

## Libyan families satisfaction with their traditional and modern houses

Abubaker MOHAMED shawesh

Faculty of engineering Architecture and Urban Planning Dept.

University of Tripoli Libya

### المخلص

يعتبر المأوى من الضروريات الأساسية في حياة الإنسان. ولا يتطلب الأمر اشباع هذه الحاجة الأساسية فحسب , بل يتطلب أيضا التوافق مع نمط الحياة والقيم الاجتماعية الحضارية , مثل توفر شروط الخصوصية والأمن , والاعتراف بالإعتبارات الدينية والرغبة في ابراز المكانة والوضع الاجتماعي, وبمقدور الأنماط التقليدية للمسكن الوفاء بهذه المتطلبات, إلا أن مقدرة الأنماط الأكثر حداثة على ذلك يبقى موضعاً للتساؤل. يمكن أن يعزى ذلك إلى المعرفة غير الكاملة أو النادرة للمصمم حول تصميم المأوى, سواء فيما يتعلق برغبات السكان المستعملين للمأوى أو العوامل التي تحدد مدى رضاهم عن بيئتهم السكنية.

لقد نتج عن التحضر السريع الذي يعتبر السمة المشتركة لمعظم الدول النامية الاتجاهها الى تبني التكنولوجيا ونظام البناء الغربي دون أدنى اعتبار للقيم الاجتماعية الحضارية واحتياجات المجتمع, ومن المرغوب فيه أكثر من ذي قبل وجود عملية إنتقائية لإختيار ما هو مناسب عوضاً عن تطبيق التكنولوجيا المستوردة بحذافيرها , ولقد أدت التنمية في ليبيا الى احداث تغيير في المحيط العمراني والاجتماعي للبلد. وبسبب الإقتصاد القائم على النفط . فقد شهد قطاع الإسكان توسعاً كبيراً للغاية في حين بقيت الحياة الاجتماعية دون تغيير يذكر, وفي الوقت الذي يقبل الناس على البناء الحديث فإنهم يرغبون بالإحتفاظ بهويتهم وقيمهم الاجتماعية الحضارية الأصيلة , أضف الى ذلك . فإن الإسكان الحديث يختلف كثيراً عن العمران التقليدي من حيث التصميم والحيز والتنظيم والشكل العام واستخدام الأرض والنمط العمراني ونوعية المسكن , وفي واقع الأمر . فإن البناء الحديث الذي يعكس القيم والمعايير الاجتماعية الغربية قد أخفق في ليبيا من احداث تفاعل اسكاني بين المساكن والبيئة التي يعيش فيها وخاصة من حيث استغلال الحيز.

### ABSTRACT

Shelter is a basic necessity of life for all human beings. Beyond meeting this need shelter should also meet the requirements of their way of life and socio-cultural values; requirements such as privacy, security, recognition of religious considerations and the desire for prestige and status. Traditional forms of shelter are able to meet these requirements but the ability of more modern forms to do so is questionable. This can be attributed designer's incomplete or scarce knowledge about shelter design, both regarding the desires of the residents using the shelter and the factors that determine their satisfaction with their housing environment.

The result of rapid urbanization, a common characteristic of most developing countries, is the tendency to apply western technology and building methods without considering the socio-cultural values and needs of the society. It is more desirable to be selective, to choose what is appropriate rather than apply the imported technology wholesale. In the Libya, development has changed the physical and social contexts of the country. The housing sector in particular has expanded tremendously as a result of the oil economy, while the social life remains largely unaltered. People accept modern architecture, but also wish to preserve their indigenous socio-cultural values and identity. Moreover, contemporary housing differs greatly from traditional architecture with respect to scale, space organization, layout, land use, architectural style and house type. Indeed, contemporary architecture seems to reflect Western social values and norms and in Libya has failed to accommodate man's interaction with his environment, particularly in the context of use space.

## Introduction

The geographical location, socio-cultural values and climate played a major role in shaping the urban pattern as well as the house form in the old town of Ghadames. The Ghadamesian house clearly reflects the user's response to the harsh environmental conditions, the need to sustain the social organization and to respect social and cultural traditions. This paper examines user perception of both the traditional and modern (Western) houses by determining the degree of satisfaction with them. The study is based on survey carried out in the Ghadames oasis in October 2013. Ghadames is located in the Libyan Sahara Desert and forms a part of the sub-region of Gharyan, one of the five sub-regions of the Tripoli region. It lies 630 km south-west of Tripoli, close of the junction with the borders of Algeria and Tunisia and is situated at altitude of 350 metres above sea level (Figure 1). It is one of the most important trade routes, connecting central Africa with Mediterranean sea coast. All these factors make Ghadames the most important of the Libyan cities. In fact, Ghadames has been inscribed on the world Heritage list of historic monuments by UNESCO since 1987

The social structure among the Ghadames population is based on a tight hierarchy. The tribal division is clearly part of the political and social structure of the oasis community (Eldblon, 1968). Confederations are subdivided into tribes. Tribes into clans. And often clans into subclans. However the family is the simplest and most important form of social structure in the old town of Ghadames. It is still highly patriarchal; its cohesion is protected and maintained by the system of matrimonial alliances and also by different social measures designed to keep the families as strong as possible. The influence of the family upon the house can be clearly seen in the house design particularly in the organization of space. Social life in the old town of Ghadames oasis was most conservative. Families were usually separated from the public life. For this reason the traditional Ghadamesian house was the outcome of the socio-cultural factors as well as climatic requirements and experiences, all contributing to this design. The main considerations were the necessity for privacy, security and proximity to water. However, more important is the social way in which divisions were reflected in physical terms by the division of the house into two distinct sections: a strictly private space to ensure that family life was completely protected from the outside world, where no glimpse could be caught from the street, even when the house entrance remained open, and a semi-private space where male guests could be entertained.

The city now also has a new Government built settlement. There are 616 housing units in this project which was designed and built by a foreign company. They were built in the 1980s as the ideal solution to the housing demand in the city. This paper consists of four sections. The first growth of Ghadames city as a result of the large revenue from petroleum during the oil boom period. The third documents the characteristics of the contemporary house. The fourth reports the main findings from the survey of user satisfaction with their traditional and contemporary houses.

