

IDENTIFYING ISSUES AND DEVELOPMENT GUIDELINES FOR
AFFORDABLE HOUSING IN BENGHAZI, LIBYA

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MENGENAL PASTI ISU-ISU DAN GARIS PANDUAN PEMBANGUNAN
RUMAH MAMPUMILIK DI BENGHAZI, LIBYA

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TESIS YANG DIKEMUKAKAN UNTUK MEMPEROLEH IJAZAH
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2013

DECLARATION

I hereby declare that the work in this thesis is my own except for quotations and summaries which have been duly acknowledged.

6 June 2013

NURA S. MOHAMED AL-FIADY

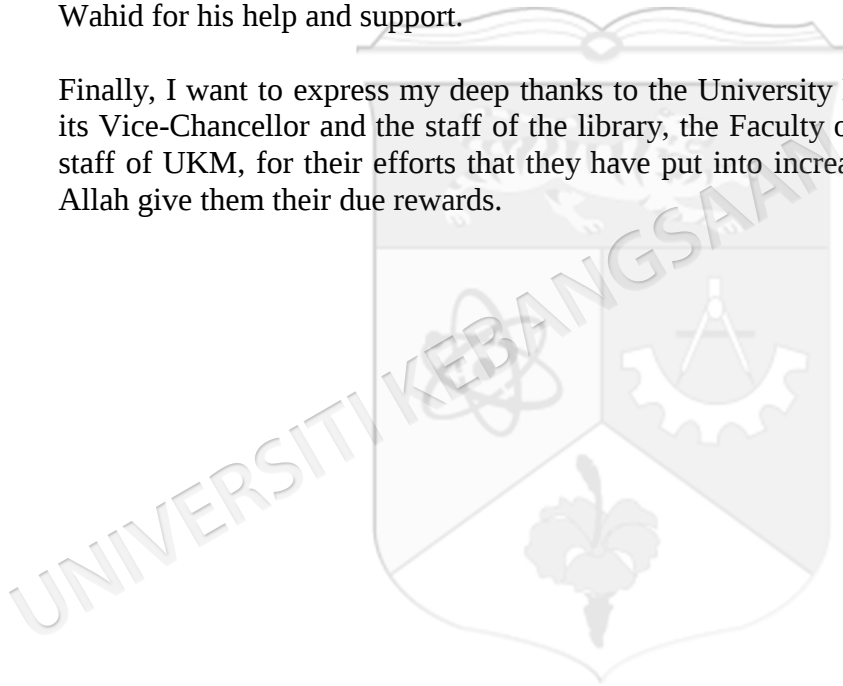
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ABSTRACT

This research is a study of the affordable housing problems in Libya particularly in Benghazi. The importance of this research lies in the fact that comprehensive studies of housing problems in Libya have not been conducted. The research is to identify the issues by clarifying the main problems and solving them appropriately. The study will also deal with the affordable housing in Libya by studying the economic factor and the affordability of the population, and finding a possible solution for affordable housing that will be commensurate with materials, technology and develop a suitable design. The research is divided into two parts: firstly, the theoretical element and secondly the practical which embodied field research. The theoretical part involves a literature review of different aspects directly related to housing in Benghazi city. The practical part of the research includes the collection of data via the use of questionnaires, interviews, field visits and photographic documentation of the area under study. The study is to discover the nature and present reality of the affordable housing areas in Benghazi and the problems. The problems of infrastructure, particularly the provision of services are studied in depth. The research will look at solution to the problem identified in the building phase of the housing project by addressing the suitability of the design, material, technology and police of affordable housing. The study concludes with the fact that that Benghazi city is facing various problems in housing. Most of the Libyan population is earning an average income. This research establishes a set of general results, which are suggestions on how to improve the living of the area under investigation. The outcome will focus on developing a guideline for the housing policy in Libya. The most important thing to focus on is the cooperation between the private sectors and the government to ensure the success of the project for the sustainability of construction and development of the houses in the future. These recommendations suggested will help to improve a housing policy guideline in Libya. This research will try to set out some preliminary observations and conclusions based on research to assess concepts and ideas for housing policy, affordable housing and strategy in Libya. Clarifying substantial issues and constrains on the housing strategy in Libya is vital assessing decision-making strategies for future housing policy.

ABSTRAK

Kajian ini merupakan satu kajian mengenai masalah perumahan yang mampu dimiliki di Libya terutamanya di Benghazi. Kepentingan kajian ini ada lah pada kajian komprehensif terhadap masalah perumahan di Libya. Kajian ini bertujuan untuk mengenalpasti isu-isu dengan melihat masalah utama dan mencari jalan penyelesaian. Kajian ini juga akan berkaitan dengan perumahan yang mampu dimiliki di Libya dengan mengkaji faktor ekonomi dan kemampuan penduduk, dan mencari penyelesaian terhadap perumahan yang mampu dimiliki bersesuaian dengan bahan-bahan, teknologi dan reka bentuk. Kajian ini terbahagi kepada dua bahagian: Pertama, elemen teori dan kedua praktikal yang melibatkan penyelidikan lapangan. Bahagian teori melibatkan kajian literatur dari aspek yang berbeza secara langsung berkaitan dengan perumahan di Bandar Benghazi. Elemen praktikal penyelidikan ini, termasuklah pengumpulan data melalui penggunaan soal selidik, temu bual, lawatan, kerja lapangan dan dokumentasi fotografi kawasan kajian. Kajian ini adalah untuk mengetahui keadaan dan realiti kawasan perumahan yang mampu dimiliki di Benghazi dan masalahnya. Masalah infrastruktur, terutamanya dalam penyediaan perkhidmatan yang berkaitan akan dikaji secara mendalam. Kajian ini akan cuba mencari kaedah penyelesaian kepada masalah yang dikenal pasti dalam fasa pembinaan projek perumahan dengan menangani isu-isu reka bentuk, bahan, teknologi dan polisi perumahanmampumilik. Kajian ini menyimpulkan bahawa bandar Benghazi sedang menghadapi pelbagai masalah dalam perumahan. Kebanyakan penduduk Libya adalah tergolong dalam kumpulan berpendapatan rendah. Kajian ini juga akan membangunkan satu set keputusan umum, iaitu cadangan tentang bagaimana untuk memperbaiki kehidupan di kawasan kajian. Hasilnya akan memberi tumpuan untuk membangunkan satu garis panduan bagi dasar perumahan di Libya. Perkara yang paling penting adalah untuk memberi tumpuan kepada kerjasama antara sektor swasta dan kerajaan untuk memastikan kejayaan projek untuk kelestarian pembinaan dan pembangunan rumah-rumah pada masa depan. Cadangan ini akan membantu membangunkan garis panduan dasar perumahan di Libya. Kajian ini akan cuba untuk menetapkan beberapa pemerhatian awal dan kesimpulan berdasarkan kajian untuk menilai konsep dan idea-idea untuk dasar dan strategi perumahan mampu milik di Libya. Menangani isu-isu yang besar dan kekangan dalam strategi perumahan di Libya adalah penting didalam menilai strategi untuk membangunkan dasar dan polisi perumahan masa hadapan.

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Keywords: *Affordable Housing, Housing problems, Average Income, Development Guideline, Housing Policy.*

MENGENAL PASTI ISU-ISU DAN GARIS PANDUAN PEMBANGUNAN RUMAH MAMPUMILIK DI BENGHAZI, LIBYA

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Kajian ini merupakan satu kajian mengenai masalah perumahan yang mampu dimiliki di Libya terutamanya di Benghazi. Kepentingan kajian ini adalah pada kajian komprehensif terhadap masalah perumahan di Libya. Kajian ini bertujuan untuk mengenalpasti isu-isu dengan melihat masalah utama dan mencari jalan penyelesaian. Kajian ini juga akan berkaitan dengan perumahan yang mampu dimiliki di Libya dengan mengkaji faktor ekonomi dan kemampuan penduduk, dan mencari penyelesaian terhadap perumahan yang mampu dimiliki bersesuaian dengan bahan-bahan, teknologi dan reka bentuk. Kajian ini terbahagi kepada dua bahagian: Pertama, elemen teori dan kedua praktikal yang melibatkan penyelidikan lapangan. Bahagian teori melibatkan kajian literatur dari aspek yang berbeza secara langsung berkaitan dengan perumahan di Bandar Benghazi. Elemen praktikal penyelidikan ini, termasuklah pengumpulan data melalui penggunaan soal selidik, temu bual, lawatan, kerja lapangan dan dokumentasi fotografi kawasan kajian. Kajian ini adalah untuk mengetahui keadaan dan realiti kawasan perumahan yang mampu dimiliki di Benghazi dan masalahnya. Masalah infrastruktur, terutamanya dalam penyediaan perkhidmatan yang berkaitan akan dikaji secara mendalam. Kajian ini akan cuba mencari kaedah penyelesaian kepada masalah yang dikenal pasti dalam fasa pembinaan projek perumahan dengan menangani isu-isu reka bentuk, bahan, teknologi dan polisi perumahanmampumilik. Kajian ini menyimpulkan bahawa bandar Benghazi sedang menghadapi pelbagai masalah dalam perumahan. Kebanyakan penduduk Libya adalah tergolong dalam kumpulan berpendapatan rendah. Kajian ini juga akan membangunkan satu set keputusan umum, iaitu cadangan tentang bagaimana untuk memperbaiki kehidupan di kawasan kajian. Hasilnya akan memberi tumpuan untuk membangunkan satu garis panduan bagi dasar perumahan di Libya. Perkara yang paling penting adalah untuk memberi tumpuan kepada kerjasama antara sektor swasta dan kerajaan untuk memastikan kejayaan projek untuk kelestarian pembinaan dan pembangunan rumah-rumah pada masa depan. Cadangan ini akan membantu membangunkan garis panduan dasar perumahan di Libya. Kajian ini akan cuba untuk menetapkan beberapa pemerhatian awal dan kesimpulan berdasarkan kajian untuk menilai konsep dan idea-idea untuk dasar dan strategi perumahan mampu milik di Libya. Menangani isu-isu yang besar dan kekangan dalam strategi perumahan di Libya adalah penting didalam menilai strategi untuk membangunkan dasar dan polisi perumahan masa hadapan.

Kata kunci: *Perumahan Mampumilik, Masalah perumahan, Pendapatan purata, Garis Panduan Pembangunan, Dasar Perumahan.*

CHAPTER I

INTRODUCTION

1.1 OVERVIEW OF THE STUDY

Housing is more than about houses; it is the foundation upon which the essentials of life are anchored. The quality of housing can enhance or diminish the well-being of individuals and families as well as that of the entire community. The main objectives of the housing policy and urban planning, are to meet the needs of residents in the community. Housing has been an important topic for mankind since the beginning of history (Leonard 1989). Researches and publications have increased in the field of housing. There is a definite need for a non-profit international body to lead and coordinate all the major activities, practical and academic, related to the topic of housing and human needs for affordable houses. Housing is not just about providing a roof, and it is not just a physical space: it provides roots, identity, security, and a sense of belonging and a place of emotional wellbeing (Nordberg 2000).

In Libya the majority of residents are people with limited income. The decline of free space urban areas has led to high costs of urban housing. In the third world countries most population cannot afford houses (Dwyer 1975).

The development of affordable housing in Libya is very limited. In Benghazi city, the government built 7000 affordable housing unit in 1985. The houses were affordable at the beginning and available to most middle income people. However, the houses were not completely successful. The materials were of low quality, and the houses prices had been manipulated by the real estates. This indicates that there is no proper housing policy or regulations imposed by the Libyan government.

Libya has no proper housing policy and guidelines monitored by the government. Most of the people have limited income and they face problem in building and renting houses. There is a lack of the housing policy and guideline, towards providing standard affordable houses for these limited income groups. Ideally, a housing association or committees should be established to play the role of determining rights and distribution for those with limited income.

This thesis sets out some preliminary observations and guidelines, towards establishing housing policies in Libya. The most important criteria to develop this policy are to identify substantial issues and constraint in Libyan housing development.

1.2 THE RESEARCH ISSUE

There have been increased talks and discussions about the housing problems in Libya. The total family income and the characteristic of affordable houses are not yet established in Libya. The high housing cost has serious implications on housing ownerships in Libya since the beginning of the 1980s. Ownerships are likely to further deteriorate in the years ahead, unless some guidelines or policy are established to counter these problems.

The problem statements are:

- i. There is no housing policy as a guideline for the affordable housing in Libya.
- ii. The factors behind the affordable housing problems in Libya is people inability to rent, buy or build a house due to the high real estate prices of building materials.

1.3 OPERATIONALIZED TERMS

1.3.1 Affordable Housing

The affordable housing definitions is the types of housing that are considered to be affordable for the people with regard to limited incomes and local house prices.

1.3.2 Middle Income

The middle income is the standard of living, related to the people earning average salaries (100 LD – 300 LD) monthly from the government. Most of the middle income group do not have the ability to buy or built a house.

1.3.3 Lower Income

The lower income is defined as a group of people that does not have a continual monthly income and their income are below 100 LD monthly.

1.4 LIMITATION OF THE STUDY

The study was carried out in Benghazi City in Libya. The finding of this research was limited to the people of that city. Benghazi city is one of the cities in Libya that been neglected and ignored in the past few years by the government, a typical city in Libya facing issues of affordable housing.

1.5 OBJECTIVES OF THE STUDY

This thesis deals with the housing problems in Libya. The objectives are outlined below:

- i. To define the middle income group, and their needs of the affordable housing in Libya.
- ii. To develop guidelines for affordable housing policies in Libya.
- iii. To identify building materials and technology for affordable housing.

1.6 SCOPE OF STUDY

The scope of study will cover the following:

- i. Studying the population's income (middle income group) of the selected areas in the city and its implication on the affordable housing problem.

- ii. Developing a guideline of housing policy addressing the needs of the Libyan people for affordable houses in Benghazi.
- iii. Identify affordable local materials (mud) which can be used to build affordable houses, which is available in the Libyan Desert.

1.7 RESEARCH METHODOLOGY

This research is divided into two parts: theory and fieldwork. The first part involves the identification of crucial housing issues derived from the literature reviews. The second part involves interviews and surveys of the selected housing areas in the city of Benghazi. This background offers a realistic approach in gathering information about the subject. This research is carried out by looking into the existing housing problems in the third world countries. It takes into account the surveys and interviews, a development housing policy of guideline for Libya, proposals for proper affordable houses and cost effective materials. It seeks to identify the problems of the affordable housing in Libya and suggests possible guidelines to overcome the issues.

1.8 THE STRUCTURE OF THE THESIS

This thesis presented in six chapters. Chapter One deal with the introduction and gives the overview of how the study is going to be carried out. Chapter Two presents the housing problems and the affordability issue in different countries, the definition of housing and affordable housing, the needs of privacy and culture in housing. Chapter Three presents the literature review which covers the housing policy in Libya and background study of the affordable housing. Identifying affordable materials in different countries and compares these to the local materials in Libya which are affordable. Chapter Four presents the research methodology of the study. Chapter Five presents the collection of data from the questionnaires, interviews and field visits of the area studied. Chapter Six outlines suggestions for housing policy or guidelines in Libya.

1.9 OUTCOME OF THE STUDY

This research attempts to develop guidelines and housing policies for affordable housing in Libya. The most important thing is to focus on the cooperation between private companies and the government for the success of any housing project and development of houses in the future. The guidelines provide information on appropriate and affordable rent or buy houses. The guidelines also outline how the government can provide lands for the people through a community housing development association, and by using affordable local material which is available in Libya.

1.10 CONCLUSION

This thesis proposes guidelines for the housing policies in Libya, which are sociable, economically responsive and utilizing proper materials for affordable houses. The guidelines aim towards development of affordable houses, for the limited income people in Libya. The guidelines cover social, economic, cultural, material, technological aspects of housing. To develop these guidelines could lead towards legislative and procedural reforms in the housing policies in Libya.

CHAPTER II

HOUSING PROBLEMS AND AFFORDABLE HOUSES

2.1 INTRODUCTION

This chapter reviews the housing problems in other countries. The discussing and studying of these problems in other countries can help to solve the housing problems in Libya. Focusing on the problems and discovering the solution, to apply these solutions depending on the circumstances in terms of economic, social and cultural in Libya. The chapter reviews the definition of the housing, the affordable housing and problems in other countries. Identifying what is housing. The human requirement for comfortable houses according to climate and social demand is of utter most significance.

2.2 WHAT IS HOUSING?

“Housing is a word that is common to many societies but most widely misunderstood especially its technical definition or meaning. Housing is therefore viewed not only is a matter of shelter together with its supporting infrastructures but more comprehensively as an evolutionary and participating process is a complex system of interactions between institutions and residents which give shape to human settlements” (Adedapot 2006).

A house can be described in three ways: First, a spatial organization, it observes the kinds of spaces the house type offers and the ways in which these spaces relate to one another. Secondly, a physical system, it describe the different kind of material that is been used in one building on the walls from the first story to the second, and using high ceiling to assure sufficient ventilation in the hot climate.

Finally, a house in a stylistic way, it is the way of the windows and doors are placed, and the decorations applied around edges and surfaces from inside and outside the building (Habracken 1988).

If we look back to the ancient history of human beings, the first thing that man was looking for ways to find a place to hide from other creatures. This need was very important to him even before food and water. Shelter provides man with peace and security and when he has these two things he can begin to relax and start working on other projects. Housing's history has known several phases, starting from the cave, using mud, wood, and bamboo and so on. However, the industrial age brought a new style of human being which is well illustrated in the city that brings people to live together. Since that time, the city has brought another sort of problem, which is the growth of the population in a specific area. This has resulted in the problem of housing particularly within the Third World Countries (Payne 1977).

Housing is the person's ability to afford buying a house which is of course crucial in this research, and should also refer to the kind of group which can afford a home. They are limited income group, and trying to provide them the ability to interact with the prices of an affordable house is the key to the property's permanent home. The planning system for home ownership is the economic transformation based on the regional targets especially in a country like Libya (MacLennan & Stephens 2011). However, describing housing needs can be in many different words like shelter, privacy, location, environment amenities, investment, land, building materials, labor, policy, planning and people (English & Bistline 2006). So, in order to solve the housing problem; we need to discuss this issue, and discuss the problem of housing in other countries. Housing is a serious problem for public and must be solved. We find that all people in all parts of the world protesting the bad housing conditions. The housing problems, in most country are trying to adopt a variety of measures to address the widespread dissatisfaction about housing. Housing problems is a global problem varies from country to country, depending on the size of requirement that is needed by the community. For the solution of housing, we need to solve the housing's need, and worthy of due consideration.

2.3 DEFINITION OF HOUSING

Housing can be defined in a simple way as a building or dwelling for one or more persons, especially for a family (Kearns 1992). The Oxford Advanced Dictionary defines house as “*a building made for people to live in usually for one family or a family and guest*” (Hornby 1984). The definition of housing can be defined in many ways, as a shelter, dwelling or a building.

2.3.1 Definition of Housing as a Shelter

Shelter in general, is a structure or building that provides cover from weather or protection against danger. According to Smith 1971 “*Shelter is another name for housing especially in economic books*”. Housing is certainly a part of the shelters with difference in meaning for the different kinds of people and places.

2.3.2 Difference between Dwelling and Building

“*Dwelling is a fundamentally human process*” (Habraken 1999). When we talk about dwelling, the first thing that comes to our mind is buildings, but actually not every building is a dwelling. For example, power stations, stadiums, hangars and bridges are buildings but not dwellings; they are not dwelling places like houses. Even so, these buildings are in the domain of our dwelling. That domain extends over these buildings and yet is not limited to the dwelling place as a home. Building is a complex activity, people go to their work but they do not dwell there, they only inhabit them but do not dwell in them, dwelling does not mean merely we take shelter in them, housing is dwelling we live most our time in it. Housing or dwelling is the base that we go back to in the end of the day. Building and housing are two different things like it has been said before buildings are a complex activity, it makes people aware and has different levels of needs; but houses has a especial need, like comfort and place. Housing has a special architectural form that we are always looking for, and to make pragmatic decisions it has to be in a suitable level of envisioning architectural spaces in the mind and on paper, and of committing one's whole being, mind and body, to capture the

ideal image for the creation of a material form. Once this is achieved, it creates the architectural form which is based on the environment of man (Lane 2007).

2.4 DEFINITION OF AFFORDABLE HOUSING

The definition of affordable housing can be in many ways, it deepens on how it is describes from one person to other and from one country to other. For example the affordable housing definitions are the types of housing that are considered to be affordable for the people with limited incomes in that locality, according to Yong 2010. And affordable housing forms as one of the basic needs of human rights (Abd Aziz, Hanif & Singaravello 2010). According to Bruegmann 2012 the definition of the affordable housing differs significantly from the federal, which define affordable housing as a family pays a limited amount from their income. And in Libya for the limited income group, they must not pay more than 1/3 of their annual income to purchase a home.

2.5 THE FUTURE OF THE AFFORDABLE HOUSING

In any countries the expectation of home prices is rising every year, in America they have been maintained a cautious but improving view of the affordable housing market and homeownership (News Center 2012). However, their stalling household financial expectations and declining economic optimism will likely mean the rate at which the affordable housing market recovers will remain tempered, that is going on in America (News Center 2012). But what about the third world countries like Libya. The outlook of the affordable housing prices in many countries economically are rising, forgetting that homes must be economic limited prices, the field of affordable housing in most countries become a market for trade aimed at financial gain, forgetting the main objective of building houses for limited income people. In Libya the situation is different from other countries, as the field of affordable housing is not within the Libyan government schemes since 1985 (Azevedo 2008).

2.6 AFFORDABLE HOUSING AND POLICY

What does affordable housing mean in policy? It involves the capacity of households to consume housing services; specifically it involves the relationship between household incomes and housing prices and rents (Nelson, Pendall, Dawkins & Knaap 2002). In countries with less development like the third world countries, it is one of the great ideas to stand for the housing policy, and the objective of affordable housing can start in Libya, to solve housing problems that is rising every day with social needs.

2.7 HUMAN REQUIREMENTS FOR COMFORT IN HOUSING AND DEMINED ACCORDING TO CLIMATE

In general, housing must provide comfort. Houses must ensure comfort according to the climate of specific region (Givoni 1976). The interior climate must be comfortable during the hottest days. These can be achieving through the selection of proper materials and building design. Also housing must have appropriateness of materials, comfort and safety (Bay & Ong 2006). Housing needs to be designed based on the climate and the influence of the climate in architecture.

2.7.1 Designing with Climate

According to Olgyay 1963 he said that "there is a relationship between the form of a building and the climate of the region in which it is located as well as a relationship between building form and energy performance exists", according to Lehmann and Yeang 2010 "*Climatic in architecture means responding to the climate with minimal reliance on fossil-fuel energy for achieving comfort*".

Architecture has been described in some countries, such as, California, Singapore, Germany and Libya may be radically different from each other, and the diversity of its presence in different climatic zones from each other. For example, in the areas of hot and dry climate especially in Libya, emphasis must be on prevention and protection from the scorching sun which is necessary, and need to shade the buildings and the surfaces, of the implication of reflecting the sun's rays, and reflect

heat from the roofs of buildings, the temperature of the house from the inside, balconies be covered with vegetation and trees, the nature of the special function of evaporate coolers is an ideal for dry climates. The trees will act as dust filter from the air, in hot humid climate needs to maintain and configure the movement of the air of comfortable. The buildings that are facing the main streets should be planned to capture breezes passing by. A blend of buildings in the highlands enhances ventilation and wind, and must not impede air traffic. Vegetation and trees with branches far from the ground, such as palm trees would be ideal. Rain may be heavy in some areas, and it needs the surfaces implementing this, to reduce the flow of water in urban areas and storm protection. In the hot climate and the direction of the wind usually changes depending on the season. It must be the street planning that will block the wind in the winter, after it allows cooling breezes in the summer through the city (http://www.bom.gov.au/climate/enviro/design/design_d.shtml#two). On the other hand it has the ability to cool parts of the building, or on exposed sites, and we need to limit the protection of the wind.

The process of housing can be divided into four stages on the basis of a balanced climate. First stages, it is about environmental adaptation and study the climatic elements located in this site, for this notice that each element is a different effect on any other element presents a different problem. Second stages, is to assess the effects of climate in physiological conditions. Third stages, it must apply some of the ways of technological solutions to help the problem of climate and comfort. Fourth stages, all solutions should be combined between all phases together, according to their importance in the unity of architecture (Nikolic 2011). In climatic solutions there is a numerous creative of climatic planning to use energy efficiently. Studying the climatic systems can be a proper way to make the building more sustainable. Regarding in countries with the four season climate regions like Libya, there are different adopted architectural approaches that can be basis to the best ways to make efficiency and sustainability by using a combination of modern and local materials. The important point in using local materials is their environment friendliness (Mofidi, Moradi & Akhtarkavan 2008). These materials besides very ingenious climatic solutions and architectural design methods such as the courtyard, the wind catcher, and wide walls, are the main reasons for energy efficiency of these buildings to these

extents. Like it has been said before housing needs to be built, design, planned and choice of material based on the climate, all that is related to the affordable housing.

2.7.2 The Influence of Climate in Architecture

Architects and engineers design buildings for the convenience of rights by controlling factors such as temperature, humidity and air flow, but we understand how these factors affect the environment in the house from the inside (Olgyay 1973). So, humans spend up to 90% of their lives indoors; consequently, the way we design and operate the indoor environment has a profound impact on our health, one step toward better understanding of how building design impacts human health is to study buildings with related to climate (Guenther & Vittori 2008). So, Libya is located in hot climate zones and dissolved fifth of the desert area. However, the process of designing buildings, depending on the surrounding environment and to use the same technical procedures for the building of those cold temperate climates and in spite of differences of human factors in responding to the environment in each region. (<http://www.everyculture.com/Ja-Ma/Liberia.html>), and studying this type of situation and studying the designs for the development of research methodology and the dynamic climate of the logical, and approaches to building design to its composition in these areas, with particular reference to the affordable housing units required for the population in these areas.

The shapes of the house and the energy performance that presents the relationship between them, it follows the existence of the relationship between house form and climate of the region that is surrounding it. The architecture in Singapore and California, and Germany in the design of housing may be radically different from any other housing if they fall into a different climatic zone (http://www.bom.gov.au/climate/environ/design/design_d.shtml#two). The process by (Olgyay 1973) of building a climate-balanced house can be divided into four steps as following:

- i. Toward environmental adjustment is a survey of climatic elements at a given location, and each element has a different impact that presents a different problem.
- ii. Evaluate each climate impact in physiological terms.
- iii. The technological solutions must be applied to climate-comfort problem.
- iv. The solutions should be combined, according to their importance, in architectural unity.

Focusing on the climate in building especially houses, is one of the importance that Libya has to concentrate on, by this way it can help by reducing energy and save power, Libya is a hot country and designing by climate can be a way of a new technology in housing.

2.8 HISTORY OF AFFORDABLE HOUSING

Affordable housing had begun an image of a project disaster, it was caught between the rising costs and falling rents (Spence 1993). So, affordable housing can mean only for the low income people. Affordable housing tenants and the vast majority are law abiding people and these people are trying to make a better life for themselves (Smith 1971). However, government and urban decline results in the rising of population, in the third world countries affordable housing had developed from its beginnings, when other countries began tearing down high rise buildings dispersing its residents and affordable housing. It also examines the growing political activism of tenants as they strive to improve their living conditions, gain greater responsiveness from the bureaucrats and politicians they deal with, low income people struggles against urban inequality and racism. But actually what we are thinning on or concerned with is how these people can find a better living for themselves and their families. The cost for good housing will be too high for them to pay especially when their incomes are too low.

According to Ogawa, Fukao, Yamazaki, Kobayashi, Kadowaki & Minami 2006. Not just cost is the problem in housing; there are different kinds of problem in housing. In Japan, a huge volume of housing was built in the mass-housing era between 1955 and 1973, and many related problems have arisen in recent years, today

for example an increase in the number of aged residents, one of the most significant pending problems concerning residential buildings. However, (Savaya, Spiro & Elran-Barak 2008) they agreed that affordable housing programs can involve enormous human, material and financial resources, and constitute huge investment. However, housing programs might result in adverse consequences if sustainability criteria are not put into consideration at the design and implementation.

2.9 PLANNING FOR SUSTAINABLE HOUSING AND COMMUNITIES

In Libya and especially housing markets there is something seriously wrong. That is the imbalance in the demand for housing significantly, which led to the high prices which are high in some places and abandoned homes in others, their role in raising the political accommodation. The government had some of the implications of the housing market overall and may not be borne by programmers such as those who had the initiative at the beginning of the houses and pioneers in houses renovation in the market, and in the future. During the next few years, sustainable communities will exist, and a framework aimed at creating societies that are more long-term sustainability, and review of the underlying issues in Libya for the lack of supply response and housing (<http://www.arch.hku.hk/research/beer/sustain.htm>). However, according to Abdellatif, Othman & A.A.E 2006 planning for programmer sustainability is the key factor in social programmers, which is an aspect of social programming lacking in many developing countries.

2.9.1 The Need of Suitable Housing

In some countries, sustainable housing is as much a question of the affordable housing and housing problems (Edwards & Turrent 2000). So, housing projects are still low in these days in Libya, and as in the past on this issue of human misery, such as housing prices today and in the search for reasonable housing prices and of good quality. And somehow, the images in housing still remain in the collective imagination and as our views in the housing problems. Furthermore, those views in the erroneous information hinder the construction of a small project which is much needed with the increase in population for the production of good housing, and trying to increase the construction

of housing affordable for low income and middle income families. We need housing in specific neighborhoods, and we need it to be affordable, because it is simple to design, and it is required by many people, plus that economically it is low and limited, therefore it is an act of business to be good and suitable to the increasing density. Affordable housing today is at a studying level in the world and being built everywhere and trying to provide middle income households, it cannot be distinguished from the rest of the housing such as housing, which is building at market prices. In fact, prices are reasonable and the units are often limited part of the developments in the market which is simply the price, and the proportion of units allocated to specific income levels of the population, including the market price (<http://www.centuryhousing.org/popup-more-affordable.htm>).

According to Friedrichs 1988 the provision of the affordability housing can depend on the affordability of material, and on the way of designing housing that most of countries can provide, for both the lowest income groups and the homeless in rich industrial societies. But the lowest income groups are facing different kinds of situation, which they cannot be capable or willing to buy or rent a house. So, in the crisis of housing problems, the economy is the main reason of the low income group, therefore, it is impossible to solve these problems by urban planning, or by providing homes that they cannot afford. According to Balchin 1989 housing problems needs affordable solutions, by both renting and buying houses, which is a fundamental choice, and developmental new affordable housing can be an incentive, which is a fundamental choice and developmental new affordable housing by the social demand can an incentive.

2.9.2 Social Demand

According to Hecht 2006 the demand is always stimulated by the growing population increasing, one of the historical problems of housing is affordable housing which seen as an imbalance between the numbers, location, size and real demand. So to satisfy the demand for housing which consists in the developing of productive forces that is based on the technological progress and the socio economic. However, housing condition in the past was the massive deterioration, which was housing paradox, and

based on socio-economic and was depending on dwelling. Housing policy is totally an inventory and applied by any housing, but in the affordable housing of the socialist housing policy strives to eliminate the housing shortages (Friedrichs 1988). Demands are rising as far as the quality of housing and related services are concerned. But the situation is better in villages and small towns; demand is higher only in big cities, especially in Tripoli and Benghazi, so the housing problems became a serious issue in Libya because of the needs of the population. Housing emerged as a crucial condition for accommodating the rapidly growing population in good living standards. Libya because of the needs of the population, housing emerged as a crucial condition for keeping the rapidly growing living standards in good proportions for a demand of suitable housing.

2.9.3 Demand for Suitable Housing

The demand for housing is attested by the long waiting lists for affordable housing and other subsidized housing. In Libya these waiting lists comes from the housing institutes, and waiting for your turn for a piece of land takes too long from ten to fifteen years. In addition, another indicator of demand is the degree of doubling up, with experts saying this has greatly increased. The size of the limited income population, and the increasing number of families, indicates that demand for low rent housing cannot be available (Municipality of Benghazi 2008). Most of the Libyan cannot afford to build or rent a house because of the low income and the high cost of the building materials. So, in this case the demand in some group of people for low cost housing is the main goal.

2.9.4 Demand for Low Income

There are groups of people that cannot afford most of things, because affordability applies to the provision for the poorest limit sections, and these groups obtain that their shelter present through occupying structure they found; some building makeshift shelters made of scrap materials. However, the needs of limited income groups rather than the poorest are different needs. The state has to offering affordable good quality housing for them (Friedrichs 1988). In the range of structure of large houses and

complex process systems, the building serve a wide variety of commercial and industrial uses, where the demands of the process itself drives the primary requirements of housing. In addition, affordable housing must be capable of adaptation to meet new changing requirements, and change the demands placed upon building means (Macmillan 2004). However, the demand is not just low cost housing, but the demand is an affordable sustainable housing development, and that will be discussed later.

2.9.5 Sustainable Housing Development

According to the Bruntland Report, sustainable development is “*the development that meets of the present without compromising the ability of future generations to meet their own needs need development*” (WCED 1987). Suggest that the principal goal of sustainable development in housing is meeting present human needs in such a way that will not jeopardize the potential of posterity to meet their needs. Viewed from a holistic perspective, that sustainable development entails the attainment of equilibrium among three contending sub-systems (economic, social-cultural and environmental) (Wiedenhoeft 1981) sustainable development in housing as applied to urban areas is the ability of the urban areas and their regions to continue to function at levels of desired quality of life by communities without limiting the options available to the present and future generations and resulting to adverse impacts (Adediji 2005). The global housing problem that exists all around us means reliance on policies and problems, and their agreement in a wider scope and sustainable development, which depends on the policies, programmers and how sustainable housing can be designed. (<http://www.arch.hku.hk/research/beer/sustain.htm>).

2.9.6 Sustainable Housing Design

The general definition and discretion in general of the sustainability as a process to meet the essential needs of mankind, without prejudice to the needs of future generations. That the search for housing sustainable design requires more comprehensive long-term perspective and have challenges to get the relationships rightly, not only for the time being, but also for the future (Wendy & Tom 2007). The

sustainable housing design is the interface between architectural, mechanical, electrical and construction engineering. In addition to classical beauty interests, such as size touch, relations, parameters, shadow and light, teams of housing design must pay attention to the social, economic and environmental long-term costs.

2.9.7 Sustainable Housing Construction

The basic idea of sustainable housing construction is to achieve balance through the elements use, practice in the housing field, indicates that the balance on the design and production of housing, despite the existence of research and studies in sustainable housing (McIntosh, Gray & Maher 2010). However, sustainable housing construction is the definition as "the establishment and responsible management of health and environment based on the principles of resource efficiency and the environment". The design of sustainable housing are designed to minimize the impact on the environment and around through the efficient use of energy and natural resources.

It contained the following principles:

- i. It must reduce the consumption of natural resources and non-renewable.
- ii. It must be strengthened in the natural environment and surrounding resources.
- iii. It must be prevented and the abolition of the use of poisons in our industries.

The defined as "sustainable housing" as those houses that build, and has a minimum and a few of the negative effects on the environment and natural resources, in and around the construction of the housing itself, therefore, their immediate surroundings in the region and also on a larger scale in the region and the world. "Sustainable housing" can be defined as building practices that seek to get a good quality including performance of economic, social and environmental, in the matters of rights. Thus, the rational use and correct in natural resources and appropriate management to contribute for housing, the correct part is to provide the use of natural resources in housing. And which were launched in shortage, and reduction of energy

consumption of any energy conservation to the extent possible, and improve the quality of the environment. So, in the past, the first place has been focus on the importance of size and a lot of construction in other countries, and it barely played the important role of quality issues and good housing. However, in terms of quantity strict in the saturated market for construction and housing now in most countries, the demand has become increasingly the request of the quality of housing. Accordingly, it should implement policies that contribute to sustainability in housing, while recognizing the importance of conditions and the development of the market now. All environmental initiatives in the housing sector, construction and demands on the users are key factors in the market (<http://www.arch.hku.hk/research/beer/sustain.htm>). The governments will need in some countries to be able to give people a big boost for sustainable housing through the promotion of these kinds of developments.

