Sustainable Residential Neighborhoods: A Case Study of Pertev Paşa District In Aşağı Maraş (Kato Varosha), Famagusta

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ABSTRACT

During the past few decades, sustainable urban development has been considered as one of the ubiquitous subject matter of urban studies and researches. During the recent years, various factors and elements affected the urban expansion and it highlights the significance of residential neighborhoods in formation of the urban areas and manage it toward sustainability criteria. A neighborhood as a fundamental building block of the community playing a crucial role to define sustainability for the bigger scale of urban areas. Undoubtedly, without having sustainable neighborhoods, achieving sustainable cities is impossible and global sustainability will become not more than an illusion. Neighborhood is a unit in which social interactions occur daily and directly in association with people who are living there.

This study, based on the reviewed literature, tries to examine sustainability indicators in neighborhood level. Accordingly, after defining the neighborhood sustainability dimensions, needs, principles, indicators, a list of measurement criteria was provided to investigate the case study (Pertev Paşa District in Aşaği Maraş-Kato Varosha) in Famagusta, North Cyprus. Furthermore, through identifying environmental and socio-economic problems of the neighborhood this research has attempted to provide some useful and practicable suggestions and recommendations to enhance the quality of life and returning this neighborhood towards sustainability path.

The breif introduction of this research is stated in the first chapter. The second and third chapter is allocated for defining sustainability and neighborhood. These two chapters profoundly investigate and interpret different points of views towards

sustainable development and neighborhoods. Subsequently, in the third chapter combination of sustainable development criteria and neighborhood is demonstrated, and has attempted to bring forward some main principles to define characteristics of sustainable neighborhood. Sustainable neighborhood characteristics have been surveyed by some qualitative and quantitative methods in the case study during the fourth chapter. Finally, in chapter five wide range of recommendations and conclusion completely cover the main problems of the desired neighborhood. According to various characteristics of sustainable neighborhood Pertev Paşa are located in a poor level of sustainability.

Keywords: Sustainable Development, Neighborhood, Sustainable Neightbourhood, Pertev Paşa District, Aşağı Maraş, Famagusta, Northern Cyprus

ÖZ

Geçtiğimiz bir kaç on yıl boyunca, sürdürülebilir kensel gelişim, araştırmalar ve çalışmalar açısından da yaygın güncel konulardan biri olmuştur. Son bir kaç yıl içinde, çeşitli faktörler ve elemanlar kentsel gelişimi etkilemiş ve yerleşim alanlarının, kentsel alanların şekillenmesindeki önemi vurgulanmış ve bu alanlar sürdürülebilir kriterler doğrultusunda yönetilmiştir. Toplumun temel bina bloklarından oluşan mahalle / yerleşim alanları, sürdürülebilirliğin büyük kentsel ölçekte tanımlanması için önemli bir rol oynar. Şüphesiz, sürdürülebilir mahalleler olmadan, sürdürülebilir kent elde etmek imkansızdır ve küresel sürdürülebilirlik ilüzyondan öteye gidemez. Mahalle, sosyal etkileşimlerin günlük olarak olduğu ve doğrudan orda yaşayan insanlar ile bağlantılı bir birimdir.

Bu çalışma sürdürülebilir mahalle kavramını, sürdürülebilir gelişme ve mahalle kavramlarının ayrıntılı literatür incelenmesine dayandırarak tanımlamayı ve sürdürülebilir mahalle özelliklerini ortaya koymayı hedeflemektedir. Literatüre dayalı çalışma bulguları Kuzey Kıbrıs'ta Gazimağusa kentinde yer alan Aşaği Maraş-Kato Varosha, Pertev Paşa Bölgesi üzerinde değerlendirilecektir. Bu bağlamda Pertev Paşa mahallesinin çevresel ve sosyo-ekonomik problemlerinin tanımlanmasıyla, mahallenin sürdürülebilir mahalle kavramına ne kadar yakın olduğu ve sürdürülebilir mahalleye dönüştürülebilmesi için neler yapılması gerektiği bu çalışma kapsamında ele alınacaktır.

Araştırmanın özet girişi, birinci bölümde belirtilmiştir. İkinci bölüm sürdürülebilirliği ve mahalleyi tanımlamak için ayrılmıştır. Bu bölümde

sürdürülebilir gelişme ve mahalleler üzerine farklı bakış noktalarının ayrıntılı olarak incelenmesi ve yorumlanması yer alacaktır. Üçüncü bölümde ise sürdürülebilir gelişim kriterleri ve mahalle kavramı birlikte ele alınarak sürdürülebilir mahalle özelliklerinin tanımlanması için bazı ana prensipler öne sürülmüştür. Sürdürülebilir mahalle özellikleri ise dördüncü bölümde bulunan alan çalışmasının nitel ve nicel methodlarla çalışılmasıyla ortaya konmuştur. Alan çalışması olarak ele alınan Pertev Paşa Mahallesi, sürdürülebilirliğin çevresel, sosyal ve ekonomik boyutları altında ve sürdürülebilir mahalle özellikleri açısından irdelendiğinde çalışma sonuçları, söz konusu mahallenin sürdürülebilirlik açısından zayıf konumda olduğunu göstermektedir.

Anahtar Kelimeler: Sürdürülebilir Kalkınma, Mahalle, Sürdürülebilir Mahalle, Pertev Paşa Bölgesi, Aşağı Maraş, Gazimağusa, Kuzey Kıbrıs

TO MY FAMILY

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anxieties, and have worked to instill great confidence in both myself and my work. Words cannot express my gratitude for all of their accomplishments in life.

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Chapter 1

INTRODUCTION

All built developments, from the small to the large, make an impact on their surroundings. The quality of these developments – and of residential developments in particular – have long-term impacts, both on the communities they house and on the surrounding neighborhoods. Dominated housing areas toward towns and cities will not meet future needs of human being. According to the population growth momently human requirement of accommodation are going up. Residential neighborhoods should create physical conditions where economically, socially and environmentally sustainable lifestyles become possible. Residential neighborhoods are the most significant parts of towns or cities which are effective on human life. A foundation of urban sustainability is the striking objective to achieve a high quality of life for the whole community within a socio-economic framework that minimizes the impact of the city on the local and global environment. In the matter of managing issues of development, growth, and the diminishing life satisfaction in urban regions, urban communities appear to be a big issue. A lot of issues and problems occurred at the macro-city scale, originates from improper, weak planning at the micro-neighborhood level. For this reason, a significant combination of sustainability criteria in neighborhoods is magnified. It is more effective in calculating, sustainable local urban foundations, such as the following; buildings, transportation, urban vegetation and water (wastewater, storm water and water supply) systems (Barton, 2000, Choguill, 2008).

1.1 Problem Statement

According to the stated problems which induce neighborhoods as a fundumental building blocks of the community to become unsustainable, the main focus of this theis is on sustainable neighborhood criteria. Meanwhile, the field study and the problem area is Pertev Paşa district in Aşağı Maraş neighborhood which is located in Maras, in city of Famagusta in North Cyprus.

Maras , is located at the south part of Famagusta and it consists of two main parts which are: closed Maras and Asagi Maras.The first one has been prohibited to the people and any social activities since 1974 and the second one is one of the pre-planned residential districts of the Famagusta. In general, Asagi Mars has been shaped by mainly one or two storey single family detached and semi detached housing with private sites.Asagi Maras is consisted of eight quarters, which are: Canbulat, Harika, Anadolu, Lalamustafapasa, Pertevpasha, Piyalepasa, Namikkemal, and Zafer. Our case study (Pertevpasa) is located at the geometric center of this area surrounded by Canbulat neighborhood northward, Hraika from south, and toward west Zafer and Piyalepasa(Figure10). The majority of residential buildings belongs to Canbulat neighborhood (651 unit) and the minority dedicated to Harika neighborhood with approximately 103 units. Pertevpasa roughly has 270 unit residential buildings which are mainly semi-detached; Most of them has been made of reinforced concrete and brick with maximum 2 storey height.

In Asagi Maras district, cause of being vicinity of the prohibited area of closed Maras and also vague future ownership and political problems in this area, a very few new housing developments and additions to the existing ones happened.However, provision of housing, which is the answer to the amount of demands has been just

developed housing units without consideration of life quality (Önal, Dağlı, & Doratlı, 1999).

1.2 Aims, Objectives & Questions of the Research

Existing dominant settlements and their environment as well as newly housing neighborhood developments must approach to sustainability to make high quality of life for humans to have less impact on the environment.

The aim of the study is to investigate the charachteistic and criteria for sustainable residential neighborhoods' plans and designs, and to adopt these criteria on the selected residential neighborhood in Famagusta to be able to answer the following research questions, one as a general question and the other as acase-based question:

- How could an existing residential neighborhood be turned into a sustainable one?
- What should be the characteristics of Pertev Pasa district so that it becomes a sustainable residential neighborhood?

Based on the main aim and to answer the research questions, the major objectives are set as:

- Understanding the characteristics and criteria for a sustainable residential neighborhood?
- Evaluating the characteristics of Pertev Paşa district in Aşağı Maraş (Kato Varosha) in Famagusta in terms of sustainability.

1.3 Research Methodology

This study, which is based on researching sustainability criteria in residential neighborhoods, would require several types of methods. However, this study focuses on two methods, which are quantitative and qualitative. First, a literature review

discusses existing perceptions of sustainability,and the concept of neighborhood. The discussion covers the following topics: definition of environmental sustainability, economic sustainability, and social sustainability, residential neighborhoods and factors which help them approximate to the sustainable area. The findings of the literature review will be examined in the case study.

Secondly, case study, which is Pertev Paşa district In Aşağı Maraş (Kato Varosha) in Famagusta will be analyzed by the determinant sustainable residential neighborhood criteria. Since the research is more like an exploratory research, rather than a quantitative one, the evaluation of case the case study will be based on observation and site survey, in which some quantitative methods for data collection will be used through a questionnaire survey. The results of the education will also be explored in a scale-chart, to make the analysis result more clear. Subsequently, guidelines for adequate residential neighborhoods in Pertev Paşa will be prepared.

1.4 Structure of the Thesis

This thesis composed of five chapters. Chapter one is an introduction to the research, which depict the main problems; likewise, main aim, objectives, research questions, and research methodology.

The second chapter, which is the literature survey of the research, gives an extensive audit on sustainable urban development by concentrating on a short foundation of the idea of Sustainable improvement. Subsequently the definition, aim, and the need for sustainable development and three pillars of sustainable development will be explained. Besides, the second chapter also introduces the concept of neighborhood. In this regard, profoundly, the concept of the neighborhood has been investigated

which has led to emerge definition of neighborhood, neighborhood unit and also the principles of neighborhood. Balanced community is highlighted as a criteria which suggest positive management and avoidance of problems that distress residents and undermine community.

Chapter three demonstrates the incorporation of sustainability and residential neighborhood. Initially, it has focused on defining the sustainable neighborhood and its specification. Then the characteristic of sustainable neighborhood will help us to interpret and conceive the significance of sustainable neighborhood. Finally, it is completed by counting some reasons of generating sustainable neighborhood and then eleven characteristic of making a neighborhood sustainable, will be illustrated.

The initial part of chapter four is the analysis methodology which will be used to evaluate and examine a variety of data and information, which has been collected from the study area to illustrate the findings, from the existing situation of local center of Pertev Paşa In Aşağı Maraş (Kato Varosha). Finally, selected characteristics of the sustainable neighborhood will be examined in detail in the case study. Chapter six will present the conclusions of the research and some recommendation and proposals to amend this area from the sustainability point of view.

Chapter 2

REVIEW ON CONCEPTS OF SUSTAINABLE DEVELOPMENT AND NEIGHBORHOOD

2.1 Introduction

Recent decades are considered as a significant period, since the literature has been spread vastly and debates have gotten intense in the case of cities and their universal influence. Starting from the Brundtland (WCED, 1987), and continuing with the Rio Earth Summit (UNCED, 1992), the problematic issues related to sustainable development became central to the considerations of governments and research foundations in many countries. Cities have been taken as the reason for the decay in the environment and reduction of sources; and their ecological effects are noticed worldwide and not just local (Girardet, 1996).In most cases, cities give images of being, polluted and problematic; they encompass poor housing units and are built with a fragile infrastructure. Cities are full of corruption and poverty. So far, cities are boosting economies and obtain the background for creativities to flourish. Cities are the places in which a cumulative global production is generated. In the near future, cities will host more than half of the world's population, from which the most is of developing countries (Jenks & Burgess, 2004). The main concept of sustainable development was brought into discussion at the beginning of the 1980's, in the World Conservation Strategy (IUCN, 1980), but it found its place in the international schedule with the World Commission on Environment and Developments (WCED), by the publishing time of "Our Common Future" (Brundtland Report) in 1987. This

concept has also been discussed in the landmark World Bank paper Environment, Growth and Development again in 1987 (Oktay, Hoskara, & Hoskara, 2010).

In addition to the need for strong natural systems, there are other factors such as jobs, which provide financial success and communities that are justifiable in the society. The systems that are sustaining within themselves are more stable and are able to keep the local budget; and they also give clues to the strength of the relation between the raising populations and residential properties. Another motivation for creating plans for strong, sustainable systems is to decrease the effects of climate change, for example the increase of sea level or wildfires and so on (Chena, Aceyb, & Laraca, 2014).

More than 60% of the earth's residents will be living in the cities till 2030. This growth puts an intense pressure on sustainable planning and urban management (Chena, Aceyb, & Laraca, 2014). "Low-density, automobile-dependent suburban sprawl has not only led to the loss of greenfields, especially valuable farmland, but has also increased energy usage and greenhouse emissions associated with commuter traffic". (Chena, Aceyb, & Laraca, 2014, p.362).

Accordingly, speaking of growth and its related issues, development and also the falling urban life quality, the problem is the cities instead of being called the solution; and this happens by the persue of the socio-economic activists and environmentalists. For the improvement of the urban situation and to increase the urban life quality for the residents; the first issue to consider in creating places is people and after in the management of natural resources (Chena, Aceyb, & Laraca, 2014).

A neighborhood as a fundamental building block of the community play a crucial role to define a sustainability for the bigger scale of urban areas. Undoubtedly, without having sustainable neighborhood, achieving the sustainable cities is impossible and global sustainability will become not more than an illusion.Neighborhood is a unit in which social interactions occur daily and directly is in association with people who are living there. Firstly , it is worthy to mention the definition of the neighborhood in this chapter and then concentrate on combination of sustainable developement and neighborhood in third chapter.

2.2 Sustainable Urban Development

The term "Sustainable Developement", was first being used since 1972 in the book "*Limits to Growth*"; with a general connection to various fields such as building design and urban arrangements, which started in the early 90's. Yet, considerations of sustainability within the Modern urban development belongs to an extensive background (Wheeler & Beatley, 2014).

Sustainable development reflects the source management and it lets the goals of a society meet in an extensive time. Hence, the term sustainability refers to the capacity of the natural environment in accommodating the humane activities; and it exclusively assigns to the groups of activities that are basic for the economic developments in the long run. According to one definition of sustainable development, which is widely accepted among people sustainable development is 'the development that meets the needs of the present without compromising the ability of future generations to meet their own needs' (WCED, 1987, p. 45). A simpler definition of this term is given by the British government, which know

sustainable development as a way to ensure higher life quality for the public, in the present and future (Gilchrist, et al., 2000).

Although this definition is commonly cited, it is also inherently vague, which has led to divergent interpretations and approaches to achieving the goal of a more sustainable global society (Gilchrist, et al., 2000).

Ambiguity of this definition, which may cause an unsustainable growth, while the economic and political issues surpass the ecological safty and social welfare ,there is an exception between the usage of such definition for developed countries and developing countries, while others claim that both types of countries are facing similar spectacles, but with considerably different amounts and intensities.The abstractness of sustainable development has given various measurments for sustainability based on variety of indicators; and those indicators can be very diverse according to the users demand of a development type or the category that should be sustained . “Sustainable Development is the focus of development on people and establishing justice for present and future generations” (Gilchrist, et al., 2000).

Accordingly, development is not all about economic accomplishment, eventually, there are different dimensions such as health care, social life, quality of life and environmental conditions are also affected.Considering a main theme, which is mutual in the literature, there are three main elements in sustainable development: ecological integrity, social equity, and economic opportunity (Gilchrist, et al., 2000).

2.2.1 Dimensions of Sustainable Development

There are three main elements in sustainable development: ecological integrity, social equity, and economic opportunity. Ecological dimensions guarantee that the environment has the capacity and ability to recover and regenerate, reinforce biodiversity and maintain the environmental functions for ecosystem wellbeing. Social values comprise diverse subjects such as indigenous and local rights, accessibility to sources, and participation of residents for decision making procedures, safety and security. Likewise, economic attitudes of sustainability support people livelihoods and face them with the basic and main needs of life (clothing, food, accommodation, water) .Ecological wellbeing and ecological degradation are oftentimes connected to economic and social incoherences (Agyeman, Bullard, & Evans, 2002).There are different suppositions on achieving sustainability, particularly having adequate levels of government supports to accomplish sustainable development criteria and schemes (Agyeman, Bullard, & Evans, 2002 and Bridger & Luloff, 1999).Nevertheless, recently there are more concentration on generating sustainability through local measurements (FAO, 2006).

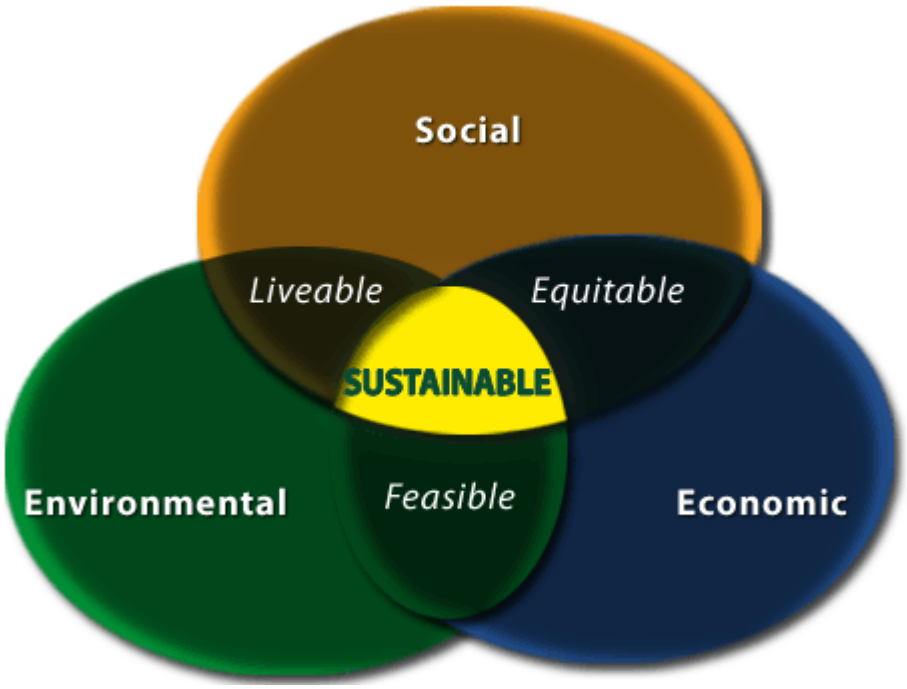


Figure 1: Three pillars of sustainability (sogesid, 2014)

It appears to be, fundamental to highlight the numerous close interconnections that these measurements have. They ought to accordingly not to be seen as autonomous, but instead as a systemic framework of components that similarly add to achieve the same objective. Subsequently, every arrangement or action ought to consider these interrelations. A development with one or a couple of these dimensions, won't lead to sustainable development (sogesid, 2014).

1. Environmental dimension of sustainable developments

Ecological Sustainability can be characterized as the ability to save over the long time the three fundamental capacities of the environment: function of resource supply, the waste recipient capacity and that of direct handiness. Put differently, inside a domain (region/ area), ecological manageability implies the ability to build and raise the worth of the earth, while guaranteeing the assurance and the replenishment of resources and the natural patrimony (sogesid, 2014).The earth

involves numerous species and abiotic with their interactions,supply human requirements to survive.Environmental decay contributes to diminish the quality and healthiness of life and also deteriorate the life of non-human species (MEA, 2005).

Biodiversity conservation: Biodiversity is explained as "the variability among living organisms from all sources including, inter alia, terrestrial, marine and other aquatic ecosystems and the ecological complexes of which they are part; this includes diversity within species, between species and of ecosystems"(UNEP, 1992). Biodiversity conservation is located under the local-level supervision of sustainable development (Kellert, Mehta, Ebbin, & Lichtenfeld, 2000 and Parris & Kates, 2003).

The indigenous types of species in a territory are regularly essential to local people for utilization, pharmaceutical properties and other cultural qualities. Biodiversity safekeeping may likewise have positive economic effects for the area. Protection of fauna, for instance, has been critical for society that rely upon ecotourism as an economic source (Parris & Kates, 2003).

Sustainable use of resources: Its definition and function is so close to the biodiversity preservation. In spite of the fact that communities are consuming and using surrounding resources, but excessive use of resources might lead to extinction of resources which led to lack of dependent species and also make socioeconomic problems (Wood, 2009).

Restoration of degraded resources: Capacity of environment to help human and fauna lives is endangered by environmental degradation which originates from remote and near factors (Diamond, 2005).Despite the fact that both ultimate and

proximate factors have their vital role toward prevention of environmental degradation, proximate factors are more tangible and governable by local area. For instance, national policy, agriculture subsidies and globalization are the subset of ultimate factors. Proximate factors normally specify as physical process which contributes to environmental degradation such as cutting trees, building roads and so on (Diamond, 2005 and Pagdee, Kim, & Daugherty, 2006).In addressing proximate factors, sustainable use is a major consideration, as is the improvement of the condition of the resource. Sustainable use is at the peak of the aims for the proximate factors which improve the condition of environment's resources (Pagdee, Kim, & Daugherty, 2006).

Preservation of ecosystem function and services: **"**Protection or simulation of ecosystem functioning is an important aspect of sustainability projects because it keeps ecosystems that people depend upon healthy (MEA ,2005).Biological systems additionally give different "administrations" that are financially and socially advantageous to people. Cases of biological system administrations are nutrient cycling, procurement of food and water, climatic regulation, aesthetical aspects (MEA, 2005).

2. Economic dimensions of sustainable developments

Economic sustainability can be characterized as the limit of a financial framework to produce a steady and enhancing development of its practical economic criteria. Specifically, the ability to produce incomes and jobs with a specific end goal to support the population. Inside a regional framework, economic maintainability implies the ability, through the most effective blend of assets, to create and keep up the most elevated included worth, in place improve the attributes of regional items

and goods and services (sogesid, 2014). Economic dimensions permit individuals to meet their fundamental needs and enhance their personal satisfaction and enhance life quality. It is critical for a community to act inside the present financial atmosphere and be adapted in accordance with change while additionally keep providing the local economic services for people (Wood, 2009).

***Poverty reduction*:** Lots of communities, especially developing countries, got in trouble since poverty grew up in them, which lead to hamper sustainability. As a matter of fact, it doesn't take to account either long-term goal and objectives or any investment for the future. Poverty reduction is an inevitable goal of sustainability. Supplying basic needs is the base of poverty reduction (Smith, Chhetri, & Regmi, 2003 and Parris & Kates, 2003).

Economic diversity: Economic diversity has become a considerable element of sustainability since:

- A community which depends on one economic activity is always in danger of deterioration if the existed activity be vitiated
- Economic diversity is an approach to put a buffer between communities and fluctuating markets, which culminate in reducing vulnerability of community toward economic decay (Bridger & Luloff, 1999).

Access to markets: Having access to markets in various scales such as local, regional, national and international play significant role in economic sustainability. Having adequate transportation, and infrastructure are the determinant factors to have sustainable market accessibility (Bridger & Luloff, 1999).

3. Social dimensions of sustainable developments

Social Sustainability can be characterized as the capacity to ensure the welfare (security, well being, instruction), fairly dispersed among social classes and different genders. Inside a region, Social Sustainability implies the limit of the diverse social performing artists (stakeholders and investors), to collaborate productively, to point towards the same objectives, support by the nearby association of the Institutions, at all levels (sogesid, 2014). Forasmuch as, social criteria tackle with the most controversial issues to maintain community projects alive and push them toward sustainability, are somehow the most significant criteria in sustainability projects. Difference social variables should be considered by the community to keep the activities toward sustainability, which are: education, information sharing, capacity building, community ownership, support from multiple levels of government, participatory decision-making processes, development of institutions, secure land tenure, development of a community vision, action plan and evaluation techniques, and equitable distribution of project benefits (Wood, 2009).

Education, interdisciplinary information-sharing and capacity building: making community members familiar with the settings through education is a key to sustainability (Kellert, Mehta, Ebbin, & Lichtenfeld, 2000).Because it expand the importance of the projects in the community and determine the way that projects can be accomplished with its divers objectives.formal education is the base part of communities and is adopted by people as a tool to reduce poverty (Nagpal, 1995).Informal education occurs between internal and external individuals and its involve them to the sustainability projects.

Generally, Local level sustainable development projects are not restricted to the existing internal sources and adequate connection between internal and external factors of community can be strengthened (Wood, 2009).For instance management of environmental resources is intensely influenced by the methods applied by internal and external factors.Sharing data and information between various kinds of community groups such as local, NGOs, institutions, local government, government reinforce the community in terms of several research fields accompany with local cultures and traditions and knowledges (Burns, Audouin, & Weaver, 2006 and Kellert, Mehta, Ebbin, & Lichtenfeld, 2000).

It is widely stated that only with interdisciplinary methods for sustainable developments can meet ecological and socioeconomic objectives (Chan, et al., 2007and Kellert, Mehta, Ebbin, & Lichtenfeld, 2000).It is additionally particularly vital for local powers to be included in imparting data to the community and give access to data from different sources (Huckle & Sterling, 1996).

One of the most affluent factors for maintaining the sustainable development schemes at local scale is capacity building (McCarthy, 2005 and Tucker, 2000). Creating capacity in the local area, permits them to be operators of progress and furnishes them with the aptitudes to proceed with what has been started (UNDP ,2008). Capacity building can likewise be enabled, giving group individuals the certainty to manage their work (Wood, 2009).

***Community ownership*:** the duty or obligation of community toward sustainability may be ceased by existence of this comprehension that processes doesn't belong to community members (Wiggins, Markfo, & Anchirinah, 2004).community members

should have stuck in performing the project and make this process tangible for them. Possession is likewise identified with extensive amounts of common trust that advantages will be imparted impartially among community members (Wood, 2009).

Support from multiple levels of government It is essential to understand that the actions of local governments and communities are not independent from the bigger scale governmental programs in scale of national and international (Berkes, 2004).Support from higher levels of community government will contribute to push long-term initiatives (Rydin & Holman, 2004).

Participatory decision-making process: its extremely linked to the community ownership ,schemes and initiatives which including participatory decision-making process are more prosperous in the long-term since they received more support from the community (Armstrong & Stratford, 2004)**.**A participatory choice making procedure may activate residents enthusiastically (Agyeman & Angus, 2003) especially if the process is transparent (Smith, Chhetri, & Regmi, 2003).Some researches mentioned that people claim that generating democratic decision-making process is undoubtedly the best way to achieve sustainability.participation of local people determine the community problems more better than external ideas (Wood, 2009).

Development of local institutions: The role of local institutions which control and qualify the process is one of the most considerable elements of sustainable developments. (Berkes, 2004 and Castillo & Toledo, 2000).The accepted local institutions can support the decision-making process , decrease the ambiguity and

obscurity and create transparent,obvious perspective for internal and external determiners (Barton Bray, et al., 2003 and Castillo & Toledo, 2000).

Secure land tenure: Secure land tenure in the form or legal or informal institutions that define ownership and use rights is also a critical aspect of sustainability projects at the local level (Barton Bray, et al., 2003 and Castillo & Toledo, 2000).

Community vision, action plan and evaluation techniques As with many projects, there must be a vision for what the community wishes the future to look like and a road map to get there .Having a vision with an action plan consisting of goals, objectives and benchmarks to work towards the vision is a critical aspect of any venture because it allows for measurement of success. Additionally, having a community vision and action plan gives the community something concrete to work towards, with outlined objectives to get there. Evaluation is also a key factor in meeting project goals and working towards a vision and is often measured through the use of progress indicators (Wood, 2009).

Equitable distribution of benefits**:** A community's commitment to sustainability may persist only if benefits are felt throughout the community (Pagdee, Kim, & Daugherty, 2006).

2.2.2 Indicators of Sustainable Development

Sustainability indicators reflect key trends in the environment, social systems, economy, human well-being, and quality of life. In short, they measure what counts to people. For example, environmental indicators might include things such as the concentration of different pollutants in the air, the amount of resources consumed locally (e.g., water and electricity), and the quantity of waste produced. To follow the

changes in the society can contain different factors such as the participation of communities in volunteer actions or the number of available affordable houses. On the other side, economic shifts can be brought by themes such as rates of unemployment or the rate of founded businesses. Indicators help visualizing and measuring the process of one's efforts for reaching the sustainable urban environment. Likewise, identification of worsening areas are done by the indicators to prepare for taking the actions (Maclaren, 1996).

Indicators are helpful in the evaluation of both local actions and the existence of the desired impact in the context of the neighborhood. These areas can use indicators in order to regulate the existing condition and also to find out the quality and amount of consistency of the neighborhood with the community targets.

Indicators can allow a group to hold itself, its public officials, its funders and supporting institutions accountable to neighborhood goals. Finally, indicators can also be used as a reporting tool that can help build consensus for an action strategy. Having defined these two terms, sustainability and indicators, we also needed to know what we mean by sustainability indicators (Meter, 1999).

Indicators improve the awareness since they show the interrelations between the issues that are frequently taken as separate issues. Indicators are defined by the members of a community, considering their experiences and traditions. Every indicator is expressive of the asset before examining complications and look towards the future instead of depending on the past (Meter, 1999).

In most of the cases, indicators do not take sustainability as a main theme. Kate Besleme and Megan Mullin in Meter 1999 identified three main categories of indicators:

(1) Indicators of local sustainability, which are arranged based on the long term future of the society and direct to the relations between variety of issues.

(2) There is a group of indicators, which point to shorter-term targets, called quality-of-life indicators; and there is no need for them to show any connections between various issues.

(3) The third category is mostly introduced by the government should performance evaluation, which tend to define how efficiently an authority is transferring particular commodities or services (Meter, 1999).

Virginia Maclaren from University of Toronto in Meter 1999 describe it more formally; "Urban Sustainability indicators can be distinguished from simple environmental, economic, and social indicators by the fact that they are: integrating, forward looking, distributional, and developed with input from multiple stakeholders in the community" (Meter, 1999, p.11).

According to Meter (1999), in *The Neighborhood Sustainability Indicators Guidebook* and Wheeler & Beatley (2014) *The Sustainable Urban Development Reader,* neighborhood sustainability indicators are:

(1) *Asset-based:* later; firstly existing assets should be analyzed and then contributed to addressing the deficiencies

(2) *Inviting residents and other diverse stakeholders:* Characterized by means of various ranges of occupants and different stakeholders, accompanied by professionals aid, which is flexible and open decision-making processes. The

historical backdrop of the social indicator development recommends that the most effective, substantial, and trustworthy indicators have been those that were created with information from an expansive scope of members in the arrangement process.This criteria is practicable to the all sustainable development indicators since sustainable development is highly sensitive and related to the context and values. It in this way bodes well to look for info on maintainability concerns and needs from a wide scope of stakeholders and investors. This can be fulfilled by allotting critical obligation regarding selecting maintainability pointers to an expansive based multi-stakeholders or by counseling in some other path with numerous partners from the soonest phases of indicator advancement (Wheeler & Beatley, 2014).

(3) *Express local values:* assessing advancement according to neighborhood values accepted by the residents (Meter, 1999)

(4) *Integrating:* clarify the connection and interrelatedness of various problems to address them with integrated solutions. Sustainability indicators are incorporated in a way that they emphasize a unity among the three pillars of sustainability (Wheeler & Beatley, 2014).

(5) *Forward-looking:* Concentrate on long-term aims and future change, not assessment of the past; next characteristic of sustainability indicators is that they must be forward-looking if they are to be used in measuring progress towards achieving intergenerational equity. There are several different ways in which an indicator might be considered forward-looking(Wheeler & Beatley, 2014).

(6) *Distributional:* Progress and processes accompanied with equitable consumption of resources ,and wealth by taking into account the current and future generations .Sustainability indicators are not only for measuring the changes, but also define and determine the direction of progress and make it understandable for people,and follow

through the endless aims of the community (Meter, 1999). Sustainability indicators have to consider both intergenerational and intra-generational equity. They ought to have the capacity to consider the dispersion of the conditions (social, financial, ecological) inside a populace or crosswise over geographic locales. Typically, spatially aggregated indicators fail to account for distributive effects.sustainability indicators have to discern between local and non-local dissuasive factors of sustainability (Wheeler & Beatley, 2014).

All the indicators of sustainability are supposed to have the second characteristic. Although it may not be possible to have the individual sustainability indicators, which hold all first three characteristics, but it is necessary for them to at least have one and within a given set of sustainability indicators, all of these characteristics should be represented (Wheeler & Beatley, 2014).

2.3 Neighborhooods

The neighborhood is a term that has been used by the urban residents since long time ago. There have been mutual characteristics between all kinds of neighborhood without considering the culture that they are dwelling. There are numbers of useful definitions for the term "neighborhood" such as:

> "A geographically localized community located within a larger city or suburb or a separately identifiable area within a community retaining some quality or character which distinguishes it from other areas or an area where the residents are drawn and held together by common and beneficial interests" (Choguill, 2008, p. 47)

The interesting issue among these definitions is that the quiddity of the neighborhood, mostly depends on the understanding of the residents. Considering the fact that the definition of the term may be given in terms of various factors such as

ethnic groups, professional section or socio-economic level; but it doesn't need to be necessarily be defined in such division. There is no specific size for the population within the definitions, and also there is no global function considered for a neighborhood (Choguill, 2008).

