target group with intensive engagement, to become truly familiar with the practices in question, and their variability.

4.2.4.2.3 Focus Group

The discussed topic of this focus group is the daily routine activities occurring at home, its related spaces, objects, and roles which makes any participant completely knowledgeable about it.

With the help of the local committee, the focus group session was held in a community center in the refugee camp and moderated by the researcher. Refugees from various backgrounds and ages participated in the session. The focus group session started by introducing the participants to the research scope and expected outcomes. To ease the communication and removing formalities, the researcher started an open discussion and opinions exchange about the significance of studying the behaviors in reference to the built environment of the camp. After that, the participants were introduced to the data collection tool as the researcher explained each section separately and gave examples with the help of one of the participants. Pencils and data collection tool were distributed, and the participants were asked to fill in a survey of their detailed daily routine activities occurring at home (Figure 4.6). With the help of the researcher, and in reference to the participant's daily routine of activities, some participants were also asked to sketch a plan of their residences. An open discussion was held at the end of the session about the outcomes of the data collection tool.

The participants were motivated seeing the problems and needs popping out naturally of the survey and started suggesting solutions. All problems, discussion points, and suggested solutions were written on a whiteboard in front of the participants (Figure 4.8), while the session was recorded for documentation issues.

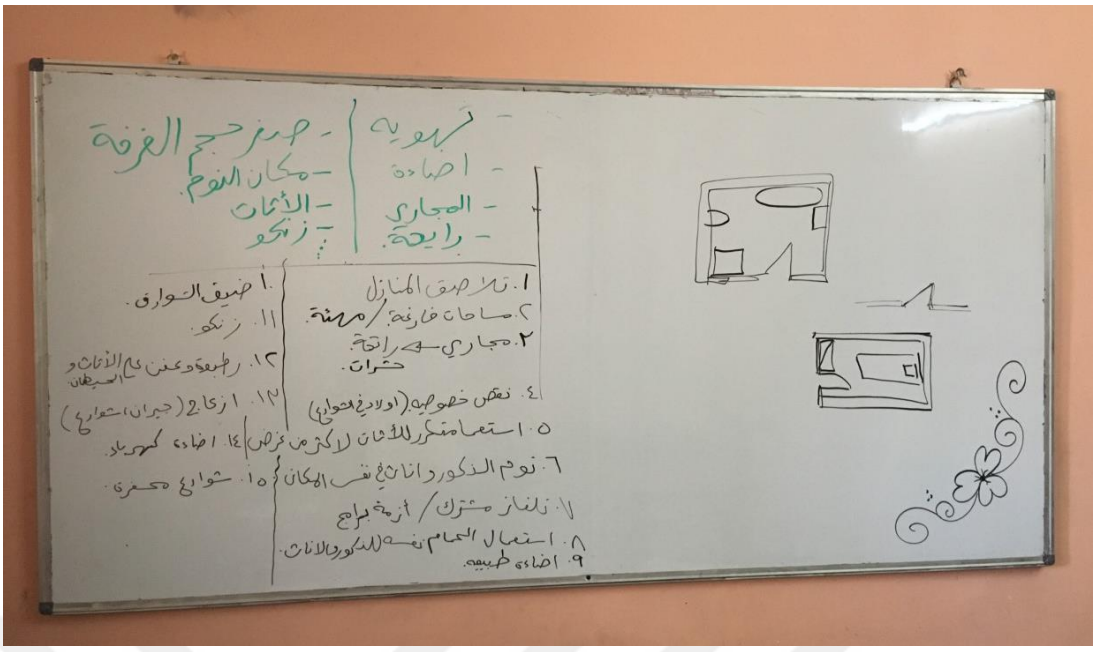

Figure 4.8: problems, discussion points, and suggested solutions by the focus group session

4.2.4.3 Behavioral Mapping

In any man-made environment, discrepancies may exist between the intent of its design and how it is actually used. Behavioral Mapping allows researchers to determine how participants use a designed space by recording participant behaviors and/or tracking participant movement within a specific space and time. This method was started to use in the late 1960s to study how physical environment features affect people's behavior, including the activity level and type of activity (Cosco, et al., 2010). Hence, behavioral mapping can be useful to help identify underlying patterns of participant movement and behavior within a given environment and later utilized as a tool to improve an existing space.

Researchers use a layout of a map to record the positions of individuals, the time they spend in a specific area, the level of engagement with others, and some other characteristics of the participant.

Throughout the study, the behavioral maps were produced by first, tracing the items of 'activity' and 'space' in the interview survey (Figure 4.7). And second, by

physically and closely observing the activities of each participant among the participatory observation instrument.

Initials, symbols, and color-coded dotes were used as a method of notation for locating recorded behaviors on the map, while lines were used to indicate participant's movement through the space. For the need of this part of the study, the researcher depended on the diagnostic physical observations and the informal interviews to capture basic demographic data on each participant and their residential environments. A single sheet can capture both motions and behaviors, visually aggregating the data in the process.

Various factors—including the time of day, the day of the week, the season, weather conditions, special events and calendar holidays—may have a dramatic impact on the number of participants observed and the types of behaviors displayed. To reduce or otherwise account for these uncontrollable variables, multiple visits to the site, within the research period were required to accurately capture a site's usage patterns. Most of the variables were covered throughout the survey while few of them were settled through the interview.

4.2.4.4 The Empirical Project

The empirical project came as a tool to examine the effect of the essential features of the behavior setting, while it was mainly concerned about creating an intrusion into a behavior setting. This phase of the research came after studying the existing residential environment by gathering the standing behavior patterns of the in-depth participants, identifying the essential features of the behavior setting, and producing behavioral maps for each participant.

Three years later, the researcher repeated the study in the same setting and conducted comparative analyses of the standing behavior patterns and the behavioral maps before and after the intrusion that was caused by the empirical project (Figure 4.9).

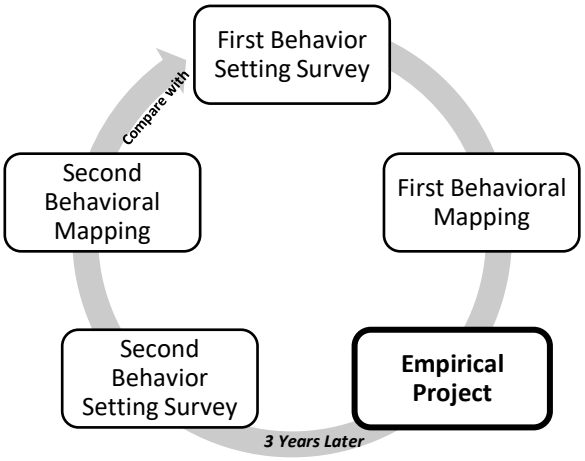

Figure 4.9: The empirical project position among the research instruments

The empirical project has extracted the problems and needs using the behavior setting survey and worked together with the local committee to design solutions for the space. The design team took the built environment as their starting point, focusing on designing solutions for the ventilation, the deteriorating roofs, and their leakage problems, before moving to the exterior walls and fixing the damaged windows and wall cracks. On the scale of the neighborhood, the team designed a robust and lively atmosphere for the residents, using wall graffiti and wayfinding signage, seating elements, and planters yet could not be applied due to lack of financial sponsorships.

Another objective was to include the residents of the house in the project, from the very early stages of planning and designing, that allowed them to guide the team through the project's different stages, and to directly respond to their needs and preferences.

This guideline also aimed to target their sense of responsibility and ownership that will eventually keep them more involved and will encourage them to sustain the changes and accept them into their environment as their own.

4.3 Findings and Discussions

In order to identify the chosen refugee camp as a behavior setting, the research data were analyzed and discussed in two dimensions (Figure 4.10), the architectural dimension by observing the physical components of the environment, and the ecological dimension by conducting a behavior setting survey and analyzing the movement patterns of behavior using the behavioral mapping instrumental methodology.

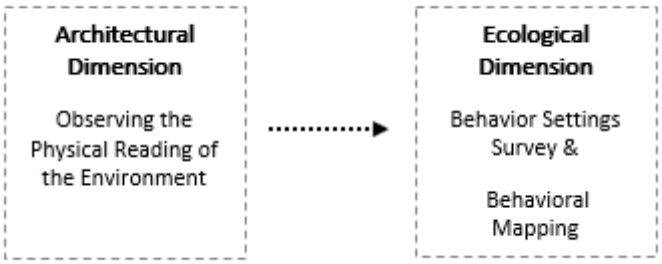

Figure 4.10: The two dimensions used for identifying the behavior setting of the refugee camp.

4.3.1 Architectural Dimension

The architectural dimension is the starting point in identifying the setting of Gaza refugee camp. Together with the local committee, the research team examined the site by documenting and analyzing the physical environment of the refugee camp using maps and satellite images, before diving deeper to study the neighborhood's residential areas using two structured observation tools (Appendix A).

4.3.1.1 Accessibility and Layout

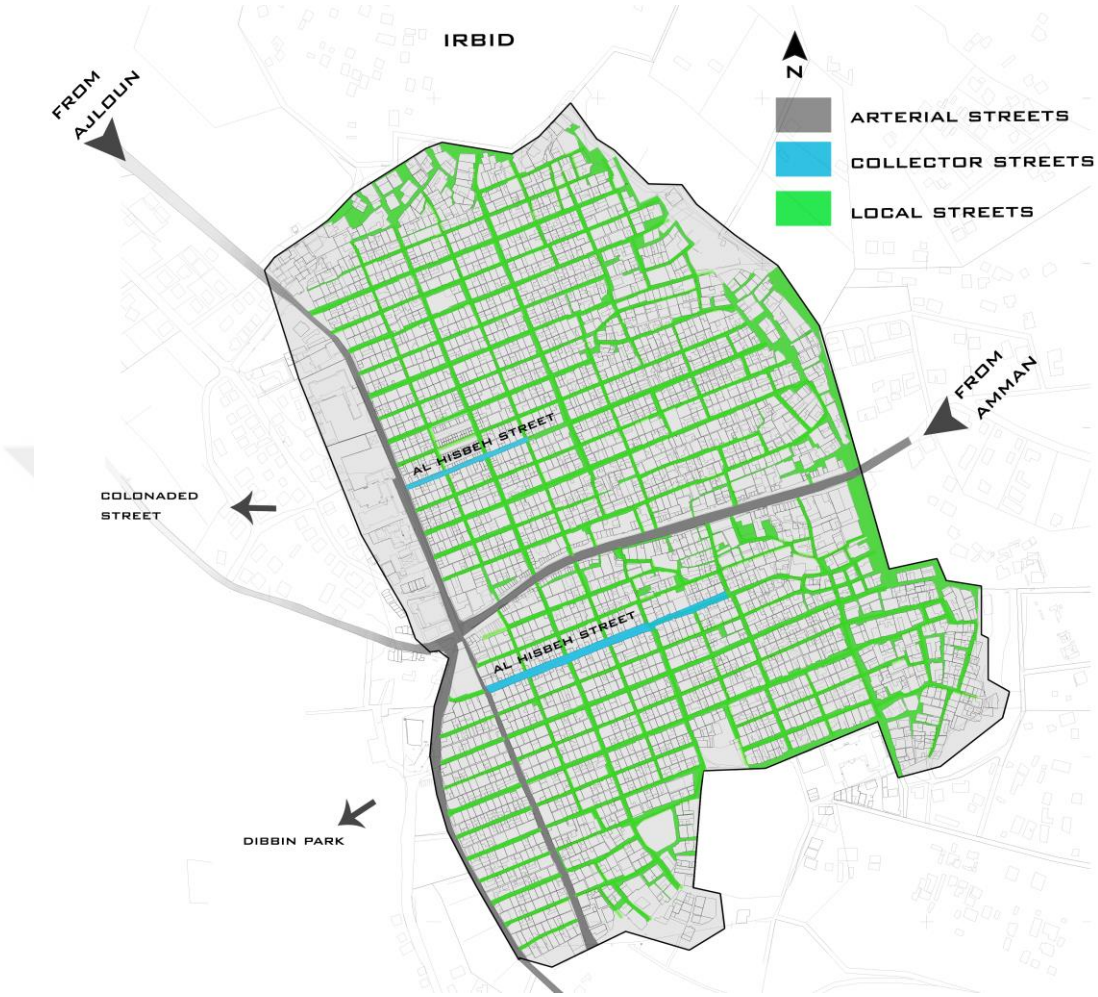

Figure 4.11: Accessibility to the camp map, showing the main road and the small local streets of the residential area.

A modular planning using a grid layout with square or rectangular areas separated by parallel streets, has been used in designing the camp for its simplicity of design and speed of implementation (Figure 4.11). This design method is efficient in terms of maximizing space, order, and security, according to the *Handbook for Emergencies* by the UNRWA (2007), however, it is not so useful in meeting individual's needs. The rigid grid design has negatively affected community layout and interaction. It has also generated difficulties in identifying proper community-based locations for services.

The camp is divided into two parts by its main two-way road. The southern part of the camp, which is called *zone A* and the northern part which is called *zone B* according to the UNRWA and the Jordanian Department of Palestinian Affairs. Along the main road, commercial properties are distributed on its right and left sides. At regular intervals, about 20 transversal narrower streets lined with mostly houses, crossing the main street perpendicularly. Access to the residential areas and the street scheme are mostly in a regular grid shape and the streets are usually narrow and hardly allows vehicles to move in them.

After about one Kilometer, the street takes a significant T-shape division were services and governmental buildings are distributed on one side of the street, whereas, the housing units are located on the other. Two other streets which considered to be the commercial vine of the camp, are located in the heart of each side of the camp. Those streets have penetrated the center of the residential areas and created the (Hisbeh), the main market line that is full of shops and carts of goods on both sides of the street.

No barriers or walls separate the camp from its surroundings. However, it can mainly be distinguishable by its spatial layout, building heights, and size of streets. The camp is contiguous to the neighborhood of Jerash from three sides and to the urban landscape on the Northwest border of the camp.

When interviewed, many refugees, unanimously declare that people in the northern part of the camp, *Zone A*, have a slightly different culture than the southern part, *Zone B*, due to their different cultural fabrics before being displaced from Palestine. The southern inhabitants of the camp are used to be shepherds and until nowadays, they still keep small spaces to raise their sheep and chickens.

Figure 4.12: A two-dimensional abstraction illustrating ‘solid-void’ relationships.

Figure 4.12 is illustrating the relationship between built and unbuilt space in the camp. Land coverage of buildings is visualized as a solid mass, while public spaces formed by streets, parks, and plazas are represented as voids. Accordingly, 90% of the camp total area is covered with private and public structures. It is shown that the density of the buildup area is very high, with very few empty plots.

4.3.1.2 Land Use

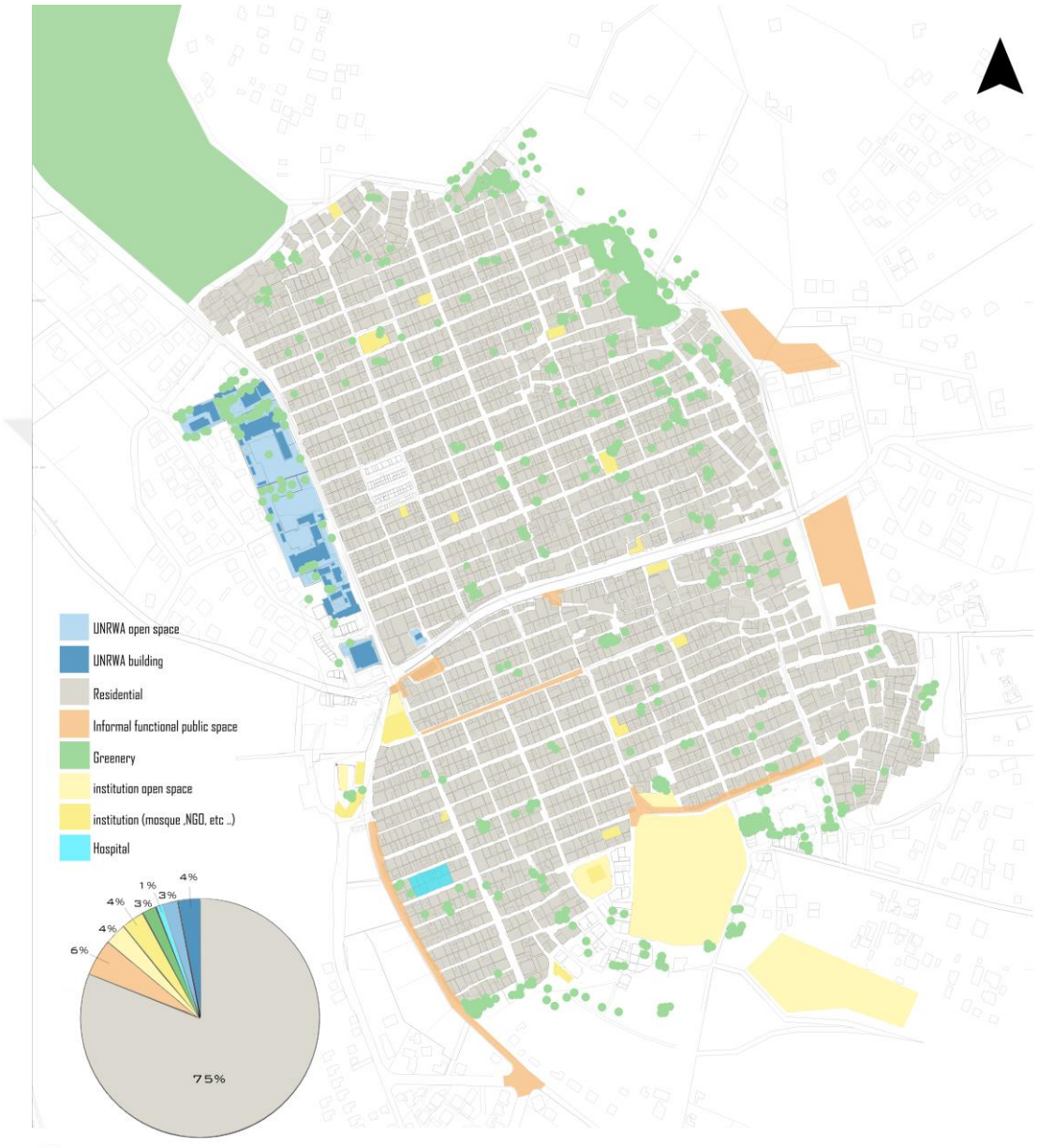

Figure 4.13: Existing land use map showing the major categories based on activities of Gaza refugee camp.