2.10 HOUSING ISSUES IN ENVIRONMENT AND SUSTAINABILITY

Housing plays a vital role in the need to maintain a temperature rang that is comfortable for humans, often in a climate that is too cold or too hot for comfort. As in the practice of design, our overall goal integration of several themes including the historical, the cultural and the environmental. In terms of sustainability, the energy use of a building depends upon the overall design. Houses have tended to naturally lit and ventilated, whereas in non-domestic housing, mechanical ventilation and air conditioning are commonplace and consequently large consumers of energy and producers of CO₂ (Thomas & Garnham 2007). The objective of accommodating human needs and their aspirations is the sustainability for the built environment (Bromley, Tallon & Thomas 2005). In addition, incorporating functional and healthy environmental housing designs is one way of solving environment problems while protecting the environment. We also need to find a way to serve human needs while doing this. It is the result of the science of the architect incorporating functional design as an art and engineering technology with the environment. This way of environmental design has already been used since the beginning of the fifties as a natural reaction to environment issues, which have become very complicated in a modern world (<http://www.arch.hku.hk/research/beer/sustain.htm>). The future place

of architecture will be in combination with politics and a complete holistic program to make sure that we can protect the environment.

2.10.1 Shelter and Environment

The relationship between the environment and human behavior, one of the most important long term interest in the field of urban planning, but estimates of these direct links between physical activity and the environment because it affects the personal health are still rare in this area (Handy, Boarnet, Fwing & Killingsworth 2002). By "environment" in general we refer to our surroundings and our vital natural environment, which in earlier times meant that the four elements, earth, fire, water, wind, and came later to include the essence of air or space (Frayne 2010). So, what is shelter? And, what is the main meaning of comfort? Shelter is the requirement of comfort. The shelter is a space you can modify the optimum natural environment of livability; and the environment consists of many elements in a complex relationship. As the environment constituents of: space, climate, animate, sound and light (Olgyay 1973). The "Comfort Zone" is the important zone for human, which human strives for the point at which minimum expenditure energy is needed to adjust themselves to their environment under conditions which are suitable.

2.11 FACTORS OF HOUSING PROBLEMS

The most important factors in determining living conditions are the housing situation. Housing conditions are expected to improve with economic growth and development (Sema 1996). However, housing problem in the world is very chronic, particularly among the low income. Nearly the whole of the housing shortage in any country is in high ascending. Hence, to address the real housing problem it is imperative that alternative models for housing finance (Manoj 2010). Like to know the requirements and needs of people in housing, especially the low income people. The larger role here to solve the housing problem is the government. A cooperative government with private sector, to provide a house with the necessary requirements and needs, to a person with a limited income to own this won house.

2.12 LOW INCOME HOUSING

The system of low income housing means is a series of regulations of the tender priority to the transfer of a type of payment system, and specific systems include that the government provides housing basic living of these families who have limited income, and provides a home of low rent specified by the authority of the country, and the Libyan government, must provide homes economically affordable for these families with limited income. The main objective of the transfer payment system is the equalization of public services in the state, and the equalization of real estate means the equitable sharing of the commodity to the public in particular, as especially in real estate, which also can help to achieve the development of the economy growing (Gao 2010). Affordable housing is the main theme all over the world and on the agenda and political planning, planning for the provision of housing in any country is a collaboration between the government and the private sector (Zainun, N. Y., Rahman, I. A. & Eftekhari M. 2011) the main objective of housing problems is to ensure that all residents, especially low income groups have access to adequate shelter, affordable and related facilities.

The housing institute in the 70s in Libya was trying to provide services to the families and individuals, especially for the limited income groups a place to build their houses, and also with the support they need to restore stability and build a better life for them (<http://www.urban.org/publications/901042.html>). However, we need to develop the best for the future, especially in the area of housing, and residential buildings of high quality that help to revitalize neighborhoods in the region and create a sense of mutual understanding among residents of the community, and this will put an end to the limited income groups and accord proper human rights and to live in dignity.

2.13 FACTORS THAT INFLUENCE HOUSING COST

Firstly, the provision of privacy is one of the most important elements in Libyan house design. Culturally privacy is an absolute requirement of the resident. According to Bekleyen & Dalkiliç 2011 in the Middle East, privacy is a very important concept in

social life. The effects of the privacy can be seen in the Libyan housing designs. Privacy is to be guaranteed for all of the activities of the users in his house. From the standpoint of urban design and architecture the family is special and should be offered with privacy from outside the street. In designing houses, the walls will either be one or some of the outer walls facing the street. If there are other openings such as the door; it must be screened and the interior or occupants in the family should not be seen. This also applies to the outer gate, which usually has a screen or curtain for the privacy of the family. Privacy is very important in Muslim families. The key point to understand about the way the house is divided in Libya is that there is a separation between the domains of male and female of the house. Certainly should be in the design of the houses in the Arab areas which requires privacy. External situation of the house is the first principle that should be considered in the making of public and private spheres. This should be fixed for the guests of the house to be unable to be seen by the family inside the house. It refers to the areas used which are far from the guests areas. This principle includes all Arab cultures in the design of houses, not only within the grounds of the house, but also those coming from outside and nearby the house (http://www.fifehouse.org/index.cfm?pagepath=Privacy_Information&id=915).

Privacy has to do with the entire house. It is essential that the development of walls, doors, and screens be constructed in such a manner that prevents curiosity felt by the guests to the house and garden. Interestingly, across the Arab World the buildings were constructed with the capability of women to be able to see the activities of the guests while remaining unseen themselves. This may be a design principle is still possible, although there may be concerns about the secret talks men.

Secondly, if you are thinking of building a house, location would be the most important decisions you have to make. The main goal would be the value of the house and its distances between public amenities and the location of your workplace. Before looking for land for sale to build on your house, you should consult a real estate agent to help you determine sites and gives you the best building and the largest value for a house. The type of the house should be such that it should be appropriate in location. If you are looking for a house with one bedroom for retirees or couples without children, you should look for land in a peaceful area outside the city where there is no

traffic. If you are looking for a house or a number of houses in the suburbs, you should look for a land for sale close to schools and hospitals so that they are conducive for the elderly as well as families with children. This will help to increase the value of your house when you decide to sell it, the same time in applying for a house in urban areas. However, most homes in urban areas are near schools and hospitals because the cities are more densely populated. If you cannot find a land for sale near hospitals and schools in an urban area you must search for land for sale close to public transport, and if you are looking for land for sale to build hospitals, you will need to check the systems division of the your municipal area. The same applies to the building of schools; generally it is better to build schools in an area of low traffic to maintain the safety of children. And hospitals tend to be located in high traffic areas, where they are most accessible to the public. A lot of people do not even think about where the nearest hospital is in relation to the property when they are buying a house. However, there may be a lot of housing near hospitals, and it is very important for the elderly people or patient that to seek permanent treatment requires them to make regular trips to the hospital. The people who work in hospitals, such as doctors and nurses prefer their homes to be near the hospitals because they can reduce the transport time between most urban areas in the city. At the same time hospitals should be accessible by public transport They should be near the main roads so that ambulance can easily gain access to the hospital from anywhere around the city in the case of emergency. Similarly, some teachers look for homes for sale near the schools where they work. Searching for homes in urban areas in the vicinity of their working area and the location of the home should fit their lifestyle process. For example, you can buy some land and build an appropriate house. This move would lessen walking distance between your home and your business meaning you will probably get a lot less time to get to your work rather than spending a lot of money on gasoline to get to your work area. If you are looking for real estate in urban areas, you may want to find homes for sale near your work and your children's schools. We can also search for homes available near public parks in urban areas and shops, so that you and your family can get to your needs easily. It also appears that houses in the urban areas for sale now have the best option of the most intelligent buyers, but it is not always the case, homes for sale in urban areas, tend to be the most expensive homes for sale in the country, and adopt cost depending on the region and the real estate market at that

time. With so many people preferring their homes in urban areas, this has increased the house value and prices in urban areas have gone tremendously high (<http://www.ringsurf.com/online/346-location.html>). Finding good locations for building houses by being close to schools and hospitals and services for the population in the region, developed and planned in a better way to be a complete city for housing will be the perfect.

Third, according to Herrera, Borgne & Videla 2009 environment plays an important role in the type and degree of degradation suffered and reflected on the cultural buildings, such as humidity and high temperatures. The pollution usually enhances the effects of weathering and deterioration of the vital construction materials. Then it can be found that environment is a wide discussion it does not only include climate as humidity and high temperatures as it been said before, but it includes more than that, like lighting and ventilation, etc. The natural ventilation provided from opening windows and its potential control of internal temperatures, and following the outdoor fluctuations, especially in days when wide velocities are high. In high daytime temperatures the body is very low to convective heat loss, even when the air speed is high, and the air temperature is above 35°C (specially Libya) convective heat gain increases the physiological load. Such as in the desert when the humidity is low it allows the body an adequate sweat evaporation rate even in still air. During the day natural ventilation be can undesirable for convective heat and unnecessary for evaporative cooling exchange, the ambient air velocity under still air conditions may be taken as 15 cm/sec (Givoni 1976). The result of the convective currents caused by surface temperature discrepancies in this air movement is differently between orientated walls, and by air infiltration through window cracks.

Fourth, the statistics reveal a very small percentage of Libyan land is arable. Agriculture places are very limited, and may be less than 2% of the total land area. And about 4% of the land is for grazing livestock and the rest is the percentage of agricultural land in the desert which is useless, because it's consuming a large amount of water without any payoff for the public benefit. The arable land mostly lies in two places only: the first is in the Green Mount the base on the city of Benghazi, and the second the Jifarah area with easy access and located near Tripoli. The higher parts of

the green mountains receive between 400 and 600 millimeters of rainfall per year only, while the surrounding areas and directly to the north of sloping meadow plain receives between 200 and 400 millimeters. And also the Mediterranean and eastern parts of the existing Jifarah area have easy access to nearby Nefoussa Mount; something also notably is that the average annual rainfall is between 200 and 400 millimeters. In describing the remaining Libyan coastal strip and areas to the south of the sectors, the average annual rainfall is about 100 to 200 millimeters. In addition to this, we have to denote the normal Jifarah area with a layer of groundwater, which make intensive well-driven irrigation possible. And between these two areas, the distance is about 50 km from the South; there is a narrow strip of land that has enough vegetation to support simple livestock. There is the desert south of this type of sector, with the cultivation in the oasis only in certain cases, such companies in Kufra, Sabha, and Marzouk (<http://countrystudies.us/libya/63.htm>).

Fifth, the cost is important in the housing field, and controlling this cost is not only during the location, style, shape, size or the materials, but even consists of the gender of the labor. As we know women occupy a secondary position in the labor market women earning limited power, even the women labor are inhibited by their domestic responsibilities. So that's why women categorize second level in the labor market. In other fields of social direction housing market is rising for better quality and making an intervention into the class structure. And, the personal wealth homes have historically changed in terms of definitions. According to Roberts 1991 the recorded labor's cost has increased at about the same rate as building material cost; although the hours worked tend to be higher and more costly. As it can be seen in Libya labor is costly and limited it is like that after the Libyan became unstable from the past one year ago.

Sixth, according to Cheshire & Sheppard 2002 they said that the architectural planning of land use in building construction in any place it needs a methodology to assess the benefits and costs like the architecture in hot areas. Therefore, architecture in hot areas is more different than other architecture buildings in any many ways around the world, and the need to design housing buildings for the good resistance to heat, building and construction techniques that maximize the advantage of air currents

and in the use of locally available materials in the country and method of construction are taken into account when building in the hot areas. And also focusing on the process of identifying the correct structure in buildings; proper planning leads to use scientific and technological designs, all the factors that help to solve the problems inherent in the design of housing in our country properly you need to go right in the world of construction and housing. There have been many attempts by private and government sectors in order to solve the problems of housing, as especially in hot areas. These efforts were not always successful; therefore one must be taught how to use local materials in the construction to resist heat and ventilation. One must also study city planning and accurate residential accepted for the region, the studies will help to discuss the exact problem in housing. The consideration should focus on the environment itself as a private party, and one needs to study buildings that should not be somewhat high, and it must be in thick walls to resist heat. High-rise buildings need high cost and technology accuracy, and the appropriate buildings for the hot areas as in use of local materials available in the desert and that these materials have the ability to withstand both high temperatures and high humidity inside and outside of these existing buildings. The building should designed with the use of good thermal insulation, ensuring that all designs are appropriate in the cost and type of design in terms of social and economic development, as it should be these homes take into account the direction of the wind, which helps to cool the buildings and the direction of the wind, and also the wind which helps to heat the building (www.Arab-eng.org/vb/showthread). Also studying the different techniques and designs, and to take into account everything that is suitable for living conditions, social and economic that are proper to the life of a hot climate.

Energy sources are in many ways and their uses are more, like solar energy can be used to heat water, and also can extract electricity from energy sources such as wind and burning garbage for fuel, and should explore the use of proper and correct sources, for example how to extract groundwater from the earth for drink and use wastewater for irrigation purposes. It is important that there must be a database for construction materials and methods that help to build it standards such as project planning for housing for the population in the areas of agricultural or industrial, as well as the type of social environment appropriate for such a home. We have to rely to

new ideas and sophisticated detection technology to help solve these problems and address the harsh environment and the need to development planning, and selection of good sites for housing would allow for a good protection against the environment. There should be suitable quality housing design, which also include the composition of residential communities, and this new design acceptable to people, and should also look at the privacy of the community in social terms. It should be based on designs not only on geographical factors and the surrounding terrain or architectural design but also on the social requirements. We must be on full knowledge of the social history and current circumstances (www.arch.arab-eng.org/news). With the moving people to hot areas away from the coast line of specialty sites in Libya, while the small numbers, trying to change. With each and every culture, the environment and the natural environment that will be used to create its own culture.

Seventh, the number of people and the population growing is an important contributory factor affecting the deterioration of the environment, but all of that on this plant is not the problem (Moughtim & Shirley 2005) in the middle of the seventeenth century the population approximately was About 0.5 billion, And about 0.3 per cent per annum was growing that is almost doubling every 250 years of the earth's population. And by the beginning of the twentieth century, the population was 1.6 billion but growing at 0.5 per cent per annum, which corresponds to be doubling every 140 years. The population in 1970 was 3.6 billion, with a growth rate of 2.1 per cent per annum. Not only was the population growing exponentially but the rate of growth was increasing. The population grew about 6 billion between 1971 - 2000, but the growth rate fell to 1.5 per cent per annum. In this way the population growth rate change to a significant improvement and means a reduction in the rate at which total world population grows. So about 0.8 per cent per annum the population growth rate is expecting to fall by the year 2030. The absolute growth will remain nearly as high as in the last decades of the twentieth century, because the population base rate keeps expanding, and in 2030 the global population is expected to be 8 billion and in 2050 it might reach about 10 billion.

Eighth, technology and construction of new houses as it is going to be presented and discussed in the search for a new direction which Libya should tend to start to concentrate on by construction of buildings on the tradition and modern way. But the type of construction in Libya is completely different from traditional buildings, and the development of construction in some countries they are starting to concentrate on, and so we need to adhere with the comments from people and the population in Libya and understand their needs, it is clear that there is some confusion of the public that urge for a new way of technology in housing, wither looking at design development or construction development, which is using old or new materials, for example using tradition material such as (clay, sand ... etc.). In Libya there has been some hesitation against the new way of technology in housing construction. The viewpoint of the population is that new buildings should be built in a new technology way of modern materials and style. Most of the buildings in Libya are not designed at this point of view, new way of technology and building materials must be sought on how to use different kinds of materials and what is affordable in the country and to the people. Concentrating on technology has many different elements for construction like walls, floors and roofs all need to be studied. Technology does not consist of only elements but even it consist of lighting, ventilation, the of providing coolness to the house by creating shading around the house and finding traditional element of design that can be used for providing ventilation and lighting to lower down the energy use. According to Sobotka and Thriene 1996 in ventilation he said poor ventilation design in buildings can be well understood in the context of human morphology, ventilation components in buildings such as windows, exhausts and ventilation ducts and air passages, serve as the respiratory organs and passages for buildings. So, poor ventilation can cause mold and fungi even in new buildings and which has significant implications on health.

2.14 CULTURE AND HOUSING

“Culture can be related to housing” (Rapoport 2000). And *“buildings are not only technical artifacts but have to do with building cultures”* (Davis, 1999). In that way understanding the relationship between culture and housing in the cities of developing countries is important, the dismantling of the term culture in the various components

and significance tests as predictors of preferences housing. However, particularly those related to the type of social status, politics and religion (Jabareen 2005). Home is powerful word, emotive and multi-faceted, as a basic desire for many, home is saturated with the meanings, memories, emotions, experiences and relationships of everyday life. The idea and place of home is perhaps typically configured through a positive sense of attachment, as a place of belonging, intimacy and security (Young 2005). Popular media plays an important role in bringing health issues and concerns to the attention of the general public. One such issue is that of culturally appropriate supportive housing with mental health issues (Roberts 2006). By supportive housing entails the provision of community support services within community living arrangements, such as group homes designed with traditional elements, even based on the definitions of cultural competency and supportive housing, culturally appropriate supportive housing can be defined as housing that facilitates community integration, maintains consumer choice and control, and provides social support in a way that respects and acknowledges the mental health consumer's cultural values. Since culture impacts every facet of an individual's life, from a health care perspective, it is imperative that supportive housing is provided in a way that is culturally congruent and appropriate to the individual being served (Nelson, Hall, & Forchuk 2003). However, using traditional elements in housing design is a requirement for a better indoor environment and also a demand for living culture. Living culture refers to the specific preference for living under the sun or prevailing wind for natural ventilation, exhibited by local group behavior (Stephen, Ming, Baharuddin, Fei & Xuan 2006). By Barrio 2000 it's imperative that supportive housing encompass cultural needs, as well as the health condition. The defining role that culturally appropriate supportive housing would play is echoed by the humanitarian philosophy of care, incorporate natural supports, and focus on strengths; they should be flexible, normalized, accountable, racially and culturally appropriate, and effectively coordinated to ensure continuity of care.

2.14.1 Relationship between Culture and Housing

House is a strong word by describing the emotional and multi-faceted feeling. It is a basic desire for many, home is the saturated as a memories, feelings and relationships

in everyday life. The idea of home and place of composition is perhaps usually through a positive feeling of attachment, instead of belonging and intimacy, relationship, security and feeling (Gorman-Murray & Dowling 2007). The housing industry has been under pressure to be innovative because of the challenges in terms of strict environmental legislations, global competition, and the emergence of clients who have become more demanding (Seaden & Manseau 2001). Organizations embrace innovation, either as a strategy to create new environments for them to gain competitive advantages and raise profits and market shares, As such the ability of an organization to innovate and be innovative has become a central issue among organizational theorists (Baer & Frese 2003). However, innovation in an organization is not something that happens naturally. To embrace the concept of innovation and be innovative, organizations need to possess environments within the organization, or in another word, cultures, that support innovation.

2.15 HOUSING PROBLEMS AND AFFORDABLE HOUSING IN DIFFERENT COUNTRIES

One of the most important issue related to housing is not only finding the best cost but how comfortable and affordable the houses are to the buyers or tenants (Suhaida, Tawil, Hamzah, Che-Ani & Tahir 2010) One of the key factors that affects the development of housing is the growth of the country, the economic status and social stability. The objective of providing suitable housing takes into accounts the policy of the state, environment, climate and building materials, and the income of all groups of the population living in the country, and studying other countries like America, South Africa, Malaysia and Arab Countries can help us to see and compare them with the problems that exist in Libya.

2.15.1 America

The reformers tried to create a public housing program in the 1930 by using modern architectural design; instead they created a distinctive look that would later stigmatize its occupants. The visionaries attempted to rebuild an American city, at 1949 after the passage of the housing act, and that by trying to placing the low income people in high rise buildings, and it looked like it became a disaster. Some believed today that

placing the low income people with the wealthier group in the same environments inhibited that will help to address the housing problems. In the future and focusing on the low income group by presenting good housing programs by the supporters not as panaceas for deep-rooted social welfare policy, it should fight for more programs that will produce better units of housing as soon as possible (Hoffman 1996). In that case Libya needs to focus on the low income group and prepare a good housing program for the people.

2.15.2 South Africa

South Africa's post-apartheid housing policy was announced in 1994. It has been developed during the transitional phase 1990-1994. With the development of a post-apartheid housing policy by the national Housing Forum during this period, a key question was whether the government should be involved in building houses for people or whether a more incremental type of policy should be followed (Tomlinson 1998). In the ideal world, we find that the governments in any country would learn from the experiences of others, by the well or badly worked in one place can be repeated or avoided in another. Of course, one country is different from another so that modifications to any policy are usually necessary in any other country. In 1994 South Africa adopted its new housing policy; there was a lot of experience around them. However, the World Bank chose to ignore much of the experience even despite the efforts of powerful institutions like the World Bank, later it arguably adopt some of the advice it previously rejected (Gilbert 2002). According to Huchzermeyer 2003 the South African housing situation over the past decade is seen as a significant legacy of the apartheid era. Race and class-based spatial inequalities were cemented through decades of housing policy that favored white people and confined most black Africans to ghettos in urban peripheries, at transition to democracy; estimates indicate that approximately 80% per cent of the population was confined to 20% of the land. Upwards of 13.5% of the population were thought to be living in informal settlements, known as squatter camps or townships. 1.5 million were thought to have no form of shelter, including the right of every South African to access adequate housing, the government was obliged to ensure the progressive realization of this right.

2.15.3 Malaysia

The developed housing policy in Malaysia since independence from the Britain in year 1957 has developed tremendously. Housing has been provided public housing for the poor civil servants. However, it has been changed from merely providing access to housing and solves the housing problem of slums, squatters and overcrowding in housing. In the 60's it was focusing on increasing the ownership of housing, especially as the social need of affordable housing. In the 70's until year 2000, it continued focusing on affordable housing for the poor, but included in the elements of the New Economic Policy was the goals of the income, and has developed tremendously, asset restructuring between different ethnic groups and especially Malaysian, Chinese and Indian (Salfarina, Nor Malina & Azrina 2010). Libya does not have ethnic groups, they are only one race, and if Malaysia knew how to focus on new economic policy of affordable housing with different ethnic groups, that means Libya has to do the same thing, and reach the goal of providing to the poor to own their own houses.

2.15.4 Arab Countries

In Egypt the systematic involvement of the government was the provision of public housing in 1952. The new government was interested in solving the housing problem by two ways. Firstly, a series of laws that passed in five-year intervals to control and reduce the rents of housing units that were constructed after year 1944. Secondly, the state's involvement in the construction of low-cost public housing built on the outskirts of Cairo and cleared the poor areas from the center of the city. Between year 1965 - 1975, the gap between demand and supply of housing, private or public was greatly widened, because of the quasi-permanent state of war and the priority given to military expenses (El-Batran & Arandel 1998). Libya has to control and reduce the rents of housing, and make a series law on housing policy.

The demand for housing facilitator increased significantly in the past decades in Saudi Arabia due to the increase in the number of population. Inflation and the disparity in income levels have backing from the Islamic banks in Saudi Arabia since

in 1980, and joint-stock companies, charities and government institutions such as Real Estate Development Fund provides funding to affordable for home buyers. There are few evidences about the size of affordable housing, and which is secured at the present time by the financial companies in the kingdom, such as banks was a survey to find out the extent to which banks, and Real Estate Development fund in the process of affordable housing, the study found that the current funding system is unable to meet the funding requests for low-income home buyers at present, and in the future the banks will improve services whether they have effective plans to address the shortfall in funding in the future (Sidawi 2009). Libya has to plan for a new housing policy by focusing on providing banks facilities for funding affordable housing for buyers, and invest money by planning and building cities with affordable housing at limited cost.

The assessment of housing projects is a fundamental task in Yemen, to determine the effectiveness of these projects and provide useful information for entrepreneurs in this project, whether in public or private sector. This could be a valuation on the numbers of different rules. Reports and results of studies and research projects aimed at the effectiveness of housing, which was initiated the Yemeni government in Sana'a. The basis chose for the evaluation of low-income housing, as a quality measurement technology for housing. These techniques are used to measure the quality and standards in accordance with this housing, and also is a way to assess the quality of the surrounding environment, and therefore this is the way to evaluate the success or failure of these housing projects (Djebarni & Al-Abed 1998). In Libya studies and projects either from the government or the private sector is very limited. The government and private needs to focus on studies and prepare researches on housing problems for the affordable housing.

2.16 CONCLUSION

In this section it reviews the definition of housing and the affordable house in general. And also it reviews the influences that affect the affordable housing such the requests and comfort in the house, through the design of the house by climate. And also describes the status of the house through the sustainable house and detailed view on

the influences that affect the cost of the house such as privacy, location, environment, labor, planning and construction. Even the culture plays a major role in the housing design especially in Libya.

In general the issues and desecrations that this chapter has been going through, the urban environmental problems are different dimensions and mostly due to special design, climatic, housing needs, policy, and cultural factors. However, the cultural factors seems to be more pronounced in Libya context because most of the identified urban environmental issues are so much associated with the way of life of the people either as reactions to urbanization or their spatial heritage. Their effects are far reaching on efforts to attain sustainable development in the country. Since no section of the country's urban environment is immune to environmental effects, there is urgent need to seek workable solutions by the application of planning, economic, educational and especially in housing problems. It is hoped that if these tools are properly adopted it will result in the enculturation of the right environmental management practices that would prevent the further deterioration of our physical urban environment; hence the possibility of achieving sustainable development in Libya in the nearest is assured. However, the adverse effects of environmental problems on sustainable development in Libya, and trying to addresses the causes of housing problems based on the environmental problems and their effects on humans and the surrounding ecological system. This study hopes to explore the implications of the increasing environmental problems spurred up by human activities for sustainable development, and the attainment of this sustainable development that will remain a mirage in developing countries in general and Libya in particular.

CHAPTER III

BACKGROUND STUDY OF HOUSING PROBLEMS AND AFFORDABLE HOUSES IN LIBYA

3.1 INTRODUCTION

The chapter reviews the affordable housing problems in Libya, including the literature review and a discussion of the background study on housing policy and housing problems in Libya. A description of how the review update has been conducted, what it has yielded in numbers of articles and content, and how it has been organized are also provided in this chapter.

The research topic was chosen by the existing situation in Libya now, from lack of the affordable housing to the Libyan citizen. And the extent of need for affordable houses, and the requesting to the government for help for many years, without a response to their demands. Therefore this research will try to solve possible solutions for the provision of affordable housing and try to solve the housing problem in Libya.

3.2 THE NEED OF AFFORDABLE HOUSING

According to Prianto, Bonneaud, Depecker & Peneau 2000 architectural design of any residential building, needs to be development and through direct observations, we find that accumulated from the surrounding areas of the building in the use of different types of materials that can be available in the same area. Finding good quality material and low cost has been the efforts since the Second World War by governments trying to find the solutions in housing problems (Paul 1981). The government has not built any affordable house for the low income people since 1985s. So families in Libya

need to wait longer for a decent home from the housing institution, since the beginning of 1990s most of Libyans cannot build private houses, as the prices of building material has risen more quickly than the retail index. For example, building material like cement costs doubled and sometimes triple the cost of manufacturing the material.

3.3 HOUSING PROBLEMS IN LIBYA

Libya is no exception, everyone should have the opportunity to own a house at affordable prices and have the liberty to choose where they wish to live. As to where they choose to reside depends largely on the distance of their houses to their work place. Libya needs more houses to meet the demands and desires of the growing population (Athram 2000).

It was found in the previous era in housing policy especially in housing as a problem, which allowed the former regime with something called the "House of the static", and by that it became the reason for assault or rape of dwellings or apartments. Buildings and facilities owned by the community without allocation procedures officially by the state, and this is punishable crime by the law, and this subject the perpetrator to the highest punishment, because of the consequent violation of the sanctity of the new state, and the consequent damage and tampering, vandalism and theft, and so on when to getting out of the housing, thus a civilized method was needed , but this behavior occurred in the previous regime and there was no law at that time. Now we are in a new era and a new state structure on the New Revolution basis on law and the right to return to the owners own their homes after it been robbed in the covenant as especially unjust (Bokhaddrh 2012). On this basis of non-housing policy in Libya will give us increasing talk and too much discussing about housing problems, and too many question about this issue, is the current distribution of housing part of the solution or is it part of the problem? The fact is, the real crisis of housing problems in Libya is the inability of some people to rent, buy or built a house of the high real estate prices and building materials.

The housing problems was always the dilemma and the largest problem for the Libyans, especially those who have no possibility or did not give them their wealth to build a house or to rent a house, and it did not have the capabilities of the state in the absence of control and the spread of corruption in some cities, and access to housing has become one of the difficulties facing the Libyan family recently. In the absence of accurate statistics of the Ministry of Social Affairs, the housing crisis, is expected, that will increase, by the housing and apartment rent rising in some neighborhoods. The existence of adequate housing for a family are factors that contributes to the stability and security of individuals, as well, housing is a vital element in influencing the tender hands of individuals and their production, Libya needs a system to provide housing in an appropriate manner, and the provision of purchase of housing for citizens at appropriate annual income to be paid premium not more than the quarter of his monthly salary, and perhaps this will help to reduce the housing crisis in which we live in and reduce the suffering of many families, and contributes to the achievement of progress in the Libyan cultural and its renaissance.

Housing problems in Libya, is estimated to be deficit in number of the housing units in excess of above 200 thousand and the main reason for this deficit is the legislation of the state “Socialism” that ended any investment or private sector role in housing, yes there are revisions to this legislation, but not enough reforms. Legislation alone is not sufficient because the shovels corruption exhausted every glimmer of hope for affordable housing for lowincome citizens, but you need reforms in state institutions. But most important now and in the present stage is that the disclosure is for civil society to contribute to finding solutions to the government, the government alone will not be able to develop any solution to this fundamental crisis. Even in the industrially developed countries, governments alone cannot meet the demands and needs of its citizens it depends and encourage the civil society to participate in public affairs through various projects to be certain, they are innovative initiatives often come from the civil society institutions because of their adherence by the community.

3.4 PUBLIC HOUSING AND ITS PROBLEMS IN LIBYA

Not only the affordable housing is a problem in Libya, but the public housing has been ignored for a very long time. The public housing has been built one time and no longer being repeated. The problems of public housing are very high in altitude, and the huge public does not have a presence in Libya. There are no high-rise projects in public housing in Libya and there may be some developments on the slightly older people only. And there are serious problems in public housing in Libya. Many of the existing public housing for low income families in Libya, are units and very old and most of the population are in dire need of reforms. The public housing unit houses were built in the middle of the 1970's occupied by families today. In the neighborhoods of the city, the land locating in most Libyans housing units for families of the Assembly, crime and drug problems exist around them. We will also explain in the next section of the history of public housing how they are located, these projects are being rooted in local political decisions, they were not granted in the interest of public housing or those people who live in these houses. Most of the families that live in public housing in Libya are very low income and they have no alternative or option to live in anywhere else. And the private sector did not have the capacity to serve the population claimants to the Libyans to increase growing housing needs of the low income and middle income families. The lack of decent low cost housing to meet the needs of Libya's hundreds of thousands of Libyan families on difficult living conditions and unfortunate crippling rents in the country is very high. The public housing history in Libya proves that it had prevented an adequate supply of subsidized housing, especially the poor in Libya, and repeated by special interests and racial prejudice and economic classes with high income in the community.

In Libya, many people with low incomes and living in public housing face many problems. There are some very bad rented accommodations in public housing and some of the tenants in private housing are in poor age. However, the problems of public housing in Libya need to be re-examined largely and audited the study is not only housing but a case study of social and economic development of low income population.

3.5 BACKGROUND STUDY

3.5.1 Policy and Housing Problem in Libya

For the last few years it has been dominated debates about affordable housing and housing policy. The purpose of this study is to point out the problems of the affordable housing in Libya, and to identify the relationships between the income of the people and the affordability to build or buy a house. To resolve the housing problems, the Libyan government has to introduce a new policy, which recognized the housing policy as a basic to the people needs and provision of affordable housing as it has to be the governments' responsibility. The aim of the study was to assess the effectiveness of the implementation of the affordable housing policy in Libya (Omar 2003).

A large part of the population in Libya was living in huts, tents and caves, lacking even the simplest conveniences for human life. After the Revolution took place on the 24 December 1951 the provision of housing was highly appropriate in quality and quantity of the housing problem in Libya, particularly housing for limited income groups, and received little attention from the government. All levels of government housing have been coordinated to implement a housing policy designed to provide the best solution to the housing problem. A unified plan was adopted, as well as a long range of housing program, based on a study of existing conditions. Until the 1st September 1969 since then, housing planning became slow until it reaches 1985 and then the government has forgotten the requirements of the people in the housing needs and an appropriate to them (Omar 2003).

Libya has suffered from a shortage of housing and affordable housing since the early 1980s. These shortages caused many negative effects on the Libyan people, and became a serious problem. To redress the housing problem situation in Libya, the government has made a number of attempts to solve the problem of housing shortages, but the success rate was low. Like the 7000 housing unit in 1985. Some studies were conducted to investigate the reasons which caused the shortage, in order to understand the reasons behind the failure of attempted this solution of housing problems. These

studies exploratory and reached a number of recommendations, which has to contribute and solving the problem of the housing shortage in Libya (Sheibani 2008).

3.5.2 Affordable Houses Unit in Benghazi

In Benghazi city a 7000 housing unit has been built as affordable housing for the middle income people. Unfortunately it was not a successful housing scheme as the inside walls of the houses were partitioned, causing the people living inside them were uncomfortable by the commotion from one apartment to another, but as a housing design for the Libyan families it was typical for them, as it shown in figure 3.1 and photo 3.1 but the prices after some time changed, they were built by the Daewoo Company (Korea) 1985, the plan of the area and in photos 3.2, 3.3, 3.4, shows the housing unit some are four floors and others are six, in Al-Brkah, Garyunes and Al-Keesh area. The housing units are divided into three groups:

- i. Two bedrooms, living room, guestroom, two bathrooms and kitchen.
- ii. Three bedrooms, living room, guestroom, two bathrooms and kitchen.
- iii. Three bedrooms, living room, guestroom, dining room, two bathrooms and kitchen.

The system allows each owner to make a down payment, and once the owners acquires it, the government starts cutting the cost from the owner's salary, and that will be from 25 LD to 50 LD monthly, and the amount will be decided on the size of the apartment. The apartment cost about 45,000 LD on the average apartment, and after the owner pays all the payment the owner will own the apartment. But now with all the high cost of everything happening everywhere, houses are becoming more expensive up to 60,000 LD for the affordable houses, and today it reached to 100,000 LD (Municipality of Benghazi, 2006).

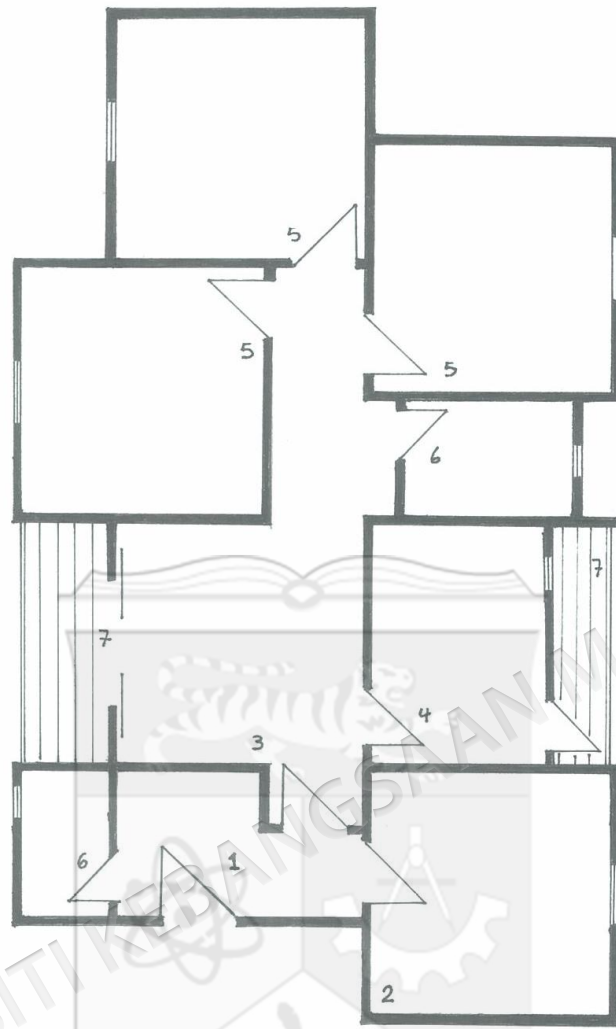


Figure 3.1 Floor Plane of Modern House in Libya (7000 housing unit)

1. Entrance. 2. Guest room. 3. Living room. 4. Kitchen. 5. Bedroom. 6. Bathroom. 7. Balcony.



Photo 3.1 General plan for the 7000 housing unit region in Al-Keesh area

Source: <http://www.earth.google.com/geoeeye/index.html> 2010



Photo 3.2 A view from the street



Photo 3.3 A four story building in Al-Keesh area



Photo 3.4 A six story building in Al-Keesh area

3.5.3 Economic Viability

The classification of countries by income index is categorized differently according to the status, industrial developed or less developed countries, and the average individual income (<http://www.alraedh.maktoobblog.com/1408712/>). The average income of rich countries is about 20000 \$ per year, the average income of average countries is about 10000 \$ per year, and the average income of poor countries is about 300 \$ per year. As we know the countries that are under poverty line, their average income is one dollar US 1/day (<http://alraedh.maktoobblog.com/1408712/>). Studying and cognition the income of the Libyan people will highlight our knowledge and see the size of the group that has limited income.

