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To my parents...

ABSTRACT

The basic need of human is a shelter, therefore in an attempt to meet the basic required necessity of human, house is no doubt a basic requirement. Traditional house construction has been known to reflect the culture of human over the years, however in attempt to improve the way of life for better, suitable living, contemporary house construction arose. Although new and improved house construction is needed, a significant consideration of the cultural identity of the users must be put into consideration for the sustainable architecture for houses.

The research, therefore, aims to examine the effect of cultural identity and sustainability of Ghadames houses with respect to several contributing elements affecting the interior design of both the traditional houses and the contemporary. In this regard, the Ghadames houses were analyzed as a reflection of the culture of the residents to determine the preference in house interior design. The cultural identity of Ghadames population is highly rich in customs, tradition, religion and other contributing elements. The research also focuses upon the sustainability of these elements and how each of these has shaped the interior architectural design of the houses.

To achieve the aims, were studied to analyze Ghadames historical houses paying detailed attention to each level of the plan thereby discussing the cultural identity and effects on the spaces of the houses in each level. The plans for both the traditional and contemporary houses were examined carefully with respect to the cultural identity elements sustained from both types of houses. As a result of the analysis, few cultural elements were found that transformed from traditional houses to the contemporary houses.

The research is ideally divided into five parts, in which the first part contains the main introduction to the topic, the aims of the research, methodology, objectives of the framework was explained. The second part focuses on a description of the key terms as the third part detailed the case study city; Ghadames. Analysis of Ghadames houses were elaborated in the fourth part. Last part is the conclusion and recommendations of all.

Keywords: Culture; cultural identity; sustainability; Ghadames City; houses.

ÖZET

İnsanın en temel ihtiyacı barınaktır, bu nedenle insanın ihtiyaç duyduğu temel gerekliliği yerine getirme çabasında konut şüphesiz temel bir gereksinimdir. Geleneksel konut yapısının yıllar içinde insanların kültürünü yansıttığı bilinmektedir, ancak daha iyi, daha uygun yaşam biçimi için çağdaş konut tasarımı ortaya çıkmıştır. Yeni ve gelişmiş konut yapılarına ihtiyaç duyulmasına rağmen, sürdürülebilir mimarlık için kullanıcıların kültürel kimliğinin dikkate alınarak tasarım yapılması gerekmektedir.

Bu nedenle, araştırma, Ghadames Konutlarının kültürel kimliğinin ve sürdürülebilirliğinin etkisini hem geleneksel konutların hem de çağdaş konutların tasarımını etkileyen farklı unsurlar açısından inceleneyi amaçlamaktadır. Bu bağlamda, Ghadames konutları, tasarımdaki tercihin belirleyicisi olarak kullanıcıların kültürünün bir yansıması olarak analiz edilmiştir. Ghadames nüfusunun kültürel kimliği gelenek ve görenekler yönünden oldukça zangindir. Araştırma aynı zamanda bu unsurların sürdürülebilirliğine ve bunların her birinin konut tasarımını nasıl şekillendirdiğine odaklanmaktadır.

Ghadames Kenti'nin tarihi konutlarına ait kat planlar ayrı ayrı detaylı bir şekilde incelenerek kültürel kimliğin etkileri araştırılmıştır. Hem geleneksel hem de çağdaş konut planları, kültürel kimlik elemanları göz önünde bulundurularak detaylı incelenmiştir. Yapılan analizler sonucunda geleneksel konutlardan çağdaş konutlara aktarılan az sayıda kültürel unsur bulunmuştur.

Beş bölüme ayrılan araştırmanın birinci bölümünde konuya genel giriş, araştırma amaçları, metodoloji ve konunun hedefleri açıklanmıştır. İkinci bölümde çalışmada yer alan terimler açıklanmış, üçüncü bölümde araştırma konusu olan Ghadames Kenti hakkında bilgiler verilmiştir. Dördüncü bölümde Ghadames Konutlarının analizi detaylı bir şekilde yapılmıştır. Son bölüm olan beşinci bölümü sonuç ve değerlendirme oluşturmaktadır.

Anahtar Kelimeler: Kültür; kültürel kimlik; sürdürülebilirlik; Ghadames Kenti; konut

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LIST OF ABBREVIATIONS

AD	Anno Doini
BC	Before Christ
IFI	International Federation of Interior Architects
UNESCO	United Nations Educational, Scientific and Cultural Organization

CHAPTER 1

INTRODUCTION

Several developing countries around the world are continuously adopting contemporary architectural design without reflecting on the cultural identity of the country, the way of life of the people, their tradition and other elements of cultural identity has not been considered prior to the implementation of the new architectural designs. Although ignored, the socio-cultural attributes and other dimensions of sustainability are key factors towards the architectural design of houses.

In the new development of contemporary houses, several non-traditional factors are used as the basis of criteria in the design. These criteria may include income, western education, and overseas occupation which in turn may give birth to contemporary architecture. Unfortunately, without cognizance to the cultural needs of the population, majority of the government of developing countries have introduced a modernized housing design which sometimes is not affordable for the majority of the people, thereby rendering the people houseless. Although the contemporary house design may increase the number of houses it has failed to embrace the sustainable cultural identity of the population. According to Rapoport (1979), the exact duplication of house forms from a culture to another is not a practicable one, this till date has been found true as reflected from the society.

Presently, some of the developing countries have adopted the system of traditional structure to rebuild a modern way of life using new technology and materials regardless of the cost implications and loss of cultural values. More so, it is quite evident that there is a high floor of significant inter-dependent relationship between the cultural identity, sustainability and the architecture design of houses as quoted by Rapoport (1969: p47);

"House form is not simply the result of physical forces or any single causal factor but is the consequence of a whole range of socio-cultural factors seen in their broadest terms. Form is in turn modified by climatic conditions (the physical environment which some things impossible and encourages) and by methods of construction, materials available, and the technology (the tools for achieving the desired environment). It will call the socio-cultural forces primary, and the others secondary or modifying."

Therefore, an acceptable architectural design should consider the reflection of cultural identity and sustainability as key elements in its design and especially, for human dwelling. The traditional house design is a reflection of the identity of the people, their background is displayed from the materials used to the adopted style of design which in other words, has directed their way of life so much, so that up till date when one enters an old or ancient house, the feeling or sense of belonging to the culture of the people is perceived. Unfortunately, these features are fading as a result of modernization, leaving behind very few sustainable key elements of cultural identity most particularly in Libyan houses. It is highly significant to adhere to the traditional ways of building. Fathy (1969) said, houses should be shape to measure the song of the people, meaning a house structure should reflect the cultural identity of the residents.

1.1 Statement of the Problem

The three main important needs of man are food, clothes, and shelter. The significance of shelter should not be a topic of discussion as this cannot be over emphasized. Humans need a stable, comforting space to be referred to as "*house*". The design of the house is a reflection of the way of life, customs, privacy, and the religion of the people. Standing in the community is self-evident from one's house, and mirrors the history of the occupant and her /his cultural values with society (El-Fortea, 1989). Rapoport (1981) also contributed by saying; housing is a basic human need which contributes to our daily activities. It is where people spend most of their time, and it is one of human's most valuable possession.

It is vivid from the referenced authors El-Fortea and Rapoport that a houses design is required to reflect the cultural identity of its residents. Most significantly in Libya for example, the culture, tradition, religion, occupation and other factors consider privacy for women very important, therefore, the architectural design of the houses place priority on privacy for women and other significant cultural factors.

House issues in Libya especially in regards to low-earners did not receive considerable attention from the government until, the end of 1960. For several years the Libyan people lived in houses with poor living conditions. During the Turkish period (1835 – 1911), the issues of house problem was ignored by the government, as a result, a large number of

traditional Libyan architecture was destroyed. The situation got worse during the Italian colonization period (1911 – 1943) that resulted to continues war which affected the economic situation of the country alongside destroying a lot of houses. Moreover, the Italian government whom took over power during this period completed abandoned the old structures in Libya, but placed more focused on building new architectural designs that reflect the Italian culture. For example, Campo die Bedouin is an Italian building built in Libya during the year 1935 (Italian period) which was used by all the Bedouins. In 1951, Libya gained independence but at this time, the culture and materials of Libya has been massively eroded. But there was lack of financial resource to cater to the issues of houses for the people. After the discovery of oil in the late 1950, Ministry of housing was established to tackle the issue of house problem in Libya. However, all effort was lost as there was no relevant information about housing requirements such as users' needs, space organization, privacy etc. (Almuakkaf, 1976). The Libyan Ministry of Housing adopted Western development housing for a large house scheme to solve the house issues of people in Libya. To achieve this, foreign contractors were hired for the construction of these buildings which in later terms was found not suitable for the Libyan family as most of the structures does not reflect the Libyan culture (Shawesh, 1992).

This topic is chosen as a case study due to the cultural identity loss in contemporary Ghadames house design. Because of the transition of people from traditional to contemporary house, there are quite some concerns on the contemporary Ghadames house designs not reflecting the cultural identity of the traditional Ghadames houses. There is, therefore, a need for new house designs that would sustain the cultural values of Ghadames. There are several studies on Ghadames houses which focus on socio-cultural description of the house, thermal conservation, and energy use, but there has been minimal focus on sustainability of the cultural identity that is reflected in the house designs. Several research journals published the general advantage of vernacular Ghadames house; however, none has studied in-depth, how cultural identity is sustained with regard to each space of the house plan.

1.2 Aims and Objectives

The main aim of this research is to identify cultural identity elements that are sustained from traditional to contemporary Ghadames houses. Building a house is a reflection of the culture, its organization are greatly influenced by the cultural identity of the architects (Rapoport, 1969). The uniqueness of architectural designs is achieved by proper reflection of the identity of the residents in the houses design. The significant impact of the thesis provides information of a sustainable architectural design that reflects cultural identity in contemporary houses in Ghadames. The aim of this research is therefore to evaluate the following;

1. Spatial organization, space distribution, and all cultural elements would be studied in each of the cases.
2. The review would focus on the cultural identity as a sustainable element of architectural design in the houses.
3. Analysis of spaces in the house would be elaborated for each floor of the house.

1.3 Methodology of the Research

The study adopted qualitative comparative study method to evaluate the sustainable cultural identity elements of the traditional and contemporary house design in Ghadames, Libya. The author visited the Ghadames city in September 2018 to conduct a field survey in order to collect data for the research. Upon the approval for the site to be studied and the collection of data from the government, around 200 photos from both traditional and contemporary houses were achieved. Facts and evidences were collected using the methods below;

1. A documentary study of old and recent relevant literature with significant relation to the architectural design reflecting culture from the Libyan library was provided by the Libyan Government.
2. Journals review, articles, power point presentation from reliable sources all amounting to over 50 published accessible and 20 unpublished files on the type of housing design in Libya starting from the pre-colonial era till after the Libyan independence was used for the construction of the thesis.

3. Schemes, chart, and figures in the study was design after general study of several literatures.
4. Brief discussions with some of the residents of Ghadames houses was conducted.

CHAPTER 2

CULTURAL IDENTITY AND SUSTAINABILITY

2.1 The Concept of Cultural, Identity, and Sustainability

Cultural Identity and sustainability have been a topic that has been discussed widely. Culture as a single word has also been discussed in almost all scientific fields with diversity in meaning. Cultural identity has been more frequently discussed in social sciences, economics, and other sciences (Hawkes, 2001). Sustainability arose from the new innovative switch to a safer, greener ecosystem as oppose the destructive traditional ways to technology. The concept of cultural identity and sustainability revolves around a larger field of science with vast debatable school of thoughts about its systemic and analytical hierarchy (Chiu, 2004). This chapter focus on the explicit definition of these keywords separately and combined by clarifying, categorizing these terms in related fields with a direct focus on architectural design.

2.1.1 Culture

Culture is generally believed to encompass collective arts, knowledge and sophistication, shared beliefs and values of a group of people. The dictionary defines culture as the total pattern of human behavior and its products embodied in speech, action, and artifacts and dependent upon man's capacity for learning and transmitting knowledge to succeeding generations (Merriam Webster Dictionary, 2006). Culture is a whole complex of distinctive spiritual, material, intellectual and emotional features that characterize a society or social group (UNESCO, 1995). The above definitions offer a broad scope covered by the concept of culture. Scholars such as (Yang, 2007) thus defined culture in the broad sense as that which offers the context, values, subjectivity, attitudes, and skills on which the development process must take place. However, some scholars prefer to refer to a domain of culture in their definition for specificity of their work. Ogboma (1992), for instance, defined culture as a pattern of beliefs and expectations shared by members of a society. Saxena (1996) posited that it is those believes and expectations that produce rules for behaviors and norms that powerfully shaped the behavior of individuals and groups in the society. The behavior of such groups or individuals in the society is, in turn, referred to

as the culture of the people. Culture affects various sections of the human way of life, including art, architecture and urban planning development in such a way that is undeniable (Madadpoor, 2000).

On the other hand, culture from an architectural point of view can be regarded as a set of beliefs, knowledge, customs, as well as materials that has been developed by a given society from their own beliefs which is reflected in the way the design, space, and occupy their houses (Naghizadeh, 2000). Danjuma(2015), an architect explained that culture can be viewed in two broad perspectives; psycho-social perspective and anthropological perspective. The psycho-social perspective focuses on the knowledge, religion, ideologies, and belief of the people while the anthropological perspective focuses on morals, values, laws, customs, heritage, lifestyles and the ways groups socialize (Minneryetal., 2000). These school of thoughts and scholars discussed earlier seem to regard culture only as a social construct, neglecting the interactions and influence of the physical environment on the culture of people. However, the Hornby& Cowie (1995) definition of culture provided some basis for culture to be considered in the domain of man's interaction with his environment. The dictionary defined culture as the advanced development of the body, mind, and spirit by training and experience. The literature on the definition of culture is therefore balanced up by Ayanga (2003), who defined culture as a reflection of the pattern of life, involving the way mankind evolved in an attempt to control his/her natural and social environment. Hence, one can simply say that culture is the total way of life of a people through which they humanize and socialize nature. The concept of culture according to a sociologist; Laura (1998) is shown in figure 2.1.



Figure 2.1: Concept of culture (Laura, 1998)

2.1.2 Identity

The Oxford Dictionary of Current English defines identity as the fact of being who or what a person or thing is. This refers to the qualities, beliefs, conditions or characters that distinguish or identify a person or thing. Two researchers, Koivunen and Marsio (2007), defined identity as the bond between an individual and a community. Identity is generally agreed to be what defines somebody or something. Identity is based on the individual image and emotions with regards to how the individual perceive the world (Hogg, 2003). In other words, identity is who you are, what differentiates you from the rest of the population, this is your identity.

2.1.3 Cultural identity

From the explanations of culture and identity given above, cultural identity maybe defined as the fact of being from a particular culture or group. Ennaji (2005) defines cultural identity as the identity or feeling of belonging to a specific group. Hence, identity describes the qualities which readily points to where a person, idea or thing comes from. Hayrynen (2007) defined collective cultural identity as an entity of visible, invisible and assumed cultural traits typical of a given group, which may influence an individual's emotive experiences and conduct. Pritchard and Morgan (2001) defined cultural identity as the identity of a group or culture, or of an individual as his/her belonging to a group or

culture affects his/her view of himself or herself. Cultural Identity is important for people's sense of self and how they relate with others. Identifying with a particular culture helps people feel they belong and gives them a sense of security (Hall, 1996). It provides the global significance of local knowledge and the sense of self, community, and nation.

From the definition of cultural identity, the basic elements of cultural identity can be highlighted as; language, dress/fashion, music/dance, time and time consciousness, eating habits, beliefs (religion), value (social/family groups), and interpersonal relations (Commonwealth of Australia, 2012, cited in (Danjuma, 2015)).

2.1.4 Sustainability

Sustainability in general deals with the relationships between human and natural systems and with a consideration for the future for a long period of time. The most cited definition of sustainability, however, is that of the United Nations World Commission on Environment and Development (1987), The Bruntland Commission that describes sustainability as the way of meeting the present needs without compromising the needs of future generations. Since environmental protection has become an important factor to consider in any activity, sustainability has become one of the most important concepts to emerge with relevance to housing (Cathalet al., 2004). Hence, there is a need to understand what sustainable architecture means. Several factors contribute to the development of sustainability in general which are the economy, environment, and the community.

Sustainable development thus shows a need to balance environmental protection with economic development (Green & Wuts, 1999). Sustainable development is generally viewed as progress in the quality of life through social and cultural progress in parallel with the more traditional goal of increasing economic growth (Sexton, 2000). The concept of sustainable development first emerged in the context of ecological and environmental concerns relating to the impact of human activity especially in developed countries (Cathal et al., 2004). Sustainable development is a priority for the United Nations global political agenda and this is reflective in the development of seventeen sustainable development goals to be achieved. These goals focus on the balancing of every human activity with the sustainable environment illustrated in figure 2.2 with culture and cultural identity used to describe the self-identity in relation to culture.

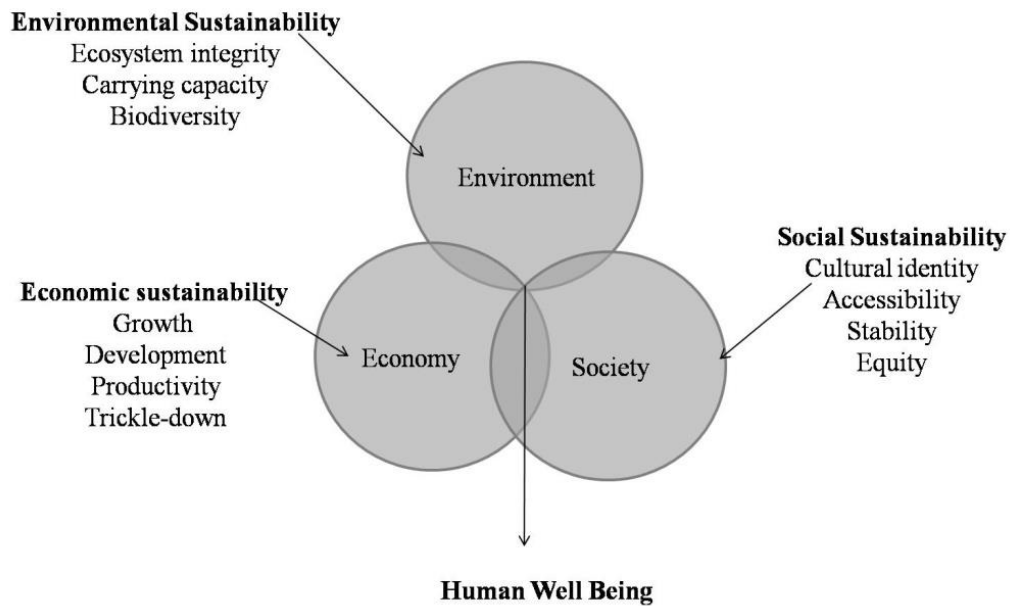


Figure 2.2: Dimensions of Sustainability (Eadie & McKeown, 2011)

2.1.5 Cultural sustainability

Culture extends fully to the contribution of sustainable life style by supporting the social and economic prosperity of people. It was explained by Hawkes (2001) that sustainable communities depend upon the cultural activities of those communities which rest on the effort of cultural society in projecting their sustainable pillars (Hawkes, 2001). Recently, there have been several arguments that cultural sustainability should shift and incorporate in the global understanding toward sustainability so as the ecosystem will not get damaged (Fithian and Powell, 2009). Cultural sustainability is thus seen as the continuous use of elements of culture in a place across several generations. It is concerned with the maintaining of cultural beliefs and practices. The concept focuses on the continuous existence of a given culture or element of culture over a long period of time into the future (Soini and Birkeland, 2014).