Howard's great accomplishment, in addition to launching what would eventually become known as the new town movement, was to transform urban planning from a public health, exercise, to one which considered the detailed spatial arrangements of urban activities: the dwelling unit, the neighborhood, or as he referred to it, the ward, and the town in relation to other places. Thus, for the first time, the neighborhood became an integral part of urban planning activity. (Choguill, 2008)

In a community, the basic building can be referred to the neighborhood. Today the neighborhoods are vigorously making deviations aiming to be more sustainable, mostly in order to expand the development that is lined up with the economical principles and sustainability of the environment. Communities whose goals are to achieve higher levels of sustainability are related to the design of sustainable neighborhoods. To reach sustainability is far more than to increase the greenery in the environment, but it integrates with the struggles for the designs and events to help reducing the gass release of green houses. The concept of sustainable neighborhood is now becoming more popular and the market is now broader and more eager for it, since the house buyers are more tend to accept this concept (Tan, 2011).

The concept of neighborhood is challenged as the concepts of sustainability and SUD did; and without any conclusive definition (Downs, 1981).It might be defined within a social viewpoint: a neighborhood is defined based on the opinions of its

inhabitants; or from the viewpoint of physical planning's form: as a mass of a greater pattern for the settelement special position, which is characterized by its special aesthetic capability (Barton, 2000). Or:

> "The approach may be to us a multi-dimensional lens: the neighborhood serves particular needs and functions, both physical and social such as providing a basis for home life and certain other activities".(Barton, 2000, p. 5)

Profesionaly discussing, 'neighborhood' has been an honored origin, rooting in Ebenezer Howard and Raymond Unwin's ideas at the beginning of the 20th century. Afterwards, it formed by the first generation of new towns in Britain. In Harlow and Stevenage, and later Runcorn, the neighborhood is a discreet residential area with a population of 4–6000 supporting a primary school and a local center, more or less physically separated from adjoining localities. This concept received a bad press from the social analysts of the 1960s and 1970s who equated it with the idea of social engineering – the artificial creation of a community by design – which they observed did not accord with the reality of individual and social behavior in an increasingly mobile age, and was based on false perceptions of the designers' role and power (Rudlin & Falk, 2009).

It is important to distinguish the various sides of the neighborhood as Rudlin & Falk 2009 describes it. The first kind is called a functional neighborhood. It takes the locality as the fundamental basis for the home life, and probably for trade, free time, education and other kinds of activities. It is the typical view of neighborhood for a city planner. The lack of local actions and facilities are mostly understood by the environmentalists, inhabitants and administration as a problem in the social and environmental realms (Rudlin & Falk, 2009).

The second perspective is the neighborhood seen as a *place*, as an aesthetic experience, to do with its historic association as well as its sensuous quality, and linked to residents/users' perceptions of their own ‘home’ territory. This is more the domain of the urban designer. Its importance has been rediscovered in recent years with the renewed emphasis on local distinctiveness and quality. Thirdly, there is the neighborhood as the locus for *the community*. The community is made by people, and people often belong to diverse interest-based communities which barely touch the locality. But many households also have locally-based activities which intertwine to give a sense of a local network of mutual support. But the reality is that all three perspectives are critically important in moving towards a more sustainable pattern of living (Rudlin & Falk, 2009).

There is much that can be achieved on the scale of the individual building, but surely now the challenge is not to push back further the frontiers of ecological building, but to raise standards across the board and to address wider issues such as car use, energy production and recycling. For this we need a wider canvas, and the neighborhood is an appropriate level with which to work, large enough to address broader environmental issues, but small enough to affect people's lives and to focus minds on the practicality of implementation (Rudlin & Falk, 2009).

The empirical research shows that the concept of neighborhood is difficult to define due to its multi-dimensional nature. However, ‘neighborhood’ is generally understood as specific cumulative settings where a group of residents confronts. The success of a neighborhood is subject to the existential meaning it acquires for its residents (Oktay, 1999).

According to the above mentioned perspective, a neighborhood has frequently been taken distinct from other city areas, considering territorial division. In this regard, the most essential condition for the social quality in the neighborhood is the spatial proximity.Jacobs' investigation into the urban scene and analysis of the use and the meaning of city neighborhoods showed that successful neighborhood could be achieved by people's concentration in the neighborhood area (Oktay, 1999).

'The neighborhood is an area of distinctive identity, normally named, which may coincide with either a local catchment area or an environmental area, or both, and is geared to pedestrian/cyclist access' (Barton, 2000).Boyd et al in the book, Homes for the People HMSO 1945 state that 'A neighborhood is formed naturally from the daily occupations of people, the distance it is convenient for a housewife to walk to her daily shopping and, particularly, the distance it is convenient for a child to walk to school. He (she) should not have a long walk and he should not have to cross a main traffic road. The planning of a neighborhood unit starts from that'(Boyd et al in Barton, 2000).

In a like manner, the neighborhood can be defined as a residential zone that has both considerable face-to-face interaction and distinctive physical or social characteristics. This definition is a combination of two well-known published definitions by the sociologists Glass and Suttlcs (Arnauld, Manzanilla, & Smith, 2012). It is intended to be applicable to diverse geographical settings and time periods and amenable to analysis with historical and archaeological data.Many definitions of neighborhood emphasize values of neighborliness and friendship, which are important norms in modern Western society, but may or may not be so in preindustrial cities or in neighborhoods of concentrated poverty in industrialized nations today .The close

interaction has a stronger role in building neighborhoods, in preindustrial cities rather than in many of current cities. Marseille was a fourteenth century, was an example of historical neighborhood. Dan Smail analyzed the information about the dwellings, proffesions and other factors:This evidence shows that among tradesmen and commoners, sociability was constructed around relations that were literally face to face; identity was built up from public spaces, that is to say the spaces in which people came into frequent contact with neighbors and colleagues. (Arnauld, Manzanilla, & Smith, 2012).

2.3.1 Neighborhood Unit

The concept of neighborhood was founded by Clarence Perry in 1929. His Ideal neighborhood took elementary school as the focal point and the school was located at the center of neighborhood greenery or the playground. Located within the walking distance of all residential units, the school was totally separated from the shopping center. Roads and accesses were located all around the neighborhood without passing through the area. Thus, it was safe for children to walk to school every day. Perry had ideas further than the physical adjustments. A main concern of him was the participation of the citizens. The school was an ideal gathering spot from his point of view; and it turned to a community besides its educational function. He believed that schools were preferable to churches for this purpose, since it was neutrual to any kind of believes. His arguments had a great impact on the contemporary urban planning. His deep concern was to cultivate social interactions between the residents of a decent neighborhood (Choguill, 2008).

A great support to Perry's ideas was given by Mumford (1937, 1954). He took the neighborhood unit as a transporter of sense of belonging to the residents and to give

good mutual feelings between the neighbors. Mumford was very sensitive about the size of the neighborhood, since he recognized that there is a breakdown within the social interaction in communities that are more than a certain amount of population. Thus, he intended to focus on preserving the positive social values within the neighborhood. Being more than just a part of the city, neighborhoods are collective areas encompassing the neighbors in urban sub-areas. According to the observations of sociologists and planners, one of the clear discussions about the relation between the size of neighborhood and people's interactions is the Fisher's idea. Accordingly, when the communities get larger, the involvement of the neighbors decreases; and when people live in an area longer, they will have more interactions within the members of the same area. The most important factor observed by Fisher is the share of common values within the society, while he mentions that to have common issues there is a need to create a bond between the society members, including neighbors (Mumford 1937 &1954 in Fisher, 1984).

In the 1929, the Regional Plan of New Yorkhas defined the "neighborhood unit" and stimulated it by a monograph. That monograph was called "The Neighborhood Unit, a Scheme of Arrangement for the Family-Life Community", and was authored by Clarence Arthur Perry (Lawhon, 2009).

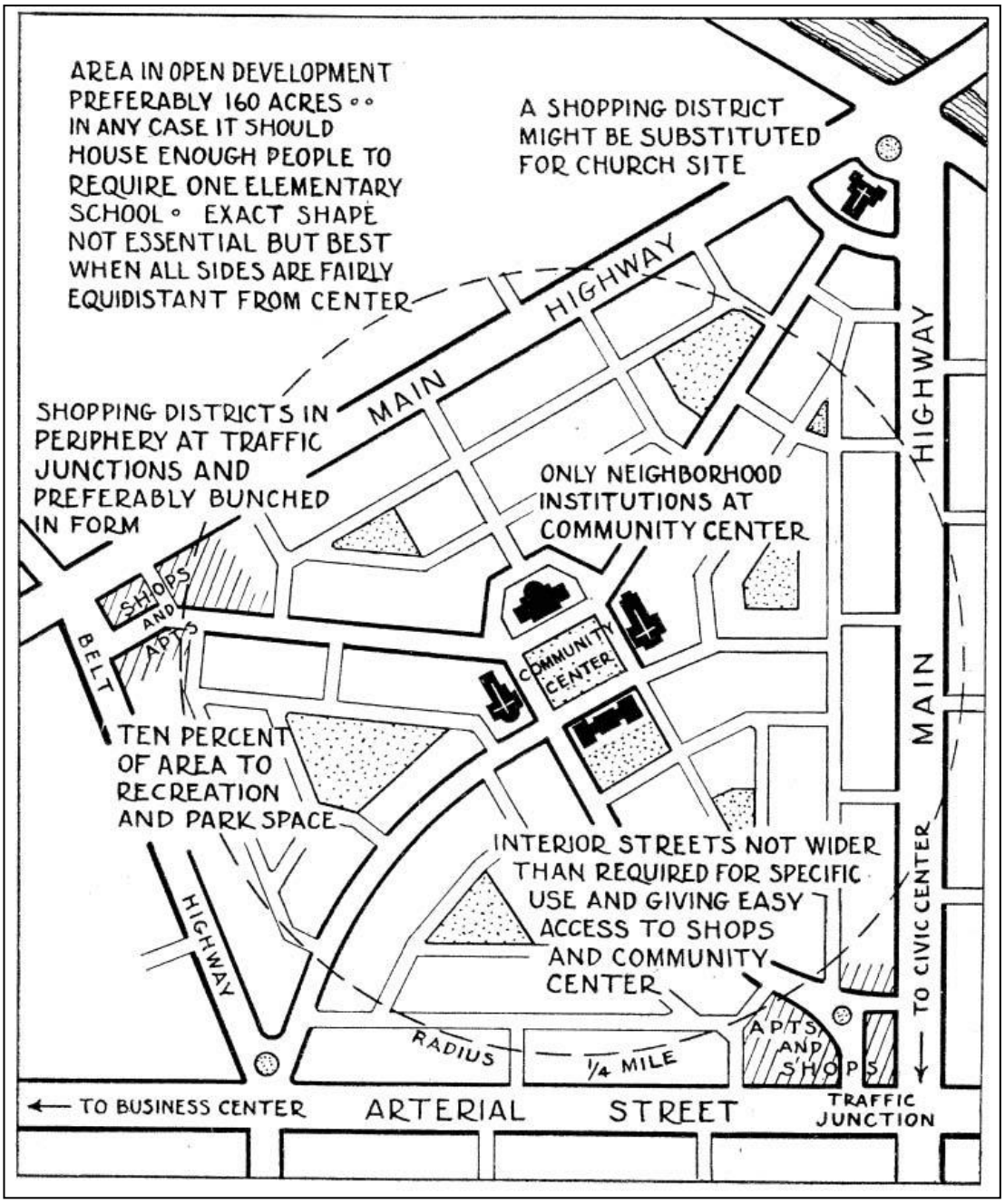


Figure 2: Clarence Perry's Neighborhood Unit (Lawhon, 2009, p.115)

It is significant to define parameters of ideal neighborhood such as, densities, population, dimensions, commercial and investment components. The criteria of neighborhoods ought to range broadly to reflect the traditions, climates, and site conditions. Subsequently some main basic design rules will mention which are:

- **Determined Center and Edge to the Neighborhood** when someone enter to the neighborhood it has to be tangible for him/her that he/she is entering another area.

It means that the neighborhood has to be specified by its edge likewise center of neighborhood ought to be discernible from its edge. The neighborhood center is better to be in walkable distance and has different density from the edge (Farr, 2008).

- **Walkable Size** Size of the neighborhood is important since it has to be walkable and adequate size is defined from 16-81 hectare .400 meters in radius is a fine benchmark which also keeps it walkable (Farr, 2008).
- **Mix of Land Uses and Housing Types:** Mixed use provides a scene that habitants can live, work, sport, entertain, talk, social interaction and shop in close and walkable distance. The amount of residential uses and nonresidential uses is vary from neighborhood to another one (Farr, 2008). The neighbourhood provides a wide range of different housing opportunities not just in terms of dwelling size, but also in terms of affordability and tenure. This provides the basis for a mixed community representative of society at large rather than having a narrow social focus.
- **Integrated Network of Walkable Streets** private and public sites is shaped by street networks .Street networks involve various or mutual routs for walking, biking and driving. The maximum block perimeter is approximately 450 m and Smaller block size and ample crossing points are necessary. Designing streets ought to be based on walkability and then considering procurements for automobiles .Speed of automobiles and motorized vehicles should not be increased more than 25 mph. High quality of public spaces with diverse functions and adequate, aesthetic values have to allocate for streets and environmental qualities ought to be managed and maintained (Farr, 2008).

- **Special Sites for Civic Purpose** Prfect neighborhood include some places for civic purposes. Civic buildings and open spaces with diverse functions and Facilities such as parks, playgrounds, plazas, and greeneries must be considered. (Farr, 2008).
- **Engaging local communities in discussion** :about how they see their neighborhood and their priorities and aspirations for the future.The dialogue should be honest, open, ongoing and with a real commitment to changing plans and designs to reflect people's views.
- **Long-term management and maintenance**: The recognition that long-term management and maintenance are as important as the initial design. New development must be designed with management and maintenance in mind, not just in terms of the choice of materials and landscape, but also with a clear definition of who will be responsible for what and a commitment to pay for maintenance over the long term (Barton, 2000).
- **Density:** Housing densities are highest around the edges of the town or district center, along the principal transport routes leading to neighboring centers and overlooking parks, waterfront areas and other amenities. Densities reduce towards the edge of the walking catchment (Barton, 2000).
- **The provision of quality public transport services.** This is a fundamental prerequisite in reducing reliance on the car (Barton, 2000).

2.3.2 Neighborhood Size

Neighborhood size can be characterized by referring to population and accesses. The catchment population needed to support a primary school and also local center which are considered as significant criteria for neighborhood. For instance Runcorn has a series of neighborhoods 'beads', each with around 5000 populace, along its

coordinating transport way. Approximately all houses in the neighborhood is in easy walking distance area (generally 5 minutes or 400 meters) from local facilities (Barton, 2000).However the neighborhood size differs widely. For ‘transit oriented developments’ (TODs) in the US, the maximum walking distance is recommended as 2000 feet (600m) and densities set at a minimum average of 18dpa (44dph or about 100pph) in order to generate sufficient demand for a light rail station (Calthorpe, 1993). Ironically, given the half circle shape of TODs the population ends up as rather less than Runcorn ‘beads on a string’ despite the larger catchment distances. The recent study of Sustainable Residential Quality in London selects 800 meters (ten minutes walk) as the critical threshold for pedestrian access to district centers (Llewelyn Davies, 1997) – the same as that adopted by Redditch new town corporation some decades earlier; and the key walking distance in the aspiring eco-city of Waitakere in New Zealand is taken as 1000m. By contrast the Peterborough neighborhoods in the Bretton township average 2000 people, and are more about identity than they are about discreet local services (Barton, 2000).

Table 1: Characteristics of Idealized Neighborhood Designs (based on Barton, 2000, p. 130)

Design	Identity	Population1 density	Facilities	Accessibility	Shape
Harlow Gibbard	Well-defined neighborhoods population linked to form districts	c.4000 districts 15-20,000	Local centers on distributor roads District Centre at major intersection	400m to local center; 1000m to district center	Dispersed concentrations - varied in detail
Runcorn Ling	Very clearly delineated separate local networks	5-6000 population	Local centers on bus-way at heart of neighborhood, off main roads	400m to bus stops	Linear single-strand; beads on string
Milton Keynes	Very clearly delineated by grid roads	c.4000 population	Local centers on grid roads between neighborhoods	500m to local services and bus stops	Dispersed grid with nucleated localities
Hook (inner town) Greater London Council	Not clearly bounded - part of urban continuum	170 persons per ha. or 53dph net at planned average household size of 3.2	Linear concentration along pedestrian spine	400m max. to primary school and local facilities	Compact linear form
Peterborough Townships	Neighborhoods with defined character but Integrated In the wider township	Neighborhoods Variable. c.2000; Township 20-30.000	Wide range of services on township high street, accessible to all neighborhoods	400m to bus stops on spine road	Linear single strand but quite concentrated
TODs (Transit* Oriented Developments) Calthorpe	Distinguished by density and ' character, but integrated into wider district	44dph net density est. 4000 population	Clustered near transit stop and arterial road	600m max To transit stop	Nucleated half-circle

2.3.3 The Balanced Community

> "The problems of a 'broken society' are rooted in neighborhoods that have lost their balance, where people do not know their neighbors or have friends and where people are 'uncivil to each other" (Griffith, *et al.*, 2015).

SUNN(Sustainable Urban Neighbourhoods Network) ,utilize balanced community to recommend adequate management and remove the community issues which pain occupants and undermine the community.Despite the fact that the term may be difficult to define, indications of imbalance are easily perceived, for example, increasing the poverty, crimes, reduction of property values, social crisis, large amounts of houses occupied by limited group, intemperate turnover of occupants, ignored civic areas and so on (Falk & Carley, 2012).

A balanced community have to embed a diverse range of families, comprising young couples, families, and elderly or retired people. Beside well designing of neighborhood, perfect management and monitoring is required to address the problems. Additionally, balance needs good continuous management and guidance for environmental spaces, such as, public spaces,shopping centers,shops ,educational buildings, and other amenities.It can likewise oblige social improvement to raise neighborhood desires and capacity to take part in the work market, for instance trough preparing plans and probations.

Neighborhoods offer its inhabitants a superior personal satisfaction and higher quality of life reinforce both the community and the encompassing zone by:

• **Balanced neighborhoods** are the way to individuals appreciating where they live and feeling good. A decent decision of homes that provide food for a scope of wages,

together with procurement of neighborhood facilities, will encourage individuals to stay in the neighborhood and it develops long-term socio-economic capital.

• **Lifetime neighborhoods:** appropriate design ,and local management policies are two significant principles for inviting people with a wide range of incomes. Accomodation should embed tenure blind to prevent stigmatization. Local policies will support both owners and renters and keep them safe against problems.

• **Total cost** ways to neighborhood planning and financing, as a component of the move towards localism, will esteem individuals living near to existing foundation and discourage further excessive sprawl, especially where the nearby economy is powerless and individuals can't bear to go far. Subsidizing must be considered for community developments and amenities (Falk & Carley, 2012) .

2.4 Summary of the Chapter

Majoity of the earth residents will live in citie. This growth puts an intense pressure on sustainable planning and urban management (Chena, Aceyb, & Laraca, 2014). Accordingly, speaking of growth and its related issues, development and also the falling urban life quality, the problem is the cities instead of being called the solution; and this happens by the persue of the socio-economic activists and environmentalists.According to one definition of sustainable development, which is widely accepted among people sustainable development is 'the development that meets the needs of the present without compromising the ability of future generations to meet their own needs' (WCED, 1987, p. 45). A simpler definition of this term is given by the British government, which know sustainable development as a way to ensure higher life quality for the public, in the present and future (Gilchrist, et al., 2000).The vague definition of sustainable developement contribute to achieve various understandings, diverse goals and accomplishments related to sustainable

developements .sustainable developement is the consequence of three interrelated elements of sustainability which are environmental integrity ,social equity,and econimoc viability (Gilchrist, et al., 2000).

It is worthy to say that, although recenly cultural dimensions also have been considerd in some references separately, but in this research it is put under the social dimension characteristics.

Ecological dimensions guarantee that the environment has the capacity and ability to recover and regenerate, reinforce biodiversity and maintain the environmental functions for ecosystem wellbeing. Social values comprise diverse subjects such as indigenous and local rights, accessibility to sources, and participation of residents for decision making procedures, safety and security. Likewise, economic attitudes of sustainability support people livelihoods and face them with the basic and main needs of life (clothing, food, accommodation, water). Sustainability indicators reflect key trends in the environment, social systems, economy, human well-being, and quality of life. In short, they measure what counts to people. Indicators are helpful in the evaluation of both local actions and the existence of the desired impact in the context of the neighborhood. These areas can use indicators in order to regulate the existing condition and also to find out the quality and amount of consistency of the neighborhood with the community targets (Meter, 1999).

In general, primary issues which are considered in sustainable development in terms of different levels can be outlined in table 2:

Table 2: Dimensions of sustainable development with their related issues

References	Dimensions of sustainable development	Issues of sustainable development
(Wheeler & Beatley, 2014), (Jozsa & Brown, 2005), (Litman, 2015), (Rudlin & Falk, 2009), (Ritchie & Thomas, 2009), (Barton, 2000), (Haughton & Hunter, 1994), (Farr, 2008), (Government of Irland, 2009),	Environmental Dimensions	**Green Space**
		Transportation
		Noise Pollution
		Visual Pollution
		Air pollution
		Waste
		Energy Consumption and Efficiency
		Water Quality
		Human and Environmental Health
		Biodiversity
		Hazards / Disasters
	Social Dimensions	**Housing**
		Health
		Recreation / culture
		Promotion of healthy lifestyles
		Safety
		Social Mix and affordability
	Economic Dimensions	**Business sustainability**
		Economic structure
		Employment
		Income
		Access and availability
		Capacity to work
		Community investment

A neighborhood as a fundamental building block of the community plays a crucial role to define a sustainability for the bigger scale of urban areas. Undoubtedly, without having sustainable neighborhood, achieving the sustainable cities is impossible and global sustainability will become not more than an illusion.neighborhood is a unit in which social interactions occur daily and directly is in association with people who are living there. In this chapter idealized neighborhoods with its different size and characteristics have been introduced which can be drawn out in table 3:

Table 3: Characteristics of idealized neighborhood

References	Characteristics of idealized neighborhood
(Choguill,2008), (Rudlin & Falk, 2009), (Oktay,1999), (Barton, 2000), (Lawhon, 2009), (Farr, 2008)	**Determined Center and Edge to the Neighborhood**
(Choguill,2008), (Rudlin & Falk, 2009), (Barton, 2000), (Farr, 2008), (UN-Habitat, 2009),	**Walkable Size**
(Rudlin & Falk, 2009), (Barton, 2000), (Farr, 2008), (UN-Habitat, 2009),	**Mix of Land Uses and Housing Types**
(Rudlin & Falk, 2009), (Barton, 2000), (Farr, 2008), (UN-Habitat, 2009), (Biddulph, 2007)	**Integrated Network of Walkable Streets**
(Rudlin & Falk, 2009), (Oktay,1999), (Barton, 2000), (Lawhon, 2009), (Farr, 2008)	**Special Sites for Civic Purpose**
(Falk & Carley, 2012), (Rudlin & Falk, 2009), (Barton, 2000), (Lawhon, 2009), (Farr, 2008), (Armstrong & Stratford, 2004), (Wood, 2009)	**Engaging local communities in discussion**
(Barton, 2000), (Rudlin & Falk, 2009), (Falk & Carley, 2012)	**Long-term management and maintenance**
(Barton, 2000), (Rudlin & Falk, 2009), (Farr, 2008), (Lawhon, 2009)	**Density**
(Barton, 2000), (Rudlin & Falk, 2009), (Biddulph, 2007)	**The provision of quality public transport services**

Based on the literature survey presented in the chapter, the next chapter will bring the two concepts (sustainability and residential neighborhoods) together.

Chapter 3

SUSTAINABLE RESIDENTIAL NEIGHBORHOODS

3.1 Introduction

Majority of the human will live in cities over the few next decades. This development is putting gigantic weight on practical arranging and administration of urban area (Chena, Aceyb, & Laraca, 2014).The result obviously can be seen in a lack of greenfield , worthy farmland ,excessive emission of greenhouse gas and inordinate use of energy ,sprawl in urban and suburban area , car-dependent and intolerable traffic.In the matter of managing issues of development, growth, and the diminishing life satisfaction in urban regions, urban communities appear to be a big issue.This is genuine in view since these effects occure along with socio-economic and environmental consequences. To enhance the urban condition and the life quality for urban occupants, it is essential to make places that put individuals first and manage environmental resources efficiently (Chena, Aceyb, & Laraca, 2014).

As aftereffects of the fast improvement of urban areas and urban settlements amid the nineteenth century and in addition changes in conditions and viewpoints that are powerful on advancement of urban communities lately, urban neighborhoods find a particular position in the development of urban communities. Additionally, the idea of sustainable development appears as a real piece of the previous studies in urban planning and design (Dehghanmongabadi, Hoşkara, & Shirkhanloo, 2014).

There are various motivations to apply sustainability ideas in urban planing and design that by and large can be specified as saving of environment system and resources, economic success and sociable communities. In this respect, people must deal with their own social orders and items especially settlements. Consequently, applying parts of sustainable improvement in the customary practice of neighborhood organization is a crucial way to attaining to sustainable urban areas all through the world (Dehghanmongabadi, Hoşkara, & Shirkhanloo, 2014).

A lot of issues and problems occurred at the macro-city scale, originates from improper, weak planning at the micro-neighborhood level. For this reason, a significant combination of sustainability criteria in neighborhoods is magnified. It is more effective in calculating, sustainable local urban foundations, such as the following; buildings, transportation, urban-vegetation and water (wastewater, storm water and water supply) systems. Neighborhood-scale analysis is an essential fact. For instance, appropriate calculation of neighborhood for perfect control of locally generated storm water runoff, needs micro-scale analysis .In addition, quality of life extremely effects on the decisions that are made at the neighborhood scale and in the equilibrium aspect, considering environmental, social and economic goals have impact on developing communities which are included in sustainable neighborhood design (Engel-Yan, Kennedy, Saiz, & Pressnail, 2005).

As an example for comparison, in England, a lot of focus is placed on the planning decisions; they pay attention to the functional qualities, where as characterizing the neighborhood in North America is established on urban design. The upcoming definition is a perfect description of sustainable neighborhood: “a walk-able residential or mixed-use area, within which residents share basic facilities and have

easy access on foot (400 or 800 meter diameter) to basic facilities and services (e.g. school, shops, community Centre, etc.)" (Kim, 2005, p.201).

The discussion of sustainability is based on human-scale with consideration of various social neighborhoods, improving resident satisfaction experience and a sense of local community. But on the other side, it decreases environmental impression. Based on definitely coherent words which were written by origin authors in the 1970s (Ecologist 1972, Boyle and Harper 1972), the main aspects is most likely the same:

> "The village would be a balanced community for people of all ages and incomes, where People can live, work and enjoy a vibrant community life, the majority without the need to commute and where everyone could feel a sense of personal belonging. It would provide affordable housing, work opportunities, food production, energy and water conservation as well as self-reliance for its residents in an ecologically aware and sensitive way". (Gilchrist, et al., 2000,p.29)

Based on the explanations above the significant role of neighborhood is undeniable and according to the guide, a recognized center to solely attend to public transport nodes; must be considered in planning new local facilities. Center can be defined by shop, places, mass of houses, mix of different service communities, and must have easily accessible by walking or biking from surrounding residential areas. Another advantages for mass of housing being close to center are reduction of cars usage and improvement of services in the area. Topography and Landscape of determined areas are affected by range, type of house spread and dependent development; furthermore, the area does have its own specific identity which is a reflection of its past history (DETR, 1998c).

3.2 Sustainable Neighborhood

Every component of the Sustainable Urban Neighborhoods shows an essential guideline. Sustainability alludes to the capacity of the area and more extensive urban frameworks to be maintained over the long run and to minimize their ecological effect. Urban indicate to both the area location and to its physical character whilst neighborhood identifies with the social and financial sustainability of the region and these two criteria ties together in community in association with surrounding area (Rudlin & Falk, 2009).

A sustainable community can be characterized as a group that actualizes project went for long-term administration of natural resources for environmental wellbeing, financial development adapted towards supporting fundamental needs, and social value (Wood, 2009).

There are diverse approaches that handle the use of sustainability to neighborhoods which among them, remain on both social and ecological as two distinctive however incorporated viewpoints is striking. Egan Review (2004) report ‘Skills for Sustainable Communities’ as social point of view, depict the covering range of both the expressions "neighborhood" and "community" could be utilized to comprehend the definition. It specifies sustainable communities as a community which meet the various needs of existing and future inhabitants together with high quality of life and give opportunity and option.

They accomplish this in ways that make suitable utilization of natural resources, amend and improve the environment, advance social union and cohesion and reinforce economic success. Elements of sustainable communities can be classified

into seven parts; governance; transport and connectivity; services; environment; Economy; housing and the built environment; sociology and culture. Hugh Barton (1996), from the ecological point of view, gives a different approach. He asserts that "One way of approaching the problem of sustainable design is to see each development as an organism or a mini ecosystem in its own right". (Barton et al, 1996,p.98) .With respect to this perspective, a neighborhood is defined as an ecosystem as it gives the vital local dwelling to people, making its determinant micro-climatic conditions, and ought to give them comfort and sustenance (Al-Hagla, 2008).

Sustainability has turned into an undeniably critical component to be considered in the arranging of urban regions. Despite the fact that it is focal in the thought of urban communities, for various reason it has gotten less consideration in the improvement of neighborhoods. Cities can't be viewed as sustainable area if their segment parts, for example, neighborhoods, don't carry sustainability criteria. It is completely practicable to incorporate sustainability components in neighborhood thought. By following the development of neighborhood theory from Howard and Perry, and looking up to more recent contributions, it is tangible that the ideas of sustainability are focal to these various allotments. Criteria of sustainable neighborhood are the reflection of the criteria which utilized in higher level of cities and towns along with regards to the economic, social, and the environmental factors (Choguill, 2008).

The Housing and Urban Development/Department of Transportation/Environmental Protection Agency (HUD-DOT-EPA) Partnership for Sustainable Communities defines sustainable communities as: Places in which have a diversity of housing and accommodation along with various kinds of transportation and vicinity of

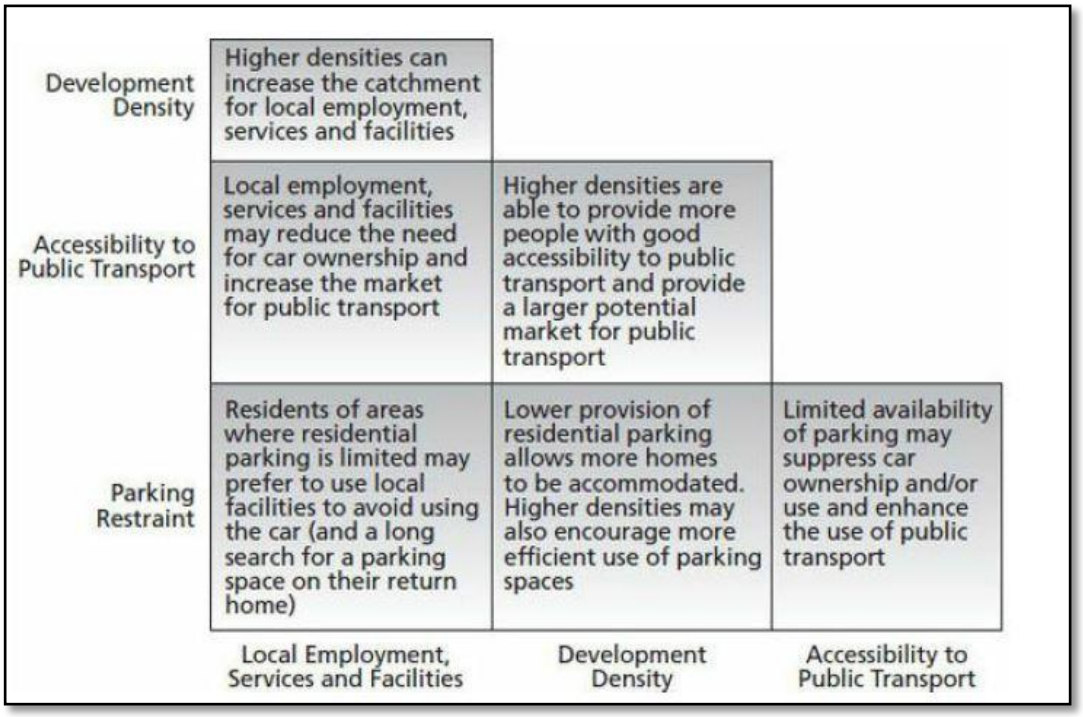
destinations. Accordingly, they have a tendency to have lower transportation expenses, decrease air contamination and storm water spillover, diminish infrastructure expenses, protect historic places and delicate lands, free-flowing traffic, and being in a good flexible economy to require demands for various types of accommodation with different prices (table4&5). Although Sustainable community methods can be applied in urban, suburban ,and even rural communities to generate healthy ,walkable neighborhood with high level of safety , anyhow these procedures will look various in each one spot relying upon the neighborhood characteristic, context, and requirement (HUD-DOT-EPA, 2011).

Table 4: Relation of environmental indicators with development density, accessibility to public transport, local employment, parking restraint (Barton, 2000, p.57)

Environmental Indicator	*Development Density*	*Accessibility to Public Transport*	*Local Employment, Services and Facilities*	*Parking Restraint*
Energy consumption	All four measures reduce the need to travel and promote the use of alternative modes to the car, thus reducing transport energy consumption. Higher density development has greater potential to use energy more efficiently (eg through CHP schemes)			
Land urbanized	Higher density developments require less land than lower density developments	Increasing the accessibility and use of public transport reduces the amount of land required for roads		Less parking space requires less land
Minerals extraction		Increasing the accessibility and use of public transport reduces the materials required for roads		Less parking space requires fewer construction materials
Carbon dioxide Nitrogen oxides Particulates	All four measures reduce the need to travel and promote the use of alternative modes to the car, thus reducing emissions from transport (ie CO_2, NO_X and particulates). Very high densities may however lead to high concentrations of local pollutants (see for example Newton, 1998).			

Furthermore, the land use planning measures identified above are complementary and help to reinforce each other.

Table 5: Synergies Between Land Use Measures (Barton, 2000, p. 58)



Also, Economic instruments and legislation as another type of measures is utilized to raise the impact of land use measures (Gilchrist, et al., 2000). Furthermore, a few researches and surveys have demonstrated that non renewable natural resources can be administered more successfully by the individuals who get a direct subsistence from them, as opposed to by a concentrated government organizations or nongovernmental associations(NGOs) (Agrawal & Gibson, 2001).