The major categories on the basis of activities shown in figure 4.13 include residential, commercial, transportation, greeneries, public, semi-public, and private governmental and UNRWA offices. This categorization is usually considered essential to keep a balance of different activities taking place in the refugee camp.

As illustrated in the map of figure 4.13, 75% of the camp's land, is used for residential areas while the remaining 25% is divided between all other activities. The density of housing is very high, and there are very few public spaces in the camp. The semi-public institutions, the informal functional spaces, and the UNRWA open spaces, all combined, takes up less than 13% of the land use. Which resulted in a lack of spaces for public interaction and playing grounds for children. According to observations, such activities occur in every place they could find, on the main street or the paths and alleys connecting the different plots of the camp together. Likewise, the camp lacks landscape plots to a great extent, as only 3% of the land is used for greeneries.

In 2007, The United Nations High Commissioner for Refugees has set standard calculations of refugee camp size in reference to the number of its occupants. Ideally, the recommended surface area is 45 m2 per person when planning a refugee camp, including a kitchen and a private planting space. However, the minimum surface area of the essential spaces should not be less than 30 m2 per person. This minimum figure includes the area necessary for roads, footpaths, educational facilities, sanitation, security, firebreaks, administration, water storage, distribution, markets, relief item storage, and residential units. That being said, Gaza refugee camp, with its 750,000 m2 area and its 30,000 inhabitants, is 600,000 m2 behind the recommended surface area and 150,000 m2 behind the bare minimum area per person.

The existing commercial land uses are predominantly basic services commercial and not intensive types of retail operations. Women have the largest share in the economic life of Gaza refugee camp with simple home-made products and goods since men are mostly not allowed to be employed in permanent jobs due to the absence of a social security number.

Gaza refugee camp represents the *planned camp* type of settlements where refugees are accommodated in purpose-built sites and a full range of services. Accordingly, services are expected to be provided to a large population in a centralized and efficient

way. At the end of the main road which divides the camp into two parts, and where the street takes a significant T-shape, main services of UNRWA and governmental buildings are distributed, such as the police station, schools, and hospitals. The grid modular design of the camp has resulted to undermine the long distances that refugees have to walk for important services that are concentrated on one side of the northwestern borders of the camp, as shown in figure 4.14.

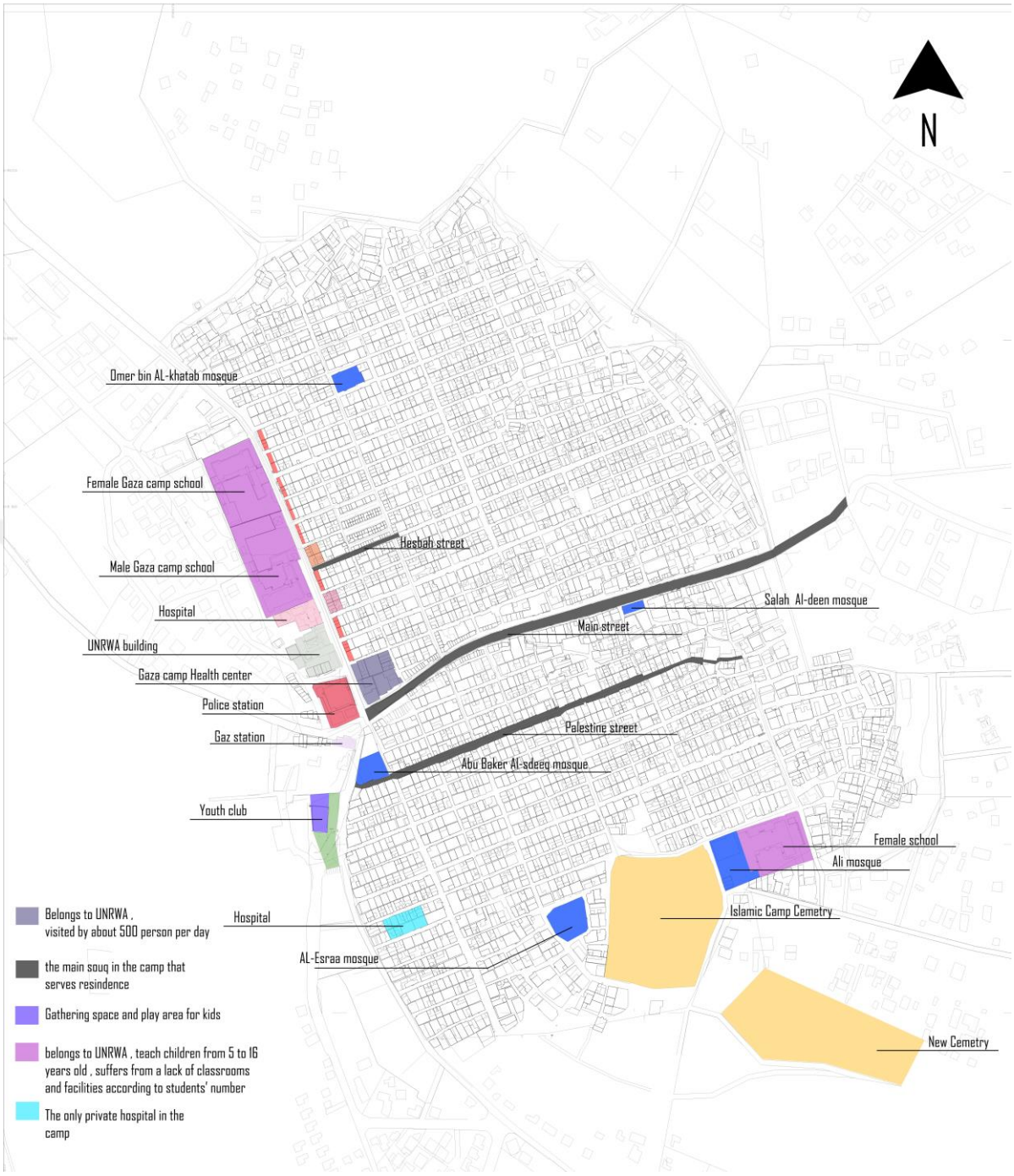

Figure 4.14: Landmarks map showing the concentration of services in the northwestern side of the camp.

4.3.1.3 The Residential Environment Characteristics

After studying the camp at a macro scale using maps and satellite images along with space inventory observational site visits, the diagnostic physical observation has moved to the neighborhoods and suburbs of the camp. Later, one residential unite was selected for an in-depth study as mentioned earlier. The physical condition of the residential environments was the main concern throughout this part of the study. The team has used Photographs, notes, sketches, measurements in addition to the one and one encounters with the residents by spending time both inside and outside, particularly where people congregate.

4.3.1.3.1 Sample Neighborhood

The modular planning of the residential area using a grid layout with square or rectangular shapes has divided the area into blocks. Each housing unit is accessible from the grid that guarantees control and accountability for the organizations managing the camp. However, this layout limits privacy since all shelters face the streets. It also reduces the sense of community and discouraging shared activities that enhance relationships among inhabitants because every residential block is separated by its neighboring one from the road system. Accordingly, the research has defined each block that is confined between two street intersections, as a neighborhood.

The chosen sample neighborhood shown in figure 4.15, is located in the northern part of the camp (Zone B), composed of two narrow streets. One with a dead end and the other one is accessible through the main access road of the camp from one side and to the residential area from the other (Figure 4.15). The neighborhood has 9 housing units with 35 inhabitants which are the average number of neighborhoods among the camp. This neighborhood also contains the (madafeh), which is considered an important space among the camp's culture that serves as a public guest room where mainly men congregate with the chief of the area (mokhtar), in special or religious occasions or to solve disputes.

Most of the residents in the camp are one-story housing units. Yet, due to the increase of the population, very few of them have recently started to build more stories above

their houses illegally. Only two housing units in the chosen neighborhood have two stories, while all the other units are one-story houses (Figure 4.16). The construction material of the exterior and interior walls is mainly cement bricks. Like most of the camp, metal corrugated zinc and asbestos sheets lay over steel and wooden bars for reinforcement, are used as roof materials. Some of the roofs were nearly new while most of them have holes, severe corrosions, or disconnected sheets that allow rainwater into the house and severe thermal bridges. The fact that the roofs material is light, bricks and car tires are placed over the rooftops to stabilize it from wind (Figure 4.17). For this reason, water tanks are placed in front of the houses that create more obstacles in the narrow streets along with the stairs, which displease the movement of the vehicle among the camp (Figure 4.19).

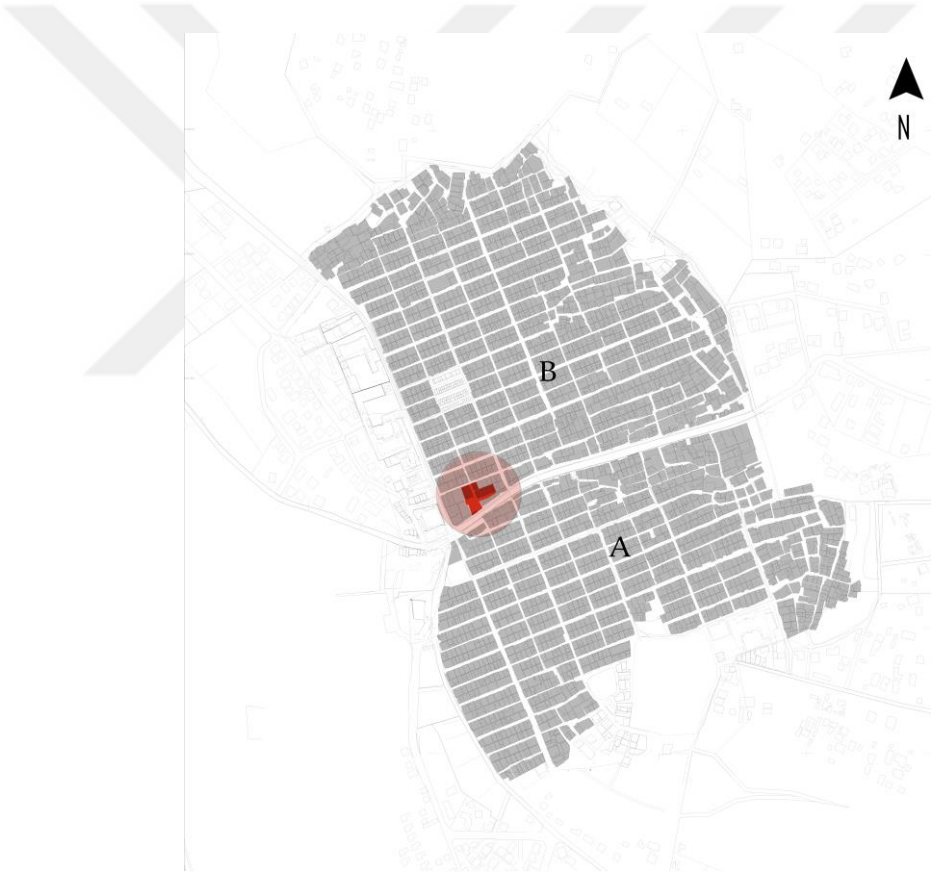

Figure 4.15: Legend map showing the chosen neighborhood in the northern part of the camp (Zone B).

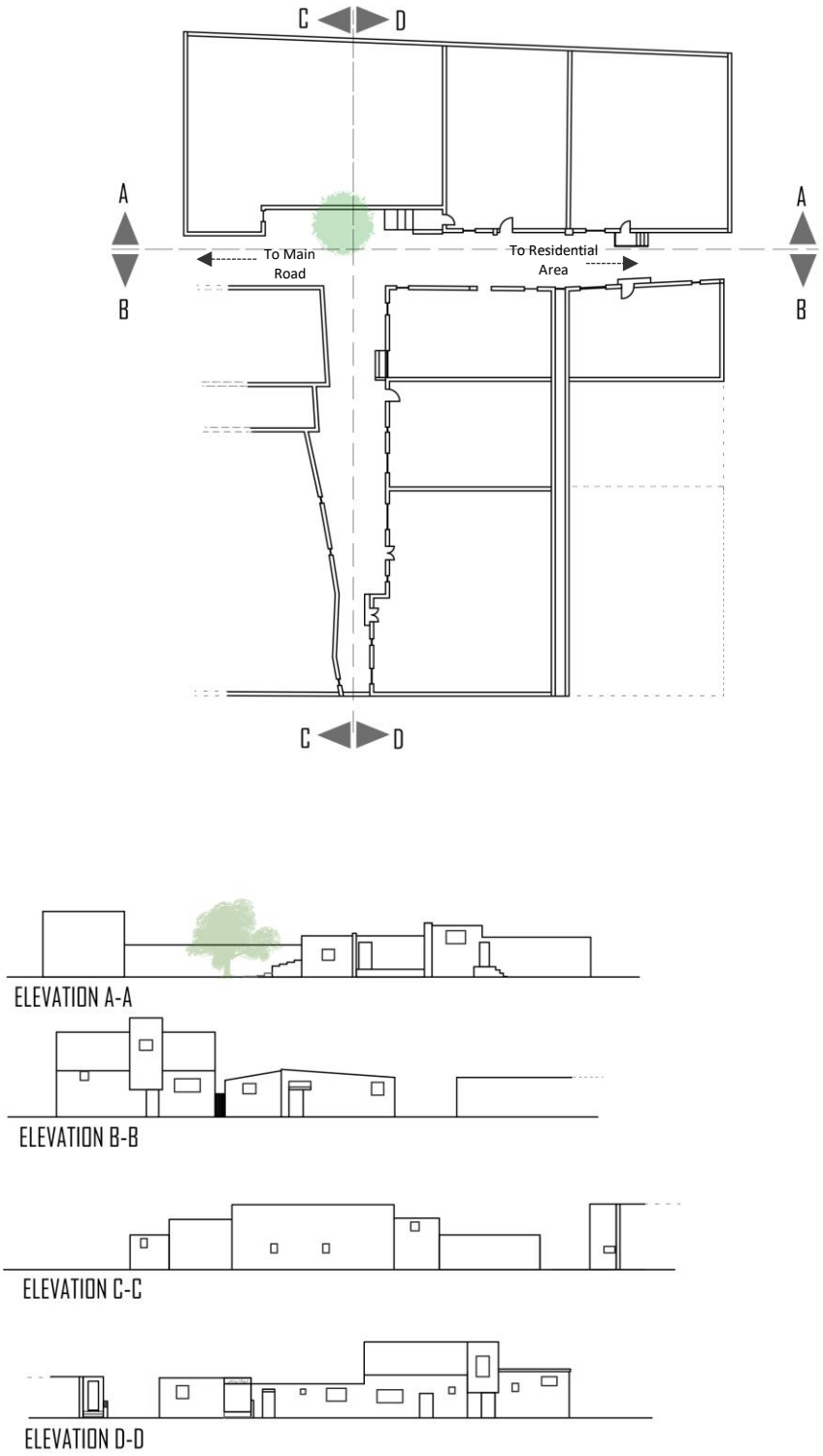

Figure 4.16: Sample neighborhood plan and elevations

Figure 4.17: Bricks and car tires placed over the rooftops to stabilize it from the wind.

Figure 4.18: Street dimensions of the selected neighborhood.