However, the elements of culture contain a wide linkage with the context of sustainability such as built environment, houses in this case would consider social and economic dimensions. For example, economic dimension includes the cost of built environment, cost and maintenance of cultural heritage and identity. Environmental sustainability on the other hand includes management of indoor air quality of water supply and water quality to

the houses and other features and lastly social sustainability in the context of culture including general well fare with the environment (Scammon, 2012).

Since the evolution of cultural related initiatives, culture has been recognized as the key driver of sustainable development (Opoku, 2015). The concept of culture always is incorporated in the idea of social sustainability; however, some researchers have the views of incorporating mode of sustainability as environmental, economic, social and cultural responsibility (Hawkes, 2001). The aforementioned qualities allow sustainability of customs and traditions. Culture occurs from one generation to another. Cultural sustainability, therefore, emphasizes the conservation of cultural beliefs and practices over a long period of time.

2.2 Architecture as a Component of Cultural Identity

Architecture refers to the art and technique of designing and building, as distinguished from the skills associated with construction (Alan et al., 2013). It refers to both the process and the product of planning, designing and constructing buildings or any other structures. Culture is a unique attribute particularly to a group of people; its broad shoulder engulfs several concepts which could define an intrinsic cultural characteristic of a person. These concepts include; religion, cuisine, social habits, occupation, lifestyle, music, art, food, language, and other things.

Globally, culture has divided regions and countries in relation to the cultural attributes of people from across the world. In the context of this study, culture and cultural identity is merged together to mean the identity of a group of people of the same cultural background. Over the years, there has been a gradual change in different cultures globally. Over the years, there has been the integration, adoption, and rejection of culture in different ethnicity or background across the world. Culture can thus be simply referred to as the way of life of people.

It is, however, important to mention that although there are several contributing factors of culture in architectural design, some factors may dictate the turnout of another factor which would thus have a direct relationship with the identity of culture. Figure 2.3 explains the various ways how culture can influence architecture as explained by Rappaport (1997).

Culture produces kinship, rules and social identity. Its primary components which includes values and world views are also responsible for the way people live their lives and interact with their environment. Architecture of a given society can be seen as the symbol of that people's culture and an indication of both their level of civilization and technological heights (Lawrence, 2006). The trend of expressing cultural identity in contemporary architecture is by using elements from traditional architecture (Mahgoub, 2007).

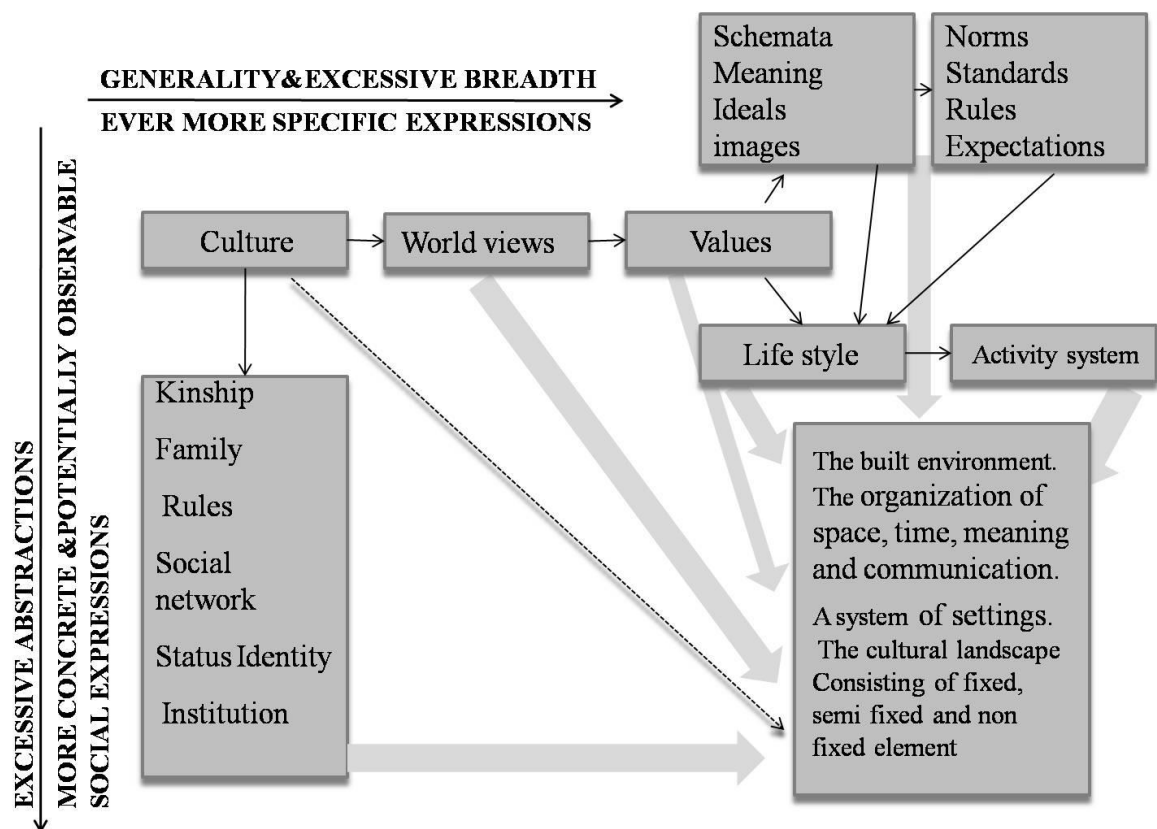


Figure 2.3: How culture interacts with built environment (Rapoport, 1977)

The interaction of human with his/her environment is highly reflective of his/her cultural identity. Every house design choice made by any individual is based, to some extent, on the individual's experience and his/her interaction with his/her environment. Meanwhile, the establishment of the daily interactions with the environment such as things one does, and how it is done are part of culture and the resultant of way of life is the identity of the person. Hence, architecture bears a signature of cultural identity at any time. In other words, one can attempt to look at a building design and readily identify which cultural

group it belongs to or originates from. A building can symbolically represent the development and/or values of particular factions and therefore play a positive role in reinforcing notions of community identity (Worthing & Bond, 2008). Studies have shown that cultural identity is boldly observable in architecture.

Beynon (2010) asserted that as much as architecture aims to provide shelter, it also represents conceptions of belonging and identity. Individual buildings may be produced with differing levels of self-consciousness, but their resultant arrangement of form, material, and space still circumscribes certain ritual and cultural outcomes. According to Howard (2006), the structure can be a piece of art and can also reflect the social and cultural stratification and the overall illustrative aspirations. Odeyale et al., (2010), have argued that although there may be some similarities in architecture of several cultures but there are always several variants of such designs that are usually typical to a particular region. Therefore, more than one traditional element should be used at the same time to reflect a cultural identity of a people in their architectural designs (Mahgoub, 2007). Architectural design and culture have always been closely interrelated, but in many instances, design is flaunted as the true measure of culture, rather than belonging to part of cultural context of the society (Carlson and Richards, 2011).

Scholars, such as Steven Holl, have however argued that historical architectural buildings mostly express the cultural identity and uniqueness than contemporary architecture. This, according to Holl, is because vernacular architecture develops from the characteristics of place rather than imposition of external meanings. While vernacular architecture distinguishes itself as a cogent source of cultural identity, identity of the built environment in contemporary cities must be dealt with at two related levels viz: architectural identity, and place identity. Architectural identity reflects the process of constructing meaning for the physical setting and expresses continuity, distinction and recognition elements while place identity represents the physical environment database that enables the individual to judge the specific physical setting and understand its meaning (Budd, 2008). Cultural identity may be expressed in architecture in different ways. It could be expressed by borrowing from vernacular architecture, or it could be expressed by showcasing the present-day trend and prosperity, or future ambition (Mahgoub, 2007).

Mahgoub (2007) identifies the direct quotation of traditional shape and design as one of the most comprehensible expression the expression of domestic style. This method of cultural expression presents cultural biases through architectural forms and styles without giving consideration to an evolving cultural identity. Architectural styles and forms vary widely from one culture to the other. The culture of various regions determines the types of buildings they build, the materials they use and the building technique they employed in their buildings (Falola, 2003). ERIC (2010) opined that culturally-responsive architecture must respect the complexities and changing qualities of culture, expressing these nuances while allowing for development over time.

Architecture is essentially a reflection of habits, modes of life and traditions as fundamental determinants of human activities. Al-Khedr (cited in Mahgoub, 2007), presented that the expression of family needs in architecture is an important element in the reflection of local identity. As a result, architects adopt transformed and integrated traditions to reflect contemporary realities such as fast-evolving cultures, values, and lifestyles (Mahgoub, 2007).

2.3 Influence of Cultural Identity Elements on Houses

The definition of house can be described as a solid structure built to satisfy the specific needs of an individual. The term house has been in use for over a thousand years (Benjamin, 1995). Its definition varies from one author and scholar to another. Brink (1995) traced the origin of house to the early Germanic forms of house which includes defining house as a village, farm, country, resting place and a camp. Furthermore, He also gave a deeper significance of house by connecting house to family to bring about household. According to Moore (2000), house is simply a dwelling place for an individual or a family. It is simply a structure built for people to live in (Eskandari, 2011). House can be in different types such as detached, undetached, and semi-detached single-family houses (Singh& Singh, 2010). These types of houses refer to more contemporary housing typology. On the other hand, one may have town-houses, huts, courtyard houses, Izba, cottages, and bungalows refer more to traditional housing typology. The design of a house reflects the quality of life of the occupants and/or owners (Gobierno, 2003). What constitute the quality of life of the house owners/occupants is a combination of factors

founded in the culture, religion, and traditions such as the sense of belonging, acculturation, privacy, sense of security, neighborliness, and the general sense of housing (Ebsen et al., 2000).

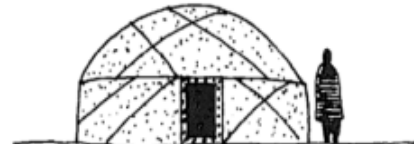
House can be defined as cut out space separated for living and family interaction. It can be defined under the concept of place rather than space. According to Roberts (1998), when the human element comes into space, space becomes more of a place than a space. Chemers and Altman (1989) as cited in (Oseland and Donald, 1993), defined the notion of place as vacuum given through individual, collective or cultural processes. Simply give people time, they will turn vacuum into a place, giving them the ability to characterize a space with place features. In the light of this, house environment is considered as place that has undergone the transformation by people through imprinting of the identity of humans on it and specifically that of the particular people driving the transformation. House environment clearly portrays identity of a culture, expressing the traditional values of the people. This explanation thus present house as a cultural element. More recently, Hauge and Kolsatad (2008) explained house to symbolize individual cultural identity. Notably, a house is a structure that functions as a shelter for an individual to dwell or live in. Rapoport (1969) gave a detailed sketch on the concept of house design as shown in figure 2.4 of the concept of house in relation to culture in his book titled *House Form and Culture* 1969. As seen, even to this day, there is characteristics of cultural identity of an individual in the type of house building construction which has been found as a sustainable element over the years thereby adapting to several changes over time. The house illustrated in figure 2.4 (a, b, c, d) are not scaled, but the sizes of the house structure are made in comparison with the human figure showing characteristics of cultural identity of an individual in the type of house building construction.



(a) Dwelling made of one materials (reeds). Left: Uru dwelling, Lake Titicaca, Peru. Right: Marsh Arab dwelling, Iraq-Iran border.



(b) Dwellings made of one material (mud). Left: Iran. Right: Pueblos, southwestern United states.



(c) Portable tent of sticks and felt. Left: Arab tent. Right: Mongol Yurt.



(d) Two examples of from the great range of house forms using thatch and wood as materials. Left: Masai dwelling (Africa). Right: Yagua dwelling (Amazon)

Figure 2.4: (a, b, c, d): Amos Rapoport's famous sketch on the concept of house design (Rapoport, 1969).

The house contains the exterior and interior design. The interior house designs to a large extent determines the exterior environment. Therefore, the interior designs of a house are more interactive with the cultural awareness of the people. That is why two houses may look similar outside but the interior design typical identifies the cultural identity. This is explained in the context of the mutual relationship between space and the user. As proposed by Ayalp (2012), in which he stated that the house design gives meaning to the

user and the user also substantiate meaning to the designed environment. Hence, the identity of a place is given to it by its built environment (Bozdayi, 1999).

Cultural identity can also be expressed in house design through the use of local decorative elements. These elements mark the difference between one regional architecture to another. For cultural expression to be made in house design, usually, the designer must adopt the use of prominent traditional features in the design. These traditional features may be tangible culture, such as sculptures, paintings, crafts; or intangible culture such as; song, dance, or legend of the place (Kelbaugh, 2004).

The interior architectural design most prominently relies on two elements namely; texture and pattern of chosen decorative materials for a significant perception of the surrounding. Texture and Patterns comes first in the list of required elements of interior house design, others of less significant includes; lines, space, forms, light, and colors. Texture refers to the 2-3-dimensional surface quality of a material, the patterns relates to a more illustrative approach of this. Texture deals mainly about the typical surface as regard to how an object feels and the way it looks. Pattern builds up more on the texture of the object redefining the interior space element as a whole. For example, flower patterns are mainly used in bed sheets, cotton, and pillow cases while wallpapers (2D and 3D) have a texture as desired by the user. In relation to cultural identity and sustainability, texture and patterns would be required to be preferred by the native residents. The selected texture and patterns of choice would reflect in the customs and tradition of the people. This indicates that the observable interior design therein would possess sustainable elements of culture as a reflection of texture and patterns (Launchpad, 2015).

Jabareen (2005) stated that culture is expressed in both abstract and physical objects. Hence, the way humans manipulate and design-built environment is in response to the perception of subjective and non-physical aspects or components of culture. Houses, thus form an integral part of the expressions of culture, both in its design and use. Bochner (1976) stated that house can have powerful influence on culture and vice versa such that a house in its design may support or disrupt culture.

Altman and Chemers (1980), also posited that houses to a large extent express both personal and cultural identity of the occupants while serving other purposes. Hence, as much as culture has influenced the designs and functions of houses in different places across the world, culture has also played a major role in determining what features are taking into consideration when designing a family housing unit in different parts of the world. According to Rapoport (1983), the concept of culture may not have a direct relation to interior architecture design but would have a direct relationship with the residents of the house. The components of culture that influence house designs are therefore listed by Rapoport (2001) to include world views (i.e., values, meanings, norms, standards, expectations, and rules), family structure, and social networks. These cultural components provide certain identity in the way they are expressed in house designs, hence making it important aspect of house designs. These are discussed briefly below:

1. **Family structure:** This refers to the type of family structure maintained in such region, be it nuclear, extended or compound family and clan. A typical family would belong to a cultural background which in turns ascribe a certain class of belonging to the family. The family structured determines who lives in the family houses and what functional spaces are designed into the house. It also determines to a large extent the arrangement and layout of these functional units. It also determines if the non-extended family will be exempted from the most important part of the house or have limited access to functional spaces within the house. For example, a culture in one region of the world may permit full access into their houses from friends and strangers (non-family members) while in another region of the world, the culture will limit or completely forbid such access to friends and strangers (non-family members) (Gram & Danielsen, 2004).
2. **Beliefs and religion:** The beliefs and religion of a person determines to some extent spatial arrangement of house designs. Several attributes in religion has been mixed with culture in such a way that sometimes, it becomes difficult to trace such element. An example is the use of head wrap “hijab” which can be found both as a religious entity and as a traditional culture in regards to women. An example in regards to men is the growing of full beard that is both a religious and traditional entity. Furthermore, the allocation of space for religious activities and the use of

religious symbols and artifacts in decorating the house is another point to consider as beliefs and religion (Oberg, 1960).

3. **Social values, norms, and traditions:** This includes principles and ideals that determine the actions of individuals within the society. It spans the concept of gender role-play, morals, judging rights and wrongs, and social stratification. For instance, it determines how men and women are viewed within the society, and such views are expressed in the architecture. The type of interaction allowed and existing among the occupants of the house are also determined by the social values. How are social functions organized? It considers if social functions are hosted within house or in-house exterior environment (Hamilton, 2016).
4. **Politics:** This is more concerned with the governance system existing in the locality. From a religious cultural point of view, politics recognize the culture of the people in order to allow a better ruling for the people; these could be military rule, democracy, monarchical regime, or Islamic rule. The different regime has its own rules and organization which directly influence the decisions of individuals (Findley, 2005).
5. **Privacy:** This is both a social and religious construct. It refers to how people define the boundary between what is accessible to them and their family alone and what is accessible to other members of the society. It is a social construct because it is in part determined by what the social values of the people define as private and public, while it is a religious construct to the extent that the religion determines floor of privacy of the people (Sexton, 2000). The concept of privacy differs among cultures in terms of how floors of privacy are regulated (Altman, 1977). Privacy, according to Hashim and Rahim (2008), is a two-way process that involves permeability of boundaries between one's self and the others. It could be seen as the element that regulates interaction between individual and the society, and between private and public domains.
6. **Occupation of the locals:** The occupation of the locals usually determines the type of houses built in the region. Several jobs and occupation results from longer period of experience which incorporates a cultural tradition. For instance, nomadic herdsmen build temporary houses that they can leave at any time when they are in search of pasture for their livestock. The occupation of members of a house may

influence the way spaces are distributed in the house in regards to their cultural identity. Such influences may be in the way storage house are built and designed, the allocation of spaces of special duties relating to their occupation and so on. (Barth, 1998)

7. **Technology:** The processes, skills, techniques, or technology utilized by a people details the cultural background of them. It is a distinct sphere of the society and easily identifies the culture and people a particular technique it belongs to (Rapoport, 1977). This is another element of culture more pronounced in the architecture. Materials used in the built environment are usually typical of a whole region subject to the forces of change propelled by modernization. In fact, when such materials are used outside the vicinity of the local people, it readily points to the original people that uses such materials. Although, materials used for housing construction may also be common to another geographical location based on the constraints placed on the choice of material according to the nature of the environment. It can be noticed that house from different cultures and different geographical locations may use similar construction materials but may exhibit different house designs as can be noted in figure 2.4 in section 2.3 (Azlitni, 2009).
8. **Adaptation to Environment:** The environmental conditions dictate how people do the things they do such as dressing, choice of food, housing, and leisure. For instance, the cold in places such as Russia, Finland and the rest determines the use of fur coats and furnace or air conditioner to warm the house, while the use of veils or turbans and light dressing in the Sahara region is an adaptation to the dust and hot weather. This element of culture provides place identity for the people of that region (Altman, 1977).