Neighborhood habitants' movements can have different measurements as distinctive objectives. The most critical contrast in movement and accessibility perspective in a neighborhood scale against to the bigger scales is in its and direct association with living issues and families. Accessibility in an area is committed to every day activity

and movements, as well as a zone with distinctive capacities and functions and it would be better to see as a character which highlight the movement process and make it pleasurable (Barton Bray, et al., 2003).

The United Nation (UN) is one of the most standout and implicit sources supporting local-level sustainable development. The advancement of neighborhood sustainability or sustainability in local-level scale has emerged in the second half of the 20th century, which was subsequently after the 1987 Brundant Commission report and also UN conference on environment and development in 1992 (Roseland, Cureton, & Wornell, 1998 and WCED, 1987).

This conference, brought about generating an agenda for worldwide sustainable development which called *Agenda 21,* highlight the significance and urgency level of local sustainability. Explanation of Agenda 21 was built based on participatory, multi-stakeholder process to fulfil the objectives of Agenda 21 at the local level in long-term accomplishments and management, tactical plan which consider local development issues with priority (Wood, 2009).

The strategies stated in this study underline that neighborhood contribution, and particularly neighborhood, authorities, are vital for sustainable development:

Since a significant number of the issues and arrangements being tended by Agenda 21 have their roots in the local area, the support and collaboration of neighborhood powers will be a determinant criteria satisfying its goals. Neighborhood powers develop, work, and look after economic, social, and environmental framework, regulate process of planing, make neighborhood ecological approaches and

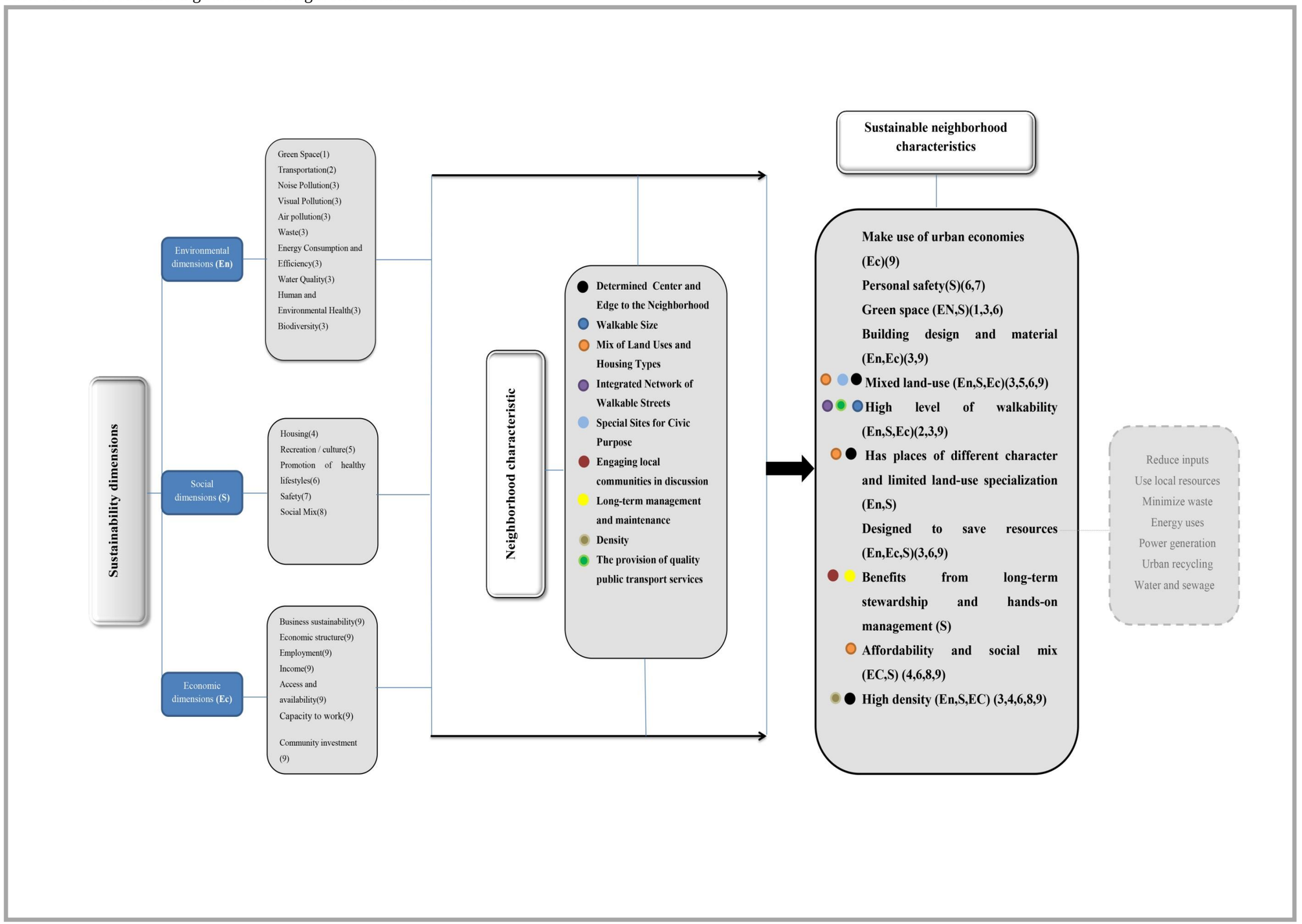
regulations, and support applying national and subnational ecological policies. They operate as a crucial figure to educate, mobilize and respond to the residents to cultivate sustainable development. Sustainability is not an end state, but a process (UNCED, 1992).Sustainable communities are described by the International Council on Local Environment Initiatives as a community "that maintains the integrity of its natural resources over the long term, promotes a prosperous economy, and hosts a vibrant, equitable society" (ICLEI, 2002).

Although Sustainable neighborhood is a type of conventional neighborhood, which faced those same requirements (accommodation, occupation, shopping, civic function), but it has compactness, more connectivity, or generally more sustainable with high quality life (Farr, 2008).

3.2.1 Characteristics of Sustainable Neighborhood

Sustainable urban neighborhood to refer to new communities that are built to last – in social and economic terms as well as in physical terms. To count as a sustainable urban neighborhood (Rudlin and Falk, 2009), The sustainable neighborhood will have several main elements. Although it is obvious that the practical implications of neighborhood sustainability is not easy, the rules are straightforward.based on chapter 2 the sustainable neighborhood consist of two main elements which are sustainability and neighborhood.during the mentioned chapter these two elements has been described comprehensively in terms of various refrences.likewise chapter 3 is going to describe sustainable neighoborhoods which include combination of main characteristics of sustainable developement and idealized neghborhood beside characteristics for sustainable neighborhood gained by various references which is shown in table (6) :

Table 6: Process of achieving sustainable neighborhoodcharacteristics



3.2.1.1 Make use of urban economies

This rule is based on the role that urban areas play in trading systems.Environmental efficiency depends upon matching up supply with demand. Green consumer products, waste recycling, public transport, etc. are only viable if they can find a market and it is in cities that the major markets exist. Even the most committed eco-community in the heart of the countryside is going to struggle to smelt its waste aluminium or glass or pulp and recycle its paper. It is going to struggle to support an efficient bus service or to manufacture low-energy light bulbs. Such activities require the sort of markets that only cities can provide. Thus the urban areas as natural centres for trade have an important role to play in promoting more circular systems of resource consumption and waste reuse.

3.2.1.2 Personal safety

Having personal safety for all residents ,for different ages with different capability and physical abilities is the primary requirments of each neghborhood .The safety within the gates is traded for a much less safe environment in the surrounding area where pavements are deserted and deprived of surveillance from surrounding buildings.Pedestrians prefer to risk narrow pavements on heavy traffic routes rather than a deserted pedestrian route where they might be safe from cars but not from muggers.

3.2.1.3 Green space

There is a great deal of confusion about green space and sustainability. Green spaces are the ‘lungs of the city’. Green lungs are critical psychologically to city occupants as can be seen by a New Yorkers' commitment to Central Park. Green space is additionally an imperative supporter to biodiversity empowering and supporting flora and fauna.

A study by Manchester University recommended that a 10% ascent in tree spread in a city could cool urban temperatures by 4°C while reporting that road trees have a demonstrated impact on house cost.

An excessive amount of green space decreases the density of urban zones diminishing the viability of public transport and expanding walking distances. Its upkeep can be a threat for public resources and around evening time it can be left and dangerous. Urban green space should be cautiously designed to Maximize its environmental-friendly aspects to the earth while minimizing its negative perspectives. (Rudlin & Falk, 2009). Bringing greenery and nature to the local area can contribute to increase life quality and also amend and support sustainability dimensions which are :

_ *ecologically* – amending micro-climate condition, support wildlife;

_ *socially* – making places more agreeable, consequently expanding the feeling of proprietorship, balancing urban streess, enhancing personal satisfaction and life quality;

_ *economically* – holding property values in light of a superior personal satisfaction (Ritchie & Thomas, 2009).

3.2.1.4 Building design and materials

Reduce the energy demand to heat the spaces by utilizing the proper orientation, form and openings to achieve the best use of passive solar gain. Likewise, the possibility of gaining overheating issue should be considered and beside that energy for cooling have to be managed.

- Materials ought to be utilized proficiently and be decided for their low exemplified energy. Waste in development ought to be minimized then reused
- Boilers ought to create to a great degree low level of contaminations and all materials chosen have not lead to indoor air pollution.
- Amplify the opportunities for catching energy and water. In relation to energy,this is primarily coordinated towards augmenting sunlight based potential, and has four main principles:

1. **Daylighting.**
2. **Passive solar gain.**Solar radiation, which fall on the building sides such as roof, windows, and walls contribute to have passive solar gain. Therefore, in heating seasons buildings demand for heating energy will decrease. On the other hand, in the cooling seasons it should be considered that excessive solar radiation should be controlled and avoid overheating while ensuring ventilation paths are working.
3. **Solar thermal panels.** These actively collect solar energy and conduct it to a fluid, usually a water and anti-freeze mixture (for more on solar thermal panels).
4. **Solar electric 'photovoltaic' panels (PVs).** Created in functional structure, particularly by the US space program, these gadgets change over sun based energy, specifically into electricity (Ritchie & Thomas, 2009).

Material

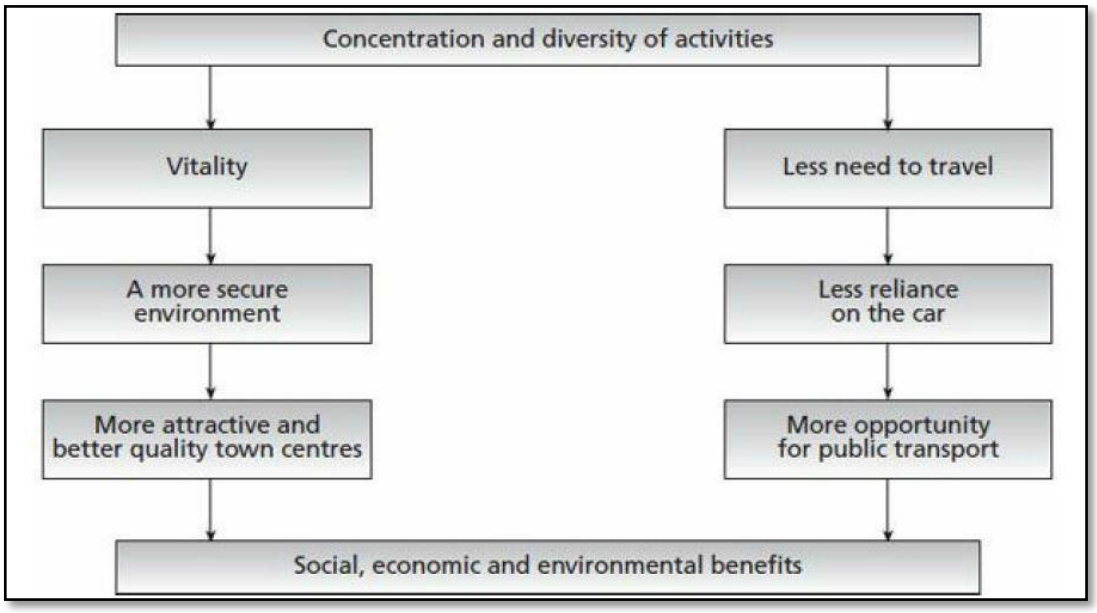
Sustainable material plays a significant role toward sustainability and therefore it should be selected in terms of some principles:

1. Performance, lifetime, cost, appearance, maintenance
2. Impact on the local environment by sourcing the material, e.g. felling, quarrying, etc.
3. Impact on the global environment, e.g. CO_2 emissions and the depletion of finite resources.
4. Health hazards associated with processing and using the material (Ritchie & Thomas, 2009).

3.2.1.5 Mixed land-use (wide and diverse choice of facilities, housings and vibrant street life)

To guarantee long-term objectives and values and make a balanced community by passing time. Neighborhoods require a minimum of 500 to 1000 houses unites along with common divers facilities. Street wideness and desirable façade, diverse activities can improve and encourage street life and decline the appearance of private transport(table 7). High density and mixed land use make street life livelier which the Principles emphasized them. Having adequate industrial and commercial service demand and sufficient manufacturing and service space in mixed use land is generated by the high population. Safe and vibrant city street life and satisfied people's moral and physical needs are significant results of applying the principles connect demand and supply appropriately. This information confirms that The Principles are main factors of sustainable cities. "At least 40 per cent of floor space should be allocated for economic use in any neighborhood" (UN-HABITAT, 2014). However, successful urban development must have significant factors more than housing; providing facilities within neighborhood for people to encourage them to walk to work, school, or shops guide us to the meaning of mixed-use development (Rudlin & Falk, 2009).

Table 7: Benefits of the Combination of Land Use Measures (Barton, 2000, p. 59)



ECOTEC(1993) and Winter & Farthing (1997) came to the conclusion that local use does (as the assumed) lead to short travel time in every way possible. The latter team used the opportunity to compare and contrast the travel dynamics in situations where there were and wasn't chance of using local services. These services that were used regularly to semi-regular basis where: supermarkets, produce stores, post office, public housing, primary and secondary schools. Based on their research they noticed a decrease in average trip length within the local area. The tendency to walk is heavily determined by trip length. In 1975/76 90 per cent of trips under one mile were on foot. Over the past twenty years, the percentage of trips taken on foot have decreased. ECOTEC has found that trips under a mile to local services where by walking and under 53%, destination that where beyond a mile, people relied upon care use and in some instances public transportation. Even though the use of car has increased, walking still remains dominated in trip under 1000 (93% being by walking). The graph people shows how the dominance of walking to play areas and open spaces. Walking is also the primary means to schools, bars and community

centers. It is important to note that walking to local shops accounts to 50%, cannot be said the same for supermarkets; trips to the supermarket seems more dependent on car use (ECOTEC,1993 and Winter & Farthing 1997 in Barton, 2000).

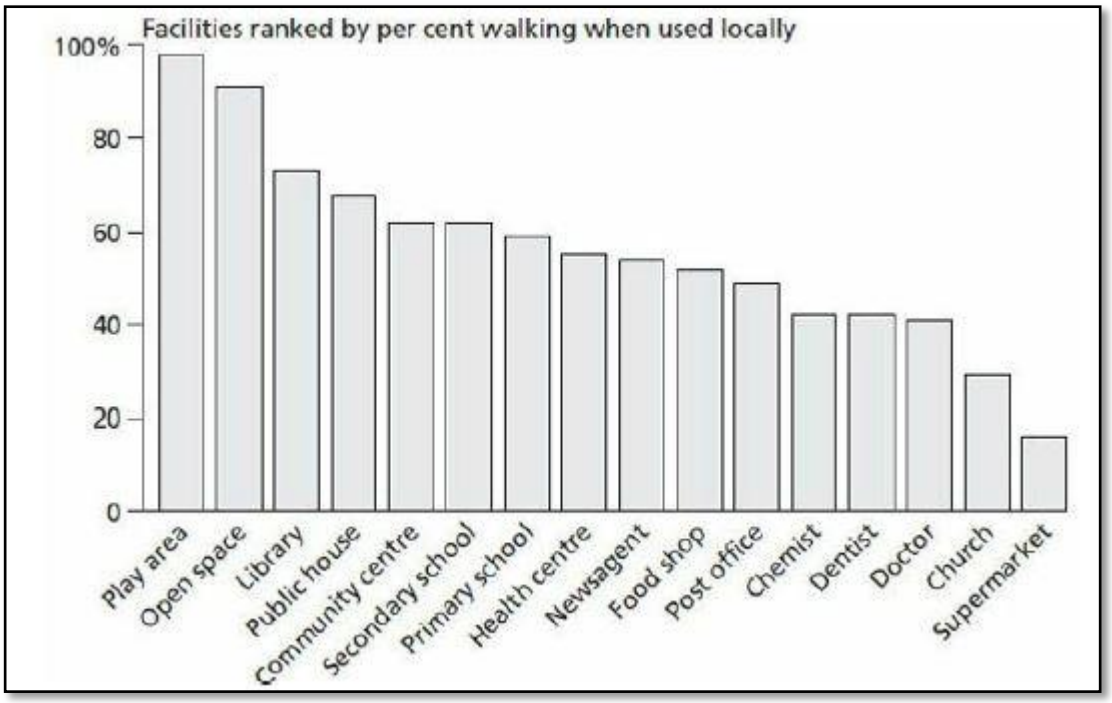


Figure 3: The Proportion of Walking Trips for Access to Local Facilities (Barton, 2000, P.75)

This principle purpose is to create a variety of suitable activates and land use near to each other compatible situation and are sufficiently adaptable to adjust to each changing in the market at a specific time. Mix land use purpose is to make employment and job within the community, endorse the neighborhood economy, decrease car usage, promote walking and biking, decrease landscape divisions, place public services in the immediate vicinity of the neighborhood and encourage community which is socially mixed. Mixed land uses should be exerted in different levels:

- Cities

- Neighborhoods
- Buildings

This character concentrates on both the neighborhood and building level until the late nineteen century the method of land usage was based on single use around the world. Cities have been badly affected by the adaptation of single use zoning strategies. Furthermore, it has had a negative effect in the following ways:

- Car reliance
- Overcrowded traffic
- Urban sprawl's have increased
- Decline of urban centers

To solve the problems mentioned above, fresh Urbanism promotes the fundamental idea of the mix. Various land uses should be assembled in the neighborhood to make it successful. At the point when these capacities are collected in an area, the economic and residential exercises ought to be made good and decently adjusted via watchful configuration and administration with high level of compatibility.The compatibility of various land uses entirely relies upon on the noise and pollution levels. To preserve the health and livelihood of a community, a research should be conducted on land use compatibility. Mixed land-use is an intrinsic part of the quidity of neighborhood, and is a column of sustainable urban development (UN-HABITAT, 2014).

3.2.1.6 High level of walkability (well connected to jobs and services and adequate space for streets and an efficient street network)

To save time and be cost-effective, providing diversity in modes of transportation is urgent. Develop a transport corridor near in walkable distance to encourage people to use public transportation. For increasing local economy and the interaction and decreasing congestion, walkability play the main role to attract people to the public open spaces. While a vibrant street life contributes to more walking or cycling, adequate street network just provides essential services need for city within defined and secure distance for walking and cycling. Closeness to work, home and services are made by appropriate, high density, mixed-use of lands and a socially mixed neighborhood. Furthermore, walkability reduces air pollution, resource evacuation and usage of the car which the result is reduction relevant congestion. Vibrancy of city life increases unimaginably by pedestrians.

Aiming for appropriate expand of street network as a purpose of this principle is to efficiently work for public transport,vehicles, and to be attractive specifically for pedestrians and cyclists. For having sustainable mobility, indicator difference must apply for designing the street network to distinguish from modern practice, some of aspects are:

- Walk-able and cyclist friendly streets
- Encouraging public transport
- Highly interconnected road hierarchy
- Adequate parking space

Level of neighborhood walkability can be determined by the walking distance to the man services which is approximately 400 to 450m.

Permeability: Permeability as a term refers to the ease with which a liquid passes through a solid such as water through rock. In the urban design context, it has come to refer to the ease with which people can move through an area with a choice of routes. The importance of avoiding long stretches of road without junctions and therefore dictates the size of urban blocks.Impermeable layouts are characterized by looping feeder roads which lead to cul-de-sacs and closes (Rudlin & Falk, 2009).

Taming the car: A pedestrian-centered neighborhood does not always mean a pedestrianized neighborhood.The key to the pedestrian-friendly neighborhood is to tame rather than to exclude the car.This means reducing traffic speeds and reclaiming much more of the street area for pedestrians but it does not necessarily mean removing cars entirely. Excluding cars and parking removes activity from streets making them feel less safe and therefore, ironically, less attractive to pedestrians (Rudlin & Falk, 2009).

Legibility: Another important factor is the ease with which people understand the structure of a neighborhood and are able to 'read' it as they walk around. Traditional urban areas are generally easy and pleasant to walk around. This relates partly to the variety of buildings and townscape. In areas with no landmarks, where everything looks the same, walking is monotonous and it is easy to get lost (Rudlin & Falk, 2009).

Public transport: The sustainable urban neighborhoods ought to likewise be served by an effective public transport framework depends on the local conditions.for instance, in urban areas like Sheffield, Nottingham, and Manchester this may be one

of the tram services grew in the most recent decade (Rudlin & Falk, 2009);Reducing transport emissions mean:

_ decreasing the need to travel, and along these lines the number and length of travels

_ accomplishing a modular movement from private engine vehicles to public transport, cycling and walking

_ encouraging the take-up of vehicles that have low or zero emissions associated with their use. On the other hand, subsequent to such vehicles can not evacuate the issue of congestion, it is indispensable that urban outline does not make entirely car-dependent settlements. Sustainable transport, in this manner obliges changes to urban configuration needs:

_ higher-density development, located close to public transport stops and interchanges;

_ mixing uses (houses, shops, workplaces, schools and public facilities) within the same area;

_ better public transport (Ritchie & Thomas, 2009).

3.2.1.7 Places of different character and limited land-use specialization:

That seems existence of different markets and a minimum required net density is 30 d/ha as same as garden cities (Alexander, 2009). It's better to say the more development in higher density the better support infrastructure, but along with high level of design quality. (Bretherton and Pleace, 2008). This is to restrict single functioning neighborhoods (aka function blocks). Single block should not cover more than 10% of any neighborhood.This principle was created to modify / limit the use of functional zones by introducing mixed land use policies. **Zoning** is used by

urban planners which is a land use planning device comprised land uses, building height, plot ratio to the buildings and combination of these factors.

Single function neighborhoods are created by the unilateral application of land-use specialization, which is the foundation of current urban challenges, which also include overcrowded cities, segregation, car usage. Controlling land use allotments are critical to develop mixed land uses. Two main ways exist to amend zoning policies and apply this principle (UN-HABITAT, 2014):

• Define neighborhood and blocks with compatible mixed land uses

• Apply land use zoning according to the urban policy and local policies

This principle is an urban planning tool to ensure the implementation of mixed land-use and to increase economic diversity. Beside of applying mixed land use, this principle contributes to economic diversity.

In 1990's Burrard Slopes IC Districts, an area of 0.55 km² was developed as an industrial only zone. Since its development Burrard Slopes has been modified numerous times since 1993 thanks to the zoning policies, Burrard slopes has gone from an industrial zone to a an industrial, commercial, residential and mixed use zone. By having a clear careful approach on both design and management, this specific district is well balanced between the economics and residential land use. This has led to increase services and industrial jobs; it has allowed to introduce residential development projects which have created a growth in activities. This is a great example of how a single-function neighborhood can be transformed into an energetic multi-functional community. Good planning and design decisions can only get you so far, these principles require legal framework and support, an examination

of the neighborhood society and the economy, proper framework innovation and limit, and the institutional ability to authorize choices (UN-HABITAT, 2014).

3.2.1.8 Designed to save resources

It should be ascertained that neighborhood is well managed and maintained so that it doesn't damage the environment. Neighborhood have to ensure that development provide sufficient green spaces to save and support biodiversity, and decrease environmental effects, and development is energy efficient.

Reduce inputs

Reduce inputs to the system in terms of the resources and energy consumed. Consuming less must be the beginning stage for any practical approach of sustainable policy. The Vales had been just ready to accomplish self-sufficiency in their lodging by diminishing the requirement for heat, water and energy to negligible levels which could then be supplied by the house itself (Rudlin & Falk, 2009).

Use local resources

Make maximum use of local resources such as the sun and the rain which falls on the roofs of the neighborhood and the food which can be grown in its gardens and allotments. These local resources also include waste produced by the neighborhood such as restored water, which can be used for toilet flushing or composted waste which can nourish gardens and allotments .By minimizing the input of resources and maximizing the use of local resources the neighborhood can significantly reduce the level of resources imported into the area (Rudlin & Falk, 2009).

Minimize waste

The neighborhood must minimize the amount of unrecycled or unrecyclable waste exported from the area(figure 4).The UK now recycles around 30% of its waste, a huge improvement on the 5% in the mid 1990s but still half the levels achieved in Germany (Rudlin & Falk, 2009).

1. Minimize demand leading to minimize waste.
2. Following the waste hierarchy indicate to utilize waste as a material resource or an energy resource.
3. Minimize water use in transporting and treating human waste.
4. Use the rain falling on the site (Ritchie & Thomas, 2009)

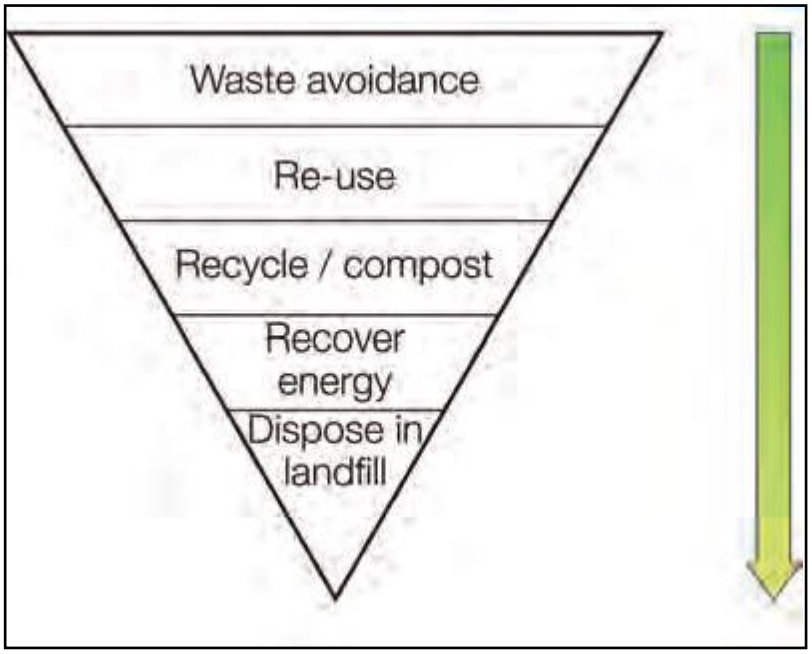


Figure 4: waste hierarchy (Ritchie & Thomas, 2009, P.86)

Energy uses

Another major natural issue that will assume an essential part in forming our urban communities is the minimizing energy utilization and emissions of CO2. Energy

efficiency has concentrated on the technical aspects of building construction, something that we do not propose to dwell on here. Technical aspects of building construction play the main role of energy efficiency. The higher density of urban improvement additionally lessens the length of streets and administration runs obliged, which has both expense and ecological advantages. Likewise, urban house types are more energy more efficient than segregated and semi-detached forms.This is likewise valid for mixed-use buildings where workspace and shops beneath lodging will lose less energy than single-story structures. Urban buildings are more inclined to be shielded by encompassing buildings (Rudlin & Falk, 2009).

Power generation

Energy which is used is more consumed by lights and appliances depend on electricity in well insulated buildings rather than heating. This was an early sample of Combined Heat and Power (CHP). At one great this involves the kind of neighborhood power station that has been conducted in London, which gives heat to the neighborhood. Individual home CHP system can heat and supply electricity for the house and return exceed electricity to the urban electric grid system in order to have even a negative bill. CHP frameworks change over up to 80% of the fuel energy into a usable shape contrasted with only 30% of customary force stations, thus can possibly have a noteworthy effect on use use and the natural outcomes of power.The sustainable neighborhood can in this way have its own by local standards controlled force station creating ecologically-friendly electricity and power. This would be connected to a district framework so getting rid of the requirement for individual local boilers.This is now commonplace in Scandinavia, indeed 65% of buildings in Copenhagen are served by CHP (Rudlin & Falk, 2009).

Urban recycling

Indeed, to have a proper urban recycling method, linear resource systems have to become circular to have domestic and commercial waste recycling.A few regions have up to five different wheelie canisters, gathered at diverse times for paper, glass, green waste, jars and general waste They additionally do not have the space to store such a large number of bins so that the neighborhood gets to be jumbled with them. An option is a Green Box framework where householders put all recyclables into a container and the waste is collected and sorted by the waste authority at the specific point of collections. This is the framework utilized in great part of the US (Rudlin & Falk, 2009).

Water and sewage

The filtration and transport of this water are immoderate and use a lot of energy as does the treatment and transfer of this water after it is utilized. This is an excellent straight framework and, as with other direct frameworks, there is the possibility to close several of the loops to make circular frameworks at the neighborhood level. Yet most urban areas don't even make great utilization of the rain which falls on their rooftops and lanes just to be diverted straightforwardly into the sewers (Ritchie & Thomas, 2009).

Water

1. Reduce demand.

2. Try to ensure that the quality of the water is as high as required for the use but no higher.

3. Organize the site so that as much of the rainwater falling onto it as possible can be re-used.

4. Even if water recycling is not incorporated at the outset of a project, allow for its incorporation (in terms of space for storage and pipes, dual water supplies, etc.) at a later date.

5. Consider rainwater recycling and bath water recycling for each new project.

6. Choose vegetation that doesn't need irrigation in the summer (Ritchie & Thomas, 2009).

3.2.1.9 Benefits from long-term stewardship and hands-on management

Benefits from long-term stewardship and hands-on management of responsible local Organizations, such as housing associations, development trusts or parish councils, both during development and after residents have moved in" (Falk & Carley, 2012).Successful communities such as Lightmoor Village in Telford or Orchard Park in Cambridge have profited from great management from the beginning. Sense of community and local pride can boost up with having neighborhood school and health center so that they attract people and residents as a community hub (Falk & Carley, 2012).The mutual cooperation of neighborhood theory formed by Howard, Perry, Stein, Wright, Mumford and Fisher supply a wide range of criteria for planning, sustainable neighborhood. to illustrate, attaining economic sustainability, according to make transportation and infrastructure, cost-effective, neighborhood size have to be specified and limited with high density. Frequently , it has been mentioned that placing the focal point of neighborhood within walkable distance, reduce automobile-dependent daily trips .Young children should not walk more than 500 m to receive their elementary school. The area comprises of a sufficient populace to legitimize the foundation of neighborhood shops, permitting locals

looking for their needed goods , but additionally as a supplier of livelihood and occupation inside the area. With a specific end goal to support social sustainability, the area populace size ought to be sufficiently little to permit the free exchange among individuals from the local community. Dynamic social interaction of neighborhood can be conceived by participation of residence in the decision making of the neighborhood.The majority of neighborhood issues could be determined and be solved mainly with an appropriate neighborhood structure. One of the most important issues is to conceive how the neighborhood is related to the wider community. The neighborhood is characterized and defined by a clear edge and boundary that can be created by primary roads on the periphery. By minimizing traffic through the neighborhood by reducing the road which passes across the neighborhood led to enhance the safety of children and neighborhood unit. Environmental sustainability can be achieved by having sufficient open spaces like parks and greenery in association with a school which play a role of meeting place for families to promote social interaction (Choguill, 2008).

3.2.1.10 Affordability and social mix

Proximity can be effected factor in reducing the costs of building services for different level of user's wealth, further, by implementing stated principles, can decrease the loss of time and resources which impact on bringing down of general service costs. These whole effects support affordability of economic activities, and also services and housing. In addition, dispense logical distribution of urban area and supplying sufficient housing by considering various levels of income-social equity and economic efficiency- through city planning regulation are some of the targets of the social mix principle. "An affordable and accommodating city is a core feature of a sustainable city" (UN-HABITAT, 2014). Housing will be made accessible in

various prices and tenures in any neighborhood to accommodate the diverse livelihoods. In the range of 20% to 50% of the space should be made available for low cost housing and to make sure that at the most 50% are allowed to be owners.

This Principle was created to unite the diverse social classes within the same community and guarantee accessibility to equal opportunity by providing different forms of housing.The backbone of city life stems from healthy social networks. These Social networks originate from Social mix. Social mix and mixed-land use are interconnected and endorse one another. The combination of mixed land use and good policy protocols contribute to social mixing, this creates job opportunities within the neighborhood; specifically for residents with different cultures, background and income. This is beneficial within the neighborhood as it brings together diverse groups of people to shape unique social network (UN-HABITAT, 2014).

Social mix is defined as a socio-spatial vision with numerous goals which are:

- Enhance social communication and social cohesion through the various groups
- Create job opportunities
- Erase place-based stigma
- Attract supplementary services to the neighborhood
- To maintain renewal / regeneration initiatives

In Holland, any space that is supervised and monitored by the VINEX policy, are allocated for new housing developments and 30% of the new housing must be cost efficient. In Ireland they have different policies, but similar in a way to Holland, Irelands policy is called "set aside", that says 20% of all new housing development

ought to be kept for affordable accomodation or in other word inclusionary zoning. Britain used another system called "planning gain and the thresholds for affordable housing", about 25% of new housing must be affordable, excluding London. In London they are increasing affordable housing between 30-50%. It is recommended that 20%-50% of residential floor should be set aside for affordable accommodation, and to make sure that at the most 50% are allowed to be owners.To make sure the statement mentioned in the previous paragraph is implemented without any issues and breed a successful social mix there are a great deal of numerous policies. This comes down to the social and economic level of the neighborhood. Based on location, the proper policies must be created and implemented to endorse a diverse local community (figure 5). The policies could include (UN-HABITAT, 2014):

Figure 5: Policies to implement the social mix and affordability (Based on UN-Habitat, 2014, P.6)

Although Social mix may not directly be the planing treatment to solve social issues like poverty and social segregation ,it can lead to provide their solutions.