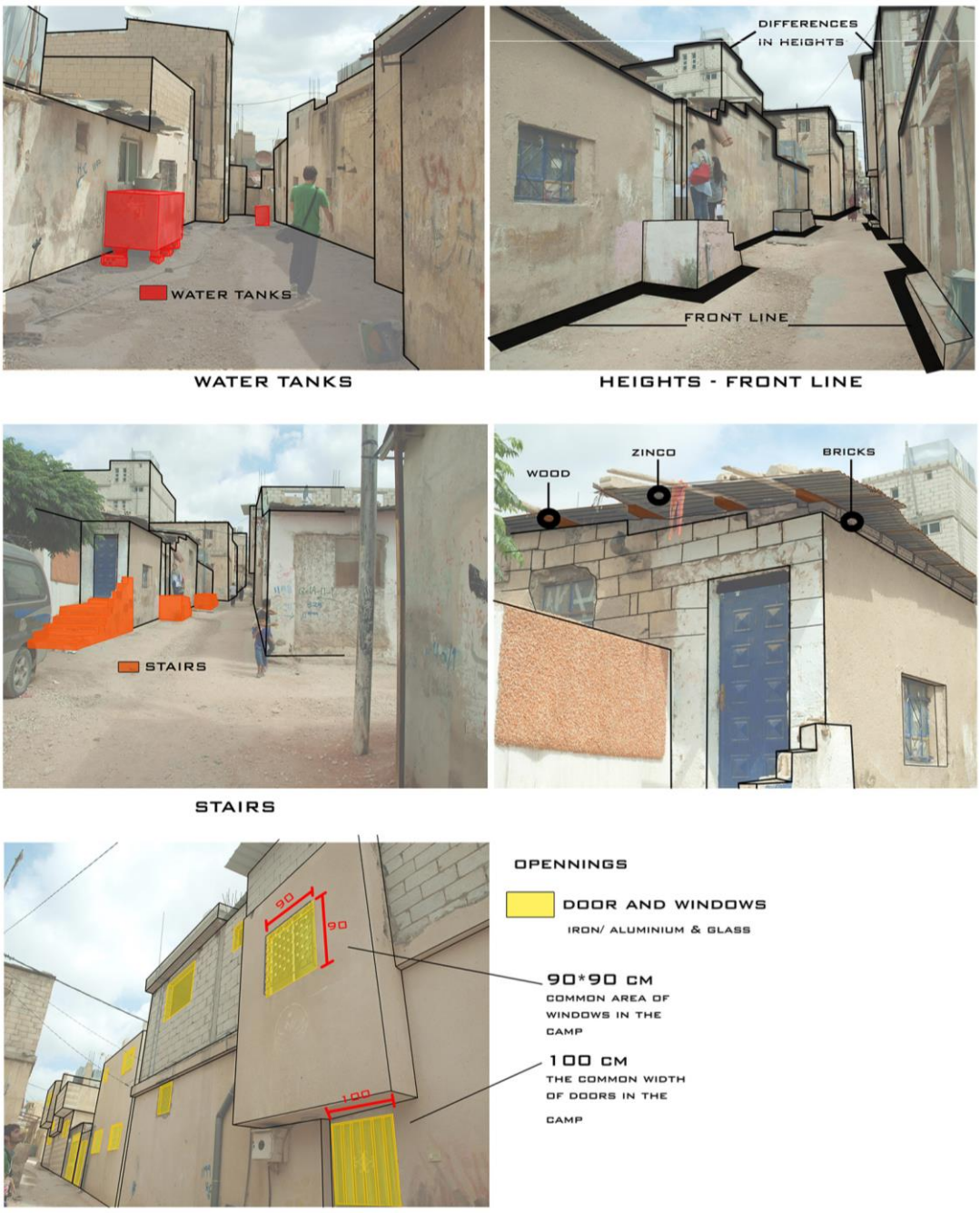

Figure 4.19: General analysis of the sample neighborhood.

4.3.1.3.2 Sample House Unit

A housing unit was selected to examine the effect of the essential features of a residential behavior setting. After documenting the existing conditions of the house, the research was mainly concerned about creating an architectural intrusion into the

behavior setting in reference to the ecological reading of its occupants using the behavior setting survey.

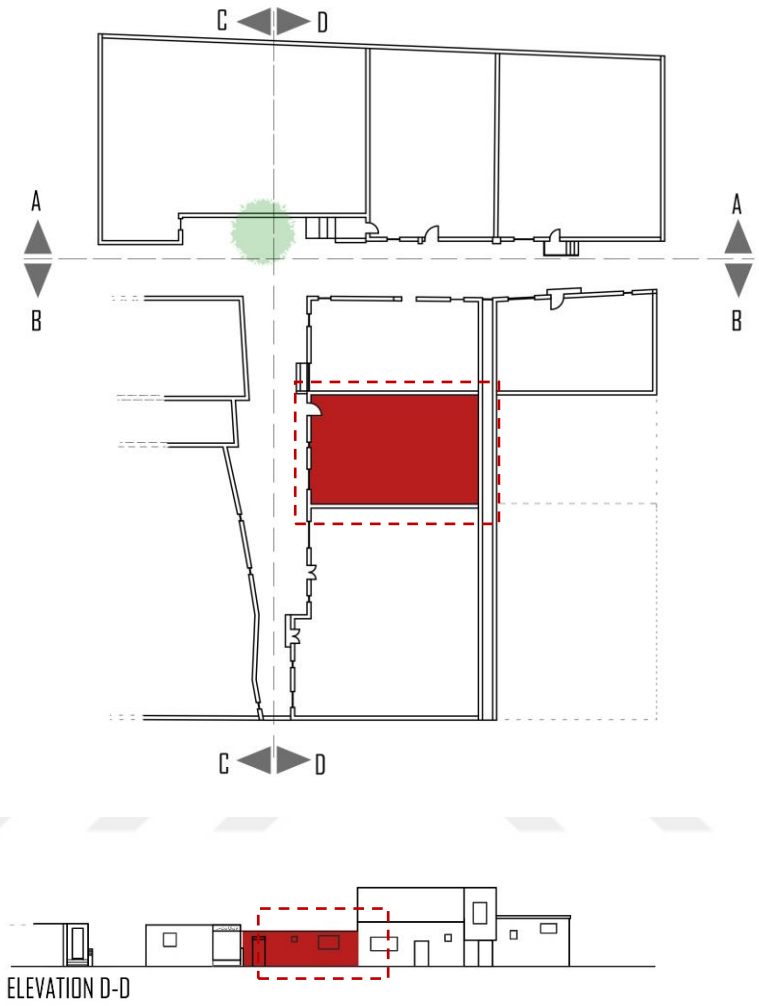

Figure 4.20: Plan and elevation, showing the sample house location in reference to the neighborhood.

Figure 4.20 shows the sample house location in reference to the neighborhood. The one-story housing unite accommodates a family of six persons. It consists of 2 bedrooms, one toilet, a living room, a guest room, and a kitchen (Figure 4.21).

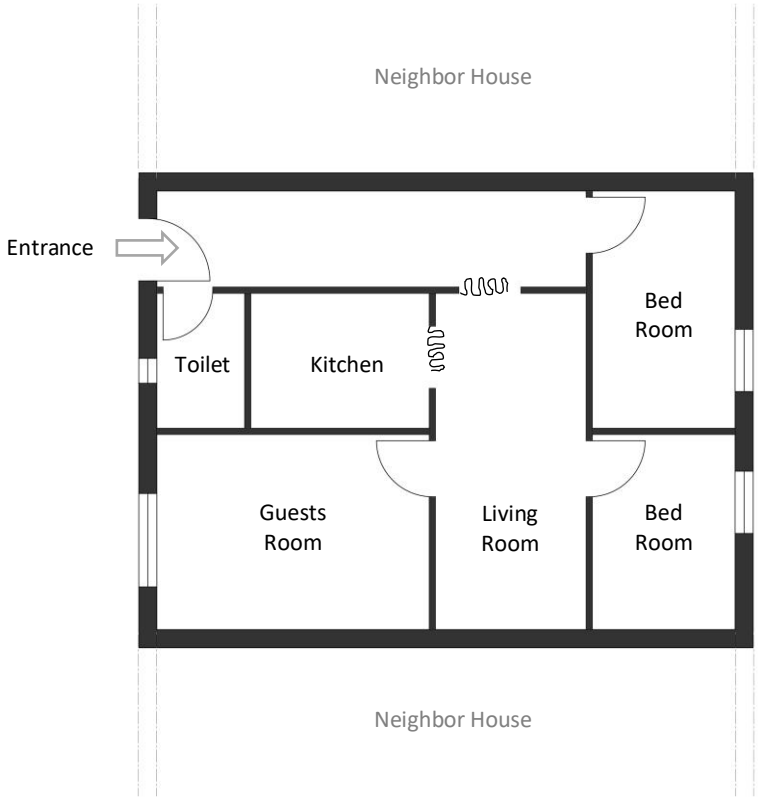

Figure 4.21: Interior plan - Sample housing unit.

The overall condition of the house is poor (Figure 4.22), as the diagnostic physical observation shows that the roof formed of detached corrugated metal sheets and asbestos, contains severe corrosions and holes. The walls as well, are in an insufficient condition. The interior surfaces are covered with moisture and have critical cracks that together with the eroded wooden bars carrying the roof, raise concerns about the structural substandard conditions.

Windows of the house are also poorly maintained as they are either broken or missing its fitting glass. Additionally, the insufficient number of windows has affected the adequacy of natural ventilation and daylight which provokes passive ventilation symptoms such as high humidity and moisture. These symptoms caused mold to grow and encouraged dust mites in the interior spaces of the house.

Figure 4.22: Images showing the situation of the sample unit – The old house.

In order of creating an architectural intrusion into the setting, the problems and needs of its occupants were extracted using the behavior setting survey. Together with the local committee, solutions for the residential space were designed (Appendix B).

The application of the designs went in two stages due to financial support. Yet, the focus of the process was on creating solutions for the structure of the house, the ventilation, the deteriorating roofs, and their leakage problems, the plumbing system, the exterior walls and fixing the damaged windows and wall cracks before moving to the interior space that was entirely designed and applied by the occupants themselves with minor supervision of the team

Figure 4.23: Images showing the first rehabilitation phase of the sample unit.

Figure 4.24: Exterior shot of the sample house unit before and after the rehabilitation

4.3.2 Ecological Dimension

In this section, ecological analyses are presented in three levels; the individual's level of ecology, the family level of ecology, and lastly, the community level of ecology. These analyses were mainly produced by documenting the standing patterns of behavior of the participants, identifying the essential features of the residential behavior setting, and producing behavioral maps for each participant in working and off days. The analyses are also discussing the ecological results of the architectural intrusion to the behavior setting by conducting comparative analyses of the standing behavior patterns and the behavioral maps before and after the rehabilitation project.

For the ease of the discussion, the term ***"Old house"*** was used to indicate the housing unit's status before the architectural intrusion (the rehabilitation project), while ***"New house"*** indicates the after situation.

4.3.2.1 Individuals Level of Ecology

- ***Participant 1***. - *Son 1*

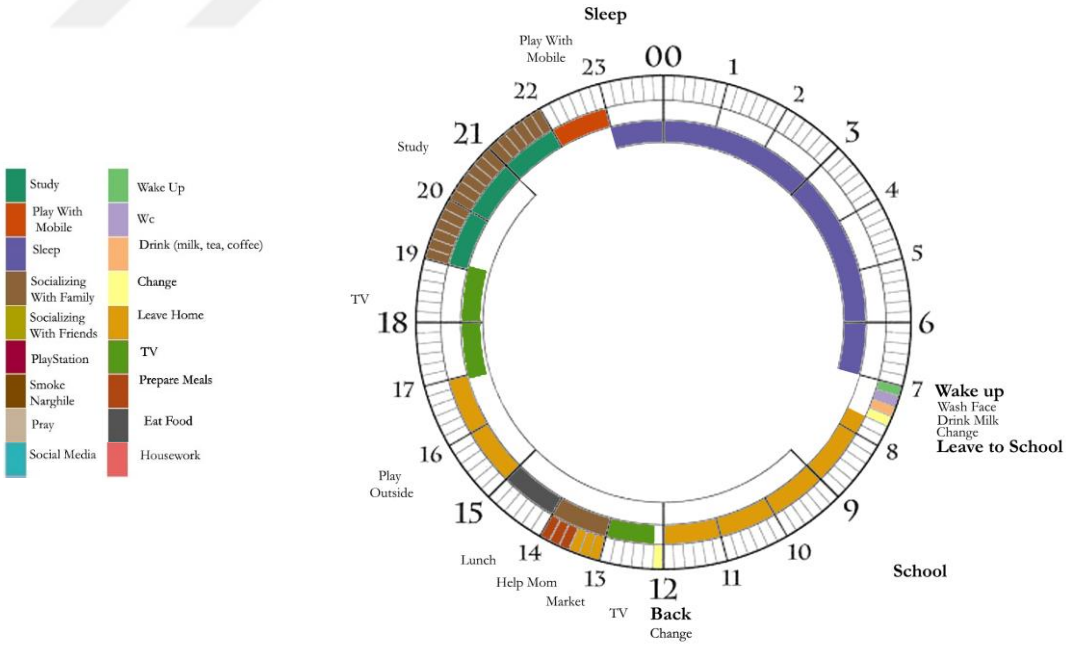

Figure 4.25: Participant 1 program. Son 1, School Day, Old House

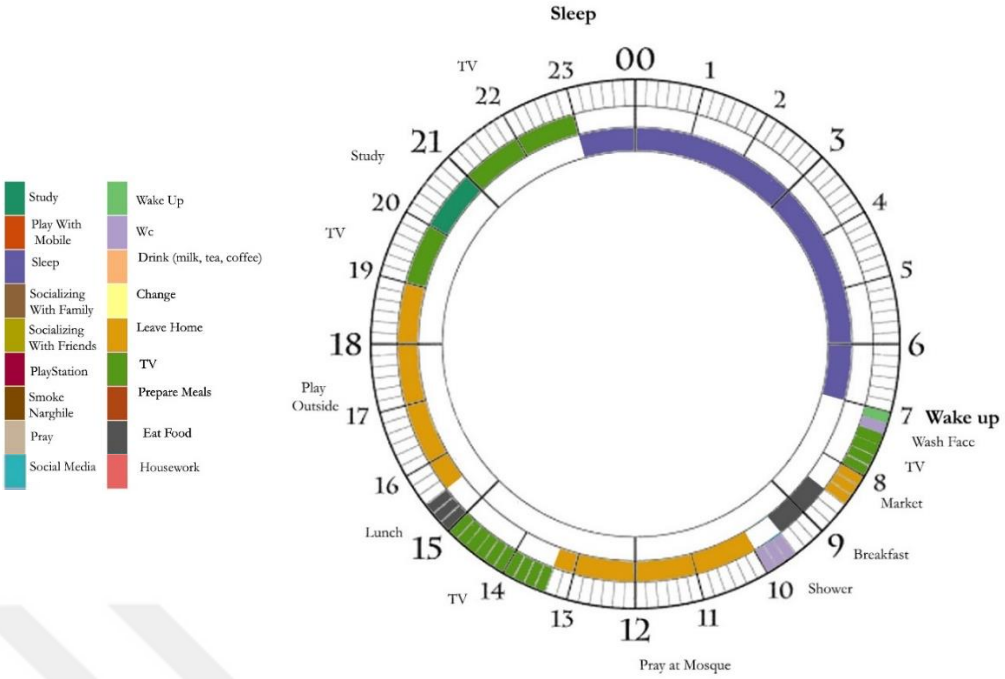

Figure 4.26: Participant 1 program. Son 1, Weekend, Old House

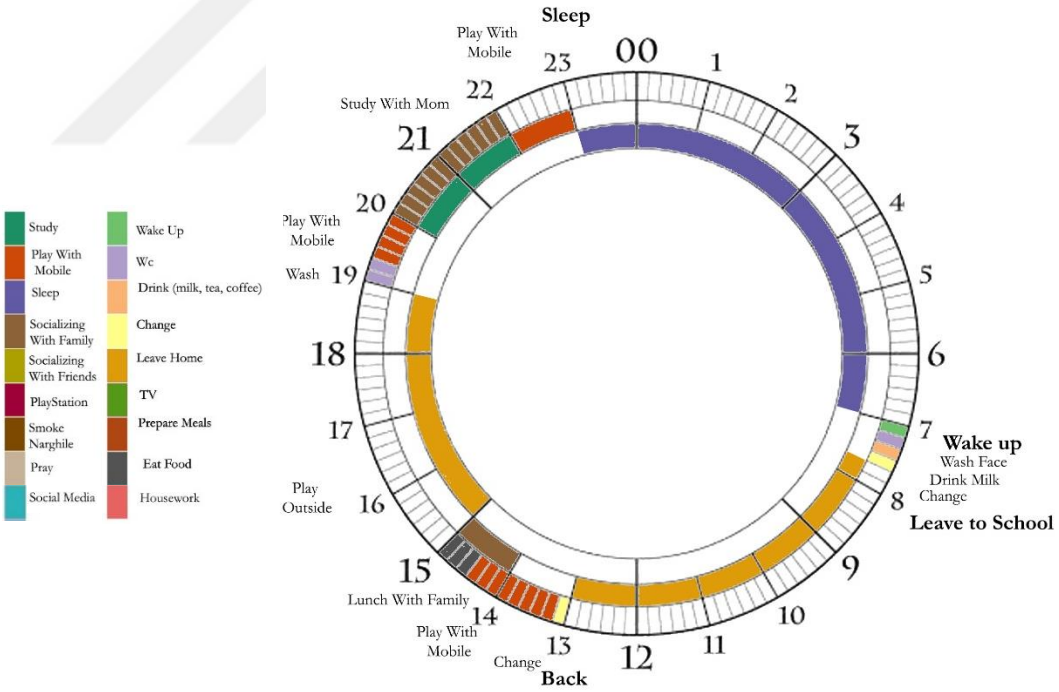

Figure 4.27: Participant 1 program. Son 1, School Day, New House

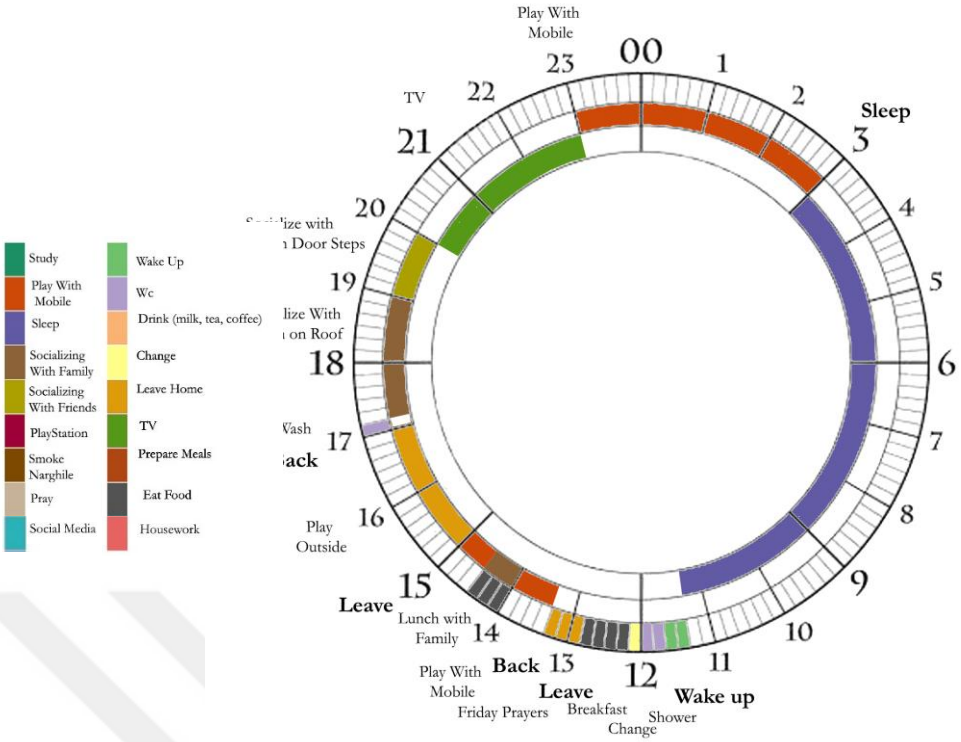

Figure 4.28: Participant 1 program, son 1, Weekend, New House

As looking at participant 1 school's day program at the old house (Figure 4.25), the 14 years old youngest child of the family, was observed helping his mother in preparing lunch for the family after watching TV for about an hour. With the supervision of his mother, participant 1 is spending nearly three hours of studying. However, when trying to measure behavioral changes at the new house, participant 1 has replaced the activity of watching TV by playing with his new mobile. It is remarkable that the appearance of a new object to the setting, simply as a mobile, has affected the mother's and the son's program. Participant 1 dedicated more hours of his program to the mobile game's activity which resulted in skipping the behavior of helping his mother preparing lunch. Additionally, the studying hours were also reduced to two hours which has eventually reduced the interaction with his mother, perceived as another role in the behavior setting.