The individual average income in Libya:

The low income group consists of people without jobs or a stable income. In Libya there are 180,000 families (all most 1,000,000 people) with an average income of about 100 DL and even below (US 70/month). Most families consist of five persons and that is the least in a Libyan family. If we divide US 70 on 5 persons; it will be US 14/monthly. Almost all 1,000,000 Libyans belong to the 180,000, families and it makes up about 20% of the total individual Libyan people living under (US 0.5/day). This group is belongs to the low income and they are under poverty line.

The medium income group consists of people with jobs and no stable income and less educated, these are upper social class people and they consist of government employee, teachers, policemen, retirees, and social insurance people. They are almost 4,000,000 people and their income is about 180 LD to 200 DL (US130/month).Almost all 4,000,000 Libyans make about 70% of the total individual Libyan people living under (US 1/day). This group is in medium low income and they are under poverty line.

The high income group is the people with jobs, high income and education. This group is the highest in social class, and most of them work in private sectors. Their income is high and they are just 10% of the social group. (<http://alraedh.maktoobblog.com/1408712/>).

In this Economic Viability shows us the statistical of the medium income group in Libya. Their income average is about 180 LD to 200 DL (US130/ month). By this economic viability shows how this group is very close to the low income group. And way far from the high income group, 70% of the Libyan people are middle income is a big problem. How these problems can be solved with these amounts of people?

The interpretation of this study illustrates the physical division income for the citizens in Libya. This study demonstrates the size of the average income, and knowing the size of this group shows us how to provide the desired citizen housing, and try to provide the required number of affordable houses. This can make the researches and architectures to increase the number and quality of houses available to buy and rent, to improve the flexibility of affordable housing.

3.5.4 Brief Requirement on Housing

The layout of a house in Libya needs to be designed in a special way. Firstly, the entrance to the house should not display itself to the street outside. Private entry is paramount in the Islamic design and especially in the Libyan design. Secondly, the house needs to have three bedrooms (Master bedroom, Girls bedroom and Boys bedroom) that will be the least of bedrooms. Thirdly, a guest room will be connected to the main door and this guest room has to include a guest bath room. This part of the house needs to be away and secured from all parts of the household (Municipality of Benghazi, 2008). In the Libyan design, it is best to design in the traditional way, as the people prefer their houses to relate with the environment (Athram 2000). According to Habraken 2008 traditional architectural theories tend to illustrate an image that is important for architects as the decision makers for the built environment.

According to Bokhaddrh 2012 proposal of housing development contains several important items on the treasury for the benefit of the Libyan society. The proposal is divided into two parts, regarding to housing and apartments within city plan as:

The new state in each province and its municipalities has to build houses of not more than four floors owned by the community and an appropriate covered area. The project should be launched in accordance with the rules of bids and tenders, so that the lowest price would suffice and the deduction of the cost of the housing. The houses will be in three models:

- i- The first model: two bedrooms, guest room and utility rooms.
- ii- The second model: three bedrooms, guest room and utility rooms.
- iii- The third model: four rooms, guest room and utility rooms.

Determine an appropriate rent for each model. It is stipulated that 30 Libyan Dinars per month for the first model, and 45 Libyan Dinars for the second model, and 60 Libyan Dinars for the third model and after paying the entire amount on each apartment the owner owns the house.

Enter into a lease whereby the tenant pays rent in cash and the provider issues a particular official receipt of the amount paid, specifying the rent contract and the time required for staying.

The tenant has to sign a pledge in the contract to maintain the contents of the apartment or house like doors, windows, sanitary items, electrical heaters, etc., after paying a sum of money as a deposit after which will be returned to him on eviction or at the end of the contract, after deducting the value of the damaged items from such content, if any.

If the lessee wishes not to renew the contract again after the expiry of its term, the house or the apartment will be submitted to the charter, and shall not in any way submit the house or the apartment to others or hire subcontractors, so the procedures are new tenant are leased by the competent authority, after entering a contract with him.

In addition to the above benefits, there is a procedure that must be abided. Any citizen who wishes to maintain his house which is an existing building, he can rent it for a limited monthly payment. His family is to stay temporarily for a period of time, months or a year for example, until the end of the maintenance of his house. Then he has to surrender the apartment or house to the owner.

To supervise tasks on housing or apartments, after opening a special account with any bank, the deposits of the rents will be channeled to build new houses and apartments. Similarly later, this idea or experience will help to solve the housing problem.

The people with high income will not be allowed to rent such kind of houses or apartments in any way or how.

Housing policy needs to take control in Libya to protect the interest of this people who are not able to rent or build houses.

3.6 LITERATURE REVIEW

3.6.1 Housing Problems

Libya in the past few years did not have or did not base on any housing policy, Libya does not have a housing policy as a guideline as procedures for building new homes for the people.

The only existing policy that have been on the past few years war based on the Green Book from Al- Qaddafi roles he said, *“Housing is an essential need for both the individual and the family and should not be owned by others. Living in another's house whether paying rent or not, compromises freedom. Attempts made by various countries to solve the housing problem did not provide a definite solution because such attempts did not target the ultimate solution – the necessity that people own their dwellings - but rather offered the reduction, increase, or standardization of rent, whether it went to privately or publicly-owned enterprise. In a socialist society, no one, including society itself, has the right to control people's needs. No one has the right to acquire a house additional to his or her own dwelling and that of his or her heirs for the purpose of renting it because this additional house is, in fact, a need of someone else. Acquiring it for such a purpose is the beginning of controlling the needs of others”, and “in need freedom is latent”.* (Al Qaddafi 1980).

In this case and what have been written in the Green Book, it was the housing policy for a long time in Libya. So the housing policy was clear, the government did not allow the people to own another house, and refused the people to build other house for renting, and at the same time it did not help to solve the housing problems or build housing for the people.

The last affordable housing was built in Libya was in 1985. The government did not have a role in solving the housing problem, and did not allow the private to help even as simple assistance in solving the housing problem. In addition of owning their own homes, the government has to provide a new development scheme, in and near the cities to accommodate the large number of low income group recorded and listed to own a house from the government. New plans have to be adopted for the citizens to reduce the burden for these numbers of citizen applicants for land, apartments and housing. This will succeed only if the government cooperates with the private companies to build homes that can provide better living. Building housing and the success of any housing project will see to the sustainability of construction and development of houses in the future. The study aims at focusing on determining appropriate rent for each type of house, by monthly payment affordable to all. Lastly to discuss how the government can provide lands for the people through creating a

new city planning, how to end slum areas and also choosing the affordable and availability of the material in the country. The Libyan citizens have the right to own a piece of land, to establish a house or an apartment to rent and own for their self. These statuses must be thoroughly to ensure justice in the distribution by the Housing Development Associations Community that will be established all over the country, and to solve the housing policy problems in Libya.

3.6.2 Housing Policy

Many people aspire to become home owners. This is because houses not only provide shelter for them; they provide the emotional and financial security. However, a dream yet materialize due to the inability of the Libyan government in the past few years to provide housing of good quality and reasonably priced for its citizens, as part of the strategy of comprehensive care for the Libyan citizen (Schmitz 2004). The private sector was actively involved in the housing construction they depend mainly on loans granted by public institutions Nevertheless, this funding was limited. According to Athram 2000 one of the major problems in meeting the housing demand is the gap between income and cost of houses. It has been suggested that the current selling price for low cost housing and still too high for the majority of the low income groups. The development in the housing sector relies heavily on the activity of public and private sectors and financial resources. The observed effects of economic factors on demand in the past few years, in the housing sectors and the findings in many of the researches, and on the demand side for housing, has confirmed in previous studies the problem of how the housing impact effects economic factors and demands for housing and consumption. The Gross National Product (GNP) has been used, in family and individual income, and consumer prices for the analysis of relations between the housing market and economic context. (<http://www.financialexpress.com/news/simplex-projects-wins-rs.-2-000>). The Libyan government provided land for the people in the end of the 70's beginning of the 80's at a lower price, but the problem for building a house still persisted as the people just couldn't afford to buy the building material.

The housing cooperative is an example of partnership between the people and the government as a self-help system in housing policy. The establishment of housing cooperative of the population has to gain full support from the Libyan government, as it shall determine the type of housing needed by the Libyan society in the twenty first century.

3.6.3 Housing Need for the Twenty First Century

Architects in this century focus on reinventing housing. They imagined that their new tools like electricity, steel, concrete, glass plate, mass production, and fresh ideas about design, could be used to transform society for a better living (Larson, Intille, McLeish, Beaudin & Williams 2004). The housing improvement, together as an active development and quality of the scene, as the end of the creation of history and natural features. The historical view point concentrates on the events that happened throughout history and these decisions have formed the environment. It would be unjust to presume that the political and economic debate regarding housing has not succeeded. Without a doubt, the difficulty of housing manufacture and housing objectives has re-emerged among several elements of disagreement. In addition there is little agreement concerning the annual number of new houses required (Golland & Blake 2004). However, the debates are established in several answers plan reports. The House of Commons environment board questioning into housing necessitate this.

In housing economics two important aspects merge to support the large differences in housing standards that is vary from chateau to tent, found in nearly all cities (Shane 2005). However, in any given society primary assets are unequally distributed along with its affiliates, and the degree to which the developing states endeavor to encourage a fair share differ from Tanzania at one end to Indonesia at the other, where extremes of prosperity and scarcity are originated. Paradoxically, the outcomes of doctrinaire socialist firmness on conservative housing in Tanzania contrasts adversely with housing in Indonesia, where individual and society venture is given full restraint. Accommodation strategies eventually have their effect on political thought and practices. On the one hand, the colonials' power facade threatened their

health from tropical ailments. They tried to overwhelm this difficulty by building institutions that provided medical treatment surrounding areas within a city that was inhabited by people of a different nationality in which very high building and sanitary standards were compulsory by government systems. However, this strategy, still upheld nowadays by native leaders, has led to intended, good-served and well-administered regions inside town boundaries and disorganized, un-served and regularly poorly located growth on the periphery of cities. In addition, the hole between the accommodations in developed states and underdeveloped states is still in several cities strengthened by official housing attitudes that are unachievable for the greater part of houses. On the other hand they stay, in a situation that brought much puzzlement in housing strategies: methods that would lead directly to the enhancement of housing are deplorable since they are not satisfactory to fulfill legal requirements. Thus, it is very important to analyze the differences between a model ideal of housing and actual positions and whether this gap can be closed or not (Murison 1979). However, if it fails to do so, the goals of the housing policy should be reviewed, to focus on developing housing that fulfills people's demands for more spaces inside a house.

3.6.4 Housing Development and the Demands on Space

The gap between what people can afford to pay and the cost of housing is the major problem in housing (Belden & Wiener 1999). However, the problem of where housing should be urbanized is rooted back to the post war housing policy debate in the third world countries. However, the key question is that in the lack of some figure of instruction, housing might be built in locations that are wholly inappropriate, such as sloping places and industrial districts. Unsuitable expansion might result housing being built in milieu sensitive districts, housing built in regions that are too unreachable and housing built in already compactly densely districts (Golland & Blake 2004). Proposing, however, that definite housing places are in some way inappropriate begs the question, from whose perspective? Are they unsuitable from the planner's point of view, the developer's outlook, the housing consumer's standpoint or the business and environmental interest group's perspectives? Once these questions

are posed, it becomes easier to recognize why the position of housing development is a political problem.

The housing problem found in Libya is just like in any other country. The problem of housing development in inappropriate areas such as sloping land, and heavily populated districts are causing many problems to many countries in developing states. Libya as a desert country it has the same problem, it is one of the countries which are facing the difficulty of land degradation or desertification that makes people make their way to the shanty districts of cities and put a huge strain on services, such as housing, water supply, waste removal and treatment, health care and education, which are already over stretched. In housing condition, the quantity of housing is the most important thing in housing strategy is to fulfill it satisfactory. Hence, the most significant thing in housing policy is the supremacy and the amount of the substance that is used in the house building that meets our needs, in which, are the final measures of good quality or poor achievement in housing approach, housing plan by its very nature must be far-reaching rather than greater. (Angel 2000). However, housing policy cannot and should not attend to the figure and function of every single house even though it's exactly the situation of every single house that is decisive. Therefore, housing condition must be totally under the care of the state of the housing sector. This increases the theoretical and practical complexity, since it is indistinct that the compilation of houses as a whole can be seized by housing policy makers as a single unit, and whether it can be calculated in a method that preserves and underlines the fundamental distinct that concern resident.

3.7 PREVIOUS STUDIES IN OTHER COUNTRIES ON BUILDING MATERIALS

The World Health Organization (WHO) not only organize and support programmers on housing and health, but also aimed to highlight housing and health problems of other countries that may be related to the current conditions of housing problems. Housing cost, location, technology and the availability of materials are recognized as the most prevalent housing problems affecting residential health and well-being. However, it proved to be difficult to identify an aspect having an overall dominant influence on health. The surveys carried out so far clearly indicated the effect of

rehabilitation work on residential satisfaction. Thus, the findings have raised expectations that housing improvements by focusing on kind of material and the technology of building a house can lead to better health living (Bonnefoy, Braubach, Krapavickaite, Ormand & Zurlyte 2003).

There are many ways to build a house. The basic of construction is the substance. Numerous studies have been carried out on how to use different materials to build an affordable house. Different ways of building depend on the different kinds of materials used, methods of construction or the designs which reflect the culture of each country. From the use of traditional elements for ventilation and lighting, can reduction the energy used. The materials chosen are either around us that goes unnoticed, elements found in nature or man-made. It is necessary to find building materials which is easily available and has the ability to lower down cost, in this section it will explain some of the ways of construction in different countries, either through the ways of material using or by building construction.

3.8 MATERIAL USE IN HOUSING

Building Materials are the most important part of any dwelling and according to Smith 1971 in generally, house building materials is the basic of the building houses which belongs to the economics' resources. There are so many different kinds of building construction materials like clay, wood, stone, cement, steel.....etc. and each kind of these materials has its limitation for building housing sector. Also glass has been used in building constructions during the past century especially the most consistent impact in term of the in terms of the architectural skill. Architects must be refined and offered to control the environment which support the technology's development, either this role must be transparent and robust mediator between inside and outside which is a constant. Also the glass must be at least the contentions material in terms of 'Green' agenda. This will lead to the early modern development of passive solar design, and how it meshed with other lifestyle and design priorities (Porteous 2002). Many years ago were found houses built by different kind of materials, which we are using nowadays. Those houses had been built by colonizers that came from America and they built their own houses from trees and stones which were found in New England's

environment. And then considering the environment's changing, houses build by using different materials like adobe block, grasses, and wood and other sustainable construction materials. As long as people need shelters, they are going to search for other sensible and affordable materials from the natural environment for their building construction. According to Knox & Ozolins 2000 said that natural building materials harvested with minimal expense and supplying shelter is the key for people with economics' limitations. In Libya people with economics limitations can build their homes by local material that is available in the country especially in the desert.

The designers often select the choice of different kind of materials in order to create interest and discovery of new materials, the countries that have interest in the use of a range of materials for the outer shell of the building or inside, could lead to differences in the pattern of absorption, and at different levels of absorption of each material effect on the surface, however, trying to use such different ideas on buildings clearly indicates that poor choice of materials and a lack of knowledge about their physical properties will affect the future maintenance of the buildings (Cook & Hinks 1992). So, the choice of poor material is not the idea to build affordable houses, there is a big different between poor material and affordable. Therefore, finding the defects resulting from improper selection of quality materials in construction, is expected to be only material performance goes up to the level required, but if they are exposed to the highest impact, which will not be any consideration for the poor in terms of quality in use, when this happens, the underlying cause can be directed towards the design or manufacture (Wai-Kiong & Sui-Pheng 2006). So, in this case Libya is located in hot area, and building houses needs to be discussed how it should be done by sticking to the surrounding environment, by the needs that encourage the population to live in affordable homes and in new designs that suits the environment and suitable for green architecture, through the use of natural materials for structures and finishing in house building. The construction must maintain harmony with the environment, and the designs should also take into account the needs of the population in the community. So, it can be a source of income and helping hand and local industries to attract tourists worldwide. Therefore, if we must discuss in the construction of buildings with the environment, we need to find the stability of economic and social interaction with people to identify the houses required with new materials and new designs. Even

prosperity is not just appropriate technically as it is a planning tool, the design should be affordable housing and suitable for people, for their homes and will have the ability to expand to add attachments to their homes in the future. In a country like Libya using these natural materials that is available in the desert environment can be useful, and also increase employment opportunities and the preservation of the cultural environment and a document for housing that is available in this area, by the buildings that are trying to use natural building materials, and should increase the quality and benefit from the sun to provide natural lighting, heat and electric power.

According to Bonnefoy, Braubach, Krapavickaite, Ormand & Zurlyte 2003 that housing improvements can lead to better health and that can be found in building technology by (Payne 1984) and assumed to recognize how important the availability of material is in the construction system of housing. It is important in climate condition, which most people assume that is the main problem, as it is important as culture which is often the principal factor in building design.

So, Hassan Fathy suggests in his studies for the formation of new ways to engage with the poor and their needs. The recipient must assist in this process and be involved in the essential. And we have to know that it must be kind of participation in the selection of materials, and of course we have to keep in mind that the nature of the materials used in house building, especially affordable homes and appropriate for the population, because the nature of materials is used in this study. But in my opinion, the use of natural materials, together with modern materials to assist in the buildings to be strong and useful at reasonable prices, so we can find a way to reduce the cost of materials, but the soil is found under your feet in the desert. Rely on two types of ways, work and mud that can be completed easily. And Hassan Fathy wanted to say about the use of soil as a structure of the building because clay is available in the country and it does not cost much, and the goal of using this type of material is to reduce the cost and good heat insulation. However, according (NREL 2000) to foundation walls and slabs should be as well insulated as the living space walls; poorly insulated foundations have a negative impact on home energy use and comfort, especially if the family uses the lower parts of the house as a living space.

3.9 DESIGN AND COMMUNITY PARTICIPATION

Housing is a very important aspect in life. It is therefore necessary for architects and planners to work in concerted effort with social scientists to develop a better understanding of the needs of the people especially the low income level whose housing is to be provided (Lazenby 1977). However, it is found that there is a big gap in the affordability aspect of the lower and the middle income people affects between the middle income and the low income people, with different severity (Harvey 2006). So, often select the physical design as an essential component of community acceptance of housing design, at both the building and its units are a double-edged sword for housing at affordable prices. Urbanized communities long excluded the product more housing, and manufactured home, due to the typical design features. At the same time, communities can design standards that are used for costs of up questions, making affordable housing difficult to develop or otherwise effectively from their neighborhoods. Feature, which dominates any discussion of housing problems to accept the design, is the quality (Zielenbach 2003). And spending a little more in the affordable housing design is worth it, in this way of affordable housing it has to overcome the public perceptions (Koebel, Lang & Danielsen 2004). So, the path to social acceptance is to create a new way of design of the affordable housing that does not look like poor affordable housing for the people.

There are different suggestions how architects and planners can develop and work a framework for the provision of good housing design. Before commencing on any project, the architect as well as the planner should gather as much information as they can after this will be given to the team of talented designers to produce an environment in line with the wishes and aspirations of its inhabitants. In the meantime the architects and social scientists collaborate in the evaluation of residential environment from the viewpoint of users. Then the architects, planners and social scientists should combine their talents, in an effort to identify these dimensions salient in residential areas and housing that contribute to the overall quality of living experience (Sidi 2011). However, the main concern is to discuss the concept of quality housing which can be the basis or the theoretical framework for studying housing problems towards developing planning quality design of housing and human needs,

the relationships of housing and cultural, environmental, economic and tenures norms of the community concerned.

3.10 NATURAL MATERIALS

Natural resources occur naturally within environments that exist relatively undisturbed by mankind, in a natural form. A natural resource is often characterized by amounts of biodiversity existent in various. Natural resources are materials and components that can be found within the environment. Every man made product is composed of natural resources. A natural resource may exist as a separate entity such as fresh water, and air, or it may exist in an alternate form which must be processed to obtain the resource such as metal ores, oil, and most forms of energy (Otene 2008).

3.11 NATURAL BUILDING MATERIALS

Natural building means sustainable building at its “Greenest” (Trevisi, Bruno, Orlando, Ocone, Paoletti, Amici, Altieri & Antonelli 2005). In all the hot arid and temperate climates earth has always been the most prevalent building material. Even today, one third of the human population resides in earthen houses; in developing countries this figure is more than one half. It has proven impossible to fulfill the immense requirements for shelter in the developing countries with industrial building materials, i.e. brick, concrete and steel, nor with industrialized construction techniques. In the developing countries, requirements for shelter can be met only by using local building materials and relying on do-it-yourself construction techniques. Earth is the most important natural building material, and it is available in most regions of the world. It is frequently obtained directly from the building site when excavating foundations or basements. In the industrialized countries, careless exploitation of resources and centralized capital combined with energy-intensive production is not only wasteful; it also pollutes the environment and increases unemployment. In these countries, earth is being revived as a building material. Earth as a building material comes in a thousand different compositions, and can be variously processed. Loam, or clayey soil, as it is referred to scientifically, has different names when used in various applications, for instance rammed earth, soil

blocks, mud bricks or adobe. Increasingly, people when building homes demand energy- and cost-effective buildings that emphasize a healthy, balanced indoor climate. They are coming to realize that mud, as a natural building material, is superior to industrial building materials such as concrete, brick and lime-sandstone (Memarian, Moradi & Dehghan 2009). The data and experiences and the specific realizations of earth construction contained in this paper may be used as guidelines for a variety of construction processes and possible applications by engineers, architects, entrepreneurs, craftsmen and public policy-makers who find themselves attempting, either from desire or necessity, to come to terms with humanity's oldest building material.

In the United Kingdom almost half of the people are living in housing that emitted carbon dioxide. The emissions come from heating running commercial and residential buildings. It is expected about three million new homes will be built by the coming years. Given the objectives of the government of the United Kingdom from 80% reductions in emissions of carbon dioxide by the year 2050, there is an urgent need to ensure new homes are required to be more sustainable, both in terms of mitigating climate change (Smith 2007). There is no shortage of ideas, demonstrations, practical, about how to achieve this, high technology smart home which are using the latest construction methods and monitor carefully and control energy use in the home, and further solutions to low technology, such as housing outside the network simple made from consumer waste recycled.

Over the last 30 to 40 years the movement and the ideas gathered from the development of a large sustainable housing has not had much progress or spread on a large scale. Builders of household whom are responsible for providing hundreds of thousands of new homes built each year have not learnt many lessons from these green builders. some studies that is due to the coexistence of letters is fundamentally different, and practices of sustainability and governance between the dominant system in the provision of adequate housing, and green builders. Accordingly, the barriers are also factors include ideological, cultural, social, political and moral, as well as economic and technical issues (Shove 1998). The challenge therefore, is to better understand and therefore harness the creative energies of community led solutions,

and adapt them for wider mainstream settings (Lovell 2004). This problem must be addressed through the investigation of the scope of sustainable housing initiative is previously studied, to contribute to the building housing a low-carbon, sustainable communities (Seyfang & Smith 2007). In doing so, it develops the emerging research program for sustainable development, and applies to the case of new experimental, by using different kind of natural materials like adobe and mud brick, cob, compressed earth, earth bag (Paper Crete), rammed earth and straw bale building, etc. The flowing will be explained in details as:

3.11.1 Adobe and Mud brick

The history of civilization is synonymous to the history of masonry. Man's first civilization, which started about 6000 years ago, was evident from the remains of the Mesopotamians masonry heritage. During those days, masonry buildings were constructed from any available material at hand. The Mesopotamians used bricks, made from alluvial deposits of the nearby River Euphrates and Tigris to build their cities beside two rivers. Where civilization existed in the vicinity of mountains or rocky outcrops, stone was used. The Egyptian pyramids that existed along the rocky borders of the Nile valley were examples of such stone masonry. In the Eastern civilization, remains of historical masonry are the reputed Great Wall of China, which is considered as one of the seven construction wonders in the world (Perera & Jayasingh 2003). The prevision of good quality housing is recognized as an important responsibility for welfare of people in any country. For this, building materials based on natural resources are often used. Some examples are the use of clay for making bricks, and river sand for making cement sand blocks. The commercial exploitation of these resources often leads to various environmental problems. If clay mines are not properly filled up, they can collect water and allow mosquitoes to breed. Extensive sand mining can lower the river- beds and allow salt-water intrusion inland. Therefore, the development of many alternative walling materials as possible will be of immense benefit to minimize the impact on the environment. Earth can be used for construction of walls in many ways. However, there are few undesirable properties such as loss of strength when saturated with water, erosion due to wind or driving rain and poor dimensional stability (Reddy & Jagadish 1989). These draw backs can be eliminated

significantly by stabilizing the soil with a chemical agent such as cement, cement stabilized soil is generally used as individual blocks compacted either with manual hydraulically operated machines.

In Thailand the form of natural architecture is built with environmentally friendly materials. Earth construction provides indoor protection from outside temperature conditions. The adobe brick that contains rice husk is the most widely used material in earth construction. It is important to consider the strength and moisture absorption capacity of adobe brick. Thailand focuses on the feasibility of using agricultural by products such as rice husk and bagasse in adobe brick. The results provide a guideline for producing adobe brick containing agricultural by products with improved strength and lower moisture absorption. Adobe brick with performance improved in these ways will be beneficial for developing low cost architecture for local people and for building houses. Adobe brick is an earth construction which offers a way for people to feel and actually become more meaningfully connected to nature because it is a form of natural architecture built with environmentally friendly materials (Carter, Cannor & Mansell 1982). Industrial development has wrought far reaching changes in Thailand, transforming many rural villages into cities and thereby ruining local ways of life, damaging the environment, and depleting natural resources, as construction industries have used and continue to use high amounts of energy manufacturing (Lertwattanakul & Tungsirirakul 2007). In Libya, architects and the parties involved in building construction should consider using this building material as it is affordable, easy to use and easily available.

i. The Clay

Brick is a ceramic material mainly used in construction industry. Its production process involves forming of clay into rectangular blocks of standard size, followed by firing to temperature ranging from 900 - 1200°C¹. It is made of clay or shale and when given desired shape is dried and fired into a durable ceramic product. Brick is one of the most important building materials. Energy consumption and pollution are the two important environmental and cost concerns related to the brick industry (Egbert 1993). The most fine-grained soil, clay is flexible when wet. It can absorb

water and capable of holding nutrients and exchanging them at a high rate. On the basis of these qualities, clay is recommended for rice planting because it can accumulate water in the long term. It contains three types of particles: sand, silt, and clay. Of these the largest particle is sand, which is an incoherent granular soil and a good ventilate. The mid-sized particle is silt, which is brittle and invisible to the eye. Clay, the smallest particle, hardens when dry, is plastic when sufficiently wet, has high porosity, and prevents air and water from circulating (Hall & Djerbib 2004). Humidity can damage and corrupt the structure of a building: the temperature changes that humidity causes in materials that contain acid or alkali salt additives results in those materials becoming corroded and cracked (Hall 1986). Clay is available in southern area of Libya. It is a material that can be found in the oasis of the Libyan Desert. It can the most suitable to be used as a building material for building houses as it is a local material.

ii. Light Clay

Light clay, alternatively known as light straw, is a variation on adobe and cob. Basically, there is a spectrum of these materials that are made from a mixture of clay, sand, and straw. At one end of the spectrum is adobe, which is primarily clay. At the other end of the spectrum, you have light clay, which is primarily straw. The straw is coated with a mixture of almost liquid clay so that it will easily stick together while remaining primarily a straw structure. The light clay is then shaped into walls (Kadir & Mohajerani 2010). The clay in Libya is almost similar to any other clay in other countries. It has the ability as to retain heat and it consists of salt and high organic elements. The clay can be gathered and shaped in bricks, and then sun dried and baked in high temperature to make it strong and hard before it is ready to be used.

iii. Clay brick strength

Compressive strength of a building block is an indicator of the strength of construction. Thus the strength of the building block has resulted in becoming an important issue in the design of brick construction (Hendry 1990). The considerable

amount of research and studies in the past that contributed to the strength of a building is stronger brick in the power of the largest brick.

3.11.2 Cob

Cob combines earth with straw to create an alternative building material that is highly similar to adobe. The major difference between the two types of alternative building materials is that the cob has more straw mixed into it than the adobe does. Another difference is that it tends to be less expensive (Jackson & Dhir 1997). As it is not as trendy in popularity as adobe so costs have not been driven up.

3.11.3 Compressed Earth

Compressed earth is a method of building that uses mechanical tools to compress earth into bricks that can be used for construction. The full name of the method is called Compressed Earth Block; it is often called CEB for short. There are several factors that go into the selection of compressed earth block for the building of a home. Internationally, culture and available labor are major issues. For the alternative home builder, labor may also be an issue because of the difficulty of the compression process. One of the major reasons alternative home builders select this method of building is that the bricks are made into a uniform shape, which facilitates the building process (Zami & Lee 2010). It also leaves room for a lot less waste in the construction of the home, which is of clear importance to the environmentally-conscious builder.

3.11.4 Earth bag (Paper Crete)

Alternative home building has taken lessons from history, as well as from different industries in making the most effective use of building materials. One interesting development has been the creation of earth bags for building homes. An Earth bag is a concept derived from the old sandbags historically used by the military for construction of barriers. The military made good use out of sandbags to create such barriers, which would stand up against the weather and the threat of force by oncoming armies. This speaks to the difficulty of destroying this building material and

points to a major reason that this material began to be used by alternative home builders (Hunter & Kiffmeyer 2006). It offers the option of using earth and natural materials for building, while offering strength and durability in construction and design.

3.11.5 Rammed Earth

Many people mistake adobe and rammed earth as the same building material. This is because the material itself is basically the same mixture. The difference lies in the way that the mixture is formed to make the home. The rammed earth home uses machinery to compress the material to create flat surfaces that offer clean lines for design. The walls of a rammed earth home are built thick using this material (Maniatidis & Walker 2008). The use of the machinery makes this a less environmentally-conscious choice than adobe, depending upon the exact process you use. However, the home tends to be more modern and solid.

Sod has played an important role in the history of home building in America. When people began to push west, they needed to work with local materials to build homes in their new areas. Sod was one of the most common of these materials to be used in the Midwest. Sod homes were constructed all throughout the 19th century as the frontier boundaries were pushed further west (Pierce 2010). And some of those sod homes are still standing today, a testament to the longevity of alternatively built homes. The difference between sod and other earth-based materials is that sod is earth that includes grass (Wanek 1999). There are more reasons to focus on earthen materials for building our home, their abilities is to absorb sound, odors and moisture, it reduce water vapor from bathing and cooking.

3.11.6 Straw Bale Building

Straw bale buildings were first constructed in the USA in the late 1800s, when baling machines were invented. The white settlers on the plains of Nebraska were growing grain crops in an area without stone or timber with which to build, and whilst waiting for timber to arrive by wagon train the following spring, they built temporary houses

out of what was, to them, a waste material - the baled up straw-stalks of the grain crop. They built directly with the bales as if they were giant building blocks, where the bales themselves formed the load bearing structure (Lacinski & Bergeron 2000). The Straw Bale Building is a smart way to build. It's more than just a wall building technique that has yet to come into its own. It's a radically different approach to the process of building itself. Like all innovative ideas, it has been pioneered by the passionate, and used experimentally by those with the vision to see its potential. Its background is grassroots self-build; it is firmly based in that sustainable, 'green building' culture that has brought to the construction industry many new and useful ideas about energy efficiency and responsibility towards the environment. It is now at a pivotal point in its development, ready to be taken on by construction firms who see its value in terms of cost-effectiveness, sustainability, ease of installation and energy efficiency. As you will see from this document, the building method itself is based on a block system, making the designs very easy to adapt from one project to another, and giving great flexibility in its use. The accessible nature of straw means that people unfamiliar with the building process can now participate in it. This opens the door for interest groups to work together on joint projects. Housing Associations and Local Authorities etc. are ideal managers for self-build straw projects that won't take years to complete, and which will engender an excitement and motivation that gets the job done. The atmosphere on a straw bale building site is qualitatively different to that found on the vast majority of other sites. It is woman-friendly, joyful, optimistic and highly motivated. Knowledge and skills are freely shared, and co-operation and teamwork predominate, all of which has a positive effect on health and safety on site (Athena & Bill 2000). Working with straw is unlike working with any other material. It is simple, flexible, imprecise and organic.

Straw is a flexible material and requires us to work with it somewhat differently than if it was rigid. Accurate measurement and precision is impossible and unnecessary with straw, but working without these aids can be worrying to the novice, and threatening if you're already used to 20th century building techniques. It is very important to make this clear at the outset. You have to develop a feel for the straw. You have to give it time, absorb its flexibility. Yet it is possible to be macho about it to hurl bales around single-handedly and force them tightly into spaces, but this

always has adverse consequences. Rushing the process, and working alone or competitively can mean that an adjoining section of wall is distorted and pushed out of shape a section that someone else has spent time and care in getting right. It's as much a personal learning process as it is learning a new building technique. More than any other material except perhaps clay, it is susceptible to your own spirit and that of the team. Straw bale building is not something to do alone. It requires co-operation, skill-sharing and common sense. Many of the inspirational and artistic features occur in this atmosphere. It is empowering, expanding the world of opportunities for you and making possible what you thought to be impossible (Holmes & Wingate 1997). When building a house using bales of straw, it's important to remember that it is the wall building material which is different. This has implications for the type of foundation required and can affect certain design decisions to do with windows, doors, roof bearing and plaster finishes. Otherwise, all aspects of the rest of the building remain the same. The installation of plumbing, electrics and interior carpentry, joinery and partition walls may be no different to the methods and materials you are used to (Magwood & Mack 2000). This Guide therefore covers details of different types of foundation, how to build walls with straw and stabilize them, how to protect walls from the weather and make them durable and how straw bale buildings can easily meet building regulations requirements, as it showing in photo 3.5.



Photo 3.5 Building hay houses

Source: arch.arab-eng.org 2006

3.12 HEALTHY LIVING ENVIRONMENT

Straw, particularly organic straw, is a healthy alternative to modern materials. It is natural, and harmless. It does not cause hay fever since it's not hay, and in fact is the material of choice for many allergy sufferers because it is so innocuous. Living within straw walls can enhance the quality of air we breathe, because it does not give off harmful fumes such as formaldehydes, as many modern materials do, and because it is a breathable material, thereby helping to keep the inside air fresh. Coupled with the use of nontoxic organic finishes such as clay and natural pigments and paints, and with opening windows, it can provide one of the safest and most comfortable atmospheres in which to live. Another health benefit is the ambience inside a straw bale house which is calm, cozy and peaceful (Myrhman & Macdonald 1997). This is partly to do with the high level of sound insulation, partly to do with the air quality, and partly to do with the organic feel to the house a beautiful, nurturing and safe environment to inhabit. And by studying the highly insulating, sustainability and durability of the material to provide a healthy living environment.

3.12.1 Highly Insulating

Straw provides super-insulation at an affordable cost. The K value of straw in a straw bale is 0.09W/mk; this combined with walls typically over 450mm thick gives a U value of 0.13W/m²K, two or three times lower than contemporary materials, and much lower than current building regulations that require walls to have a U-value of 0.45 or less (Minke & Mahlke 2004). Focusing on local material or natural material which is available in the country has the ability of heat insulation and affordable in cost is the most important in this research.

3.12.2 Sustainability

Straw is an annually renewable natural product, grown by photosynthesis, fuelled from the sun. Approximately 4 million tones are produced surplus to requirements each year in the UK. Using straw can mean less pressure to use other more environmentally damaging materials and in the unlikely event that the building is no

longer required, it could be composted afterwards (Magwood, Mack & Therrien 2005). Straw is a material which has the ability to retain heat and lower cost. Using straw in countries like UK, and America have been fully successful, but in Libya it is not practical as it is not available enough in Libya and it is not a local material as it is in Arizona.