3.2.1.11 High density

The areas that have high demand for housing can be indicated the definition of higher net densities of residential development, although may this definition cause more sustainable living for people. ”The theory is straightforward: the more people that live within the vicinity of a given shop, service or facility, the more likely that its use will be sustained”. The distance that most people willing to walk for reaching to shop stores or public transport stop is usually around 400 m, so it can come across with this vision that agreed with this idea, “people who live within the vicinity of such services, will choose to walk to them rather than drive”. In reality the facts are different in some points, for instance, Services don’t just serve a local population and somehow people may be willing to travel across town for shopping, going to school or using the services. However, local facilities can be accountable and usable point if it causes to enhance an ethical desire of resident to decreasing their willingness to travel. Several methods exist for measuring density(figure 6):

- **Gross density:** All aspects of a neighborhood, containing the housing, roads, open spaces, schools and their grounds and other uses are described gross density.
- **Net density:** Everything that is established for housing, which is contained: the housing footprints and garden areas, the pavements and access roads, car parking areas, incidental landscaping and local children's play spaces. Net density also has exclusions: major roads, schools and their grounds, commercial and community buildings, urban parks or other significant open spaces.
- **Plot ratios:** The quantity of development on a site is defined plot ratios. The measurement is based on the total floor area of the buildings multiplied by the number of storeys, and represent by presented as a ratio of the total area of the site.

- **Dwellings per hectare/acre:** By ignoring the size, number of houses in the site are accounted.
- **Bed spaces per hectare/acre:** Size of properties and estimation of how many people might live within a scheme.

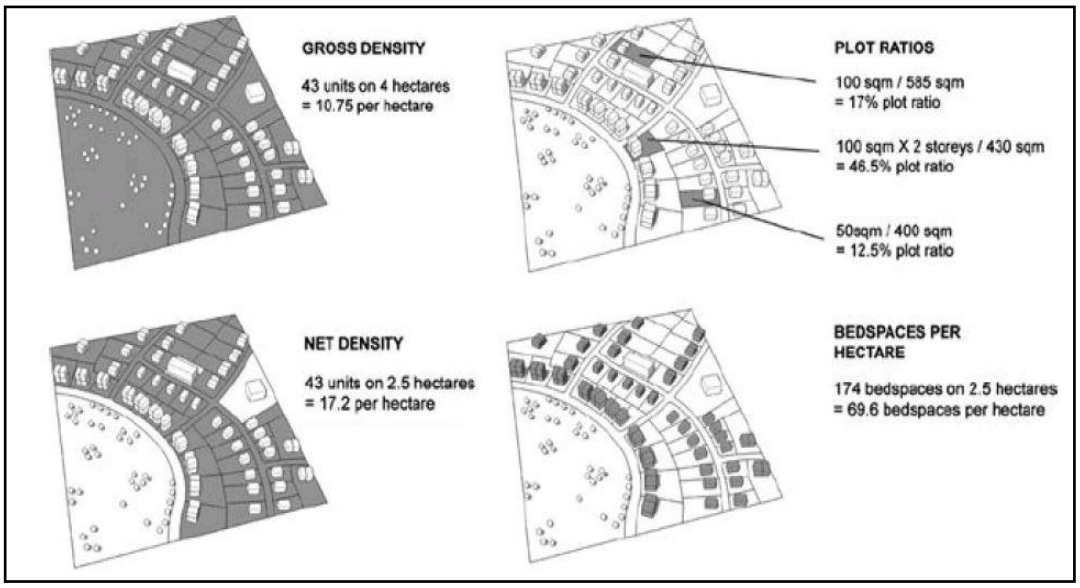


Figure 6: Comparing density measures (Biddulph, 2007, P.111)

Based on residential density, different countries have distinct expectations which effect on population inhabitants by considering net density of a scheme. For instance: "In Australia, net residential densities of between 8–10 dwellings per hectare are common, and policies to achieve a more sustainable form of development encourage developers to increase that to 15 units/hectare in Melbourne (State Government of Victoria, 2005) and between 15–25 units/hectare in Perth (State of Western Australia, 2000). In the United States the Environmental Protection Agency indicates that Phoenix has an average net density of 5 and Minneapolis 12 dwellings per hectare; other data suggest that net densities in medium sized cities in the USA range from an average of 7 (Charlotte in North Carolina) to 16 (Las Vegas) dwellings per hectare (North West Environment Watch, 2004). New Urbanists in the USA

encourage general neighborhood development at net densities of between 15 and 50 units per hectare. In the UK standard forms of suburban development have been at 25 dwellings per hectare for some time ,whilst the UK Government hopes to raise that to 30 units per hectare through its planning guidance (Urban Task Force 1999; Office of the Deputy Prime Minister, 2000). Barton et al. (1995) and the Urban Task Force (1999) suggest that the minimum net density for a bus service to be economical is about 100 people per hectare or roughly 40–50 dwellings. In Germany so called sustainable urban extensions have higher net densities: Französisches Viertel in Tübingen supports a range of services and a frequent bus service and has 60 units per hectare , while Rieselfeld in Freiburg has a range of local services, supports a tram system and has 78 units per hectare . The shift from housing to apartments occurs at between 25 and 30 units per hectare" (Biddulph, 2007, p. 111).

Consider how the same density can be achieved using different urban forms: High-rise buildings and prompts people to talk about 'overcrowding' or the reduction of open space within an urban area; most of the time is pictured as a definition of higher densities of development. The high densities is playing essential role to finding out the connection between realizing net density, resulting urban form, or availability of open space. Furthermore, having different perspective on higher density and applying it in specified situations is necessary for the ambition of changing the forms of housing and configuration within a scheme (figure 7).

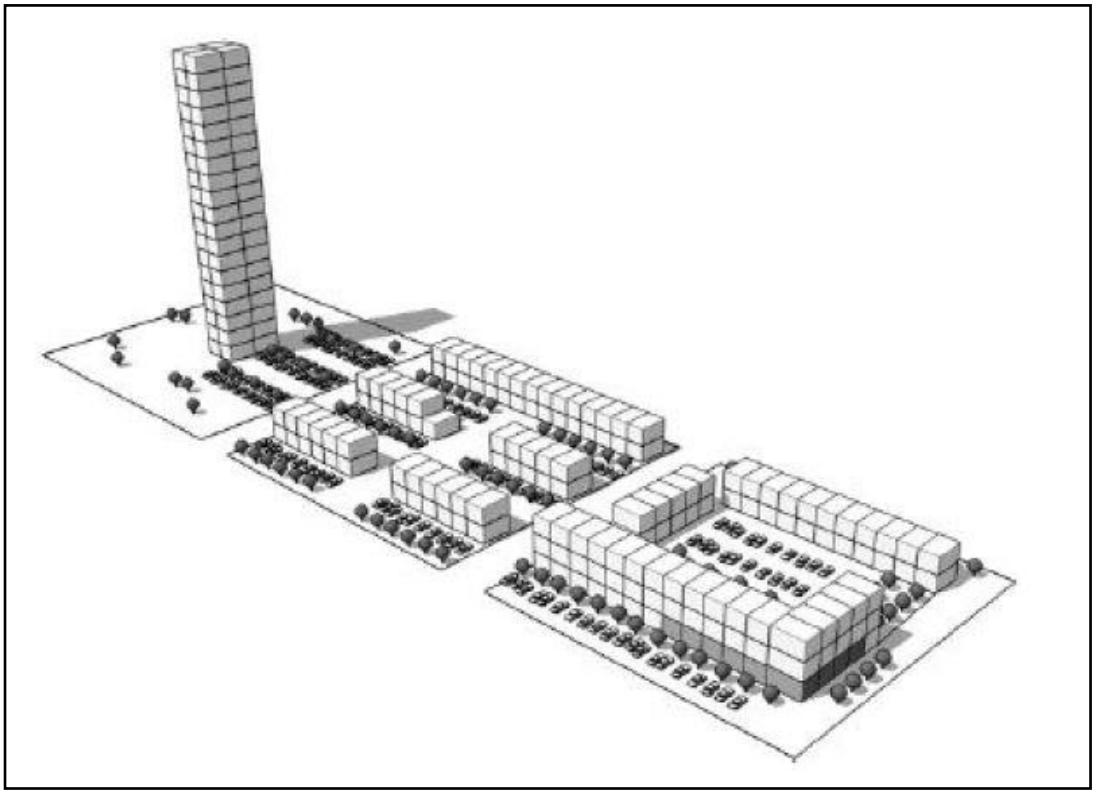


Figure 7: Different development forms at 75 units per hectare based on the work of Andrew Wright Associates for the Urban Task (Biddulph, 2007, P.113)

Sometimes giving the words like ‘low’, ‘medium’ and ‘high’ before density to describe the situation can be misunderstand and not give the exact meaning which the target is; Also there is no national standard exist to examine density measures with it Sometimes different standards are applied by local councils and state authorities. “In NSW, the Growth Centers Commission has nominated the following net residential density ranges”. (Landcom, 2011).

Table 8: NSW, the Growth Centers Commission has nominated the following net residential density ranges (Landcom, 2011, P.26).

NET DENSITY	NUMBER OF DWELLINGS PER HECTARE
Residential component in mixed use configurations	66 dwellings per hectare
High density development	40 dwellings per hectare
Medium density development	20-40 dwellings per hectare
Low density development	12.5-20 dwellings per hectare

The reduction of using cars and enhancement of willingness of people to travel shorter distances for their shops and services need are the beneficent outcomes of increased residential densities. (Balcombe et al. 2004: 123–124). Further, Support of public transportation systems and enhancement of higher level of service in a longer period of the day are the consequences of high densities -more people within a given area- of development (Addenbrooke et al. 1981; Del Mistro 1998; White 2002). The decisive guide for new urbanism indicate, for instance, “that an average net density of about 24 units/hectare will provide a critical mass for a viable bus service, but

higher average net densities such as 45 units per hectare are necessary for light rail or a more frequent bus service (Calthorpe 1993: 58). For public transport to be successful, a high proportion of residents should live within about 400 m or a 5 minute walk from stops linking directly to key destinations". (Rudlin & Falk, 2009).

At least 15,000 people per km², that is 150 people/ha or 61 people/acre. Reaction to population growth, rapid urbanization and global population are principle two's main contexts. In addition, Fundamental of having sustainable neighborhood is reaching to the high density, which causes sustainable urban extension, and prevents urban sprawl. Also, concentration on people and their activities is the main vision of high density.

Economic, social and environmental advantages are results of applying high density in comparing with low density, For example:

• High density neighborhood embeds more people per area which causes less urban sprawl and more efficient use of land.

• Costs of public services such as police and emergency response, school transport, roads, water and sewage, etc. are reduced by applying high density neighborhoods.

• Community service improvement.

• Public transport becomes more suitable and need of cars and parking decrease.

• Provision social equity.

• Public open space enhancement.

• Pollution reduction and enhancement of energy productivity

In opposite of incorrect perceive of people about the connection between density and social problems such as crime, poverty and depression, the major of these factors

relate to income and wealth of people who are living there. The significant factor to reach viable high density areas is good quality design although; safe and comfortable high density neighborhoods are the results of well-designed and organized. “In the context of fast urbanization, high density is a smart choice and is at the core of sustainable urban planning”.

Even if the local facilities effect on the mass of density, the higher density areas has more opportunity to use local facilities (ECOTEC, 1993). Furthermore, from the complex of different studies, reduction of travel is the result of closeness to facilities.

Up to now, the researches that have done around neighborhood case testified that people do use local facilities where they are available and this cause less travel. “ECOTEC (1993) report a clear relationship between the distance from a local center, the frequency of its use, and average household journey lengths. Hanson (1982) found similarly that proximity to local facilities is associated with shorter average distances, after taking account of socioeconomic variations. Interestingly Hanson also found that people living closer to facilities made more trips, and this tunes in with the results of Banister’s study (1992) comparing settlements in south Oxfordshire. The small town of Henley, with a good range of local facilities, had more trips per person, but half the total travel per person when compared with commuter villages with few facilities”(figure 8).

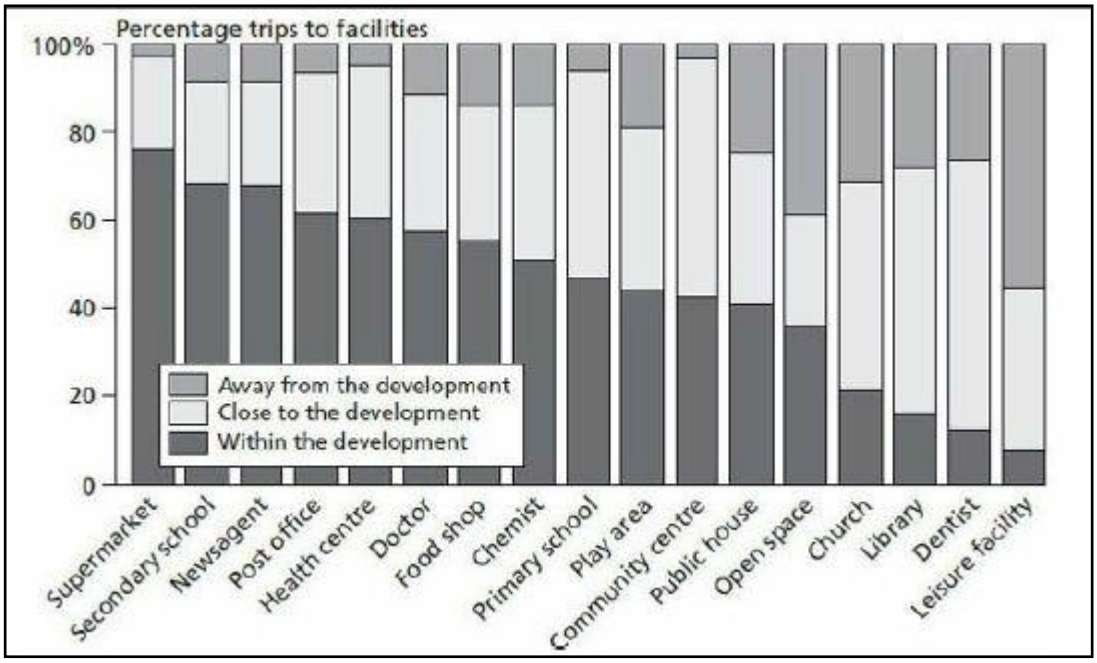


Figure 8: Percentage of Trips Made to Local Facilities

3.3 Summary of the chapter

Table 9: Summary of chapter three

References	Characteristics	Sustainability Dimensions	Definitions
(Rudlin & Falk, 2009), (Barton, 2000), (Wheeler & Beatley, 2014), (Kazimee, Brebbia, Martin-Duque, & Wadhwa, 2002), (Chena, Aceyb, & Laraca, 2014), (Karol & Brunner, 2009),	Make use of urban economies	Ec	This rule is based on the role that urban areas play in trading systems. Environmental efficiency depends upon matching up supply with demand. Green consumer products, waste recycling, public transport, etc, are only viable if they can find a market and it is in cities that the major markets exist
(Rudlin & Falk, 2009), (Barton, 2000), (Wheeler & Beatley, 2014), (Ritchie & Thomas, 2009), (Kazimee, Brebbia, Martin-Duque, & Wadhwa, 2002), (Falk & Carley, 2012)	Personal safety	S	Having personal safety for all residents, for different ages with different capability and physical abilities is the primary requirements of each neighborhood
(Rudlin & Falk, 2009), (Barton, 2000), (Wheeler & Beatley, 2014), (Ritchie & Thomas, 2009), (Kazimee, Brebbia, Martin-Duque, & Wadhwa, 2002), (Chena, Aceyb, & Laraca, 2014), (Engel-Yan, Chris, Saiz, & Pressnail, 2005), (Choguill, 2008)	Green space	En, S	Ecologically – amending micro-climate condition, support wildlife; Socially – making places more agreeable, consequently expanding the feeling of proprietorship, balancing urban streess, enhancing personal satisfaction and life quality; Economically –holding property values in light of a superior personal satisfaction
(Kazimee, Brebbia, Martin-Duque, & Wadhwa, 2002), (Engel-Yan, Chris, Saiz, & Pressnail, 2005), (Karol & Brunner, 2009), (Clark, 2001)	Building design and material	En,Ec	Reduce the energy demand to heat the spaces by utilizing the proper orientation, form and openings to achieve the best use of passive solar gain. Sustainable material plays a

			significant role toward sustainability
(Kazimee, Brebbia, Martin-Duque, & Wadhwa, 2002), (Chena, Aceyb, & Laraca, 2014), (UN-HABITAT, 2014), (Falk & Carley, 2012), (Karol & Brunner, 2009)	Mixed land-use	En, S, EC	Wide and diverse choice of facilities, housings and vibrant street life. Mixed land-use is an intrinsic part of the quidity of the neighborhood, and is a column of sustainable urban development
(Kazimee, Brebbia, Martin-Duque, & Wadhwa, 2002), (UN-HABITAT, 2014), (Falk & Carley, 2012), (Choguill,2008),	High level of walkability	En, S, EC	Well connected to jobs and services and adequate space for streets and an efficient street network.
(UN-HABITAT, 2014), (Falk & Carley, 2012), (Rudlin & Falk, 2009), (Government of Irland, 2009)	Places of different character and limited land-use specialization	S	This principle was created to modify / limit the use of functional zones by introducing mixed land use policies
(Kazimee, Brebbia, Martin-Duque, & Wadhwa, 2002), (Engel-Yan, Chris, Saiz, & Pressnail, 2005) , (Falk & Carley, 2012), (Karol & Brunner, 2009), (Government of Irland, 2009)	Designed to save resources	En,Ec	It should be ascertained that neighborhood is well managed and maintained so that it doesn't damage the environment
(Armstrong & Stratford, 2004), (Agyeman & Angus, 2003), (Falk & Carley, 2012), (Clark, 2(1), (Government of Irland, 2009), (Barton, 2000), (Rudlin & Falk, 2009)	Benefits of long-term stewardship, hands-on management & engaging local communities in discussion	S	About how they see their neighborhood and their priorities and aspirations for the future. The dialogue should be honest, open, ongoing and with a real commitment to changing plans and designs to reflect people's views. Successful communities have profited from great management from the beginning
(UN-HABITAT, 2014), (Falk & Carley, 2012), (Karol & Brunner, 2009), (Rudlin & Falk, 2009), (Government of Irland, 2009), (Barton, 2000)	Affordability and social mix	Ec,S	To unite the diverse social classes within the same community and guarantee accessibility to equal opportunity by providing different forms of housing .An affordable and accommodating city is a core feature of a sustainable

			city
(Kazimee, Brebbia, Martin-Duque, & Wadhwa, 2002), (Chena, Aceyb, & Laraca, 2014), (UN-HABITAT, 2014), (Karol & Brunner, 2009), (Choguill, 2008), (Rudlin & Falk, 2009)	High density	En,S,Ec	The reduction of using cars and enhancement of willingness of people to travel shorter distances for their shops and services need are the beneficial outcomes of increased residential densities. people who live within the vicinity of such services, will choose to walk to them rather than drive

Chapter 4

CASE STUDY: SUSTAINABILITY OF THE PERTEV PAŞA DISTRICT IN AŞAĞI MARAŞ (KATO VAROSHA), FAMAGUSTA

4.1 Introduction and Selected Characteristics

The methodology used for the case study investigation, examined to accumulate each data required was concentrated around both quantitative and qualitative methods which will be delineated in this part.

Foremost, it should be mentioned that, the overall site analysis (including 1.location and history,climate,vegetation,land use, lynch(city scale),lynch(local scale),building height,building condition, typology,figure ground, lost spaces,traffic and accessibility,permeability, area-beased proposal,building-based proposal,traffic proposal,(intervention proposal,design proposal,land use proposal) for shared space,agricultural institute,residential street,outdoor fitness,sport complex) and also proposal for the case study of this research have been done during the Fall Semester of 2013-2014 Academic Year as a part of Urban Design Studio II (UDES 502), which is one of the compulsory courses of MS in Urban Design Program in Department of Architecture, Faculty of Architecture at Eastern Mediterranean University (EMU). The studio course was run by Prof. Dr. Şebnem Onal Hoskara(who is the supervisor of this thesis), Prof. Dr.Naciye Doratli, Res. Assist. Muge Riza and the group comprised of five master students (Sobhan Hashemzadeh – the author of this thesis, Kamyar Lotfi,Sanaz Nezhadmasoum,Ebunoluwa

Akıngbaso,Ladan Tavangaran) who worked on the theme of the Improvement Project For The Local Center Pertev Paşa In Aşaği Maraş (Kato Varosha) - Famagusta. Thus, the initial site analyses and regarding proposals of this research has been provided by the stated maser class work (Appendix c).

To gain initial information toward various perspectives of sustainability, a questionnaire survey has been distributed to 70 residents of Pertev Paşa neighborhood. The objective of this research induced us to select the residents who are living there more than 5 years who conceive the strength and weakness of the neighboring zone better. The data obtained from the questionnaire survey were statistically examined to show the result of various existing environmental and social-economic condition.The majority of the respondents are within the ages of 12-54, a total of 75% and 20% are within 55 and above. High percent of young population, 67% of the respondents have attained secondary and college education with just 12% having tertiary education. Just an average level of education. Above 70% are TRNC-Turkish/Turkish and about 27% are TRNC with the majority (57%) have lived here over 20 years, which confirms the historical development of this district.

Beside questionnaire, a strong interview has been conducted to achieve more acceptable assessment.The interviewees was opted among 10 habitants who have lived there more than 10 years.Since the main aim of sustainable housing environment is boosting up the human life quality with long-term environmental and socio-economic objectives without considering the ability of further generations to achieve their needs ,interpretation of human demands and their own point of views

are at the pick point of aims. The interviewees was encouraged to easily indicated and highlighted the main neighborhood's problems and strengths.

Moreover, for more clarification on the obtained results, another method has also been used. This qualitative method is a visual site study. The visual site study has been operated by observation and photography which enhance the perception of the author over the desired area.

Based on literature review following characteristics has been chosen to achieve sustainable neighborhood (chapter 2, p. 51). Furthermore, by considering the fundamental motivation behind this survey, for assessing the current situation of case study toward sustainability and making decisions toward achieving a sustainable residential neighborhood in the mentioned neighborhood. Table (10) depicts demands.

Table 10: Demanded Characteristics along with their related sustainability dimension and evaluation methods

Characteristics of sustainable neighborhood	En	S	Ec	Evaluation Methods
Mixed land-use (En, S, Ec)	■	■	■	Site analyses, questionnaire, interview
High level of walkability (En, S, Ec)	■	■	■	Visual study & site analyses
High density (En,S,Ec)	■	■	■	Visual study & site analyses
Building design and material (En, Ec)	■		■	Visual study& site analyses & questionnaire
Designed to save resources (En,Ec)	■		■	Questionnaire & visual study & interview
Green space (En, S)	■	■		Visual study & site analyses
Affordability and social mix (Ec,S)		■	■	Questionnaire & interview
Places of different character and limited land-use specialization (S)		■		Visual study & site analyses
Benefits of long-term stewardship, hands-on management & engaging local communities in discussion (S)		■		Questionnaire & interview
Make use of urban economies (EC)			■	Questionnaire & visual study & interview
Personal safety (S)		■		Questionnaire & visual study & interview

4.2 General Information about Famagusta and Pertev Paşa District in Aşağı Maraş (Kato Varosha)

Cyprus is the third biggest island in the Mediterranean sea with 9.251 km2 area. It has a vital area situated as it is at the notable junction of trade and culture in the area (Hoşkara, Çavuşoğlu, & Öngül, 2009). Famagusta placed on the eastern shoreline of Cyprus, is the second biggest city of the island with a nearly 35,000 residents. It has extraordinary too many opportunities since it is known as a Mediterranean city on the

island with a rich differences of social, environmental and local attributes (Asilsoy, 2012 and Hoşkara, Çavuşoğlu, & Öngül, 2009). Particularly the neighborhood customs and traditions that have a significant role in sustaining character. Famagusta has confronted a quick, unsustainable urban development after 1970's that diminished all these nearby, social and natural qualities.Gazimagusa consist of four main parts (figure 8):

(1) The Walled City

(2) Asagi Maras region —area which has been expanded predominantly by the Greek Cypriots

(3) The Maras region — an impressively expansive area which has been prohibited to residents since 1974

(4) The newly developed quarters to the north-west of the Walls (Önal, Dağlı, & Doratlı, 1999).

> "The history and urban development of Gazimagusa date back to the first century AD and the contemporary city have developed throughout seven particular periods: the early periods (648-1192 AD — the foundation of the city); the Lusignan (1192-1489): the Venetian (1489-1571); the Ottoman (1571 -1878): the British (1878-1960); 1960-1974; and the period after the war in 1974" (Önal, Dağlı, & Doratlı, 1999).

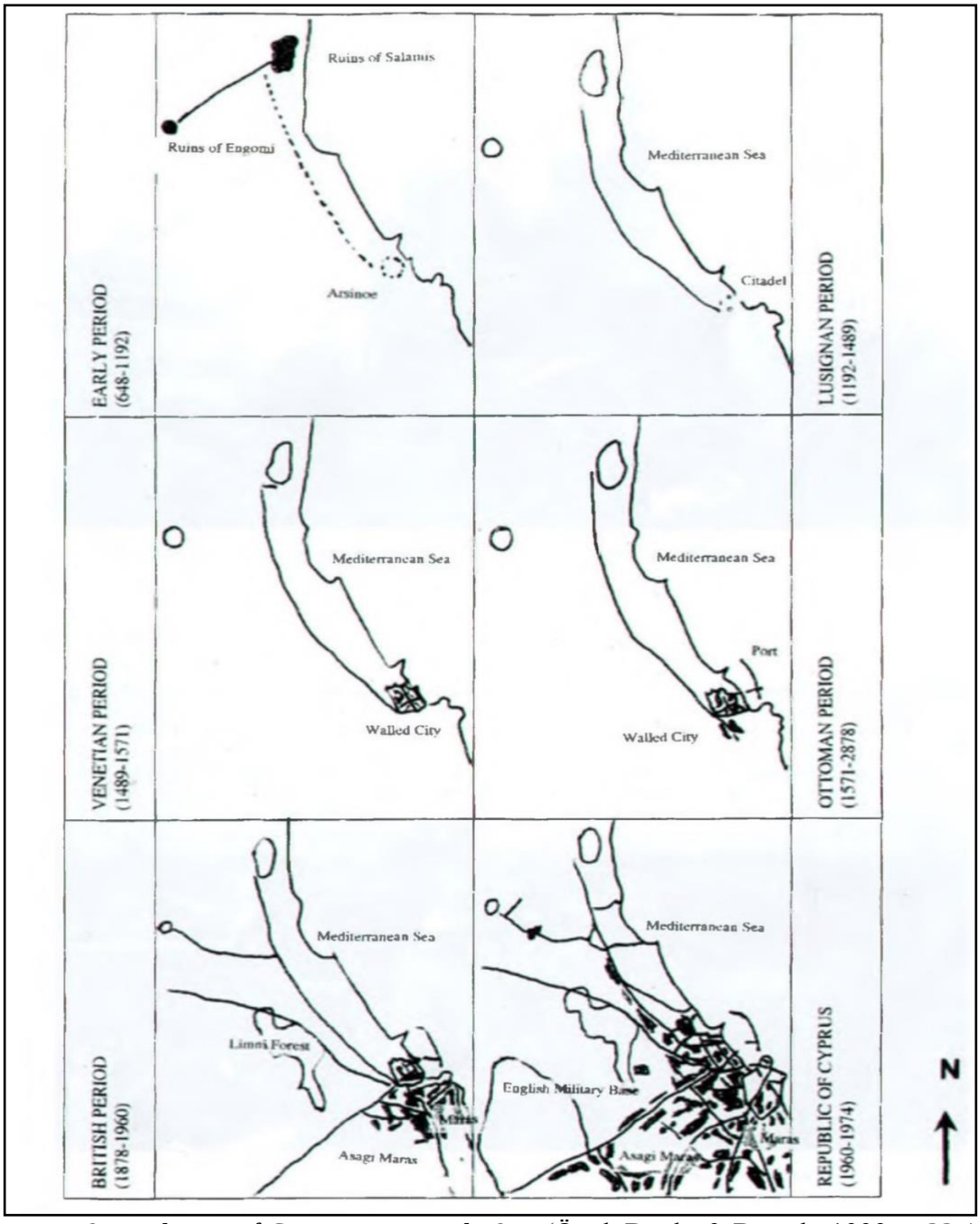


Figure 9: Evolution of Gazimagusa until 1974 (Önal, Dağlı, & Doratlı, 1999, P.337)

In 1878 The Ottomans rented the Island to the British and in 1910 it turned into a colonial state of the British Empire. In this era, both Greeks and Turks were living together, the port of Famagusta was achieving vital magnetic point for the Famagusta. Development of the city outside the Walls increased towards the south. The Turkish Cypriots were existing inside the Walls and the Greek Cypriots outside

the Walls in the Maras and Asagi Maras regions. Development of the city in this period was predominantly towards Maras, since the major financial issues were controlled by the Greek Cypriots in this part where there existed proper chances to embed them.The British left the Island In 1960 and the Republic of Cyprus was established.

The occurrence of 1974 induce to separation of Turkish and Greek Cypriots.This happening deteriorate the socio-economic ,political ,and physical situation of famagusta.Likewise the population of tourists who annually travel to this area intensively reduced.The situation of Kato Varosha (Asagi Maras) led to ban further developement twoards suth. Accordingly ,north was allocated for the new developeents(Doratli et. al 2001; Oktay 2005). The surplus lodging stock left empty by the flight of the Greek occupants was in the long run filled by the pioneer populace from Turkish Anatolia and the outcasts from the southern part. Albeit, as normal in most circumstances, the demographics of the island had changed definitely in the period promptly after the war, the spatial arrangement did not change much (Oktay & Conteh, 2007).

City after 1974: With the foundation of the High Institute of Technology in 1979 (later the Eastern Mediterranean University), the general financial and social structure of Gazimagusa has experienced a fast development (Önal, Dağlı, & Doratlı, 1999).

Since Maras was out of utilization and residence, the conventional center in the walled city demonstrated the advancement and development inclinations which consist of large amount of vegetable and fruit lands.

In Asagi Maras, which were abandoned by the Greek Cypriots, were possessed by the Turkish Cypriots who had relocated from the south of the Island. There was additionally a flood of Turkish individuals from the Turkish territory.

“The most important reason for settling people in Asagi Maras region was to provide efficient care for the already existing agricultural area and citrus orchards” (Önal, Dağlı, & Doratlı, 1999) .For this reason, an individual house was assigned for every family while farming fields and enclosures were dispersed. Additionally, new private quarters (restricted in number) created to the southwest and north-west of the Walls. In this manner, the broken social structure began to rearrange and reshape itself under this impact of recovery so as to capacity as a city once more (Önal, Dağlı, & Doratlı, 1999).

The city after 1986: The change of the High Institute of Technology to Eastern Mediterranean University (EMU), generate new development and improvement inclines in the city. Because of the absence of any master plan , the city has not been ready to accommodate the expanding students and academic staffs.The fundamental change in the general structure of Gazimagusa was in the redirection of the development — which was predominantly towards the south before 1974 — towards the University in an opposite direction (northwest).Until 1986 the housing development in the city was primarily horizontal which was maximum two residential buildings. Requiring enough accommodation induce to provide more vertical development after 1986 (figure 10).

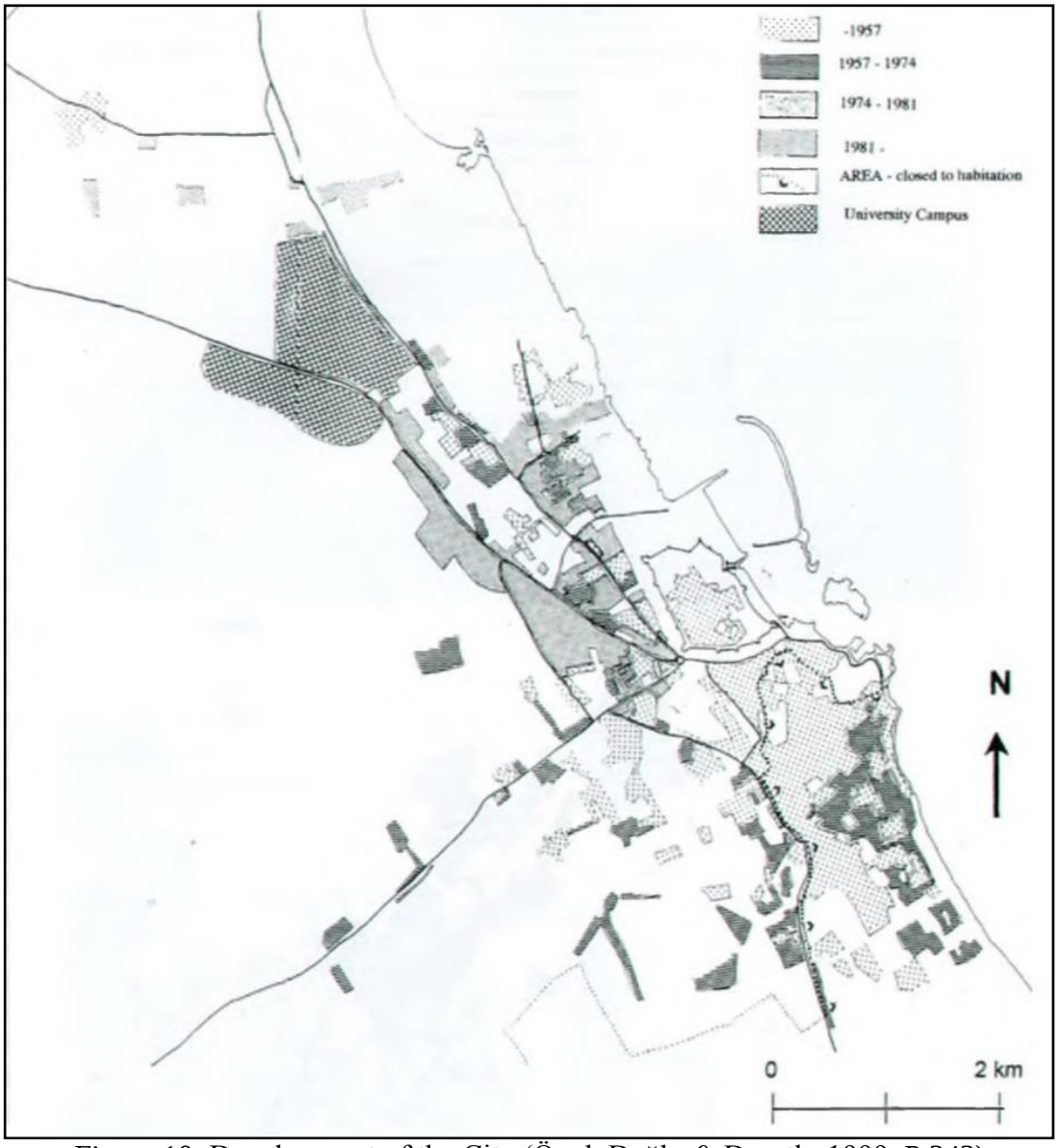


Figure 10: Development of the City (Önal, Dağlı, & Doratlı, 1999, P.343)

In the Asagi Maras district, cause of being vicinity of the prohibited area of closed Maras and also vague future ownership and political problems in this area, a very few new housing developments and additions to the existing ones happened (Önal, Dağlı, & Doratlı, 1999). However, provision of housing, which is the answer to the amount of demands has been just developed housing units without consideration of life quality.