Figure 4.29: Behavioral Maps of Participant 1, (Son 1), for the old and new house

By comparing the weekend programs of the old and new houses of participant 1 (Figures 4.28, 4.26), a major change has occurred in the sleeping hours. The activity of waking up in the new house has shifted for four and a half hours in comparison with the old house. The results of the survey explain the reasons behind this behavioral change that mainly three modifications occurred among the essential features of the behavior setting. Two of them are related to the '*objects*' feature of the behavior setting, while the other one is associated with the spatial boundary of the setting.

The participant obtaining a mobile in the new house has also affected the sleeping hours, which eventually reflected on the time he wakes up. In addition, the fact that the rooftop material at the old house is made of metal corrugated sheets affected maintaining the proper temperature of the house. It was very high in summer and extremely cold in winter, caused by the thermal bridges between the interior of the

house and the exterior environment. *"The room temperature forces me to wake up early even at weekends. Once the sun rises, the room temperature gets too high and the space becomes uncomfortably hot" (Participant 1- Son 1).*

Moreover, participant 1 has been uncomfortable at the space where most of his activities occur. "*I suffer from a lack of privacy. I spend most of my time in the living room. It's the place where I study, watch TV, eat, and hang out with my brothers. I even sleep there, where it is too noisy. I don't feel that I have a place of my own" "My mom wakes up before sunrise to pray at the living room and then she reads loudly" (Participant 1 – Son 1).*

However, at the new house circumstances, participant 1, is seen spending more time at home than before. In fact, by tracking his daily program at the weekends or summer breaks (Figure 4.28), the participant recorded two and a half hours spent outside the new home in comparison with seven and a half hours at the old house. He reported being comfortable and enjoying the sense of privacy provided by dedicating him to a bedroom rather than staying in the living room at the old house. *"Finally, I have got some privacy in my own* room*. I am happily enjoying spending more time there" (Participant 1 – Son 1).*

Moreover, the new physical components of the behavior setting (Objects), as the new soundproofed doors, windows, fane, and having an actual bed and closet in the bedroom, have enriched the experience of staying at home and influenced the activities at various levels. "*I sleep comfortably in my own bed without any noises or feeling guilty of waking up my brother to take my clothes from the room" (Participant 1- Son 1).* He added*, "I have a fane over my head and a bed and that was all I needed",* He also commented on the doors by stating: *"The new doors are great. I can play my video games and listen to music without disturbing anyone" (Participant 1 Son 1).*

Adding a simple element like stairs had also provided the opportunity for a new behavior to appear. While participant 1 had used to meet his friends outside the house, the three steps in front of the new house have facilitated him a space to sit and socialize with his friends.

- ***Participant 2.*** *– Son 2*

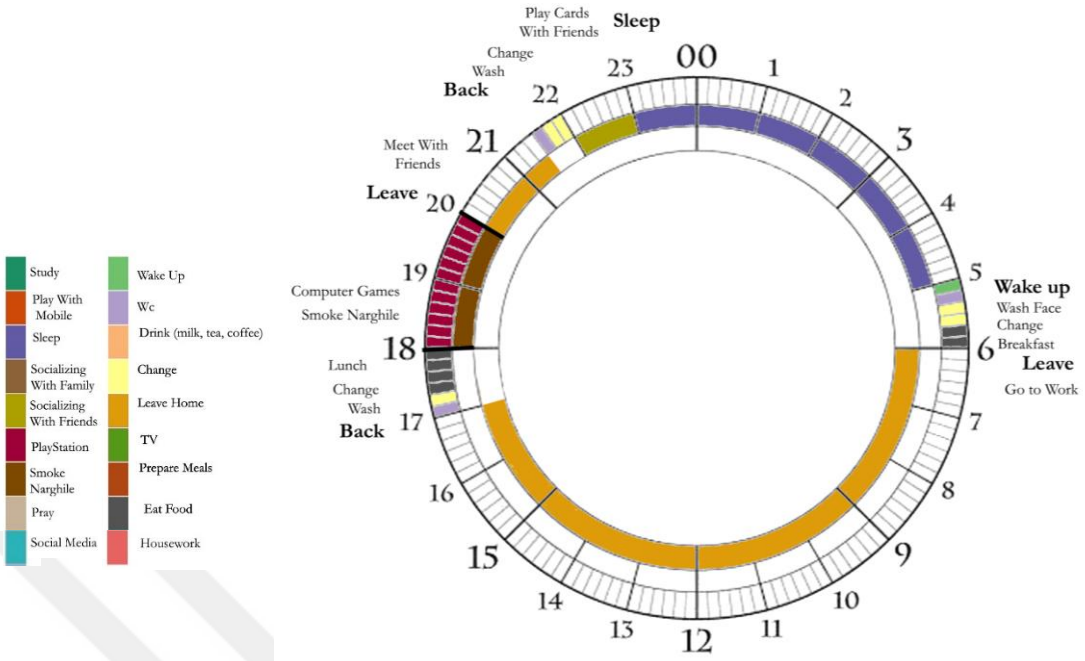

Figure 4.30: Participant 2 program, Son 2, Working Day, Old House

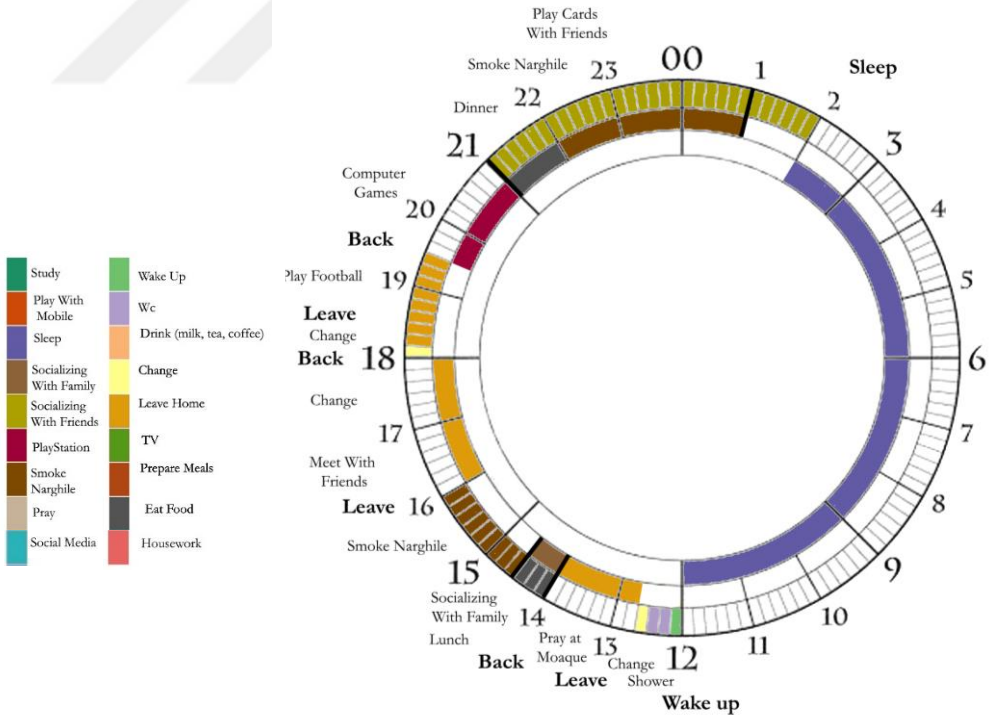

Figure 4.31: Participant 2 program, Son 2, Day Off, Old House

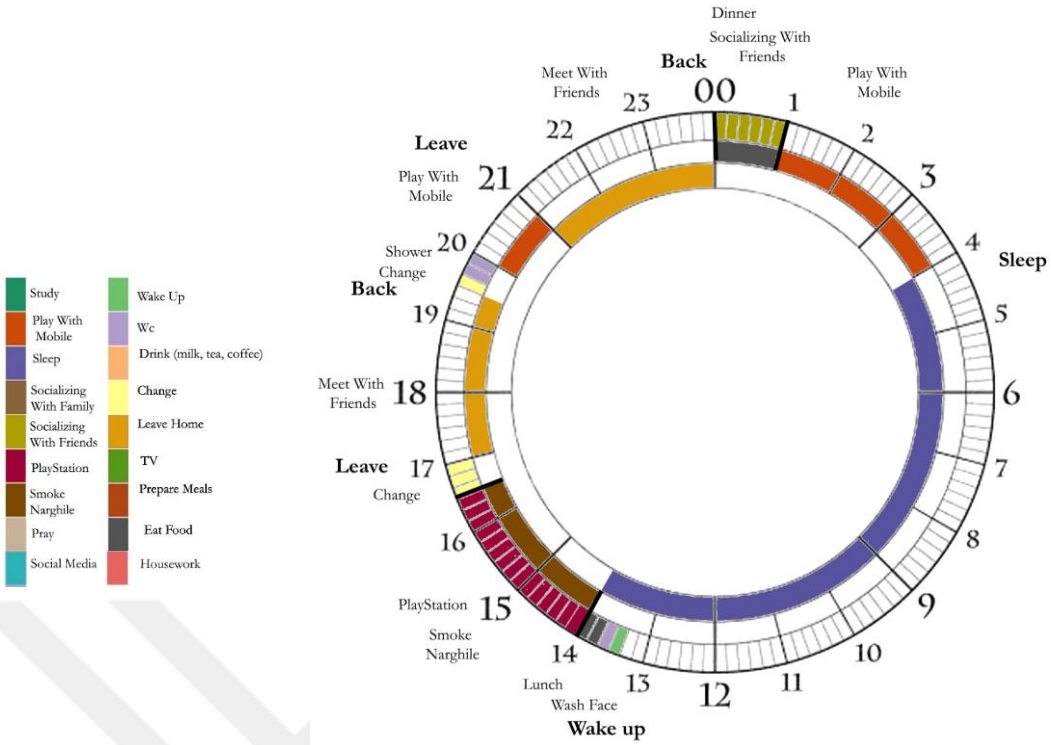

Figure 4.32: Participant 2 program, Son 2, Unemployed, New House

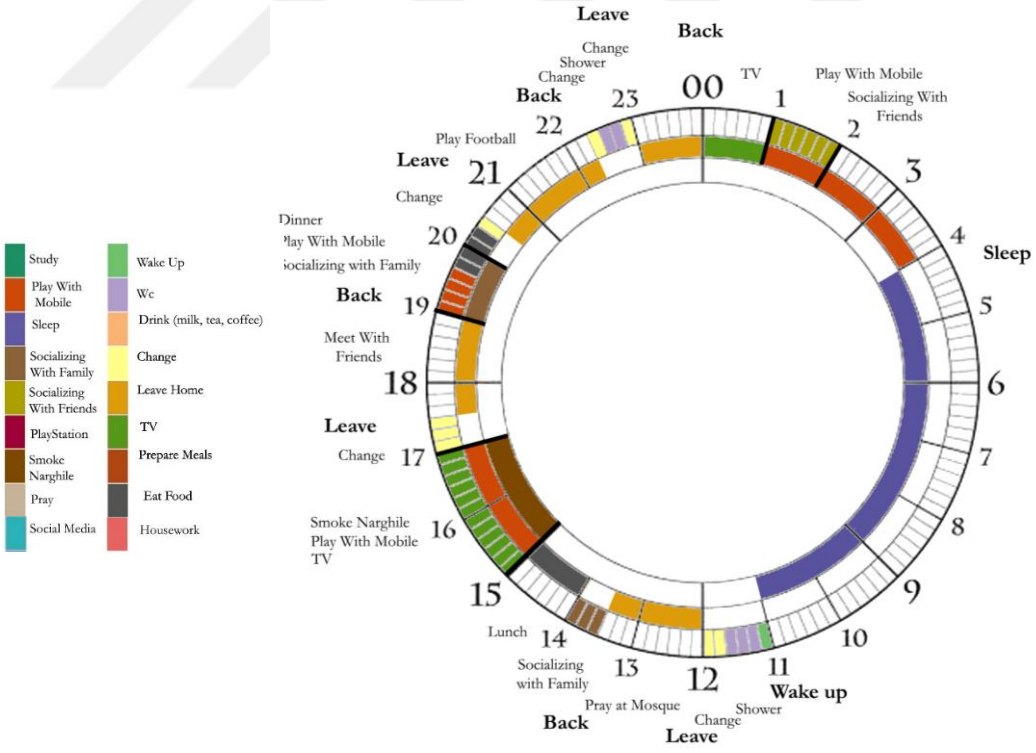

Figure 4.33: Participant 2 program, Son 2, Weekend, New House

Figure 4.34: Behavioral Maps of Participant 2, (Son 2), for the old and new house

Like the previous case of participant 1 perusing most of his activities in the living room, his older brother (participant 2), was using the old house's guestroom as his private space. "*The guestroom is where I spend most of my time whenever I am at home. It is where I sleep, eat, and meet with my friends" (Participant 2 - Son 2).*

Participant 2 had a close relationship with his brother who passed away in a car accident during the beginning of the research period at the old house. The 23 years old son of *Abu Mrefeh Family (Participant 2),* used to share the bedroom with his two siblings up to the unfortunate accident of losing his brother when he decided to move to the guestroom. "*I used to sleep in the same room together with my two brothers. Yet, when my eldest brother passed away, I could not sleep in that room anymore" (Participant 2 - Son 2*). One change in the 'roles' component of the behavior setting has affected the spatial boundary of another role. In other words, the

fact that a member of the family had been eliminated in the behavior setting, caused a change in the space where most of the activities of participant 2 occur, and initially affected his behavior. However, the tracking of his program using the behavioral mapping tool (Figure 4.34), recorded that the participant went back to use his bedroom at the new house. The changes that have been made in the physical components (Objects) of the old bedroom, had given a new identity to the space and contributed to a behavioral change. The new house program and the behavioral mapping of participant 2, shows that he was involved in more indoor activities than before. The participant has also recorded more interaction with other roles in the setting. "*My total sleeping hours did not change in comparison with the old house. However, the quality of sleep is way much better than the old house. I can enjoy sleeping now without getting annoyed by the heat is summer nor the rainwater leakage in winter. The new roof has also provided sound insulation that has also made my sleeping experience more comfortable" (Participant 2- Son 2).*