2.4 Cultural Sustainability of House Designs

Cultural sustainability in architecture is best explained as the continual use and repetition of tradition in the design of houses just as Rapoport (1969) posited that it is meaningful repetition that contributes eventually to the tradition. According to Ayalp (2012), culture is responsible for the conveyance of the sustainability of vitality of the community. Hence, observation of similar elements of culture in both traditional and contemporary house

designs is the major evidence of cultural sustainability in architecture. In contemporary architecture, several layers of the meaning that suggests the culture and tradition of the people can be observed. At some time, the symbolism or tradition may be overlaid but it does not necessarily mean that it is replaced or totally concealed by imported traditional culture (Beynon, 2010).

Interior environment displays cultural values and perception of the people of what shelter, warmth, privacy, and protection should be (Ayalp, 2012). Experience over time from civilization and religion strongly shape cultural values of any people in which these values form the central focus for the design of interior environment. Rapoport (2004) thus suggested that design of interior environment is highly responsible for the way the exterior environment is designed and produced. This argument thus presents that culture is responsible for the way the world is being perceived; it is responsible for the sustainability of such perception; and the production of effects of such perceptions such as is observed in design of house interiors.

It is very germane to understand that cultural identity is sturdily related to the environment. Cultural identity as argued by Ayalp (2012), is the tool through which humans perceive and cognate the environment. Hence, it will be impossible to discuss the built environment of any region, be it interior or exterior environment without considering the cultural identity of that place. Any attempt to create a more sustainable environment without cultural awareness is more likely to fail as it encounters but fails to recognize very deeply structured personal responses to particular places that will tend to override shallow environmentalism (Guy and Farmer, 2000). Therefore, to be truly sustainable, buildings need to remain relevant and functional to the community they serve over the long term (McMinn & Polo, 2005).

Therefore, Guy and Farmer (2000) concluded that contemporary architecture should, therefore, seek a greater understanding of local culture if it is to be sustainable. Similarly, Vale and Vale (1991: 116) posited that the best way to achieve longevity and demolition is to design buildings that are capable of adapting to changes over time. Those needs may be defined from the point of view of the material traditions for a particular population in which it is of fundamental origin of the cultural identity (McMinn & polo, 2005).

2.5 Sustainable Architecture of Interior House Designs

The International Federation of Interior Architects and Interior Designers (IFI) referred to interior design as profession enterprise. Interior design and interior architecture are a mode of cultural production, existing as a place-maker that interprets, translates, and edits cultural capital. In a global world, interior design and interior architecture must play a role in facilitating the retention of cultural diversity.

Sustainable houses that is of cultural predominance describes the incorporation of sustained architectural elements in the interior design of the resident house which reflects their cultural identity. Furthermore, a sustainable architectural houses design should ensure a healthy environment, support positive energy, and eco-friendly lifestyle/activity system which affect the interior design of house as argued by Rapaport (1977). Architectural houses reveal the culture of the people (Parvizi, 2009). Sustainable architecture is a form of architecture that attempt to minimize the impacts of buildings on the environment while at the same time improving the efficiency of the houses and its interior design, thus, creating wider opportunities for future directions (Jones, 2008).

The concept of sustainability in interior design is expressed as the use of resources in such a way that they are not depleted; a method of practice or use of materials that is capable of being continued with minimal long-term effect on the environment (Kang& Guerin, 2009). The living habits directly influences the way in which elements of interior design are arranged or organized. Cultural value is one of the major determinants of the design of interior environment.

The concept of cultural identity in sustainability functions to elaborate how the interior of houses design system remained the same over the years as a result of its sustainability. Furthermore, it can be conclusively inferred that there is a direct interdependent relationship between sustainability, architecture, and culture since architectural style reflects the sustainable culture over time, both in exterior and interior of house designs. There is a powerful ability of sustainable architectural design to retain its sustainability over new trends of design as dictated by societal culture. The styles of architecture have changed over the years in the modernity of interior designs but essential sustainability and

cultural identity has remained the same in the interior design of some houses. However, where cultural identity has shifted, the architectural design has also shifted to support this shift but its sustainability has also remained. The value of cultural heritage is desired to be retained in the houses and their interior design even in the transformation or modernization of the building (Ayalp, 2012).

The main principles of sustainable architecture influencing interior house designs cut across the world is listed below which is further explained in the following chapter (Ayalp, 2012; Akadiri et al., 2012);

- Values from the socio-cultural group
- Climatic factors
- Usage of sustainable, economical building material
- Water availability and efficiency
- Usage of colors and patterns

2.6 Cultural Identity and Spatial Organization in Houses

Cultural identity is being reflected by how certain group of people arrange spaces and buildings within their environment. Spatial organization becomes an important issue of concern when concepts such as dimension, view, function, accessibility, hierarchy, and natural light source are being considered (Eskandari, 2011). Depending on the influence of cultural identity of the residents of the house, the space may exist in different forms, the different culture of the people would allow different mode of house construction hence dictating the spatial organization of the houses. This spatial organization is concerned with both internal and external environment of architectural designs. In the words of Denver (1978), the style of architecture used in a place is defined by the arrangement of the house forms and its individual buildings, thus he further argued that building style is also one of the major ingredients of cultural identity and that different cultural groups have their unique manner of buildings, organization and arrangement.

Spatial organization is designed in different ways and can be classified into five fundamental types namely: linear, centralized, grid, radial and clustered organization (Ching 1979). Spatial organization is simply the way a space is organized within a built

environment. The distribution of space in accordance to cultural identity describes the allocation of rooms in each floor of the house, creating a diverse type of space distribution through the entire house. The choice of spatial organization usually depends largely on the culture of the place. The different types of spatial organization are thus discussed below:

- **Linear Organization** the most basic form of space organization and it is mostly seen in most designs (Meiss, 1990). It consists of a group of spaces which are usually same in function, form, and importance and they are organized in a row. It mostly reflects unity or uniqueness of a traditional type of culture. In a typical house setting where the culture requires a clustered group of living arrangement of several families' culture living in a single compound house structure exhibits such linear organization of house structure which allows them to exhibit cultural characteristics. (Eskandari 2011) This type of space organization is seen in hallway houses in which functional spaces are arranged along a linear space.
- **Centralized Organization** consists of a central space surrounded by a group of secondary spaces in a regular form. The secondary spaces may be similar in form, size, and functions and are arranged to produce a symmetrical composition (Meiss, 1990). This type of organization is seen in courtyard or houses or religious building which centralize space allows for religious cultural gathering of the people.
- **Radial Organization** combines the features of linear and centralized organizations. A mixture of several cultural identity is reflected which allows the house construction to differ as a result of self-taste of the owner, job or level of exposure (travel) to allow a diversify type of house building construction. Thus, the linear arms are presented in radial forms but they may differ in function, dimension, and description, and these surround a central space serving as the hub (Rudolf, 1997).
- **Clustered Organization** in Clustered organization, proximity is the focal characteristic. It consists of spaces that may be similar or dissimilar in form, functions, and arrangement but are closely ordered together. According to Ching (1979), it refers to the repetition of cellular spaces that have similar functions in a close pattern. This type of house construction may exist in staff buildings allowing people of similar cultural jobs to coexist in sharing space.

- **Grid Organizations** used when spaces and forms are controlled by a three-dimensional grid pattern. This type of organization makes use of grid, which is composed of two groups of parallel lines arranged perpendicularly to each other. Several cultural elements contribute to the grid organization, one of which includes style of the owner. One's style greatly influence the choice of design of house and its distribution of space in general. (Ching, 2014)

Since cultural identity can be explained with the existence of materials, techniques associated to a given people over a long period of time, spatial organization has thus been influenced by cultural identity over the years in many places (Cheng et al., 2018). Those elements of culture that may influence spatial organization include visual privacy, religion, social organization and security. For instance, centralized organization which permits for harmonious relationship provides space for social interaction in a central hub as seen in courtyard houses.

2.7 Chapter Summary

In the context of the scope of the thesis, consideration is given to cultural identity and sustainability in regards to design of houses. Cultural identity uses the relationship between the social group of people and its environment. Cultural sustainability overlaps with several elements to describe interior house designs. The chapter explains the concept of cultural identity and sustainability on the architectural design of houses with respect to spatial organization of the house describing the various types of spatial organization existing

CHAPTER 3

THE GHADAMES CITY IN LIBYA

3.1 Geographical Location

Ghadames City is a town located in the northern part of the African desert at the point where the borders of three Arab countries meet – Algeria, Libya, and Tunisia. It is located between the latitude of 30°08' N and the longitude of 9°30' E as seen in figure 3.1. Ghadames City is located at about 300 m above the sea level and 620 km southwest of Mediterranean Sea coast and Tripoli- the capital city of Libya (Almansuri et al, 2015). The housing area of Ghadames is about 820 hectares.



Figure 3.1: Location of Ghadames city in Libya (Sharan, 2017)

The living area of the Ghadames is a desert town that was built by the attachment of small houses to each other in layers. Ghadames is recognized for its beautiful and creative architecture, designed to fight the harsh desert climate. The unique structure of the

Ghadames has been studied by several researchers because of its house designs, choice of materials used, cultural identity and sustainability of the house design and according to Kjeilin (2007), it is often called ‘the jewel of Sahara’, and was in 1999 added to the UNESCO World Heritage List, as one of the top five places in Libya. Figure 3.1 shows the location of Ghadames city in Libya while figure 3.2 shows the aerial view of Ghadames City.



Figure 3.2: Aerial view of Ghadames city (Word Press, 2000)

3.2 The Climatic Condition in Libya

The climate of the Libyan Desert is generally dry and hot in summer. In winter, it is mostly arid because it rarely rains (Al-Mansuriet al., 2008). The climate in the city is warm during winter, due to the desert sand. The city of Ghadames generally has hot days and very cold nights because the sand warms up quickly and becomes cold equally fast. In summer, the day is unbearably hot while the night is moderate, fitting and comfortable. The mean maximum temperature for Ghadames, from May to October, is between 35°C and up to

48°C (Al-Zubaidi, 2002), while the minimum average temperature in January is 2.1°C and the maximum average in August is 40.2°C. Figure 3.3 and 3.4 show temperature outdoors in blue and in the site in red for winter and summer respectively. Although, Chojnacki (2003) noted that temperatures of over 50.0°C have been recorded. The relative humidity of the air ranges from 72% in winter to 17% in summer (Al-Mansuri et al., 2015). The sun shines daily from 69% to 88% with an average of 79%. The sunlight increases to 7.5 hours in the December period. The wind speed has an average of 3.5 m/s with a maximum of 11 m/s over 23 days in a year. Due to the low rainfall, high heat and windstorm, the condition for evapotranspiration increases to 2700 mm/ year (Sharan A, 2017).

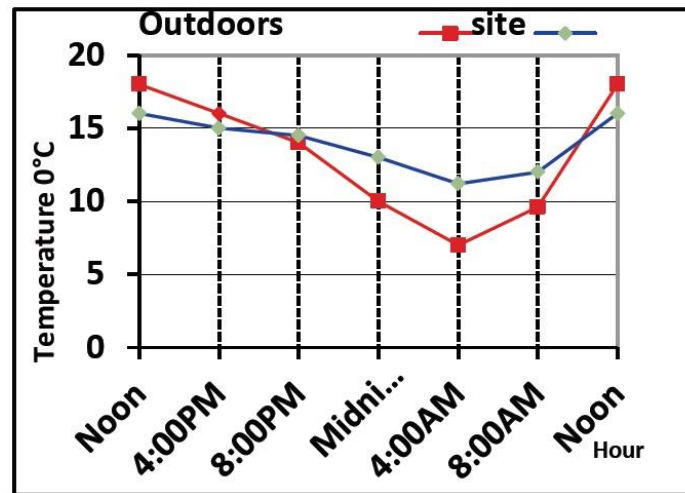


Figure 3.3: Temperature changes in Ghadames in winter (January) (Sharan, 2017)

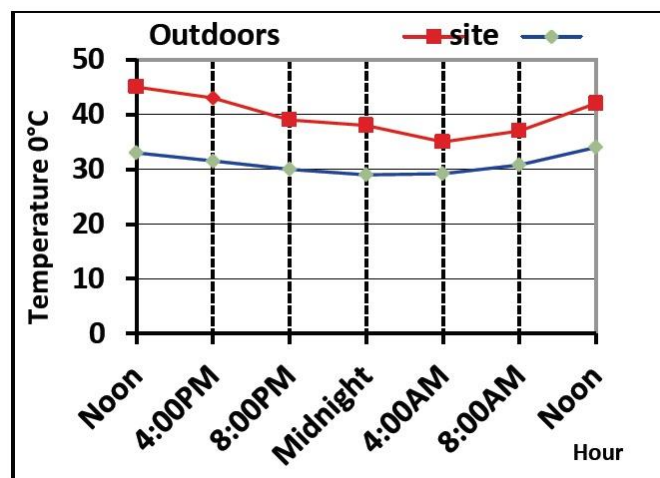


Figure 3.4: Temperature changes in Ghadames in summer (July) (Sharan, 2017)

3.3 Historical Background

Libya as a whole has been subjected to several invasions and colonization for more than 2,500 years. Those invasions were perpetrated by the Phoenicians, Carthaginians, Greeks, Romans, Vandals and Byzantines, Arabs, Turks, Italians and the British. These colonialists have ruled parts or all of the country at different times in the history of the country (Shahran, 2017). The most important period of colonization of Libya is after the invasion and conquering of Libya by the Arabs in 642 AD. The Arabs significantly influence the culture and lifestyle of the Libyans and caused a huge shift in their cultural and historical background (Buhagar, 2012). They were able to influence the changes through the force of religion and faith; hence, the Libyans adopted the Arab culture, language, architecture, social system, values, and lifestyle (Shawesh, 1996).

Ghadames is a part of Libya, and every colonization effort that affected Libya, affected Ghadames as well. According to Joffe (1989 cited in Shawesh, 1996), the name Libya has been used to describe the whole of North Africa except Egypt for more than two thousand years. However, present day Libya came into context after the defeat of the Italian colonialists in January 1943 (Shawesh, 1996). In the period between the old Libya and the present-day Libya, several colonial efforts have been recorded.

In 642 AD, Libya was a province of the Arabs. This period had the most impact on the Libyan socio-cultural lifestyle. Although before that period, the Phoenicians, the Greeks, Garamantes, Romans, and the Byzantines had colonized the regions at different periods. However, in 1551, Libya became a province of the Turkish Empire and the Italians invaded it in 1911 to take rule of the Libyan Coast. However, after World War two, Italians surrendered to the Allied powers while British and French powers took over the country's administration as caretakers between 1943 and 1951 (Shawesh, 1996).

One of the most visible and important effects of the colonization efforts is the effect on the housing choices and lifestyles of the people of Ghadames. These stages of development affected the housing designs in terms of types, spatial organization, materials and the construction. The architectural development in Libya's colonization era could be divided into four distinct eras namely the classical era, the Islamic period and the twentieth century. A brief explanation of this eras is provided in the following subsections.

3.3.1 The classical era (2000 BC - 700 AD)

This period refers to the era of the Phoenicians, Greeks, Garamantes, and the Romans and dates back to the first millennium BC. It was characterized by massive masonry which is still traceable along the Mediterranean.

- **The Phoenicians Period (2000 BC)**

The Phoenicians were the first to settle in Libya near the end of the second millennium BC. The local people were pastoral nomads referred to as Bedouin, who used simple shelter that can modify the extreme temperature of the region. As simple as the shelter is, it still meets the privacy requirement for Libyan houses. The interior of the shelter can be divided into three spaces to accommodate the family, a kitchen and a guest room, using curtains to separate the rooms (Shaiboub, 1979).

- **The Greeks Period (700 BC – 500 BC)**

The Greeks took over the Cyrenaica parts of Libya in the first half of the seventh century BC. The Greeks established four important cities in the region namely; Barce (Al-Marj), Hesperidins (later Berenice, present-day Benghazi), Teuchira (later Arisone, present-day Turkish) and Apollonian (Susah) (Nelson, 1979). Greeks developed public life more than the private life, hence little attention was placed on the private buildings. However, in the Hellenistic period, attention was shifted to private life and more luxurious houses with central courtyards were built. The houses consisted of a number of rooms surrounding a central yard and usually a single story-building. (Nelson, 1979)

- **The Garamantes Period (500 BC – 150 BC)**

The Garamantes refer to an ancient Hamitic people who inhabited the Libyan Sahara from the time of Herodotus until the Roman period of North African history (Blunsum, 1968). The people were mostly Bedouins and are insulated from external interference and live in portable houses. These people settling in the Saharan region were mostly unaffected by colonization and thus maintain a high level of conservatism. Such areas included Ghat, Sabha and Ghadames, and as a result, the ancient traditions are still very visible in these regions. The Garamantes established some settlements in Fezzan region and had Germa as the ruling capital of the desert region until Augustus made an expedition with Cornelius Babuls in 19 BC. Against the Garamantes and captured Germa (Hassan, 1982). The settled

habitations of the Garamantes comprised of one or more apartments and their walls were plastered with colored lime or gypsum (Shawesh, 1996).

- **The Romans Period (146 BC – 680 AD)**

Romans influence on Libya started in 146 BC in the Tripolitania. They copied the Greek courtyard houses because it appealed to them and it met the indigenous people socio-cultural values and environmental needs. The courtyard houses consisted of two stories, an open court, a tree or fountain in the center with a cistern which collected water from the roofs or a well to a side of the building (Shawesh, 1996). The use of courtyard houses in almost every part of Libya revealed that the people have a culture of gathering together in function especially for marriage purposes. (Daza, 1982).

3.3.2 The Islamic period (700 – 1911 AD)

- **The Arab Period (700 – 1600 AD)**

The Arab influence on the Libya society has been identified as the strongest. Its fundamentals of Islam, extracted from the Quran was widespread in the Arab period of colonization which commenced in the 7th century, and it has been sustained till date. The influence was also felt in Libyan architecture, strengthening their privacy requirement particularly. However, the Arab Muslims did not bring a new housing design, but adapted the previous courtyard houses that has been established by the Greeks and Romans. They only developed it to adapt more to their socio-cultural values of Arabian origin and the environmental conditions of Libya. Although Arab influence can still be observed in terms of decorative arches and triangular wall edges in houses in Libya. (Daza, 1982).

- **The Ottoman Period (1600 –1911)**

This period was responsible for the rebuilding of several renowned Libyan architectures which according to Shawesh (1996) was responsible for the irregular shapes. Hence, the belief by so many people that the current Libyan architecture was introduced during the Ottoman rule in Libya. They also prioritized Islamic principles such as the separation of males and females within the house right from the plan and design of the house. (Essayed, 1981)

3.3.3 The twentieth century

- **The Italian Colonization (1911 – 1943)**

Unlike the previous eras, the Italians decided to create a new European type of housing totally different from the local architecture and without regards for the socio-cultural and environmental requirements. They therefore created European city with wide streets, multi-storied buildings, piazzas, and modern shops. This created a difficult situation for the Libyans and was worsen in the Fascist regime. They regarded the culture the people as inferior and treated the indigenes as such. The plan was to take over the land for Italians and displace the locals. However, the World War Two saw the end of their oppression over Libya. (Daza, 1982).