3.12.3 Durability

Straw bale walls require a render or coating that will protect the straw from the weather while allowing any trapped moisture to escape. Traditional lime renders offer one solution and have protected many historic walls. In many instances lime is recommended as the main constituent of renders by organizations such as the UK's National Trust and the Society for the Protection of Ancient Buildings. However, for load-bearing straw bale walls, render or external plaster will resist some vertical and lateral loads. All corners around openings through a lime render need reinforcement, to reduce the incidence of cracking. Earth renders are becoming more popular but potentially need more maintenance than lime materials, and cannot as yet be recommended as an external finish on exposed facades. Both lime and earth renders require a lime or lime–earth wash final coating. A number of modern straw bale building walls have been protected using rain screens, some using natural materials such as timber and others using impervious modern materials such as profiled plastic and metal sheets (Goodhew & Griffiths 2005). So I want to show that the hay structural method is a traditional way and I think that the West took from us this idea by building with mud, brick and hay. We found this method a long time ago, but so far this kind of traditional structural has only been used in the south in Saudi Arabia on the coast of (Geezan), shown in Figure 3.2, and on the coast of (Tham) in Yemen (www.arab-eng.org). The problem with this kind of house is they are made for only poor people and it is an inferior architectural design.



Figure 3.2 Hay houses in Saudi Arabia

Source: arab-eng.org 2006

So we must embolden traditional structural methods, especially with mud. Using it as the only material will not be harmonious with the Libyan environment and it might cause a loss of profit (www.arch.arab-eng.org). As we can see that the this kind of houses was used by hay to controlled the heat, but using hay as a material will be accepted in a country that supplied this kind of material and it does not cast too much. And studying this kind of building will late use understand that we have to exploitation the kind of material that is available in Libya, and specially natural material lake the mud that is been used on the hay houses and it is available in the Libyan desert, and it can help to protect the houses from the outside and it works as a heat insulation.

3.13 EXAMPLES ON HOUSES MADE OF ADOBE IN LIBYA AND OTHER COUNTRIES

3.13.1 Ghadames Area in Libya

“The Pearl of the Desert” or *“The Town of Shadows”*. That is how Ghadames is known, being one of the most beautiful oasis in Libya. Ghadames is one of the oldest desert towns and an outstanding example of a traditional residential area. Ghadames is the oldest oasis in the world, and the small villages provided the most fascinating example of vernacular earth architecture in the desert environment. Ghadames, in the

past was a very important commercial center situated in a key location for the ancient caravan routes which led from the Mediterranean to the interior of the continent and from the Atlantic coast towards Tripoli and Mecca. Here merchants and pilgrims on their way to holy places found help and rest during their journeys. Roughly circular in shape, the old town is composed of a cluster of houses. Those houses on the outside, with their reinforced external walls, protect the town (<http://whc.unesco.org/pg>). The houses in the old town Ghadames in Libya shown in figure 3.3, was built by mud bricks (traditional materials) the houses are made of local materials, like mud brick, sun dried, hot baked that contained straw and animal manure and had a high concentration of salt, shown in photo 3.6, trunk of palm tree, and sealed with brown gypsum for the mortar and structure and used as a white wash to plaster and seal walls and surfaces. Clay mixed with organic elements was the main building material. Trunks and leaves of palm trees were used to build ceilings and roofs (Salem 1985). Most houses stand wall to wall with other houses on three sides and the facade of each faces street which is usually covered at the top.

Stones are used in the foundations to a height of about one and a half meter, despite the availability of stones in the nearby areas. The mud stone is more commonly used due to the inability to bond stones together using the local mud. The mud stone is in the building walls. The basic material for making earth stone is mud which is mixed with water and some organic material (stalks or animal done). It is placed inside rectangular molds made of four pieces of wood; the mud is used in bonding the earth stone molds together, the mud is mixed with broken material and used in building arches, domes and steps as shown in photo 3.7. The broad pieces of palm tree wood are used in roofing, doors and wall storages. It is prepared for use by mixing it with salt and lime, and then it is buried in the ground until the summer season passes. This method is used for isolating it from future moth attack. The palm tree thorns are used for floors and some doors; but leaves are used against the leakage of mud and gypsum to the lower floors of the building. The gypsum is extracted from nearby places of the city and is used in floors and whitening of walls and the building of domes. The locally produced gypsum is used in whitening walls. One may mention the wooden planks from various trees which are used for lower and inner doors. Iron is used for making keys and locks and window bars.

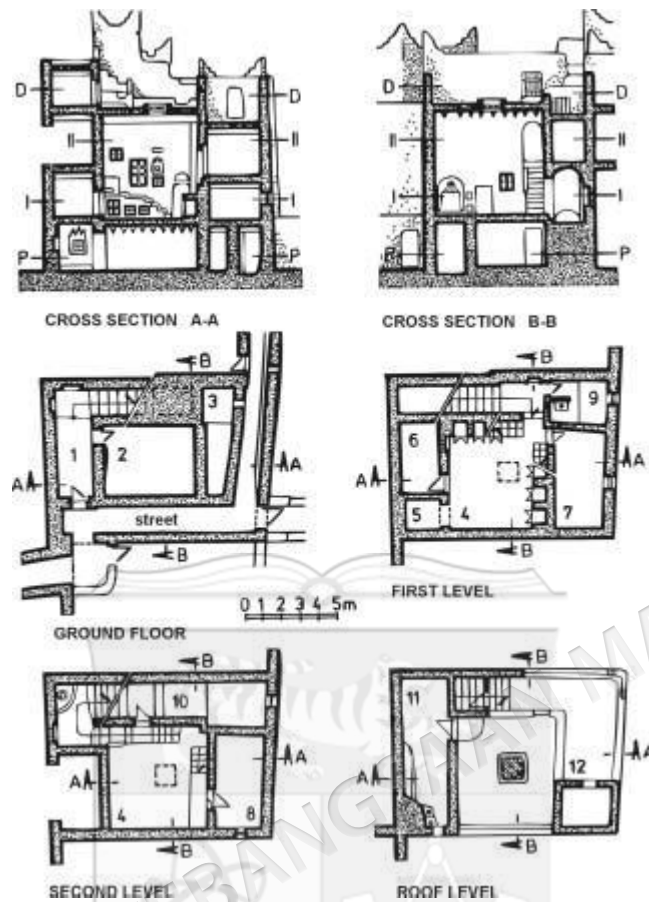


Figure 3.3 Traditional houses in Ghadames, Libya

Source: Municipality of Ghadames 1961-1962

Traditional house sections: 1. Covered Pedestrian Street. 2. Guest room. 3. Store room. 4. Toiled pit. 5. Toilet. 6. Living room. 7. Master bedroom. 8. El-kepa. 9. Boy's bedroom. 10. Store room. 11. Girl's room. 12. Kitchen.



Photo 3.6 Mud brick, sun dried, hot baked

Source: Horizonsunlimited.com/Johnson/Libya.shtml 2006



Photo 3.7 Structural walls

Source: galenfrysinger.com 2006

The houses are constructed in such a way so that they all fit together with covered alleyways between them and adjacent roofs, allowing passage from one house to another. So the temperature there is much lower than outside. The streets are also built in a way that makes it possible to maintain a favorable microclimate, functioning together with the buildings, their compact structure to keep the temperature and the humidity of air at a satisfactory level. They are fragile houses of clay and unfired brick, decorated inside with whitewash which preserve a degree of coolness in the height of summer (Salem 1985). However these houses are not being maintained which means this remarkable example of the traditional housing of Ghadames is slowly disappearing. While the entire populations have moved out to the modern village, the old one offers the only good shelter against summer heat. Nevertheless the old village is still popular.

To present a complete description for the city of Ghadames, a tour inside the city is a must. When you enter the streets from any direction, you feel the sudden change in temperature and feel what is known as the "climatic comfort" from the point of coolness and humidity despite the desert surrounding of extreme heat and dryness. You pass through covered streets which give you a feeling of your humanity and be assured that this city was created to be refuge for man from the harsh environment, shown in photo 3.8.



Photo 3.8 Covered streets

Source: glenfrysinger.com 2006

3.13.2 Fezzan Area in Libya

The same thing is in Fezzan city. Dwellings of mud and brick design were well designed to withstand the harsh realities of desert living, the houses have been left usually have roofs made of palm beams and fronds and these will deteriorate over time without periodic maintenance and from the rare rainfall. Because of the movement of the people into the new modern housing areas, the older median style homes will eventually crumble from neglect (Ham 2002), shown in photo 3.9.



Photo 3.9 Fezzan mud houses

Source: <http://www.inmagine.com/imb055/imb0550825-photo>

3.13.3 Egypt

Another example in Egypt there is a small city named Al-Agser, south of Egypt and it was built by Hasen Fathee. Hasen Fathee is an Egyptian architect that designed with traditional structures and built traditional houses in the AL-Agser area, shown in photo 3.10. His objective was to design a harmony in the architectural units that used the natural materials and attempting to hold on to the legacy of living. The new city of AL-Grna was built by Hasen Fathee in the south of Egypt. After he started to build it no one would live in the houses and he finally abandoned it. He found that the project in the AL-Grna new city did not benefit the people in spite of the many improvements

designed into the project that used domes on the structure and had pathways for air ventilation to cool the inside (www.arch.arab-eng.org/news). Parts of the buildings were buried under the sand to give some protection from the sun and give the design a romantic form.



Photo 3.10 The new city AL-Grna in AL-Agser 1952

Source: arch.arab-eng.org/news 2006

The mud house or mud brick houses are forms of traditional houses built from local clays. Some of the products are modernized today in the form of burnt bricks being fabricated locally. This will be built at a fraction of the cost and at a more acceptable environment (Olawepo 2009). Hasen Fathee has suggested from his studies to form a new way of participation with the poor. The recipients must help in the process and this participation is necessary. He suggested that there must be a kind of participation in selection of materials. Of course the nature of materials used in the construction of houses especially desert houses must be given due consideration which is pertinent to this study. But the researcher is in the view to use natural material combined with modern material to help the buildings to be strong and useful. A way must be come up to lower the cost of material. One possibility is to use soil. Lean on these two kinds of ways: work and mud that they can finish. What Hasen Fathee wanted to say about using soil as a structure material is that mud is available and it does not cost much. The objective of using this kind of material is to lower cost so all of the people can use it (www.arch.arab-eng.org/news). Using mud however, gives the

house a gloomy ambiance and an unpleasant look as shown in photo 3.11. This is not due to the material used but more in the weakness of the design.



Photo 3.11 A house in AL-Gruna (Egypt)

Source: arch.arab-eng.org/news 2006

3.15 THE LIBYAN ARCHITECTURE

According to Itewi 2007 the Islamic architecture which is inherent is in the Libyan architecture is heavily depends on engineering and aesthetic principles. In Libya there are areas which have used ingenious architectural designs in their living quarters. These have been dictated by centuries by harsh climate and the difficult terrain in which they live. Libyan who lived in mountainous and desert regions are cut off of the natural mountainous fortification living quarters. Materials from the oasis desert are much like the American Indians of the South West (Ham 2002). The Libyan architecture it reflected in their homes through the kind of materials and the way of the designs. In Libya homes in the desert use mud as a form of protection from the sun and heat, whereas deep holes in the ground are being dug to protect them from the strange passing through the land while they surround themselves by the coolness of the mountains.

3.16 THE SAHARAN ARCHITECTURE

The Fezzan dwellings of mud and brick design were well designed to withstand the harsh realities of desert living. In Ghadames, the older parts of the city that are still

inhabitable are utilized in the severe summer heat. People in Ghadames will move out of their new modern air-conditioned houses that have been built by the government and return to the older part of the city that continues to remain cooler in the summer. Following the trend of modernity and the lure of electricity, running water and air-conditioning, the people have moved out of the medinas of the Saharan desert into new modern housing and the older areas are deteriorating at a rapid pace. These older towns that were built along the old caravan routes were built with natural materials. These were mud and clay, sun-dried brick that contained straw and animal manure and had a high concentration of salt. Buttresses, doors and window frames were usually constructed of beaten palm trunks. The Fezzan houses that have been left usually have roofs made of palm beams and fronds and these will deteriorate over time without periodic maintenance and from the rare rainfall (Ham 2002). Because of the movement of the people into the new modern housing areas, the older median style homes will eventually crumble from neglect.

3.17 WHY USE EARTH FOR BUILDING?

Building with earth materials can be a way of helping with sustainable management of the earth's resources. It can be put in place by using simple machinery and human energy; it can also achieve low energy costs throughout their manufacture and construction, in their use as homes, and eventually in their recycling back to the earth, earth. Even though is more time consuming than conventional design and construction, but for those who are providing their own labor, the time involved in earth construction may be less significant than the money cost of modern materials, many people also value earth construction for its aesthetic qualities (Makunza 2006).

3.18 SUCCESSFUL USE OF MUD IN HOUSING BUILDING

The construction of mud in housing uses minimal energy, the building uses massive construction technique; mainly because of the temperature extremes and its unique earth sheltered design. All exposed mud walls are built like a thermos or burnt earth bottle. A passive air conditioning system supplies cool air to the house through these massive mud walls. However, it is easily to build, anyone can create any shape of their

own buildings or community can participate without constructor payment bills. The mud house construction uses an only simple natural material, which is absolutely different from wood, rock, cement or metal, owing to durability and recycling ease, mud can be formed for our shelters and it can be reformed back to nature, to be simple soil on earth. Therefore, mud is harmonized with all environments and good for being a passive air-conditioning system. Thus living in mud house is comfortable year round, frugality and reuse in mud house construction can create tremendous saving in environmental impact, energy use and capital expenditure.

In a nutshell the advantages of using mud in housing construction is an appropriate technology that can offer us the basis of a sustainable civilization, which should be environmental friendly design, as the advantages are as listed below:

- i. Low cost of materials.
- ii. Low energy and transportation costs.
- iii. Can be built personally by the homeowner.
- iv. Maintains a balance indoor climate without extremes of temperature.
- v. A renewable non-toxic resource which can be readily recycled.
- vi. Low fire risk, non-combustible.
- vii. Allows expression of personal creativity using traditional crafts and skills.
- viii. Can be shaped by hand into attractively rounded forms and niches.
- ix. Variable light quality reflected from molded and textured surfaces.

3.19 PRINCIPLES OF BUILDING DESIGN AND CONSTRUCTION IN DESERT REGIONS IN LIBYA

Desert buildings are traditionally designed by small windows, flat roofs and heavyweight material, but the buildings itself are designed differently by different areas. For example, in rural areas, the dried mud is used for the roofs and they are composed of a thick layer, and impervious layer is the second cover. In roofing contemporary buildings in urban areas is usually used reinforced concrete. The thick exterior walls and roof damp the temperature fluctuations; at the level close to the average external surface temperature it stabilizes the internal temperature. The individual structure and the layout of the building is compact, to expose the minimum

surface to radiation and the hot air outside. Patios and internal courtyards are often provided for social purposes and also as sleeping areas. During the day ventilation is reduced to minimum, to exclude the hot, dusty land outdoor air from the interior (Givoni 1976). However, this is achieved at the expense of nocturnal conditions as the aim of this type is basically to lower daytime temperature as far as possible, which we can find that outdoor will be warmer. In most areas, during several months of the year, therefore, the day temperature is too high, and artificial cooling systems are used in the traditional building for the true comfort that can only be achieved. Occasionally it also went into the provision of underground rooms, in which temperature fluctuations are further stabilized, at a level close to the annual average; in buildings above the ground at summer time the temperature are there for much lower. The inhabitants have to sleep on the roofs or in the courtyards when usually buildings are without mechanical cooling. The high heat capacity within the conjunction of the use of modern insulating materials allows the opening to be larger while maintaining or obtaining in the traditional buildings and even improving on the thermal conditions.

3.20 DEVELOPMENT AND APPLICATION OF PRINCIPLES, TO DESIGN NATURALLY COOLED BUILDINGS IN LIBYA

The outdoor temperatures in any country or any climate its function to cool down buildings, it is the decision of the kind of material to use. So according to the outdoor temperatures, the purpose of high heat capacity concrete walls externally insulated by expanded plastics or rock wool and covered by waterproofing materials. May be these materials could be computed by the required thickness, and the similar composite construction is another thing that should be, and the internal partitions of high heat capacity. The concrete layer reduces the effect on the internal temperatures which the heat penetrate, and the heat that enter the building during the day, and the heat can enter through windows, but if it is large windows it should be protected by shading elements or movable insulated shutters (Givoni 1976). So, for reducing heat from the building shutters and window must be closed during the day especially during surfaces facing the sun.

3.21 CONCLUSION

In this section it reviews the needs of the affordable housing and describing the housing problems in Libya through the housing policy. The chapter will also focus on the affordable houses unit in Benghazi in details. Describing types of units by the number of rooms, mentioning the cost of the unit before and after, include plan of the unit and photos of the apartment and area location. The economic viability and brief requirement on housing is in details, the literature review of housing problems and housing policy in Libya through the existing policy in the past few years. The chapter is focusing the natural materials in other countries and in Libya, how it can be used in building houses by design and construction, describing kind of natural material like adobe, mud brick, earth bag and straw, and how these natural materials reflect on the health living environment and cost of the building. Using examples on houses made of mud in Libya and other countries, attaining it with photos and drawing on the traditional house. Desiccation how can mud be successful use in building houses, showing the principles of the building design, construction and the naturally cooling inside the traditional house in Libya.

CHAPTER IV

RESEARCH METHODOLOGY

4.1 INTRODUCTION

The chapter discusses procedures to be used in the current study. The discussion is divided separately into the following sections: design of the study; measurement and instrumentation; description of the population; sample size; testing procedures of data collection and data analysis. The methods section is the most important aspect of a research paper because it provides the information by which the validity of a study is ultimately judged. Therefore, the author must provide a clear and precise description of how an experiment is done and the rationale for the specific experimental procedures chosen. In this chapter the research methodology used in the study is described. The geographical area where the study is conducted, the study design and the population and sampling, the instrument used to collect the data are described.

The effect of the housing policy on the country can help the government to create a guideline and decide on how to prepare a new scheme or amend an existing scheme as a result of a regional planning process. The housing policy has the effect on the development of applications when they are assessed or the provision of land to the community (Gilmour 2011). The government has to identify the housing needs of their community and analyzes it and makes necessary modifications if necessary. There need to be a planning scheme to remove the housing problems and provide opportunities for affordable housing options that respond to the housing needs of the community which include the range of housing required for the various household sizes and types. Meanwhile, many households are in real need and are unable to obtain the support and stability that housing can offer.

4.2 MAIN BODY

The main body contains the content relating to the introduction, review, opinions, and references all relating to the main research subject. Defining, explaining, justifying or defying the theory. This part will also consist of finding the reasons of the housing problems. The subject matter is given due explanation through content, interviews, questions, graphs, studying housing problems of other countries. The finding for a suitable solution is in using affordable materials, design and etc. The basic review is elaborated in the main body of the research.

4.3 DESIGN OF THE STUDY

This research design builds on research done in other countries having similar problems in housing. It employs the qualitative research method. This discussion of the methodology attempts to present some of the specific tools and experiences used in solving housing problems to inform the design of the research and the development of an interpretation. There are a number of important articles describing the case study approach to researches in developing a guideline in the housing policy. Articles are basis on the comprehensive definitions and suggestions similar to this case research.

4.4 RESEARCH METHOD

The authenticity and cogency of the research depends upon the validity of research data, the reliability of measures taken to amass the data, as well as the time taken to conduct the analysis. Hence, it is imperative to provide the reader with details of data collection and generation, analysis method of the problems, with their solutions or effects of the researched data.

4.5 THE STUDY POPULATION AND SAMPLE

The study will be conducted in Benghazi, a city in Libya, which population of 800,000 people. The study will cover 10% of each of the six areas, which concentrate on a cluster house built of selects groups or clusters and simple random sampling. It divides the entire population (Population of Benghazi) into different clusters (areas). This selects a number of clusters through simple or systematic random sampling. Then, from the selected clusters (randomly selected areas) 10% of the houses are selected.

Benghazi Al-Madinah, Al-Slmany, Ras Abydah, Sidy Hseen, Sidy Abydah, Al-Sabry, Al-Brkah, Al-Keesh, Al-Nwagyah, Al-Megzah, Shwhada Al-Slawly, Al-Thorah Al-Shabeyah, Al-Kwyfah, Al-Mktar, Al-Aroba and Sidy Kalyfa. There are areas that are similar to each other, we can consist of them as a one area and we will divide them in to six groups or areas:

i. Benghazi Al-Madinah.

In this area the total population is 30940 people, the 10% of the area are 3094 people are analyze.

ii. Al-Slmany, Ras Abydah, Sidy Hseen and Sidy Abydah.

In the Al-Slmany area there are 33834 people. In Ras Abydah area there are 21540 people, in Sidy Hseen area there are 19884 people, and in Sidy Abydah area there are 15288 people, in these area the total population is 90548 people living in these areas, the 10% of the area are 9054 people are analyze.

iii. Al-Sabry.

In this area the total population is 30056 people living in this area, the 10% of the area are 3005 people are analyze.

iv. Al-Brkah and Al-Keesh.

In the Al-Brkah area there are 76186 people, and Al-Keesh area there are 39243 people. The total is 115429 living in these areas, the 10% of the area are 11542 people are analyze.

v. Al-Nwagyah, Al-Megzah, Shwhada Al-Slawly and Al-Thorah Al-Shabeyah.

In the Al-Nwagyah area there are 2316 people, Al-Megzah area there are 1989 people, Shwhada Al-Slawly area there are 21101 people and Al-Thorah Al-Shabeyah area there are 29202 people. The total is 54608 living in these areas, the 10% of the area are 5460 people are analyze.

vi. Al-Kwyfah, Al-Mktar, Al-Aroba and Sidy Kalyfa.

In the Al-Kwyfah area there are 63943 people, Al-Mktar area there are 19538 people, Al-Aroba area there are 33194 people and Sidy Kalyfa area there are 9368 people. The total is 126043 people living in these areas, the 10% of the area are 12604 people are analyze.

The questions asked for the data collection purposes each contain an option. The person who answers the questions on behalf of his family is given two days to complete answering all the questions. The questionnaire covers 10% of the region and distributed to the people in each region. After a day or two the researcher collects the questionnaires from selected homes. There will be an informal interview carried between the researcher and the owner of the house to seek his idea on to solve the housing problem.

4.6 AIMS

The goal of the questions is to know who is responsible to resolve the problems. The questions asked are deemed necessary as it is viewed as the easiest and clearest way to see the problems that have long been the cause of sufferings to the population of Benghazi City, Libya.

4.6.1 Questions Design

Designing questions before making the survey needs to be firstly, in good structuring, to decide in which group of questions by asking it in which order. Start by the questions that are easy which the resident can answer comfortably, and finding whether the questions are asking to the right people, trying to put the right questions at the beginning to help avoid the resident to interrupt the survey. Secondly the questions have to be individual questions, so it can be clearly to the people without confusing them, with complicated questions that they cannot answer, designing the questions to makes a good survey has to be short, clear and precisely with simple words, clear choices which has all the options covered, and avoiding unnecessary question that are not related to the study. To design a survey questions it has to address the objectives and issue agreed for the survey.

4.6.2 Types of Questions

There are many different types of questions that can be used in surveys to collect information. The types of questions which are used in this study are multiple choice questions. The questions offers the respondent direct answers of responses from which have been choose. The structure will make the data collection and analysis less time to answer.

Examples of Structured Questions:

1. What is the monthly income for your family?

- i- Between 100 and 300 LD ()
- ii- Between 400 and 800 LD ()
- iii- Between 900 and 1500 LD ()
- iv- Above 1600 LD ()

2. What kind of a house do you live?

- i- Privet apartment ()
- ii- Government apartment ()
- iii- Privet house ()
- iv- Government house ()

3. In what year your house was built?

- i- Between year 1960 – 1969 ()
- ii- Between year 1970 – 1979 ()
- iii- Between year 1980 – 1989 ()
- iv- Between year 1990 – 1999 ()

4. Your house that you live in, is it:

- i- Owned ()
- ii- Rented ()

5. If your house is rented, how much is the rent in Libyan Dinar?

- i- From 100 LD to 300 LD ()
- ii- From 400 LD to 800 LD ()
- iii- Above 800 LD ()
- iv- Less than 100 LD ()

6. If your house is rented, will you be able to build a house for your family?

i- Yes ()

ii- No ()

Above is an example of easy attractive questions followed by main question. The point was to gather information's related to housing problems in Benghazi city.

4.6.3 Initial Concept of Research Method

Many problems and obstacles were in the way at the initial stages of this research. Especially at the beginning it started with selecting the title, the drafting of the research plan, and the choosing of the curriculum, the subject matter, the time constraint, identifying sources and access to references. In gathering information, there were many steps to be observed such as the processing, organizing, studying and sorting the information gathered. The presentation of the research must adhere to the scientific writing style as well as the approach and discussion of the findings and recommendations. The research methodology intended objective uses a structured method in dealing with issues and the problems. A number of coordinated steps were successfully and logically planned, starting by definition of the problem and its many aspects, a number of measures which may make the phenomenon different from one to another.

The scientific method of thinking and studying help us to choose a specific topic. Once confine to our thinking we can start working in the scope of our analysis tools. Then descriptive method and analytical approach will be used. This plan is prior to the research, and then comes in the conclusions. The next step generalizes the results to cases similar to the research before issuing a number of scientific recommendations for future purposes.

4.6.4 Designing the Interviews

In the study will interview a group of people in each area, regarding about their social situations which include the needs of houses. The researcher will compare the different of their needs of houses. The interview will give insights of how the families are forced to live with each other and how these situations impacted their life.

4.7 VALIDITY AND RELIABILITY

The researcher needs some kind of assurance that the instrument being used will result in accurate conclusions. Validity involves the appropriateness, meaningfulness, and usefulness of inferences basis of the data collected by the researcher. The Validity can often be thought a sample; content validity is determined on the appropriateness of the instrument's content, identifies four principles to improve content validity.

- i. Using a sample of questioning on a limited area of the city.
- ii. Knowing the possibility of people to understand the questions.
- iii. Writing the questions in a measure appropriate skill.
- iv. Knowing if the questions can help to obtain sufficient information to resolve the problem at hand in the research.

These four principles were addressed when writing the survey items. To provide additional content validity of the survey instrument, the researcher focused on a limited area of the city, at the end of the focusing area, the researcher reviewed the questions and restricts them to know if the questions are clear to the population in the region. And the result was changing two of the questions sample.

4.8 MEASUREMENT AND INSTRUMENTATION

The research identified six key areas that are relevant to this research, the researcher has been support with groups helps carried the simples in all six areas, and it is fully explained in Chapter Four. The Survey and questioning will be time consuming as it has a large area to cover.

The fieldwork is also invaluable in that it guides us in our development of an instrument to measure the housing problems before it can be developed as a guideline. In order to analyze these, it is essential to have a validated and reliable instrument in order to collect the information and confirming on understanding the questions by residents to measure how successful the implementation has been. The process of developing and validating this instrument, and indeed the reasons why it is felt as necessary to develop a new instrument rather than using an existing one, lies in the knowledge of the researcher's own people whose problems are her main concern.

4.9 DATA COLLECTION

An interview is conducted on the families in each area of the city. The questions ask are pertaining to their homes and needs. The objective of these questions is to gather more information about housing problems, particularly on their housing and personal details and their living conditions for the past few years. All the questionnaires forms then collected from these families.

After collecting the questionnaires and the information from the families, tabulation of the data begins and the statistical results follow. The findings are clearly shown.

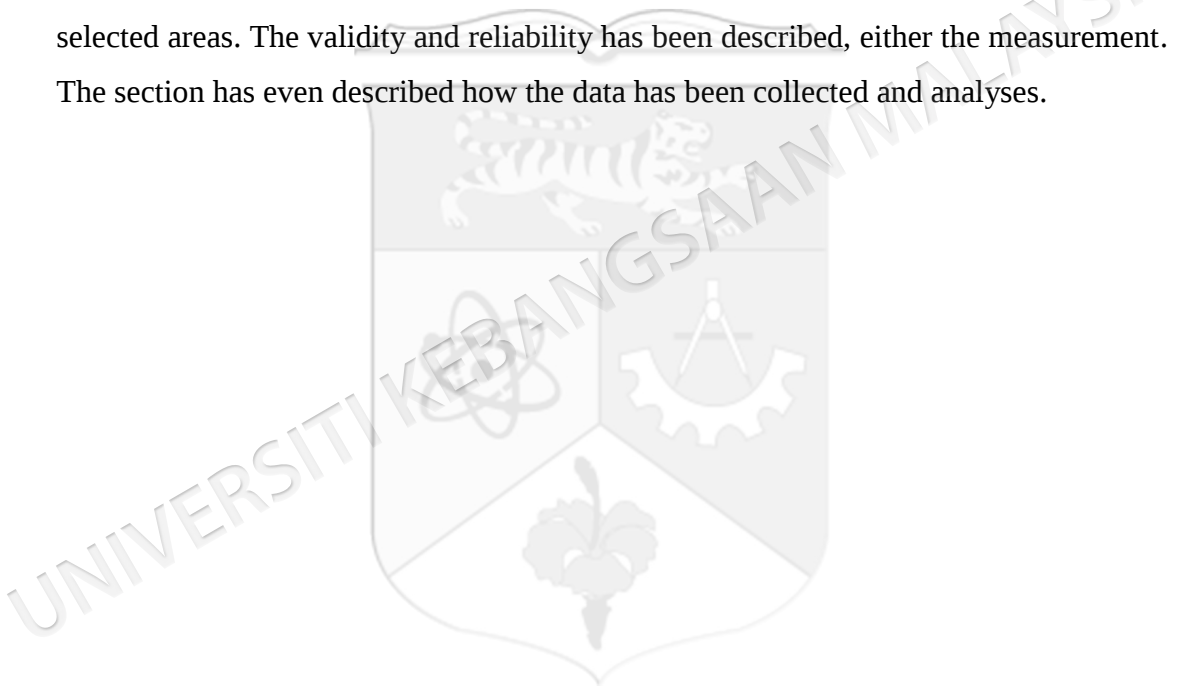
4.10 ANALYSIS OF DATA

The interviews only cover 10% of each area from the six areas. Each interview lasts between 10 – 15 minutes. The questionnaires are then collected and the answers reviewed. The first interview tries to extract all the issues pertaining to their houses and their way of living. The researcher is looking for new ideas and issues arising directly from the respondent's views. The researcher will then analyze the answers from the initial interviews of each area and subsequently refined these in the light of a larger number of responses in all areas. This enabled a simultaneous investigation of the data from the interviews themselves, and from the engagement based on themes derived from existing theory and research questions. The answers are classified and listed in the Appendix. They are considered to be of helpful in the analysis as they are

able to build up a picture of important dimensions of the study. However, as we see in the detailed chapters, it is necessary to generate further detailed schema for analyzing particular aspects in the housing problems in Libya.

4.11 CONCLUSION

In this section it reviews the method of the research by describing the mine body and how the study is designed. Focusing on what kind of group to be studied and giving them the samples for the survey. Either mentioning the aims of the study and how the questions are designed by the type of questions which has been chosen, initial concept of the research method and designing the interviews on these particle groups in the selected areas. The validity and reliability has been described, either the measurement. The section has even described how the data has been collected and analyses.



CHAPTER V

QUESTIONNAIRES AND DATA ANALYSIS OF HOUSING IN LIBYA

5.1 INTRODUCTION

In the future we will see the return of the process of forming and facts of the building construction and planning in the affordable houses, which takes into account the environment around us and the climate that, integrate the building fully integrated. And the mechanical systems in any affordable house such as ventilation systems and heating, and the problem of energy without doubt is the biggest problem facing us today of human problems that we faced before. We can note that the percentages of the energy consumption in the world are all consumed by housing on about 50% of energy consumption. And the issues of the design of housing today to embrace issues of sustainability and energy efficiency that is used in the design and this will lead the inevitably to the new forms in the design and construction of a new form of language and concepts in architecture in the future. I think when you build a house it must focus on energy efficiency particularly in the housing, also should focus on minimizing energy consumption and improve indoor environmental conditions of housing. And the needs of the relevant necessary to achieve economic efficiency and social functions associated with the composition, it also needs to serious work. The aesthetics of housing is a vital element that claims to be environmental or sustainable. And loss of aesthetic quality is reflected in the structure of our environment and has no place in sustainable development in our society. It should embrace these issues in the design and be seen as a problem in the case but with a specific description to the new quality in the design of housing. In order to achieve social and economic objectives and for sustainable development, it is clear

that these strategies in achieving the efficiency and the use of energy and sustainability in the built environment around us, which is one of the main things on the agenda of the architect, when designing any house. It may believe in the existence of evolution in housing that the inclusion of these aspects, it would lead to a new architectural language, which dramatically reflected in the design directly. (http://www.energystar.gov/index.cfm?c=new_bldg_design.new_bldg_design_guidance#development). This research deals with the housing problems of low income groups employing both theoretical and empirical research methods with qualitative and quantitative analysis. Based on questionnaire and interview investigation, the current housing conditions and housing demands of the middle income groups are revealed and analyzed systematically; relevant suggestions are proposed to resolve the housing problem of middle income groups.

This chapter will examine the obstacles encountered by the possibility of affording a house, particularly the issues relating to the public services in these areas. The researcher will examine proposals put forward by the government that attempt to provide solutions to limited income population in Benghazi city. The researcher will trace any information that was collected during the study and then attempt to identify dissimilarities in the quality of the achievement of the government solutions in this area. In addition, this study will investigate the data obtained through the surveys, the model of the tenant population; and those experts in charge of the policy implemented in Benghazi city area. In conclusion, this study will establish, highlight and underline the many factors that the administrators should consider when designing the most applicable from the city accommodation.

5.2 RESULTS: NATURE OF THE RESEACH SITES

The multivariable tables in Appendix A contain two variables: the location of housing area; and the characteristics of that area that are being detailed. These areas of the city, whether, owned or rented and the specific location of the housing units. In addition, the level of privacy available for the residents and the amount of sunlight and ventilation in the houses will be investigated. This study is based upon the information extracted from the completed questionnaires taken from the residents of sixteen areas

from twenty five areas in Benghazi city, as shown in table 5.1. The measurements of the population, number of families and persons, Libyans and not Libyans on year 2006 in Benghazi city.

Table 5.1 Number of Families and Persons in Benghazi

Source: Municipality of Benghazi 2006

Area	Number of Families	Total of Persons	Persons	
			Libyans	Non Libyans
Benghazi				
Al-Madinah	6325	30940	24510	6430
Al-Slmany	5595	33834	31158	2676
Ras Abydah	3861	21540	20074	1466
Sidy Hseen	3710	19884	17755	2129
Sidy Abydah	2857	15288	14269	1019
Al-Sabry	5657	30056	27289	2767
Al-Brkah	14241	76186	69697	6489
Al-Keesh	7469	39243	37911	1332
Al-Hadak	4669	28314	27620	694
Benghazi				
Al-Gadydah	4362	30130	29647	483
Al-Hwwary	5707	31666	30407	1259
Al-Fwehat	2276	12279	12026	253
Al-Gawarsha	2382	13616	12390	1226
Garyunes	2531	13889	13228	661
Boofakra	1331	7142	6378	764
Al-Nwagyah	600	2316	1846	470
Al-Megzah	570	1989	1575	414
Shwhada				
Al-Slawly	3924	21101	19933	1168
Al-Thorah				
Al-Shabeyah	5281	29202	28054	1148
Al-Kwyfah	11398	63943	59287	4656
Al-Mktar	3259	19538	19030	508
Bynena	1900	10522	9180	1342
Al-Aroba	5627	33194	31977	1217
Boatny	5812	34417	30531	3886
Sidy Kalyfa	1634	9368	8412	956
Total	112978	629597	584184	45413

And the areas that will be analyzed are only 10% of the total area which includes: Benghazi Al-Madinah, Al-Slmany, Ras Abydah, Sidy Hseen, Sidy Abydah, Al-Sabry, Al-Brkah, Al-Keesh, Al-Nwagyah, Al-Megzah, Shwhada Al-Slawly, Al-Thorah Al-Shabeyah, Al-Kwyfah, Al-Mktar, Al-Aroba and Sidy Kalyfa. There are areas that are similar to each other, we can consist of them as a one area and we will divide them in to six groups or areas:

- i. Benghazi Al-Madinah.
- ii. Al-Slmany, Ras Abydah, Sidy Hseen and Sidy Abydah.
- iii. Al-Sabry.
- iv. Al-Brkah and Al-Keesh.
- v. Al-Nwagyah, Al-Megzah, Shwhada Al-Slawly and Al-Thorah Al-Shabeyah.
- vi. Al-Kwyfah, Al-Mktar, Al-Aroba and Sidy Kalyfa.