- ***Participant 3*** *- Mother*

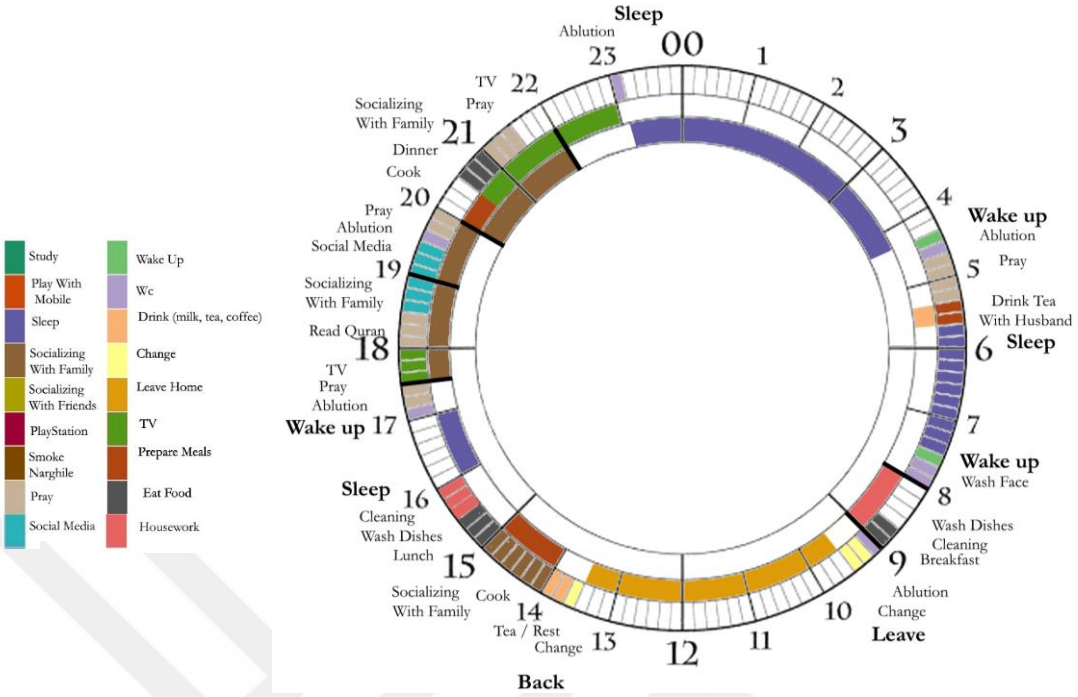

Figure 4.35: Participant 3 program, Mother, Working Day, New and Old House

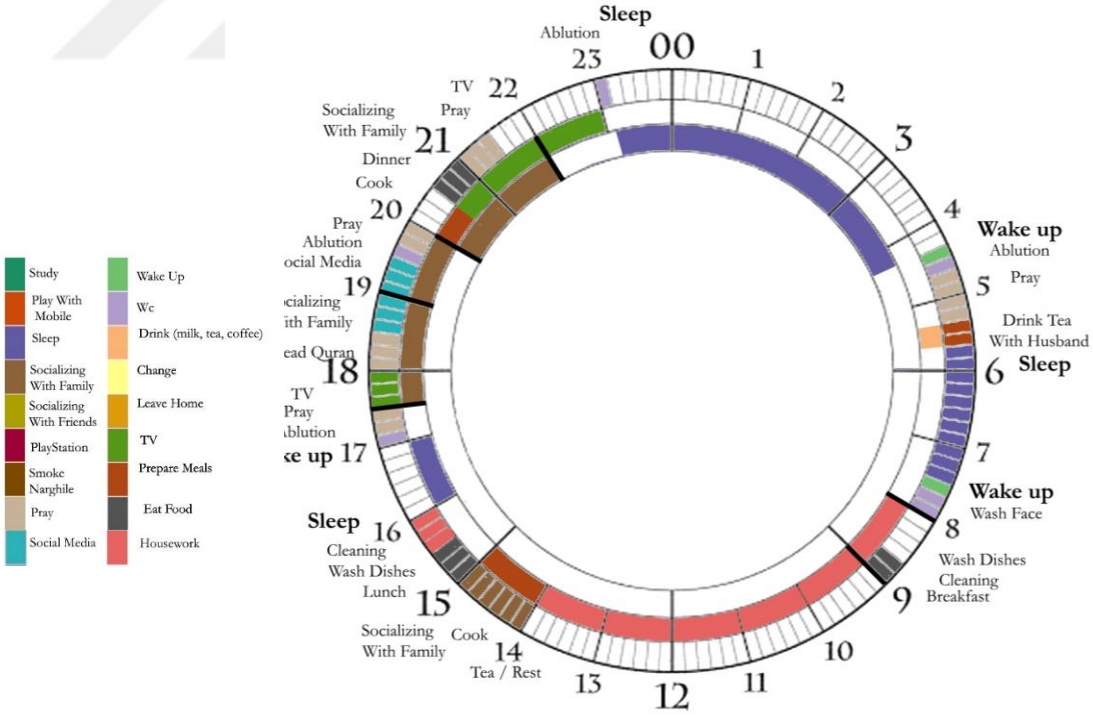

Figure 4.36: Participant 3 program, Mother, Day Off, New and Old House

Figure 4.37: Behavioral Maps of Participant 3, (The mother), for the old and new house

Participant 3, the mother, described an emotional overload – doing for cleaning and tidying up the old house, while still not feeling effective. "*There was no way to make this house clean. As much as I put effort and time cleaning and tidying it up, it would still look messy and dirty"* (Participant 3 - Mother). Her fatigue during the day was psychologically derived rather than physically. *"Regardless of the time I rest, I constantly feel tired"* (Participant 3 - Mother).

Her attempts in competing for care and household demands were demotivated by the physical conditions of the setting and accordingly prevented her from being the mother she wanted to be for her family. "*At the old house, I used to feel demotivated to work at home. Dirty dishes were piled up for days in the sink. I truly hated my kitchen"* (Participant 3 - Mother).

The ceiling condition was again, the main concern of the mother. Cleaning dust was the most challenging task for her. "*The moisture brought insects into the house and my bedsheets and clothes are always full of dust and mold" (Participant 3* - Mother*).*

Her bedroom is where the family's valuable clothes and belongings were kept as its ceiling was relatively in good shape. *"My bedroom looks like a storage" (Participant 3* - Mother*).* The mother had worked hard to enhance the difficult condition of the house, to the extent that she created a stretched ceiling by sewing different fabrics together to cover the perforated parts of the ceiling.

Moreover, it is remarkable that the mother's daily routine is constantly similar during weekends and weekdays for the old and the new house (Figures 4.35, & 4.36), except the volunteering working hours of the day. The behavioral mapping analyses (Figure 4.37) shows that the mother's patterns of movements along the week are also alike, despite all the changes at the new house. Indeed, she was not surprised when the results were shared with her. *"At that age, my daily program is fixed since it is focalized about my family and repetitive essential responsibilities" (Participant 3* - Mother*).* The mother's toleration of change was more psychological than behavioral. She showed positive attitudes during observations and interviews, towards her satisfaction in the new house.

Looking at her daily programs (Figures 4.35, & 4.36), it is distinguished that her activities are mostly linked with other members of the family. Participant 3, has recorded the highest rate of interaction among all other roles of the setting, which is nearly 50% of her daytime was observed in interaction with other roles of the behavior setting. Her time outside the house was also dedicated to interaction with the community of the camp for a good cause. She valued time away from home and family demands; this occurred as she practiced her voluntary job at the women's and children's educational center during the day. *"My voluntary job is my refuge space. I feel productive and effective in the community of the camp" (Participant 3* - Mother*).* Although, looking at the mother's pattern of movements (Figure 4.37), unlike the other family members, she has recorded an appearance in each space of the house. This could be elaborated by the fact that all housework responsibilities are part of the mother's pattern of behavior.

- ***Participant 4.*** *- Father*

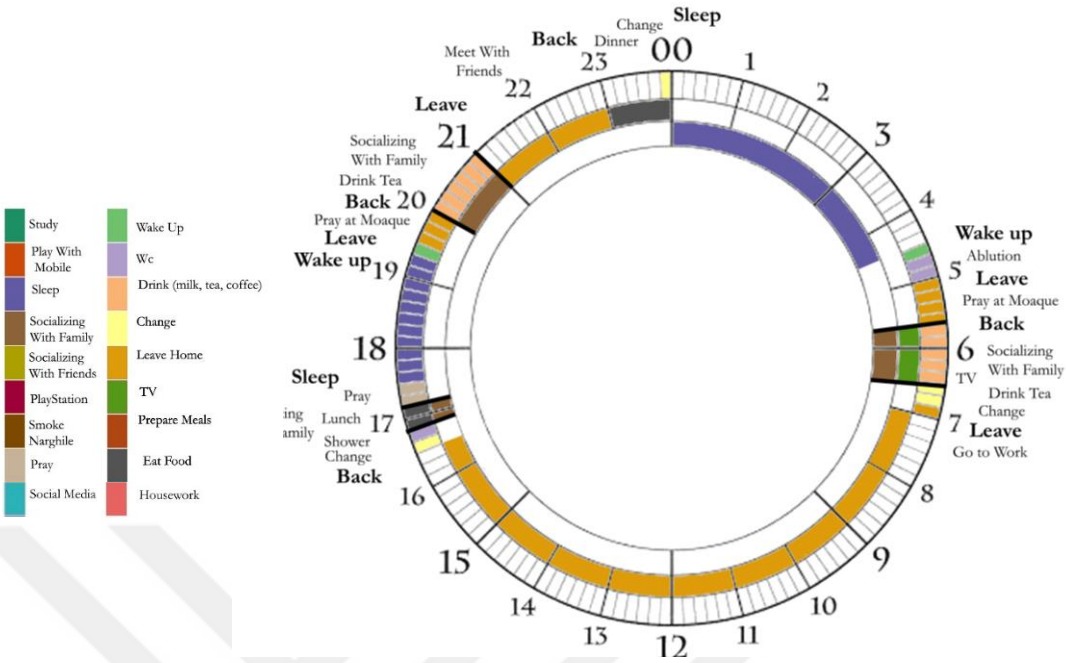

Figure 4.38: Participant 4 program, Father, Working Day, Old and New house

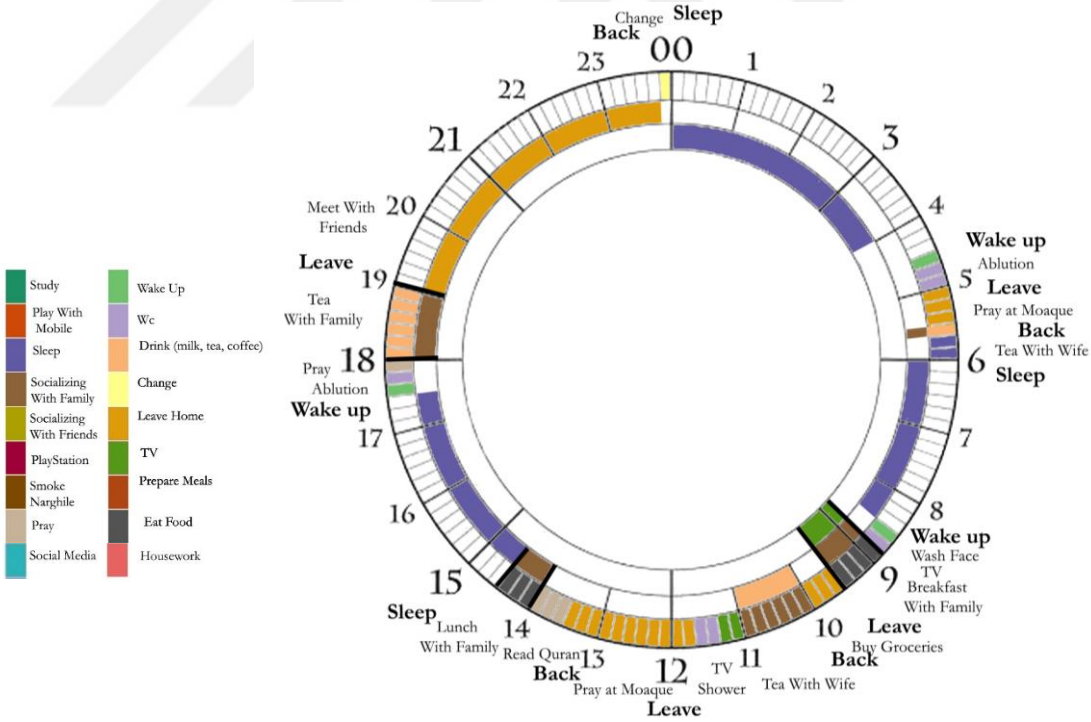

Figure 4.39: Participant 4 program, Father, Weekend, Old and New house

Figure 4.40: Behavioral Maps of Participant 4, (The father), for the old and new house.

The 53 years old father of the family works irregularly in construction labor works due to his unstable health conditions. Accordingly, his working days program (Figure 4.38), and days off program were occurring unorderly, until the death of his eldest son, who was the family's main source of income.

Unlike the rest of the family, neither the father's daily routines (Figures 4.38 and 4.39), nor his pattern of movements (Figure 4.40), reported any changes in response to the new house turnovers. However, the frequency of the working days and the days off programs, where affected due to the elimination of an essential role of the setting; the death of the son. The father had to work more often than before to fill in a fundamental vacant role in order to cover the family's expenses. This means, that the program of his working days (Figure 4.38), is repeated throughout the week more often.

Participant's 4 daily programs show repetitive activities associated with outdoor events, in multiple times during the day. This frequent egression of the house is mostly occurring to perform five times prayers at the neighborhood mosque. The fact that the mosque is relatively close to the house, provided the opportunity of interaction between two different behavior settings, which would initially have its consequences at its users. "*My time schedule is bonded with five prayer times during the day" (Participant 4* - Father*).*

The father's program also shows, that his indoor activities are mostly related to his wife (Participant 3 - Mother). This interaction contains socializing activities, such as chatting while drinking tea, watching TV, or having meals with other members of the family.

4.3.2.2 Family Level of Ecology

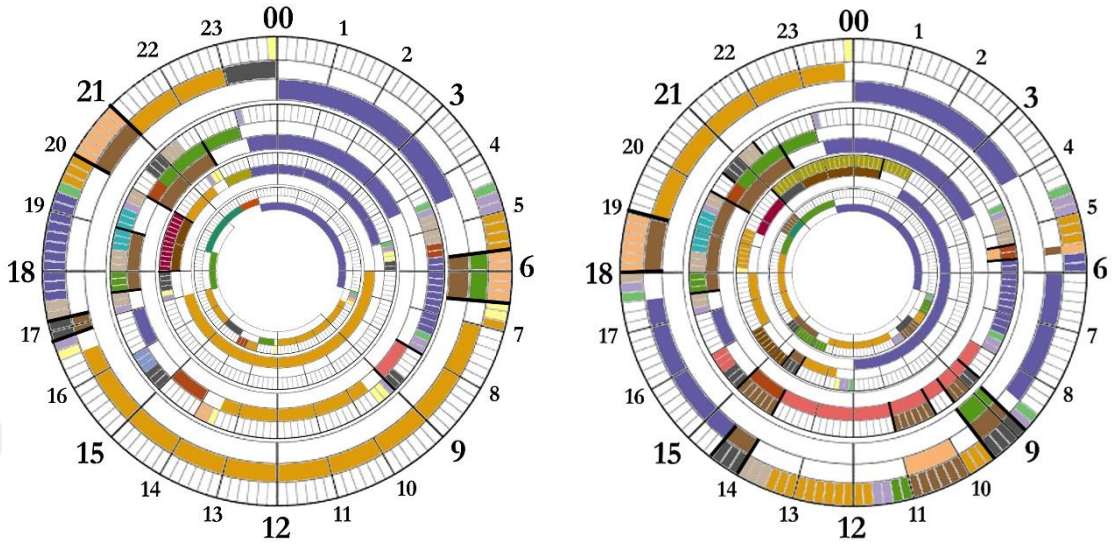

Figure 4.41: Old House, Family programs during working days (left), and days Off (right).

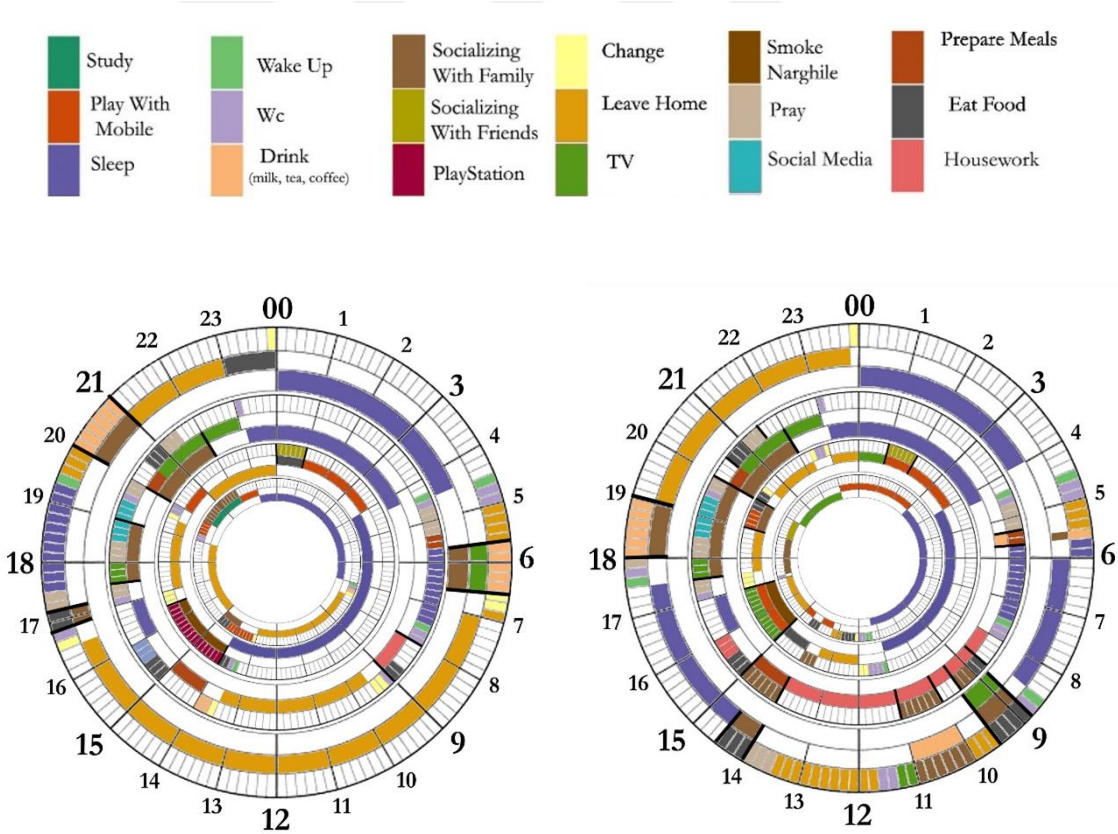

Figure 4.42: New House, Family programs during working days (left), and days Off (right).