- **The British/French Tutelage (1943 – 1969)**

This era had limited influence on the Libyan architecture because they only administered caretaker functions. Hence, the recent traditional house in the region was hugely influenced in the periods before the British/French administration. However, contemporary houses in Libya reflects some imported architecture from Europe, especially of British and French origin due to the discovery and exploitation of oil in the 1960s which led to huge importation of materials and design from the western world. (Azlitni, 2009).

3.4 Traditional Libyan House

The existing traditional houses in Libya reflect features adopted from several historical periods and development attempts of the region architecture. Typically, a traditional house consists of a courtyard on the ground floor for social activities. The main entrance is adjacent to the living room and not directly opposite a neighbor's door. It was designed to ensure the privacy and security of the women in the house while they go about their daily activities. The kitchen and stores were also located on the ground floor to ease access by the women. The second floor is usually a private space and sleeping space for the family. It is usually a long space on both sides of the open courtyard. Men and guests were placed in the living area while the women while placed in the private sessions such as their sleeping rooms and the kitchen.

Traditionally, houses were mostly built by their owners themselves, who were totally involved in the process and took full responsibility for financing, designing the houses, choosing materials, and organizing construction without an architect or civil engineer (Shawesh, 1996). As a result, the spatial organization of the house interior was determined by the owner's socio-cultural values such as religion, privacy, security, interpersonal relations and environmental conditions. The houses were constructed from local natural materials and had thick walls of either sandstone, limestone or mud bricks, based on availability. The construction of the houses was built with local building materials such as flat roofs of timber, joists, or palm trunks and usually covered with a mixture of small stones and lime. (Daza, 1982) Below is explanation of two cities in Libya and their traditional houses:

- **In mountain area: Gharyan City**

The city of Gharyan is located south of Tripoli, about 90 km, on a mountain chain called "The western mountain". The city has a population of about 161 000 inhabitants and has the area of approximately 4660 km². Underground houses are mostly used in the Gharyan City. The underground house is one of the dwelling types used in the ancient civilizations in many parts of the world and Gharyan City is included. This is also an evidence of cultural adoption from various civilizations. The climate of Gharyan is cold and rainy in winter, with an average temperature of 10°C, and hot and dry in summer with an average temperature of 35°C. This leads people to utilize the mass effect strategy, the warmth of soil in winter and its coldness in summer. (Sharan et al., 2017). Figure. 3.5 shows the traditional house plan of traditional house in Gharyan.

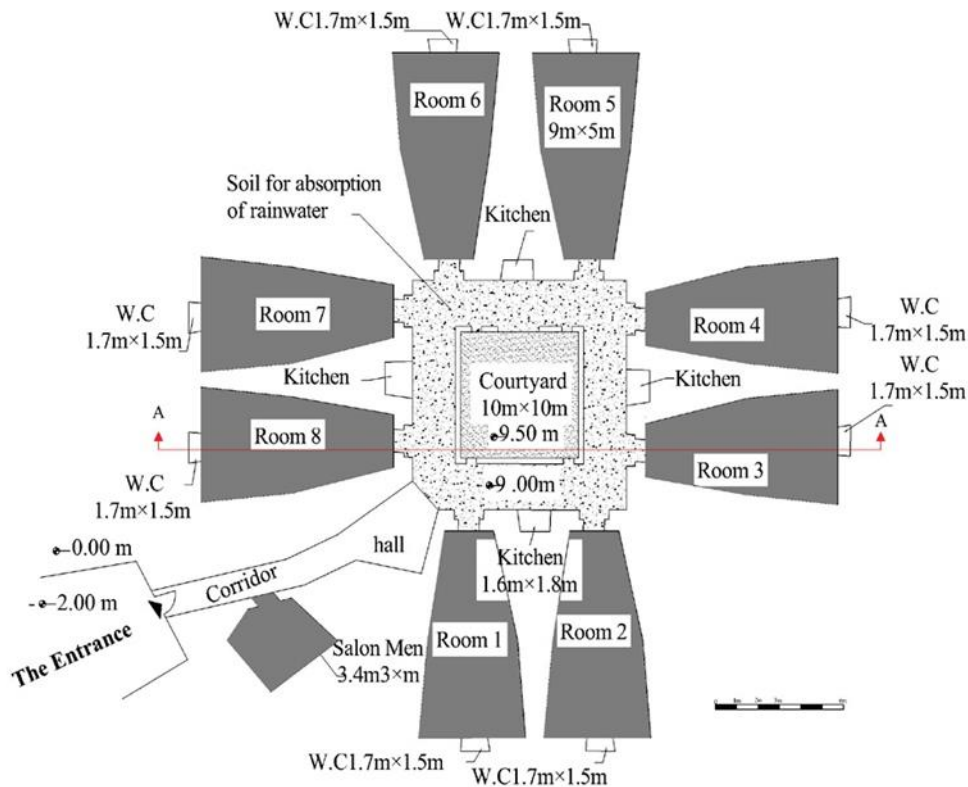


Figure 3.5: Traditional house plan in Gharyan (Sharan et al., 2017)

The underground house consists of eight large rooms, where each room is used as a home for one family. Total area of the house is about 446m². The space analysis of the central open courtyard allows air circulation and sunlight to enter the rooms during the day, and the natural light of the moon during the night. The house does not lean on any structural element, and therefore there are not any partition walls dividing the internal space. Figure 3.6 shows an example of a traditional underground house in Gharyan.

Bedrooms are dug deep in a shape similar to trapezoid, where the dimensions of the entrance area are about 1.90 m. This is the smallest dimension of the space in the analysis angle, and the width of the room expands until it reaches approximately 5 m. The room is divided by curtains into three parts. The first part is a living room, since it is located next to the entrance. The second part is in the middle of the space and it is the children's room. The third part is at the end, and it is planned for a married couple. And, at the very end, there is a bathroom. As it can be noticed, the difference between these three parts is just in the ground floor. Each floor is elevated base on the space 15 cm from the previous one. The room are well designed with furniture which are according to the nature of the

mountain area such as covering the walls by cloth, sit and sleep on the floor and also, the use of white paint on the walls. (Sharan et al., 2017)



Figure 3.6: An example of a traditional underground house in Gharyan (John, 2007)

- **In the city of Tripoli**

The old houses in Tripoli show a great variety in size, according to the income of the family. Due to the impact of various invasions, one can find Spanish, Maltese, and Italian influences in the houses in Tripoli. The Spanish houses are called “Hooch” and they are similar to the houses around the Mediterranean generally such as seen in Greece, Rome, and Spain. The Hooch courtyard house can also be seen in Islamic countries as well as in China and many other areas across the world (Lafi, 2018).

Due to the hot climate, the choice of construction material used are those that do not conduct heat with selection of locally available building materials such as clay, granite stones, stumps of palm trees and limestones. The mode of spatial organization of these houses plays a significant role in the allocation of space especially in the interior design of the house. This involves the placement of the kitchen to increase shading and removal of

smoke from the house. The roof also allows children playing, sitting and sleeping during the summer including high end exterior walls for privacy purposes.

Also, the space analysis of courtyard houses gives a feeling of security for the owner and a well-defined place protected from all kinds of interference even in a case of overcrowding (Al-Jaber, 1997). Figure 3.7 shows the typical traditional Tripoli houses.



(a)street view

(b) courtyard

Figure 3.7: Typical Tripoli house (Mahdawi, 2000)

The traditional houses both in Tripoli and in Gharyan show some striking similarities ranging from construction materials to the design of the houses. One of the striking similarities in the house designs is the presence of court yards in all the traditional houses in Ghadames, Gharyan, and Tripoli. Furthermore, similar local construction material such as mud, pumice stones, limestone, trunk, leaves of palm trees, gypsum, and straw are used as materials for the construction of traditional houses in these cities.

3.5 Cultural Elements of Ghadames

Some of the cultural elements found in the way of life of Ghadames people include family structure, privacy, adaptation, techniques and technology, occupation. These cultural elements are briefly discussed below:

3.5.1 Family structure

The family system in Ghadames is based on blood relations. A typical Ghadames household consists of a husband, wife, and children. This means that members of a typical family consist of 6-8 members. However, the family structure may be larger if some members of his/her extended family (relatives- especially females that are either divorced or widowed) live in the same house. The family structure or size may also be larger if the man practices polygamous (marriage to more than one wife) which is a very rare case. The culture of the Ghadames people views the family as a social group or an institution on its own that requires the loyalty of members of the family and tribe/clan to be a major priority (Al-Sibae, 2014)

This system shows to a large extent that the Ghadames family is a matrilineal extended family. It is uncommon to have a single nucleated family for a long time. In the same vein, adult status is only bestowed on married men, especially the fathers. It is thus uncommon to have a single bachelor to have a separate house or housing layout. Hence, marriage is usually set up by parents or through the service of a professional matchmaker. The family system, though more traditionally inclined than religious, still anchors on some of the teachings of Islam which allows for polygamous households as long as the husband can treat the wives equally. One can therefore see a typical polygamous family in the Ghadames as a standard family setting (El-Agouri, 2004).

3.5.2 Beliefs and religion

The Ghadames natives are Muslims by religion due to the strong influence of the Arabs on their culture and lifestyle. Islam is also one of the most popular and strongest religions in the world that determines how people live, interact and express themselves. Hence, the influence of Islam on the cultural identity of Ghadames is one of the strongest cultural elements that characterizes a Ghadames people and their way of life. For instance, the people of Ghadames see the need for reserving specific and special spaces for worship purposes which can be seen in their houses, markets, and general public spaces. Furthermore, the religious beliefs are associated with various religious symbols and artifacts which are used in body, space and environmental decoration. As a result of popular

belief that mirrors deflect evil and bad energy from the surroundings, the people of Ghadames in the old time use mirrors in their surroundings. The religious belief of Islam actually affects the dressing style of the people that is why women are often seen dressed full body covered. Generally, Islam is a complete way of life which governs house people behave in the society. Therefore, the influence of Islam on Ghadames people can be seen in all spheres of their lives such as communication, house design (symmetry and geometry), and gender differentiation. Other cultural elements noticed in the Islamic beliefs of the Ghadames people is the inscriptions of Quranic verses on walls, the use of arches and courtyards in their built environment that easily identify that you are in the religion (Oberg, 1960).

3.5.3 Social values, norms and traditions

Social values of Ghadames refer to the standard rules, guidelines, and expectations of the actual behavior of the Ghadames people, whereas the values of Ghadames refer to the abstract conceptions of what is vital and has a worthwhile consideration. In principle, the social values of a people are ends while norms are the means to achieve those ends. Therefore, the social norms and values of the Ghadames people may include gender role play in the society, their social interaction, and gender separation. It may also include the preference of the people in terms of where social functions take place within built environments. This also reflects on how the attributes of Ghadames values dictates preference in style of decoration of the house spaces (Hamilton, 2016).

3.5.4 Politics and rules

This is more concerned with the governance system existing in the locality. It could be military rule, democracy, monarchical regime, or Islamic rule. The different regime has its own rules and organization which directly influence the decisions of individuals and their way of life. The norms, values and beliefs was affected from one era to another due to changes in the politics and rules. However, the last and most impactful era was the Arab era whose political impact and rules is hugely present today in Ghadames. Therefore, the politics and rules adopted in Ghadames determines to a large extent the rules that the people live by. The rules become determinant to a large extent of how Ghadames society is

organized and, in this case, how the built environment is designed. It would be observed that one of such rules can be seen in how defining private and public life is largely imprinted in the designs of their built environment (Fisher, 1978).

3.5.5 Privacy

Privacy in the culture of the Ghadames people is founded basically on the instruction of Islam founded in the Quran. The Islamic teachings emphasized the privacy and gender separation. Privacy is also considered very crucial factor that controls the interaction between males and females. While privacy in other Arab regions may be seen in the way of life of the people, it is one of the most sustained cultural elements in the lifestyle of the Ghadames people and their community in general. AL-Kodmany (1999) defined privacy as the ability to carry out everyday activities hidden from the eye of outsiders or without fear of being observed by them.

3.5.6 Occupation of the locals

Due to the geography of the country, most of Ghadames citizens were sedentary subsistence farmers farming on the little water resources. The sedentary lifestyle led to the design of permanent structures that can be use over several years. But due to the same water scarcity, they were nomadic and semi-nomadic and built their settlements to fulfill the requirements of their occupation. Houses were thus designed to accommodate the occupation of the people such as allocating space to store the farmer or the shepherds' occupational tools. (Shawesh, 1996).

3.5.7 Techniques and technology

The local people of Ghadames are skilled in the use of mud and gypsum for house constructions. They are also craft men who use palm tree leaves and other primitive materials to create crafts use for farming, processing food as well as decoration in their houses. Hence, the designs used are basically those that are conformable with the available skills and technology. The techniques and technology of the Ghadames people were gradually improved through the influence of different civilizations and the introduction of foreign technology to the people. In addition, the level of knowledge in building water

wells among the people of Ghadames encouraged the building of water wells in all houses to achieve ease of access for the users. One of the greatest achievements of the Ghadames people in terms of techniques and technology is their previous use of mud, gypsum, and palm trees for the construction of their traditional houses. (Al-Zubaidi, 2002).

3.5.8 Adaptation to the environment

Ghadames people have a lifestyle that is fitted to the environment they live in. Ghadames is close to the desert which means that the weather is mostly hot with and breeze. In order to adapt to this environment, the people of Ghadames usually wear full body covered clothing that are light in weight. Their houses are built with materials and painted in colors that do not retain heat, hence maintain a micro-climate, different from that of the exterior environment. Since there is water scarcity in Ghadames, the people developed wells and other means of water storage in order to adapt to the environment. (Fortea, 1989).

Designed to adapt to the environment in such a way that the houses help to maintain a micro-climate, different from that of the exterior environment. Thermal comfort is a major consideration in building Ghadames houses. For instance, the materials used for building the houses such as mud, lime, gypsum, palm trunks and the likes, are very good insulators that helps to reduce the heat coming from the exterior. At the same time, Ghadames houses maintain the warm environment in the interior during very cold weather. Windows are situated very high in the houses to reduce dust infiltration, while an open space is used from the roof so that natural sunlight can lighten the house. (Almansuri, et al 2015)

All these cultural elements and their influences will be related to the Ghadames houses design and the way the spaces are organized in all the houses.

3.6 Chapter Summary

This chapter has been able to identify the major cultural elements that influence the way of life and the environment of the people of Ghadames in conjunction to their location, climate, history, religion, occupation and the designs of their houses. In conclusion, it was elaborated that the above-mentioned cultural elements contribute highly to the lifestyle of the people of Ghadames in Libya.

CHAPTER 4

ANALYSIS OF GHADAMES TRADITIONAL AND CONTEMPORARY HOUSES

4.1 Introduction

Cultural Identity and sustainability revolve around the idea that culture is of inestimable importance to a community's identity and well-being. Cultural identity such as art, food, music, style occupation, tradition, customs and many more has influenced the architectural designs of Ghadames houses. Some of which has been found as sustainable elements transferred from the traditional house design to the contemporary house design. Cultural identity and sustainability of the Ghadames tradition also contributes to the spatial organization of the traditional houses. Generally, a typical Ghadames house contains the ground floor, first, second and third floor. Some houses can have a fourth floor which typically resembles a third floor, however, such houses have become extinct and can hardly be found today. The sustainability of the cultural identity of the Ghadames is visible from all spaces of the houses.

This chapter focuses on analyzing the cultural identity of Ghadames houses that has been sustained from traditional houses to contemporary houses. The traditional and contemporary Ghadames houses chosen as a case study for this research was nominated by the Ghadames institute of urban development. The plan for the selected houses is ideal for this research. This is because of the presence of cultural elements that are intact and still visible in the traditional house despite long years of disuse and the visibility of sustained cultural identity that can be visibly seen in the contemporary house. For the traditional house analysis, a typical house was chosen as a case study because all the traditional houses have the same spatial organization, floor plans, same spaces and same functions. The element of cultural identity that can found in one house can be found in the others traditional houses as well. This is further explained in section 4.3 for the contemporary house analysis, the example was from a typical housing project chosen for case study analysis. The housing project consist of 616 identical houses from which a typical house was selected for this study. This is further explained in section 4.4.

The houses were evaluated as a whole to discuss the cultural identity that are still visible in the designs. However, detailed attention to in each floor of both the traditional and contemporary house to identify and discuss the cultural identity that is sustained in regards to the architecture of the interior designs. Furthermore, different sections of each floor in the houses under study are also discussed. All the cultural elements that were identified in the traditional houses and sustained in the contemporary houses are fully explained as contributing factors to the cultural identity of the houses.

4.2 The City of Ghadames

Ghadames city is made up of covered streets with closely arranged square house in compact form for the purpose of reducing exposure of the people to the harsh sunlight as well as for privacy of family life (Chojnacki, 2003). The architecture of the Ghadames is perfectly adapted to the desert life and social life of the people (Azzouz, 2000). The design and compact cluster of houses creates a micro-climate that maintains the ambient temperature at relatively modest floors by shielding the streets from direct sunlight. This is made possible due to the fact that the buildings are constructed vertically and firmly grouped together rather than spreading out horizontally (Fortea, 1989).

The settlement building material is mostly made of mud and palm trees, with buildings connected with each other whereby they share the same roofs and walls. The surrounding settlement structure is already surrounded by wall as a security measure against war attacks. Furthermore, different house structures have a gate providing security measures for the occupants. Not surprisingly, all the houses in Ghadames are similar in decorations, size, arrangement, which reflects the cultural identity of the owners.

The Settlement of Traditional Ghadames is made up of seven clans which originated from seven different families namely Tsuku, Djarrasan, Mazigh, Tharefra, Tangzin, Glorsan, and Auid Blél as illustrated in figure 4.1. The males of these seven clans meet up regularly at the central meeting square where there is a general mosque for the community. The central meeting place in the area is also responsible for the distribution of water, exchange of goods and previously used as a market center in the old period. The construction is done by using six main building materials;

1. The Mud
2. Lime Stone
3. Pumice Stone
4. Trunk, Leaves of Palm trees
5. Gypsum
6. Straw.

Using these basic materials, the people of Ghadames were able to build their desired houses in the middle of the desert. There are several factors that may contribute to the construction of houses and the interior design of these house in the Ghadames, such factors include;

1. Climatic Condition
2. Family structure
3. Beliefs and religion
4. Social values, norms and traditions
5. Politics and rules
6. Privacy
7. Occupation of the locals
8. Techniques and technology
9. Adaptation to the environment

A typical Traditional Ghadames house uses a foundation construction of about 100cm in depth, with mud bricks and straws of 60 x 40 x 15 cm. While the floors and rooms use palm tree materials gently separated in to 50 cm x 70 cm in size. The stairs noticeable in all floor of the house is constructed with pumice stone and gypsum. The total construction of Ghadames house requires about 12 months to be completed requiring 20,000 bricks that are made entirely from mud, 800 meters of palm trunk 20,000kg of gypsum, 2,000kg of lime and 1500 palm branches (Shawesh, 1992).