We will include each group as one area and every area will be analyzed 10% of the area, as the areas are shown in figure 5.2.

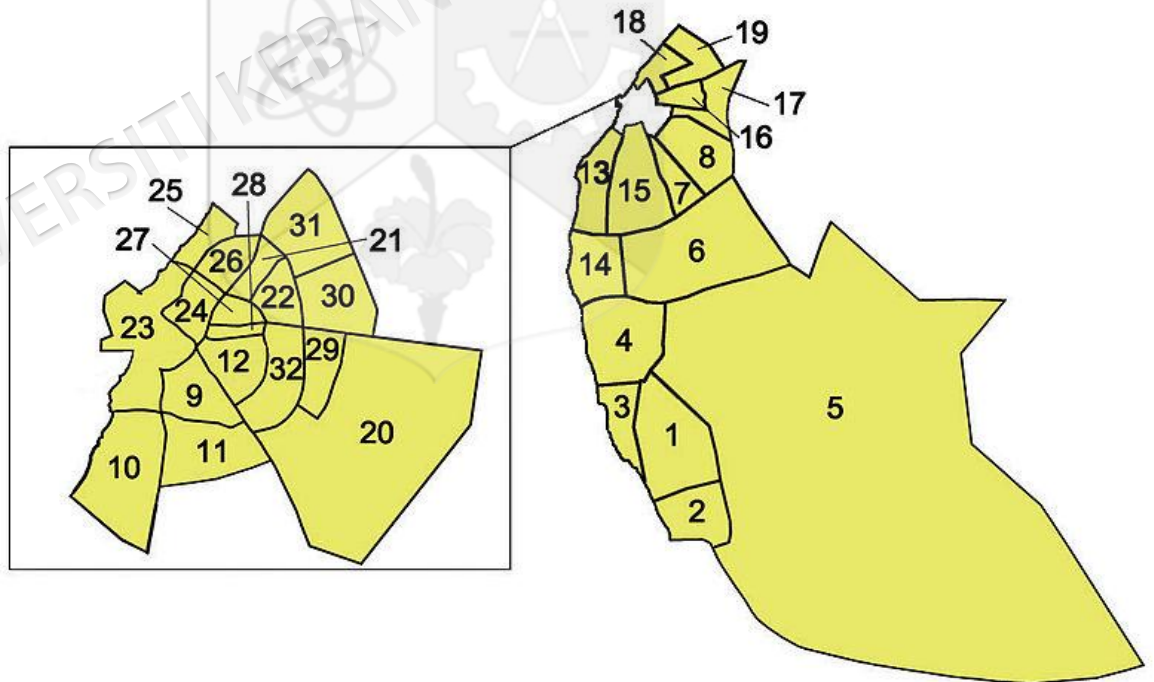


Figure 5.2 Benghazi Map with the Areas Name

Source: <http://en.wikipedia.org/wiki/Benghazi> 2012

- | | | |
|------------------------|---------------------------|------------------------|
| 1- Al-Magroon | 12- Al-Berka | 23- Madinat Benghazi |
| 2- Al-Saahil al-Gharbi | 13- Bu-Fakhra | 24- Sidi Hsayn |
| 3- Karkoora | 14- Jarrutha | 25- Al-Sabri |
| 4- Gimeenis | 15- Al-Quwarsha | 26- Sidi Abayd |
| 5- Suluq | 16- Bu Atni | 27- Al-Salmani |
| 6- Al-Khadhraa | 17- Benina | 28- Raas Abayda |
| 7- Al-Nawagiya | 18- Al-Kwayfiya | 29- Benghazi Al-Jadida |
| 8- Al-Magziha | 19- Sidi Khalifa | 30- Al-Uruba |
| 9- Al-Keesh | 20- Al-Hawari | 31- Hay Al-Mukhtar |
| 10- Garyounis | 21- Al-Thawra Al-Shabiyah | 32- Al-Hadaa'iq |
| 11- Al-Fuwayhat | 22- Shuhadaa Al-Salawi | |

5.3 COMPARISON BETWEEN THE SIX AREAS

5.3.1 Age of the Residents

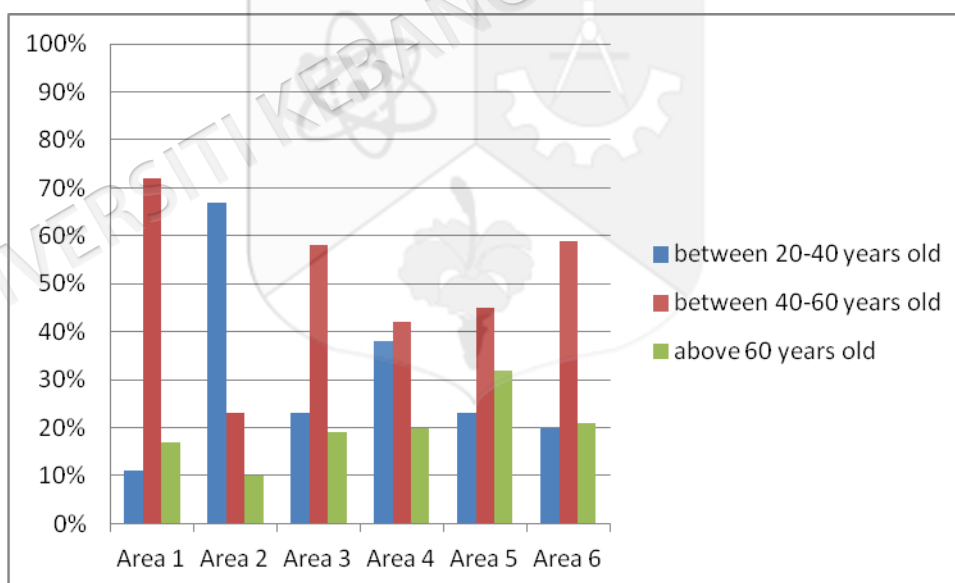


Figure 5.3 Survey Results on Age of the Residents in the Six Areas

Area 1 is Benghazi Al-Madinah. There are 30940 people living in this area, 11% of the residents are between 20-40 years old, and 72% of the residents are between 40-60 years old, and 17% are above 60 years old. All six areas are illustrated in Figure 5.3.

Area 2 consists of Al-Slmany, Ras Abydah, Sidy Hseen, and Sidy Abydah, in these areas 67% of the residents are between 20-40 years old, and 23% of the residents are between 40-60 years old, and 10% are above 60 years old.

Area 3 is Al-Sabry area, in this area 23% of the residents are between 20-40 years old, and 58% of the residents are between 40-60 years old, and the rest are 19% are above 60 years old.

Area 4 consist of Al-Brkah, and Al-Keesh, in these area 38% of the residents are between 20-40 years old, and 42% of the residents are between 40-60 years old, and the rest are 20% are above 60 years old.

Area 5 consist of Al-Nwagyah, Al-Megzah, Shwhada Al-Slawly and Al-Thorah Al-Shabeyah, in these area 23% of the residents are between 20-40 years old, and 45% of the residents are between 40-60 years old, and the rest are 32% are above 60 years old.

Area 6 consist of Al-Kwyfah, Al-Mktar, Al-Aroba, and Sidy Kalyfa, 20% of the residents are between 20-40 years old, and 59% of the residents are between 40-60 years old, and the rest are 21% are above 60 years old.

The residents between the age of 40-60 years more up the majority of the population, and most of the houses belong to their parents. In area 1 and in other areas, the majority of ages from 20-40 years say that they own the house and their grown up children still lives in the same house after marriage.

The residents between the ages of 20-40 years wish to have their own houses and hope the government to help them. In figure 5.5 shows the statement of ownership and renting houses, it shows that most of them own their houses. And if you compare

the statistics of age with statistical that is shown in figure 5.21 which specialist shows a large number of families that their children still lives with them after marriage.

This indicates shows a lack of ability of many residents that cannot afford to build or buying a house for their children after marriage to have a stable family of their own. The data will be summary by the Single Factor Survey ANOVA, shown in table 5.4a, 5.4b and 5.4c.

Table 5.4a Clarify the Age of the Residents in the Six Areas

	Area 1	Area 2	Area3	Area 4	Area 5	Area 6
Between 20-40 years						
Old	11%	67%	23%	38%	23%	20%
Between 40-60 years						
Old	72%	23%	58%	42%	45%	59%
Above 60 years old	17%	10%	19%	20%	32%	21%

Table 5.4b Summary the Age of the Residents in the Six Areas

Groups	Count	Sum	Average	Variance
Area 1	3	1	0.333333	0.1130333
Area 2	3	1	0.333333	0.0892333
Area 3	3	1	0.333333	0.0460333
Area 4	3	1	0.333333	0.0137333
Area 5	3	1	0.333333	0.0122333
Area 6	3	1	0.333333	0.0494333

Table 5.4c ANOVA: Single Factor Survey Results on Age of the Residents in the Six Areas

Source of Variation	SS	df	MS	F	P-value	F crit
Between Groups	2.22E-16	5	4.44E-17	8.231E-16	1	3.105875
Within Groups	0.6474	12	0.05395			
Total	0.6474	17				

From the ANOVA it shows the successful of the result, shown by P-Value = 1. Most of the resident's age is between 40 – 60 years old.

5.3.2 Ownership of the Houses

i. Housing Characteristics

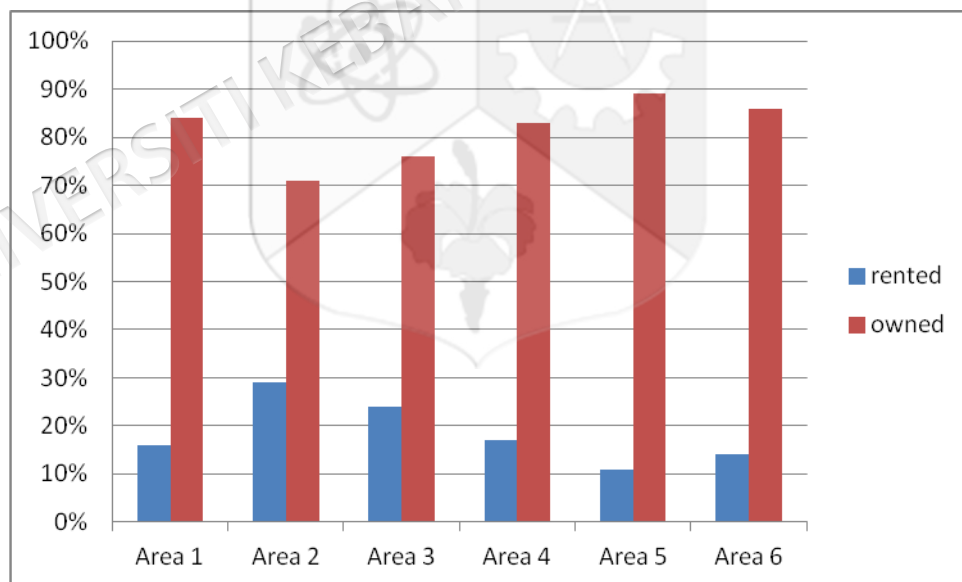


Figure 5.5 Survey Results on the Rented and Owned Houses in the Six Areas

Area 1 is Benghazi Al-Madinah area 84% of the residents owned their houses and only 16% rented the house. All six areas are illustrated in Figure 5.5.

Area 2 consists of Al-Slmany, Ras Abydah, Sidy Hseen and Sidy Abydah area, 71% of the residents owned their houses and only 29% rented the house.

Area 3 is Al-Sabry area 76% of the residents owned their houses and only 24% of the sample rented the house.

Area 4 consists of Al-Brkah and Al-Keesh area, 83% of the residents owned their houses and only 17% of the sample rented the house.

Area 5 consists of Al-Nwagyah, Al-Megzah, Shwhada Al-Slawly and Al-Thorah Al-Shabeyah area, 89% of the residents owned their houses and only 11% of the sample rented the house.

Area 6 consists of Al-Kwyfah, Al-Mktar, Al-Aroba and Sidy Kalyfa area, 86% of the residents they owned their houses and only 14% of the sample rented the house.

In figure 5.5 shows the percentage of owned and rented houses. It shows that the majority of the population that own their homes, and if this chart is compared with the chart in figure 5.9 the construction of these houses are very old, the apartments that are based in the area one was mostly built in the 60s, and most of the houses that was built between the years 70s and 80s. It demonstrates the failure of the affordable housing construction by the government in the late 80s.

People have become uncomfortable from the lack of the inadequate housing and from the rising prices of building materials, so one of the solutions is to allow their growing up children to live in the same house after marriage. The data will be summary by the Single Factor Survey ANOVA, shown in table 5.6a, 5.6b and 5.6c.

Table 5.6a Clarify the Rented and Owned Houses in the Six Areas

	Area 1	Area 3	Area 4	Area 5	Area 6
rented	16%	24%	17%	11%	14%
owned	84%	76%	83%	89%	86%

Table 5.6b Summary the Rented and Owned Houses in the Six Areas

Groups	Count	Average	Variance
Area 1	2	0.5	0.2312
Area 2	2	0.5	0.0882
Area 3	2	0.5	0.1352
Area 4	2	0.5	0.2178
Area 5	2	0.5	0.3042
Area 6	2	0.5	0.2592

Table 5.6c ANOVA: Single Factor Survey Results on the Rented and Owned Houses in the Six Areas

Source of Variation	SS	MS	F	P-value	Fcrit
Between Groups	0	0	0	1	4.387374
Within Groups	1.2358	0.205967			

Total	1.2358
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From the ANOVA it shows the successful of the result, shown by P-Value = 1. The houses the mostly owned.

ii. Type of House

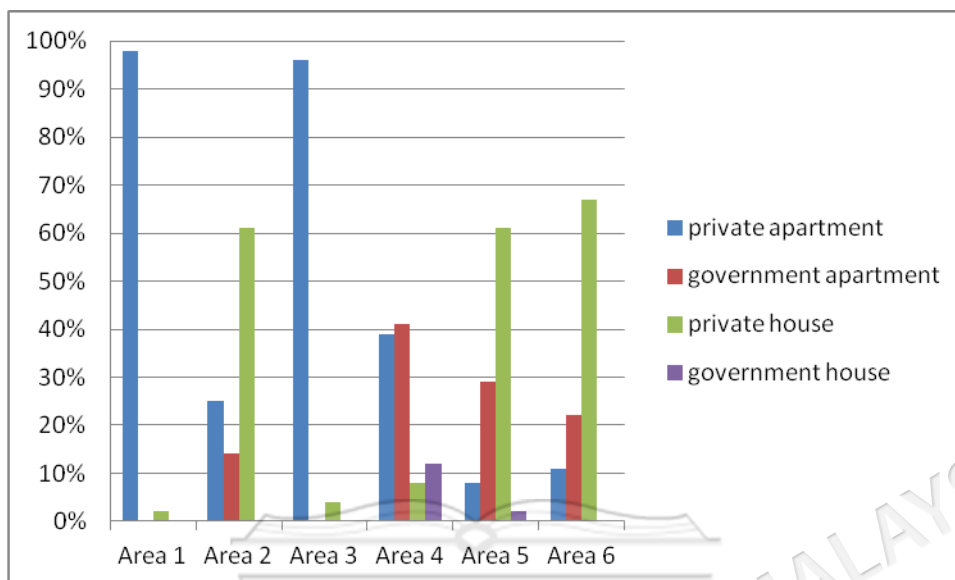


Figure 5.7 Survey Results Type of Houses in the Six Areas

Area 1 is Benghazi Al-Madinah area it is the central of the city in Benghazi; most of the houses that are built are apartment, since the 1960s private apartments have been built in the Benghazi A-Madinah area. 98% of the residents live in apartments and the other 2% was ground floor and became apartments in time for their children. All six areas are illustrated in figure 5.7.

Area 2 consist of Al-Slmany, Ras Abydah, Sidy Hseen and Sidy Abydah area, 25% of the residents live in privet apartments, and 14% lives in government apartment, and 61% lives in privet houses and some houses became apartments in time for their children by building a second floor , and non-lives in government houses.

Area 3 is Al-Sabry area, 96% of the residents live in privet apartments, and none lives in government apartment, 4% of the resident lives in privet houses, and none lives in government houses.

In time the private houses in Al-Sabry area are coming in to three and four story buildings, to find places for their children to live in after marriage.

Area 4 consist of Al-Brkah and Al-Keesh area, 39% of the residents live in private apartments, and 41% of the resident live in government apartment, 8% of the resident live in private houses, and 12% of the residents live in government houses.

Area 5 consist of Al-Nwagyah, Al-Megzah, Shwhada Al-Slawly and Al-Thorah Al-Shabeyah area, 8% of the residents live in private apartments, and 29% of the resident live in government apartment, 61% of the resident live in private houses, and 2% of the residents live in government houses.

Area 6 consist of Al-Kwyfah, Al-Mktar, Al-Aroba and Sidy Kalyfa area, 11% of the resident live in private apartments, and 22% of the resident live in government apartment, 67% of the resident live in private houses, and none of the residents live in government houses.

Most of the private houses in in these areas become apartments in time for their children by building a second floor for them.

As it is shown in figure 5.7 there is a lack of government houses in most areas. The government apartments were built in 1985, (almost 30 years ago) and it is the called 7000 Housing Unit. The data will be summary by the Single Factor Survey ANOVA, shown in table 5.8a, 5.8b and 5.9c.

Table 5.8a Clarify the Type of Houses in the Six Areas

	Area 1	Area 2	Area 3	Area 4	Area 5	Area 6
private apartment	98%	25%	96%	39%	8%	11%
government apartment	0%	14%	0%	41%	29%	22%
private house	2%	61%	4%	8%	61%	67%
government house	0%	0%	0%	12%	2%	0%

Table 5.8b Summary the Type of Houses in the Six Areas

Groups	Count	Sum	Average	Variance
Area 1	4	1	0.25	0.236933
Area 2	4	1	0.25	0.068067
Area 3	4	0.96	0.24	0.2304
Area 4	4	1	0.25	0.030333
Area 5	4	1	0.25	0.071
Area 6	4	1	0.25	0.086467

Table 5.8c ANOVA: Single Factor Survey Results House Privacy in the Six Areas

Source of Variation	SS	df	MS	F	P-value	F crit
Between Groups	0.00033333	5	6.667E-05	0.000553	1	2.7728532
Within Groups	2.1696	18	0.1205333			
Total	2.16993333	23				

From the ANOVA it shows the successful of the result, shown by P-Value = 1.
Most of the population lives in private apartments and private houses.

iii. Year of Building the House

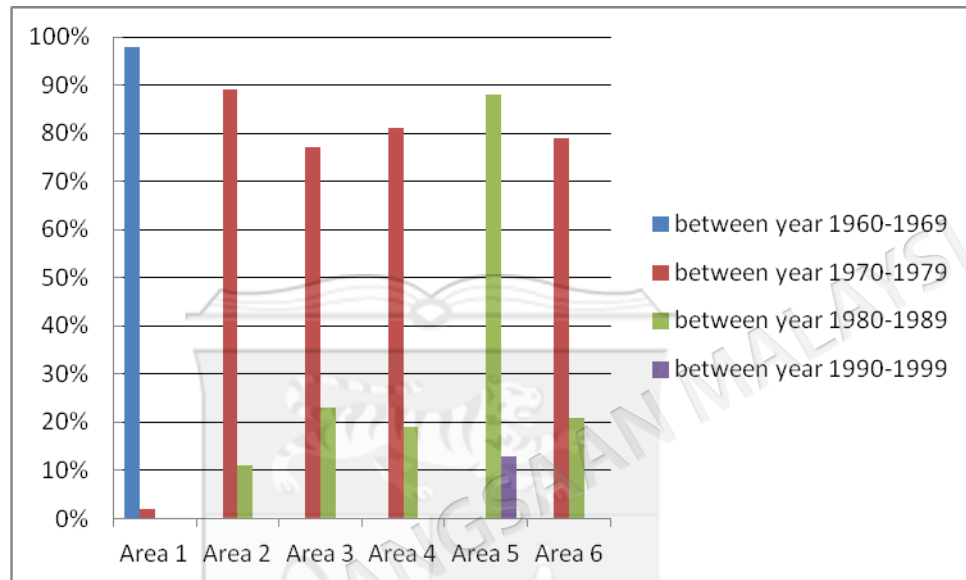


Figure 5.9 Survey Results on Year of Building the House in the Six Areas

Area 1 is Benghazi Al-Madinah area 98% of the residents their houses was built between year 60-69; and 2% their houses was built between year 70 -79. All six areas are illustrated in figure 5.9.

Area 2 is Al-Slmany, Ras Abydah, Sidy Hseen and Sidy Abydah area 89% of the residents their houses was built between year 70 -79; and 11% their houses was built between year 80 -89.

Area 3 is Al-Sabry area 23% of the residents their houses were built between year 80 -89; and 77% their houses was built between years 70 -79 as.

Area 4 is Al-Brkah and Al-Keesh area 19% of the residents their houses were built between year 80 -89; and 81% their houses was built between years 70 -79.

Area 5 is Al-Nwagyah, Al-Megzah, Shwhada Al-Slawly and Al-Thorah Al-Shabeyah area 88% of the residents their houses was built between year 80 -89; and 13% their houses were built between years 90 -99.

Area 6 is Al-Kwyfah, Al-Mktar, Al-Aroba and Sidy Kalyfa area 21% of the residents their houses was built between year 80 -89; and 79% their houses were built between years 70 -79.

As it is shown in figure 5.9 in area 1 the construction of these houses were built in the 60s, and the rest of the construction was built between the years 70s and 80s. In areas 1 most of the houses are owned; and the houses are old building houses.

The housing skims in Libya at the end of 80s, filed provide adequate houses to most of the population. With the rising of the material prices, labor and land prices due to these limited income residents cannot afford to build their own houses. The data will be summary by the Single Factor Survey ANOVA, shown in table 5.10a, 5.10b and 5.10c.

Table 5.10a Clarify the Year of Building the House in the Six Areas

	Area 1	Area 2	Area 3	Area 4	Area 5	Area6
between year 1960 - 1969	98%	0%	0%	0%	0%	0%
between year 1970 - 1979	2%	89%	77%	81%	0%	79%
between year 1980 - 1989	0%	11%	23%	19%	88%	21%
between year 1990 - 1999	0%	0%	0%	0%	13%	0%

Table 5.10b Summary the Year of Building the House in the Six Areas

Groups	Count	Sum	Average	Variance
Column 1	4	1	0.25	0.2369333
Column 2	4	1	0.25	0.1847333
Column 3	4	1	0.25	0.1319333
Column 4	4	1	0.25	0.1474
Column 5	4	1.01	0.2525	0.1787583
Column 6	4	1	0.25	0.1394

Table 5.10c ANOVA: Single Factor Survey Results on Year of Building the House in the Six Areas

Source of Variation	SS	df	MS	F	P-value	F crit
Between Groups	2.0833E-05	5	4.167E-06	2.453E-05	1	2.772853
Within Groups	3.057475	18	0.1698597			
Total	3.05749583	23				

From the ANOVA it shows the successful of the result, shown by P-Value = 1. Which most of the houses are built between years 1970 – 1979, the Libyan people have the ability to build their houses. From years 1980 – 1989 prices was starting to rise.

iv. The level of Privacy Available

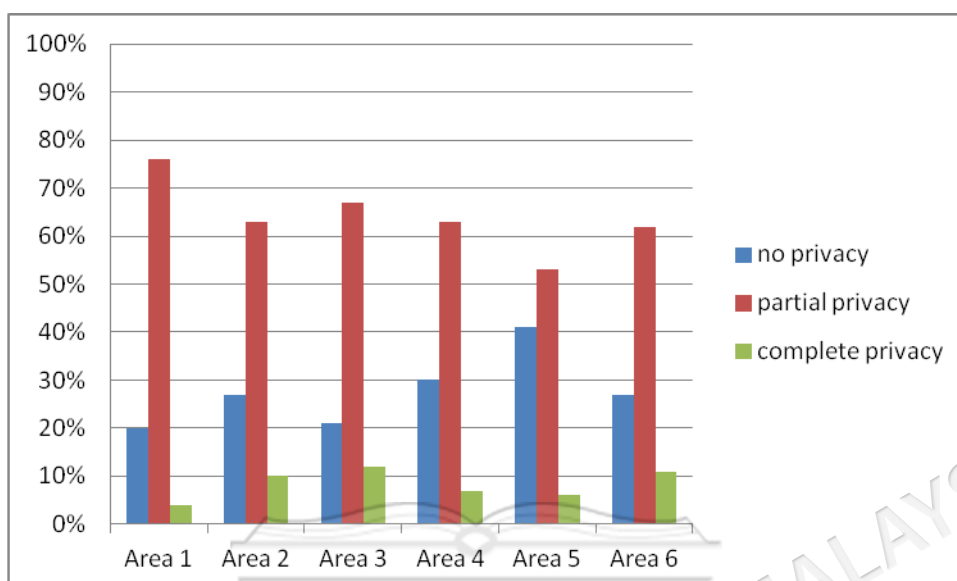


Figure 5.11 Survey Results on Level of Privacy Available in the Six Areas

Area 1 is Benghazi Al-Madinah area 76% of the residents their houses had partial privacy; 20% their houses had no privacy at all; and 4% their houses had complete privacy as all six areas are illustrated in figure 5.11.

Area 2 is Al-Slmany, Ras Abydah, Sidy Hseen and Sidy Abydah area 63% of the residents their houses had partial privacy; 27% their houses had no privacy at all; and 10% their houses had complete privacy.

Area 3 is Al-Sabry area 67% of the residents their houses had partial privacy; 21% their houses had no privacy at all; and 12% their houses had complete privacy.

Area 4 is Al-Brkah and Al-Keesh area 63% of the residents their houses had partial privacy; 30% their houses had no privacy at all; and 7% their houses had complete privacy.

Area 5 is Al-Nwagyah, Al-Megzah, Shwhada Al-Slawly and Al-Thorah Al-Shabeyah area 53% of the residents their houses had partial privacy; 41% their houses had no privacy at all; and 6% their houses had complete privacy.

Area 6 is Al-Kwyfah, Al-Mktar, Al-Aroba and Sidy Kalyfa area 62% of the residents their houses had partial privacy; 27% their houses had no privacy at all; and 11% their houses had complete privacy.

One of the most important elements in Libyan house design and the society's culture is the provision of privacy. Privacy is a cultural requirement of the resident, and privacy must be available in the gardens, the entrance of the main door, open windows and garage parking.

The effects of the privacy can be seen in the Libyan housing designs. Privacy has to be provided for all activities of the users in the house through urban design and architecture culturally. The family is special and should be provided with privacy from the outside or external element of the house distinction between public and private spheres has to be provided. The guests of the house should not be unable to see the family inside the house. Therefore the areas used by the family must be located away from the guest's area.

If there openings such as doors and windows these must be screened and the occupants inside should not be seen from the outer gate. Privacy is very important in the Libyan families. The key point to understand about the way the house is divided in Libya is that there is a separation between the domains of male and female in the house. This should be adopted in the house design in Libya.

Figure 5.11 illustrates that most of the housing in Benghazi city fails to meet this requirement. Most of the houses provide only partial privacy or no privacy at all. In order to obtain desired privacy residents built high walls around their balcony houses or heavy curtains in the balcony or on the widows, which considerably restricts ventilation. The data clearly shows the importance of privacy to the Libyan residents and this must be considered in Libyan house design. Libyan residents will not live in a

house that does not have any privacy. In addition to the provision of privacy the houses design must ensure that both ventilation and lighting are available. The data will be summary by the Single Factor Survey ANOVA, shown in table 5.12a, 5.12b and 5.12c.

Table 5.12a Clarify the Level of Privacy Available in the Six Areas

	Area 1	Area 2	Area 3	Area 4	Area 5	Area 6
No privacy	20%	27%	21%	30%	41%	27%
Partial privacy	76%	63%	67%	63%	53%	62%
Complete Privacy	4%	10%	12%	7%	6%	11%

Table 5.12b Summary the Level of Privacy Available in the Six Areas

Groups	Count	Sum	Average	Variance
Column 1	3	1	0.33333333	0.1429
Column 2	3	1	0.33333333	0.0732
Column 3	3	1	0.33333333	0.0870
Column 4	3	1	0.33333333	0.0792
Column 5	3	1	0.33333333	0.0596
Column 6	3	1	0.33333333	0.0680

Table 5.12c ANOVA: Single Factor Survey Results on Level of Privacy Available in the Six Areas

Source of Variation	SS	df	MS	F	P-value	F crit
Between Groups	0	5	0	0	1	3.105875
Within Groups	1.0202	12	0.085016667			
Total	1.0202	17				

From the ANOVA it shows the successful of the result, shown by P-Value = 1. Most houses have partial privacy.

v. Number of Rooms in a House

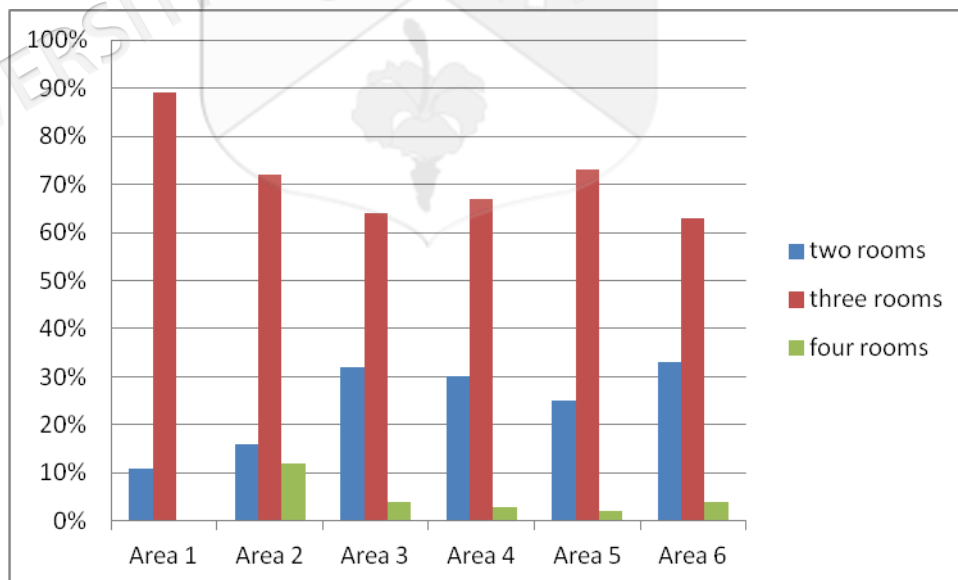


Figure 5.13 Survey Results on Number of Rooms in a House in the Six Areas

Area 1 Benghazi Al-Madinah area of the city 11% of the resident had two rooms, and the 89% of the resident had three rooms, but none of the residents had four rooms in their houses, as all six areas are illustrated in figure 5.13.

Area 2 is Al-Slmany, Ras Abydah, Sidy Hseen and Sidy Abydah area of the city 16% of the resident had two rooms, and the 72% of the resident had three rooms, 12% of the residents had four rooms in their houses.

Area 3 is Al-Sabry area of the city 32% of the resident had two rooms, and the 64% of the resident had three rooms, 4% of the residents had four rooms in their houses.

Area 4 is Al-Brkah and Al-Keesh area of the city 30% of the resident had two rooms, and the 67% of the resident had three rooms, 3% of the residents had four rooms in their houses.

Area 5 is Al-Nwagyah, Al-Megzah, Shwhada Al-Slawly and Al-Thorah Al-Shabeyah area of the city 25% of the resident had two rooms, and the 73% of the resident had three rooms, 2% of the residents had four rooms in their houses.

Area 6 is Al-Kwyfah, Al-Mktar, Al-Aroba and Sidy Kalyfa area 33% of the resident their houses had two rooms; 63% their houses had three rooms; and 4% their houses had four rooms.

Figure 5.13 show that most houses have three bedrooms. Children can sleep with each other until a certain age limit. When they get older male and female children must be separated from each other. It also shows that some homes have two bedrooms, and these types of small houses is for small families and are only suitable for a limited time.

Libyan families prefer to live in a house that have three bedrooms at least, and this must be in the existing conditions in the construction of house, even in building affordable houses for the limited income resident. The data will be summary by the Single Factor Survey ANOVA, shown in table 5.14a, 5.14b and 5.14c.

Table 5.14a Clarify the Number of Rooms in a House in the Six Areas

	Area 1	Area 2	Area 3	Area 4	Area 5	Area 6
two rooms	11%	16%	32%	30%	25%	33%
three rooms	89%	72%	64%	67%	73%	63%
four rooms	0%	12%	4%	3%	2%	4%

Table 5.14b Summary the Number of Rooms in a House in the Six Areas

Groups	Count	Sum	Average	Variance
Area 1	3	1	0.333333	0.23543333
Area 2	3	1	0.333333	0.11253333
Area 3	3	1	0.333333	0.09013333
Area 4	3	1	0.333333	0.10323333
Area 5	3	1	0.333333	0.13123333
Area 6	3	1	0.333333	0.08703333

Table 5.14c ANOVA: Single Factor Survey Results on Number of Rooms in a House in the Six Areas

Source of Variation	SS	df	MS	F	P-value	F crit
Between Groups	0	5	0	0	1	3.1058752
Within Groups	1.5192	12	0.1266			
Total	1.5192	17				

From the ANOVA it shows the successful of the result, shown by P-Value = 1. Houses are in three bedrooms.

vi. Adequacy of Rooms inside the House

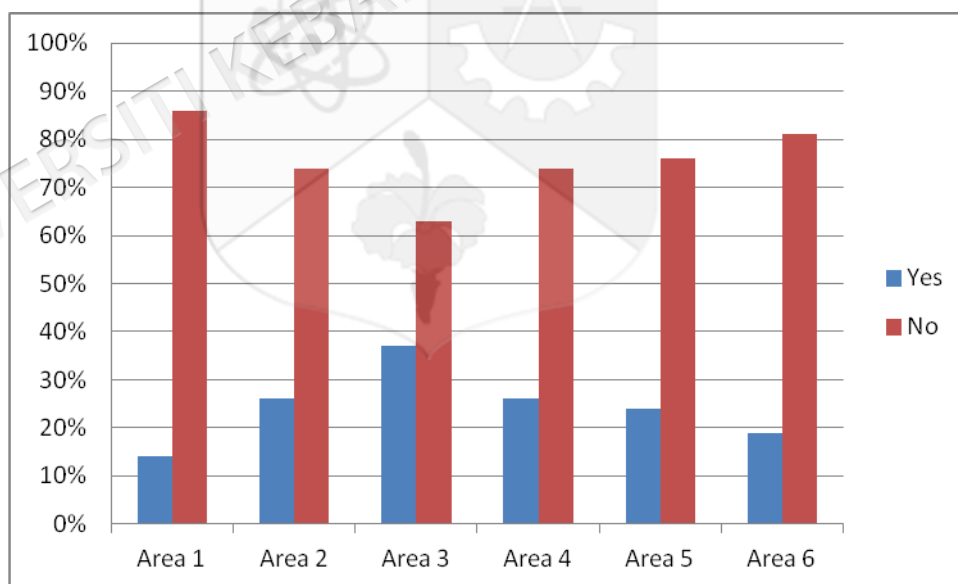


Figure 5.15 Survey Results on the Satisfaction of Number of Rooms inside the House in the Six Areas

Area 1 is Benghazi Al-Madinah area 86% of the residents are not adequate by the number of the rooms in their house, and 14% of the resident are satisfied with their rooms, as all six areas are illustrated in figure 5.15.

Area 2 is Al-Slmany, Ras Abydah, Sidy Hseen and Sidy Abydah area 74% of the residents are not adequate by the number of the rooms in their house, and 26% of the residents are satisfied with their rooms.

Area 3 is Al-Sabry area 63% of the residents are not adequate by the number of the rooms in their house, and 37% of the residents are satisfied with their rooms.

Area 4 is Al-Brkah and Al-Keesh area 74% of the residents are not adequate by the number of the rooms in their house, and 26% of the residents are satisfied with their rooms.

Area 5 is Al-Nwagyah, Al-Megzah, Shwhada Al-Slawly and Al-Thorah Al-Shabeyah area 76% of the residents are not adequate by the number of the rooms in their house, and 24% of the residents are satisfied with their rooms.

Area 6 is Al-Kwyfah, Al-Mktar, Al-Aroba and Sidy Kalyfa area 81% of the residents are not adequate by the number of the rooms in their house, and 19% of the residents are satisfied with their rooms.