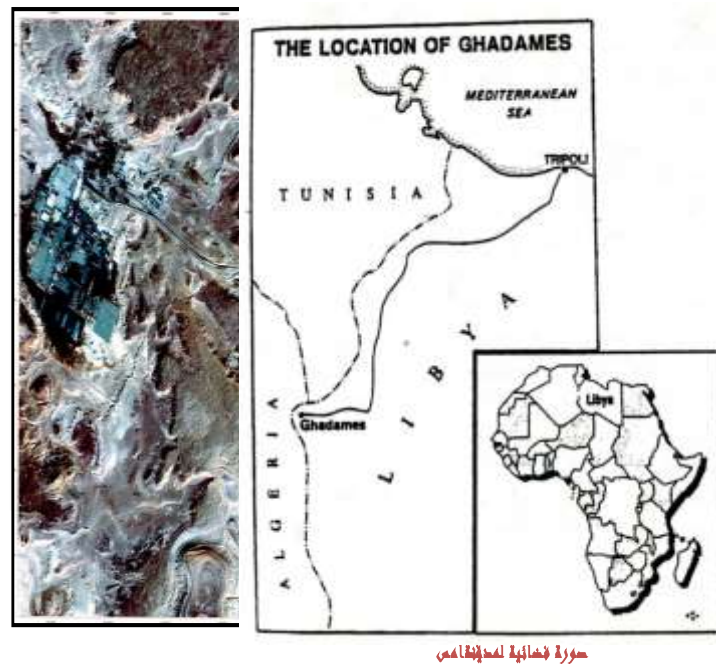


Fig. 1 Geographical location of Ghadames

### The character of the traditional home

The traditional settlement was organized and governed according to socio-cultural and climatic needs, and this clearly shows that an overall social unity was established in this settlements. Despite the fact that the settlement dates back more than 2000 years, the townscape features proved that the spatial pattern of the traditional residential area related directly to the traditional social organization. According to Piccioli (1935,p.209)

In few places on earth, I believe, is one dominated, as at Ghahames, by that singular charm which is exercised by traces of a vanished way of life, of a world that has lasted from immemorial times. Everything here is as it enturies.

Consequently the separation of spaces into a hierarchy, from totally private to completely public, can be seen clearly.

The old settlement of Ghadames is located in the south-west of the oasis and forms one large agglomeration of houses (Figure2 and 3). It consists of about 2,120 dwelling units, markets, mosques and other public spaces.

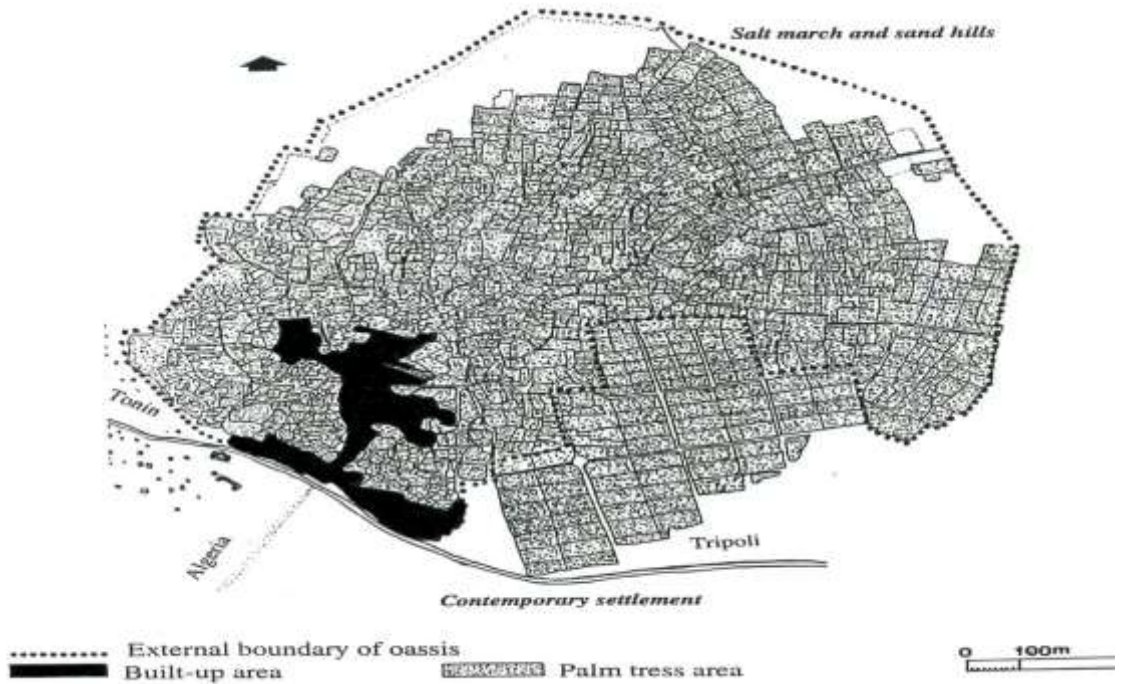


Fig. 2 : Location of the traditional Ghadames settlement

Source: A Idblon (1968)

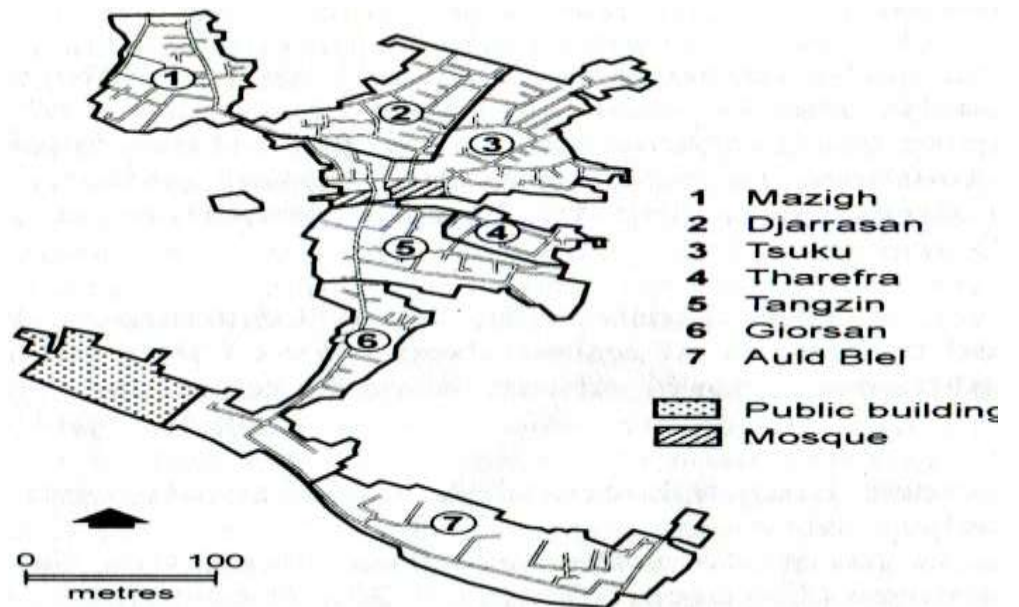


Fig. 3 The seven neighbourhoods of the traditional Ghadames settlement

Source: After Eldblon (1968)

Ghadamesian house design represents a clear expression of the socio-cultural values held by Libyan society and provides a clear illustration of the ways in which the original architects responded to the