The city encountered two defining moments regarding urban development: development after 1974, and development after 1986. As a consequence of this unseemly and unsustainable urban advancement, the city manages another method for living to its tenants that is not recognizable to them. Lack of urban structure and design and also lack of the sufficient strategies and organizations to improve the nature and to decidedly impact ecological maintenance and practices intensely are required. In this setting, executing techniques towards sustainable ways of life among the Famagusta occupants shows up as a possibly vital need (Asilsoy, 2012).Since no master plan exists, these developments demonstrate a quickened sprawl for shops, restaurants, bistros, bars, discos, clothing administration shops, and so on all through the city. Hence, this sort of improvement has brought about a few types of lacks which can be summed up to the following issues :

- Since their situating is totally subject to the choices of private financial stakeholders, frequently physical environment is adversely influenced
- Lack of parking area and undirected chaos traffic
- Private development and neglected nature of the physical environment;
- Lack of existence of any main city center as a main focal point of the city (Önal, Dağlı, & Doratlı, 1999)

Maras , is located at the south part of Famagusta and it consists of two main parts which are : Maras and Asagi Maras .The first one has been prohibited to the people and any social activities since 1974 and the second one is one of the pre-planned residential districts of the Famagusta. In general, Asagi Mars has been shaped by mainly one or two story single family detached and semi detached housing with private sites.Asagi Maras is consisted of eight quarters, which are: Canbulat, Harika,

Anadolu, Lalamustafapasa, Pertevpasha, Piyalepasa, Namikkemal, and Zafer. Our case study (Pertevpasa) is located at the geometric center of this area (figure 10) surrounded by Canbulat neighborhood northward, Harika from south, and toward west Zafer and Piyalepasa. The majority of residential buildings belongs to the Canbulat neighborhood (651 unit) and the minority dedicated to the Harika neighborhood with approximately 103 units. Pertevpasa roughly has 270 unit residential buildings which are mainly semi-detached. Most of them has made of reinforced concrete and brick with maximum 2 story height.

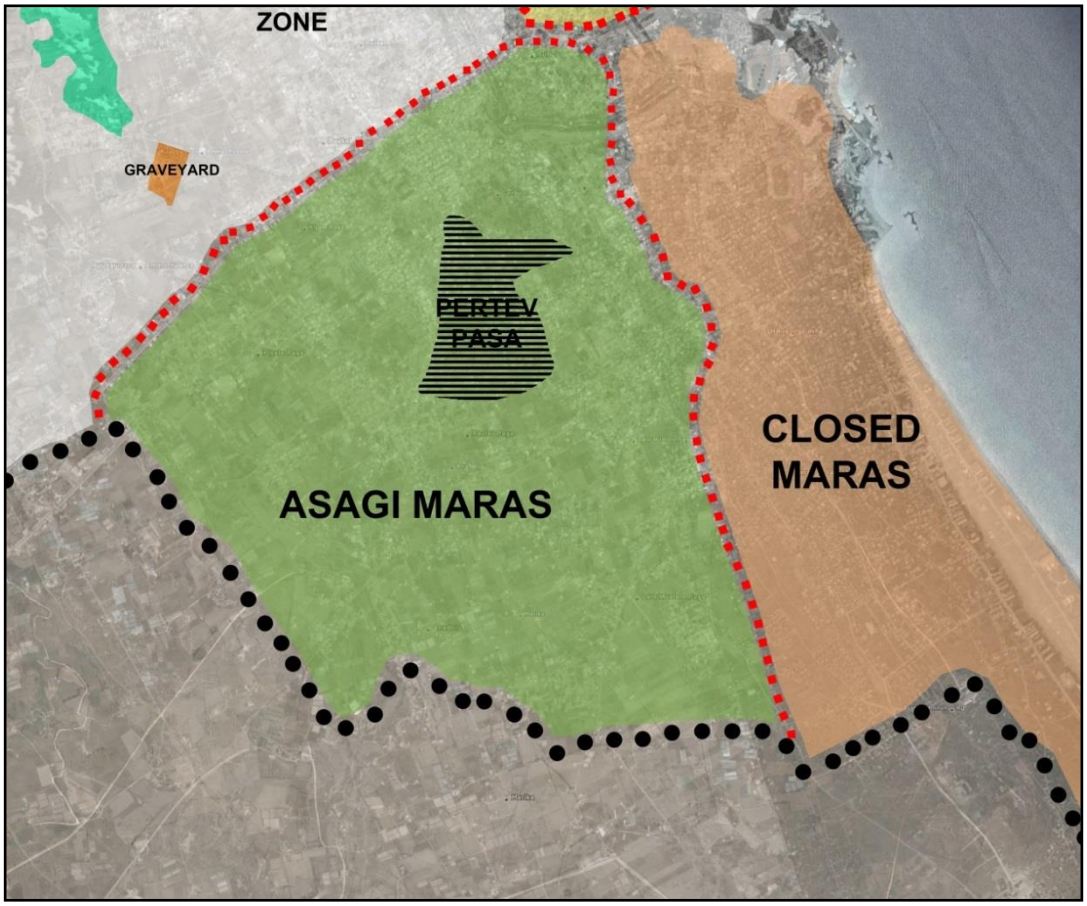


Figure 11: Pertev Paşa location

4.3 Evaluating Sustainability Measures In Pertev Paşa

Although almost all the characteristics have common roots in sustainability dimensions, but in this research has tried to put them in an order inwich all characteristics are more near to them, therefor as it has shown the analyses divided to three parts which are, environmental analyses, economic analyses, and social analyses.

Mixed land-use and has places of different character and limited land-use specialization: Mixed land-use support to establish local economy and jobs, increase independence, supply adjacent public services, enrich and encourage walkability and cycling that directly and indirectly support the environmental sustainability.

By looking at the land use map (in appendix c) it is obviously conceivable that mixed-functions are incompatibly concentrated at the neighborhood center (figure 19). Centralized functions along with inappropriate street and pedestrians led to increase car-dependency. Unsuitable place of workshops more and more highlighted the problems. Lacking of some required basic needs contributes to commute to city center most of the time by car.

Figure 12: Incompatible Mixed Land-Uses

Existence of elementary school, supermarkets, cafes, restaurants, butchery can refer to strength and positive points of this housing environment.result of the questionnaire showed that 67% of habitant are demanding to have more facility such as, sport complex, greenery, shopping center, health center, and bank.Absence of these facilities leads to travel to the city center frequently(figure 19, 20). Interviewees insist that lack of bank and park intensively are felt.

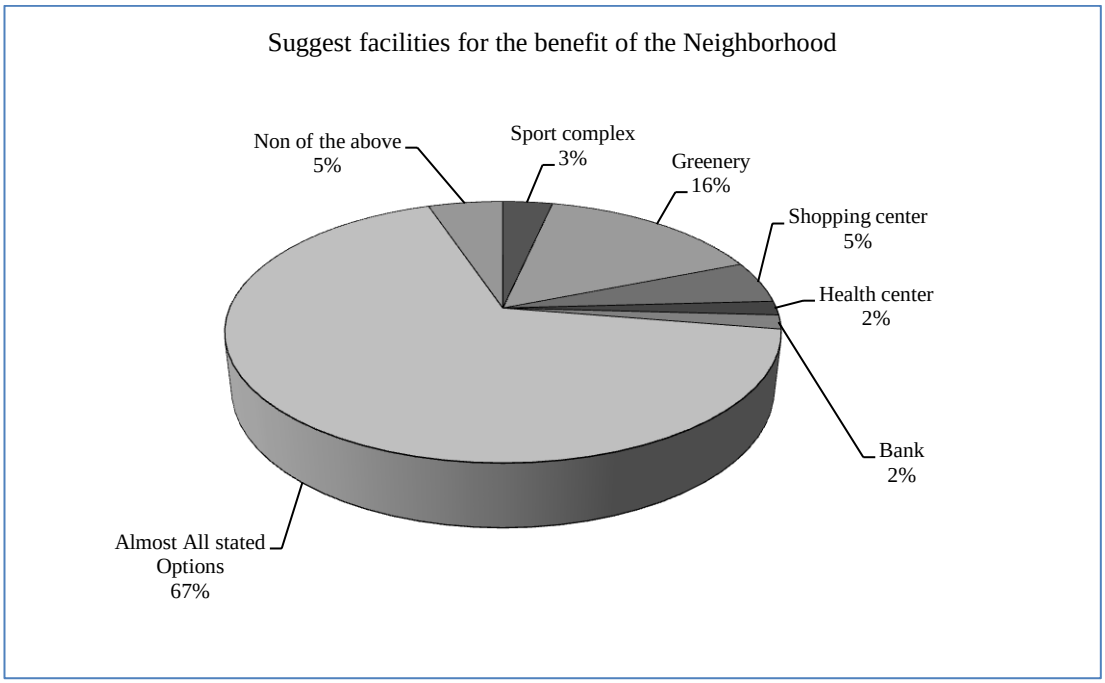


Figure 13: Demanded Facilities Stated by Residents

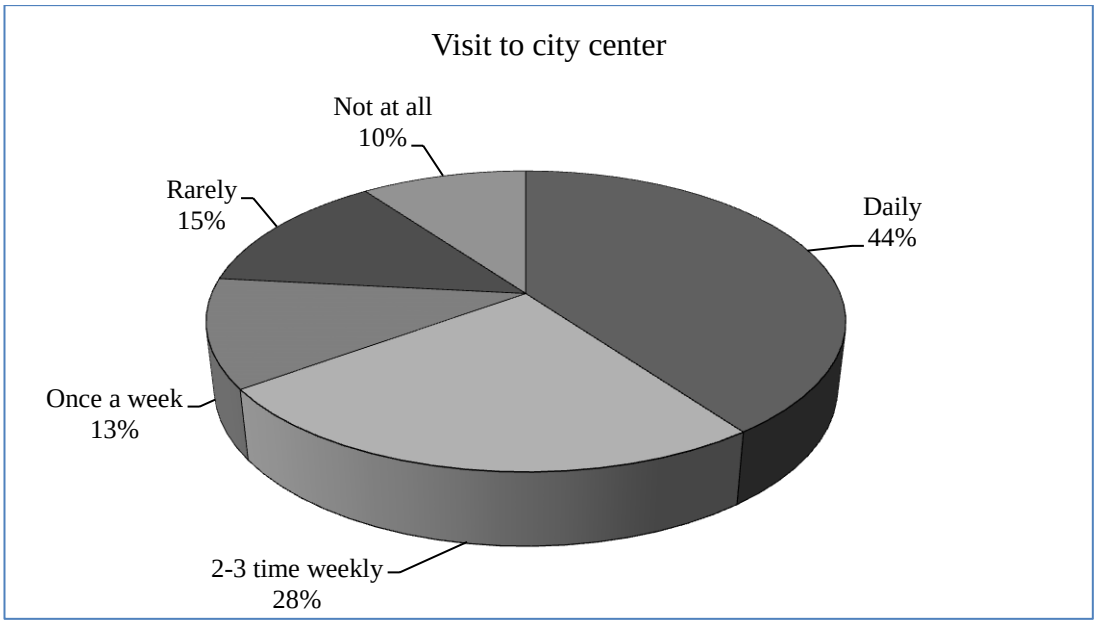


Figure 14: frequency of visiting city center by neighborhood residents

High level of walkability

In accordance with traffic and accessibility map (appendix c) generally the neighborhood is accessible with two way roads, but developing buildings among agricultural lands culminated in having numerous Cul-De-Sacs. The junction between pedestrian and crossroads are not sufficient and create dangerous junctions. Figure grounds map (appendix c) illustrate that most of the area is occupied by dispersed building which have been built haphazardly. Legibility map specified that area involved two main parts which are residential district and vast agricultural lands.From the legibility point of view this neighborhood embed two main landmarks which are Ulucami and Corap Fabrikasi (figure 22).

Figure 15: Exsiststance of Two Landsmark In The Neighborhood

Transportation can be classified into 4 mods:

- Public transport (i.e. Bus and Taxis)
- Private cars
- Walking
- Cycling

The neighborhood is suffering from lack of appropriate public transportation, especially bus or minibus.There are just taxis with non cost-effectiveness rent prices. Commuting with private cars is dominant, so that 79% of residents mentioned that they mostly use their own cars.lack of bicycle line , inappropriate streets and also lack of lighting at night, inadequate diversity of use, inappropriate pavements, diminish the willingness of habitant to be encouraged in walking and cycling.Respondendent mentioned that mostly their occupation is out of the neighborhood and they commute there by their own car (figure23)

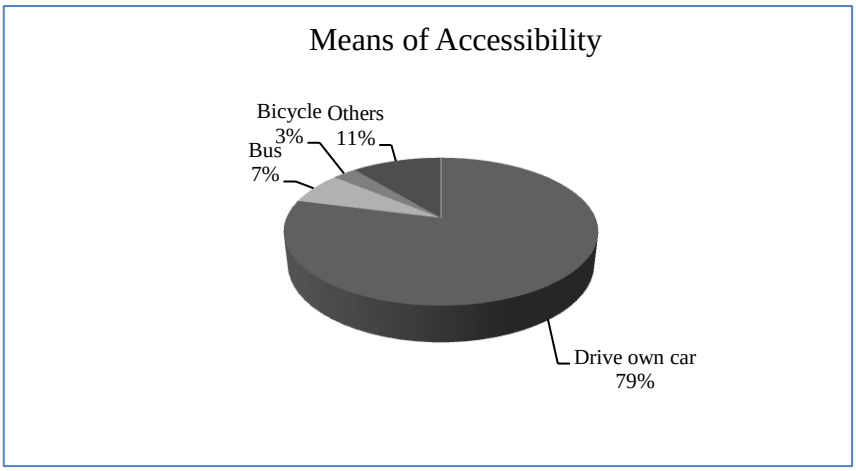


Figure 16: Common means of accessibility by residents

Lack of parking area and even lack of on-street parkings led to have aesthetically very awful perspectives. Lots of houses prepared inappropriate off-street parkings for themselves (figure 24). Additionally the lack of adequate, legible traffic signs also adds to neighborhood problems. There is no any measure to reduce traffic speed whether vertical or horizontal.

Figure 17: Lack Of Parking Area And Inadequate Man-made Parking For Houses

Density

Gross residential density has been applied to measure the density of the area since it measures general net residential density along with effect of land use at the

neighborhood scale. This way of calculating residential density show the real human experience of a desired place can be valuable if your motivation is to comprehend more extensive issues, for example, walkability. Local center of PERTEV PAŞA includes approximately 230 housing units. Neighborhood Area is calculated by Auto-Cad software which outcome is 90 hectares. Accordingly Gross residential density will equal to the number of residential units (230) over the neighborhood area (90 hectare).

270/90=3 Unit/Hectare

According to the last census population of this area is 1026 person therefore the net population density is:

1026/222 (Acre) =4. 6 ppa

In comparison to the other planned policies in different urban areas, it is clear enough to conceive density of Pertev Pasa neighborhood is too far from them. To illustrate, in Melbourne the ordinary net residential density is 8-10 d/ha but the policy is to attain 15 d/ha and in Perth is to achieve 15-25 d/ha.likewise in USA the policy is to gain 15-50 d/h in neighborhood planning. In a like manner UK principles of suburban developments was 25d/ha but recently its increased to reach 30 dwellings per hectare.Also Barton *et al*. (1995) in Biddulph, 2007 mentioned that minimum net residential density to have economical bus service is 100 people per hectare or 40-50 d/ha (i.e. Französisches Viertel in Tübingen in Germany has supported various ranges of public services which has 60d/ ha (Biddulph, 2007, P.111).

Building Design And Materials (Home Energy Efficiency) Almost all the constructions have been made of brick and reinforce concrete without any insulation. The old structure of the houses(building condition map in appendix c), one glazing windows, non-airtight envelopes, are reasonable enough to make the residents inconvenient (38%).

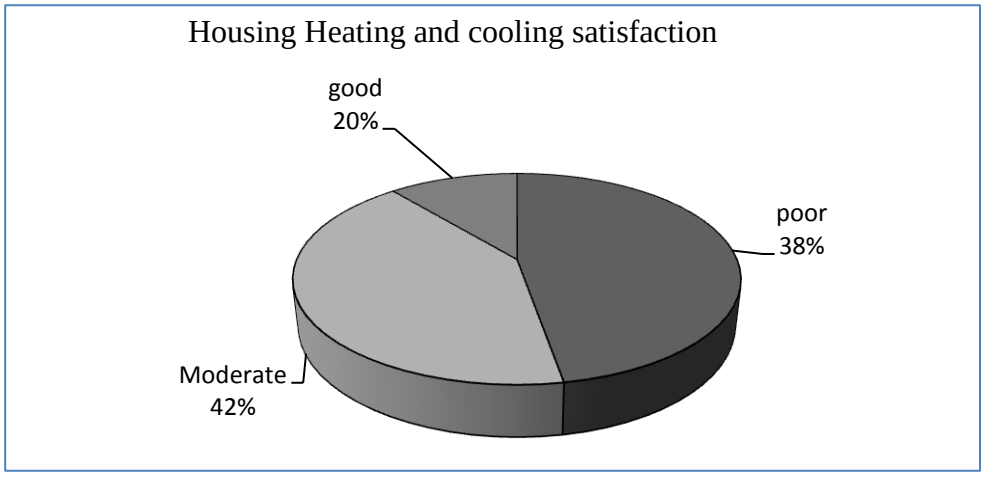


Figure 18: Satisfactions of residents toward Heating and cooling of houses

The housing orientations not only can affect the level of daylight and sunlight penetration to the different spaces but can directly affect the energy demand for heating and lighting.lack of master plan induce to place buildings in different incorrect rotations. Solar collectors also is used by not more than half of the house (42%)(figure 18).

Figure 19: Different Incorrect Rotation Of Buildings

Designed to save resources

- **Waste management**

Finding the proper site for waste disposal is one of the most significant issues in solid waste management which needs to be assessed carefully. According to Kara & Doratli in 2012 "Landfill site selection (LSS) in urban or rural areas is a critical issue for the planning process because of its enormous impact on the economy, ecology and the environmental health of the region".

164 Settlements (combination of cities and villages).exist in Northern Cyprus with twenty eight municipalities. 117 settlements have this opportunity that their wastes are collected and will be dropped in 23 open dumps (Figure 11).Moreover, waste of 20 settlements is collected by a private company. For the 27 left settlements, the waste is not legitimately gathered. Without waste gathering administrations, the waste is dumped at accommodation by the occupants. Open dumps in the Northern Cyprus are the reason for some natural issues and wellbeing dangers. The principle issues are surface water and groundwater contamination, air emanations and smell issues, litter and visual defilement, and wellbeing dangers because of uncontrolled risky and restorative waste disposal.

> "According to the Master Plan on Solid Waste Management in the Turkish Cypriot Community (MPSWMTCC, 2008), the average generation of municipal waste (includes household and commercial waste) in Northern Cyprus is about 400 kg per capita per year. The evaluated annual generation of municipal waste is approximately 107 thousand tons and makes up about 37% of the total waste amount generated per year, which is approximately 291 thousand tons. Based on 1.4 percent average annual population growth and 3.2 percent Gross Domestic Product growth rates, the amount of solid waste existing in 25 years was projected as 1,836,641 tons. Moreover, the area required for the central landfill site was calculated approximately as 190000m2 (19ha) for the next 25 years (2008 to 2033) in the study area. MPSWMTCC (2008) emphasized that more than one landfill site for Northern Cyprus would not be cost-effective. Consequently, a single LSS is considered within the study area" (Kara & Doratli, 2012).

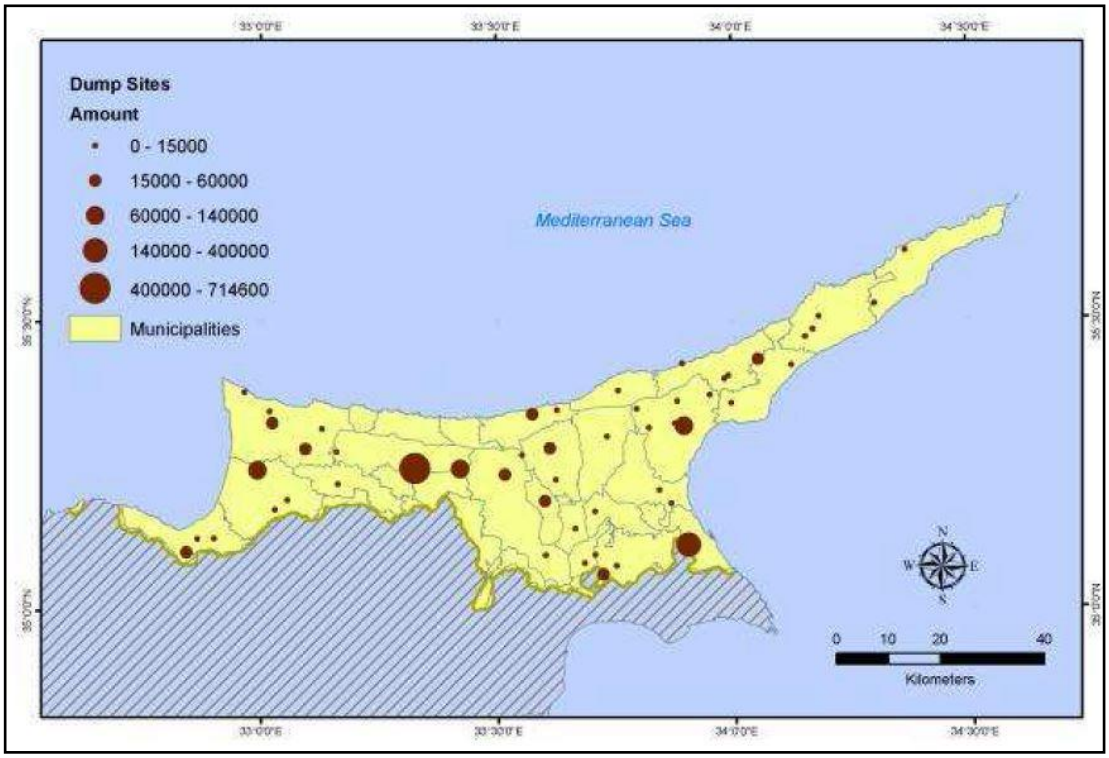


Figure 20: location of open dumps in North Cyprus (Kara & Doratli, 2012, P.24)

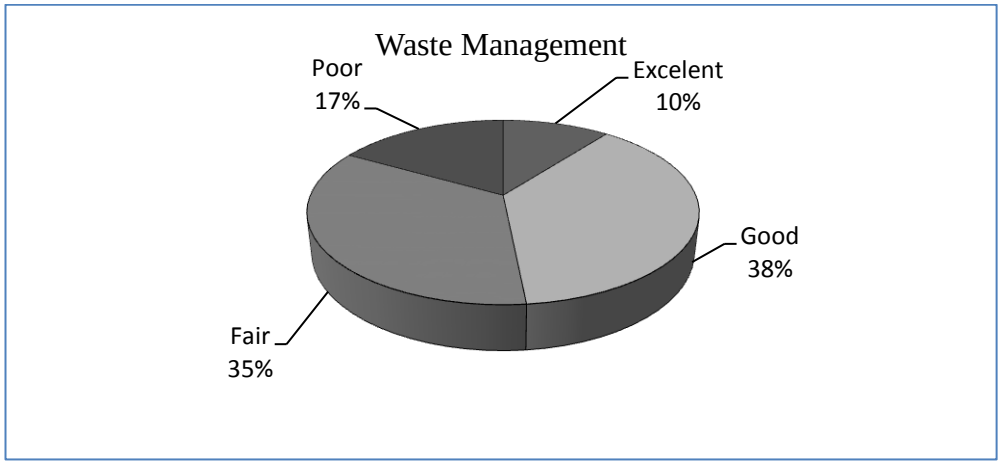


Figure 21: perception of residents toward waste management quality in neighborhood

According to the figure (13) half of the respondents implies that waste management of this area is inadequate.Observation shows that inappropriate location,type and size

of the dustbins negatively affect the aesthetic view, and environmental pollution of the area (figure 14).

Figure 22: Quality of Waste Management in Neighborhood

- **Water Management** The procurement of sufficient consumable water, and the safe disposal of storm waters and human waste waters play a significant role in a healthy neighborhood.

The survey, conducted with (n=45) 65% residents in the environment demonstrate that the majority of them strongly have the impression that the poor water quality and inadequate source of waters affect both residents and agricultural lands. They indicate that salty water of housings suffer them and somehow leads to hair loss.Inadequate source of water impressively limited the agricultural activities and wide fertile soil of the neighborhood gradually converted to the lost spaces.Inappropriate design and un-managed streets over the decade inwich drainage system and sloped surfaces for guiding and managing stormwaters leads to widespread rainstorm accumulation (figure 15).

Figure 23: Stormwater management in neighborhood

Greenery

Having both Mediterranean climate and Large and fertile expanse of agricultural land induce to embed a variety of fruit species like orange, fig, pomegranate in this neighborhood(vegetation map in appendix c). Palm and Pine are two significant trees which have been distributed widely along the neighborhood.majority of the houses has private gardens with a variety of plants and fruits. Although this area benefit from superiorities such as striking fertile and Mediterranean weather, insufficient management and local organization create a disturbing perspective and left over land throughout the neighborhood (figure 16).

Figure 24: Unmanaged Greenery Twoard Neighborhood Street

Affordability and social mix:

According to figure (27) often rental payment does not exceed over the 500 T. Lira which has provided an affordable situation for residents. Meanwhile habitants confirms that housing price (32%) in this neighborhood is one of the main reasons

that from the economic point of view keep them in this area. Likewise vague future of Asagi Maras contributes to create not secure land for investment.Both Government

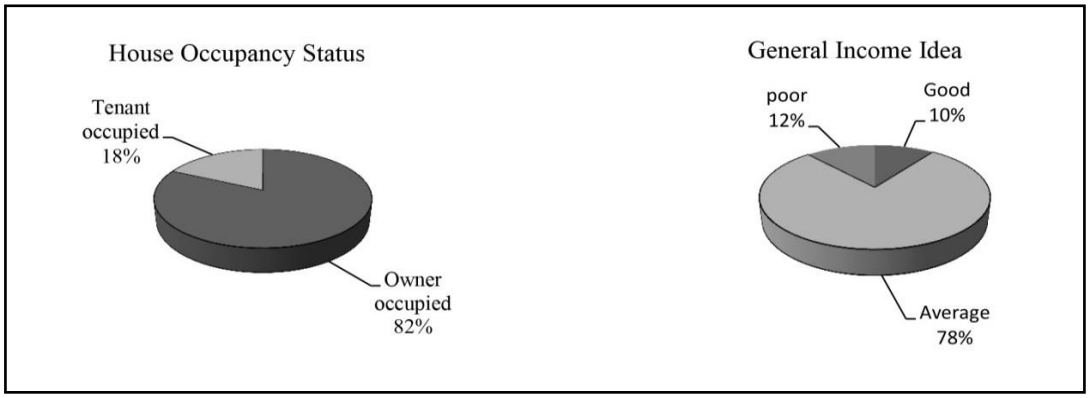


Figure 25: Situation Of House Occupancy In Neighborhood- Figure 26: General income idea of neighborhood residents

and stakeholders are unwilling to invest in this area.Accordingly, over decades' development in this neighborhood epitomized to just construct less than five apartment buildings by private stakeholders and one recreational complex building.The largest amount of vacant lands and vacant houses is a distinct proof for absence of investment.

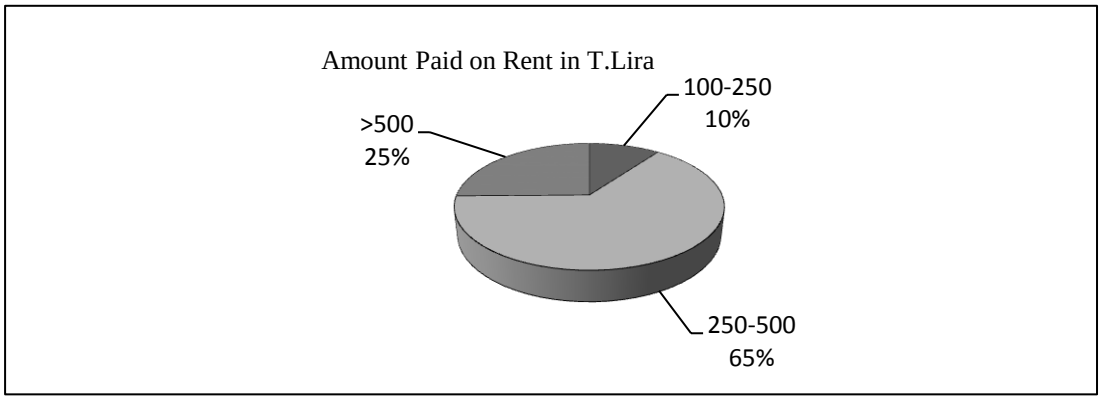


Figure 27: average amount paid for rent in T. Lira of the residents

Benefits from long-term stewardship and hands-on management (Participatory decision making, government support, vision, action plan, and stewardship): As already its stated in the previous pages, cause of political issues neighborhood continues its life in a critical situation. Negligible stewardship at local and governmental level along with lack of action plan and minimum support and investment, undoubtedly are the main reasons which have limited the housing environment in a deteriorating condition (figure 31). Somehow it is tangible that the only investment of government during past decades till now is Magem (sport and recreational complex). In a like manner, when people were asked about their participation in community life, the answers weren't unpredictable. During the last few decades, they have never been investigated or evaluated by any governmental agency.

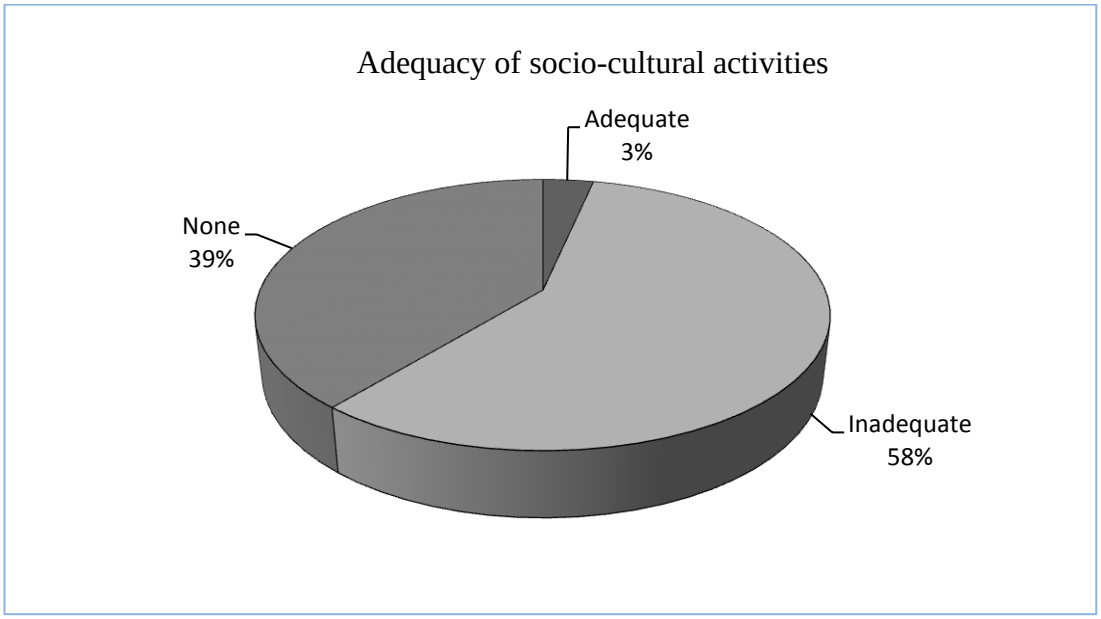


Figure 28: perception of residents toward adequacy of socio-cultural activities

Make use of Urban Economies (Economic Condition, Diversity, and Access to the Markets)

Although economic diversity is not limited to the neighborhood scale, generally according to the respondents, they have various occupations. Among these professions, it was discovered that artisans have the highest percentage, followed by retirees, and government officers. In neighborhood scale, there are some wide agricultural lands in which there are some agricultural activities.the desired area doesn't have any attractive economic trade center.There are just some retail activities which can somehow provide basic needs.lack of policies on provision of local products leads to forget this opportunity for the neighborhood.

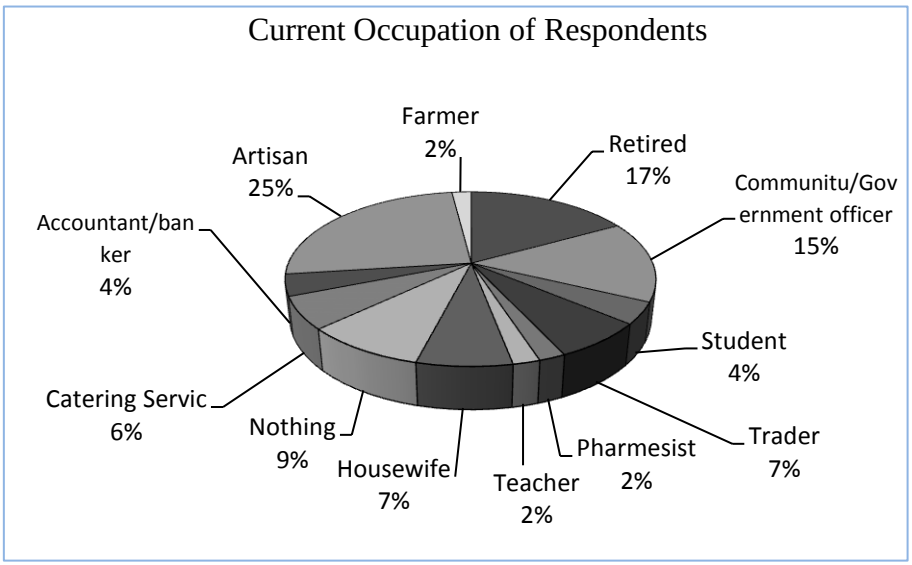


Figure 29: Current Occupation of Respondents

Respondents satisfaction about their incomes indicate that the majority of residents is convinced with their financial situation, and survey ascertains that the majority of residences (82%) are owners (figure 30).