While the orchestration of the family's patterns of behavior, is a result of a group tendency of interaction, it was primarily evoked by one role, which is the mother. Despite the intensity of housework and family demands, such as cleaning, preparing meals, doing laundry, and teaching the son, the mother was responsible for all these activities. The father's support, similarly to the sons, was infrequent within the daily patterns of behavior. The kitchen space in particular, and its related activities, were exclusively occupied by the mother at multiple times of the day. Slight changes to the new space, such as open kitchen design, have successfully urged interaction with other family members in the living room.

The main meals over the weekend prepared by the mother were the time when the family comes together on multiple times along the day. Family lunch has been viewed in the eastern culture, as a symbol of an interconnected family. For *Abu Mrefeh* family, the firmness of this group activity showed that some behaviors, likewise roles, serve as foundations for the sustainability of the behavior setting. Indeed, all the family members reported Friday lunch as their most favorite activity throughout the week.

Like most of the camp's inhabitants, winter had always been difficult for Abu-Mrefeh's family. The poor conditions of their old houses had made the situation very challenging and intensely affected their behaviors. The cold temperature of their spaces was mainly caused by the lack of insolation in the roof and walls. Even though the ceiling material is metal, which conducts temperature more than other solids do, the sheets are disconnected from the walls, corroded, and perforated due to length of service.

Accordingly, significant activities associated with this difficult season, have appeared along with the patterns of behavior of this family. Cooking pots, for instance, were distributed in multiple spots at each room of the house to contain the rainwater leakage, while cement bricks were used to left up all furniture to prevent mold. Another undesirable family activity for the male members of the family was to spread plastic sheets over the rooftop to decrease water leakage into the house.

Family members were also observed saving the used books at the end of each school year to burn them in cold days. Furthermore, using the toilet or shower in winter was

'a torture' as described by participant 2 – Son 2. *"We heat up some water using cooking pots and then we use it to shower" (Participant 2 - Son 2)."*

Such activities have completely vanished from the participant's routines after the rehabilitation of their setting.

The family has gained a new space for interaction by having a solid rooftop made of reinforced concrete. This space has provided the family with a new experience which they didn't have with their old house. "*My favorite activity in the new house is spending time on the rooftop. I feel that it's a place where I can breathe fresh air and have an open view of the neighborhood. I did not have this privilege in our old house" (Participant 1 – Son 1).*

Using a participatory design approach in rehabilitating the house, allowed the family and their neighbors to engage in the design process and construction of the house. Observations and interviews had shown that the construction period had strengthened the relationships within the family members on one hand, and with their neighbors on the other. "*The fact that the family worked together in designing and rebuilding the new house, has brought the family together. We had several discussions before deciding on anything. My friends and neighbors have also stepped up and offered their help for free" (Participant 2 – Son 2).*

Observations showed that the number of visitors has remarkably increased in the new house. The rehabilitation of the house has encouraged the family members to rebound with their neighbors and friends. *"I always felt embarrassed about inviting people to my old house. I used to avoid friends' gatherings at home so that I won't have to host the next one at mine" (Participant 3 - Mom)*

4.3.2.3 Community Level of Ecology

As discussed earlier, Gaza refugee camp, as most of the refugee camps around the world, is overcrowded. Poverty, cultural practices, and poor planning of the space have also contributed to causing more challenges in the residential environments at various levels. Households are seen living in inadequate residential spaces or shared with the extended family.

In consequence, this situation has caused unpleasant living environments and led to complications in maintaining privacy. "*My favorite activities of the week occur whenever I leave home to spend some time out with my kids. I feel that there are fewer people outside the home than inside" (Focus group participant).*

The modular approach of designing the residential areas of the camp has also resulted in the insufficiency of privacy, ventilation, and noise problems. Looking at the four sides of the modular rectangular shape of the housing units (Figure 4.43), the inhabitants complained from poor ventilation and lack of daylight as there is only one façade of the house facing the street, while the other one in the opposite direction, is facing a very narrow ventilation gap. The other two sides of the house are attached to neighbor housing units.

Families have experienced noise problems and privacy limitations since all housing units face the streets. *"I just have one window facing the street and even though, I cannot open it for privacy issues" (Focus group participant). "I struggle from having fixed sleeping hours because of the children playing in front of my house. I wish I can stop them, but I also feel sorry about them. If they don't play in the street in front of the house, where else would they go?" (Focus group participant).* The grid system of planning the residential area has also reduced the sense of community because every dwelling is separated by its neighboring one by the road system.

In a different manner, some participants addressed their concerns about sharing bedrooms by opposite genders. *"I know many families in the camp who were obliged to share bedrooms due to poverty and lack of space. The parents together with children of opposite genders are sleeping in the same room" (Focus group participants).*

When participants of the focus group or during random interviews were asked about their favorite activity among their daily workdays and weekend programs, the majority of their answers were associated with outdoor activities, (activities taking place outside their houses). This finding is related directly to the absence of the basic components of a proper residential environment. The participants have repeatedly complained about the lack of adequate and proper indoor and outdoor spaces. "*There are no proper public spaces at the camp, where people can congregate. We end up at our homes or at the alleys of the camp to play cards and chat for instance" (Focus group participants).*

In addition, they have described their primary dilemma of the weak structures of their houses, particularly the problems they face by applying metal or asbestos corrugated sheets as the roofing material.

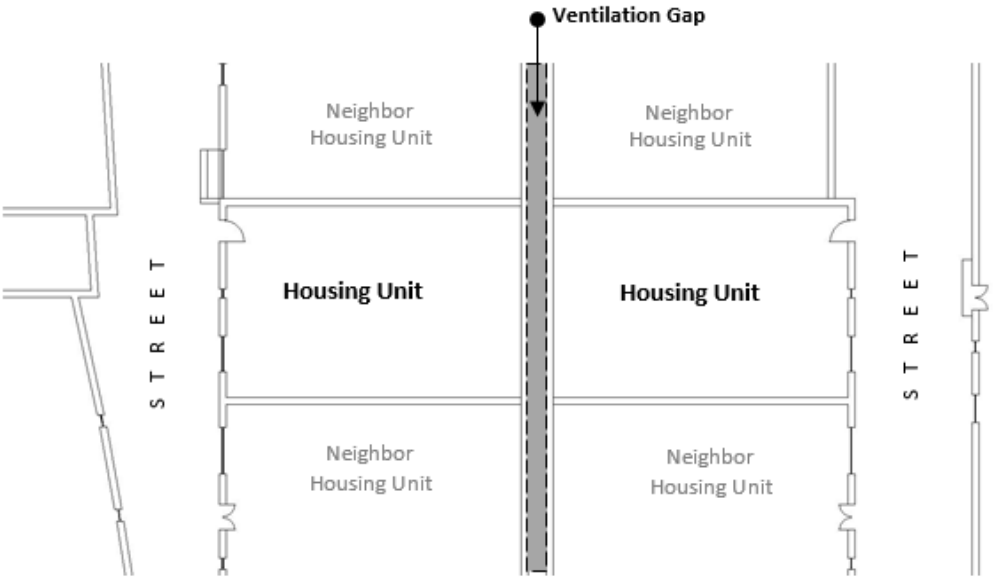

Figure 4.43: Zoomed in view, showing the planning of the residential areas.

Having such problems affected the behavior setting at various levels. Activities as reading, napping or interacting with other family members were either confined to the necessary period of time or avoided completely from their standing patterns of behavior.

The camp's community has also complained about disturbances of bad smells and mosquitoes. *"I am very irritated by the bad smell while having our meals at the kitchen. Especially in summer, those smells in addition to mosquitoes, really disturb our normal activities such as sleeping or eating" (Focus group participant).* Accordingly, a problem of garbage accumulation in residential neighborhoods and ventilation gaps was founded. Later, an interview with the UNHCR representatives reviles the problem of an insufficient waste management system in the camp. This problem resulted as a consequence of overpopulation, in addition to planning issue which prevented access for the waste-collecting vehicles to many residential areas.

However, it is worth to mention that nearly all of the observed houses were relatively clean and tidy. The activity of cleaning and tidying the house appeared repeatedly in every behavior setting survey, which leads to the conclusion that the problem of waste in the camp is related to planning and management issues rather than behavioral practices by individuals. In fact, many participants have suggested solutions to the waste problem that could be useful if the management of the camp cooperated. *"I suggest distributing waste bens in every street"* Another participant added*: "I believe those bens need to be designed in a manner that durability and sizes in relation to the width of the streets, are considered" (Focus group participants).*

Unlike many other traditional communities, women of Gaza refugee camp, have the largest share in the economic life. In consideration of a wide range of informal employment, they are mostly engaged in micro-enterprise activities, such as home-based work and dependent subcontracts. The reasons behind this paradox are that men are often not allowed to be employed in permanent jobs, due to the absence of a national identity number. Despite the financial responsibility that women took upon themselves, they still shoulder the largest share of the housework than men.

CHAPTER 5: CONCLUSION

This research was conducted for the objective of understanding how the built environment shapes behavior in protracted refugee camps. With a contribution from the researcher, behavior settings survey, presented by Roger Barker (1968), was used as a primary research tool along with observation and questionnaire methods.

For the period of three years, the research, carried out at Gaza refugee camp in Jordan, proceeded in three stages; firstly, analyzing architecture; second, patterns of behavior, and finally, conducting a research project to examine and compare the relationships between behavior and physical environment.

5.1 Overview of the Study

In attribution to Wicker (1979), people abandon inadequate settings if they were not able to obtain satisfying outcomes. Likewise, the setting would reject its occupants and create vacancies for more promising ones, if compatible behaviors were not obtained. However, in protracted refugee situations, where substitutes are not available, people had to remain at unsatisfying settings, and the settings had to sustain occupants with incompatible behaviors.

That being said, Barker and Wright's (1955) and Wicker's (1979) proposal of regulation systems in behavior settings shown in chapter 2, figure 2.2, does not seem to apply to every situation. The mechanism they proposed within Barker's theory (1968), in which three main mechanisms work continually for the sustainability of the behavior setting, should be restricted and conditioned to work only in a self-regulated system. While otherwise, as in the case of refugee camps, where its regulation systems are composed by outsider authorities, the mechanism of the theory will be interrupted after the '*executive mechanism*' phase. The following '*maintenance mechanism'* which requires changing the source of the problem or removing it from the setting, is not usually an applicable option in refugee camps due to the specialty of the circumstances of its behavior settings.

Studying the camp at a macro level has diagnosed several behavior setting's inadequacies. This conclusion follows from the fact that the programs of its occupants are under excessive control and disciplinary power by outsider authorities. Corresponding to the conditions that generate inadequate settings by Barker (1968) and Wicker (1984), the camp's behavior settings contains too many occupants for its essential features. The "temporary" mentality in establishing a refugee camp, made its behavior settings occupy a space designed for a different purpose.

The camp is overstaffed in the eyes of its administrators, as the maximum number of resources cannot cover the basic needs of its settlers. However, the camp is understaffed in the eyes of its own occupants, as the minimum needed positions that the management of the camp should provide, are not available.

The fact that a required surface area for spaces like social infrastructures and communal services was disregarded, adversely affected the indoor behaviors occurring in the residential environments.

The present study confirms previous findings of Barker & Wright (1955), Barker (1960, 1968), Barker & Schoggen, (1973), and Wicker (1968, 1979, 2002), and contributes additional evidence suggesting that the components of the behavior settings are firmly connected and dependent on each other. Any changes that could occur on any of the essential features of a behavior setting or any intrusion to the standing pattern of the occupant's behaviors, would certainly influence the structure of the whole setting. It would redefine its components or generate new sub-settings with interdependent relations between the old and the new behavior setting.

Along the research period, spaces in residential environments demonstrated the tendency to be redefined and to be used for multifunctional purposes. When one of the roles in the behavior setting was eliminated due to a car accident, the spatial boundaries of other roles changed and initially affected the behavior setting at various levels. The occupants were observed developing new definitions of their territories while practicing various disconnected activities at the same space, such as using living and guest rooms, for some family members, as their bedrooms, dining, and for hosting visitors.

The physical components of the behavior setting *'Objects'* had resulted to have the strongest influence on behaviors among all other components of the setting; a result that casts a new light on the relationship between objects and behaviors. The changes in the physical components at the new house, for instance, developed new activities that delivered different experiences and feelings related to space. It has even replaced negative thoughts, behaviors, and displeasing memories with more favorable ones.

The results of this research have also indicated a psychological dimension in relation to the behavior settings theory, which had not been adequately considered at the original work of Barker and Wright (1955), Schoggen (1973), nor Bechtel (1977, 2000). This was clearly demonstrated in the ecological analyses of the individuals, family, and community participants.

Overall, the findings proved and confirmed the effectiveness of using the behavior settings survey to examine directly observable behaviors that are closely linked with the physical environment. The survey helped extensively in collecting and tracking people's lives and to ensure that essential components of the setting were not missed, which appears consistent with the propositions of Robert Bechtel's (1977). The contributions presented along with the behavior settings survey provided a potential mechanism of detecting problems that considered to be a threat to the existence of an essential component of the behavior setting and could affect the standing patterns of behavior at various levels

Recording unpleasant situations such as the constant existence of mosquitoes in the residential areas, have led to revel the problem of waste congregations in between the residential units and in the ventilation gaps between the houses. Such problems could not be observed by initiating regular site analyses. Meanwhile, detecting the refugee's constant behavior of cleaning their houses, has directed the efforts of determining the source of the problem. While identifying such a problem, bypassing the behavior of the occupants, would have led to shift the blame to the wrong side of the situation or consume efforts and resources in the false direction.

Moreover, in agreement with Day & Parnell (2003), and in line with the UNRWA's (2007), recommendations, the data indicates that users, more than anyone else, have adequate knowledge about the spaces they occupy. Giving them the opportunity to

discuss and suggest solutions to their spaces, could be a ‘shortcut’ to many design proposals. When refugees were given the chance to engage in several stages of the filed study, such as the rehabilitation of the house, they have constructively participated in suggesting applicable solutions and coming up with practical methods. Their contributions were more suitable to the camp’s culture and environment than the design proposals and inputs of the team of architects, engineers, and sociologists.

Using a participatory design approach in the research project, had positively affected the relationships between the participants. It has increased the sense of responsibility and ownership that will eventually encourage them to sustain the changes and accept them into their environment as their own.

The main conclusion that can be drawn from this research, is that people are always an integral part of a behavior setting and they tend to reflect in different manners to the changes of its coherently connected components. The findings demonstrate a strong effect of any natural or intentional intrusions that could occur to the setting, as it could be utilized to form a structured methodology in order to change, omit, fix, or redirect behaviors of people in certain spatial-temporal boundaries, or to redefine spaces and perceptions associated to it.

The data of such methodology could also be adapted in either improving an existing space or to recognize the specific needs and characteristics of its occupants.

5.2 Limitations of the Study

One of the limitations of the research project was financial support. At the rehabilitation stage of the empirical project, the research team proposed design solutions for the outdoor area of the selected residential environment of the camp. These proposals shown in Appendix (C), were built on interactive survey methods and they combine wall graffiti and wayfinding signage, seating elements, and planters, which together effectively were expected to enhance the outdoor behavior settings of the residential environment. However, they could not be applied due to a lack of financial sponsorship.

An apparent limitation of the method, however, is that the researchers and particularly, the participant observers are required to be acceptable to the community and to have a sensitivity for the personal boundaries and cultural norms and fabrics of the studied area. The relationship between the researcher and members of the community has to be established on trust and acceptance, while problems of research need to be openly communicated.

5.3 Further Studies

The methods used for this research may be useful for predicting the behaviors of a certain group by studying and analyzing their behavior settings.

The study can be applied in other protracted refugee camps, elsewhere in the world and the results could be compared in a manner that would contribute to the existing studies of refugees' situations. It would also be useful to compare the experiences of individuals within the same groups at longer periods.

More research on the behavior settings theory is required in consideration of the psychological consequences of the behavior. While future studies could also expand the research on a larger sample that includes the relationships and connections between the residential environments and the public spaces. The outdoor environment may play an influential role in the activities and programs of the indoor spaces and their occupants. Investing more efforts in studying the refugee's behavior settings can improve the living standards and well-being of those who suffer from displacement, all over the world.

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APPENDIX

Appendix A: Research data collection tool

The Field study includes two main parts. Firstly, the Behavior Settings Survey. And secondly, the empirical project which studies the effect of creating an intervention in the essential features the behavior setting.

Task 1: Select the Setting of the Study.

- Include but not exclude the empirical project's settings of the study.
- Fill in Section **1 – B**

SETTING	OWNER
RESIDENCE 1	
RESIDENCE 2	
RESIDENCE 3	

Task 2: Select the Participants of the Study.

- Select a sample group for the survey. The chosen participants should include the participants of the empirical project.
- Fill in Section **1 – A**

PARTICIPANTS	RESIDENCE 1	RESIDENCE 2	RESIDENCE 3
Par. 1			
Par. 2			
Par. 3			
Par. 4			
Par. 5			
Par. 6			
Par. 7			

Task 3: Produce Architectural Drawings.

- Draw a plan of the chosen residences showing all interior spaces and key furniture that define the space.
- Take adequate photographs and panoramic photos of each space.