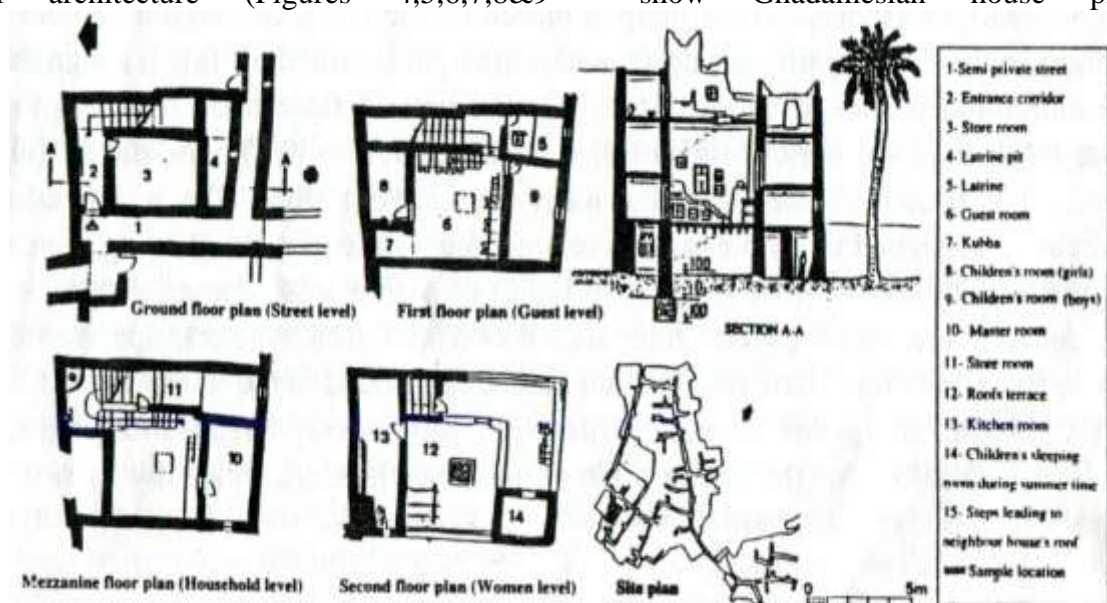
climate and users' living requirements in the settlements, neighbourhood and house in particular.

**House form and siz:**

When one looks at the traditional Ghadames house the first time, one is surprised because the eye sees something that it has never seen before. One also gets a strange feeling about the place, because the houses are well designed and beautifully constructed. The Ghadamesian people put all their abilities into building their homes. They make their homes very comfortable in terms of climate and social needs. The architectural form in the old town of Ghadames suits local requirements. Climatic conditions and ethnic needs. It is a compact architecture to protect its users from the hostile environment. All buildings are constructed entirely from local building materials. The house form allows only a few visible facades, rising in an almost fortified manner to a height of about 10 metres. The houses in this complex are of the same basic design, only slightly different in size and decoration, for example, in the number of bedrooms, or in the area of the living room in the middle of the house. Despite the differences in some of these elements, the uniformity of the house is apparent. The similarity in scale, colours and main forms are the reasons for this.

Interestingly, houses in old town are characterized by the of open courtyards, which is a distinct feature of most houses in other parts of the country. It seems that the people of Ghadames may have paid more attention to the house form and its articulation as an important mechanism responding to climate and social conditions.

There is a shortage of agricultural land therefore the plot area of these Ghadames houses may range from 25 to 50 square metres with the house area ranging between 70 to 80 square metres. There are some standard areas for the inside elements of Ghadames houses: the area of the bedrooms is between five and 12 square metres, the area of the living room is between 10 and 16 square metres, the area of the bathroom is between four and six square metres, and the area of the store rooms 20 square metres. The actual age of the building form is very difficult to assess, due to it having evolved over a long period of time. Ghadames does not seem to have been influenced by colonial architecture style, whether Phoenician, Garamants, Greek, Roman or Italian. It is unique amongst Islamic style and design. It is also argued below that the plan and architecture of the town is part of the original ancient Arab traditional architecture (Figures 4,5,6,7,8&9 show Ghadamesian house plans).



**Fig. 4 Layout of traditional Ghadames house in the Mazigh neighbourhood**

Source: Fieldwork (2013)

### House desing and space use:

According to the house plan shown in Figure 4, it can clearly be seen that the Ghadamesian house is an institution, not just a structure, founded for a complex set of purposes. Building a house is a cultural phenomenon, its form and organization are greatly influenced by the soci-cultural environment and way of life. This has been reflected in the physical form of the Ghadamesian traditional house. There are three distinct floors in the house, each floor adapted to a different use. The main entrance is on the ground floor where there is a single entrance door, made of palm tree trunk. This entrance usually opens directly on to the covered semi-private street about 1.40m wide. It is fitted with a heavy iron lockj which can be operated by means of a key from outside. To secure this door from inside there is also a sliding wooden bolt. The common features of this door emphasise the sharp line between external public areas and private internal ones. Leading from the main door is the entrance hall, sqifa. In the entrance hall there is often a bench for sitting where the house owner may rest as he comes from his work, or the visitor who comes to call at the house. This a private and secure place where a person is given the feeling of relaxation and safety.

Two interesting features can be observed in the sqifa, one is that it is considered very important to hang gazelle or antelope horns above the door frame to prevent an evil spirit from entering the house, the other being a niche for an oil lamp near the main door. When the oil lamp is placed in the middle of the nich, it indicates that the family is willing to receive visitors. If plaaced to the right, the visitor will know that this a time of family happiness, such as a wedddding or a new baby's arrival is being celebrated, and the visitor will therefore know whether he can meet the household members. If the lamp is placed on the left it is a sign that there is sadness in the house, perhaps a death, and if the light is turned off this is a sign that the household wishes to be left alone( Figure 5). On the ground floor there is access to a store room used for agricultural tools, it measures 4.75m by 3.50m and is quite dark. It is usually located near the main entrance corridor. The whitewashed staircase is designed to enable visitors to ascend or descend without being seen by people on the different floor levels. It is built like a piece of sculpture, and leads to the upper floors. As a general rule, each corner and each available space of the house has a function. Drinking jars are placed in a round niche in the wall of the last langing of the grand staircase. These jars form a very beautiful decoration, which are usually brought by the bride at wedding time. Additionally there is a room with a pit for the latrine above.

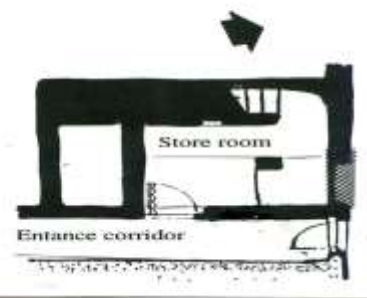


Fig. 5 Oil lamp location

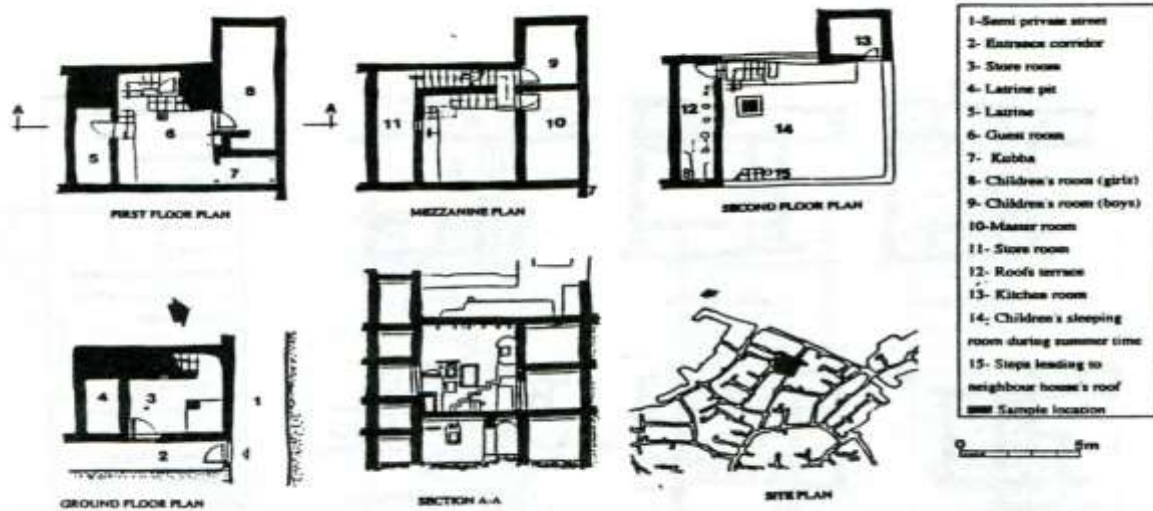


Fig. 6 Layout of tradional Ghadames house in the Djarrasan neighbourhood

Source: Fieldwork (2013)