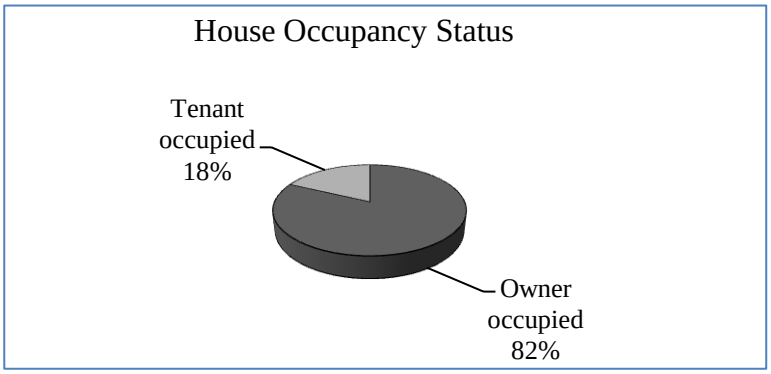


Figure 30: House occupancy status

Safety: One of the most significant criteria wherein human is living is safety with high level of security. As mentioned by residents, neighborhood in terms of safety and quietness is settled in a desirable position(figure 31).

Interviews reveal that habitant are suffering and concerning about the existence of betting office which leads to distribute antisocial behaviors and negatively affect people, especially youths. Lack of recreational and sport facilities also is stated that is one of the serious issues which is partly responsible for tending youths to anti-social, bad habited.

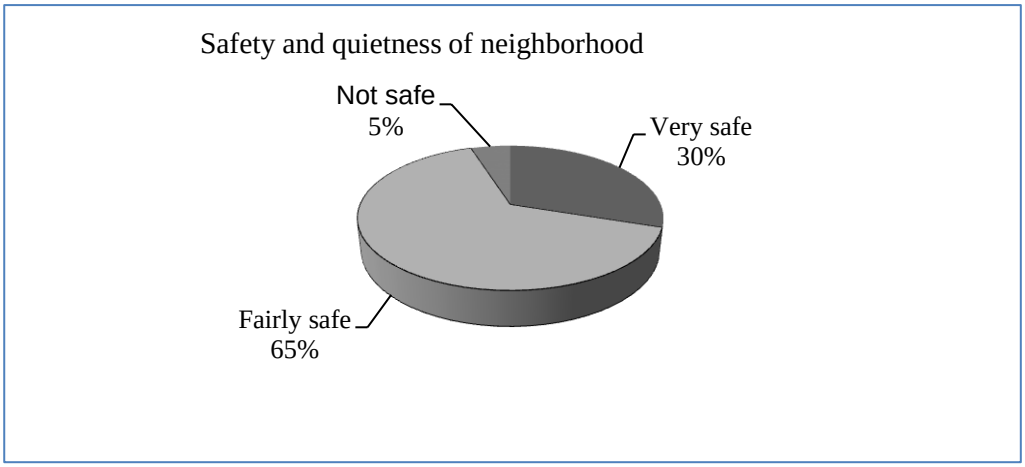


Figure 31: Perception of residents toward safety and quietness of neighborhood

Visual studies, questionnaires and interviews affirm that maintenance and quality of roads, sidewalks and streets are unsatisfactory (figure 32).

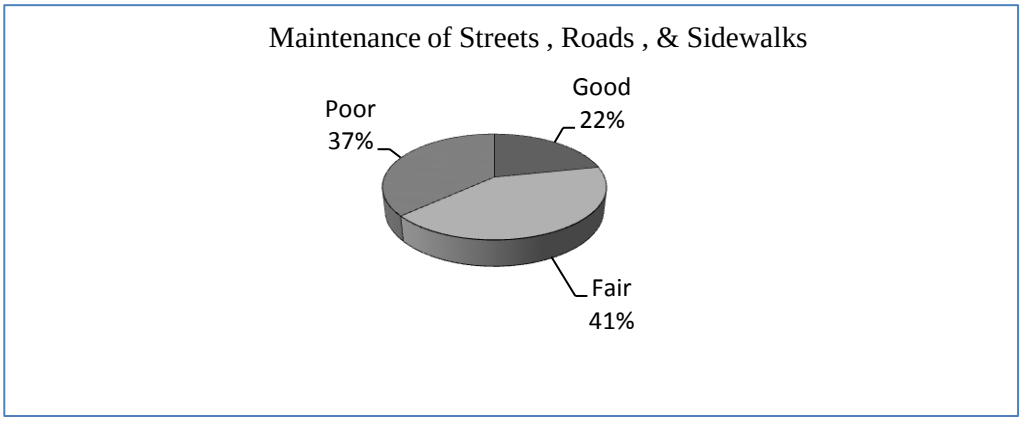


Figure 32: perception of residents twoard maintenance of streets ,roads,and sidewalks

To illustrate, very narrow sidewalks, inappropriate poles places, inappropriate and ruined pavements, in some parts lack of pedestrian, bumpy and rough streets are some deficiencies(figure 33) .

Figure 33: Existing Situation of Streets And Pedestrians

Likewise, 68% of respondent mention that lack of lighting at night is a considerable urgent deficiency which make a dead space throughout the outdoor spaces. With

regard to many retired and old populations, risky, dangerous urban spaces have been generated and even minimum design criteria are not considered.

4.4 Summary of Evaluations and Findings

Almost all the selected characteristics of sustainable neighborhood have been analyzed in Pertev Paşa district as a pilot one to illustrate the general status of sustainability in Aşağı Maraş. Although the goal of this thesis is not to measure the sustainability level, but the deficiencies of sustainable neighborhood characteristics illustratively depict the existing situation. In following table (Table 11) outline of analyses' results divided in two separate attributes which are positive and negative viewpoints. Likewise, general evaluation roughly explain the status of desired characteristics in the area.

Table 11: Evaluation and findings

Characteristics of sustainable neighborhood	Positive Points	Negative Points	General Evaluations	Status		
				Good	Fair	Bad
Make use of urban economies (Ec)	• Sufficient income • The majority of residents are owners • Large and fertile expanse of agricultural land and fruit plants	• Lack of policies on provision of local products and support local activities • Doesn't have any attractive economic trade center • The vague future of Asagi Maras contributes to create not secure land for investment	Although Area has good potential but it is suffering about lack of using proceedings and measures which improve local economies			■
Personal safety (S)	• Good level of safety and quietness	• Inappropriate sidewalks, pavement • Lack of sufficient lighting at night time • Evolving anti-social and bad habit behavior because lack of recreational activity and places for youth • Lack of street furnitures	Level of security is appreciable but as it is mentioned in negative points there too much deficacies toward safety		■	
Green space (En, S)	•Having both Mediterranean climate and Large and fertile expanse of agricultural land •The majority of the houses has private gardens with a variety of plants and fruits	• Insufficient management and local organization create a disturbing perspective and left over land throughout the neighborhood.	The potential is good, but low level of green spaces in public spaces is easily conceivable			■
Building design and material(En,Ec)	_____	• Constructions have been made of brick and reinforce concrete without any insulation • Old structure of the houses	Poor level of building design and material contribute to more use of energy and more waste of			■

		• Single glazing windows • non-airtight envelopes • Buildings in different incorrect rotations • The majority of the houses doesn't have solar collectors • No PV panels	energy			
Mixed land-use (En, S, Ec)	• Existence of elementary school, supermarkets , cafes, restaurants, butchery	• Mixed-functions are incompatibly concentrated at the neighborhood center • Unsuitable place of workshops • Lacking of some required basic needs contributes to commute to city center most of the time by car • Lack of sport complex, greenery, park, shopping center, health center, and bank	Insufficient		■	
High level of walkability(En, S, Ec)	• The neighborhood is accessible with two-way roads	• Developing buildings among agricultural lands culminated in having numerous Cul-De-Sacs • Dangerous junctions between pedestrian and crossroads • Area is occupied by dispersed building which have been built haphazardly • Lack of public transportation • Taxis with non cost-effectiveness rent prices • Lack of bicycle line, street furnitures and light, inappropriate pavements, inadequate diversity of use • Lack of adequate, legible traffic signs • No any measure to reduce traffic speed whether vertical or horizontal • Lack Of Parking Area And Inadequate Man-made Parking For Houses	Low level of walkability			■
Has places of different character and limited land-use	_____	• Neighborhood and blocks with incompatible mixed land uses • lack of land-use zoning urban policy and local policies	İnappropriate and insufficient			■

specialization(En,S)		• Lack of sufficient mixed-use has made a mono-functioning neighborhood • Low level of design quality make monotonous area from different points of view				
Is designed to save resources(En,Ec)	————	• Inadequate waste management • İnadequate type, size, and location of dustbins • Environmental pollution by waste and workshops • Poor water quality and inadequate source of waters affect both residents and agricultural lands • Inadequate drainage system • Lack of recycling organization • Nonexistence of water reuse system • Lack of policy for reducing input and local power use	Saving resources are neglected			■
Benefits of long-term stewardship, hands-on management & engaging local communities in discussion (S)	•The only investment of government during past decades till now is Magem (sport and recreational complex).	• The neighborhood continues its life in a critical situation • Negligible stewardship at local and governmental level along with lack of action plan • Minimum support and investment	Almost no-existed			■
Affordability and social mix(Ec,S)	•Affordable housing price(buying and renting)	• Lack of different form of housing for diverse social classes • Lack of socio-spatial vision	Affordable housing is existed but becouse of low quality of housing it is not adequate		■	
High density (En, S, Ec)	————	• Large amount of vacant lands and vacant houses • Very low level of residential density (3uph) and also population density (4.6pph)	Vast lost spaces are illustrative enough to show inappropriate low density			■

Chapter 5

CONCLUSION AND RECOMMENDATIONS

A neighborhood as a fundamental building block of the community plays a crucial role to define sustainability for the large scale of urban areas. Undoubtedly, without having sustainable neighborhood, achieving the sustainable cities is impossible and global sustainability will become not more than an illusion. The neighborhood is a unit in which social interactions occur daily and directly is in association with people who are living there. They use energy to commute, to heat or cool housings, to lightening the spaces. Neighborhood involve and create a place in which investments, buying and selling, occupation are continuing.

Asagi Maras as one of the primary developed areas in North Cyprus has faced too many problems since it is located in a very vague political situation. According to this possibility that it might belong to the south Cyprus in the future, has created fear of losing the area and properties since few past decades; but we cannot ignore the significance of environmental and socio-economic issues which gripped the area and day to day are increasing so that, not only it stays away from the sustainability criteria but also diminishing quality of life will lead to have haunted neighborhood in future. Vast agricultural lands, sustaining own traditions and place at a situation which have great access from other parts of the city, and high level of affordability are just some examples which specify the significance of keeping this area dynamic and alive.

This research has tried to find out the present issues in Pertev Pasa as a case study to scrutinize it and reveal the main elements which has kept it far from sustainability criteria. Furthermore, it has been tried to define some recommendations and proposals to turn the present situation of the neighborhood to a sustainable one together with considering future development in this area.

Accordingly, brief introduction of this research has been stated in the first chapter. The second chapter has been allocated for defining sustainability and neighborhood. This chapter profoundly has investigated and interpreted different points of views towards sustainable development and neighborhoods. Subsequently, in third chapter, a combination of sustainable development criteria and neighborhood has been demonstrated to be able to define the characteristics of sustainable (residential) neighbourhoods. The 4th chapter has attempted to bring forward some main principles to make a neighborhood sustainable by mentioning some qualitative and quantitative rules. The the research has implied all findings of the literatüre survey onto the case area, which is Pertev Paşa District in Aaşağı Maraş, Famagusta, North Cyprus.

Based on all this, this final chapter will present the recommendations of this research based on its findings. These recommendations will be presented at two levels. One as general recommendations, which will answer the first research question of the research:

- How could an existing residential neighborhood be turned into a sustainable one?

The other recommendations will be for the case study to be able to answer the second research question, which is:

- What should be the characteristics of Pertev Pasa district so that it becomes a sustainable residential neighborhood?

5.1 General Recommendations

Achieving some fundamental characteristics of the sustainable neighborhoods have been one of the objectives of this research. Forasmuch as there was not existed a complete mentioned, ready characteristics in reference, it has tried to combine sustainable development dimensions, idealized neighborhood characteristics, and sustainable neighborhood characteristics itself to receive more comprehensive characteristics for sustainable neighborhoods. Accordingly, eleven characteristics have been introduced in chapter three which certainly can be used for all neighborhoods.

Although these characteristics are fundamental for all residential neighborhoods, local conditions of each neighborhood require a detailed survey to achieve a proper list of requirements and investigation on proper local decisions to achieve sustainability characteristics for the selected neighborhood. As a general conclusion it is worthy to indicate sustainable residential characteristics briefly, as in the following:

- **Mixed land-use:** Mixed land use as an impressive attribute of sustainable neighborhood provide facilities within neighborhood for people to encourage them to walk to work, school, or shops. Therefore, applying the appropriate level of mixed-use should be considered as an inseparable component of sustainable neighborhood.
- **High level of walkability:** Having good level of walkability in a way that it is well connected to jobs and services and adequate space for streets and an efficient street network is highly required for sustainable neighborhood. Walk-able and cyclist

friendly streets, encouraging public transport, highly interconnected road hierarchy ,and adequate parking space are main subdivision of this characteristic.

- **High density:** Density plays a crucial role to achieve sustainable neighborhood. The reduction of using cars and enhancement of willingness of people to travel shorter distances for their shops and services need are the beneficial outcomes of increased residential densities. Further, support of public transportation systems and enhancement of higher level of service in a longer period of the day are the consequences of high densities -more people within a given area- of development.
- **Building design and materials:** Neighborhoods consist of collections of various buildings and blocks which together extensively eclipse the level of sustainability in the neighborhood. In this respect, considering the criteria to achieve sustainable building in microscale is meaningful.
- **Designed to save resources:** It should be ascertained that neighborhood is well managed and maintained so that it doesn't damage the environment. Neighborhood have to ensure that development provide sufficient green spaces to save and support biodiversity, and decrease environmental effects, and development is energy efficient. In this respect, reducing inputs, using local resources, waste management, water and sewage management, and power generation play important roles.
- **Green space:** Having high quality, proper design and efficient management of green spaces is one of the most significant elements of sustainable neighborhood.
- **Affordability and social mix:** Sustainable neighborhood has to be well designed so that it is affordable for different people of a society and also well socially mixed, and not belonged to a specific group of people.
- **Places of different character and limited land-use specialization:** Sustainable neighborhood embeds different character and different land uses so that it's not

making a single zone or one function character for the area. The mixed uses should be compatible and covering percentages of each function require profound local survey.

- **Benefits of long-term stewardship, hands-on management & engaging local communities in discussion:** Sustainable neighborhood will not be generated and survived unless, wise management and local participation in the decision making act as the main core of the sustainable neighborhood engine.
- **Make use of urban economies (EC):** Different characteristics of sustainable neighborhood are only viable if they can find a market and it is in cities that the major markets exist. Although the urban economy is not restricted to the neighborhood scale but economic activities in neighborhoods play a crucial role to achieve sustainability in larger scales.
- **Safety:** Having personal safety for all residents, for different ages with different capability and physical abilities is the primary requirements of each neighborhood.

5.2 Recommendations for the Case Study

According to eleven characteristics of sustainable neighborhood, which have been chosen for the case study, the district has been found to be in a poor level of sustainability. Accordingly, considering the eleven characteristics, following recommendations could be presented based on the findings of the literature survey.

Mixed-use:

- Designing new green areas, parks, recreational activity complexes, outdoor fitness areas, banks, better shopping places

High level of walkability:

- Provision of appropriate public transportation
- Designing appropriate parking areas
- Designing pedestrian friendly spaces have to be provided to encourage walkability and cycling
- Improving the quality of public open spaces e.g. designing shared space for public use
- Making new policies to taming cars and encourage walking and cycling and using public transport

High density:

- Looking at the massive lost space areas as a potential to increase residential density and also increase quality of life in this area to amend population density

Building design and materials:

- Attaching appropriate elements of the existing buildings to increase energy efficiency. For instance, relocating single glazing windows with double and triple windows, installing PV panels and solar collectors to reduce energy demand, installing water reuse system
- Setting up new rules to construct new buildings with the sustainability standards
- Master plan and local plans to manage and organize construction standards

Designed to save resources:

- Improving waste management and recycling

- Improving water quality of the neighborhood and adopting new water systems to renewing and renovating agricultural lands to help the local economy and maintaining agricultural fertile lands

Green space:

- Preserving local vegetation and greeneries by appropriate management and irritation
- Proposing new public green spaces and parks
- Improving greeneries in leftover soft spaces to achieve better aesthetic perspective

Places of different character and limited land-use specialization:

- Adaptive reuse of incompatible functions
- Planing new standards for the future developments of neighborhood to improve density, mixed-use, land use specialization, building design and material

Benefits of long-term stewardship, hands-on management & engaging local communities in discussion:

- Engaging community participation in decision making and problem solving
- Generating local management to respond the neighborhood problems as they arise

Make use of urban economies (EC):

- Attracting investments by short and long-term planning and management

- Encourage local activities to preserve the local cultural economy
- Preserving agricultural land as a good potential of neighborhood economy

Safety:

- Improving and locating street furnitures, lighting, facilities
- Redesigning existing inappropriate urban spaces, streets, drainage systems, pedestrian area

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APPENDICES

Appendix A: Sample of Questionnaire

DAÜ MİMARLIK FAKÜLTESİ
MAĞUSA, AŞAĞI MARAŞ BÖLGESİ ANKET ÇALIŞMASI

Bu anket calismasi, Aşağı Maraş Bölgesindeki yaşayanlarin, sosyo-kültürel, ekonomik ve fiziksel yapısını, yaşadıkları çevre ile ilgili anlamak üzere amaçlanmiştir.

1.

Cinsiyet		Yaş								Eğitim Durumu				
Erkek	Kadin	12-16	17-24	25-34	35-44	45-54	55-64	65-74	75 uzeri	Okula hic gitmemis	İlk Okul	Orta okul	Lise	Üniversite

2- Uyruğunuz nedir?

○ Kıbrıslı Türk ○ Türk ○ Kıbrıslı Türk - Türk ○ Diğer _____

3- Şimdiki işiniz nedir? _____

4- Kaç yıldır bu mahallede oturuyorsunuz?

○ 0-2yıl ○ 3-5 ○ 6-10 ○ 11-15 ○ 16-20 ○ 20+

5- Nasıl bir evde sakinsiniz?

○ Tek katlı müstakil ev ○ İki katlı müstakil ev ○ Tek katlı sıra ev ○ İki katlı sıra ev ○ Apartman dairesi

6- Mülkiyet durumunuz nedir?

○ Ev sahibi ○ Kiracı ○ Tahsis

7– Size göre, mahallenizde yaşayanların gelir düzeyi nedir?

○ Çok iyi ○ İyi ○ Orta ○ Kötü

8- Mahalleniz emniyetli ve sakin mi?

○ Çok Emniyetli ○ Orta Derecede Emniyetli ○ Emniyetsiz

9- Komşularınızla hangi sıklıkla görüşüyorsunuz?

○ Her gün ○ 2-3 günde bir ○ Haftada bir ○ Ayda bir-iki ○ Hiç

10- Mahallenizde kültürel ve sosyal faaliyetler var mı?

○ Var - Yeterli ○ Var - Yetersiz ○ Yok

11- Yaşadığınız bölgede toplu taşıma araçları bulunuyor mu?

○ Evet ○ Hayır ○ Fena değil

12- Şehir merkezini hangi sıklıkta ziyaret ediyorsunuz? ziyaret ettiğiniz yer neresidir? _____

○ Hergün ○ Haftada 2-3 ○ Haftada bir ○ Nadiren ○ Hiç

13- Mahallenizdeki binaların kalitesini nasıl buluyorsunuz?

○ Yüksek ○ Orta ○ Kötü

14- Gelecekten beklentiniz nedir?

○ Aynı mahallede ve evde oturmak ○ Başka yerde yeni bir ev almak ○ Aynı mahallede yeni, büyük bir ev yapmak ○ Kent merkezinde bir apartman dairesi almak ○ Diğer _____

15- Eğer varsa, mahallenizdeki problemler nedir?

○ Gürültü problemi ○ Güvenlik sorunu ○ Kirlilik ○ Hiç yok ○ Diğer_____

16- Mahallenizde, önermek istediginiz bir tesis varmı? (en önemli 3 tane seçiniz)

○ Spor salonu ○ Çocuk parkı ○ Yeşil alan ○ Toplum / Kültür merkezi ○ Alışveriş merkezi ○ Sağlık merkezi ○ Banka ○ Eğitim binası ○ Diğer _____ ○ Yok

17- Genel olarak bu çevredeki yaşam koşullarından mennun musunuz?

○ Çok memnunum ○ Memnunum ○ Memnun değilim ○ Emin değilim

Tesekkurler.

Appendix B: Sample of Interview

1. Are stakeholders, investors, and government willing to invest in this area?

2. Does This area get benefit of good waste management and recycling?

3. How do you explain the safety and security of this area during the day/night time?

4. How and where do residents obtain their primary requirements of life?

5. How is the situation of properties, renting and buying prices of the houses?

6. Do you contribute to make decisions and managements of the area?

7. How is the quality of life here ? Do you prefer to live here or other areas?

8. Do your houses have Pv panels, solar Collectors ?

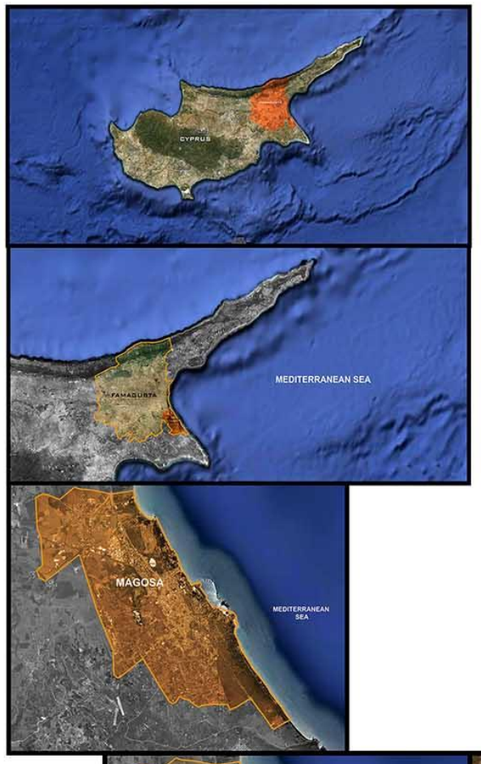
Appendix C: UDES 502 Urban Design Studio II Maps

EASTERN MEDITERRANEAN UNIVERSITY
FACULTY OF ARCHITECTURE
DEPARTMENT OF ARCHITECTURE
MASTER OF SCIENCE IN URBAN DESIGN
FALL 2013

IMPROVEMENT PROJECT FOR THE LOCAL CENTER
PERTEV PAŞA IN AŞAĞI MARAŞ (KATO VAROSHA) - FAMAGUSTA

COURSE INSTRUCTORS
PROF. DR. ŞEBNEM ÖNAL HOŞKARA
PROF. DR. NACIYE DORATLI
RESEARCH ASSISTANT: MÜGE RIZA

SITE ANALYSIS



Asagi maras is a district in Famagusta, North Cyprus, it is located at 1.53km close to the Famagusta walled city and about 4.10km away from the Eastern Mediterranean University.

Development until 1974

Gazimagusa became an important center on account of its natural harbor and because of this, a citadel and a fort were built to protect the city. Thus, originally a small fishing village, Gazimagusa grew in size and importance under the Lusignans in the 13th century (1192–1489)

Under the Venetians (1489–1571), Gazimagusa was turned into a fortified city as a military base. The Walled City dating back to the 15th century, is a superb example of a fortified Medieval city with its bastions, citadel (Castella), moat (cut out of solid rock), Sea Gate (Porte del Mare) and Land Gate (Ravelin)

The city was conquered by the Ottomans (1571—1878). In the first two decades following the conquest, population was transferred from Anatolia, and the non-Muslim population was forced to sell properties and move out of the Walled City. Maras ve Asagi Maras — the areas outside the walls towards the asouth housed this community then. By the end of the ottoman period Maras and Asagi Maras were thickly populated by the mid-19th century with many fruit gardens.

During the British administration (1878–1960), in which the two ethnic groups in the city — the Greeks and the Turks— were living together (the Turkish Cypriot living inside the wall and the Greek Cypriot living outside the wall) , the port of Gazimagusa was expanded and gained importance as a port. The British also constructed an administrative center between the Walls and Maras, as a part of their colonial experience. The intention was, then, to develop an alternative city center which would include mainly administrative and additionally commercial activities.

Tourism became a major magnet of attraction and urbanization towards Maras due to the Lebanon/ Beirut war (1969-1970) but soon came to a stop (UN restriction in 1974) and again, the traditional core in the walled city and Asagi Maras were occupied by Turkish Cypriot and Turkish people.

Development within 1974-1986

After the war in 1974, the traditional core in the Walled city showed development and growth tendencies; the Walled City, and also the residential areas, including those with large vegetable and fruit gardens in Asagi Maras which were left by the Greek Cypriots, were occupied by the Turkish Cypriots who had migrated from the south of the Island. There was also an influx of Turkish people from the Turkish mainland. The most important reason for development in the Asagi Maras during this period was to provide service for the those who relocated from the south. Therefore an individual house was allocated for each family while agricultural fields and gardens were distributed to provide efficient care for the already existing agricultural area and citrus orchards by the inhabitants from south and Turkish mainland. Moreover, new residential quarters (limited in number) developed to the south- west and north-west of the Walls.

Development after 1986

Urbanisation took a different course in its direction — from the south eastern growth before 1974 to more of a north western growth. Some other Famagusta districts include:Baykal district, Sakarya district, Dumlupinar, the Walled City, Karakol district, Asagi Maras, many of which (in exception of Asagi Maras) had a fair share of the urbanization that emerged with the tranformation of the formally High Institute of Technology to Eastern Mediterranean University(EMU) in 1986. (S. Onal et al. 1999)

1 LOCATION AND HISTORY

UDES 502
EBUNOLUWA AKINGBASO
SOBHAN HASHEMZADEH

KAMYAR LOTFI
SANAZ NEZHADMASOUM

LADAN TAVANGARAN

UDES 501
MARAL YAZDANKHAH

SCALE 1:2000

EASTERN MEDITERRANEAN UNIVERSITY
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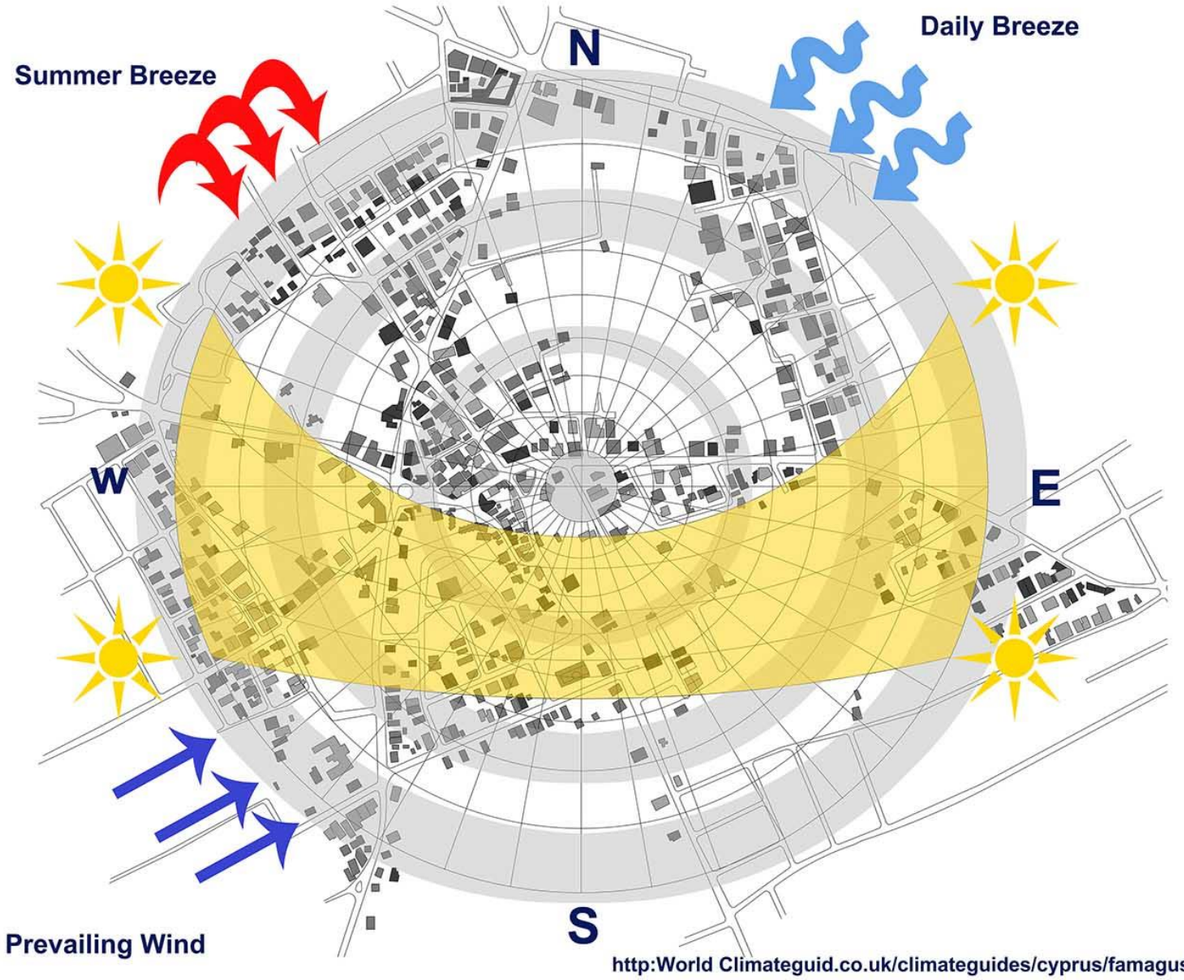
PROF. DR. NACIYE DORATLI
RESEARCH ASSISTANT: MÜGE RIZA

SITE ANALYSIS



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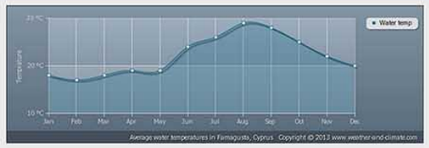

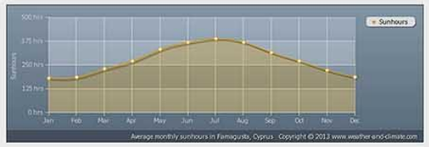

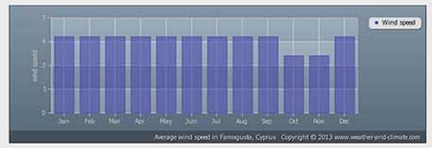

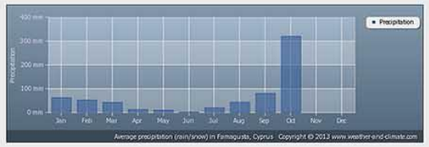

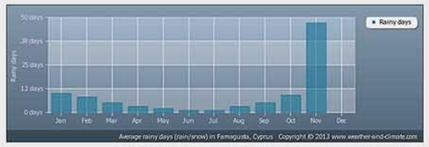

Large Temperature Variations and Long Sun Hours Specially in Summer and Direction of Dominant Winds are Major Climatic Issues to be Considered.