Task 4: Conduct the Behavior Settings Survey.

- Refer to **Section 2, 3, & 4**
- Use the "Daily Routine Cards" to ease the data selection
- Remember to document weekends and working days for each role.

Task 5: **Conduct the Empirical Project.**

- In reference to the survey, create an intervention in any of the essential components of the behavior setting.

Task 6: **Evaluate the Effect of the Empirical Project.**

- Refer to the Behavior Setting Survey and trace back the feature of the setting that you interfered with.
- Study and evaluate the effect on this feature in particular and on the behavior setting as whole.
- Re-interviewing participants and re-observation of behaviors are expected in this task.

SECTION 1: DIAGNOSTIC PHYSICAL OBSERVATION OF THE **NEIGHBORHOOD**

Date:	_____/_____/_____	**Neighborhood Name:**	
Monitor(s):		**House owner:**	
Neighborhood #:		**Reference Contact :**	

Item / Condition	Observation	Notes
The neighborhood is accessible to the main streets in the camp	□ Yes □ No	
There are manholes in the neighborhood.	□ Yes □ No	
The neighborhood has empty land plots	□ Yes □ No	
The neighborhood has an open and wide space between the different houses.	□ Yes □ No	
There is enough space to install pipes and water tanks	□ Yes □ No	
Number of houses in neighborhood	--------	
There are windows and are in proper conditions	□ Yes □ No	
There are doors and are in proper conditions	□ Yes □ No	
There are rooftops	□ Yes □ No	
If there are rooftops, please identify the overall condition. *In the notes, identify the material used*	□ Excellent condition □ Good Condition □ Bad condition □ Very bad condition	
There are cracks in the exterior and interior walls of the houses.	□ Yes □ No	
There are stairs on the entrance of the house.	□ Yes □ No	
Is the neighborhood passage to important settings? What are they?	□ Yes □ No	Settings:
Width of intersection	Dimensions:	
Width of street	Dimensions:	
Allows vehicles	□ Yes □ No	
The neighborhood tends to be populated. *Estimate the number of women, children and men.* *e.g there are many youth who are willing and would help us throughout the lifecycle of the project.*	□ Yes □ No	

Doc. Number: .....

SECTION 1: *IDENTIFYING A POSSIBLE BEHAVIOR SETTING –GENERAL*

Date:	_____/_____/_____	**Neighborhood Name:**	
Monitor(s):		**House owner:**	
Neighborhood #:		**Owners Contact info:**	

A. ROLES – DIAGNOSTIC INTERVIEW

	1	2	3	4	5
Name + FAM.NAME					
AGE					
GENDER	☐ M ☐ F	☐ M ☐ F	☐ M ☐ F	☐ M ☐ F	☐ M ☐ F
OCCUPATION					

	6	7	8	9	10
Name + FAM.NAME					
AGE					
GENDER	☐ M ☐ F	☐ M ☐ F	☐ M ☐ F	☐ M ☐ F	☐ M ☐ F
OCCUPATION					

B. SPACE – GENERAL DIAGNOSTIC OBSERVATION

GENERAL CONDITION OF HOUSE				
	Poor	Good	Excellent	**Notes:**
Roof :				Material: ☐ *Metal corrugated.* ☐ *Asbestos.* ☐ *Concrete*
Doors and Windows				
Walls				
Structure				
Ventilation & Natural Lighting				
plumbing and Drainage Systems				

GENERAL HOUSE INFORMATION	
Number of stories	
Number of Rooms	
House Ownership	☐ Owned ☐ Rented
Years of Occupancy	( ) years.

GENERAL NOTES:

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Doc. Number: ……..

SECTION 2: *STANDING PATTERN OF BEHAVIOR -DOCUMINTATION*

IDENTIFYING THE FEATURES OF BEHAVIOR SETTINGS – Observation & Interview

Date:	_____/_____/_____	**Neighborhood Name:**	
Monitor(s):		**House owner:**	
Neighborhood #:		**Owners Contact info:**	

*Trace Activities occurring only at home

MAIN ROLE: …… **NAME:** ……

ACTIVITY/ACTION Involved Behavior	**TIME**	**INTERACTION** with other Roles / B. Settings	**SPACE** Room	**OBJECTS** Involved Physical Features	**PROBLEM** Threat on Any Feature	**REASON** Source of Threat
	:					
	:					
	:					
	:					
	:					
	:					
	:					
	:					
	:					
	:					
	:					
	:					
	:					

SECTION 3*: ANALYZING A SYNOMORPHY IN A BEHAVIOR SETTING*

Date:	_____/_____/_____	**Neighborhood Name:**	
Monitor(s):		**House owner:**	
Neighborhood #:		**Owners Contact info:**	

Description of a Synomorphy.

Describe how the actions of people are coordinated with or 'fit' the physical features or objects in the setting. Describe how are they designed, arranged, or placed in a way that facilitates what people do with/on/near them.

SECTION 4*: ANALYZING A LACK OF SYNOMORPHY IN A BEHAVIOR SETTING*

Date:	_____/_____/_____	**Neighborhood Name:**	
Monitor(s):		**House owner:**	
Neighborhood #:		**Owners Contact info:**	

A. Description of the lack of a Synomorphy.

- *Refer to section 2 and observe the behavior setting and problem caused by lack of synomorphy.*
- *Refer to the setting program in section 2, then describe how the lack of synomorphy interferes with the smooth operation of the setting.*
- *Give sketches of the objects and/or arrangements.*

B. Impact of the lack of Synomorphy.

- *Which roles in the setting are most affected by the lack of synomorphy?*
- *Explain how they are affected.*
- *Which roles are least affected?*

C. Proposed solutions and recommendations.

- *Considering the features of the behavior setting in section 2, together with the occupants, think about how changeable each feature is.*
- *How would this change reflect on the behavior setting?*

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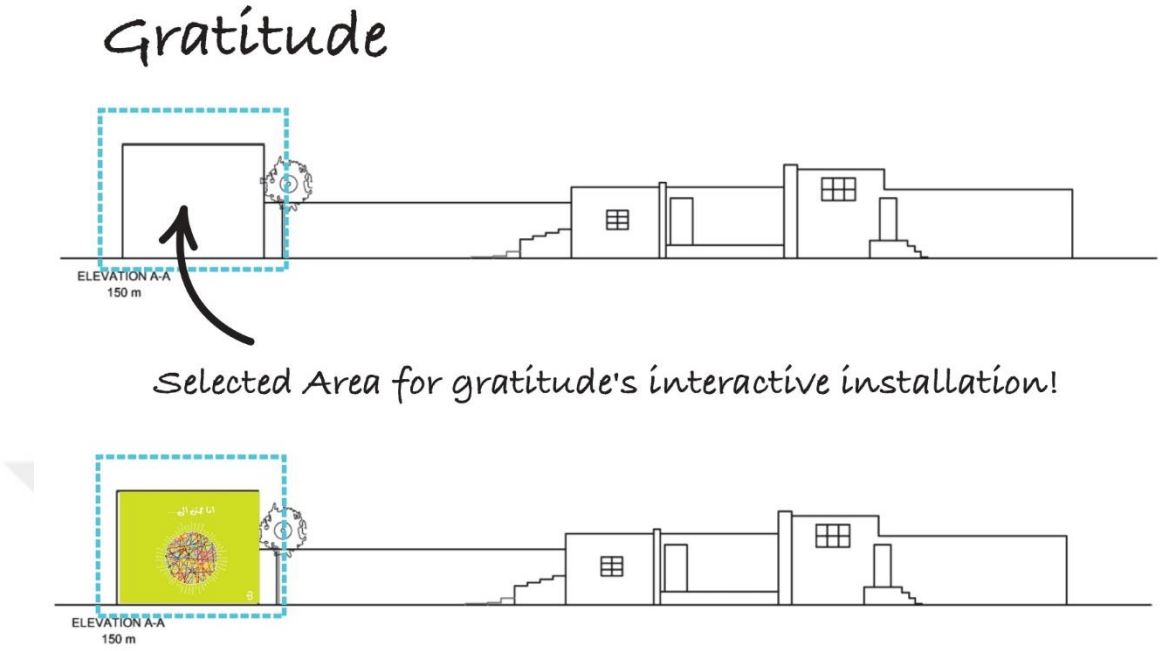
SECTION 5*: OBSERVATIONS*

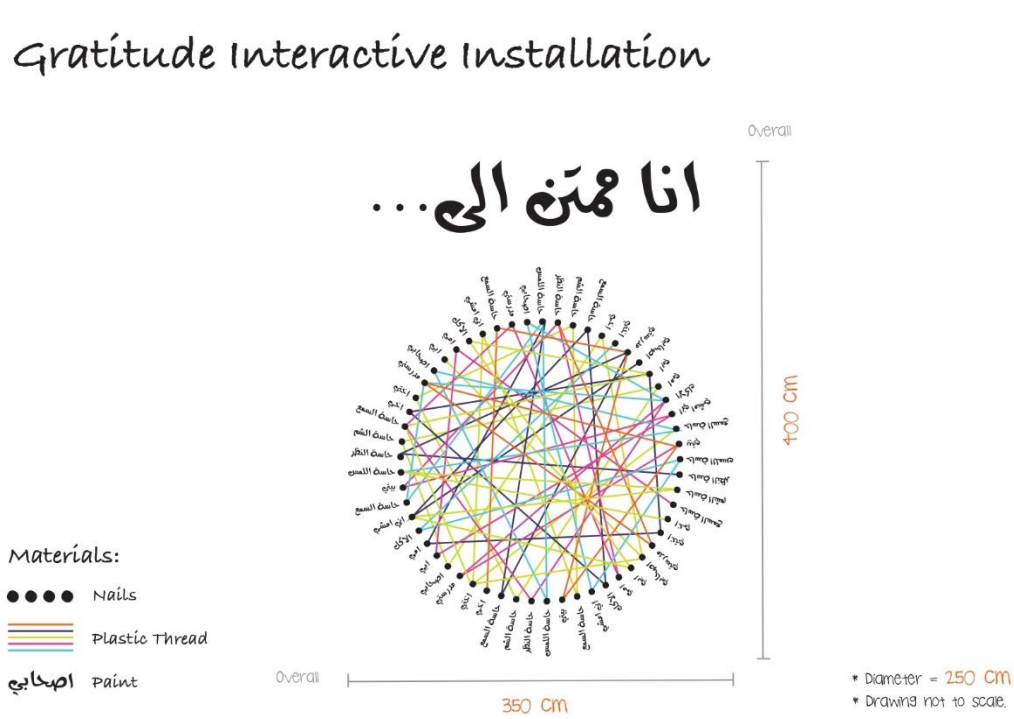
Date:	_____/_____/_____	**Neighborhood Name:**	
Monitor(s):		**House owner:**	
Neighborhood #:		**Owners Contact info:**	

TIME	OBSERVED BEHAVIOR	INTERPRETATIONS

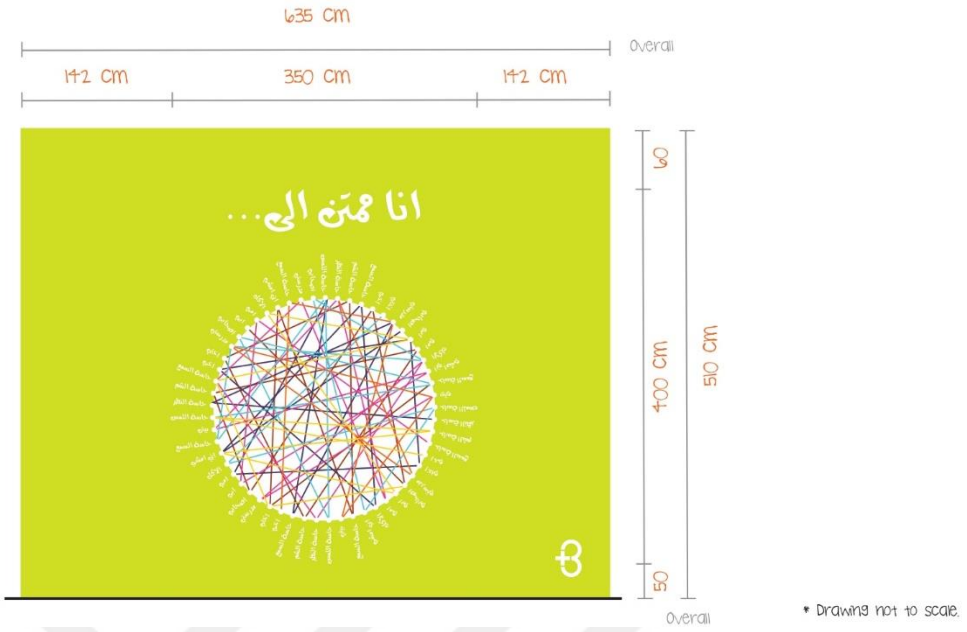
Appendix B: Interior images of the selected housing unit after the rehabilitation

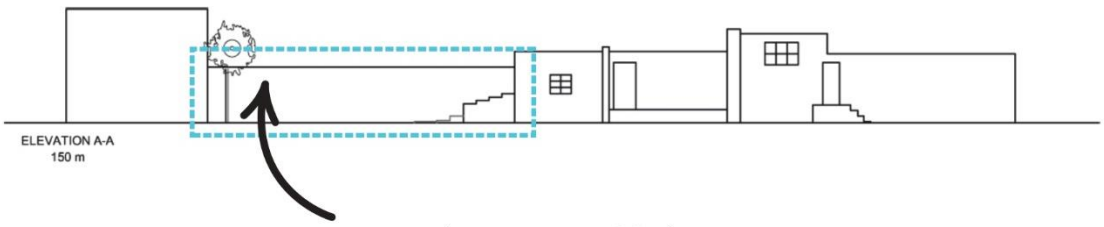
Appendix C: Proposed designs for the exterior area of the selected neighborhood, presented by the design team of the research project.



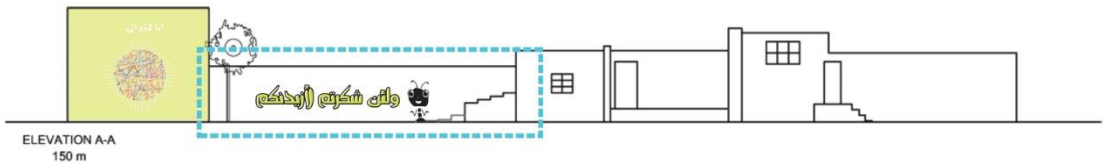


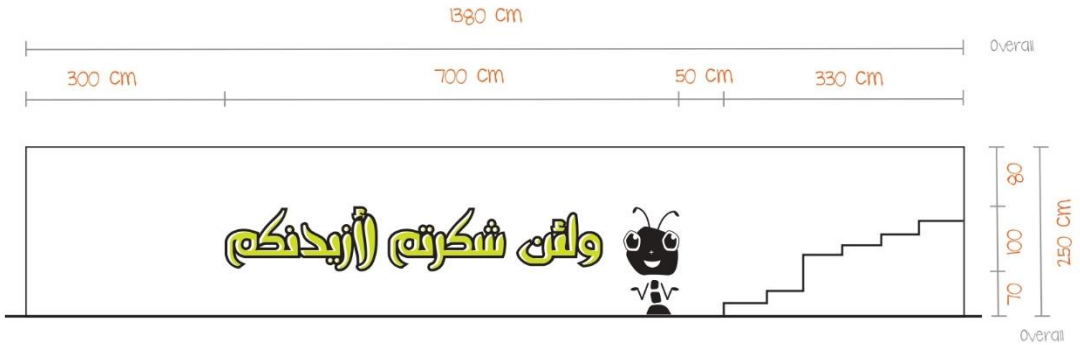
Gratitude Interactive Installation



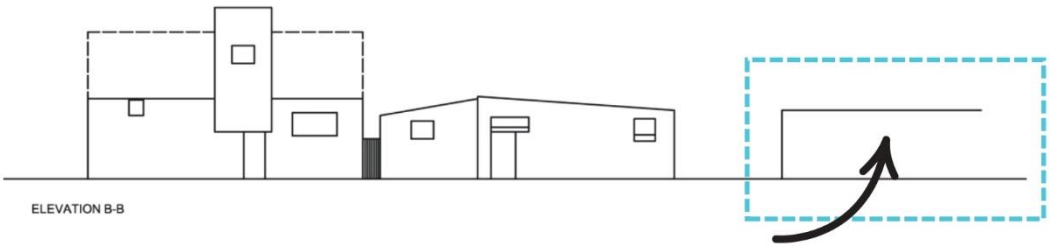


Gratitude Graffiti 1!

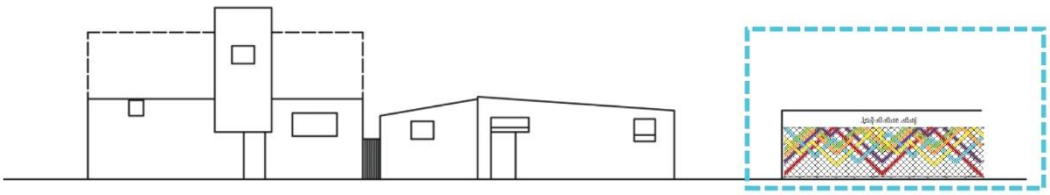




Mindfulness



Selected Area for mindfulness's interactive installation!