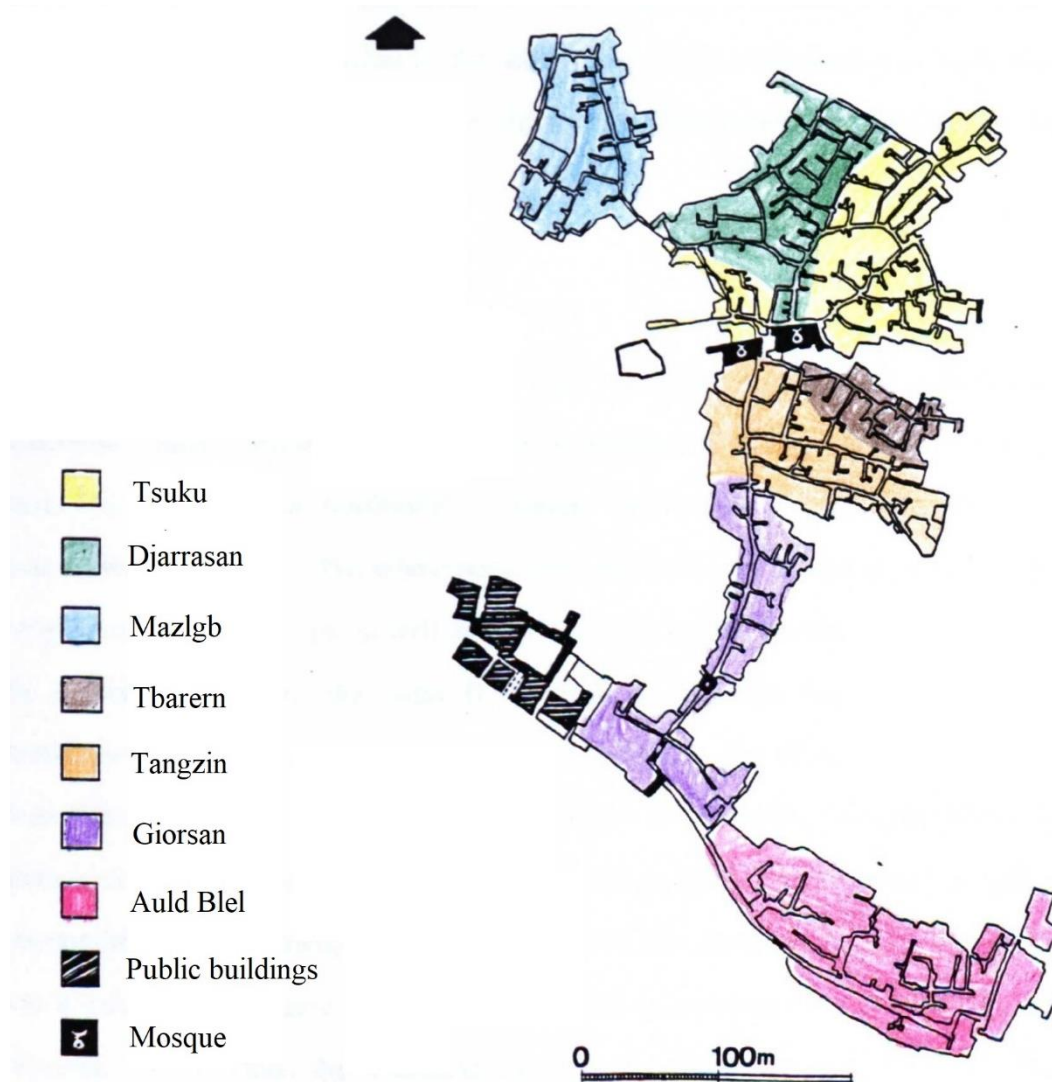


Figure 4.1: The settlement of traditional Ghadames showing the neighborhood of seven Ghadames clans (Eldblon, 1968)

According to El-Agour (2004), the housing zone can be classified into three main categories. Firstly, the traditional house within the old settlement, which constitute about 11% of the total residential zone. Secondly, there are scattered house in the entire settlement, forming about 15% area. Thirdly, new contemporary house has been built recently from concrete, comprising 74% of the area. The main principles guiding the planning and layout of the old Ghadames city and the nature of the traditional housing construction are: covered streets, narrow passageways, compact urban fabrics and exclusively designed houses.

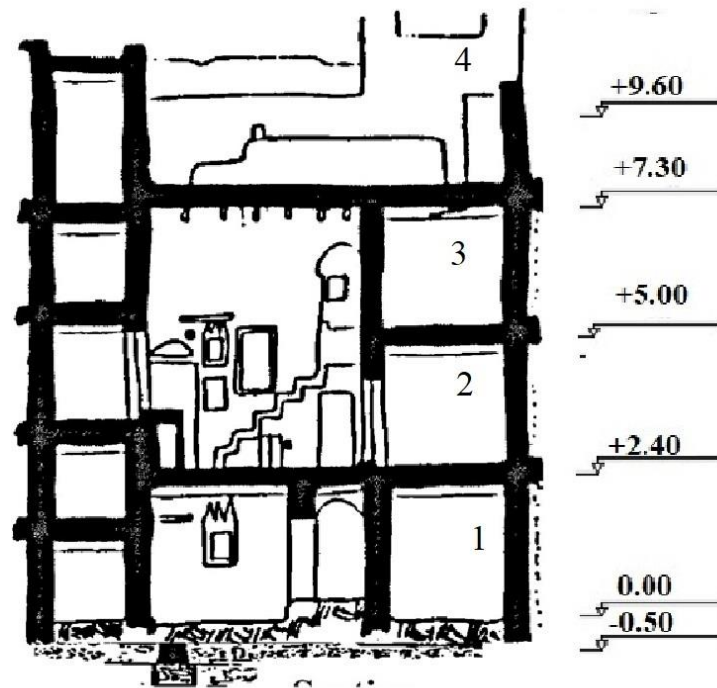
4.3. Analysis of Ghadames Traditional House

At times, it can be quite difficult, to differentiate in the type of house in Ghadames as a result of similar design and the sharing of same walls and the roof located close to each other in the houses sharing same elevation as can be observed in figure 4.2. However, striking differences are achieved by the number of rooms in the house and the area space of the living room. Ideally, plot area of Ghadames house is about 25 – 50 square meters with house area of 70 – 80 square meters (Shawesh, 1992).

The ground floor is regarded as the street level while the first floor is regarded as the visitor level. The second floor in the house is regarded as the household level while the third floor is regarded as the women level. Occasionally, there is a fourth floor which is not typical of a Ghadames house since it is a matter of preference by the house owner. The entrance on the ground floor have staircase leading to the first floor where the female reception is located. The ground floor is dug half a meter underground from ground or soil level. The second floor is usually used by the women for storing food items, while the third floor is where the kitchen is located and it contains spaces mostly used in the summer period, usually at night for air ventilation and it is also used as route by the women connecting to neighboring houses. According to Alabid (2014), the majority of houses in Ghadames are similar in plans, structure, and design. However, there could become differences in only the size of the houses and the interior decorations which can be due to financial condition of the owners, family and occupants of the Ghadames house. Figure 4.3 shows the sectional view of Ghadames house design, revealing the organization and the floors of the houses. There are porous and blind shutters used to shut or open the uppermost aperture in the ceiling of the living room (female reception or Wast Alhosh) as dictated by the outdoor climate conditions (Ealiwa, 2000). The house stands wall-to-wall, with adjacent houses.



Figure 4.2: Traditional Ghadames houses showing connected walls, passage ways, and entrances



- 1) Ground floor (street level)
- 2) First floor
- 3) Secound floor
- 4) Third floor (women level)

Figure 4.3: Section of traditional Ghadames house (Shawesh, 1995)

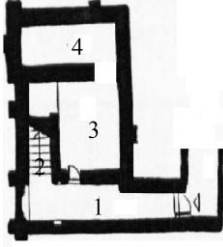
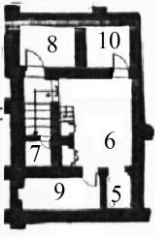
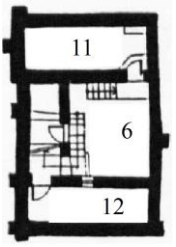
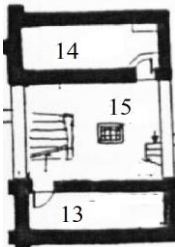
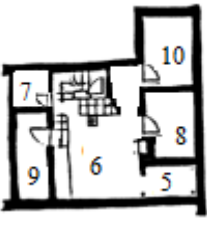
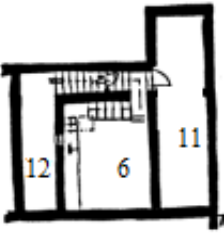
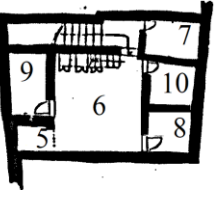
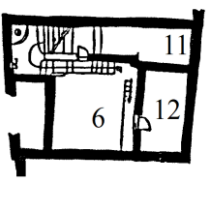
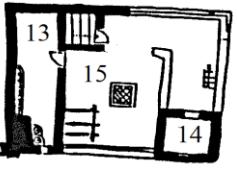
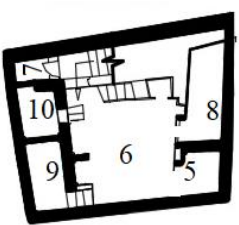
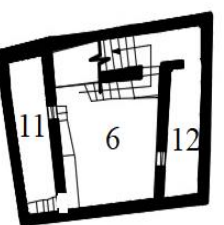
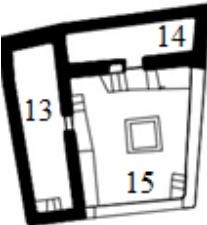
To show the common of the spatial design of all traditional Ghadames houses, four examples will show the outstanding distribution of spaces across the room spanning from the ground floor to the third (top) floor where the kitchen is located. A typical Traditional Ghadames house consists of four floors (ground, first, second, and third floor) in which the entrance to leading into the house is always located in the ground floor leading to an interior room. The largest rooms of the Ghadames is placed on the first floor (Alkhazmi & Esin, 2017).

Table 4.1 shows the similarity as well as striking differences in the layout of each level of four different traditional Ghadames house plans (example 1, 2, 3 and 4). The difference is only in the layout arrangement as most of the houses contain the same level of floors and spaces arrangement. In table 4.1, all spaces in the house are represented by numbers as shown below.

1 Entrance	6 Female reception	11 Mash room
2 Stairs	7 Toilet	12 Grain store
3 Male reception	8 Female bedroom	13 kitchen
4 Store	9 Master room	14 summer sleeping room
5 Kidwa room	10 Male bedroom	15 Roof

All the house plans in the table have four floors, central room on first floor, and two entrances; one on the ground floor the other on the top floor. Example 4 is the case study used in this thesis for the analysis of the traditional house.

Table 4.1: Showing the layout of traditional Ghadames houses

	Ground Floor	First Floor	Second Floor	Third Floor
Example 1				
Example 2				
Example 3				
Example 4				

The following figures (4.4, 4.5, 4.6 4.7) below are a more detailed representation of the examples of houses layout in table 4.1 showing the house section and the layout. This figures clearly shows detailed spaces arrangement in the examples.

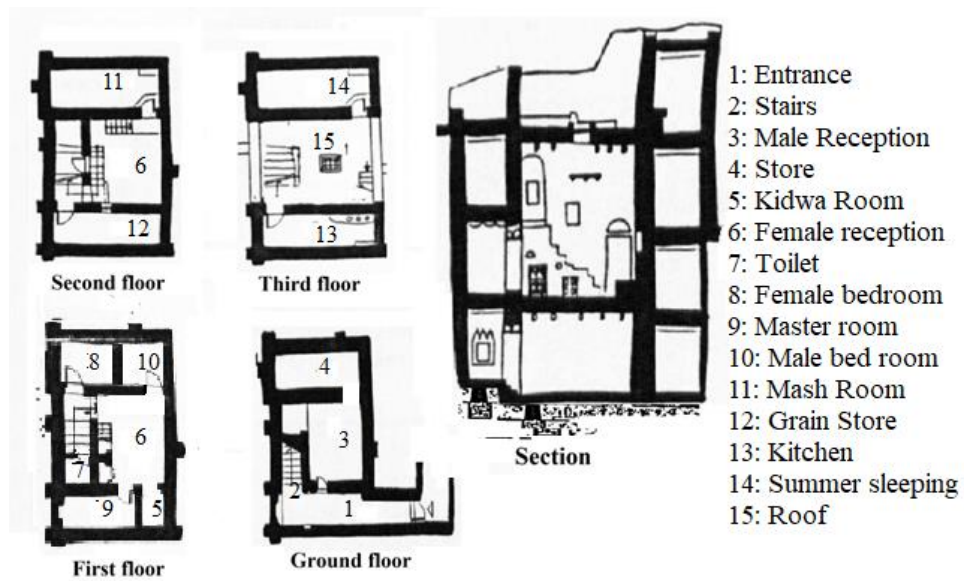


Figure 4.4: Example 1 showing the layout of floor plans and section (Shawesh, 1996)

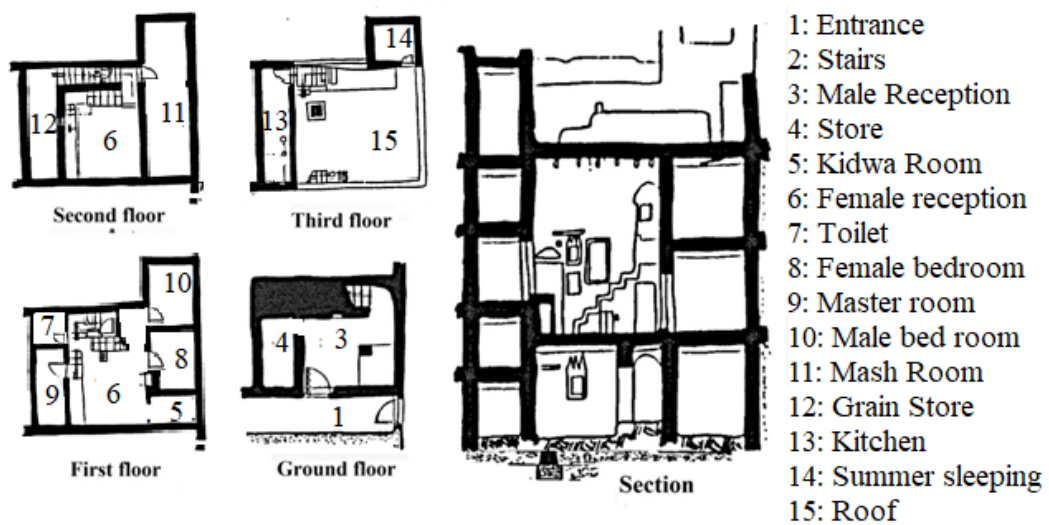


Figure 4.5: Example 2 showing the layout of floor plans and section (Shawesh, 1996)

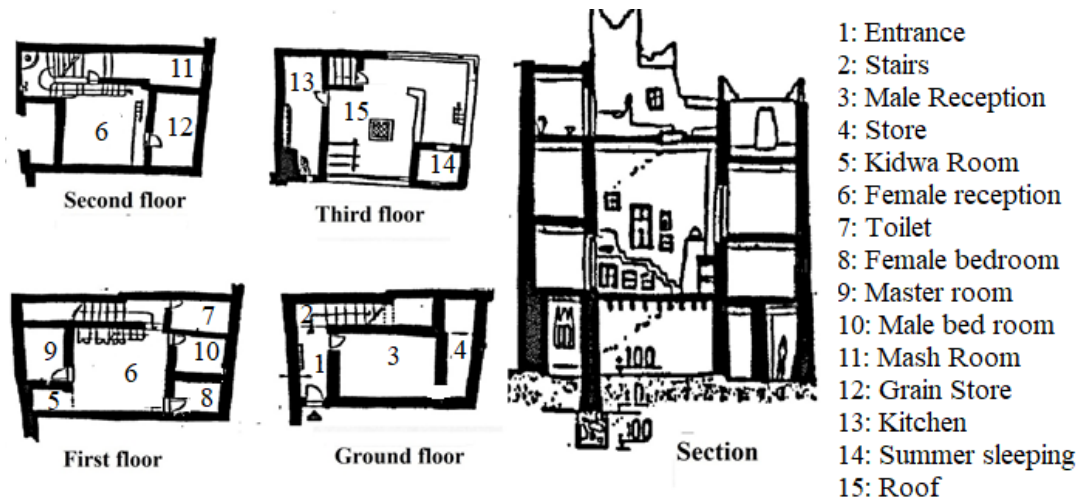


Figure 4.6: Example 3 showing the layout of floor plans and section (Shawesh, 1996)

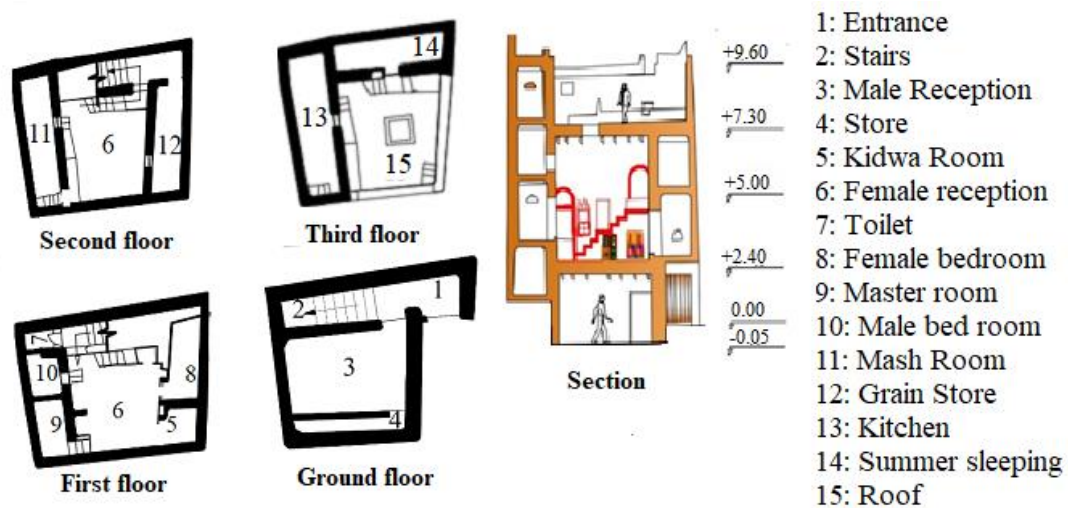


Figure 4.7: Example 4 showing the layout of floor plans and section
(Institute of Ghadames urban development, 2018)

Figure 4.7 shows a clear and full detailed plan of all floors of traditional Ghadames house chosen as a case study for this research. This house belongs to Mr. Abdullah Mowaffak's family, a resident of Ghadames city who had already moved to a contemporary house in Ghadames. As can be seen in the figure 4.8, the traditional house under study has four floors, a central room on first floor, and two entrances; one on the ground floor the other on the top floor which is similar to the example of houses plan shown in table 4.1. The traditional house is still in good shape and has all the requirements of the study. The detailed cultural elements such as privacy, family structure, adaptation to the environment,

and occupation mentioned in chapter three section 3.5 in each floor of the house is elaborated in figure 4.7. The selection of the house as a case study was nominated by the Ghadames institute of urban development because of the richness in cultural elements found in the house. The house was also found to be well defined as it attracts tourism due to the fact that it kept several cultural elements in place. These cultural elements include colors and special patterns design, locally made decorative hand crafts, and locally made tools etc. Other cultural elements such as copper crafts, colorful wall fabrics, palm tree woven covers (Tabak), and framed mirrors are used around the walls to improve its beauty and the reflection of light.