One of the design features of the Ghadamesian traditional house reflects the modesty between males and females. This need for modesty is achieved by the vertical arrangement of the house, the males have free movement in streets and squares at the ground floor level and females having free movement above street level, and in a big living room with a double floor to ceiling height known as the "middle home"(wast El-Housash).This central space is used as the living area of the house, and is the most important room of the house. It also functions as a guest room in which the owner receives his guests , and it is here that the decorationis concentrated. Generally this room is arranged in a way that allows male visitors and guests easy access without disturbing the privacy of female members of the household.

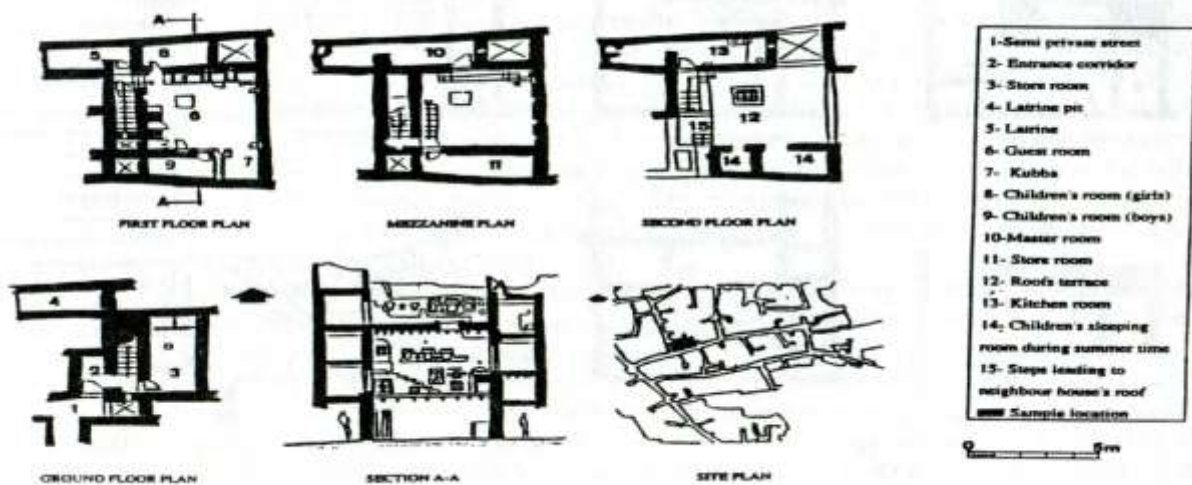
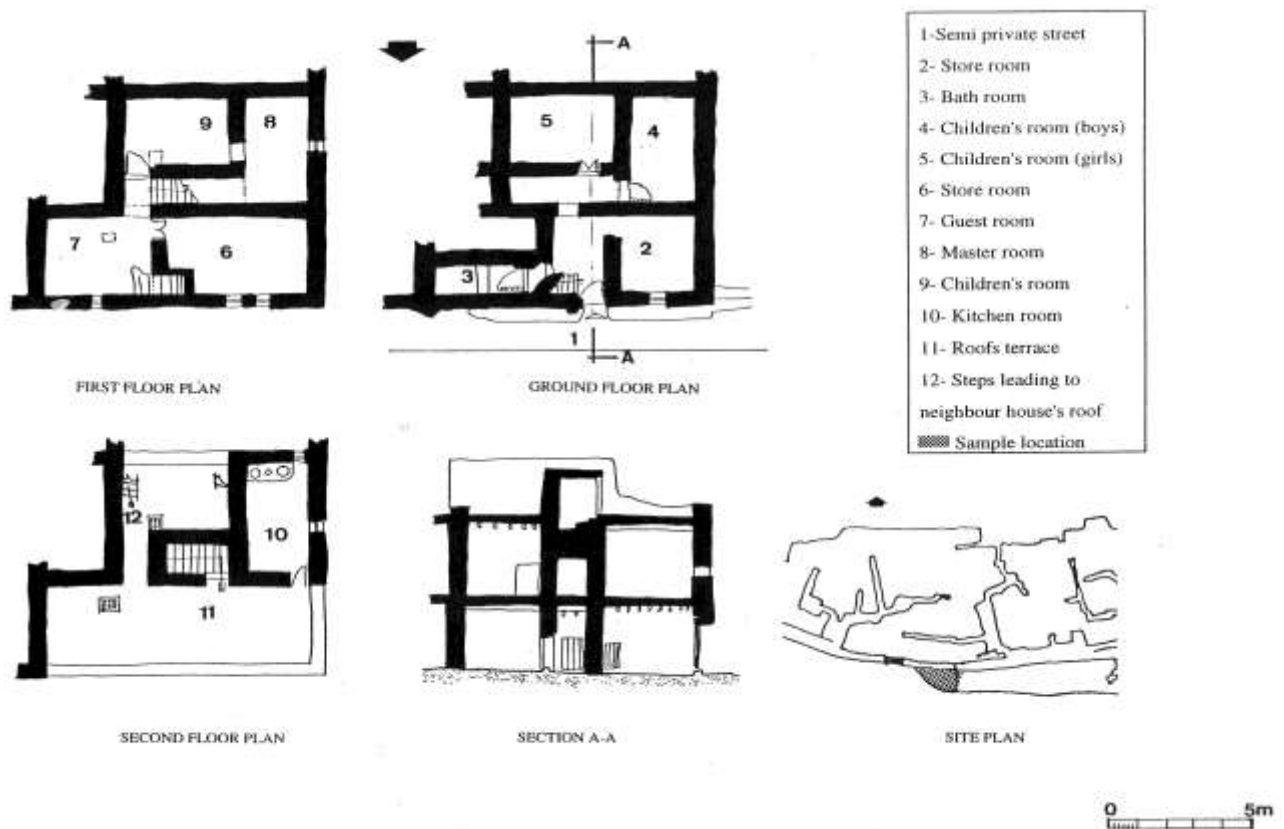


Fig. 7 Layout of a traditional Ghadames house in the Tangzin neighbourhood

Source: Fieldwork (2013)

The most interesting room is at the same level as the middle home, and is called elkubba. It is a small space and is reserved for two special occasions, the first being when a women marries and the second when the her husband dies. The space is used for one night only, for the first night of the marriage (when it is richly and traditionally furnished and decorated) and when the husband dies, when the widow spends the night there. Her son, if living in the same house, could bring his newly married wife to spend the first night in this place. Additional rooms have access directly from the living room, either at floor level or at mezzanine level; in the latter case, with a flight of steps inside the room. The mezzanine level mainly consists of the master bedroom and two stores for clothes and grain. This floor is used by all members of the household during day time, and used by husband and wife at night in complete privacy. All these rooms are ventilated and lit through the main living room sky light, and some windows opening into the well. They are furnished simply and adequately with carpets and mats, although the living room, where male guests are entertained, receives more attention than the other rooms.