As it is clear from figure 5.15, that most of the Libyan families are dissatisfied with the number of the rooms in their houses. The residents have large families and they are always in need of more rooms and space. The data will be summary by the Single Factor Survey ANOVA, shown in table 5.16a, 5.16b and 5.16c.

Table 5.16a Clarify the Satisfaction of Number of Rooms inside the House in the Six Areas

	Area 1	Area 2	Area 3	Area 4	Area 5	Area 6
Yes	14%	26%	37%	26%	24%	19%
No	86%	74%	63%	74%	76%	81%

Table 5.16b Summary the Satisfaction of Number of Rooms inside the House in the Six Areas

Groups	Count	Sum	Average	Variance
Area 1	2	1	0.5	0.2592
Area 2	2	1	0.5	0.1152
Area 3	2	1	0.5	0.0338
Area 4	2	1	0.5	0.1152
Area 5	2	1	0.5	0.1352
Area 6	2	1	0.5	0.1922

Table 5.16c ANOVA: Single Factor Survey Results on the Satisfaction of Number of Rooms inside the House in the Six Areas

Source of Variation	SS	df	MS	F	P-value	F crit
Between Groups	0	5	0	0	1	4.3873742
Within Groups	0.8508	6	0.1418			
Total	0.8508	11				

From the ANOVA it shows the successful of the result, shown by P-Value = 1. People need more space.

vii. The Need of More Rooms in the House

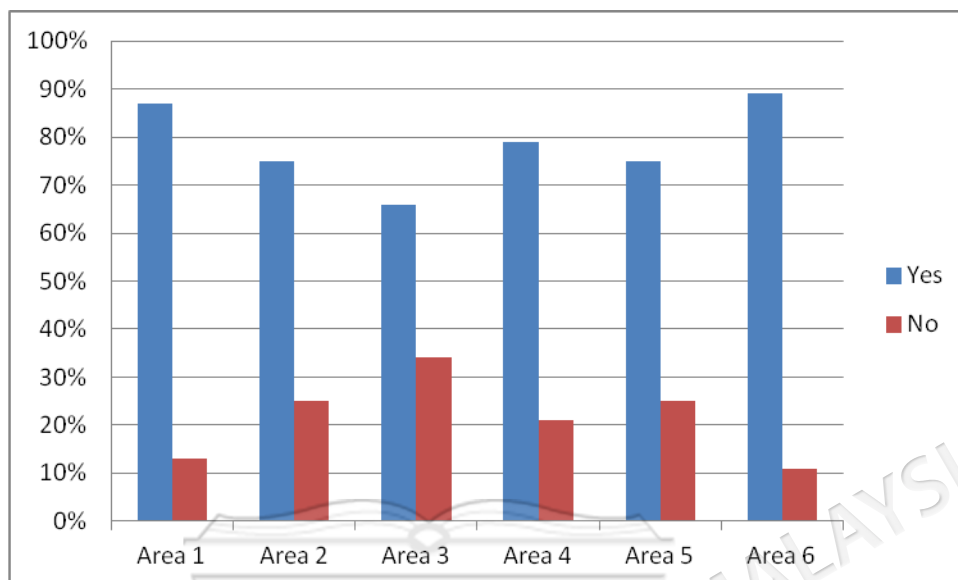


Figure 5.17 Survey Results on the Need of More Rooms in the House

Area 1 is Benghazi Al-Madinah area, 87% of the resident needed more rooms, and especially when their children get married, and 13% of the resident no need for more room, as all six areas are illustrated in figure 5.17.

Area 2 is Al-Slmany, Ras Abydah, Sidy Hseen and Sidy Abydah area, 75 % of the residents needed more rooms, and especially when their children get married, and 25% of the resident no need for more room.

Area 3 is Al-Sabry area, 66% of the residents needed more rooms, and especially when their children get married, and 34% of the resident no need for more room.

Area 4 is Al-Brkah and Al-Keesh area, 79% of the residents needed more rooms, and especially when their children get married, and 21% of the sample said no need for more room.

Area 5 is Al-Nwagyah, Al-Megzah, Shwhada Al-Slawly and Al-Thorah Al-Shabeyah area, 75% of the residents needed more rooms, and especially when their children get married, and 25% of the resident no need for more room.

Area 6 is Al-Kwyfah, Al-Mktar, Al-Aroba and Sidy Kalyfa area, 89% of the residents needed more rooms, and especially when their children get married, and 11% of the resident no need for more room. The data will be summary by the Single Factor Survey ANOVA, shown in table 5.18a, 5.18b and 5.18c.

The residents usually have large families therefore they are permanently in need of extra spaces, whether in the bedrooms or in an areas to accept guests. They also need to have appropriate spaces for their children when they grow up. For example, the possibility to build a suitable apartment on the second floor in the future or is divided it into two small apartments, and also the possibility to build the third floor. So, in that case the ceiling should be constructed with adequate height so that it will permit the building of an additional storey in the future.

Table 5.18a Clarify the Need of More Rooms in the House

	Area 1	Area 2	Area 3	Area 4	Area 5	Area 6
Yes	87%	75%	66%	79%	75%	89%
No	13%	25%	34%	21%	25%	11%

Table 5.18b Summary the Need of More Rooms in the House

Groups	Count	Sum	Average	Variance
Area 1	2	1	0.5	0.2738
Area 2	2	1	0.5	0.125
Area 3	2	1	0.5	0.0512
Area 4	2	1	0.5	0.1682
Area 5	2	1	0.5	0.125
Area 6	2	1	0.5	0.3042

Table 5.18c ANOVA: Single Factor Survey Results on the Need of More Rooms in the House

Source of Variation	SS	df	MS	F	P-value	F crit
Between Groups	0	5	0	0	1	4.3873742
Within Groups	1.0474	6	0.1745667			
Total	1.0474	11				

From the ANOVA it shows the successful of the result, shown by P-Value = 1. People need more rooms.

viii. Provision of Daylight and Ventilation in Housing Units

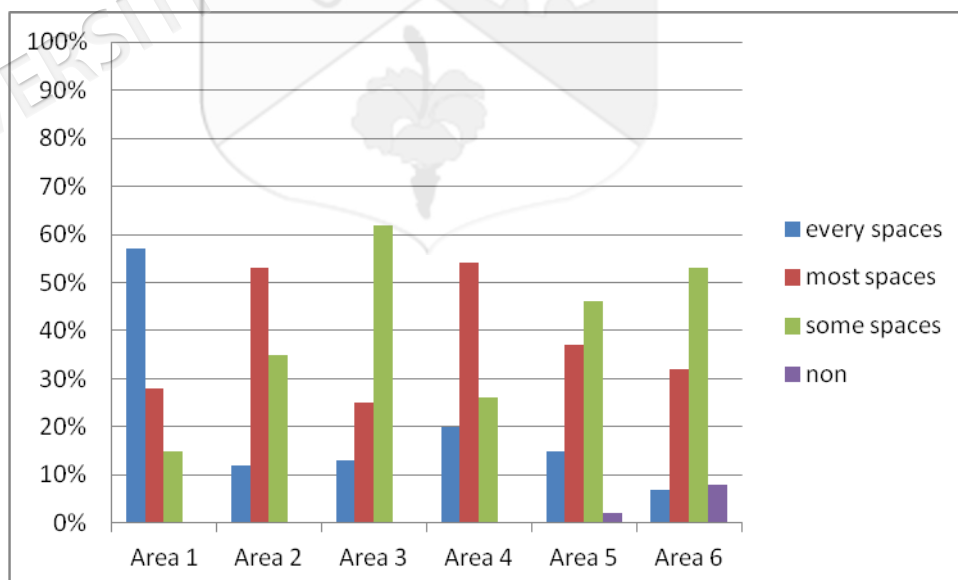


Figure 5.19 Survey Results on the Provision Daylight and Ventilation in Housing Units on the Six Areas

Area 1 is Benghazi Al-Madinah area of the city 57% of the residents had daylight and ventilation everywhere in the house; 28% had it in most places of their houses; and 15% had it only in some places of their houses, as all six areas are illustrated in figure 5.19.

Area 2 is Al-Slmany, Ras Abydah, Sidy Hseen and Sidy Abydah area of the city 12% of the residents had daylight and ventilation everywhere in the house; 53% had it in most places of their houses; and 35% had it only in some places of their houses.

Area 3 is Al-Sabry area of the city 13% of the residents had daylight and ventilation everywhere in the house; 25% had it in most places of their houses; and 62% had it only in some places of their houses.

Area 4 is Al-Brkah and Al-Keesh area of the city 20% of the residents had daylight and ventilation everywhere in the house; 54% had it in most places of their houses; and 26% had it only in some places of their houses.

Area 5 is Al-Nwagyah, Al-Megzah, Shwhada Al-Slawly and Al-Thorah Al-Shabeyah area of the city 15% of the residents had daylight and ventilation everywhere in the house; 37% had it in most places of their houses; and 46% had it only in some places of their houses, and 2% had no thing.

Area 6 is Al-Kwyfah, Al-Mktar, Al-Aroba and Sidy Kalyfa area of the city 7% of the residents had daylight and ventilation everywhere in the house; 32% had it in most places of their houses; and 53% had it only in some places of their houses, and 8% had no thing. The data will be summary by the Single Factor Survey ANOVA, shown in table 5.20a, 5.20b and 5.20c.

Libya is a hot country and consists of 95% desert. However, most over-riding element of house design is how to ensure sufficient ventilation to cool the house and this should be available in all parts of the house. Figure 5.19 show that most of the houses do not have adequate ventilation. This is because the residents are using heavy curtains and building walls on their balcony, which block the air from passing through. This results in creased heat levels in the houses. Sufficient ventilation to cool

the houses can be achieved by the use of bay windows and provision of inside yards (internal courtyards). When designing houses in a hot country like Libya it is essential to consider how to use the earth in a proper way by working in concert with the Libyan climate. One must ensure good ventilation and also provide protection of the housing area from hot air, noise and sand pollution. Internal yards planted with local plants and flora can provide adaptive internal environment for the houses. Using solar energy for lighting and heating can help to reduce the energy. Libya enjoys strong sunshine for more than nine months of the year, so solar energy should be used in housing design.

Table 5.20a Clarify the Provision Daylight and Ventilation in Housing Units on the Six Areas

	Area 1	Area 2	Area 3	Area 4	Area 5	Area 6
every spaces	57%	12%	13%	20%	15%	7%
most spaces	28%	53%	25%	54%	37%	32%
some spaces	15%	35%	62%	26%	46%	53%
non	0%	0%	0%	0%	2%	8%

Table 5.20b Summary the Provision Daylight and Ventilation in Housing Units on the Six Areas

Groups	Count	Sum	Average	Variance
Area 1	4	1	0.25	0.0586
Area 2	4	1	0.25	0.05593
Area 3	4	1	0.25	0.07127
Area 4	4	1	0.25	0.04973
Area 5	4	1	0.25	0.04047
Area 6	4	1	0.25	0.0482

Table 5.20c ANOVA: Single Factor Survey Results on the Provision Daylight and Ventilation in Housing Units on the Six Areas

Source of Variation	SS	df	MS	F	P-value	F crit
Between Groups	1.11022E-16	5	2.2204E-17	4.11E-16	1	2.77282
Within Groups	0.9726	18	0.0540333			
Total	0.9726	23				

From the ANOVA it shows the successful of the result, shown by P-Value = 1. The provision of daylight and ventilation are not completely in all spaces in the house.

5.3.3 Social Characteristics

i. Children living in the Same House after Marriage

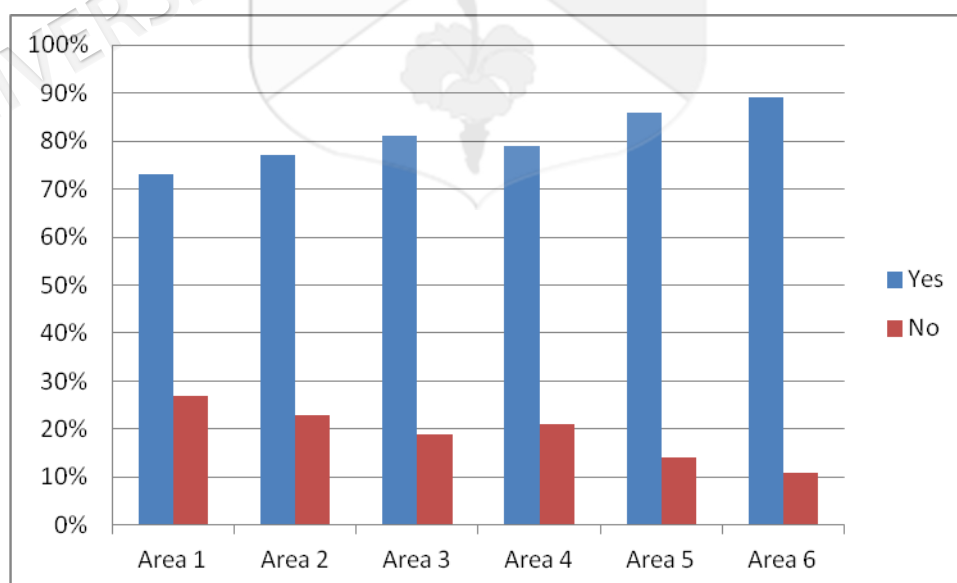


Figure 5.21 Survey Results on Social Characteristics: Children Living in the Same House after Marriage in the Six Areas

Area 1 is Benghazi Al-Madinah area of the city 73% of the resident live with their parents after marriage, and 27% of the resident they live alone, as all six areas are illustrated in figure 5.21.

Area 2 is Al-Slmany, Ras Abydah, Sidy Hseen and Sidy Abydah area of the city 77% of the resident live with their parents after marriage, and 23% of the resident they live alone.

Area 3 is Al-Sabry area of the city 81% of the resident live with their parents after marriage, and 19% of the resident they live alone.

Area 4 is Al-Brkah and Al-Keesh area of the city 79% of the resident's lives with their parents after marriage, and 21% of the resident they live alone.

Area 5 is Al-Nwagyah, Al-Megzah, Shwhada Al-Slawly and Al-Thorah Al-Shabeyah area of the city 86% of the resident live with their parents after marriage in the area, and 14% of the resident they live alone.

Area 6 is Al-Kwyfah, Al-Mktar, Al-Aroba and Sidy Kalyfa area of the city 89% of the resident live with their parents after marriage in the area, and 11% of the resident they live alone. The data will be summary by the Single Factor Survey ANOVA, shown in table 5.22a, 5.22b and 5.22c.

Housing is a very big problem and we can see it, in the new married couples, and to find places for their children in the age of marriage to live in the future, most of the people in these areas do not have the ability to build or buy houses for their children, they only have the ability to provide a small place that is available with the necessary supply needed in the house, for example one bedroom, bathroom, living room and a small areas of a kitchen, in some families they cannot provide these areas they just provide a bedroom and a bathroom, the rest of the activity areas they share with the family, and that is costing them uncomfortable living.

Figure 5.21 shows that majority of children live in parent's homes after marriage. These suggest a serious lack of houses for the young people. The government did not provide any affordable houses for young people for a long time, and the people do not have the capacity to build or buy a new house after marriage.

Table 5.22a Clarify the Social Characteristics: Children Living in the Same House after Marriage in the Six Areas

	Area 1	Area 2	Area 3	Area 4	Area 5	Area 6
Yes	73%	77%	81%	79%	86%	89%
No	27%	23%	19%	21%	14%	11%

Table 5.22b Summary the Social Characteristics: Children Living in the Same House after Marriage in the Six Areas

Groups	Count	Sum	Average	Variance
Area 1	2	1	0.5	0.1058
Area 2	2	1	0.5	0.1458
Area 3	2	1	0.5	0.1922
Area 4	2	1	0.5	0.1682
Area 5	2	1	0.5	0.2592
Area 6	2	1	0.5	0.3042

Table 5.22c ANOVA: Single Factor Survey Results on Social Characteristics:
Children Living in the Same House after Marriage in the Six
Areas

Source of Variation	SS	df	MS	F	P-value	F crit
Between Groups	0	5	0	0	1	4.3873742
Within Groups	1.1754	6	0.1959			
Total	1.1754	11				

From the ANOVA it shows the successful of the result, shown by P-Value = 1. Most of these young people still live in the same house after marriage.

ii. Occupations of Residents

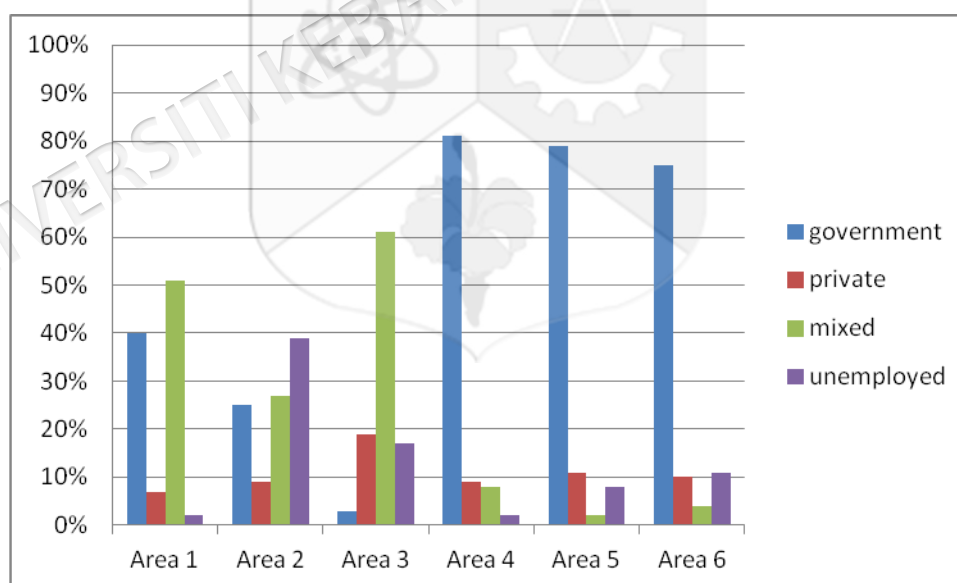


Figure 5.23 Survey Results on Occupation of Residents in the Six Areas

Area 1 is Benghazi Al-Madinah area of the city 40% of the residents are employed by the government; 2% of the residents are unemployed; 7% of the populations are private sector; 51% of the populations are mixed. About 98% of the residents are retching to improve themselves for a batter living, as all six areas are illustrated in figure 5.23.

Area 2 is Al-Slmany, Ras Abydah, Sidy Hseen and Sidy Abydah area of the city 25% of the residents are employed by the government; 39% of the residents are unemployed; 9% of the populations are either employed in the private sector, and about 27% are in mixed jobs. About 61% of the residents are retching to improve themselves for a batter living.

Area 3 is Al-Sabry area of the city 3% of the residents are employed by the government; 17% of the residents are unemployed; 19% of the populations are either employed in the private sector, and about 61% are in mixed jobs. About 83% of the residents are retching to improve themselves for a batter living.

Area 4 is Al-Brkah and Al-Keesh area of the city 81% of the samples are employed by the government; 2% of the residents are unemployed; 9% of the populations are either employed in the private sector, and about 8% are in mixed jobs. About 98% of the residents are retching to improve themselves for a batter living.

Area 5 is Al-Nwagyah, Al-Megzah, Shwhada Al-Slawly and Al-Thorah Al-Shabeyah area of the city 79% of the residents are employed by the government; 8% of the residents are unemployed; 11% of the populations are either employed in the private sector, and about 2% are in mixed jobs. About 92% of the resident's areas are retching to improve themselves for a batter living.

Area 6 is Al-Kwyfah, Al-Mktar, Al-Aroba and Sidy Kalyfa area of the city 75% of the residents are employed by the government; 11% of the residents are unemployed; 10% of the populations are either employed in the private sector, and about 4% are in mixed jobs. About 89% of the residents are retching to improve

themselves for a better living. The data will be summary by the Single Factor Survey ANOVA, shown in table 5.24a, 5.24b and 5.24c.

Building affordable housing community needs to provide new jobs for the residents, and that will not only develop the city but also the country, the government has to finance affordable housing communities to the people with affordable rents for the residents' required, with all services and facilities to the affordable houses built in standard.

Table 5.24a Clarify the Occupation of Residents in the Six Areas

	Area 1	Area 2	Area 3	Area 4	Area 5	Area 6
government	40%	25%	3%	81%	79%	75%
private	7%	9%	19%	9%	11%	10%
mixed	51%	27%	61%	8%	2%	4%
unemployed	2%	39%	17%	2%	8%	11%

Table 5.24b Summary the Occupation of Residents in the Six Areas

Groups	Count	Sum	Average	Variance
Area 1	4	1	0.25	0.058467
Area 2	4	1	0.25	0.0152
Area 3	4	1	0.25	0.062667
Area 4	4	1	0.25	0.140333
Area 5	4	1	0.25	0.131
Area 6	4	1	0.25	0.112067

Table 5.24c ANOVA: Single Factor Survey Results on Occupation of Residents in the Six Areas

Source of Variation	SS	df	MS	F	P-value	F crit
Between Groups	2.22E-16	5	4.4409E-17	5.13E-16	1	2.7728532
Within Groups	1.5592	18	0.0866222			
Total	1.5592	23				

From the ANOVA it shows the successful of the result, shown by P-Value = 1. Most of the people are government employee.

5.3.4 Economic Characteristics

i. Monthly Income

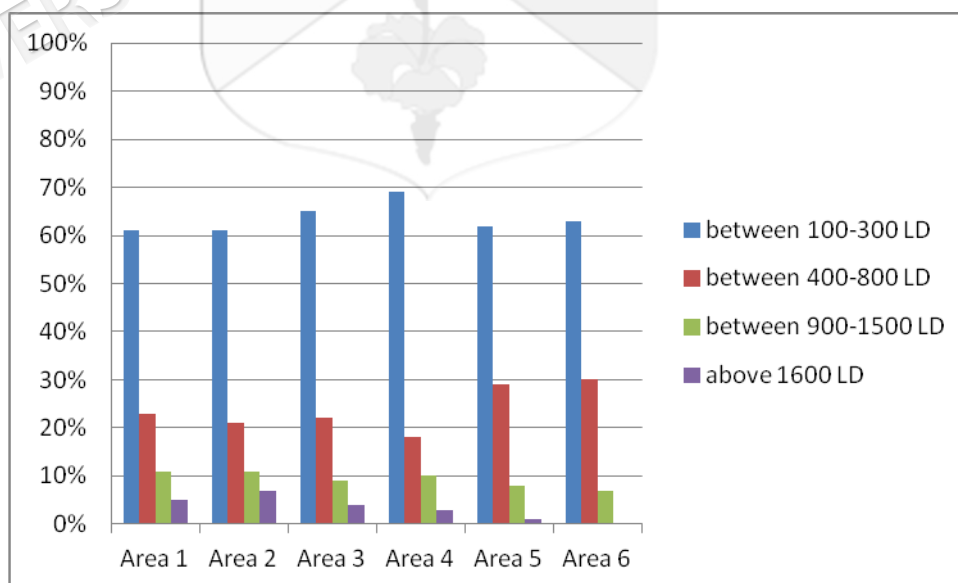


Figure 5.25 Survey Results on Economic Characteristics: Family Income in the Six Areas

Area 1 is Benghazi Al-Madinah area, it was found that 61% of the residents had a monthly income that was between 100-300 Libyan Diner; 23% of the residents had an income that was between 400-800 Libyan Diner; 11% of the residents had an income that was between 900-1500 Libyan Diner; 5% of the residents are above. Most of the residents are in government employ and their income is an average income as all six areas are illustrated in figure 5.25.

Area 2 is Al-Slmany, Ras Abydah, Sidy Hseen and Sidy Abydah area, it was found that 61% of the residents had a monthly income that was between 100-300 Libyan Diner; 21% of the resident had an income that was between 400-800 Libyan Diner; 11% of the resident had an income that was between 900-1500 Libyan Diner, 7% of the resident had an income that was above 1600 Libyan Diner. Most of the residents are in government employ and their income is an average income.

Area 3 is Al-Sabry area, it was found that 65% of the residents had a monthly income that was between 100-300 Libyan Dinar; 22% of the resident had an income that was between 400-800 Libyan Dinar; 9% of the resident had an income that was between 900-1500 Libyan Dinar, 4% of the resident had an income that was above 1600 Libyan Dinar. Most of the residents are in government employ and their income is an average income.

Area 4 is Al-Brkah and Al-Keesh area, it was found that 69% of the residents had a monthly income between 100-300 Libyan Dinar; 18% of the resident had an income between 400-800 Libyan Dinar; 10% of the resident had an income that was between 900-1500 Libyan Dinar, 3% of the resident had an income that was above 1600 Libyan Dinar. Most of the residents are in government employ and their income is an average income.

Area 5 is Al-Nwagyah, Al-Megzah, Shwhada Al-Slawly and Al-Thorah Al-Shabeyah area, it was found that 62% of the residents had a monthly income that was between 100-300 Libyan Dinar; 29% of the resident had an income that was between 400-800 Libyan Dinar; 8% of the resident had an income that was between 900-1500 Libyan Dinar, 1% of the resident had an income that was above 1600 Libyan Dinar.

Most of the residents are in government employ and their income is an average income.

Area 6 is Al-Kwyfah, Al-Mktar, Al-Aroba and Sidy Kalyfa area, it was found that 63% of the residents had a monthly income that was between 100-300 Libyan Dinar; 30% of the resident had an income that was between 400-800 Libyan Dinar; 7% of the resident had an income that was between 900-1500 Libyan Dinar, and none of the resident had an income that was above 1600 Libyan Dinar. Most of the residents are in government employ and their income is an average income.

It is clear in figure 5.25 that most of the residents have limited income between (100 – 300) LD, and this is evident in the six areas of the study. Therefore most people are not able to build or buy a house, due to the high cost of building materials, high prices of the land and the lack of cooperation of the government with the people. With this situation no one will not able own a home in the future, and the housing problems in Libya will remain as it is. Housing problems is related to the resident's lack of income. The data will be summary by the Single Factor Survey ANOVA, shown in table 5.26a, 5.26b and 5.26c.

Table 5.26a Clarify the Economic Characteristics: Family Income in the Six Areas

	Area 1	Area 2	Area 3	Area 4	Area 5	Area 6
between 100-300						
LD	61%	61%	65%	69%	62%	63%
between 400-800						
LD	23%	21%	22%	18%	29%	30%
between 900-1500						
LD	11%	11%	9%	10%	8%	7%
above 1600 LD	5%	7%	4%	3%	1%	0%

Table 5.26b Summary the Economic Characteristics: Family Income in the Six Areas

Groups	Count	Sum	Average	Variance
Column 1	4	1	0.25	0.0632
Column 2	4	1	0.25	0.0610667
Column 3	4	1	0.25	0.0768667
Column 4	4	1	0.25	0.0898
Column 5	4	1	0.25	0.075
Column 6	4	1	0.25	0.0806

Table 5.26c ANOVA: Single Factor Survey Results on Economic Characteristics: Family Income in the Six Areas

Source of Variation	SS	df	MS	F	P-value	F crit
Between Groups	0	5	0	0	1	2.7728532
Within Groups	1.3396	18	0.0744222			
Total	1.3396	23				

From the ANOVA it shows the successful of the result, shown by P-Value = 1.
Most of the people their monthly income is between 100 – 300 LD.

ii. Rental Amount

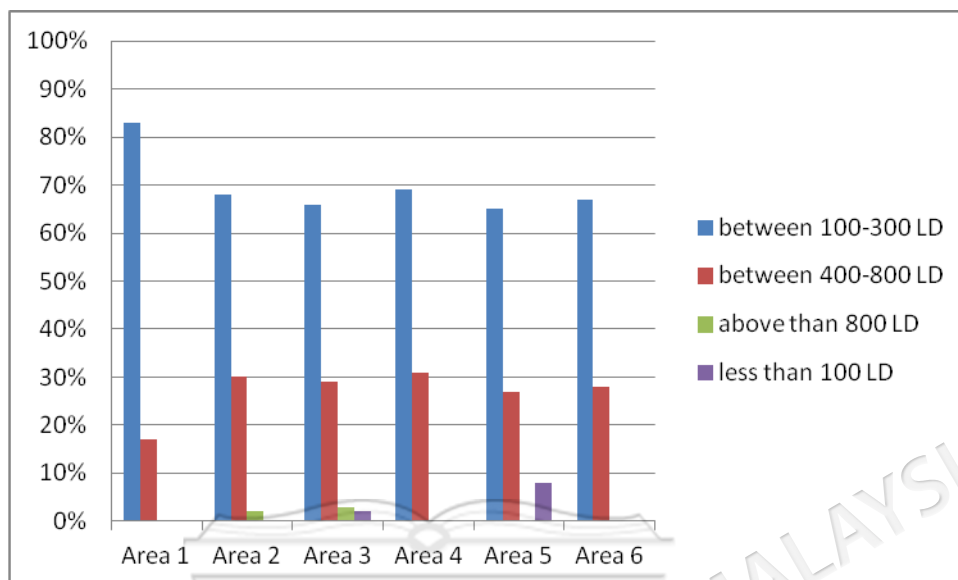


Figure 5.27 Survey Results on Economic Characteristics: Rental Amount in the six Areas

Area 1 is Benghazi Al-Madinah area, 83% of the residents can only pay rent between 100-300 LD, 17% of the residents are paying rent between 400-700 LD, and none are paying rent above 800 LD or less than 100 LD as all six areas are illustrated in figure 5.27.

Area 2 is Al-Slmany, Ras Abydah, Sidy Hseen and Sidy Abydah area, 68% of the residents can only pay rent between 100-300 Libyan Dinar, 30% of the residents are paying rent between 400-800 Libyan Dinar, 2% of the residents are paying rent above than 800 Libyan Dinar, and none are paying less than 100 Libyan Dinar.

Area 3 is Al-Sabry area, 66% of the residents can only pay rent between 100-300 Libyan Dinar, 29% of the residents are paying rent between 400-800 Libyan Dinar, 3% of the residents are paying rent above than 800 Libyan Dinar, and 2% of the residents are paying less than 100 Libyan Dinar.

Area 4 is Al-Brkah and Al-Keesh area, 69% of the residents can only pay rent between 100-300 Libyan Dinar, 31% of the residents are paying rent between 400-800 Libyan Dinar, none of the residents are paying rent above than 800 Libyan Dinar, and none of the residents are paying less than 100 Libyan Dinar.

Area 5 is Al-Nwagyah, Al-Megzah, Shwhada Al-Slawly and Al-Thorah Al-Shabeyah area, 65% of the residents can only pay rent between 100-300 Libyan Dinar, 27% of the residents are paying rent between 400-800 Libyan Dinar, none of the residents are paying rent above than 800 Libyan Dinar, and 8% of the residents are paying less than 100 Libyan Dinar.

Area 6 is Al-Kwyfah, Al-Mktar, Al-Aroba and Sidy Kalyfa area, 67% of the residents can only pay rent between 100-300 Libyan Dinar, 28% of the residents are paying rent between 400-800 Libyan Dinar, none of the residents are paying rent above than 800 Libyan Dinar, and 5% of the residents are paying less than 100 Libyan Dinar. The data will be summary by the Single Factor Survey ANOVA, shown in table 5.28a, 5.28b and 5.28c.

As it is clear in figure 5.27 most of the people are limited income, and they cannot afford to pay high rents, and these rents are for small houses and suitable only for small families, and that returned to the same problem. Which is the need to increase more space; the problem returned again and does not have a solution. The only solution the government should provide affordable houses for the people and meet their needs.

Table 5.28a Clarify the Economic Characteristics: Rental Amount in the six Areas

	Area 1	Area 2	Area 3	Area 4	Area 5	Area 6
between 100-300						
LD	83%	68%	66%	69%	65%	67%
between 400-800						
LD	17%	30%	29%	31%	27%	28%
above than 800 LD	0%	2%	3%	0%	0%	0%
less than 100 LD	0%	0%	2%	0%	8%	5%

Table 5.28b Summary the Economic Characteristics: Rental Amount in the six Areas

Groups	Count	Sum	Average	Variance
Column 1	4	1	0.25	0.15593
Column 2	4	1	0.25	0.10093
Column 3	4	1	0.25	0.09033
Column 4	4	1	0.25	0.1074
Column 5	4	1	0.25	0.08393
Column 6	4	1	0.25	0.09327

Table 5.28c ANOVA: Single Factor Survey Results on Economic Characteristics:
Rental Amount in the six Areas

Source of Variation	SS	df	MS	F	P-value	F crit
Between Groups	0	5	0	0	1	2.77283
Within Groups	1.8954	18	0.1053			
Total	1.8954	23				

From the ANOVA it shows the successful of the result, shown by P-Value = 1. They can only pay around 100 -300 LD for renting payment.

iii. Affordability to Own a House

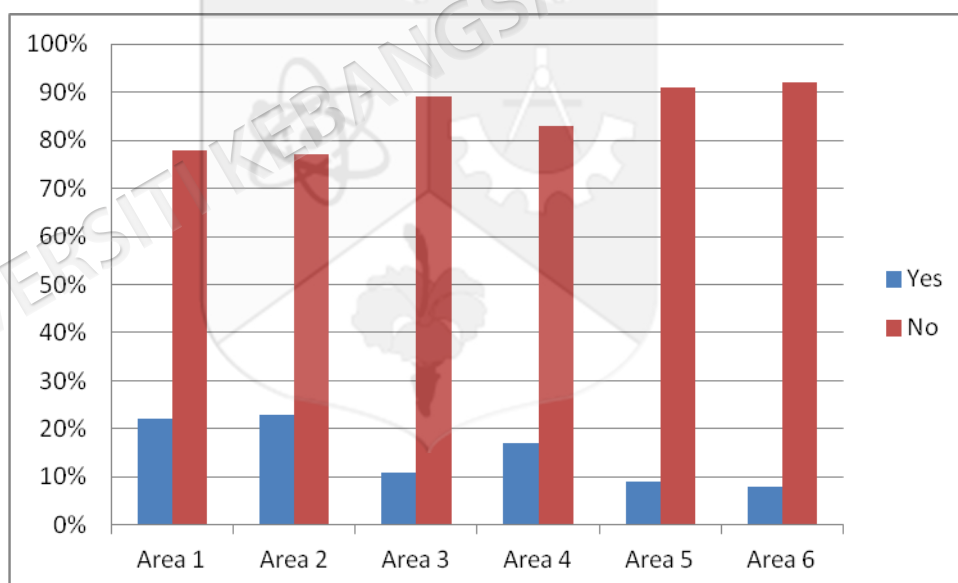


Figure 5.29 Survey Results on Economic Characteristics: Affordability to Own a House in the Six Areas

Area 1 is Benghazi Al-Madinah area, 78% of the residents was unable to afford to build their own house; 22% had sufficient funds to build their own house, as all six areas are illustrated in figure 5.29. Most of the residents in Benghazi Al-Madinah area are government employee and their monthly incomes are average income.

Area 2 is Al-Slmany, Ras Abydah, Sidy Hseen and Sidy Abydah area, 77% of the residents were unable to afford to build their own house; 23% had sufficient funds to build their own house. Most of the residents are government employee or unemployed and their monthly incomes are average income.

Area 3 is Al-Sabry area, 89% of the residents were unable to afford to build their own house; 11% had sufficient funds to build their own house. Most of the residents are government employee or unemployed and their monthly incomes are average income.

Area 4 is Al-Brkah and Al-Keesh area, 83% of the residents were unable to afford to build their own house; 17% had sufficient funds to build their own house,. Most of the residents are government employee or unemployed and their monthly incomes are average income, and even the income of the privet sector residents is not too much.

Area 5 is Al-Nwagyah, Al-Megzah, Shwhada Al-Slawly and Al-Thorah Al-Shabeyah area, 91% of the residents were unable to afford to build their own house; 9% had sufficient funds to build their own house. Most of the residents are government employee or unemployed and their monthly incomes are average income, and even the come by of the privet sector residents is not too much.

Area 6 is Al-Kwyfah, Al-Mktar, Al-Aroba and Sidy Kalyfa area, 92% of the residents were unable to afford to build their own house; 8% had sufficient funds to build their own house, as most of the residents are government employee or unemployed and their monthly incomes are average income, and even the come by of the privet sector residents is not too much. The data will be summary by the Single Factor Survey ANOVA, shown in table 5.30a, 5.30b and 5.30c.

Most of the Libyan people do not have the ability to build a house. The cost of the building material is rising day after day. In the Libyan Desert there is a natural material that can be used in building houses. Starting to build a small house that usually has one bedroom, bathroom, living room and kitchenette and usually it is suitable for two people starting their life. But this can be a problem in the future when there are kids. The basic problem here is to find a solution of the housing problem, also finding a way to develop the house in future.