4.3.1 Ground floor

The spaces in the ground floor contains the entrance, stairs, male reception (Marboa), and store. Figure 4.8 shows the layout of the ground floor. Most of the ground floor plans in Ghadames houses exhibit similar characteristic structures using mostly traditional building materials such as mud, palm trees and straws for the construction of houses. The male reception located in the ground floor, the coldest room during the day time in the summer season according to the inhabitation of Ghadames. For this reason, this room is used as the sleeping room during the day in summer.

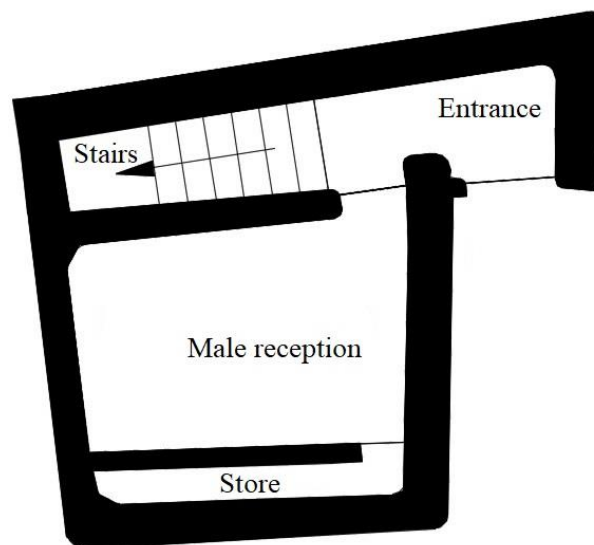
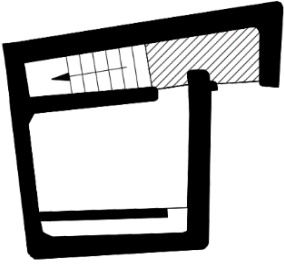

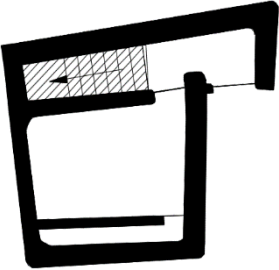

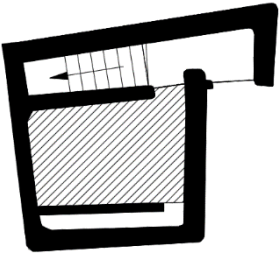

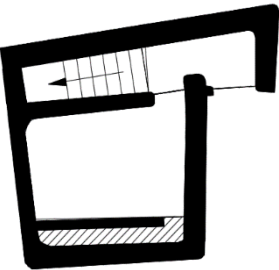



Figure 4.8: Ground floor layout of traditional Ghadames house (Institute of Ghadames urban development, 2018)

The ground floor is decorated with brightly colored design in patterns and furniture of floor sitting arrangement, which contributes to the culture of the Ghadames people. In the entrance, the walls are characterized by drawings/painting with bright colors which are red and white which could possibly symbolize religious believe, adaptation to environment or social values, for example, the Ghadames people use white and other bright color all over the house due to the hot weather of the desert, because, the white colors do not retain heat like black or darker colors do. In ancient times, red paints were used in decoration in the Ghadames house for the purpose of evil or bad energy repulsion which signify that red color is an element of belief. The wall is built by use of local materials like mud bricks while the entrance door is made from palm trees. These can be attributed to the cultural elements of techniques and technology. It is also important to note that the duty of painting the entire house in white is for the men while the decoration by other colors such as red, blue and yellows is a usual duty of the women. This can be attributed to social values, norms, and mores as cultural element. Privacy is noticeable from the entrance (only stairway can be seen from the entrance). Other elements such as clay pots is also noticeable in the entrance photo. Drawing/painting is also done on the arch of the stairs. The stairway leads to the living room of the first floor. Both the stairs and the walls of the stairs are painted in white for the purpose of adaptation to the hot environment. The male reception is characterized by traditional carpets of distinct patterns as well as traditional wall cover used for protecting residents and visitors from particles from the mud used in the house. The uppermost part of the wall is also decorated with traditional covers (Tabak) made from woven palm tree leaves. For both traditional and religious (Islam) purpose, Ghadames people sit on the floor with the aid of pillow (Mendar) arrangements. The store is painted with plain white color. It has no noticeable decorations. It is used for storing local farmer tools such as axes, hoes, saw etc. depending on the occupation of the residents. These can be attributed to the cultural elements of occupation of the locals. All these elements can be seen in table 4.2. Typically, there is only a door entrance of about 140cm from the ground floor in to the house.

Table 4.2: Ground floor plan of traditional Ghadames house

Space	Name	Interior Photo	Cultural Element
	Entrance (Door)		The walls are characterized by drawings/painting with bright colors which in red and white. The door is made from palm trees. There is clay pot in the entrance
	Stairs		Drawing/painting is done on the arch of the stairs. The stairway leads to the living room of the first floor. Both the stairs and the walls of the stairs are painted in white for the purpose of adaptation to the hot environment.
	Male Reception (Marboa)		The walls and carpet are covered with carpets and fabrics of distinct patterns of bright red, yellow and blue color. Three Tabak (covers) made from woven palm trees are decorated. Mendar/pillow arrangements.
	Store		The store is painted with plain white color. It is used for storing local farmer tools such as axes, hoes, saw etc. depending on the occupation of the residents.

4.3.2 First floor

The first floor of traditional Ghadames houses consists of the Kidwa room, female reception (Wast Alhosh room), toilet, female bedroom, master room, and male. This can be

seen in the layout shown in figure 4.10. The first floor of a typical Ghadames house is where the living room is usually placed with a single toilet. The interior decoration of the living room contains similar patterns in design. The pattern and interior design came about from the cultural identity of the Ghadames. These items of decoration of distinctive pattern which are seen as the significant bright colors has also been link to the religious element of culture.

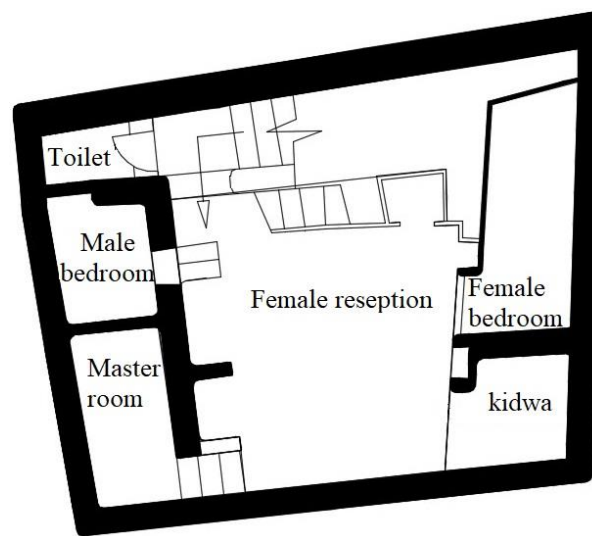


Figure 4.9: First floor layout of traditional Ghadames house (Institute of Ghadames urban development, 2018)

The first floor contains the male and female room which may be separated or demarcated in to two, separating the male children from the female. The decorations on the walls, stairs are retained even in some of the mosque building structures in Ghadames and other cities in Libya indicating the religious elements of the old Ghadames. As there are no windows in all floors but the last floor, light is shined from the last floor through a small opening that is reflected to all area of the house by the mirrors on the walls. This is as a result of the temperature of the location being very high, therefore little rays of sunshine is allowed in the house. The most fascinating room in the Ghadames houses is located in the first floor known as Al- Kidwa which is decorated in red bright color, since the people are in the middle of desert and get isolated to bring life to the house. This room is used only in special occasions one of which is when a woman marries, while the other is when her husband dies and to keep the new born child if there's a wedding in the house. This is as a

result of the customs and tradition in which the Ghadames Libyan people are accustomed to. According to the culture of the Ghadames, the male child of the house when grown can also use this same room for his wife when he is mature enough for marriage.

The Kidwa room is designed like a tent. The floor and walls are covered with traditional rich bright colors (eg. red, yellow, and blue etc), carpets and fabrics respectively. The upper part of the wall is painted white while the arch is painted in red and decorated with traditional copper ornaments. The floor has mendar and pillow arrangement. Traditionally, this room is for the bride on her wedding night or the widow the day her husband dies. Characterized with red color designed wall cover. The carpets are designed in various patterns and colors. The walls of this contain a cupboard/wardrobe (painted in green- an Islamic/religious identity) for storage of clothes. Mirrors with golden frames are placed on the upper walls for reflection of light and superstitious belief. This is attributed to beliefs as a cultural element. Traditional copper crafts are decorated on the walls as well signifying the cultural element of techniques and technology. The toilet room is painted white with no decoration. The toilet is pit latrine built using muds and straw that is attributed to religion as the teachings of Islam prefer the squatting position while using the toilets. The wall and floor of the female bedroom are covered with bright colored fabric patterns and carpet respectively. There is a mirror placed in the wall for makeup purpose. The floor is also characterized by the presence of mender and pillow designed with bright colors for sleep and sitting comfort. The wall is covered with blue and white striped fabric material. Traditional painting in red, yellow and other bright colors can also be observed on the walls. All cultural elements in the female room can also be found in the master room which is used by the husband and wife. Ghadames culture attributes bright colors and decoration to females while the males are attributed solid pale colors as a result of the cultural elements of norms, values and mores. The room is painted white with carpet and mendars/pillows on the floor for comfort due to the fact that the males of the house spend most of their time working outside the house. All the above mentioned cultural elements can be noticed in the interiors photos in table 4.3.

Table 4.3: First floor plan of traditional Ghadames house



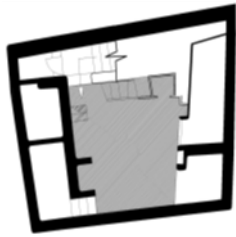







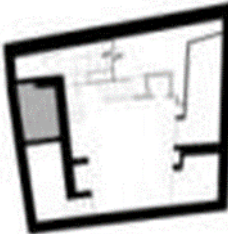

Space	Name and (Special name)	Interior Photo	Cultural Elements
	Kidwa Room		The floor and walls are covered with carpets and fabrics of bright colors (red, yellow, and blue). The arch is painted in red and decorated with copper ornaments. The floor has mendar/ pillow arrangement
	Female Reception (Wast Alhosh)		The floor and walls are covered with carpets and fabrics of bright colors & pattern. It contain the cupboard/ wardrobe (painted in green) for storage of clothes. Golden frame mirrors are placed on the upper walls for reflection of light and superstition. Copper crafts are decorated on the wall
	Toilet		The toilet is pit latrine with no decoration. Built with muds and straws.

Table 4.3 Continued

	<p>Female bedroom</p>		<p>The floor and walls are covered with carpets and fabrics of bright colors& pattern. There is Mender/ pillow on the floor</p>
	<p>Master room</p>		<p>All cultural elements in female room can also be found in the master room which is used by the husband and wife</p>
	<p>Male bed room</p>		<p>Carpet with solid pale colors and walls painted in white color. There is Mendars for sitting.</p>

4.3.3 Second floor

The spaces in the second floor includes the mash room and grain store. Figure 4.10 shows a layout of the second floor. The first floor is connected to the second floor. In fact, the female reception is a courtyard that connect the first floor to the second floor. This means, the same cultural elements that can be found in the female reception room can be found in the walls of the second floor as well.

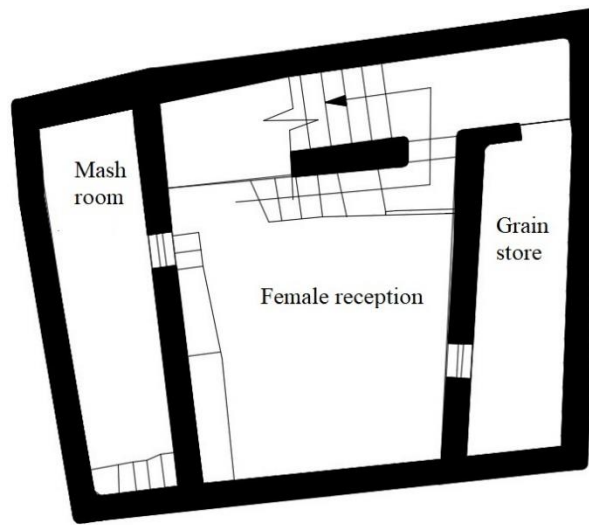
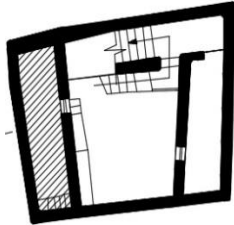

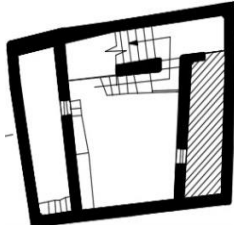



Figure 4.10: Second floor layout of traditional Ghadames house (Institute of Ghadames urban development, 2018)

The mash room is located close to the kitchen for easy movement for females working in the kitchen and the mash room, an indication of social norms in the Ghadames society. All locally made mashing tools like jugs and cover (Tabak) for storage of water, milk, and grain is stored in the mash room on the floor and walls. The seive is used to separate the mashed graines from the chaff which is an indication of the techniques and technlogy of the people. The grain store has an open window accessible from the living room to easily access the stored food without opening the grain store door to keep the grain safe from humidity as result of environment adaptation. The second floor of the traditional Ghadames houses can be seen in Table 4.4.

Table 4.4: Second floor plan of traditional Ghadames house

Space	Name	Interior Photo	Cultural Element
	Mash Room		For preparation of grains before taking to the kitchen for cooking. It is painted white and the floor is covered with a plain colored carpet. All locally made mashing tools like jugs and cover (Tabak) for storage of water, milk, and grain.
	Grain Store		As a farmer the resident of the house needs a storage for the grain. The window opens into the living room to allow easy access to stored food, the window use to get the grain without open the grain store door, to keep the grain safe from humidity.

4.3.4 Third floor

The third floor of most traditional Ghadames houses consist of kitchen, summer sleeping, and roof as shown in the layout in figure 4.11. There is a striking resemblance in the third floor and fourth floor of Ghadames house. The people of Ghadames spent most of their summer period at the room of third or fourth floor of the house for socialization.

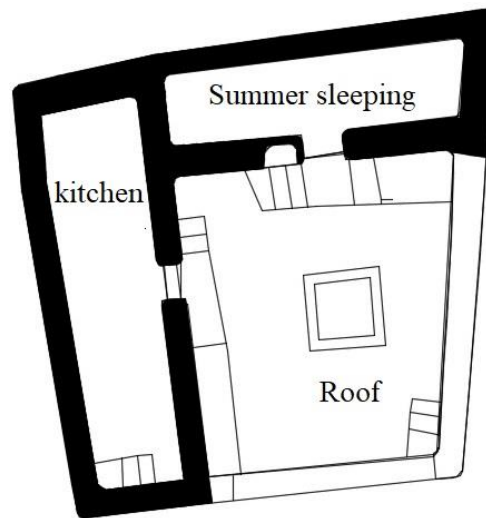


Figure 4.11: Third floor layout of traditional Ghadames house (Institute of Ghadames urban development, 2018)

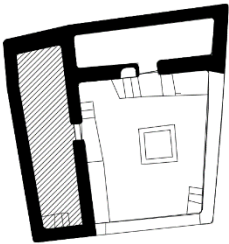

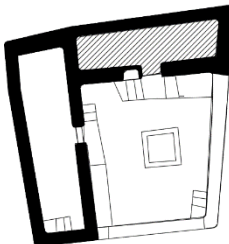

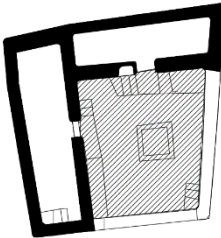

The kitchen and storage unit are located on this floor which is usually operated by the women as a result of the social values and privacy of the Ghadames people. Present in the kitchen as shown in table 4.5 is the oven which is built from locally made mud and privately used by the women in the house for baking bread and roasting meat. It is by custom that the women are responsible for the kitchen therefore one would hardly see the men at the kitchen floor except for the husband or man of the house. This is an indication of family structure, social values, norms, and mores, politics and rules as well as the privacy. The storage unit and some cooking and cleaning items can be seen in table 4.5.

The kitchen is painted in white color without any floor and wall coverings. It contains the oven, water, and spices storages. The oven is for baking bread and roosting meat. It has two chambers, one for fire and the other for heat. Three small dome shaped mud of different sizes are used for placing large or small pots or pans for cooking. There is a section that is used for keeping clean water and another jug for collecting used water from the kitchen. The section carved in the middle of the wall of the kitchen is used for storing spices. Privacy allows the separation of females from the guests thereby allocating the upper third floor for the females of the house. The summer sleeping room is a room with open room top used for sleeping at night due to hot temperature during the summer. It is painted white. Characterized by triangular shaped section (Sherifat). The roofs of

Ghadames houses are connected with each other which allow privacy between the women to easily move from one house to another for interaction. This floor is mostly used by women. There is an opening that allows the passage of light in to the female reception.

Generally, a typical Traditional Ghadames house has three floors but in some cases the house may extend to a fourth floor as preferred by the owner. When available, the fourth floor of the house is the roofing area which joins with neighborhood houses. The walls of this route are usually very narrow allowing only females to run petty errands or greetings from one neighborhood to another. In other words, as a result of privacy, the Ghadames house has separated even the route or passage of the males from that of the female.

Table 4.5: Third floor plan of traditional Ghadames house

Space	Name	Interior Photo	Cultural Element
	Kitchen		painted in white color. It contains the oven, water, and spice storages. Three small dome shaped mud of different sizes are used for placing large or small pots or pans for cooking. There are storages for water and spices.
	Summer Sleeping		This is a room with open room top used for sleeping at night due to hot temperature during the summer. It is painted white with no noticeable cultural elements.
	Roof		Characterized by triangular shaped section (Sherifat). The roofs are connected with each other which allow privacy for women to easily move to neighboring house. There is an opening for light passage in to the house.