**Fig. 8 Layout of a traditional Ghadames house in the Auld Blel neighbourhood Source: Fieldwork (2013)**

The Ghadamesian house layout ensures visual privacy from outside or adjacent areas, yet allows members of the household to be in contact with nature via the roofs. Thus, the roof level was considered to be one of the most important parts of the house (Figure 8). It played a significant social role, containing a cluster of kitchen cubes, courtyards and terraces reserved for the women to conduct most



of their activities, including cooking, washing and traditional crafts such as making mats and carpets. It also serves as their meeting place, allowing them to visit their neighbours in any part of the town. This is possible because all the town houses are connected to each other by terraces covering the lower streets. This allows the women considerable freedom of movement and communication which parallels the men's movement and communication in the lower streets, and gives opportunities to meet each other in complete privacy and security without contravening the traditional segregation of the sexes. The roofs are surrounded by a high parapet wall, about two meters in high, to ensure privacy. Moreover, household members use the roof extensively during the summer nights for gathering and sleeping, enjoying cool night breezes



**Fig. 9 Plan of traditional rooftop area in Ghadames**

Source: Fieldwork (2013)

When a death occurs in the family, the women in the house climb to the upper passage: and their lamenting can be heard by their neighbours, who share in their grief and sadness. On happy occasions such as marriages, the women also gather together to sing and dance and celebrate, and they convey the bride across the roofs to her home. The beautiful view from the top of the houses adds to the

pleasure of happy celebrations and gives solace at times of sadness. The men, at these times of mourning or happiness, gather together in the street squares, and on the ground floor.

### Ghadamesian house decoration

The Ghadamesian house also has unique characteristics where decoration is concerned, for it is one of the most outstanding, and regarded as one of the best, desert habitations developed by the local builders with a richness of decoration (hassan, 1982).Ghadamesian people are extremely concerned with their home's decoration; they use many expressive materials, ranging from locally made paint, to mirrors, brass, tapestries, pictures of saints, objects of local handicraft, and souvenirs inherited from the caravan trade. All these elements are arranged on the walls, mainly by the Ghadamesin women, but are concentrated within the living room. Interior doorways are framed and decorated by the women of the household who choose and decorate the living room walls with stucco moulding



**Fig. 10 Shows the use of various decorations in traditional houses**

Source: Fieldwork (2013)

The most adapted form of decoration in the Ghadamesian house is the wall paint which the women are proficient at making. The interior walls are all plastered with gypsum and whitewashed and decorated with motifs painted in a bright red. Red is the preferred colour, used inside the rooms, and, together with mirrors and various utensils hanging on the walls, combines to make a delightful interior. The



external walls have a general appearance characterized by the brownish and pale yellow colours of the sundried clay bricks. Conical patterning on the top of the walls and the stepped finials at the corners are whitewashed, providing a characteristic feature to the external appearance of the house. Besides the spectacular visual effect, these measures also improve the capacity of the walls to resist weathering and general deterioration. Moreover, a particular conical pattern on the top of the external walls was an ancient form of protection against evil spirits in the days before Islam became the religion of the people. This design can also be seen on the city walls showing that the people wished to protect their city. This pattern was also brought into the interior walls when the dwellers were decorating their home with red to protect their family members

### **Building materials and methods**

In the horizontal floors, divisions are constructed by bisected and smoothed trunks of palm trees; the wood should be kept to dry for one year before use and treated twice with a wood preservative made from a solution of detes, salt and lime. About 30 different kinds of palm trees provide materials of varying properties: gypsum and lime for plaster were produced in the vicinity of Ghadames, but only a few people now practice the old craft of providing these materials. For example craftsmen preferred to use Tamudi palm trees in floors because they provided more flexibility and resistance to deflection. Ribs of palm leaves are left in water for three months before plaiting to provide support for the upper floors slab. The slab consists of light stones and mud with a floor screed of gypsum (Figure-11)

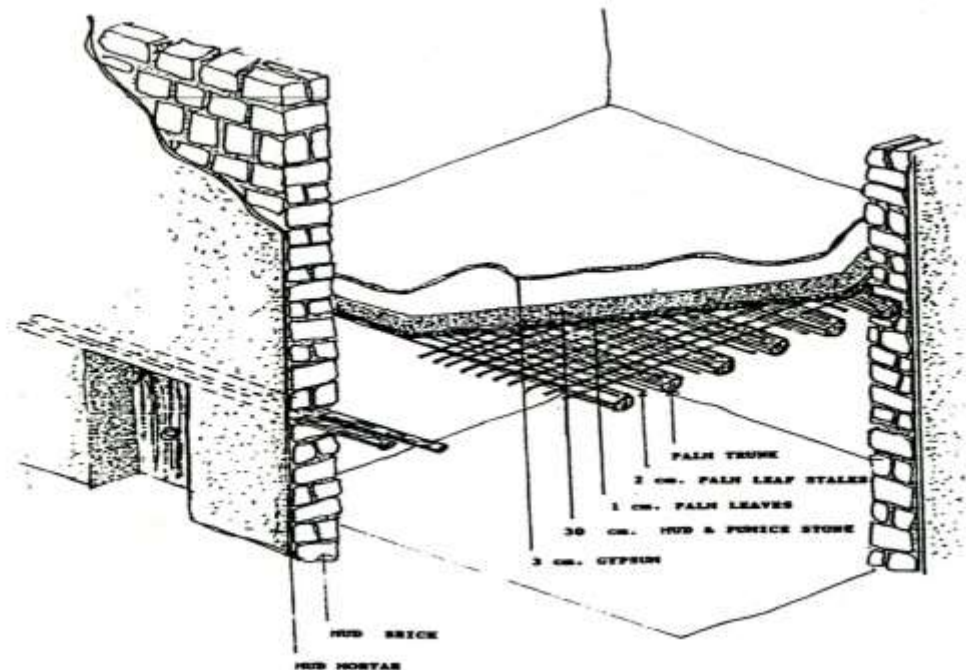
The latrine is situated on the first floor next to the main staircase. It empties down into a pit located in a separate room in the ground floor. The latrine pit is constructed of stone and measures about two metres square. When used regularly by one family it is necessary to empty it only once a year. After each visit, ashes from the pit are thrown into the latrine pit to prevent any smell coming from the latrine. The fermented contents of the pit become dry and friable, providing a useful fertilizer for the fields. The building materials which were available for building the old town hoses are:

- 1-Mud
- 2-Hard lime ston
- 3-Pumice stone
- 4-Palm trees- trunk, leaf stalks and leaves
- 5-Gypsum
- 6-Chopped straw

With these six very simple building materials, Ghadamesians used to build their houses in the middle of the Sahara Desert. Many factors determine the selection of specific types of materials: the economic structure of the society, experience with certain types of materials and methods of construction, the level of technology, the urge to adapt certain dwelling forms and climatic conditions.