Table 5.30a Clarify the Economic Characteristics: Affordability to Own a House in the Six Areas

	Area 1	Area 2	Area 3	Area 4	Area 5	Area 6
Yes	22%	23%	11%	17%	9%	8%
No	78%	77%	89%	83%	91%	92%

Table 5.30b Summary the Economic Characteristics: Affordability to Own a House in the Six Areas

Groups	Count	Sum	Average	Variance
Area 1	2	1	0.5	0.1568
Area 2	2	1	0.5	0.1458
Area 3	2	1	0.5	0.3042
Area 4	2	1	0.5	0.2178
Area 5	2	1	0.5	0.3362
Area 6	2	1	0.5	0.3528

Table 5.30c ANOVA: Single Factor Survey Results on Economic Characteristics: Affordability to Own a House in the Six Areas

Source of Variation	SS	df	MS	F	P-value	F crit
Between Groups	2.22045E-16	5	4.4409E-17	1.76E-16	1	4.387374
Within Groups	1.5136	6	0.2522667			
Total	1.5136	11				

From the ANOVA it shows the successful of the result, shown by P-Value = 1, which they do not have the ability to build or buy a house.

5.4 GENERAL FINDING

Based on the ANOVA analyses the general finding, consist of the following points:

- i. Most residents aged between 40 – 60 years old.
- ii. Most houses are owned by residents (not rented).
- iii. Most houses are built between years 1970 – 1979.
- iv. Most houses have considerable privacy.
- v. Most houses have three bedrooms each.
- vi. Most of the residents need more spaces in their houses.
- vii. Most of the residents need more rooms.
- viii. Daylight and ventilation is not enough.
- ix. Most of the young residents live in the same house (parents' house) after marriage.
- x. Most residents are government employee.
- xi. Most residents received monthly income between 100 – 300 LD, as they are average income group.

- xii. Most residents can only afford rental between 100 – 300 LD per month.
- xiii. Most residents cannot afford to build or buy new houses.

5.5 CONCLUSION

The housing problems of the limited income groups are identified by means of empirical survey method and analyzed qualitatively and quantitatively. Based on the questionnaire and the interviews conducted, the current housing conditions and housing demands of the limited income groups are revealed and analyzed systematically. Factors behind the housing problems in the districts studied are identified. The results are based on the data collection and interviews from the selected areas of the residents, gathering these data in the form of a graph and ANOVA.



CHAPTER VI

CONCLUSION AND RECOMMENDATIONS

6.1 INTRODUCTION

This chapter summarizes the finding of this research. It will also highlight the recommendations which will help to solve the problems of affordable housing in Benghazi City. These findings only address the middle income population. The types of houses that are going to be built and provided for this group will take into consideration the environment, the culture and the needs of the Libyan people. The types of housing that meet their needs will deal with aspects such as space, number of rooms and amenities. The houses will be of three different types depending on the number of family members and the income of each individual. The cost of each type of the houses varies according to the size of the house as well as the size of the land area. Through the Community Housing Development Associations the primary focus will be only on limited income people. The association will try to meet their requirements pertaining to housing and land location. The payment of such houses will be structured to allow the easiest way of payment so that the people can own a house of their own comfortably.

6.2 KEY POINTS FOR GUIDELINES IN AFFORDABLE HOUSES

To ensure success in development the housing issues in Libya, following key points should be addressed in the housing guideline:

- i. More new houses.
- ii. More rooms/space.
- iii. Incentive for the young groups to own houses.
- iv. Houses for middle income groups.
- v. Lower rental.

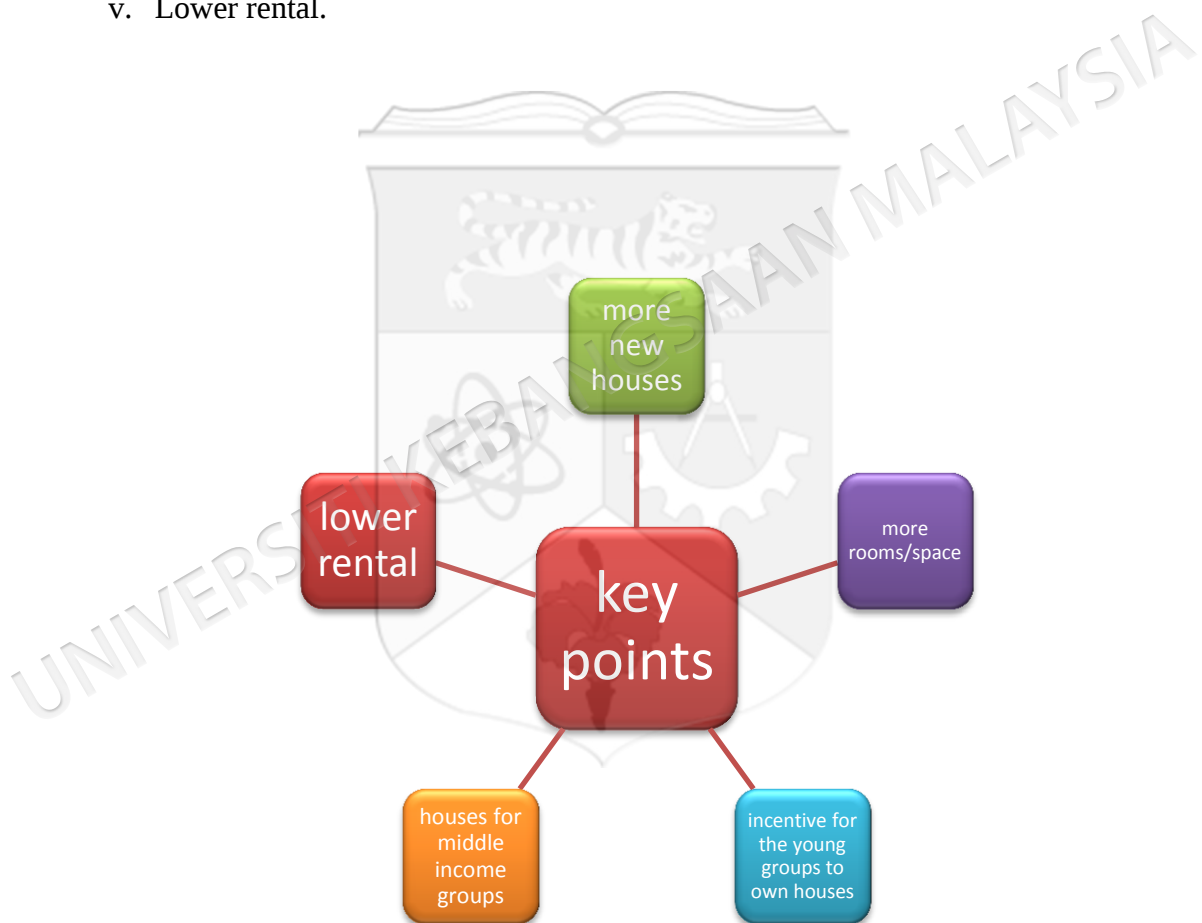


Figure 6.1 Key Points for Guidelines in Affordable Houses

6.3 ESTABLISHING COMMUNITY HOUSING DEVELOPMENT ASSOCIATIONS

Choosing this kind of association had a positive effect on the Libyan people a long time ago. The government established it ones before in the 70's for a limited time to provide only land for the people for building houses. The association was a successful idea, it provide land for a limited price which was affordable of the people that time, and the government hand over the land to the people after a period of time (Municipality of Benghazi 2008).

6.4 MAIN POINTS THAT NEEDS TO BE ADDRESSED IN GUIDELINES

- i. New houses need to be constructed cost effectively for the middle income group. This can be done through the Community Housing Development Associations, which has to be established in Libya
- ii. Provide more spaces/rooms. Through the survey carried out, it has proven that most of the Libyan population in the districts studied needs more space in their houses.
- iii. Provide incentive for younger generations to leave parents homes, by building new low cost houses for them and providing better jobs.
- iv. The houses price should cost less to suit the middle income groups who made up most of the population.
- v. Rental should be not more than 100 – 300 LD, as 70% of the Libyan population is middle income.
- vi. To ensure success affordable houses needs to have adequate daylight and ventilation (improvement for future houses).

6.5 GUIDELINES TOWARDS SUCCESSFUL AFFORDABLE HOUSING

6.5.1 Physical Aspects

i. Design Suitable for Middle income Group

Consideration in design is required that it suits the local culture according to the lifestyle of the people. It provides a balance in the relationship between used spaces, movement paths, building formation, mechanical systems, and construction technology. Also symbolic expressions of land and area history, spiritual values and principles should be studied. The building should be distinct in its easy use and fine architectural quality and outside beauty. It could be said that green architecture gives priority to health and environment and protects the resources and the performance of the building throughout its life cycle. Most green architecture is considered to be easily distinguishable and of a high quality because its expected life is longer than other type's. Its costs and maintenance is lower, and it is more satisfying among users than typical building.

It is interesting for many people that the new design of green architecture has little or no extra construction cost if compared with classical building. This dedication in performance improvement and working as a team during the design process; being open to new design directions; the availability of information about the best means of application; will lead to better results of construction budget. Hasan Fathi is one of the first architects who called for this direction, he is considered to be a naturalist at work. The house which he built in (Meet-Rihan, Cairo, 1983) is an example where natural temperature insulation is carried out during building design, and inside yard design is an application for maintaining principles of suitable natural ventilation and energy.

An affordable house requires a simple idea and a simple design, which can be used by the middle income group. Whatever the design may be it has to assure privacy of the main entrance. Based on the survey carried out, privacy means condition when a guest can enter and exit the house without meeting the people of the house. Or any desirable to see inside, the study explained that the specialty in the

housing Libyan design most be, the living room, kitchen, bathroom and a bedroom. Only the necessary rooms will be built in the beginning.

This idea of this house can be expanded and developed in the future and it will be only when needed, based on the survey of adequacy of rooms inside the house. The need will be depending on the capacity of each person and the number of the members of the family. When the owner needs an extra bedroom, all he needs to do is just add a bedroom. In other words, only built a roof and two walls and one column and installation will be based on the number of family members and on has capacity. The potential for the homeowner depends on the needs of rooms, it is not necessary to add all the rooms at the same time; it is based the increase of the number of the family.

The design of the house for the middle income family has to be suitably designed and only for the middle income group. The house consist of one main entrance with the availability of privacy, a guest room with connected bathroom, a living room, a kitchen, a master bedroom with attached bathroom and two bedrooms each for the children (girls and boys) with connected bathrooms.

Courtyard is one of the most important elements in this type of designs, and it has been used this type of item to adjust the temperature inside the house and to lowdown the temperature. This is a very important element in the world of architecture and this type of element is to be one of the architectural solutions and more effective climate in the desert areas. Based on the survey provision of daylight and ventilation in housing units, the courtyard has many possibilities in the uses and it is used for ventilation and for lighting, and the most importantly has a property discipline for natural daylight to interior rooms.

Incorporating functional and healthy environmental design is one way of solving environment problems while protecting the environment. We also need to find a way to serve human needs while doing this. It is the end result of the science of the architect incorporating functional design as an art and the use of engineering technology with the environment. This way of environmental design has already been used since the beginning of the fifties as a natural reaction to environmental issues,

which have become very complicated in a modern world. The future place of architecture will be in combination with politics and a complete holistic program to make sure that we can protect the environment in Benghazi city and the same as the other cities in Libya.

ii. Local Material

Green architecture observes these materials properties regarding the lack or reduction in elaborated elements or harmful gases and a decrease in their toxicity. It also observes the possibility of recycling, their disintegration resistance, predicted life and possibility of local production. It suggests use of materials produced from removal and destruction because they contain chemically inactive materials. It also suggests use of dimensional planning which depends on repeated measurements and decreases cost by the use of fewer materials. It also observes ensuring enough space to implement programs to get rid of solid wastes, to recycle destructive wastes, to include a special time to gather recycled wastes. The usage of adobe for example itself is a sustainable material, it applies appropriate technology, and it creates jobs opportunities and it sustain the community.

In Libya this is preferable to use natural local materials found around us, especially if these materials have the ability to build houses, and also have the ability to keep the house cool, a material that is economic and available for people with limited income and also substances that have the ability to save energy.

Using the local material available in building the affordable housing for the limited income people can help to reduce the cost, and based on the survey (Affordability to Own a House) shows that most of the Libyan people cannot afford to build a house. The government needs to focus on how to provide affordable material that is affordable to the people, and a new planning policy for building new houses in a new design, by choosing local material that is available and affordable for the people. The material that has been using for the past few years was cement and the price is raising increases every year with difficulty obtained, due to the presence of only one cement factory in the city of Benghazi. The factory system to get a quantity

of cement for building, is register your name in a list of getting the quantity of cement for construction. Because of the presence of only one cement factory, and only one type of building material, and many people register their names for cement, your role may be after a year or more. After getting the role of the person obtaining cement, he takes a small amount which is not enough for the purpose of you need. Registering takes from three to four times for the right amount of cement to build a house.

In the Libyan Desert, the local material which is available and affordable to be used in building houses is mud. The mud consists of salt, straw and organic elements. Adoba which consist of mud, straw and water can be found in the salty oasis was used before in many times in the past for building houses. The mud is more commonly used due to its ability to bond stones together. The mud stone is used in the building of the walls. The basic material for making earth stone is mud which is mixed with water and some organic material (stalks or animal done). It is placed inside rectangular molds made of four pieces of wood. This kind of material has the ability to protect the houses from the heat produced by the direct sunlight. This local material (mud) is a possible solution to be used in building affordable houses for the limited income people. This kind of material has been used in real houses in Libya, for example, the old town in Ghadames, Fazzan, Yefren and Quser Al-Hage.....etc. and more other area in Libya. These houses still stood strong up till today. These real houses have the ability to lower down the temperature inside the houses making the house cool all day long.

Mud is efficient to be used on housing as it reduces the elaborated elements or harmful gases and it also decrease their toxicity. It also observes the possibility of recycling their disintegration resistance, predicted life and possibility of local production. It is also suggested that the use of dimensional planning which depends on repeated measurements and decreases in cost by the use of fewer materials.

The use of proper material in the right environment and climate can reduce the energy levels in the houses by creating the natural ways of ventilation, heating and cooling of the house. It also strikes a balance between taking care of the environment and the use of the new technologies that make houses more comfortable.A

comfortable house uses different kinds of elements to low down energy use such as applying shading devices, building of courtyards and bay windows. All these elements can protect the houses from heat, direct sunlight and even from the sand storms and dust.

6.5.2 Socio – Culture

This study identifies the needs of affordable housing in Libya. It will explore the major trends in housing provision, conditions, availability and quality. It analyses housing policy responses, and provides the recommendations needed to increase affordable housing. It has been discovered that majority of Libyan people adequate of the affordable housing is simply it is not available.

The Libyan population suffers from the lack of the affordable housing. The majority of the young people in Libya do not have the ability to build or buy a house, based on the survey affordability to own a house. Based on the survey, carried out most of young people live with their parents after they are married. They live in the same house after they subdivide the rooms to make way for the extended family. Therefore an affordable house needs to be built to suit requirement of the young groups.

The average members of the Libyan family is about 6-8 persons. Most of the Libyan families prefer to have many children. In the areas out of the cities they prefer to have more than 8 children due to the fact that these children will help their parents to earn living by working on the lands and tending to the livestock.

The problem of crowded living happens in most Libyan houses. Based on the survey adequacy of rooms inside the house, and the survey the need of more rooms in the house space is an issue. Most of these families whom are being deprived of privacy are struggling to raise their children in such a condition. An effort must be made especially on the young households they should be provided with better standards of living. A feasible payment scheme must be set up to allow these people to own their own house, based on the survey monthly income). The young households

lost their ability, to own their own house in the past few years leaving them no option, but to live with their family in one room or in a small area. This has taken a toll on their married life. They are being deprived of the happiness to enjoy their life together. It also has added the stress year by year as the need for more space for their children and privacy living in their own house ceases to exist. The young households need a place of their own. In this way solving housing problems for these young households can make a big difference for a better life for these living groups to start.

Housing in Libya is the clearer example to reflect the Libyan culture. One of the most important cultures is privacy. In the housing Libyan design it is very important to provide privacy in the house. The Libyan families will refuse to live in a house without privacy. Privacy starts with the main door when guest upon entering inside the house, there should be privacy at the main entrance and as especially if guests are men, a guest room with an extension bathroom for the guests only. Guests should not see any one of the family when they enter the house or when they leave. Windows must also have privacy when opening them; it should not be open in front of the house windows next door. Even the garden that attached to the house should be privacy when household is enjoying it.

6.5.3 Economy

Identifying the families with limited income and providing them with affordable houses by priority must be dealt with immediately. The middle income people in Libya make up almost 70% of the population, which is based on the survey monthly income. They need to be identified and given first priority to meet their needs of the affordable house.

In Libya the housing problems started in the beginning of the 1980s based on the survey, year of building the house. That time prices started to rise especially in the cost of building materials. This has resulted in the limited income people losing their ability to build and own a house. Most of the Libyan newly married couples live with their families. This has become a burden to the family as too many people from the elderly to the children are being crammed up in one house. Different generations

living together with different needs and perceptions will have effects on the children's behavior. Thus, to overcome this problem it is suggested that better jobs with higher salary be given to the middle income earners. It is very likely that this move can solve the housing problems for the people.

6.5.4 Infrastructure

The government has to provide different types of houses depending on the number of the families or the number of rooms inside the house. The small size house should include two bedrooms, kitchen, bathroom, living room and guest room. The medium size house should include three bedrooms, kitchen, two bathrooms, living room and guest room. The big size house should include four bedroom, kitchen, three bathrooms, living room and a guest room.

The government has to cooperate with the private companies. The government provides the land at a reasonable price payable one time or by monthly installments depending on the income of each person. The area allocated for the big and medium size houses should be 600m² and 400m² respectively the small size houses will be 200m² and the government has to provide that land for free. The private companies will build the houses based on the designs.

The houses payment has to be under a housing policy association monitored by the government. A monthly payment system should be made available and affordable for the limited income group. The payment includes both the prices of land and the house. The monthly payment should not be more than 80 LD per month for the big house, 60 LD per month for the medium house, and 30 LD per month for the small house. Once the monthly payment is completed the house is legally owned by the residents. Once the government gets seriously involved in the housing policy, the infrastructure and the public amenities should improve.

A simple and easy system which enables these middle incomes to own a house must be set up. A payment scheme which allows a lenient payment on a monthly basis deducted from the salary can be a way for this people to realize their dreams of owning their own property. The middle income group is a group of people who are facing hardships and that are why the government of Libya must take up all measures to protect the interest of these people.

6.5.5 Refining the Renting System

Libya needs to reorganize the housing policy to solve the housing problem. Planning for a better housing policy creates the skills and ethical responsibility in coming up with a good community where diverse housing options are available to existing community. Developing a guideline for the housing policy sets forth specific policies and actions which will help the people in Libya in meeting their specific housing needs. Once their needs are met, their lives will change for the better. The houses will provide the support they needed, to live safely and healthily. It can also ensure that the limited income residents make a better life for themselves and for their children.

Planning a system has to be done to produce housing that is of good quality and yet affordable to the limited income group. Planning for affordable housing using local material that is available in the country and establishing the cooperation between the government and private sector to build and provide these housing units as needed by the people are some ways to solve the existing problems.

There is a need for a price controlling policy concerning rental of houses. The activities of buying and building houses are to be controlled by the Community Housing Development Associations that is suggestion to provide a housing policy system, as a way to plan for affordable housing in Libya.

The establishment of Associations for affordable housing community for the limited income groups can control housing distribution for the limited income people and make them affordable. These Associations are controlled by the government and are established by people who have vast and sound knowledge on housing problems. The associations have roles to play and they are:

- i. The government has to be the first controller.
- ii. The employed has to be specialists in the housing field.
- iii. The associations have to provide the land that is under the government help.
- iv. The associations control the housing and land price.
- v. The housing and land payment has to be through the associations.
- vi. The associations control the cooperation between the government and the private companies.

The housing policy pertaining to land will see the government providing land for building houses. Libya does not have any problem of finding land for building houses. The government shall provide land for the private companies to build the affordable houses. Through the government's help by providing the land, the partnership with the private companies and establishing the Community Housing Development Associations, the government can play a positive role in solving housing problems.

6.6 LEARNING FROM OTHER COUNTRIES

Since the housing guidelines in Libya are not well developed, it is not surprising to see efforts made in finding new solutions to overcome housing problems from other countries. Most of these countries have housing problems in the selling price of the land, the prices of building areas, or the cost of building materials and construction. Efforts have been made in other countries to introduce innovative building methods and materials to produce new homes at lower cost. These moves can be generally welcomed by the limited income people as a way to provide them the best solution for affordable housing.

The government should depend on the studies and researches, which have been carried out by many researchers on the housing problems and look into plans adopted in other countries on how to find appropriate solutions. The government also should focus on the problems which are similar to those happening in Libya. An in depth study on the solutions and the suitability of the solutions to the Libyan people in terms of economy and social should be done. Whether the solutions are in sync with the culture of the country can be of great help in finding a better solution of the housing problem in Libya. The government and private companies have to cooperate and redouble their efforts to meet the needs of the people and provide them the suitable affordable housing for them and their families.

6.7 FUTURE DIRECTIONS AND SUGGESTIONS

Most of the residents do not have the ability to own a house of their own and even they do not have the possibility to build or buy a house, most of the populations are limited income groups. They have no possibility of finding solution of the housing problem for them; these limited income populations tried to find and solve these problems after they found that the government is not helping in solving the housing problem, or even provide affordable housing to live especially for young people. These young people found that the only solution is to find a solution of their own, depending on the circumstances of each person and their family, they found some solutions, but all of these solutions are temporary solutions. So, in this research it will try to suggest possible solution that will be suitable for the residents in Libya.

The proposal of the Housing Development Association Community needs to be established in Libya which will focus only on limited income families. It should have a say in the control of the distribution of homes and land among other aspects especially aspects subjected to public scrutiny. Every citizen has to go through the Housing Development Association Community to request for a house. The establishment will observe the full display of the physical level, living standards and the extent of how he can facilitate payment of his housing due to his limited income.

The government should control, supervise and prevent speculation in the distribution and ensure proper use of the house delivered to the middle income families so that all citizens can acquire a house without any delay. This can see to the order of the system and prevents chaos in the country. This will ensure every citizen can have the right to own a house. It can suspend the right to rent only to residents in limited cases according to the law. Thus a new law and organization of housing policy in Libya will be created.

Therefore, the affordable housing needs more research to solve housing problems especially in Libya with the primary focus on the middle income residents which make up about 70% of the Libyan population. Libya is one of the Arab countries where the people have been denied the opportunity to own houses in the past few years. So it just not only a need to study on how to create an affordable house, but how to create a housing policy to give each and every limited income citizen the right to live and own his and his family to own a place. With that many issue are brought to our attention such as what did we miss in the development of housing policy? What solutions did the other countries create? By studying the successful solutions on housing policies of other countries it is hoped that appropriate solutions to solve the housing problem in Libya will be sighted. By understanding on how to develop a housing policy appropriate for Libyans that meet the physical, social potential and cultural aspects and through the kind of materials that are available within the country will be considered as possibilities as solutions.

6.7.1 Organizational Aspects by Planning and Technical Aspects of the Area

The government should focus on providing houses and apartments for the residents, also be collaboration with the private companies and facilitate their affairs and procedures in building affordable housing. The lack of adequate housing caused for the residents is too much pressure on many people and their inability of comfort in their homes, because of the participation of their grown up children in the same house after marriage, the governments in other countries has a great role in solving the housing problem, but as shown in figure 5.21, our government has no role or any help in solving the housing problems in the past few years in Libya.

The government has a big responsibility to solve this problem, the government has to raise the peoples salaries, with a fixed prices for the building materials and land prices, the government has to provide a system to solve the housing problem, such as a Community Housing Development Associations to help the people to own a house, and also there must be a cooperation between the government and private companies, to facilitate the process of the construction and purchasing through these housing associations, housing problem in Libya is a big problem and it must clarify the main steps to solve the housing policy.

One of the important steps that have to be followed is that the government and private companies should be responsible in finding solution in housing problems. The government and private companies have to realize that researching future housing needs by gathering all the information, results and examples, will provide the best way possible to be able to manage and communicate the issues.

Affordable housing units must be built in such a way, that they are available to those who have limited income and with support from the government. Proper planning must be divided between the uses of the housing unit land areas and city planning, like streets and the infrastructure of rain water and sewage with the composition of the natural terrain.

Finding the best solution of the housing design by using the proper material and affordable, finding the best solution of architectural treatment by using the lowest energy levels in the houses and calculating into the design other natural ways of ventilation, heating and cooling of the house. And green areas must be discussed by planning high trees around the areas; it can protect the houses and people from the sand that the wind carries. Green areas between the houses and green open spaces can help to lower the temperature, including the aesthetic value that is given to the area.

6.7.2 Organizational Aspects by the Social Needs

In the Islamic religion and the society's cultural aspects privacy is the most important aspect to the Libyan houses. Privacy must be available in the gardens, the

entrance of the main door, open windows and garage parking. The architectural design of the houses must satisfy all personal needs, from the neighborhood, the social society and from the area itself.

Most of the families need to increase the size of their houses. The Libyan people always need extra space in their houses, not only more rooms but more space in the future for other houses that are connected with the main house. This can be accomplished by building on top of the current houses or building beside them. They need the possibility of future house development.

Designing affordable housing should cater for the residents' needs but also be compatible with the environment. Designing housing that takes into account the environment helps to design it correctly and by using that knowledge to design a comfortable house the resident should be provided with a natural level of comfort. The high heat in the houses is very difficult to live in, so the most important need is to maintain the coolness in the house in order to be comfortable.

6.7.3 Organizational Aspects by the Economic Factors

Affordable housing needs special research to determine the best way to build affordable cost houses for small income residents'. Generally Libyan residents are low average income people.

Libya consist 95% desert, so in that planning affordable housing needs to be consider as a desert housing design in most areas of the city. Libya enjoys strong sunshine for more than nine months of the year. Using solar energy should be used in housing design for lighting and heating water it can save a lot of energy.

Using local building materials does not necessarily mean designing low cost houses that reduce its quality, the use of local materials that is affordable can help the people to build and own their own house.

Government financed affordable housing communities with affordable rents for the residents' required and all services and facilities to the affordable houses built in standard. It should be constructed that permit the building of an additional storey in the future for more space.

6.8 INTERNAL COURTYARD AS A DAYLIGHT ADJUSTER IN AFFORDABLE HOUSING

The daylight has many advantages in the use of buildings with many ways of control has been proven in many studies and different research study, to take advantage of the daylight in many places of the world. And the most important and most important advantage of daylight is that it is free and has advantages in the comfort of the eyes. And requires the person to the least amount of light compared with artificial daylight in the room, but daylight stimulates natural person and help him to perform a better job. It also shows the day of the medicinal properties and raises, also shows the real colors around us. Plus, daylight focuses on the yards inside the place and its advantages as an officer in the day. It is possible to use this element in the architectural designs, which have been used and described to adjust the temperature and other objects of art in the desert areas to control the entry of light to open spaces for existing homes .

In the desert areas the presence of inner courtyard is one of the most important elements in this type of designs, and it has been used this type of item to adjust the temperature inside the house and to lowdown the temperature, especially during the summer time, as well as the protection from cold wind in the winter time. This is a very important element in the world of architecture and this type of element is to be one of the architectural solutions and more effective climate in the desert areas. In addition, this is the most important element of the architectural elements with aspects of the functional task in the Islamic house. It has been published numerous project in researches and studies related to the climatic advantages.

This part is somewhat neglected as a very important element, it must have a special study in how to modify the daylight entering in day time and to exploit as much as possible, in the many offices of Arab library of the problem and the inability

of the lack of publications on these subject; and this area still needs a lot of research and careful study. On the other hand, research has begun in broad daylight in the western countries in advance of the Arab countries, and the Western countries became to the extent that they branched out and went to the very fine details in design. There are many programs to estimate the amount of daylight of the exterior and interior of the building.

The courtyard has many possibilities in the uses and it is used for ventilation and for lighting, and the most importantly has a property discipline for natural daylight to interior rooms through the use of three-dimensional structures of the material and measuring the impact of lighting from adjoining rooms will require serious consideration. There are some courtyards its measurements and heights up to four floors and other additives in the courtyards, which are affecting the level of lighting in the room such as wall colors; they allow us to estimate the effect of these changes on levels of lighting rooms.

6.9 SPIRITUAL VALUES OF SUSTAINABLE DESIGN IN DEVELOPMENT AND ARCHITECTURE

Development of environmental design (green or sustainable design) based upon an idea of buildings, which ensure an environment maintains the user's health, uses less energy, and lowers its negative effect. This development will not be of any use if done away from community culture and life style.

If a decrease in energy use in building is done to use in other activities then the design direction will not achieve its goal. It is necessary to bind design concept with main principles, which are predominate in many cultures all over the world. Values such as greed and a tendency to ensure infinite development reflect a kind of violence when we are isolated from life's network. We justify destroying nature in order to satisfy our infinite materialistic desires. It is a suicidal tendency, which will push humanity, during the next twenty five years to consume more than already exists on the planet.

The existence of many low-level values results in many social diseases, such as violence, drug addiction, crime, and child abuse, violence against women, family destruction, indifference, homelessness, education avoidance, and poverty. These reflect a lack of spiritual and psychological immunity.

Research has showed that immunity breakdown comes from a feeling of lack of values. A lack of respect evolves when there is no opportunity for the individual to be useful and valuable to the family and community. All these are spiritual and psychological elements, which enrich skills, self-respect, mutual respect and a feeling of being valuable to the community. This work satisfies spiritual needs and helps the continuity of ourselves and the world of which we dream. This internal result of work and its psychological yield is more useful and beneficial than its external yield.

Sustainable design requires changes in our thoughts and actions during coming years and the building of foundations, which prevent growth of harmonious consumption values within the community of greed and violence. It is important to have concepts and values which help in the development of a spiritual basis in our life and community, such as values assuring work enrichment and obtaining happiness by least consumption and less effort for wealth.

The development considered necessary to help poor people has resulted in a concentration of wealth among rich people and no improvement in poor people's status. There is a need for justice in distributing earnings to put an end to poverty and support all. Additionally, stabilizing development rates and ensuring justice by ending injustice may lead to a decrease in the consumption of energy, materials, financing and human cost.

The gained wisdom from the generations of many cultures on this planet has emphasized need for true goals. These lead to compassion, forgiving, strength of spiritual aspects and a desire to give to others a determination of fair solutions to cover all. This also leads to solve problems, an emphasis on justice, honesty, responsibility, respect, dignity and the development of environmental continuity to support all people's needs and living.

6.10 OUTCOME OF THE STUDY

Libya does not have any housing policy for affordable houses that cater for the need of the people. Libya does not have a housing policy as a guideline as procedures for building new homes for the people. The other problem statement which the Libyan people are facing is people unable to rent, buy or build a house due to the high real estate prices of building materials.

In addition to highlight these statements and how to provide a proper solution, is to define affordable household in Libya. More affordable houses need to be provided in Libya. By focusing on how the government has to provide a new development scheme, in and near the cities to accommodate the large number of middle income group recorded and listed to own a house from the government. New plans have to be adopted for the citizens to reduce the burden for these numbers of citizen applicants for land, apartments and housing. This will succeed if the government cooperates with the private companies to build homes that can provide better living. Building affordable housing will ensure the sustainability of construction and development of public houses in the future. The study focuses on determining the appropriate rental or purchases of house, by monthly payment affordable by the middle income public. Lastly to discuss how the government can provide lands for the people through creating a new city planning.

This thesis develops guidelines for affordable housing policies in Libya, by establishing an appropriate development plan, suitable for middle income people in Libya, and by establishing guidelines towards successful affordable housing through the needs of the people.

This thesis identifies proper building materials and technology, for the affordable housing in Libya and the selection of material that is available and affordable in the country. The local mud is a natural material available in the Libyan Desert since time immemorial. This kind of material can help to reduce the cost; it saves energy and most of all it is affordable.

The Libyan citizens should have the right to own a piece of land, to build a house or an apartment for rental or ownership if he is capable of doing so. All these status must be provided to ensure justice in the distribution of land ownership. The Housing Development Associations Community that should be established all over the country.

6.11 CONCLUSION

This thesis proposes a guideline to solve the affordable housing issues in Libya. The Libyan government should provide housing which is sociable responsive and economical taking into accounts the use of proper materials. These guidelines can be used to develop houses, which are affordable to the Libyan people. The housing guideline covers aspects such as technology, planning and cost of the house. Based on this study, it is observed that the middle income residents of Libya need to have their housing and infrastructure problems solved. The people need contributions from the government to provide housing, not just for the middle income group but also for the low income group. The residents are privacy conscious and would prefer more spacious housing and well planned environment to reduce the stress on existing infrastructure and improve environmental quality.

The study provides some of the possible guidance for the government to solve the housing problem in Libya. Through the provision of land by the government and the cooperation between the government and the private sectors the middle income groups can own or rent houses through the one time pay off or feasible monthly payment system suitable for their income level. The solutions for the housing problems include proper design of houses, which are sociable and economically responsive. It has to include the use of proper materials affordable by the people in Libya. In addition, in order to realize the affordable housing objectives, more procedures need to be flexible and cover strategies of socio, economic, cultural, material, technology and regional development, based on a democratic process. Therefore, it is necessary to pursue legislative and procedural reforms. These reforms should be enhanced by measures such as public awareness, capacity building and technical and financial support.

All these guidelines and procedures have to be enforced by the Housing Development Association Community. There should be cooperation between the government and the private companies. The Associations can help and serve the Libyan population. The guidelines and procedures developed in this thesis should be enforced by the Associations. The cooperation between the government and the private companies in Libya will help to enhance the enforcement of the guidelines to solve affordable housing issues in Libya.



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APPENDIX A

RESEARCH QUESTIONS

Housing problems questions on selected areas in Benghazi city.

Note: Please Tick (X) in the Appropriate Place, and do not Tick more than one Option.

Part One: Personal Details

1. How old are you?

- i- 20- 40 years old ()
- ii- 40- 60 years old ()
- iii- Above 60 years old ()

2. Your house that you live in, is it:

- i- Owned ()
- ii- Rented ()

3. If your house is rented, how much is the rent in Libyan Dinar?

- i- From 100 LD to 300 LD ()
- ii- From 400 LD to 800 LD ()
- iii- Above 800 LD ()
- iv- Less than 100 LD ()

4. If your house is rented, will you be able to build a house for your family?

- i- Yes ()
- ii- No ()

5. Your Job.

- i- Government employee ()
- ii- Unemployed ()
- iii- Private sector ()
- iv- Mixed ()

6. What is the monthly income for your family?

- i- Between 100 and 300 LD ()
- ii- Between 400 and 800 LD ()
- iii- Between 900 and 1500 LD ()
- iv- Above 1600 LD ()

7. Do your children live with you in the same house after getting married?

- i- Yes ()
- ii- No ()

8. How many in the family are in the following level of education?

- i- primary school ()
- ii- Secondary school ()
- iii- University ()
- iv- Other (Specify) ()

Part Two: House Details

1. What kind of a house do you live?

- i- Privet apartment ()
- ii- Government apartment ()
- iii- Privet house ()
- iv- Government house ()

2. In what year your house was built?

- i- Between year 1960 – 1969 ()
- ii- Between year 1970 – 1979 ()
- iii- Between year 1980 – 1989 ()
- iv- Between year 1990 – 1999 ()

3. How many rooms are there in your house?

- i- Two rooms ()
- ii- Three rooms ()
- iii- Four rooms ()

4. Is the number of rooms and spaces in your adequate for your family?

- i- Yes ()
- ii- No ()

5. Do you need moor rooms?

- i- Yes ()
- ii- No ()

6. What is the level of privacy in your house?

- i- Complete privacy ()
- ii- Partial privacy ()
- iii- No privacy ()

7. Are, sunlight, ventilation and good airflow in your house?

- i- Everywhere ()
- ii- In most places ()
- iii- In some places ()
- iv- Nothing ()

APPENDIX B

THE LOCATION OF HOUSING AREA ITSELF, AND THE CHARACTERISTICS OF THAT ARE BEING DETAILED (TYPE OF HOUSING) IN BENGHAZI AL-MADINAH AREA 30940 PEOPLE, 10% IS 3094 PEOPLE

Table A.1 Showing the Age of the Owner in these areas
Answers to Q1 in Part One

Area Name		
Age	Benghazi Al-Madinah	
Status	No.	%
From 20-40 years old	340	11
From 40-60 years old	2228	72
Above than 60 years old	526	17
Total	3094	100

Table A.2 Showing the Relationship between the area Location of the Housing Units
and the Ownership Status
Answers to Q 2 in Part One

Area Name		
Ownership	Benghazi Al-Madinah	
Status	No.	%
Owned	2599	84
Rented	495	16
Total	3094	100

Table A.3 Showing the Relationship between the area Location and the Kind of the Living House.