4.3.5 Spatial organization of traditional Ghadames house

Cultural identity of the Ghadames tradition also contributes to the spatial organization of the traditional houses. Generally, a typical Ghadames house contains ground floor, first, second and third floor although some house has a fourth floor which typically functions as the third floor. However, houses with four floors have become extinct and is hardly seen today. The cultural identity of the Ghadames is visible from all space of the houses.

The significant element such as privacy is elaborated in regards to the spatial organization of the design of traditional Ghadames house. The spatial design of the traditional Ghadames house reveals the composition of different spaces graduated from fully shaded rooms on the ground floor to exposed spaces on the top floor, such as the kitchen. The houses which are usually four floors has a central courtyard surrounded by rooms and functional spaces around the house. The entrance and window occurring only at the ground and third floor respectively, all floors are occupied with variety of rooms such as guest room, kids' room, kidwa room, with living rooms in all floors except for the third floor which has an open roof. The stairs are also seen in all floors of the Ghadames house linking each floor to another.

The spatial organization of the traditional Ghadames house has a courtyard in the first floor which has a central organization as reflected in figure 4.12. The central spatial organization is the most prominent space located in the center of the house within the secondary spaces, this is found in the living room of the first floor of the Ghadames surrounded by other secondary spaces such as the toilet, and kidwa room. Noticeably, all stairway links to this same central room as found in all floor of the house.

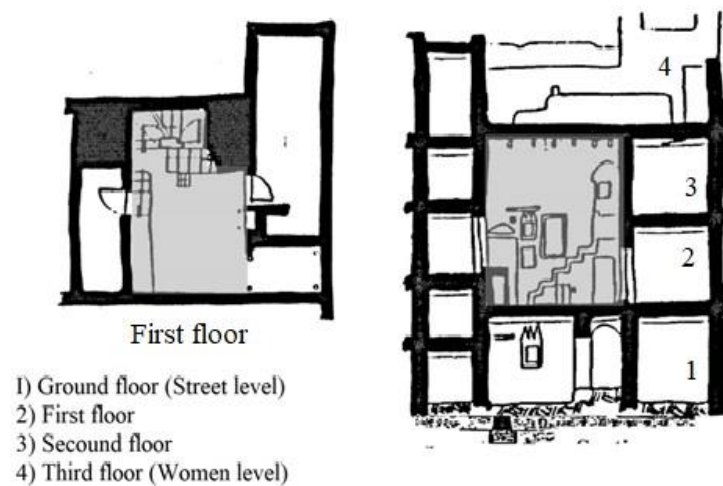


Figure 4.12: Central organization of traditional Ghadames houses

4.4 Contemporary Ghadames Houses

The contemporary houses in Ghadames is overlaid with imported architectural design yet with intrinsic cultural elements. Such designs have flat roof tops with no rooms and wall connection to neighboring house. While the contemporary Ghadames city which contain the contemporary houses is linearly oriented and accommodates more families or occupants as planned by the government interest in housing policies and development (Azlitni, 2009). The contemporary houses design is inherently laid with cultural identity of the region that is observed in traditional housing. Although, it is not as expressed as in traditional houses where local materials and techniques are used, some of the cultural identity is still visible in the interior of the contemporary houses. Hence, to understand the elements of contemporary house designs in the Ghadames, one needs to consider the traditional housing designs.

The new residences of Ghadames were based on the contemporary architectural design, characterized by structure isolation, usage of new, standard, and modern building materials with larger space area. The introduction of the contemporary houses started off as a result of the introduction of tourist centers in the town. Following this was the creation of new professional jobs like teaching, banking, building and many more. The creation of multiple jobs in this area gave rise to the new ways of building and construction of houses leaving behind several cultural attributed elements of the traditional houses. As a new proposal of

the master plan, public spaces, roads, parking areas are put in to consideration in the development of the new city. Figure 4.13 Map of contemporary Ghadames houses.

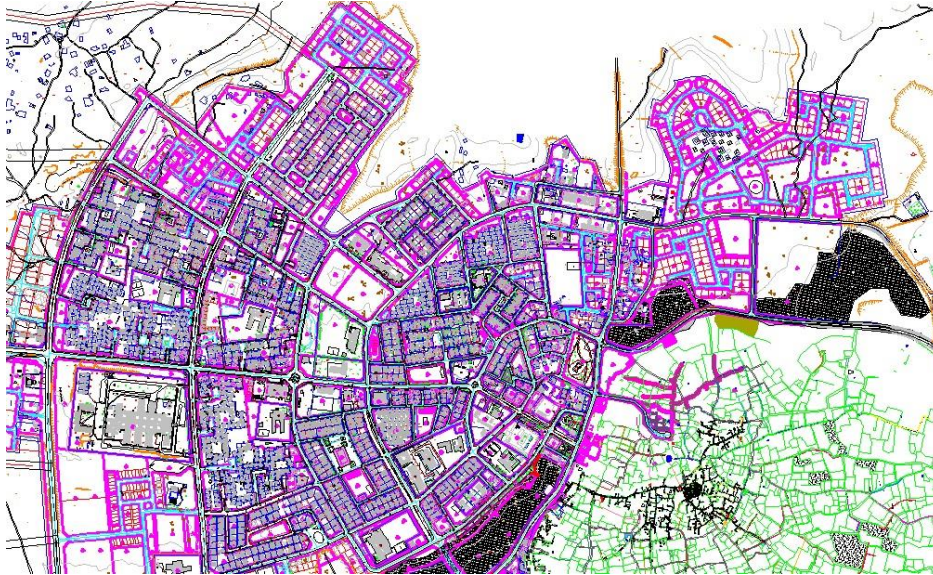


Figure 4.13: Map of contemporary Ghadames houses (Institute of Ghadames urban development, 2018)

Contemporary house designs are mostly surrounded by high walls with a center park or garden thereby allowing the windows and terraces to directly open in to the outer center space. Public spaces, roads, parking areas are put in to consideration.

However, regardless of the vast space area planned out in the development of the new building, the new house demonstrated limited consideration for the type of clans or family as highlighted in the traditional structures of house which the residents of Ghadames have been accustomed to. As a result of the economic growth from the oil production of the Ghadames city, modern architectural design of houses, schools, hospitals and other several infrastructures were implemented thereby transforming the old small town in to a large modernize city. These transformations caused several changes in the house plan such as the loss of storage unit on the ground floor as a result of change of occupation such as from farming to teaching.

A total number of six hundred and sixteen house project was introduced by cooperative company called Tocash in which in due time, the residents of the traditional house began

migration in to the contemporary house. All these house share very similar architectural characteristics. For this reason, a contemporary house was chosen from these 616 houses as a case study. Figure 4.14 shows one of contemporary Ghadames houses and an improved houses elevation by the Institute of Ghadames urban development.



Figure 4.14: Contemporary Ghadames houses

The allocation of space in the exterior of the contemporary houses depends largely on the function of the resident owners. Typically, the contemporary houses have an open space which opens to provide student playground event centers, car parks to further link to the streets and road network. The aerial view of Ghadames city is shown in figure 4.15, the red circled area is the traditional Ghadames city while the area in yellow is the contemporary city of Ghadames. Figure 4.16 shows the area of the case study area.

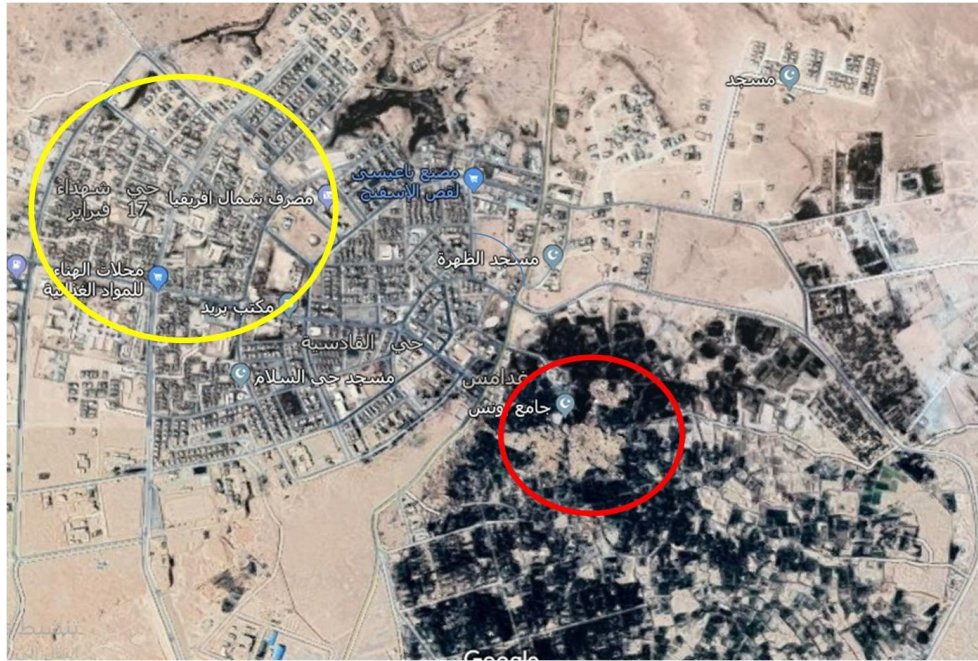


Figure 4.15: Aerial view of Ghadames city (Google Map, 2019)

A lot of the Ghadames family who are presently living in contemporary houses in Ghadames had once lived in the traditional houses of Ghadames. That means they will have opinions on the living standard of the traditional and contemporary house. In order to obtain their opinions, a brief discussion was observed with some of the staff at Institute of Ghadames urban development. They explained some reasons why people move from traditional to contemporary houses. Their opinion on this was because of the new government housing policy that has constructed contemporary houses affordable to the people. The housing project have constructed so many residential houses, modern markets, boutiques, hospitals and other urban lifestyle amenities etc. which are not easily accessed from the traditional city duty bad road, hence people moved from traditional houses to the contemporary houses. Also, people moved to the contemporary houses for occupational reasons.

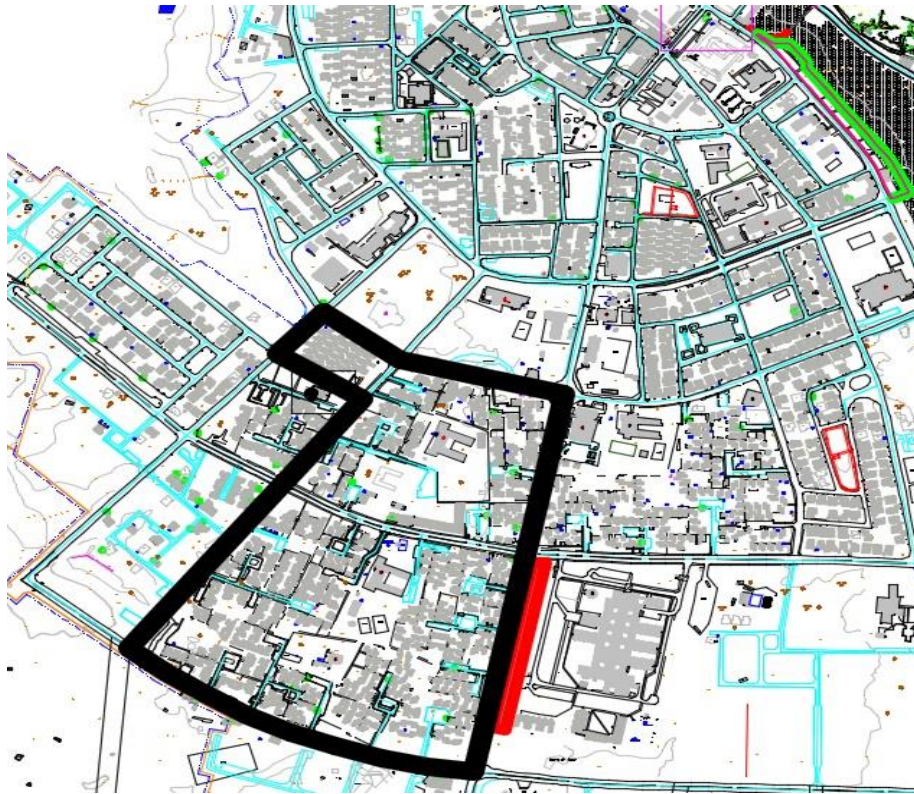


Figure 4.16: Area of the case study (Institute of Ghadames urban development, 2018)

Furthermore, the expressed their opinion on whether the contemporary houses are as comfortable as the traditional houses and whether the contemporary houses satisfy their privacy needs. The people believe that the traditional houses are more comfortable than the contemporary houses in terms of thermal characteristics due to the fact that the traditional house are constructed with local materials such as mud that provide a relatively comfortable temperature. They said, the contemporary house is also comfortable only with the use of air conditioner which is uses electricity to cool or heat the house. For privacy, they said that the privacy in the contemporary houses is less compared to the traditional houses due to the absence of roof tops allocated for only the women and which serves as route for easy movement of the women to neighboring houses. They also said that the presence of windows in each room of the contemporary houses which is sometimes open to the street and only covered by curtains is a privacy concern. The contemporary houses are sometimes close to each other, while in some cases, they are quite separated apart. For this research, the contemporary house was a single hose not connected with other contemporary houses.

4.5 Analysis of Ghadames Contemporary House

Following the response of Abdul Rahim Mowaffak and some of his colleague from the institute of urban development in Ghadames, the main building materials includes; hollow cement blocks, wood, mosaic, steel, cement, marble and aggregate. The structural system adopted for the modern building is the skeletal structure using concrete as the columns, roofs and beams while hollow cement blocks is used for walls construction.

In the architecture design of the contemporary house design, each unit of the house has a different mass of architecture space. However, there is a mixture of residential and commercial attributes occurring in the same building. The house contains different distribution of elements, size and forms. As a result of the new technology, modernity of the traditional house transforms in to the contemporary houses. The change of job, way of life due to education, travelling and exposure contributes to the significant adaption to the contemporary houses. The uniqueness of building occurs with the large opening facing directly in to the public space. Furthermore, for indoor space privacy purposes, there are a large asphalt streets and passages. The social interaction has reduced with the advent of adoption of a non-Libyan traditional mode of construction as the architectural design is challenged by several factors, such as inferior privacy floor, lack of congruence at the urban structure scale leading to socioeconomic stratification in communities, and detached housing having repercussions upon local lifestyle. For this reason, the harness and integration of the passive design features of indigenous architecture into new housing designs in an expedient way could lead to radical transformation toward sustainable development in Ghadames. Figure 4.17 illustration of a layout of a contemporary house in Ghadames which was constructed by Tocash Company.

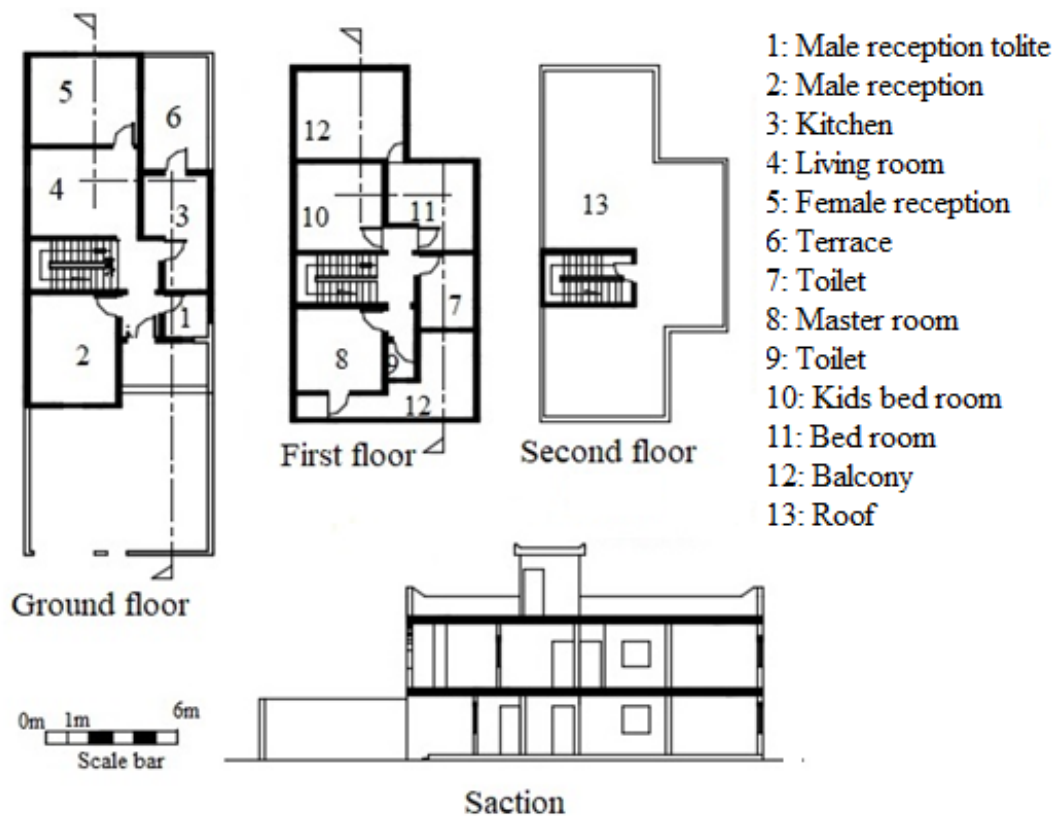


Figure 4.17: Layout of floor plans and section (Institute of Ghadames urban development, 2018)

4.5.1 Ground floor

The ground floor contains the entrance, toilet, male reception (Marboa), kitchen, living room (Wast Alhosh), Female reception, and Terrace. Figure 4.18 shows the layout of the ground floor. The entrance is designed in such a way that allow guest to see only the male guest rooms, a toilet, and a door that opens to the female reception. The door that opens to the female reception is always closed in order to ensure privacy for residents of the house from male guests. The toilet on this floor is a modern pit latrine system tiled with green and white ceramics on the floor and the walls. The toilet also contain a windor for ventilation. It is located close to the male reception room and serve the guest, but it can some times be used by women. The male reception is used to entertain the male guests. The room has a window and the walls are painted with white color without any decorations or wall cover. The floor is covered with bright color (red, yellow, and nude) carpet with Mendar/pillow arrangements.