All load bearing walls are constructed of sun-dried clay brick on a foundation constructed of hard limestone in a mud mortar. The foundation trench does not exceed one meter in depth. The thickness of the walls diminishes from the bottom of the house to the top, corresponding to the size of the bricks

.The walls measure 60 by 40 by 15 centimeters at ground floor level, 50 by 40 by 15 centimeters at first floor level and 40 by 40 by 15 centimeters at second floor level. The bricks are made from mud mixed with straw. The raw materials should be left in moist conditions for at least one year before being used to produce bricks.



**Fig. 11 Building materials used in traditional Ghadames**

Source: Fieldwork (2013)

The main materials used in the floors and roofs are palm trunks used as beams, either as whole pieces or cut into lengths. They are spaced 50 to 70 centimetres apart. On top of these beams the palm leaf stalks are placed horizontally. On top of these more palm leaves are laid in the opposite direction. Mud mixed with small pumice stones is then laid on top of the structure. The last stage is a layer of gypsum as a floor or roof finish

The stairs are usually constructed with light pumice stone and gypsum mortar. First, an arched structure is constructed carrying the steps of the stairs then these steps are finished in gypsum. The lintels above the doors and windows are constructed by two methods: the palm trunk lintel, which works like a beam to distribute the load in two directions, and is used always in the main entrance, other doors and windows. The second method can be found in traditional houses which have been built by the self-help process, which usually takes a period of about one year to complete. Materials needed usually are 20,000 mud bricks, 800 meters of palm trunk, 1,500 palm branches, 20,000 kg. gypsum and 2,000 kg lime. As in many desert habitats, openings are very limited and the small Ghadames house contains about 10 doors and 3 to 5 windows (shawesh, 1992).

Finally the Ghadames traditional dwelling, successfully preserves its ancient history in its artefacts, decoration and architecture. The traditional Ghadames house could be described as a museum representing the family and its preceding generations. Socio-cultural forces and environmental forces are the boundaries which affected both the settlement and its architectural contents. The house reflects



an ingenious method of shelter design using limited resources and space to meet physical, functional and socio-cultural needs as well as modify the harsh conditions for the benefit of the human inhabitant



Interior view of the guest room



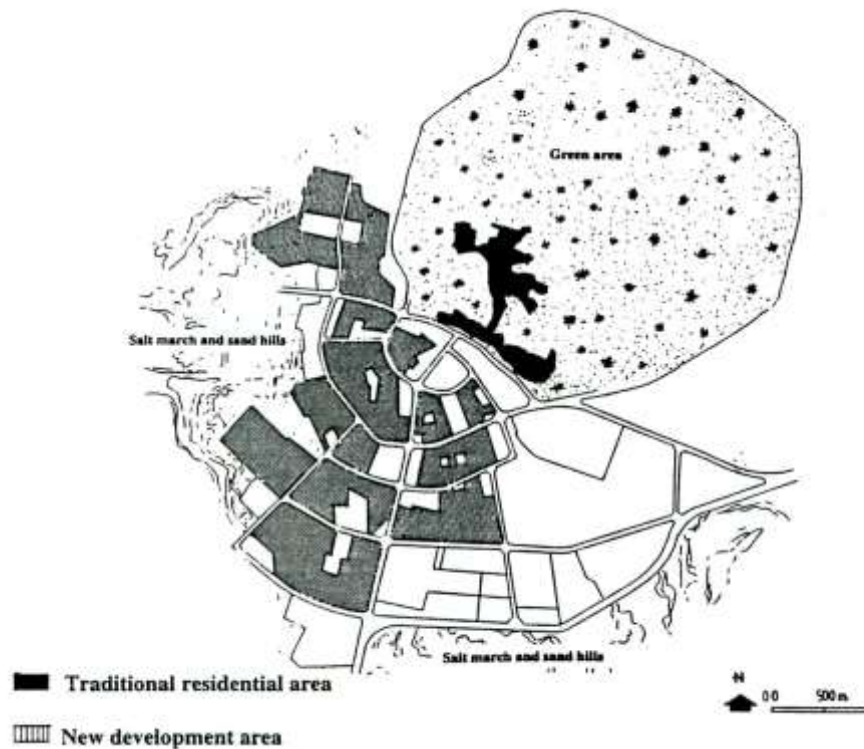
Elkubba view

**Fig. 11 Interior wall decorations**

Source: Ahmed (1985:48)

### **Development of Ghadames city**

The economic growth that resulted from oil production affected the socio-physical characteristics of Ghadames city like the other cities in Libya. The city witnessed a massive modern building boom in both public and private sectors, especially in terms of housing, which transformed Ghadames from a small town to a large city (Figure-11). The main purpose of these new dwellings was to meet the pressing need for housing. However, the issue of the socio-cultural values that influenced the Ghadames traditional settlement had been completely ignored in their design. This fact was emphasized by Ben Swessi (1993, p.16) 'the new housing project was crude and is lacking in sensitivity to local traditions, values and climate'. It was designed by foreign architects in complete conflict with traditional housing design, construction methods and building arrangements. Furthermore, it is located outside of the Ghadames oasis, in a harsh unprotected area where there is no water or greenery