Answers to Q 1 in Part Two

Area Name		
Kind of House	Benghazi Al-Madinah	
Status	No.	%
Apartment	3032	89
House	62	2
Total	3094	100

Table A.5 Showing the Relationship between the area Location and the Level of Privacy Available.

Answers to Q 6 in Part Two

Area Name		
Privacy	Benghazi Al-Madinah	
Status	No.	%
Complete privacy	124	4
Partial privacy	2351	76
No privacy	619	20
Total	3094	100

Table A.6 Showing the Relationship between the area Location and the Number of Rooms in the House.

Answers to Q 3 in Part two

Area Name		
Privacy	Benghazi Al-Madinah	
Status	No.	%
Two rooms	340	11
Three rooms	2754	89
Four rooms	0	0
Total	3094	100

Table A.7 Showing the Relationship between the area Location and the Adequate of the Number of Rooms in the House.

Answers to Q 4 in Part Two

Area Name		
Adequate of the Number Of Rooms	Benghazi Al-Madinah	
Status	No.	%
Yes	433	14
No	2661	86
Total	3094	100

Table A.8 Showing the Relationship between the area Location and the Needing More Rooms.

Answers to Q 5 in Part Two

Area Name		
Benghazi Al-Madinah		
Needing More Rooms		
Status	No.	%
Yes	2692	87
No	402	13
Total	3094	100

Table A.9 Showing the Relationship between the areas Location and the Sunlight and Ventilation in the Housing Unit

Answers to Q 7 in Part Two

Area Name		
Benghazi Al-Madinah		
Sunlight and Ventilation		
Status	No.	%
Every where	1764	57
In most places	866	28
In some places	464	15
No thing	0	0
Total	3094	100

APPENDIX C

THE SOCIAL CHARACTERISTICS OF THE AREAS UNDER STUDY (ORIGIN, LEVEL OF EDUCATION, NUMBER OF FAMILY MEMBERS, JOB OF THE FAMILY BREADWINNER, ACTIVITIES, ETC).

Table C.3 Showing the Relationship between the area and the (Children Living in the
Same House after Marriage)
Answers to Q 10 in Part One

Area Name		
Living in the Same House	Benghazi Al-Madinah	
Status	No.	%
Yes	2259	73
No	835	27
Total	3094	100

Table C.5 Showing the Relationship between the area and the Occupation.
Answers to Q 5 in Part One

Area Name		
Occupation	Benghazi Al-Madinah	
Status	No.	%
Government employee	1238	40
Unemployed	62	2
Private Sector	217	7
Mixed	1577	51
Total	3094	100

APPENDIX D

THE RELATIONSHIP BETWEEN AREA LOCATION AND ECONOMIC CHARACTERISTICS SUCH AS: FAMILY INCOME, RENT, ABILITY TO BUILD, SERVICES PAYMENT, ETC.

Table D.1 Showing Economic Characteristics: Family Income.

Answers to Q 6 in Part One

Area Name		
Family Income	Benghazi Al-Madinah	
Status	No.	%
Between 100-300 LD	1887	61
Between 400-800 LD	712	23
Between 900-1500 LD	340	11
Above than 1600 LD	155	5
Total	3094	100

Table D.2 Showing Economic Characteristics: Rent Paid

Answers to Q 3 in Part One

Area Name		
Rent Paid	Benghazi Al-Madinah	
Status	No.	%
From 100-300 LD	2568	83
From 400-800 LD	526	17
Above 800 LD	0	0
Less than 100LD	0	0
Total	3094	100

Table D.3 Showing Economic Characteristics: Ability to Build Own House.
Answers to Q 4 in Part One

Area Name		
Ability to Build Own House		
Benghazi Al-Madinah		
Status	No.	%
Yes	681	22
No	2413	78
Total	3094	100



APPENDIX E

THE LOCATION OF HOUSING AREA ITSELF, AND THE CHARACTERISTICS OF THAT ARE BEING DETAILED (TYPE OF HOUSING) IN AL-SLMANY, RAS ABYDAH, SIDY HSEEN AND SIDY ABYDAH AREA 33834 PEOPLE IN AL-SLMANY AREA, 10% IS 3383 PEOPLE

Table A.1 Showing the Age of the Owner in these areas
Answers to Q1 in Part One

Area Name		
Age	Al-Slmany, Ras Abydah, Sidy Hseen and Sidy Abydah	
Status	No.	%
From 20-40 years old	2267	67
From 40-60 years old	778	23
Above than 60 years old	338	10
Total	3383	100

Table A.2 Showing the Relationship between the area Location of the Housing Units
and the Ownership Status

Answers to Q 2 in Part One

Area Name		
Type of the house	Al-Slmany, Ras Abydah, Sidy Hseen and Sidy Abydah	
Status	No.	%
Owned	2502	71
Rented	981	29
Total	3383	100

Table A.3 Showing the Relationship between the Kinds of the Living House
Answers to Q 1 in Part Two

Area Name		
Kind of the house	Al-Slmany, Ras Abydah, Sidy Hseen and Sidy Abydah	
Status	No.	%
Privet apartment	846	25
Government apartment	473	14
Privet house	2064	61
Government house	0	0
Total	3383	100

Table A.5 Showing the Relationship between the area Location and the Level of
Privacy Available
Answers to Q 6 in Part Two

Area Name		
Level of privacy	Al-Slmany, Ras Abydah, Sidy Hseen and Sidy Abydah	
Status	No.	%
Complete privacy	338	10
Partial privacy	2131	63
No privacy	914	27
Total	3383	100

Table A.6 Showing the Relationship between the area Location and the Number of Rooms in the House
Answers to Q 3 in Part Two

Area Name		
Number of rooms	Al-Slmany, Ras Abydah, Sidy Hseen and Sidy Abydah	
Status	No.	%
Two rooms	541	16
Three rooms	2436	72
Four rooms	406	12
Total	3383	100

Table A.7 showing the Relationship between the area Location and the Adequate of the Number of the Rooms in the House
Answers to Q 4 in Part Two

Area Name		
Adequate of room number	Al-Slmany, Ras Abydah, Sidy Hseen and Sidy Abydah	
Status	No.	%
Yes	880	26
No	2503	74
Total	3383	100

Table A.8 Showing the Relation between the area Location and the Needing More Rooms
Answers to Q 5 in Part Two

Area Name		
Needing more rooms	Al-Slmany, Ras Abydah, Sidy Hseen and Sidy Abydah	
Status	No.	%
Yes	2537	75
No	846	25
Total	3383	100

Table A.9 Showing the Relation between the areas Location and the Sunlight and Ventilation in the Housing Unit
Answers to Q 7 in Part Two

Area Name		
Sunlight and ventilation	Al-Slmany, Ras Abydah, Sidy Hseen and Sidy Abydah	
Status	No.	%
Every where	406	12
In most places	1793	53
In some places	1184	35
No thing	0	0
Total	3383	100

APPENDIX F

THE SOCIAL CHARACTERISTICS OF THE AREA UNDER STUDY. (ORIGIN, LEVEL OF EDUCATION, NUMBER OF FAMILY MEMBERS, JOB OF THE FAMILY BREADWINNER, ACTIVITIES, ETC).

Table C.3 Showing the Relationship between the area and the (Children Living in the
Same House after Marriage)
Answers to Q 10 in Part One

Area Name		
Living in the Same House	Al-Slmany, Ras Abydah, Sidy Hseen and Sidy Abydah	
Status	No.	%
Yes	2605	77
No	778	23
Total	3383	100

Table C.5 Showing the Relationship between the area and the Occupation
Answers to Q 5 in Part One

Area Name		
Occupation	Al-Slmany, Ras Abydah, Sidy Hseen and Sidy Abydah	
Status	No.	%
Government employee	846	25
Unemployed	1319	39
Private sector	304	9
Mixed	914	27
Total	3383	100

APPENDIX G

THE RELATIONSHIP BETWEEN AREA LOCATION AND ECONOMIC CHARACTERISTICS SUCH AS: FAMILY INCOME, RENT, ABILITY TO BUILD, SERVICES PAYMENT, ETC.

Table D.1 showing Economic Characteristics: Family Income
Answers to Q 6 in Part One

Area Name		
Family Income	Al-Slmany, Ras Abydah, Sidy Hseen and Sidy Abydah	
Status	No.	%
Between 100-300 LD	2063	61
Between 400-800 LD	710	21
Between 900-1500 LD	372	11
Above than 1600 LD	238	7
Total	3383	100

Table D.2 Showing Economic Characteristics: Rent Paid
Answers to Q 3 in Part One

Area Name		
Rent Paid	Al-Slmany, Ras Abydah, Sidy Hseen and Sidy Abydah	
Status	No.	%
From 100-300 LD	1962	68
From 400-800 LD	1353	30
Above than 800 LD	68	2
Les than 100 LD	0	0
Total	3383	100

Table D.3 Showing Economic Characteristics: ability to Build Own House
Answers to Q 4 in Part One

Area Name		
Build Own House	Al-Slmany, Ras Abydah, Sidy Hseen and Sidy Abydah	
Status	No.	%
Yes	744	23
No	2639	77
Total	3383	100



APPENDIX H

THE LOCATION OF HOUSING AREA ITSELF, AND THE CHARACTERISTICS OF THAT ARE BEING DETAILED (TYPE OF HOUSING) IN AL-SABRY AREA 30056 PEOPLE IN AL-SABRY AREA, 10% IS 3005 PEOPLE

Table A.1 Showing the Age of the Owner in these Areas.

Answers to Q 1 in Part One

Area Name		
Age of owner	Al-Sabry	
Status	No.	%
From 20-40 years old	691	23
From 40-60 years old	1743	58
Above than 60 years old	571	19
Total	3005	100

Table A.2 Showing the Relationship between the area Location and the Type of the
Housing

Answers to Q 2 in Part One

Area Name		
Type of the Housing	Al-Sabry	
Status	No.	%
Owned	2284	76
Rented	721	24
Total	3005	100

Table A.3 Showing the Relationship between the kinds of the living house
Answers to Q 1 in Part Two

Area Name		
Kind of the living	Al-Sabry	
Status	No.	%
Privet apartment	0	0
Government apartment	120	4
Privet house	2885	96
Government house	0	0
Total	3005	100

Table A.5 Showing the Relationship between the area Location and the Level of
Privacy Available
Answers to Q 6 in Part two

Area Name		
Level of Privacy	Al-Sabry	
Status	No.	%
Complete privacy	361	12
Partial privacy	2013	67
No privacy	631	21
Total	3005	100

Table A.6 Showing the Relationship between area location and the Number of Rooms
in the House

Answers to Q 3 in Part Two

Area Name		
Number of Rooms	Al-Sabry	
Status	No.	%
Two rooms	962	32
Three rooms	1923	64
Four rooms	120	4
Total	3005	100

Table A.7 Showing the Relationship between the area Location and the Adequate of
the Number of the Rooms in the House

Answers to Q 4 in Part Two

Area Name		
Adequate of the Number	Al-Sabry	
Status	No.	%
Yes	1893	63
No	1112	37
Total	3005	100

Table A.8 Showing the Relationship between the area Location and the Needing More Rooms
Answers to Q 5 in Part Two

Area Name		
Needing More Rooms	Al-Sabry	
Status	No.	%
Yes	1983	66
No	1022	34
Total	3005	100

Table A.9 Showing the Relationship between the areas Location and the Sunlight and Ventilation in Housing Unit
Answers to Q 7 in Part Two

Area Name		
Sunlight and Ventilation	Al-Sabry	
Status	No.	%
Every where	391	13
In most places	751	25
In some places	1863	62
No thing	0	0
Total	3005	100

APPENDIX I

THE SOCIAL CHARACTERISTICS OF THE AREAS UNDER STUDY. (ORIGIN, LEVEL OF EDUCATION, NUMBER OF FAMILY MEMBERS, JOB OF THE FAMILY BREADWINNER, ACTIVITIES, ETC).

Table C.3 Showing the Relationship between the area and the (Children Living in the same House after Marriage)
Answers to Q 10 in Part One

Area Name		
Living in the same House		
Status	No.	%
Yes	2434	81
No	571	19
Total	3005	100

Table C.5 Showing the Relationship between the area and the Occupation
Answers to Q 5 in Part One

Area Name		
Occupation		
Status	No.	%
Government employee	1833	61
Unemployed	511	17
Private sector	571	19
Mixed	90	3
Total	3005	100

APPENDIX J

THE RELATIONSHIP BETWEEN AREA LOCATION AND ECONOMIC CHARACTERISTICS SUCH AS: FAMILY INCOME, RENT, ABILITY TO BUILD, SERVICES PAYMENT, ETC.

Table D.1 Showing Economic Characteristics: Family Income
Answers to Q 6 in Part One

Area Name		
Family Income	Al-Sabry	
Status	No.	%
Between 100-300 LD	1353	65
Between 400-800 LD	1262	22
Between 900-1500 LD	270	9
Above than 1600 LD	120	4
Total	3005	100

Table D.2 Showing Economic Characteristics: Rent Paid
Answer to Q 3 in Part One

Area Name		
Rent Paid	Al-Sabry	
Status	No.	%
From 100-300 LD	1833	66
From 400-800 LD	1022	29
Above than 800 LD	90	3
Less than 100 LD	60	2
Total	3005	100

Table D.3 Showing Economic Characteristics: Ability to Build Own House
Answers to Q 4 in Part One

Area Name		
Ability to Build Own House		Al-Sabry
Status	No.	%
Yes	331	11
No	2674	89
Total	3005	100



APPENDIX K

THE LOCATION OF HOUSING AREA ITSELF AND THE CHARACTERISTICS OF THAT ARE BEING DETAILED (TYPE OF HOUSING) IN AL-BRKAH AND AL-KEESH AREA 76186 PEOPLE IN AL-BRKAH AND AL-KEESH AREA, 10% IS 7618 PEOPLE

Table A.1 Showing the Age of the Owner in these areas.

Answers to Q 1 in Part One

Area Name		
Age of owner	Al-Brkah and Al-keesh	
Status	No.	%
From 20-40 years old	2895	38
From 40-60 years old	3200	42
Above than 60 years old	1523	20
Total	7618	100

Table A.2 Showing the Relationship between the area Location and the Type of the
Housing

Answers to Q 2 in Part One

Area Name		
Type of the Housing	Al-Brkah and Al-keesh	
Status	No.	%
Owned	6323	83
Rented	1295	17
Total	7618	100

Table A.3 Showing the Relationship between the kinds of the living house
Answers to Q 1 in Part Two

Area Name		
Kind of the living	Al-Brkah and Al-keesh	
Status	No.	%
Privet apartment	2972	39
Government apartment	3123	41
Privet house	609	8
Government house	914	12
Total	7618	100

Table A.5 Showing the Relationship between the area Location and the Level of
Privacy Available
Answers to Q 6 in Part two

Area Name		
Level of Privacy	Al-Brkah and Al-keesh	
Status	No.	%
Complete privacy	533	7
Partial privacy	4799	63
No privacy	2286	30
Total	7618	100

Table A.6 Showing the Relationship between area location and the Number of Rooms
in the House

Answers to Q 3 in Part Two

Area Name		
Number of Rooms	Al-Brkah and Al-keesh	
Status	No.	%
Two rooms	2285	30
Three rooms	5104	67
Four rooms	229	3
Total	7618	100

Table A.7 Showing the Relationship between the area Location and the Adequate of
the Number of the Rooms in the House

Answers to Q 4 in Part Two

Area Name		
Adequate of the Number	Al-Brkah and Al-keesh	
Status	No.	%
Yes	1981	26
No	5637	74
Total	7618	100

Table A.8 Showing the Relationship between the area Location and the Needing More Rooms
Answers to Q 5 in Part Two

Area Name		
Needing More Rooms	Al-Brkah and Al-keesh	
Status	No.	%
Yes	6018	79
No	1600	21
Total	7618	100

Table A.9 Showing the Relationship between the area Location and the Sunlight and Ventilation in Housing Unit
Answers to Q 7 in Part Two

Area Name		
Sunlight and Ventilation	Al-Brkah and Al-keesh	
Status	No.	%
Every where	1524	20
In most places	4114	54
In some places	1980	26
No thing	0	0
Total	7618	100

APPENDIX L

THE SOCIAL CHARACTERISTICS OF THE AREAS UNDER STUDY (ORIGIN, LEVEL OF EDUCATION, NUMBER OF FAMILY MEMBERS, JOB OF THE FAMILY BREADWINNER, ACTIVITIES, ETC).

Table C.3 Showing the Relationship between the area and the (Children Living in the
same House after Marriage)
Answers to Q 10 in Part One

Area Name		
Living in the same House	Al-Brkah and Al-keesh	
Status	No.	%
Yes	6018	79
No	1600	21
Total	7618	100

Table C.5 Showing the Relationship between the area and the Occupation
Answers to Q 5 in Part One

Area Name		
Occupation	Al-Brkah and Al-keesh	
Status	No.	%
Government employee	6171	81
Unemployed	152	2
Private sector	686	9
Mixed	609	8
Total	7618	100

APPENDIX M

THE RELATIONSHIP BETWEEN AREA LOCATION AND ECONOMIC CHARACTERISTICS SUCH AS: FAMILY INCOME, RENT, ABILITY TO BUILD, SERVICES PAYMENT, ETC.

Table D.1 Showing Economic Characteristics: Family Income

Answers to Q 6 in Part One

Area Name		
Family Income	Al-Brkah and Al-keesh	
Status	No.	%
Between 100-300 LD	4495	69
Between 400-800 LD	2133	18
Between 900-1500 LD	762	10
Above than 1600 LD	228	3
Total	7618	100

Table D.2 Showing Economic Characteristics: Rent Paid

Answer to Q 3 in Part One

Area Name		
Rent Paid	Al-Brkah and Al-keesh	
Status	No.	%
From 100-300 LD	4647	69
From 400-800 LD	2971	31
Above than 800 LD	0	0
Less than 100 LD	0	0
Total	7618	100

Table D.3 Showing Economic Characteristics: Ability to Build Own House
Answers to Q 4 in Part One

Area Name		
Ability to Build Own House	Al-Brkah and Al-keesh	
Status	No.	%
Yes	1295	17
No	6323	83
Total	7618	100



APPENDIX N

THE LOCATION OF HOUSING AREA ITSELF, AND THE CHARACTERISTICS OF THAT ARE BEING DETAILED (TYPE OF HOUSING) IN AL-NWAGYEH, AL-MEGZAH, SHWHADA AL-SLAWLY AND AL-THORAH AL-SHABEYAH AREA 29202 PEOPLE IN AL-NWAGYEH, AL-MEGZAH, SHWHADA AL-SLAWLY AND AL-THORAH AL-SHABEYAH AREA, 10% IS 2920 PEOPLE

Table A.1 Showing the Age of the Owner in these areas.

Answers to Q 1 in Part One

Area Name		
Age of owner	Al-Nwagyeh, Al-Megzah, Shwhada Al-Slawly and Al-Thorah Al-Shabeyah	
Status	No.	%
From 20-40 years old	672	23
From 40-60 years old	1314	45
Above than 60 years old	934	32
Total	2920	100

Table A.2 Showing the Relationship between the area Location and the Type of the
Housing

Answers to Q 2 in Part One

Area Name		
Type of the Housing	Al-Nwagyeh, Al-Megzah, Shwhada Al-Slawly and Al-Thorah Al-Shabeyah	
Status	No.	%
Owned	2599	89
Rented	321	11
Total	2920	100

Table A.3 Showing the Relationship between the kinds of the living house
Answers to Q 1 in Part Two

Area Name		
Kind of the living	Al-Nwagyeh, Al-Megzah, Shwhada Al-Slawly and Al-Thorah Al-Shabeyah	
Status	No.	%
Privet apartment	234	8
Government apartment	847	29
Privet house	1781	61
Government house	58	2
Total	2920	100

Table A.5 Showing the Relationship between the area Location and the Level of
Privacy Available
Answers to Q 6 in Part two

Area Name		
Level of Privacy	Al-Nwagyeh, Al-Megzah, Shwhada Al-Slawly and Al-Thorah Al-Shabeyah	
Status	No.	%
Complete privacy	175	6
Partial privacy	1548	53
No privacy	1197	41
Total	2920	100

Table A.6 Showing the Relationship between area location and the Number of Rooms
in the House

Answers to Q 3 in Part Two

Area Name		
Number of Rooms	Al-Nwagyeh, Al-Megzah, Shwhada Al-Slawly and Al-Thorah Al-Shabeyah	
Status	No.	%
Two rooms	730	25
Three rooms	2132	73
Four rooms	58	2
Total	2920	100

Table A.7 Showing the Relationship between the area Location and the Adequate of
the Number of the Rooms in the House

Answers to Q 4 in Part Two

Area Name		
Adequate of the Number	Al-Nwagyeh, Al-Megzah, Shwhada Al-Slawly and Al-Thorah Al-Shabeyah	
Status	No.	%
Yes	701	24
No	2219	76
Total	2920	100

Table A.8 Showing the Relationship between the area Location and the Needing More Rooms
Answers to Q 5 in Part Two

Area Name		
Needing More Rooms	Al-Nwagyeh, Al-Megzah, Shwhada Al-Slawly and Al-Thorah Al-Shabeyah	
Status	No.	%
Yes	2190	75
No	730	25
Total	2920	100

Table A.9 Showing the Relationship between the area Location and the Sunlight and Ventilation in Housing Unit
Answers to Q 7 in Part Two

Area Name		
Sunlight and Ventilation	Al-Nwagyeh, Al-Megzah, Shwhada Al-Slawly and Al-Thorah Al-Shabeyah	
Status	No.	%
Every where	438	15
In most places	1080	37
In some places	1343	46
No thing	59	2
Total	2920	100

APPENDIX O

THE SOCIAL CHARACTERISTICS OF THE AREAS UNDER STUDY (ORIGIN, LEVEL OF EDUCATION, NUMBER OF FAMILY MEMBERS, JOB OF THE FAMILY BREADWINNER, ACTIVITIES, ETC).

Table C.3 Showing the Relationship between the area and the (Children Living in the
same House after Marriage)
Answers to Q 10 in Part One

Area Name		
Living in the same House		
Al-Nwagyeh, Al-Megzah, Shwhada Al-Slawly and Al-Thorah Al-Shabeyah		
Status	No.	%
Yes	2511	86
No	409	14
Total	2920	100

Table C.5 Showing the Relationship between the area and the Occupation
Answers to Q 5 in Part One

Area Name		
Occupation		
Al-Nwagyeh, Al-Megzah, Shwhada Al-Slawly and Al-Thorah Al-Shabeyah		
Status	No.	%
Government employee	2307	79
Unemployed	234	8
Private sector	321	11
Mixed	58	2
Total	2920	100

APPENDIX P

THE RELATIONSHIP BETWEEN AREA LOCATION AND ECONOMIC CHARACTERISTICS SUCH AS: FAMILY INCOME, RENT, ABILITY TO BUILD, SERVICES PAYMENT, ETC.

Table D.1 Showing Economic Characteristics: Family Income

Answers to Q 6 in Part One

Area Name		
Family Income	Al-Nwagyeh, Al-Megzah, Shwhada Al-Slawly and Al-Thorah Al-Shabeyah	
Status	No.	%
Between 100-300 LD	1431	62
Between 400-800 LD	1226	29
Between 900-1500 LD	234	8
Above than 1600 LD	29	1
Total	2920	100

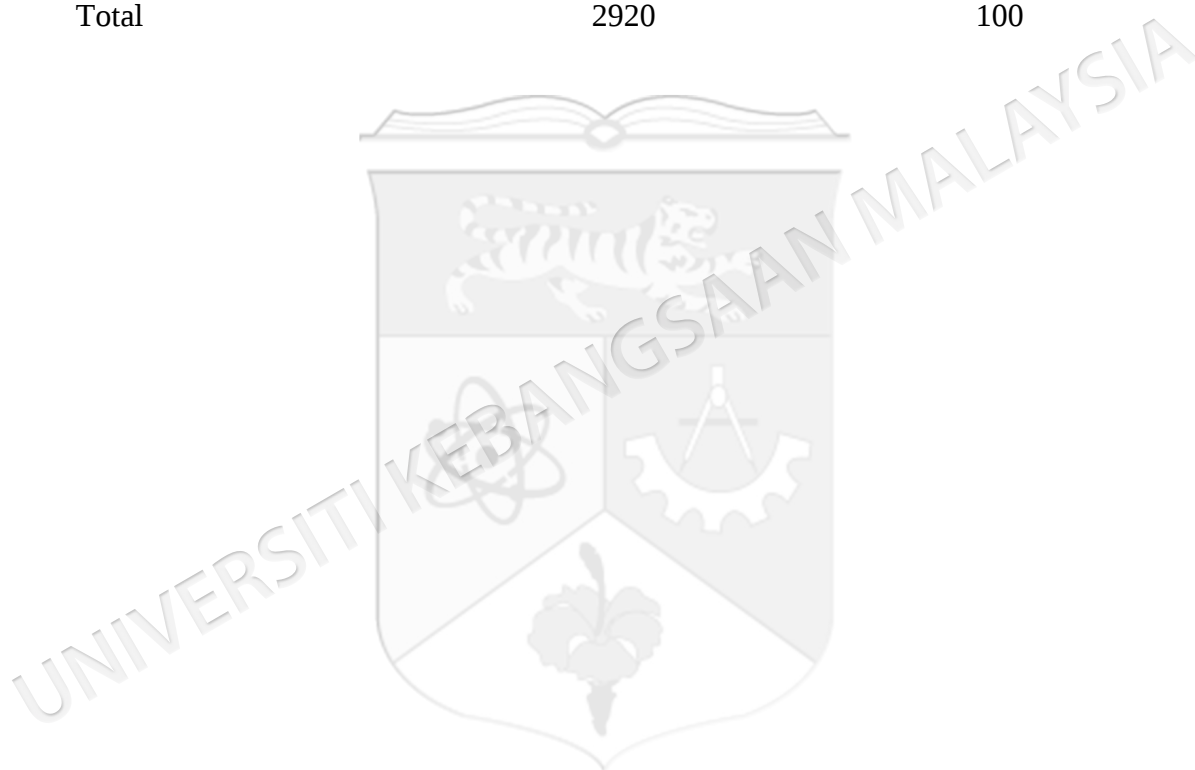
Table D.2 Showing Economic Characteristics: Rent Paid

Answer to Q 3 in Part One

Area Name		
Rent Paid	Al-Nwagyeh, Al-Megzah, Shwhada Al-Slawly and Al-Thorah Al-Shabeyah	
Status	No.	%
From 100-300 LD	1898	65
From 400-800 LD	788	27
Above than 800 LD	0	0
Less than 100 LD	234	8
Total	2920	100

Table D.3 Showing Economic Characteristics: Ability to Build Own House
Answers to Q 4 in Part One

Area Name		
Ability to Build Own House	Al-Nwagyeh, Al-Megzah, Shwhada Al-Slawly and Al-Thorah Al-Shabeyah	
Status	No.	%
Yes	263	9
No	2657	91
Total	2920	100



APPENDIX Q

THE LOCATION OF HOUSING AREA ITSELF AND THE CHARACTERISTICS OF THAT ARE BEING DETAILED (TYPE OF HOUSING) IN AL-KWYFAH, AL-MKTAR, AL-AROBA AND SIDY KALYFA AREA 63943 PEOPLE IN AL-KWYFAH, AL-MKTAR, AL-AROBA AND SIDY KALYFA AREA, 10% IS 6394 PEOPLE

Table A.1 Showing the Age of the Owner in these areas.

Answers to Q 1 in Part One

Area Name		
Age of owner	Al-Kwyfah, Al-Mktar, Al-Aroba and Sidy Kalyfa	
Status	No.	%
From 20-40 years old	1279	20
From 40-60 years old	3772	59
Above than 60 years old	1343	21
Total	6394	100

Table A.2 Showing the Relationship between the area Location and the Type of the
Housing

Answers to Q 2 in Part One

Area Name		
Type of the Housing	Al-Kwyfah, Al-Mktar, Al-Aroba and Sidy Kalyfa	
Status	No.	%
Owned	5499	86
Rented	895	14
Total	6394	100

Table A.3 Showing the Relationship between the kinds of the living house
Answers to Q 1 in Part Two

Area Name		
Kind of the living	Al-Kwyfah, Al-Mktar, Al-Aroba and Sidy Kalyfa	
Status	No.	%
Privet apartment	703	11
Government apartment	1407	22
Privet house	4284	67
Government house	0	0
Total	6394	100

Table A.5 Showing the Relationship between the area Location and the Level of
Privacy Available
Answers to Q 6 in Part two

Area Name		
Level of Privacy	Al-Kwyfah, Al-Mktar, Al-Aroba and Sidy Kalyfa	
Status	No.	%
Complete privacy	703	11
Partial privacy	3964	62
No privacy	1727	27
Total	6394	100

Table A.6 Showing the Relationship between area location and the Number of Rooms
in the House

Answers to Q 3 in Part Two

Area Name		
Number of Rooms	Al-Kwyfah, Al-Mktar, Al-Aroba and Sidy Kalyfa	
Status	No.	%
Two rooms	2110	33
Three rooms	4028	63
Four rooms	256	4
Total	6394	100

Table A.7 Showing the Relationship between the area Location and the Adequate of
the Number of the Rooms in the House

Answers to Q 4 in Part Two

Area Name		
Adequate of the Number	Al-Kwyfah, Al-Mktar, Al-Aroba and Sidy Kalyfa	
Status	No.	%
Yes	1215	19
No	5179	81
Total	6394	100

Table A.8 Showing the Relationship between the area Location and the Needing More Rooms
Answers to Q 5 in Part Two

Area Name		
Needing More Rooms	Al-Kwyfah, Al-Mktar, Al-Aroba and Sidy Kalyfa	
Status	No.	%
Yes	5691	89
No	703	11
Total	6394	100

Table A.9 Showing the Relationship between the area Location and the Sunlight and Ventilation in Housing Unit
Answers to Q 7 in Part Two

Area Name		
Sunlight and Ventilation	Al-Kwyfah, Al-Mktar, Al-Aroba and Sidy Kalyfa	
Status	No.	%
Every where	448	7
In most places	2046	32
In some places	3389	53
No thing	511	8
Total	6394	100

APPENDIX R

THE SOCIAL CHARACTERISTICS OF THE AREAS UNDER STUDY (ORIGIN, LEVEL OF EDUCATION, NUMBER OF FAMILY MEMBERS, JOB OF THE FAMILY BREADWINNER, ACTIVITIES, ETC).

Table C.3 Showing the Relationship between the area and the (Children Living in the
same House after Marriage)
Answers to Q 10 in Part One

Area Name		
Living in the same House	Al-Kwyfah, Al-Mktar, Al-Aroba and Sidy Kalyfa	
Status	No.	%
Yes	5691	89
No	703	11
Total	6394	100

Table C.5 Showing the Relationship between the area and the Occupation
Answers to Q 5 in Part One

Area Name		
Occupation	Al-Kwyfah, Al-Mktar, Al-Aroba and Sidy Kalyfa	
Status	No.	%
Government employee	4796	75
Unemployed	703	11
Private sector	639	10
Mixed	256	4
Total	6394	100

APPENDIX S

THE RELATIONSHIP BETWEEN AREA LOCATION AND ECONOMIC CHARACTERISTICS SUCH AS: FAMILY INCOME, RENT, ABILITY TO BUILD, SERVICES PAYMENT, ETC.

Table D.1 Showing Economic Characteristics: Family Income

Answers to Q 6 in Part One

Area Name		
Family Income	Al-Kwyfah, Al-Mktar, Al-Aroba and Sidy Kalyfa	
Status	No.	%
Between 100-300 LD	3399	63
Between 400-800 LD	2548	30
Between 900-1500 LD	447	7
Above than 1600 LD	0	0
Total	6394	100

Table D.2 Showing Economic Characteristics: Rent Paid

Answer to Q 3 in Part One

Area Name		
Rent Paid	Al-Kwyfah, Al-Mktar, Al-Aroba and Sidy Kalyfa	
Status	No.	%
From 100-300 LD	4284	67
From 400-800 LD	1790	28
Above than 800 LD	0	0
Less than 100 LD	320	5
Total	6394	100

Table D.3 Showing Economic Characteristics: Ability to Build Own House
Answers to Q 4 in Part One

Area Name		
Ability to Build Own House	Al-Kwyfah, Al-Mktar, Al-Aroba and Sidy Kalyfa	
Status	No.	%
Yes	512	8
No	5882	92
Total	6394	100



APPENDIX T

INFORMATION PERTAINING OF HOUSING IN THE OLD TOWN OF GHADAMES

These questions was conducted on 50 sample families that used to live in the old town area of Ghadames and some of them goes to the old town at summer time when it is ugly very hot, especially in July and August.

1. Did you have a house at the old town?

Yes ()

No ()

2. Is the residents comfortable in their houses?

Yes ()

No ()

3. When you had a house at the old town what was it like especially at summer time?

Find it coolness ()

Find it hot ()

4. What kind of materials used for building the house at the old town?

Natural materials ()

New materials ()

5. Why can you feel the coolness inside the houses at the old town even when it is hot outside?

Is it the material ()

Is it the construction ()

The way the house was build (side by side) ()

All of the above ()

6. Does the shadows all over the town helps for cooling the town?

Yes ()

No ()

7. Can your house protect you from the desert heat?

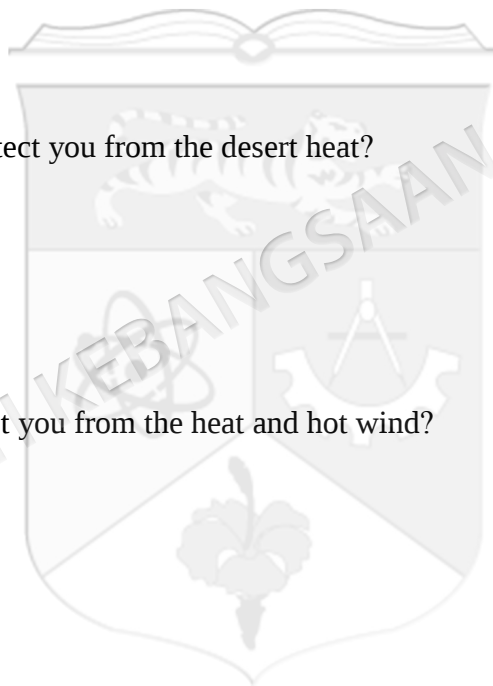
Yes ()

No ()

8. Can the town protect you from the heat and hot wind?

Yes ()

No ()



APPENDIX U

DESCRIBE THE SOCIAL CHARACTERISTICS OF THE FAMILIES THAT USED TO LIVE IN THE OLD TOWN.

Table G.1 Showing if the Residents had a House at the Old Town.

Q1	Having a House	
	No.	%
Yes	50	100
No	0	0
Total	50	100

Table G.2 Showing if the Residents were Comfortable in their House.

Q2	Comfortable in their house	
	No.	%
Yes	45	90
No	5	10
Total	50	100

Table G.3 Showing the Condition at Summer Time if it is Cooling Enough.

Q3	Condition of the house	
	No.	%
Find it coolnes	50	100
Find it hot	0	0
Total	50	100

Table G.4 Showing the Kind of Materials was used to build the Traditional Houses.

Q4	kind of materials	
	No.	%
Natural Materials	50	100
New Materials	0	0
Total	50	100

Table G.5 Showing the Reasons of the Coolness in the Traditional House.

Q5	Reasons of Coolness	
	No.	%
Is it the Material	0	0
Is it the Construction	0	0
Side by Side	0	0
All of the above	50	100
Total	50	100

Table G.6 Showing of Using the Shadows all Over the Old Town.

Q6	Using the shadows	
	No.	%
Yes	50	100
No	0	0
Total	50	100

Table G.7 Showing if you're House can protect you from the Heat Outside.

Q7	Protection from the heat	
	No.	%
Yes	50	100
No	0	0
Total	50	100

Table G.8 Showing if the Old Town Can Protect You from the Heat and Hot Wind.

Q8	Protection from the heat	
	No.	%
Yes	50	100
No	0	0
Total	50	100