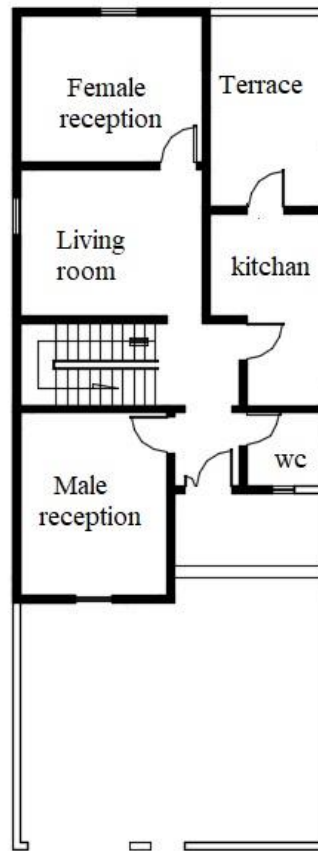


Figure 4.18: Ground floor layout of contemporary Ghadames house (Institute of Ghadames urban development, 2018)

The kitchen is designed with modern shelves and kitchen utensils. The wall and floor are covered with tiles of white color. The lower part of the wall is colored in brown. There is a window in the kitchen for ventilation. The living room (Wast Alwash) is covered with carpet and Mendar arrangement with little patterns of less bright colors. There is a window and the walls are painted with white colors and a section of the wall is colored in brown. As shown in table 4.6. The female reception is at the farthest part of the house and is located close to the kitchen for easy movement for the women. The walls are painted in white. The floor is covered with carpet of green and other less bright color with a modern type of Mender called “Jalsa lounge”. The Jalsa lounge is designed with red bright color for sitting and a center table. It is used for female guests. The terrace is close to the female reception and the kitchen, it has an only door that opens to kitchen. This for easy access for

the women from the kitchen to their room and to the kitchen. It is used for domestic and household chores.

Table 4.6: Ground floor plan of contemporary Ghadames house

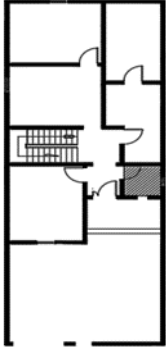

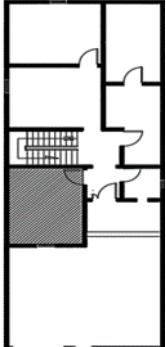

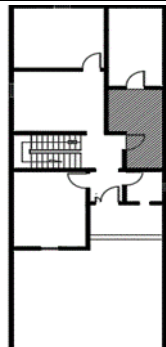

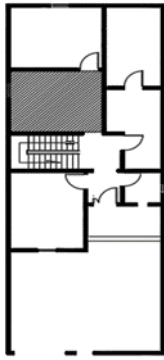

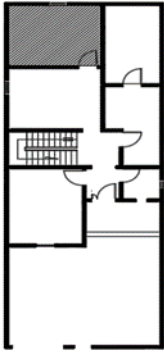



Space	Name and (Special name)	Interior Photo	Cultural Elements
	Male Reception Toilet		The male toilet is located close to the male guest room with latrine toilet made from ceramics. The toilet has a window. The upper part of the wall is tiled white and lower part is tiled green
	Male reception Marboa		The floor is covered with carpet, and Mender arrangement of visible pattern of bright colors like red and yellow. There is a window in this room and the color painted on the walls is white.
	Kitchen		The kitchen seen to have modern shelves and kitchen utensils. There is a window for ventilation. The wall is tiled with white and brown color. The floor is constructed with tiles

Table 4.6: Continued

	<p>Living room</p> <p>Wast</p> <p>Alhosh</p>		<p>There is window and the walls are painted with white colors and a section of the wall is colored in brown. The floor is covered with carpet and Mendar arrangement with little to no pattern of less bright colors</p>
	<p>Female reception</p>		<p>Located far from the entrance. Walls are painted in white. A Jalsa lounge in red bright color for sitting and a center table. The floor is covered with carpet of green and other less bright color. It is used for female guests</p>
	<p>Terrace</p>		<p>The terrace is close to the female reception and the kitchen, it has an only door that opens to kitchen. This for easy access for the women. It is used for domestic and household chores.</p>

4.5.2 First floor

The first floor contain two toilets, a master bedroom, kids bedroom, bed room and a balcony. Figure 4.19 shows the layout of the first floor. The toilets are modern water system (WC). One of the toilet Is used by everyone in the family. This is the toilet that contains the bath tube, mirrors and window on the wall. The wall and floor are tiled with white and green color ceramics. The master bedroom is for the man and his wife. It has a

modern bed and bed fittings of solid pale color such as brown, coffee and nude color. The floor is covered with carpet of nude color.

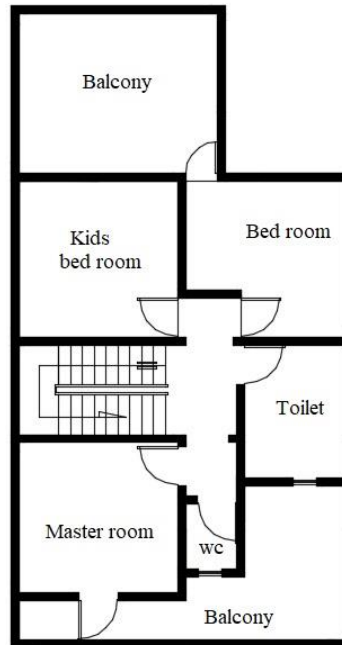


Figure 4.19: First floor layout of contemporary Ghadames house (Institute of Ghadames urban development, 2018)

The bed room contain the other toilet (WC) to cater to the wife and her husband. This toilet is covered with white tiles on the walls and dark green tiles for the floor. The kids room is made for both males and females of the house who live in the same room with different bed arrangement. The floor is covered with pale green while the wall is painted white with a window. The room is colorful. The bed room will be used as a female room when the female kids mature in the future, but it is currently used for storage purposes. The floor is covered with carpet of pale color and the walls are painted in white color. The balcony is designed in an arch shape. as can be seen in table 4.7.

Table 4.7: First floor plan of contemporary Ghadames house

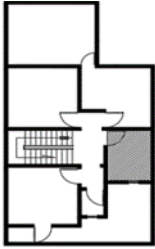

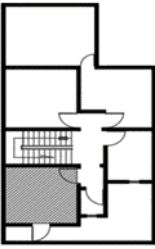

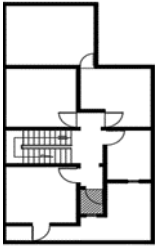

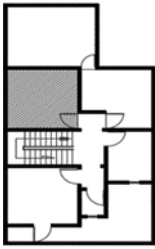

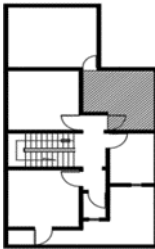



Space	Name and (Special name)	Interior Photo	Cultural elements
	Toilet		Modern water system (WC) toilet and bath tubs. Part of the walls are covered in green tiles while other apart is covered with white tiles. There is a small window on the wall.
	Master room		Modern bed and bed fittings of solid pale color such as brown, coffee and nude color. The floor is covered with carpet of nude color without any pattern. It is used by the wife and husband.
	Toilet		The second modern water system (WC) toilet design with ceramic. It used just by the husband and the wife. Again the primary color of tiles on the wall is white and the floor is tiled in dark color.

Table 4.7: Continued

	<p>Kids' bed room</p>		<p>Both the male and female kids live in the same room with different bed arrangement. The floor is covered with pale green while the wall is painted white with a window. The room is colorful</p>
	<p>Bed room</p>		<p>This room is painted with white color, with a window. The floor is covered with carpet with no pattern. Its use as store but it may be used as female bed room in the future when the female mature.</p>
	<p>Balcony</p>		<p>The balcony is designed in an arch shape. It opens to an open space with bringing a light source</p>

4.5.3 Second floor

The roof structure of the contemporary house is vividly different from the traditional house in which serves as a sleeping center during summer periods. Figure 4.20 shows the layout of the second floor. The roof structure in the contemporary house is observed as an enclosed compartment of the house in opposition to the traditional house which is occasionally used by the women of the house to other houses as it links to the roof structures of neighboring houses see table 4.8.

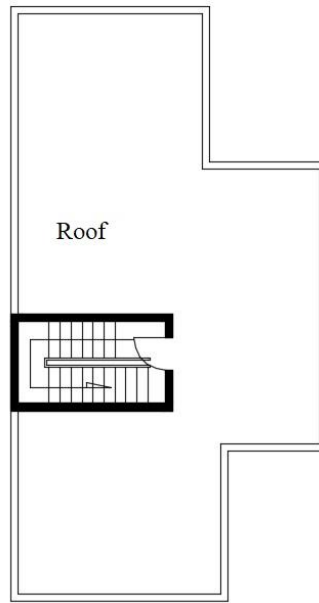
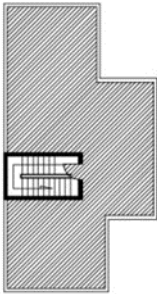



Figure 4.20: Second floor layout of contemporary Ghadames house (Institute of Ghadames urban development, 2018)

Table 4.8: Second floor plan of contemporary Ghadames house.

Space	Name and (Special name)	Interior Photo	Cultural element
	Roof		The roof does not connect to neighboring houses. It is used for drying olives and other grains during the summer.

The contemporary Ghadames house is a complex structure which is not centralized and is existing primarily in space between each building. However, the spatial organization of contemporary houses gives a sense of continuity and regularity of the existing traditional house forms in relation to the different sizes and functions existing in the houses design.

4.6 Sustainable Cultural Elements from Traditional to Contemporary Ghadames Houses

As a result of modernization of the structure of the houses, several key cultural elements have been lost leaving few sustainable elements in the contemporary plan. The modernity of the house design unfortunately ignored the moral identity and cultural values of the Ghadames people. However, some cultural identity elements that were sustained from the architectural design of traditional Ghadames houses to contemporary Ghadames houses. Table 4.9 present the cultural elements that are sustained from traditional to contemporary houses in Ghadames. A brief explanation and comparison of the houses in terms of spatial arrangement is needed in order to understand the sustained cultural elements. The traditional houses have four floors, ground, first, second and (third) roof top while the contemporary houses have three floors, the ground, first and (third) floor (roof top on the surface level).

4.6.1 Ground floor of traditional and contemporary house

In the traditional house, the ground floor contains entrance/stairs, male reception and a store. The ground floor is also dug half a meter underground. From the entrance, only the male guest or reception room (Marboa) is visible which is attributed to privacy as an element of culture. Moreover, there is visible cultural drawing/painting and local made pottery in the entrance. In the contemporary house, the ground floor contains the entrance, toilet, male reception (Marboa), kitchen, living room (Wast Alhosh), Female reception, and Terrace. This means that there is more spaces and spatial arrangements in the ground floor of the contemporary house than in the traditional house.

The ground floor of the contemporary house is on the soil level while the underground of the traditional house is half a meter underground. From the entrance of the contemporary house, only the male reception room, a toilet constructed mainly for men is visible. Although other rooms are available on the ground floor, but there is a door that leads to these room which is always closed for sake of privacy for the women. This means that privacy as a cultural element has been sustained. However, cultural drawing/painting and local made pottery has not been found in the contemporary house.

4.6.2 First floor of traditional and contemporary house

The first floor in the traditional house contain the Kidwa room, female reception (Wast Alhosh), toilet, female bedroom, master bedroom, and the male bedroom. The first floor contains most of the spatial arrangement is considered the most important because of the colorful and decorated kidwa room. The Kidwa room is designed like a tent used for the bride on her wedding night or the widow the day her husband dies. The walls are traditionally painted in red, yellow and other bright colors. There is a different room for the males and a different for the females. In fact, the female reception is a courtyard that connect the first floor to the second floor. This means, the same cultural elements that can be found in the female reception room can also be found in the walls of the second floor as well. On the other hand, the first floor of the contemporary house contain two toilets, a master bedroom, kids bedroom, bed room and a balcony. The master bed room is used for the husband and wife and one of the toilets in this floor is contained in the master room. The other toilet is used generally by the members of the house or guest entertained in this floor. The kids room in this case is used for both the males and females.

In comparison, kidwa room has not been sustained from the traditional house to the contemporary house because most activities such as wedding is not performed in the contemporary house, hence the colourful decorations is not visible seen on the walls of the first floor in the contemporary house. When a woman's husband dies, the woman can move freely within the walls of the house which is a change of the social norms and traditions of the ghadames as the first floor of the traditional house contain the kidwa room that is used by the woman when her husband dies. Also the courtyard that connect the first and the second floor is not sustained.

4.6.3 Second floor of traditional and contemporary house

The second floor of the traditional house contain the mash room and the grain store. The mash room is located close to the kitchen for easy movement for females working in the kitchen. All locally made mashing tools like jugs and cover (Tabak) for storage of water, milk, and grain is stored in the mash room on the floor and walls. The grain store has an open window accessible from the living room to easily access the stored food without opening the grain store door to keep the grain safe from humidity. On the other hand, the

contemporary house does not contain a second floor. Therefore, the mash and grain store are not sustained.

4.6.4 Third floor (Roof) of traditional and contemporary house

The third floor in the traditional house contain the kitchen, summer sleeping room, and the roof. The summer sleeping room is a room with ceiling used for sleeping at night due to hot temperature during the summer. The roof is characterized by triangular shaped sections (Sherifat). The roofs of Ghadames houses are connected with each other which allow privacy between the women to easily move from one house to another for interaction. This floor is mostly used by women. There is an opening that allows the passage of light in to the male reception. On the other hand, the contemporary house the roof top which is on the surface level. This means does not connect to neighboring house. It is used for drying olives and other grains during the summer. The kitchen is not located in this floor, it is located in the ground floor of the contemporary house.

In general, it is observed that there are significant changes in the spatial arrangements of the contemporary house. For example, the kitchen is located in the third floor for the traditional house while it is located in the ground floor for the contemporary house. There are some rooms that are completely missing from the contemporary house such as the kidwa room, grain storage and mash room. The walls of the traditional house were wholly painted in white color. The rich and colorful bright color designs on the carpet and walls in the traditional house is not sustained in the contemporary house. Some sections of the walls of the contemporary house is covered in tiles of different colors and some are painted in white and brown colors. The traditional painting/drawing found in the entrance, walls, and arches of the traditional house is not sustained in the contemporary house. Cultural elements such bright coolers used for decoration in the traditional, it has been most undermined in the contemporary house. Table 4.9 shows the sustained cultural elements from traditoonal to contemporay Ghadames house.

Table 4.9: Sustained cultural elements from traditional to contemporary Ghadames houses.

Name and (Special name)	Traditional House	Contemporary House	Remarks
Latrine Toilet			The pit latrine system of toilet is sustained due to Islamic teachings
Female Reception (Wast Alhosh)			Mendar floor sitting arrangement is sustained from traditional to contemporary house.
Male Reception			The colorful carpet and mender sitting arrangement is sustained. White color is the primary for painting the entire house.

4.7 Chapter Summary

This chapter made an analysis of both the traditional and contemporary houses of Ghadames. This analysis was made with respect to the culture and religious beliefs of the people of Ghadames, the building materials used in the construction of houses, and other cultural elements such as decorative elements, spatial organization and the structure of the houses. The chapter further analyzed each floor of both the traditional and contemporary

Ghadames houses with focus on arrangement of spaces, decorations, and designs. The traditional house contains cultural elements of identity such as the privacy, Kidwa room, the bright color patterns on carpets and fabrics, and general decoration of the house interior. The result from the analysis of traditional and contemporary houses shows that some of these cultural elements has been sustained to the contemporary houses. For instance, both the ground floor of traditional and contemporary houses has male reception rooms with toilets located close to them for the purpose of privacy. The layout plan, central or grid organization, spatial organization and space arrangement of both houses were also discussed in this chapter.

To conclude the analysis from this chapter, there are some cultural elements of identity that has been found to be sustained from the traditional Ghadames houses to the contemporary house. However, there have been very important cultural elements that have also been lost such as the kidwa room, the courtyard, copper crafts decorations, route connecting the houses wall to wall etc. this means that there is little reflection (sustainable elements of culture) of the cultural elements of identity from traditional to contemporary houses of Ghadames.

CHAPTER 5

5.1 Conclusion

In accordance to the conducted research regarding the sustainable cultural identity of Ghadames houses, one can conclude that there is a significant interdependent relationship between culture and houses as a whole, its element attributing to cultural identity and the sustainability of cultural identity reflected in architectural house design. Furthermore, the architectural house design in accordance to the spatial organization, space plan, privacy as reflection of cultural identity and sustainability was compared amongst the traditional Ghadames houses with the contemporary houses of Ghadames.

The analysis shows that the traditional Ghadames houses built with mud's and palm leaves, shows strong ties to the cultural identity of the Ghadames which was sustained from one generation to another. Also, several spaces such as the interior design of the female reception and living room, their patterns were found to be sustained over other cultural elements such as occupation and religion. The most frequent occupation in traditional Ghadames was farming by the men which allow the men's agricultural tool storages close to the men's space (rooms) in the house. The women whom are mostly engaged in household activities mostly use the upper floors of the house for their activities for the purpose of privacy. As a result of privacy, the spaces for women and men is separated.

In the contemporary houses of Ghadames, some cultural elements such as social values, occupation, and most importantly privacy, of cultural identity were lost as a result of the new jobs created by the government which triggered total mass migration from traditional to contemporary houses. Other cultural elements were also lost because of the new system of education, the awarding of contemporary housing programs to foreign contractors who have little to no idea about the cultural identity of Ghadames and how they should be sustained in the contemporary houses. Although the implementation design uses new building materials such as glasses and concretes, the architectural plan shows little consideration for the cultural elements of identity of Ghadames. The spatial organization and space analysis of the contemporary house designs does not correlate very much with the customs and tradition of the people of Ghadames. For instance, the Ghadames people

are accustomed to privacy as in the separation of males from the females which is also encouraged by the religion of the Ghadames people; Islam which does not permit the mixing of male and females in the society. This has been the social norms and values attributed in the traditional houses, however, it was lost in the design of the contemporary houses. For example, in the ground floor of the contemporary houses, the kitchen is located close to the female and male reception in an attempt to encourage socialization of guests and family members which is not the social norms and values found in traditional Ghadames houses.

Globalization, intercultural integration and the lack of profound architectural education also may contribute to the loss of sustainable cultural elements of architectural design of contemporary Ghadames houses. The education system in Libya may also lacks competent lecturers in the field of architecture who would have tutored potential individuals that would restore the cultural attributes of Ghadames in further housing projects in the future. If not, Ghadames will continue to seek the help of foreign contractors who have poor knowledge of the cultural contributes and the cultural identity of contemporary houses in Ghadames.

5.2 Recommendations

Culture contributes to the evolution of man. Cultural identity needs to be preserved and sustained; it should not be lost to war, colonization or modernization in architectural design. It should be sustained over even in modernize forms. The Libyan education system should ensure the stated above, the board, committee of Libyan architects should ensure a modern design that would cater for both the need of the residents, while at the same time protecting the cultural identity of the people. The Libyan government is therefore advised to seek architectural plans influenced by cultural attributes of Ghadames from Libyan academic scholars before contracting with foreign contractor for future housing programs. The Libyan ministry of housing & interior should also ensure that the contracted foreign contractors understand the user's need (Ghadames people) as well as the users' cultural identity before implementing such house designs on future housing programs.