**Fig. 12 Ghadames new development**  
**Source: Fieldwork (2013)**

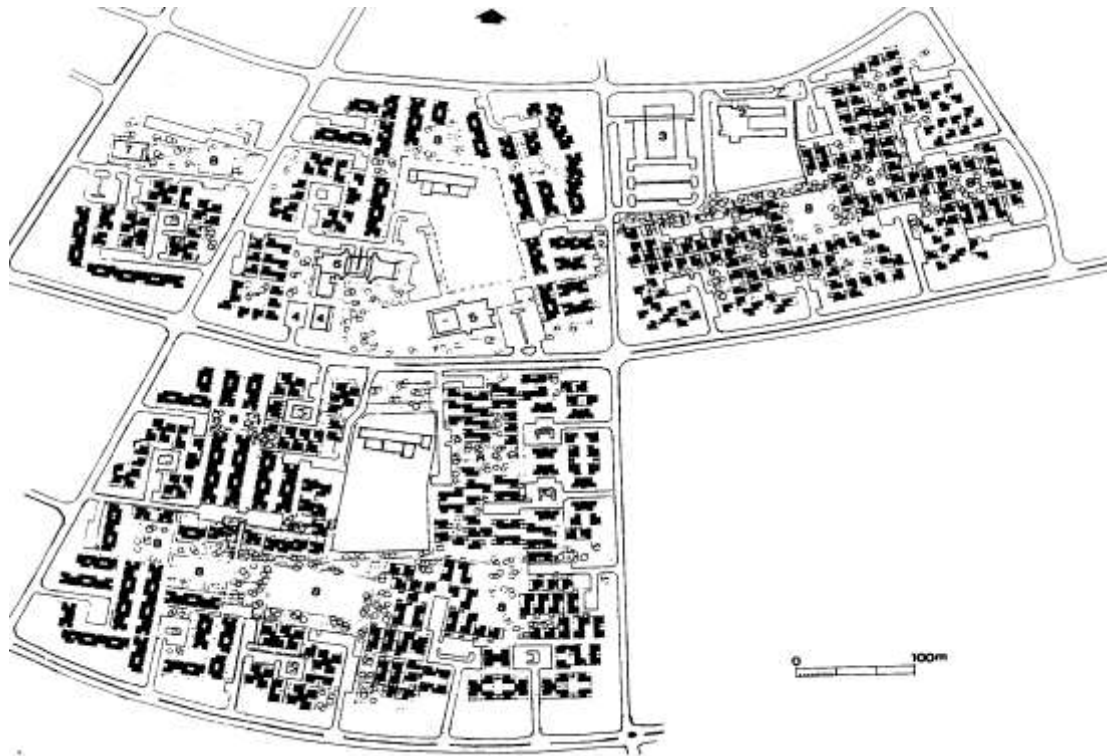
### Characteristics of modern house

The modern settlement of Ghadames was affected by the concept of the master plan. Which was based on Western models of development. It was characterized by isolated structures, high standards of construction and building materials, large spaces and modern infrastructure as well as dwellings randomly grouped (Figure -12). From the new master plan proposal, it can be seen that there was a greater amount of attention given to public open spaces, need commercial activities and car parking spaces than to the residential areas.

Despite the fact that the dispersed layout provided more space, better access and facilities than the compact traditional layout of the old town, it is clear that it did not respond effectively to the social and climatic conditions of Ghadames. The new plan for housing did not take into consideration the importance of kinship, religion and family structure, which had been the basis for the traditional way of life and so has created problems and friction between neighbors, leading to social disharmony.

The structural system of the new dwelling can be simply described as a skeleton structure, where reinforced concrete is used for columns, beams, floors and roofs, and hollow cement blocks are used for walls. The dwelling unit is based on separate architectural masses, new building codes and new building materials. Sometimes there is a mixture of residential and commercial activities in the same building. If we look at the dwellings' plan and sections in the new town from the inside, it consists of different levels, depending on the type of dwelling. The modern dwelling are characterized by a lack

of similarity in terms of form, size and distribution of elements. All the dwellings' openings are large and face directly onto the outside public space. In addition, there are large unprotected openings overlooking the neighboring houses, the wide asphalt unshaded streets and passages. The size and position of these openings have a great impact on the private indoor space .

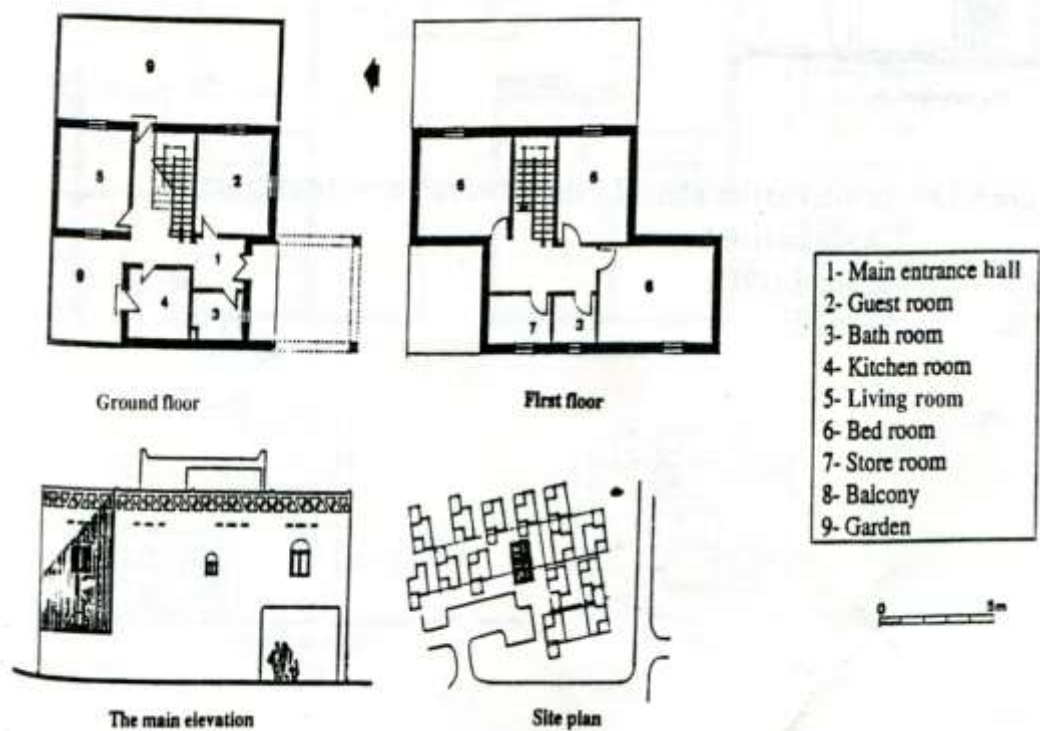


**Fig. 13 Ghadames new development**  
**Source: Fieldwork (2013)**

Figures 13,14, 15 and 16 represent the typical space arrangements in modern dwellings. The ground floor in the plan shown in Figure 13 has only a single main entrance, a living room, a guest room, a bathroom used by the visitors and family members located in front of the guest room. The kitchen where the women normally spend much of their time, is located on the ground floor near the guesets' area. In addition, the kitchen window opens directly to the outside, or to the neighbouring dwelling creating privacy problems. There is also a room used by family members or female visitors and a staircase up to the next floor. The first floor is designed as a family sleeping area only and includes one room used as store or kitchen, as well as a balcony. The balcony is a foreign element inherited from the Italians. Its purpose is to give additional space to the dwelling but the socio-cultural and climatic problems make the use of the balcony extremely difficult .

The built environment in general, and housing in particular, reflect changes in society. In Ghadames modern town this is clearly evident in the development of the housing design, from traditional houses to various housing types. The modern dwelling was influenced by the Western plan which affected the internal arrangement of space and made access to such houses, particularly when the family has a visitor, very difficult. This happened because the modern dwelling was designed by architects who did not have adequate information about the socio-cultural factors and ways of life of the people for whom they were designing.

In an area like Ghadames where the socio-cultural values and hostile climatic conditions are dominant, outdoor and open spaces need to be treated just as carefully as indoor spaces. In other words, both of them need to respect people's socio-cultural conventions and need to be protected from the hostile climate. However, in Ghadames modern town the dwelling are free standing, the asphalt streets and passages are wide lack any place for users to meet or sit and also lack any shade to protect people from the heat. Another important point is that the new settlement lack harmony and unity due to the different and alien building forms.