2 CLIMATE

UDES 502
EBUNOLUWA AKINGBASO
SOBHAN HASHEMZADEH
KAMYAR LOTFI
SANAZ NEZHADMASOUM
LADAN TAVANGARAN
UDES 501
MARAL YAZDANKHAH

SCALE 1:2000

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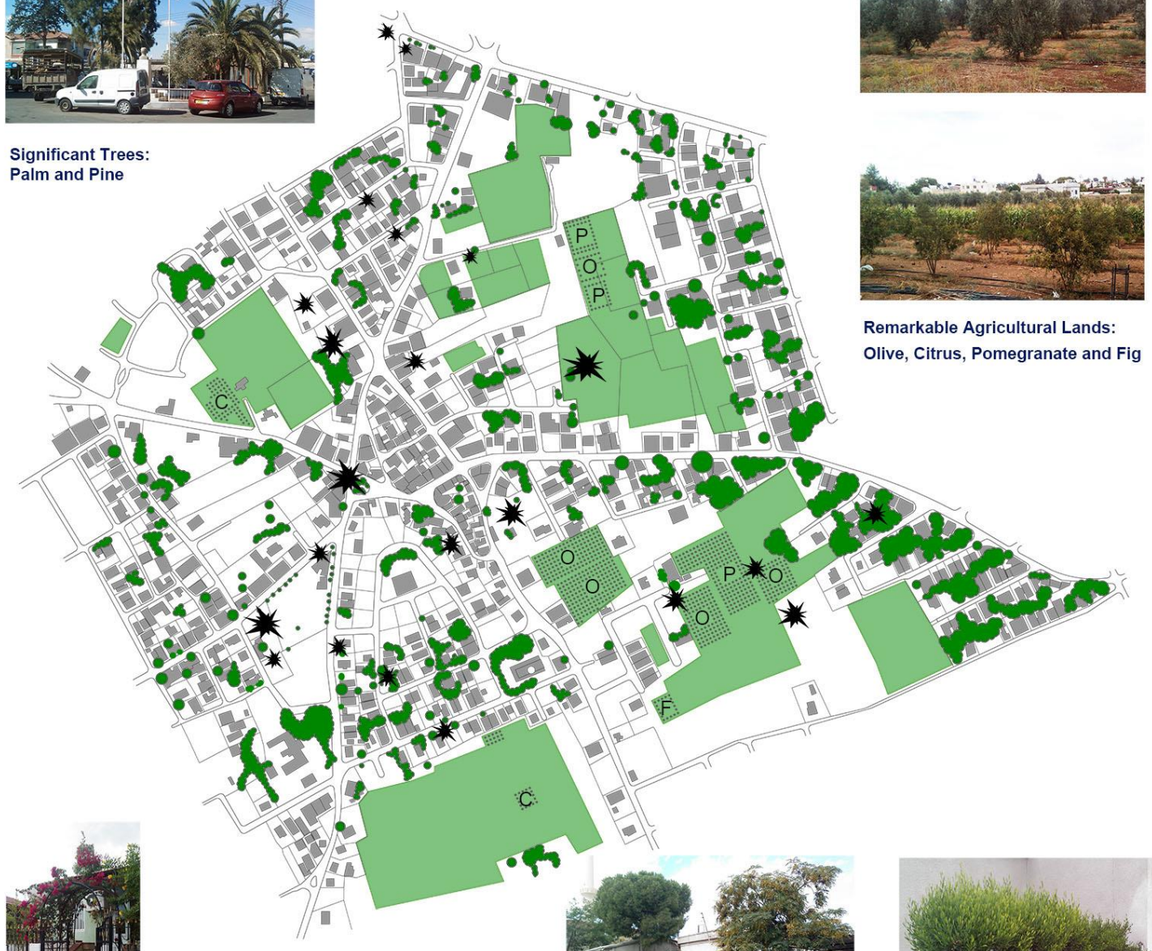
PROF. DR. NACIYE DORATLI
RESEARCH ASSISTANT: MÜGE RIZA

SITE ANALYSIS

Significant Trees:
Palm and Pine



Remarkable Agricultural Lands:
Olive, Citrus, Pomegranate and Fig

Domestic Gardens

Pergola Provides Shade

Decorative Bushes

LEGEND

- Trees
- Agricultural Land
- O Olive Land
- C Citrus Land
- P Pomegranate Land
- F Fig Land
- Palm

3 VEGETATION

UDES 502
EBUNOLUWA AKINGBASO
SOBHAN HASHEMZADEH

KAMYAR LOTFI
SANAZ NEZHADMASOUM

LADAN TAVANGARAN

UDES 501
MARAL YAZDANKHAH

SCALE 1:8000

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DEPARTMENT OF ARCHITECTURE
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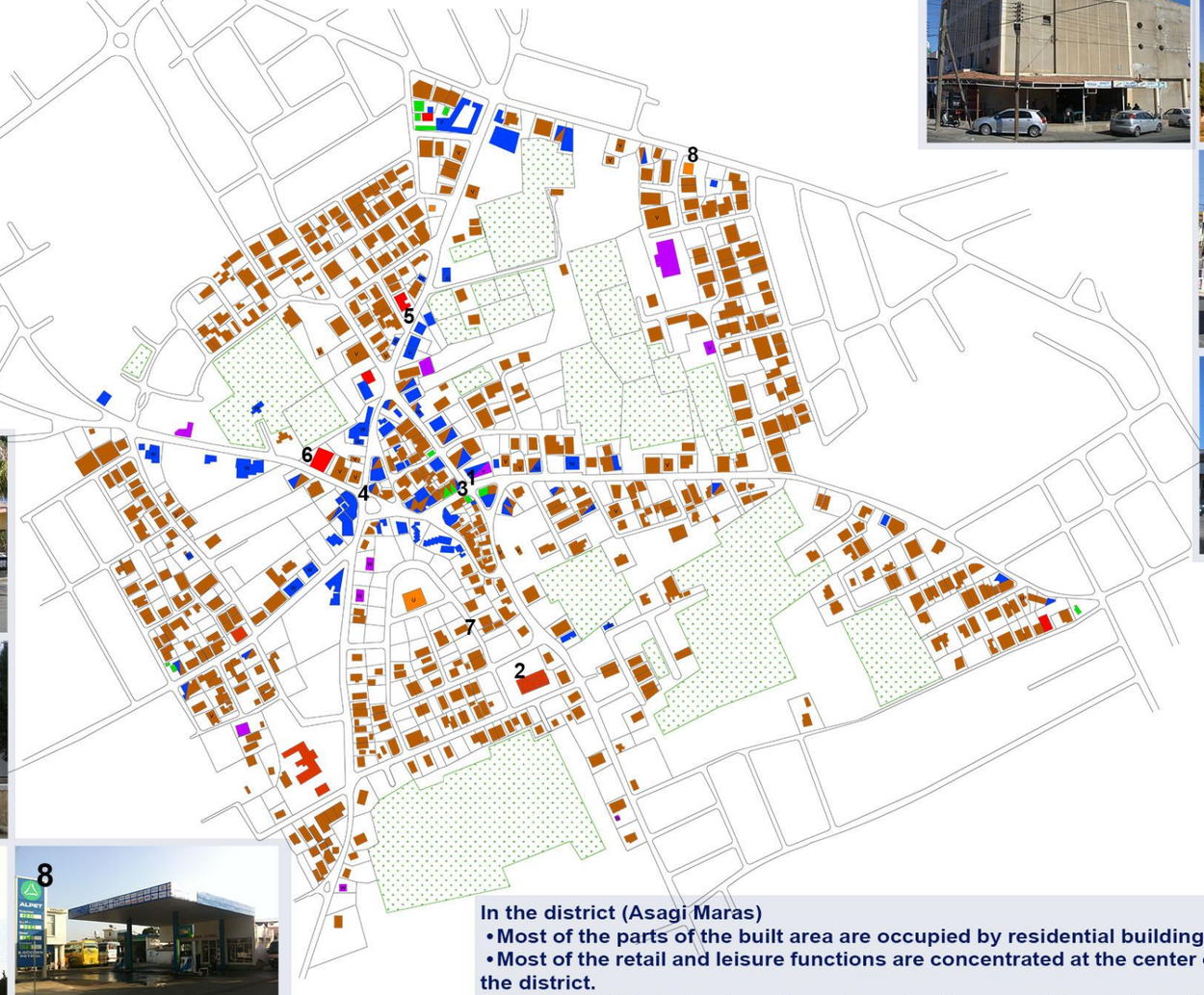
RESEARCH ASSISTANT: MÜGE RIZA

SITE ANALYSIS



N

LEGEND

- Residential
- Retail
- Office
- Leisure
- Community Services
- Public Utility
- Industry
- Agricultural Land
- V Vacant
- W Workshop

In the district (Asagi Maras)
- Most of the parts of the built area are occupied by residential buildings.
- Most of the retail and leisure functions are concentrated at the center of the district.
- Incompatibility in land use is an important issue which exists in this area (unsuitable placing of workshops/ workshop blocks).

4 LAND USE

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SOBHAN HASHEMZADEH

KAMYAR LOTFI
SANAZ NEZHADMASOUM

LADAN TAVANGARAN

UDES 501
MARAL YAZDANKHAH

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IMPROVEMENT PROJECT FOR THE LOCAL CENTER PERTEV PAŞA IN AŞAĞI MARAŞ (KATO VAROSHA) - FAMAGUSTA

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PROF. DR. NACIYE DORATLI
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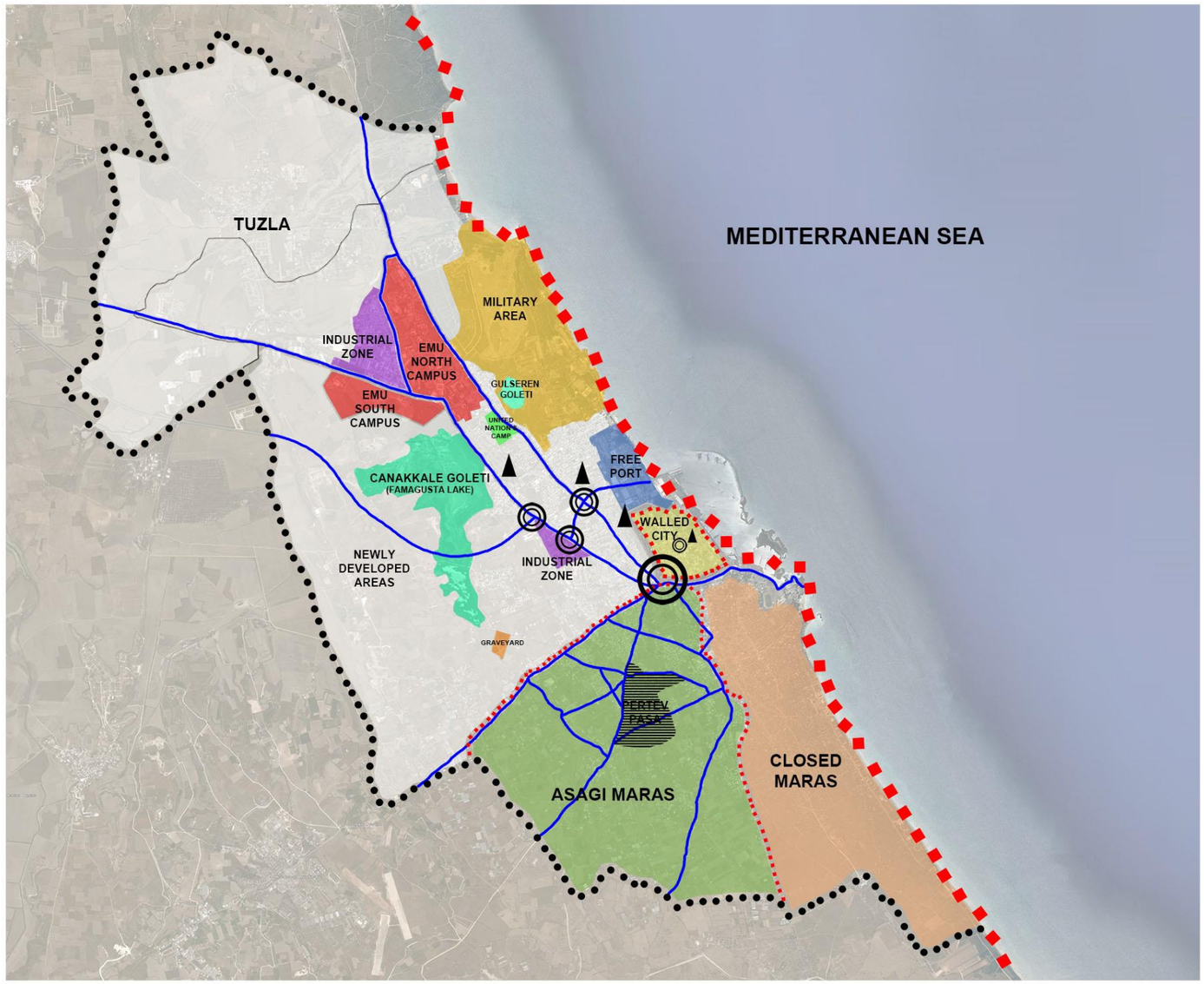
SITE ANALYSIS




Osman Fazil Polat Pasa Mosque


Northernland Apartments


Walled City (Lala Mustafa Pasa Mosque)

LEGEND

- City Boarder
- Edge
- Main Path
- District
- Node
- Landmark

5 **LEGIBILITY (LYNCH ANALYSIS-CITY SCALE)**

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KAMYAR LOTFI
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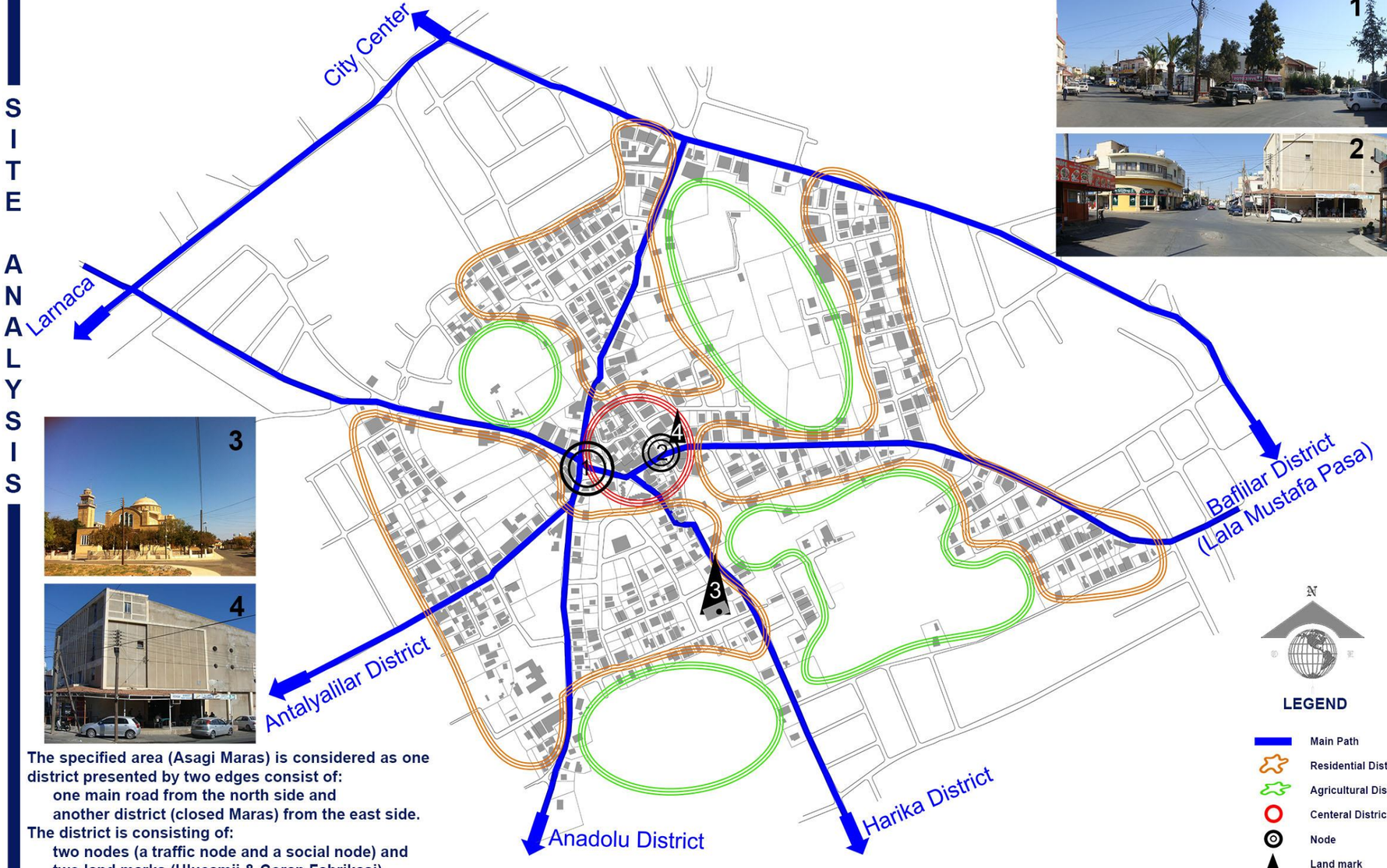

The specified area (Asagi Maras) is considered as one district presented by two edges consist of:
- one main road from the north side and
- another district (closed Maras) from the east side.

The district is consisting of:
- two nodes (a traffic node and a social node) and
- two land marks (Ulucamii & Corap Fabrikasi).

6 LEGIBILITY (LYNCH ANALYSIS)

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LADAN TAVANGARAN

UDES 501
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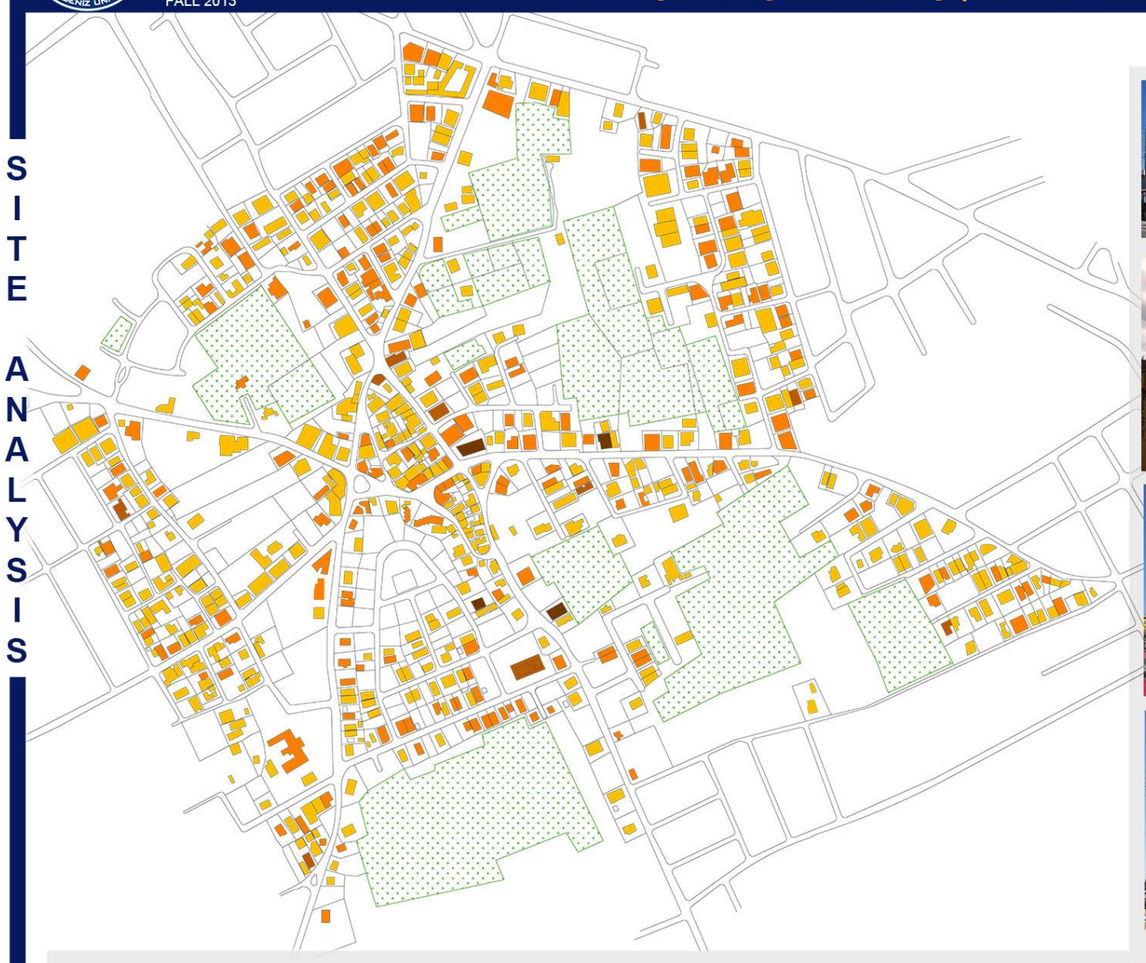








Majority of buildings are one and two story, except some of significant building such as the factory and also newly constracted apartments.
In case of prospective development, height of the church as a land mark should be considered.

N

LEGEND

- 1 Story
- 2 Story
- 3 Story
- 4 Story and more

7 BUILDING HEIGHTS

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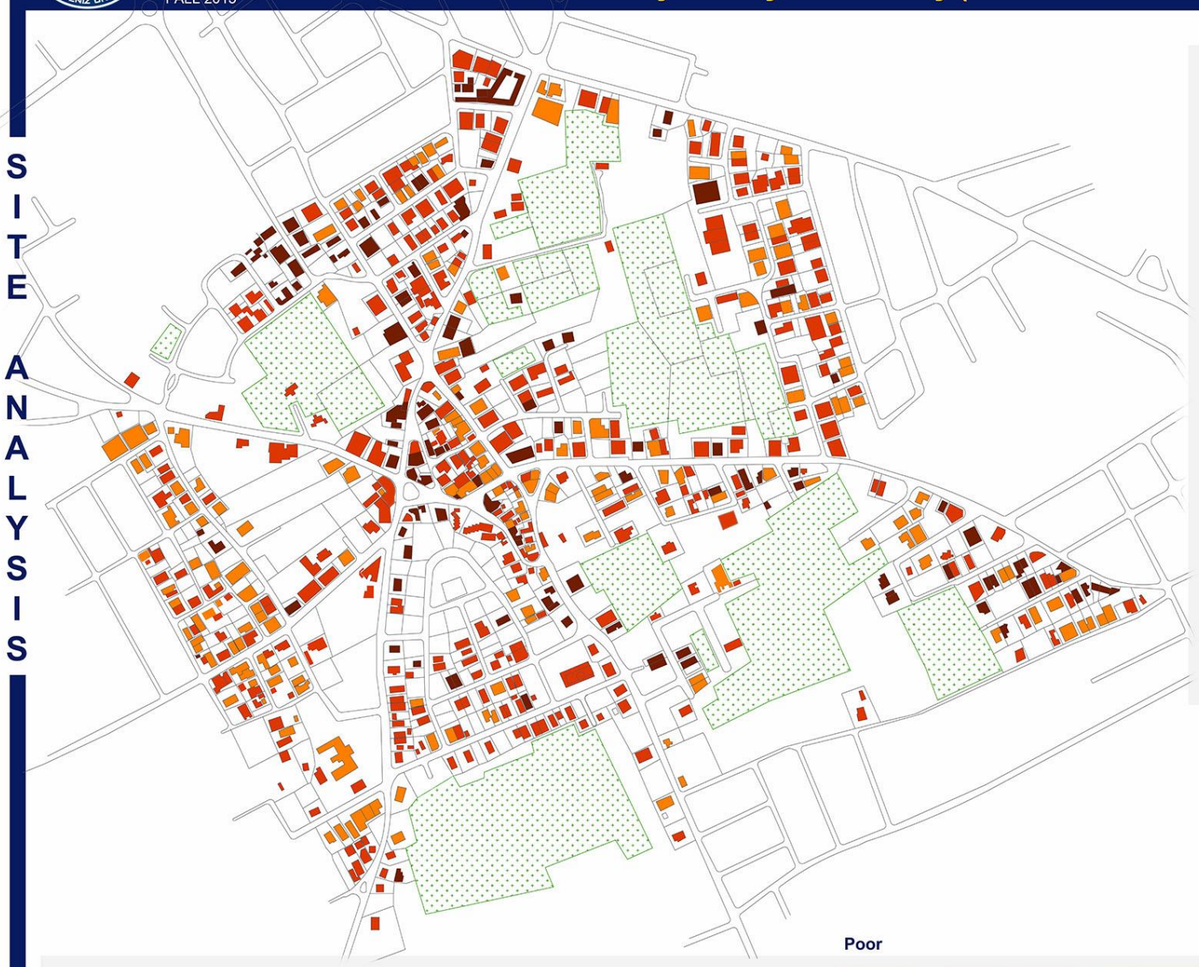

Average

Good

Poor

Good: newly constructed or renovated buildings
Average: moderate conditioned buildings in terms of external facade
Poor: buildings with generally poor external appearance
According to the gathered data, good looking buildings are very rare while most of the buildings have average condition with a few poor ones

N

LEGEND
- Good
- Average
- Poor

8 BUILDING CONDITION

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SITE ANALYSIS

Semi-detached Buildings




Detached Buildings



Terraced Buildings



Apartments


Most of the buildings of the area are semi-detached, while the central part majorly include terraced buildings

9 BUILDING TYPOLOGY

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SITE ANALYSIS

Space Defining Buildings


A


A1


A2

Space Occupiers

B

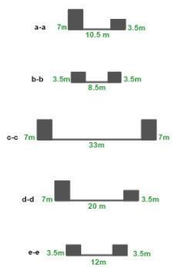
B1


B2


B3


B4

Sections



Most parts of the area are occupied by dispersed buildings which have been built haphazardly. Another issue is the extensive number of empty spaces which commonly pertain to agriculture lands.

10 FIGURE GROUND

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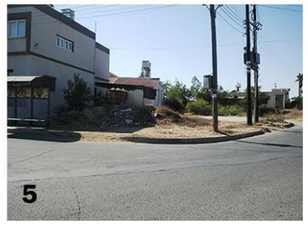

According to the analysis, most parts of the areas are covered with lost spaces, especially surroundings of central part of the site. The dimensions of these spaces are extensively large which should be considered in design proposal.

N

LEGEND

Lost space

11 LOST SPACES

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SANAZ NEZHADMASOUM

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SITE ANALYSIS

Primary Road and Secondary Road Junction

Primary Road and Major Town Street Junction

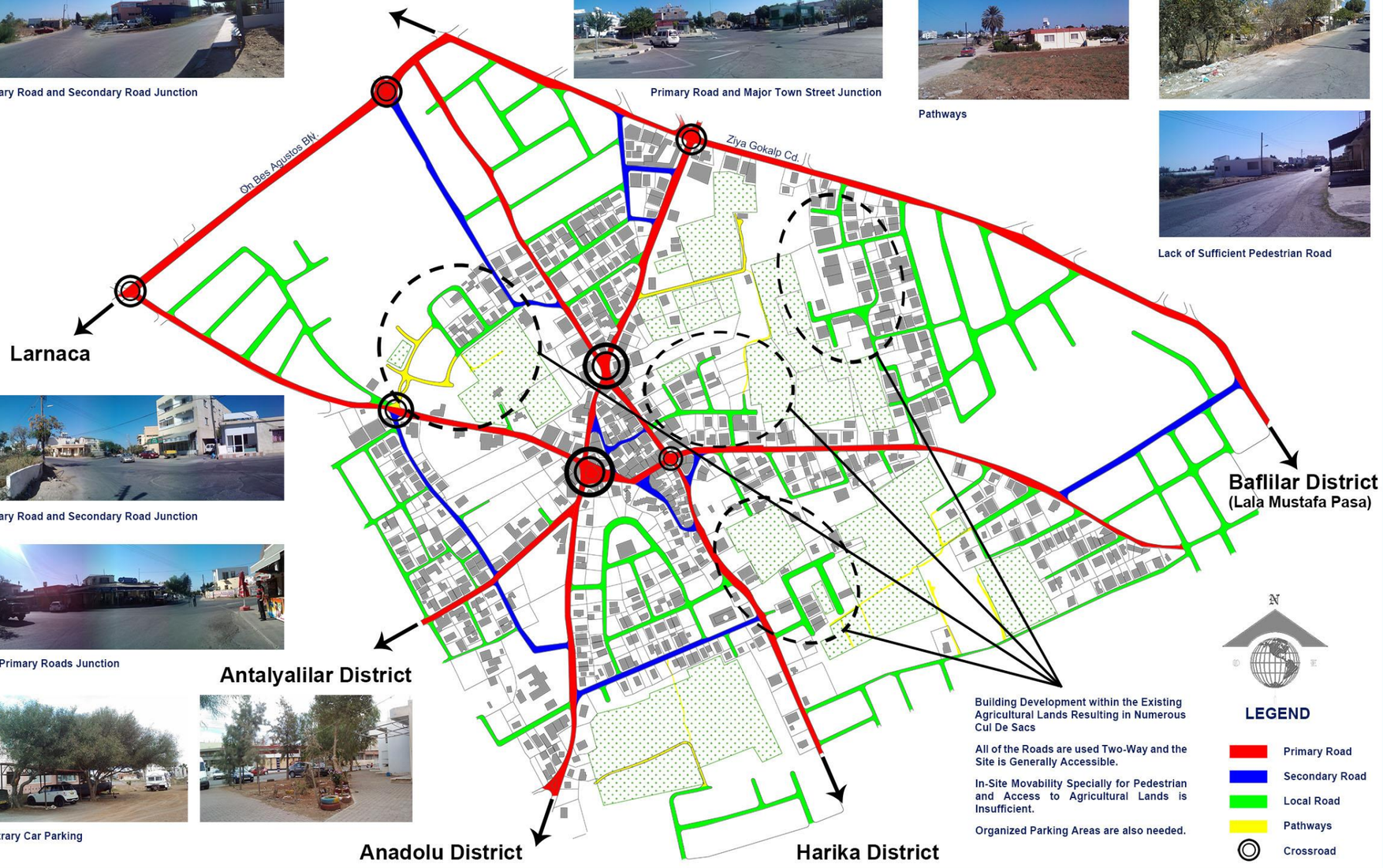
Pathways

Lack of Sufficient Pedestrian Road

Primary Road and Secondary Road Junction

Two Primary Roads Junction

Arbitrary Car Parking



Building Development within the Existing Agricultural Lands Resulting in Numerous Cul De Sacs

All of the Roads are used Two-Way and the Site is Generally Accessible.

In-Site Movability Specially for Pedestrian and Access to Agricultural Lands is Insufficient.

Organized Parking Areas are also needed.

N

LEGEND

- Primary Road
- Secondary Road
- Local Road
- Pathways
- Crossroad

12 TRAFFIC AND ACCESSIBILITY

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LADAN TAVANGARAN
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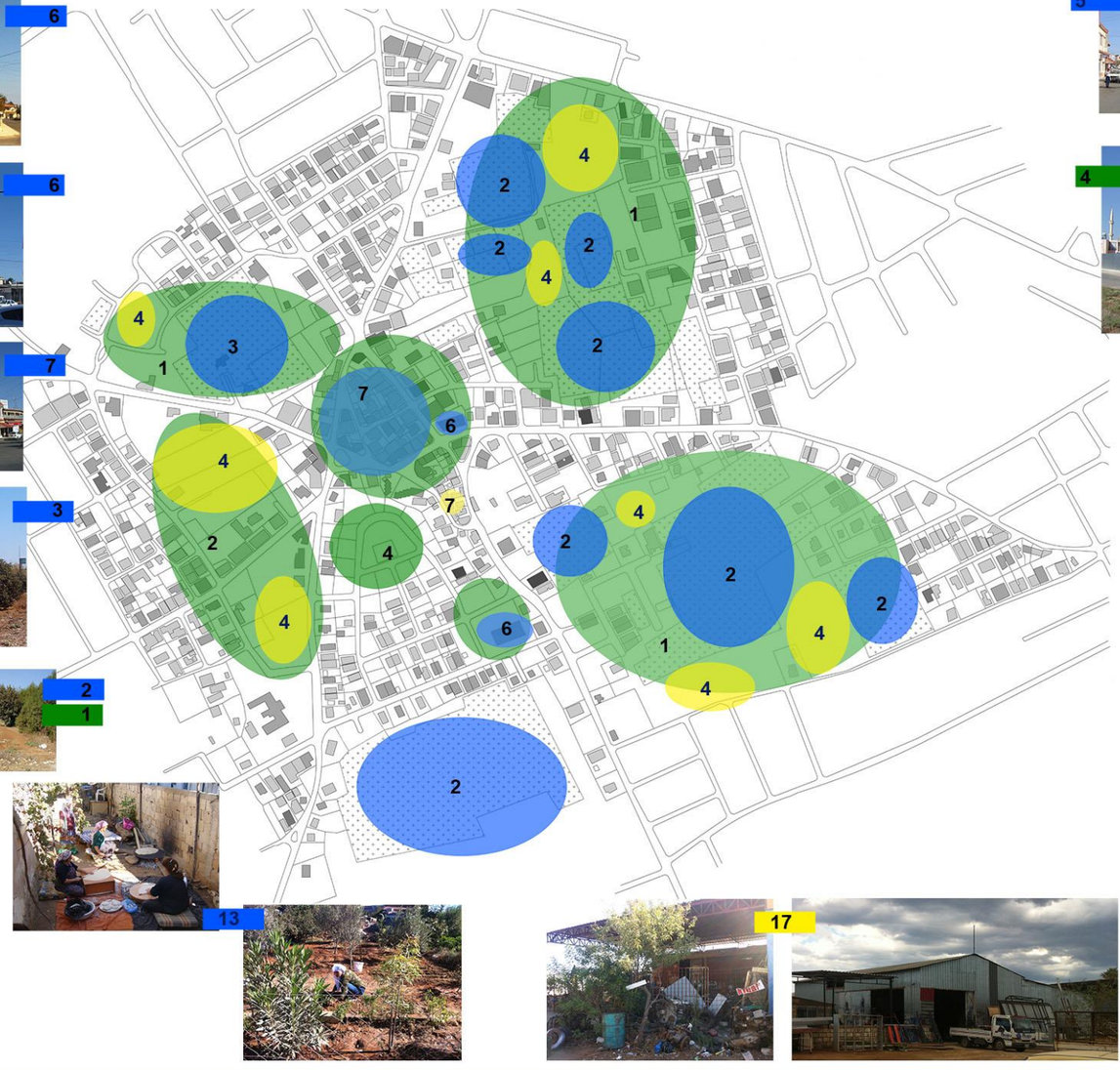

- STRENGTHS
- WEAKNESSES
- OPPORTUNITIES
- THREATS

N

16 SWOT ANALYSIS

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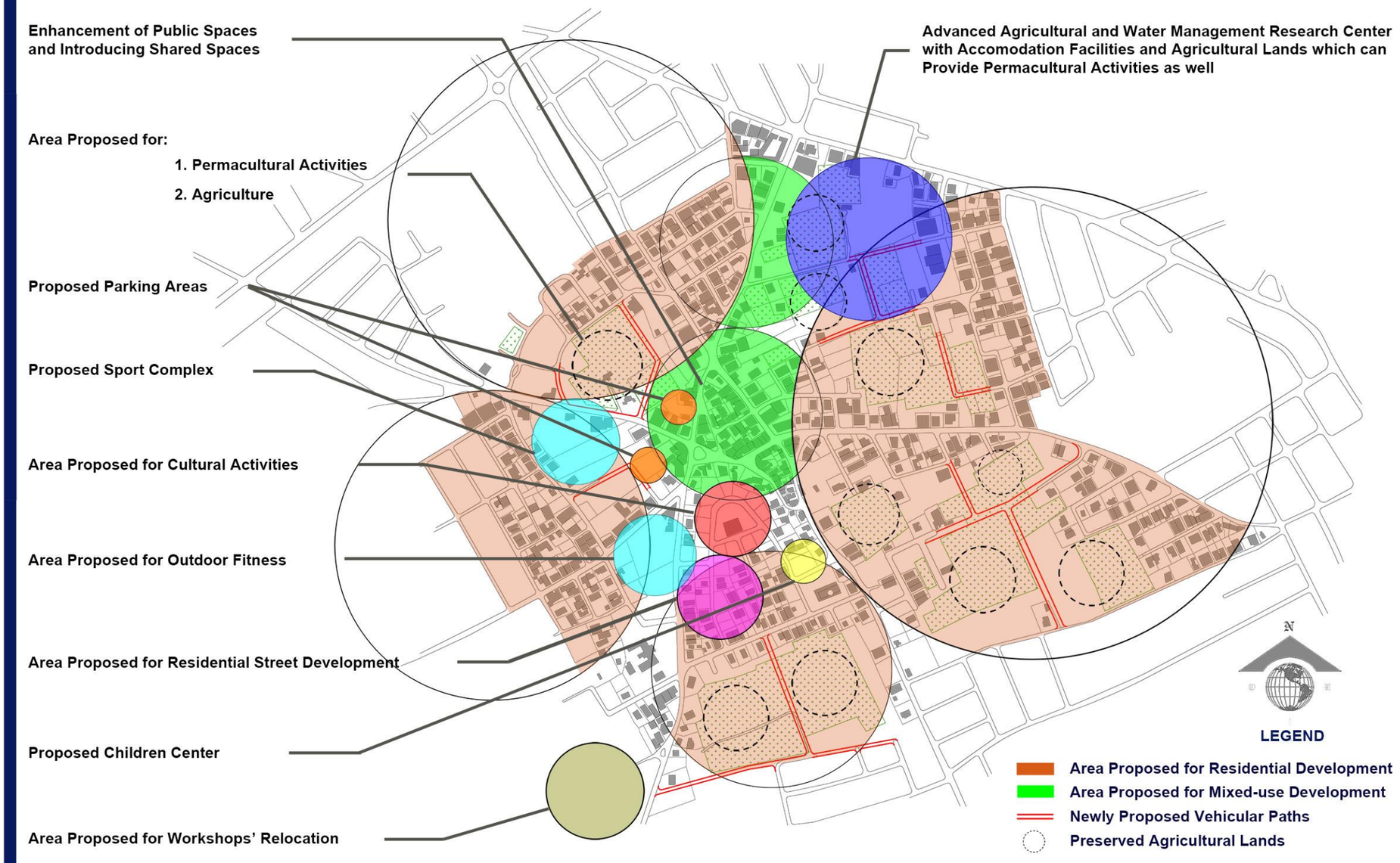

18 AREA-BASED PROPOSAL

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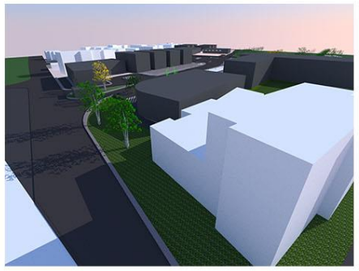
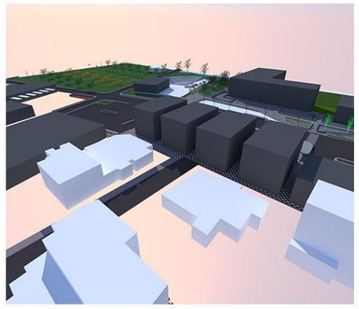
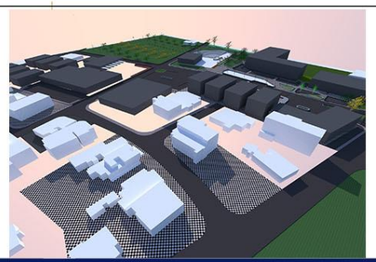
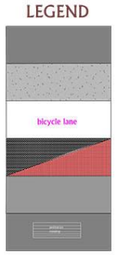






LEGEND



Dual Access road
1way Access road
bicycle lane
pedestrian access only
Drop off lane
pedestrian crossing

Traffic Proposal for Agricultural Inst.