Mindfulness Interactive Installation

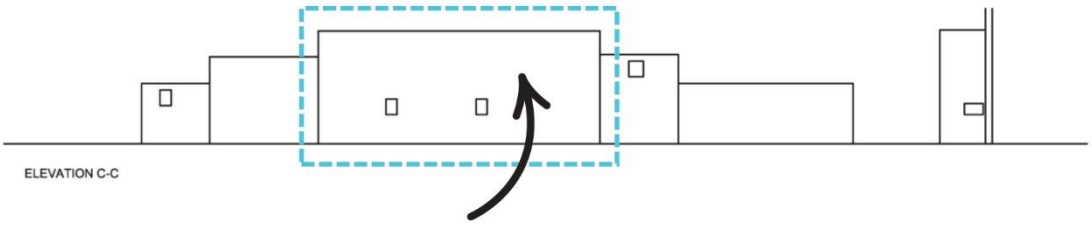
* Pattern shown is subject to change after collecting the laughters of people in Gaza Refugee camp.
* Installation covers the entire selected area for Mindfulness.

Materials:

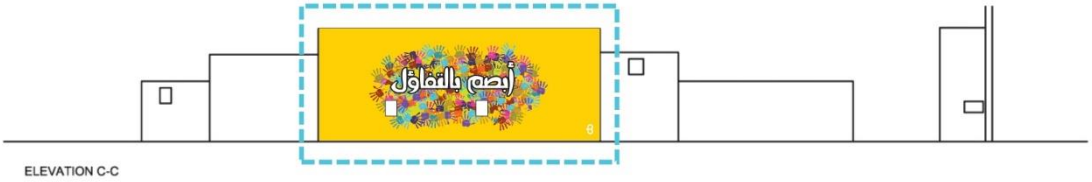
- Fencing
- Wool Thread
- Under Painted Pattern
- Fixtures on the edges to hold it on the wall.

* Drawing not to scale.

Optimism



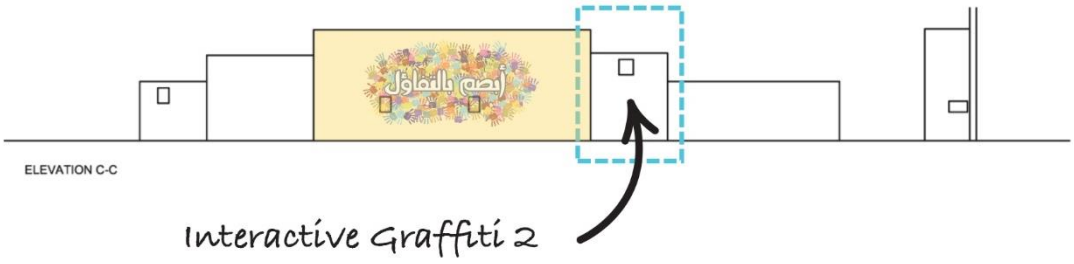
Selected Area for optimism's interactive installation !



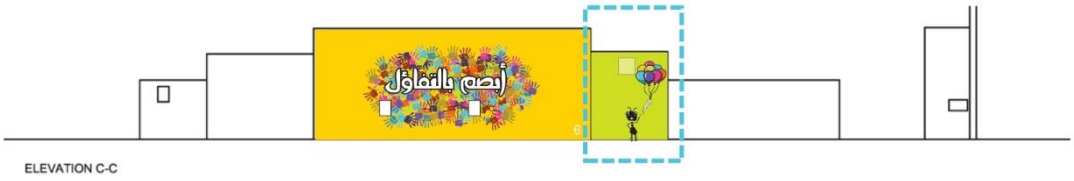
Optimism Interactive Installation

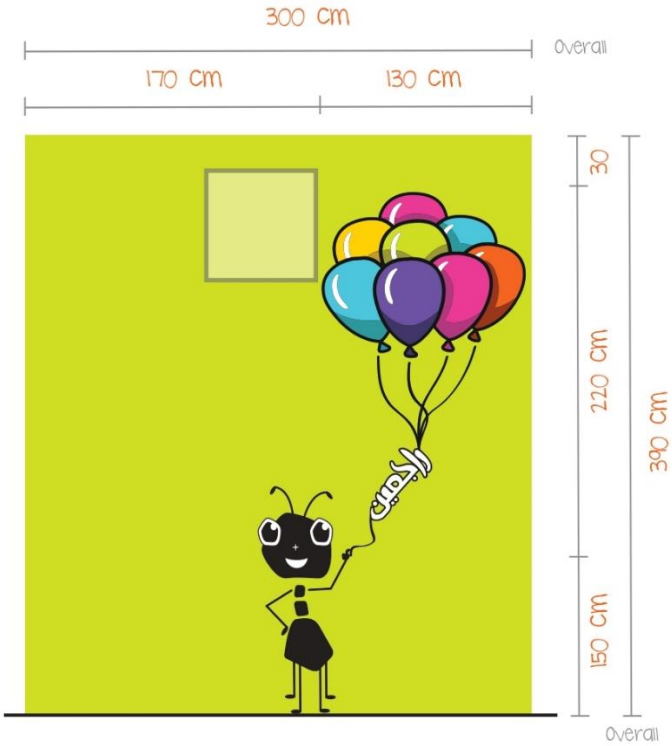
* Hand prints may cover more space on the wall, not particularly in this shape nor in this color pattern.
* Font size is fixed.

* Drawing not to scale.

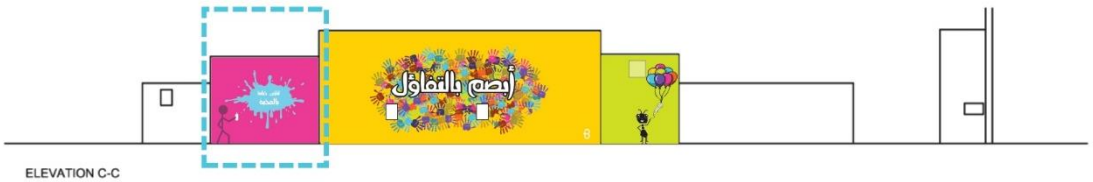


Interactive Graffiti 2

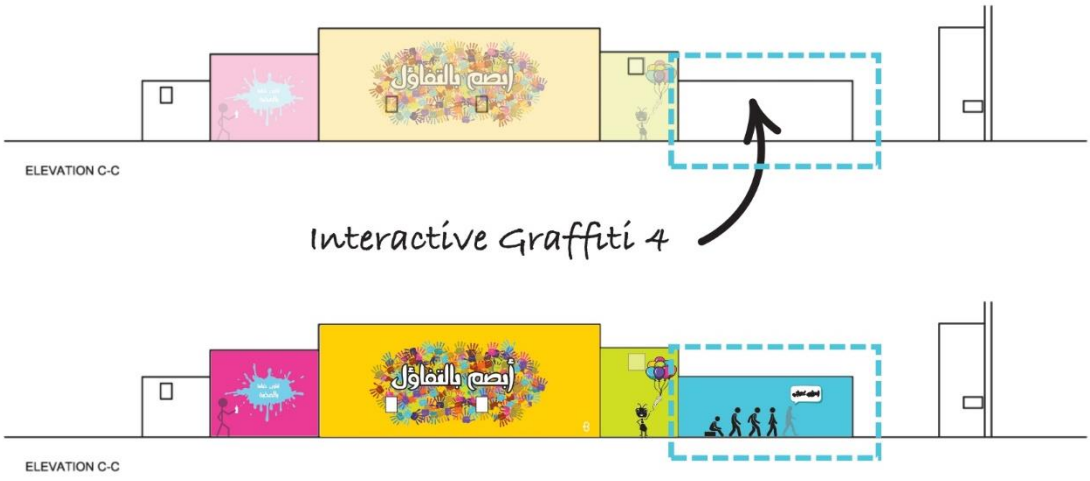


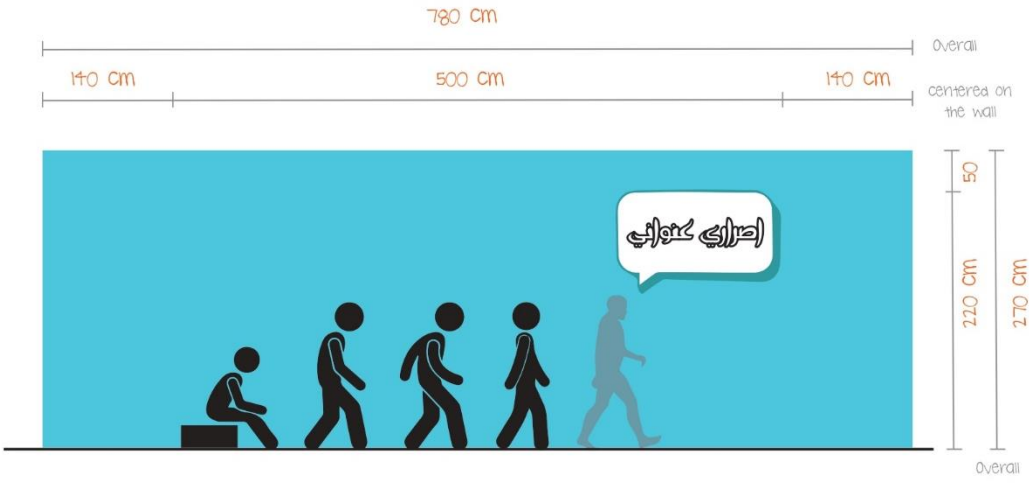


Interactive Graffiti 3




480 cm
Overall
50 cm
380 cm
50 cm
100 cm
190 cm
100 cm
390 cm
Overall
* Drawing not to scale.

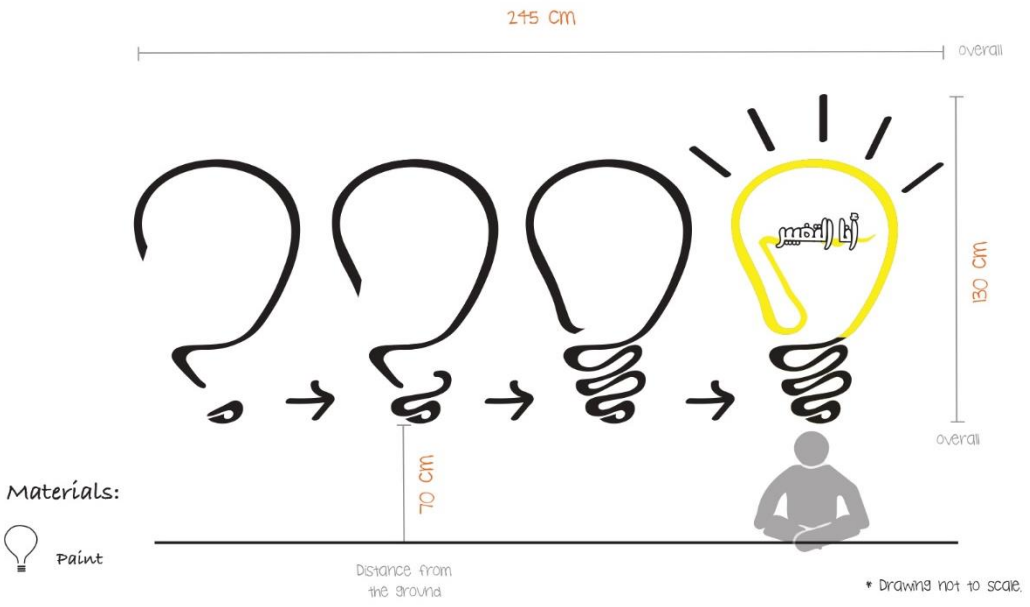

ELEVATION C-C
Interactive Graffiti 4
ELEVATION C-C

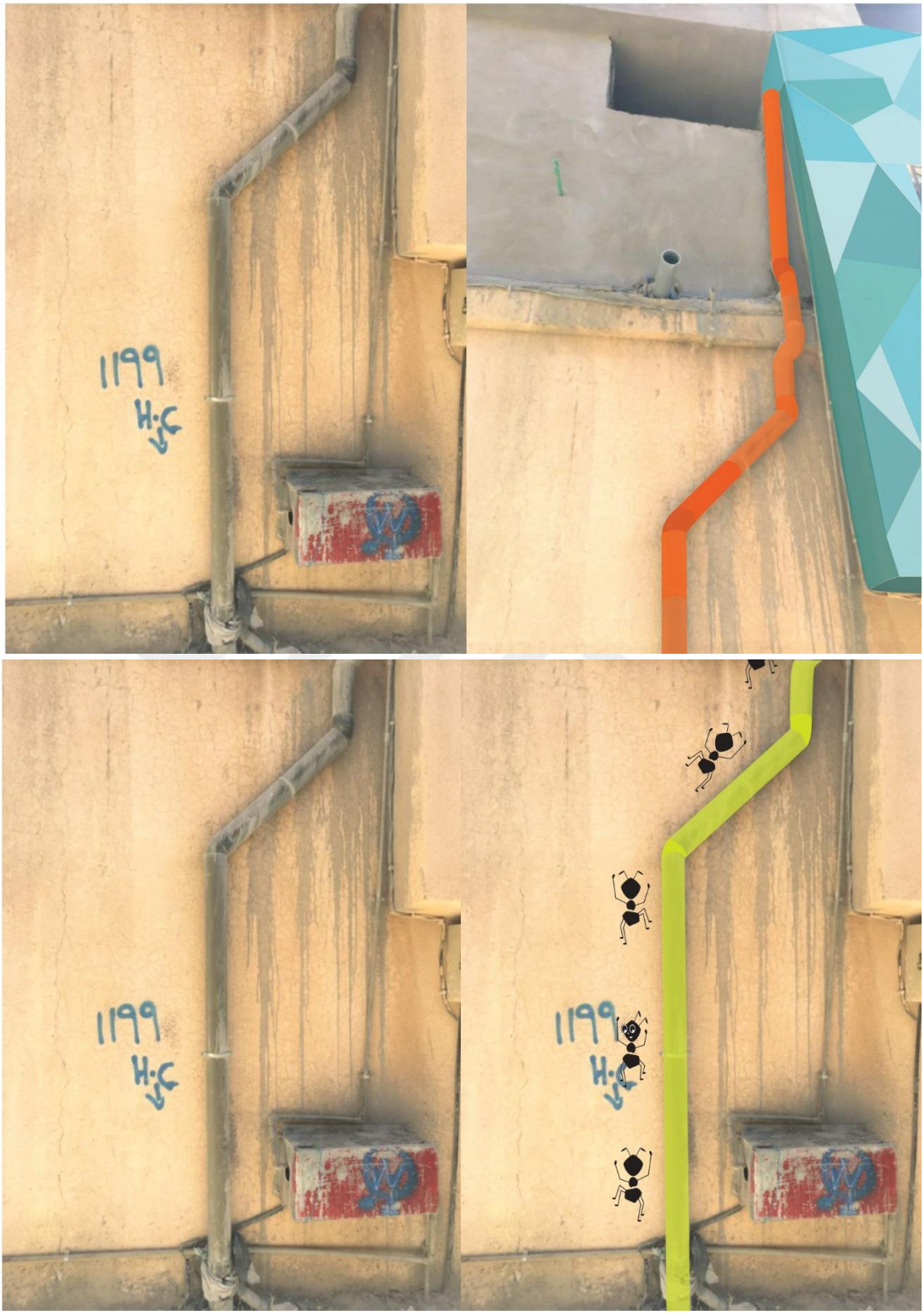


* Drawing not to scale.


ELEVATION C-C
Graffiti 5


ELEVATION C-C


245 cm
overall
130 cm
overall
70 cm
Distance from the ground
Materials:
Paint
* Drawing not to scale.


1199
H.C
1199
H.C
1199
H.C

Door Branding

- Colors can be subject to change

- A list of family names should be provided.

- If a font is to be created in the same handwritten brushstrokes, we can then perhaps customize what is to be written, according to the family wishes.

- For instance, instead of "AL" we can write "DAR" or even something completely different.

Wayfinding


المركز الطبي
سوق الحسبة
المدرسة
الشارع الرئيسي
المركز الطبي
سوق الحسبة
المدرسة
الشارع الرئيسي

Appendix D: Research Team

Project Manager and Participant Observer	Arch. Zaid Alawamleh
Design Team	
Architects:	
	Arch. Salam Kilani
	Arch. Ahmad Marie
	Arch. Dania Aburous
	Arch. Basem Doudin
	Arch. Zeid Kakish
Structure Engineers:	
	Eng. Seif Jundi
	Eng. Abdulrahman Homsi
Graphic Designers:	
(Be Positive – Phew) Initiative	Jude Abdulhadi
(Be Positive – Phew) Initiative	Razan Jilani
	Sara Derbi
	Ibrahim Balushi
Project Coordinator:	
Social Researcher.	Sandra Shaban
Documentation and Site Analyses Team	
Supervisor:	Arch. Nama' Qudah
	Arch. Hanan Al-Qaraghuli
	Arch. Nirmeen Jawdat
	Arch. Doa'a Hawwari
	Arch. Shaima'a Abdel-Mutaleb
	Arch. Anas Qudsi
Local Committee	
	Khadejah Abu Amra
	Eng. Muhannad Salem

	Younis Abu Amra
	Eng. Ahmad Rayyan
	Eng. Haitham Abu Amra
	Eng. Murad Bassam
	Basheer Mufleh
	Khaled Abu Jarad
Media and Crowdfunding Team	
	Rana Sawalha
	Ala Alhussan
	Mohannad Abu Rizik
	Jude Al Safadi
	Hani Alkhaldi
	Alaa Wardi
	Salma Alkaldi
	Hani Alkhaldi
	Arch. Farah Ghnaim
	Reem Abu Ghdaib
	Anas Qolaghasi
	Mohammad Emteir