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LADAN TAVANGARAN
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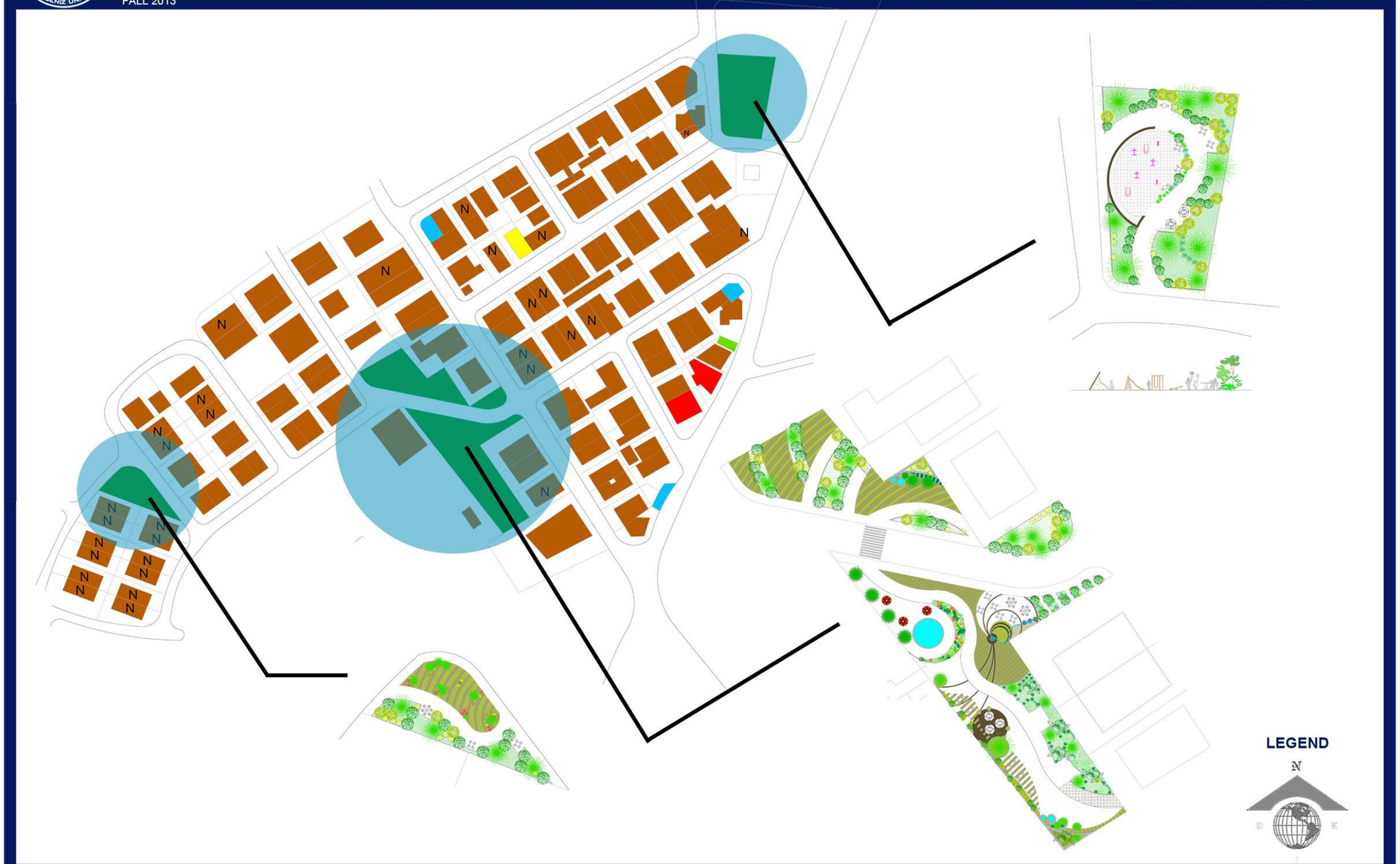

DESIGN PROPOSAL (GREENERY)

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KAMYAR LOTFI
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LADAN TAVANGARAN
UDES 501
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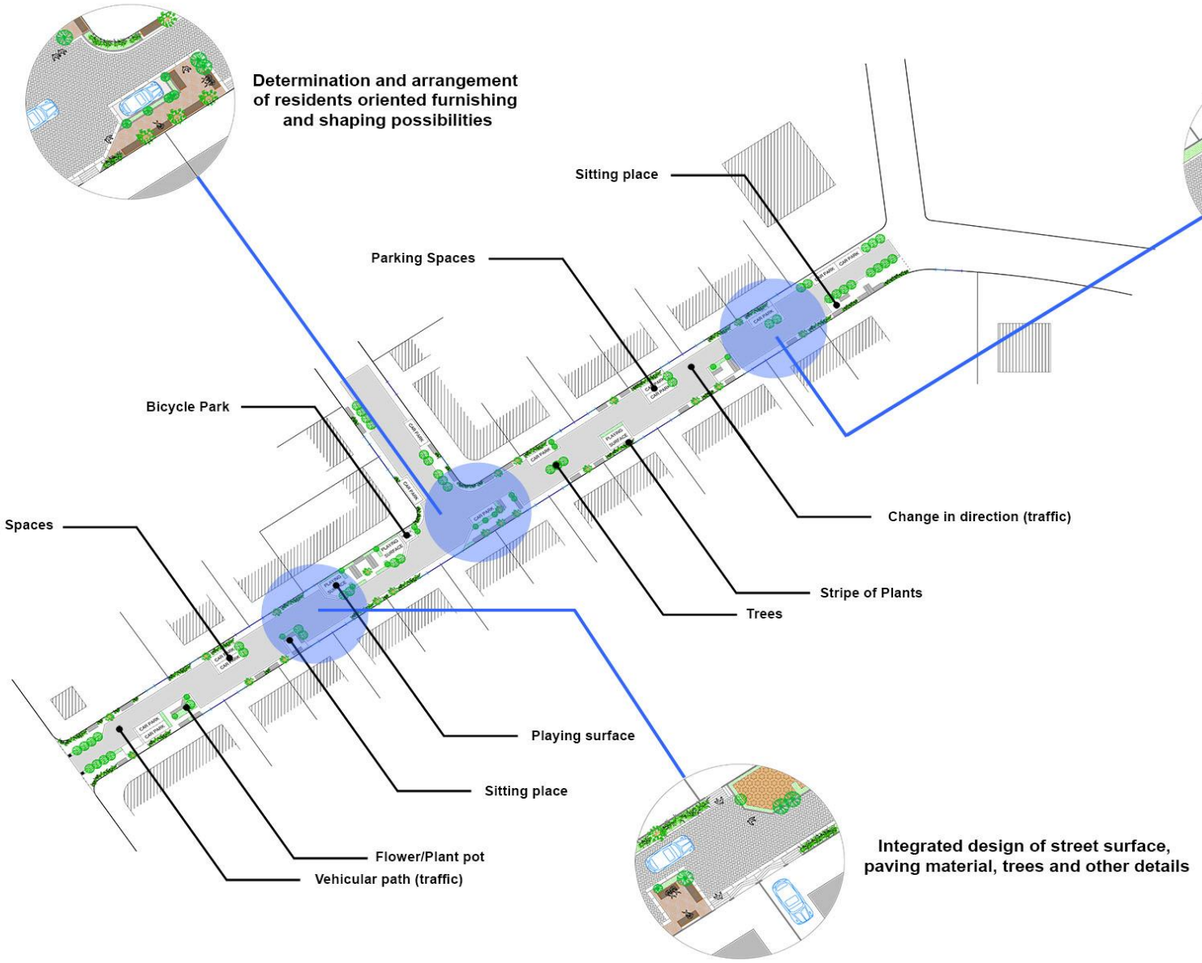

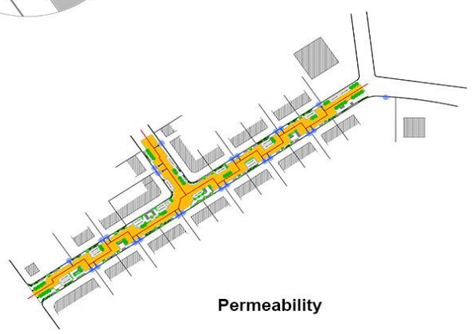

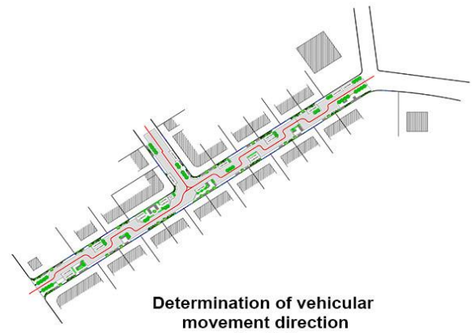

Elements of Design and Furnishing of a RESIDENTIAL STREET

RESIDENTIAL STREET DESIGN

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KAMYAR LOTFI
SANAZ NEZHADMASOUM
LADAN TAVANGARAN
UDES 501
MARAL YAZDANKHAH

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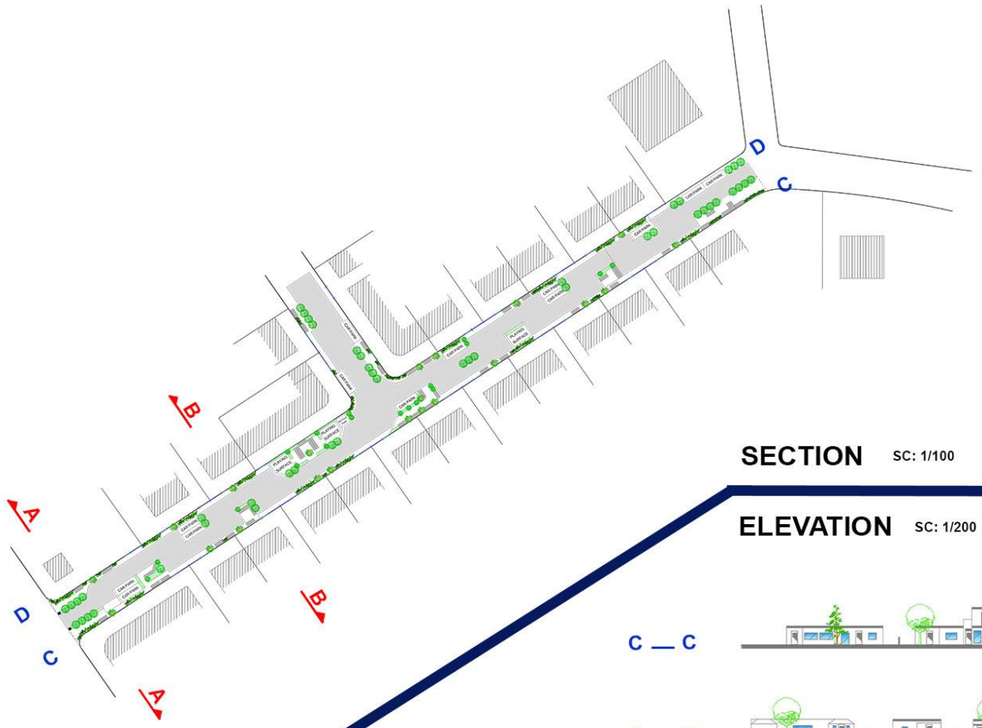

SECTION SC: 1/100

A — A

B — B

ELEVATION SC: 1/200

C — C

D — D

N

SECTION AND ELEVATION

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SANAZ NEZHADMASOUM

LADAN TAVANGARAN

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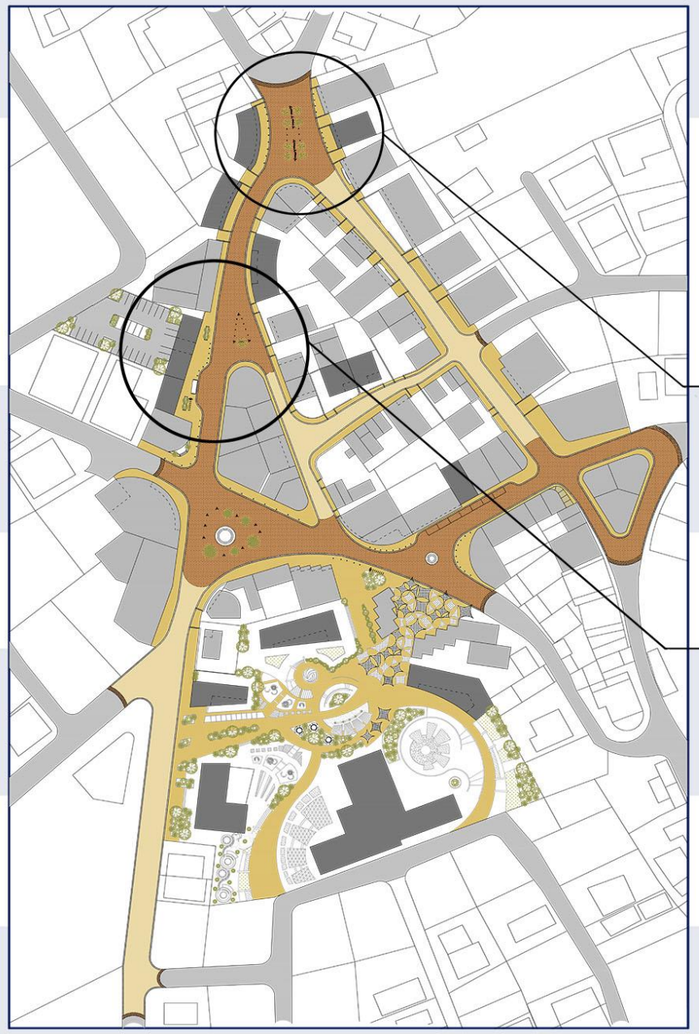
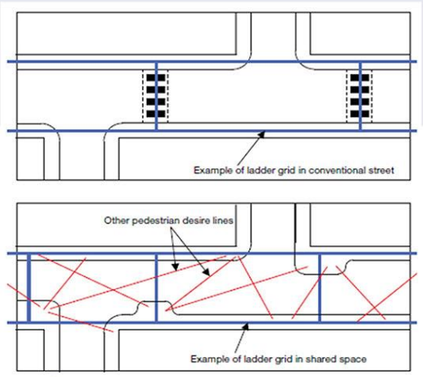
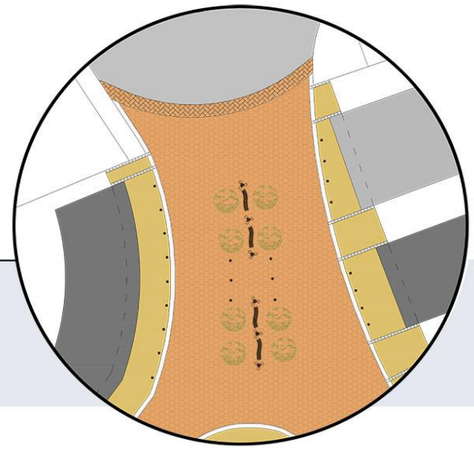


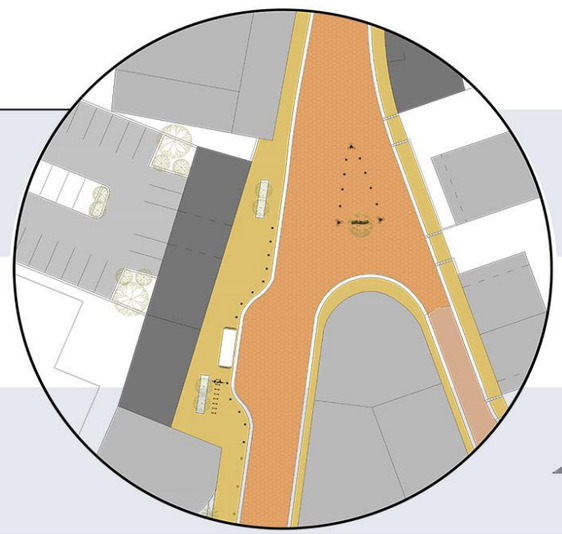


1. Attract Drivers' Attention and Encourage to Reduce Speed upon Entrance to Shared Space:
Raised Table, Material Change (Paving), Visual Narrowing, Tighter Geometry, Trees, Portal Feature, Parked Vehicles, etc.



2. Courtesy Crossings:
Tonal Contrast, Raised Table, Paving Usually of Brick, Bollards

3. Comfort Space: Street Furniture and Tonal Contrast



4. Level Surfaces
5. Tactile Paving (Especially for Partially Sighted People)
6. Public Transportation
7. Cycle Parking

N

LEGEND
- Courtesy Crossing
- Pedestrian Path
- Paved path

DESIGN CONSIDERATIONS IN SHARED SPACE

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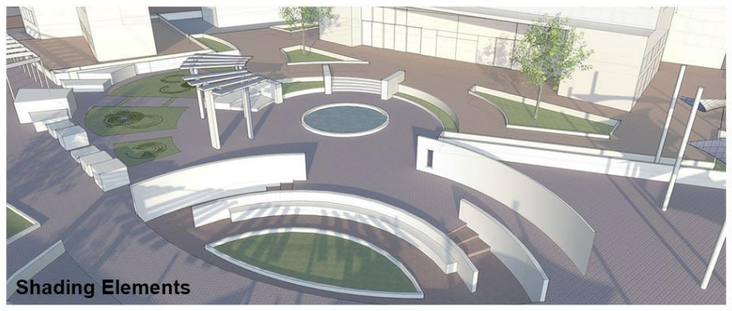
PROF. DR. ŞEBNEM ÖNAL HOŞKARA
PROF. DR. NACIYE DORATLI
RESEARCH ASSISTANT: MÜGE RIZA

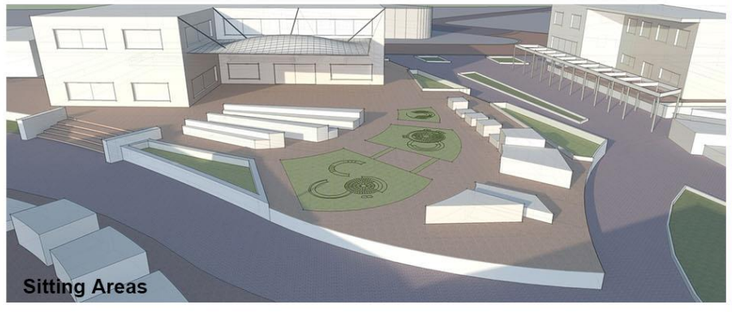
A-A

B-B

Water Features



Shading Elements



Sitting Areas

LEGEND
Courtesy Crossing
Pedestrian Path
Paved path

N

SCALE 1:200

DESIGN PROPOSAL (Central Zone)

UDES 502
EBUNOLUWA AKINGBASO
SOBHAN HASHEMZADEH

KAMYAR LOTFI
SANAZ NEZHADMASOUM

LADAN TAVANGARAN

UDES 501
MARAL YAZDANKHAH

EASTERN MEDITERRANEAN UNIVERSITY
FACULTY OF ARCHITECTURE
DEPARTMENT OF ARCHITECTURE
MASTER OF SCIENCE IN URBAN DESIGN
FALL 2013

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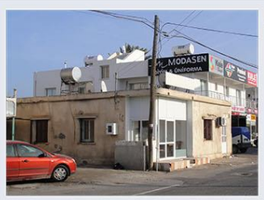


1


6


2

7


3

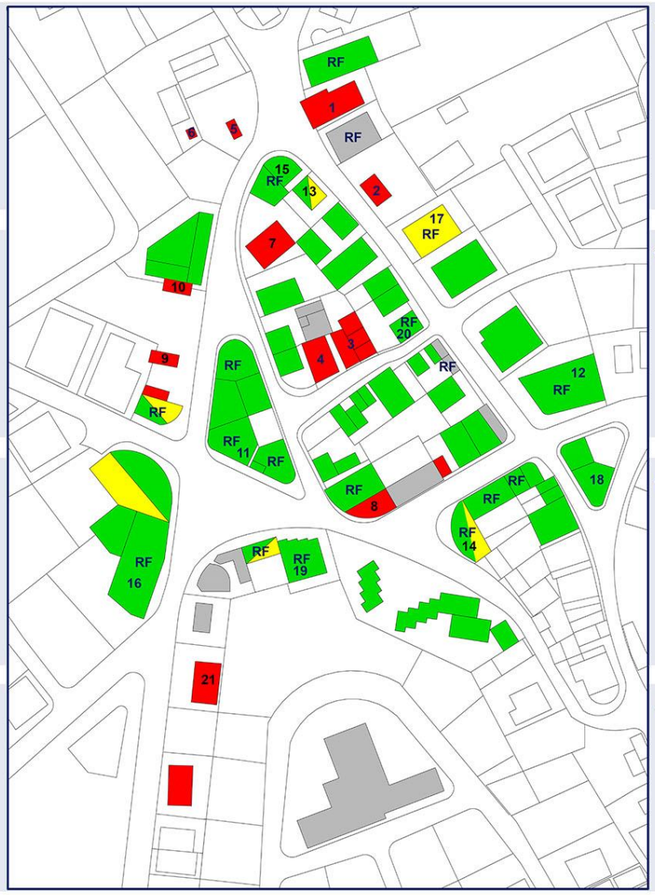

8


4

9


5


10



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19


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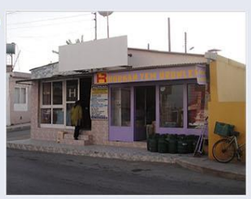
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21


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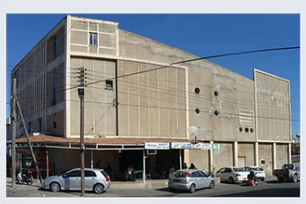
12

17

LEGEND

- To be Demolished
- To be Refurbished
- Floor Addition
- RF Refunction

N

INTERVENTION PROPOSAL IN BUILDING SCALE (Central Zone)

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LADAN TAVANGARAN

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SCALE 1:2000

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South-West View

North-East View

LEGEND

- Retail
- Residential
- Leisure
- Community Service
- Office
- N — New Building

LAND USE PROPOSAL (Central Zone)

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LADAN TAVANGARAN

UDES 501
MARAL YAZDANKHAH

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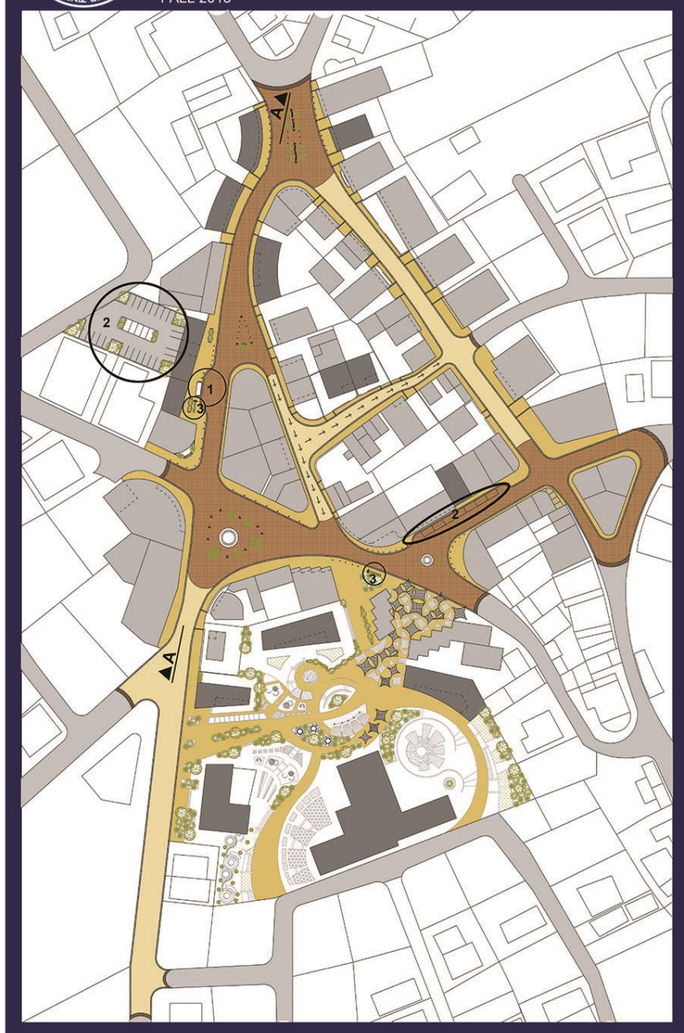

1. Bus Station

2. Parking

3. Bicycle Rack

LEGEND

- Courtesy Crossing
- Pedestrian Path
- Paved path
- One-Way Path

N

SCALE 1:2000

TRAFFIC PROPOSAL (Central Zone)

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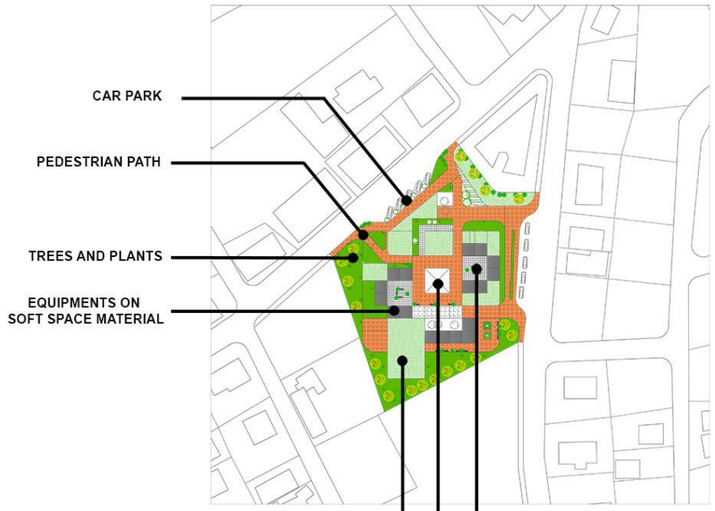

OUTDOOR FITNESS

DESIGN PROPOSAL (OUTDOOR FITNESS)

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EBUNOLUWA AKINGBASO
SOBHAN HASHEMZADEH

KAMYAR LOTFI
SANAZ NEZHADMASOUM

LADAN TAVANGARAN

UDES 501
MARAL YAZDANKHAH

N

SCALE 1:2000

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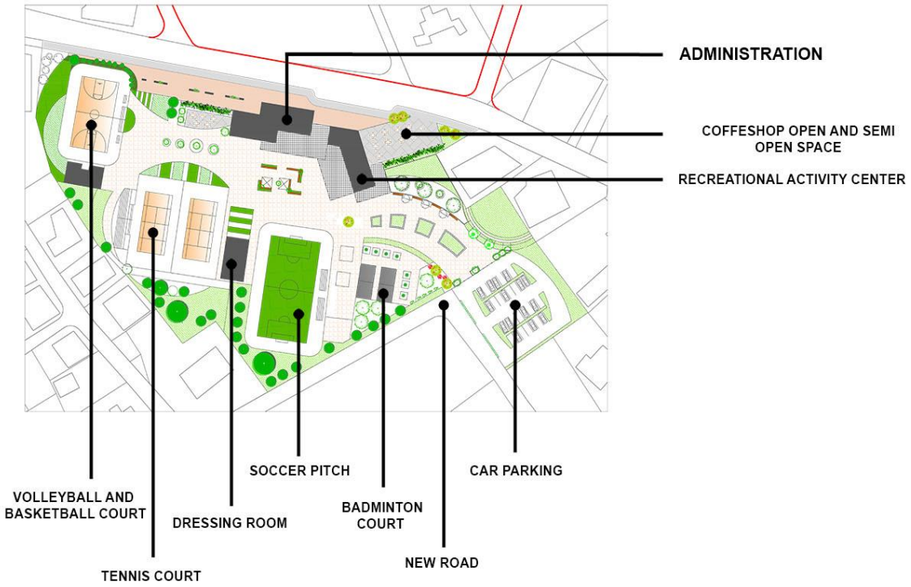
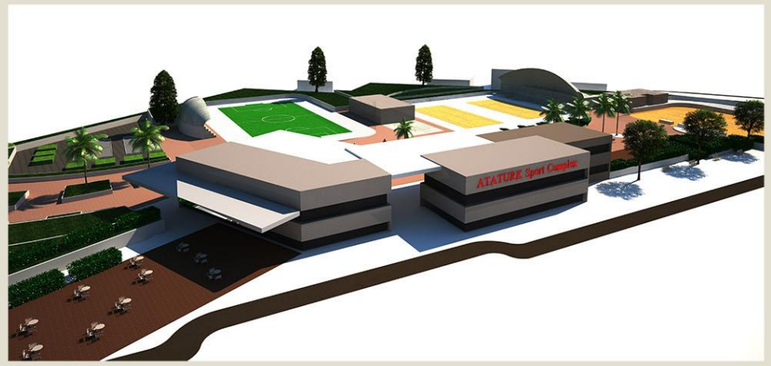
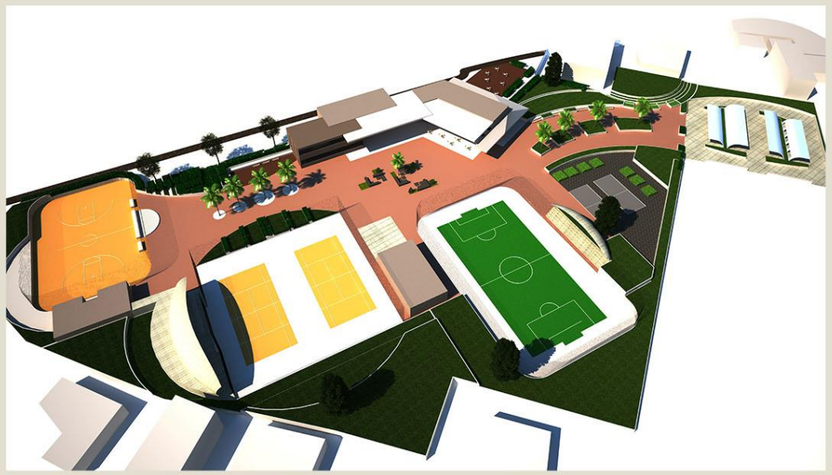
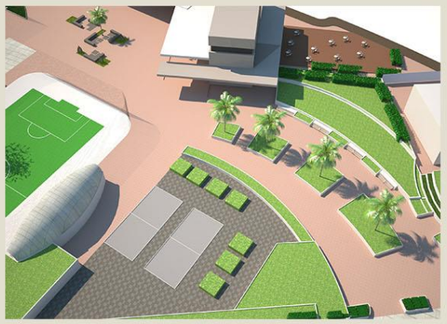




SPORT COMPLEX





DESIGN PROPOSAL (SPORT COMPLEX)

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KAMYAR LOTFI
SANAZ NEZHADMASOUM
LADAN TAVANGARAN
UDES 501
MARAL YAZDANKHAH

N

SCALE 1:2000