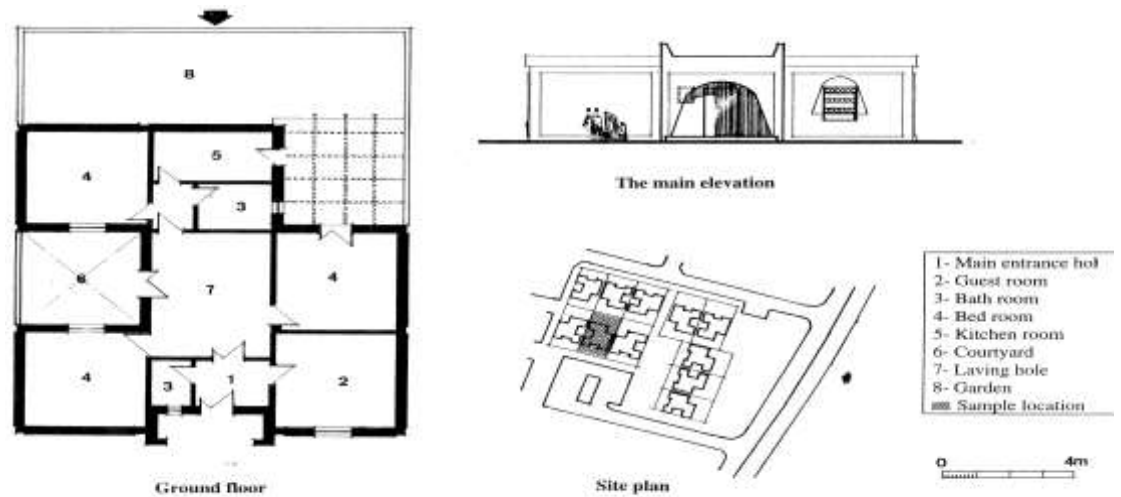


**Fig. 14 Plan of a three bedroom modern Ghadames house**

**Source: Fieldwork (2013)**

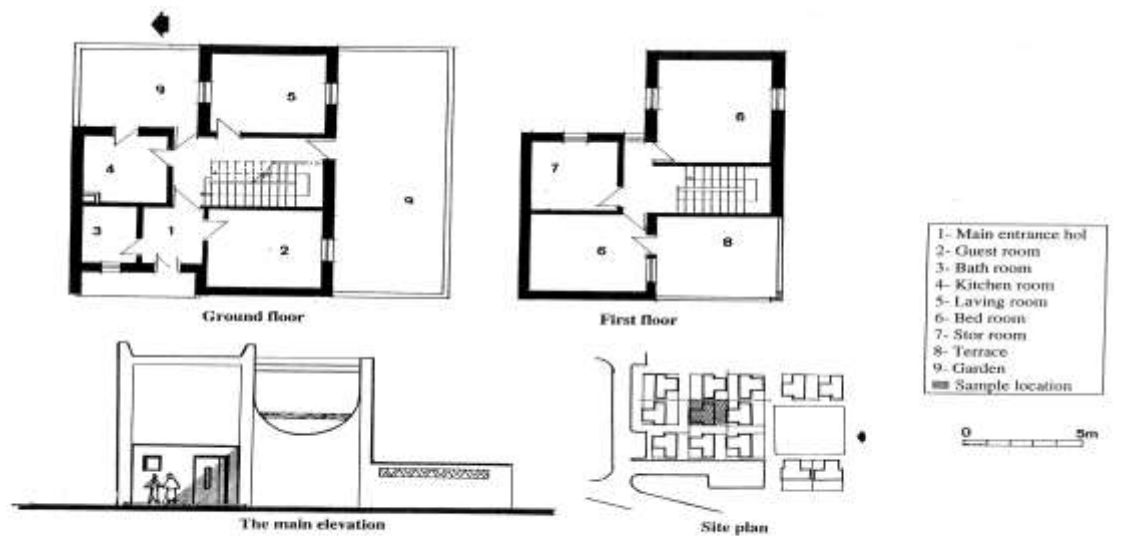
**The** fact that the inhabitants of the new town always return to their old houses during religious, wedding and fraternal occasions, as well as during the hottest periods, demonstrates the functional achievements of the traditional architecture. It ought to be seriously considered that the local traditional house form should provide a model for new building in the desert.





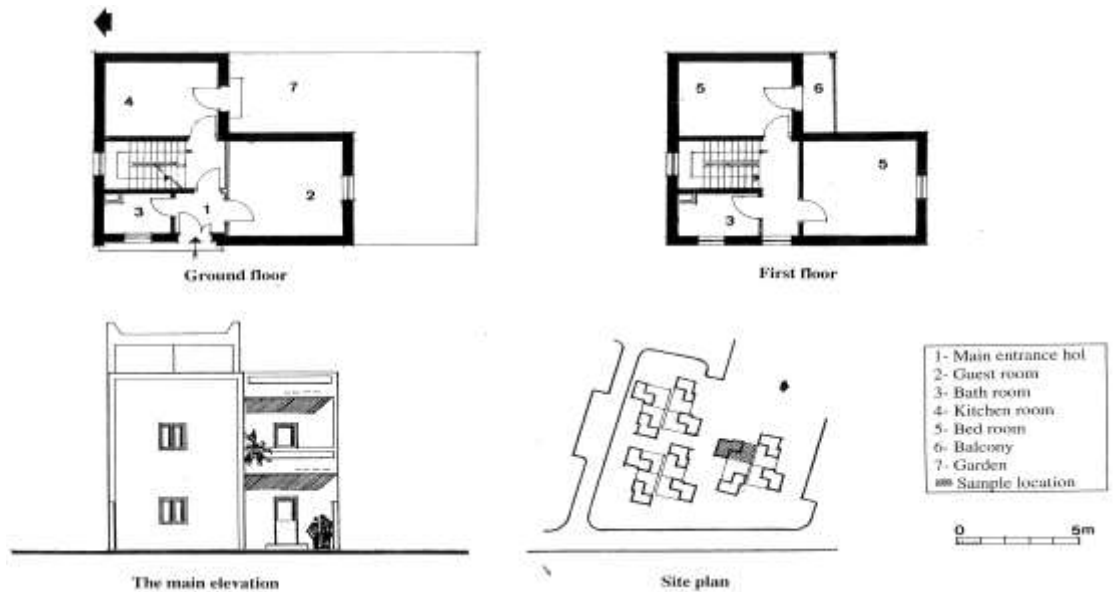
**Fig. 15 Plan of single hose type three bedroom modern Ghadames house**

Source: Fieldwork (2013)



**Fig. 16 An alternative plan of a three bedroom modern Ghadames house**

Source: Shawesh (1995)



**Figure 17 An alternative plan of a two bedroom modern Ghadames house**

Source: Shawesh (1995)

### Users' satisfaction with their traditional and modern house

Sudy was undertaken in Ghadames in November 2018 in order to measure users' satisfaction with their traditional and modern houses in terms of meeting their social life needs. According to theoretical and empirical studies, five social factors were chosen: choice, privacy, security, religion and prestige in order to examine respondents' satisfaction with their houses. A sample of 60 households was selected at random from a traditional settlement that has been occupied for more than six generations, and from the modern settlement. Twenty-four variables were examined in this study in order to assess users' satisfaction with their traditional and modern housing environment in terms of response to their socio-cultural needs .

### Computation of the index of satisfaction

The first step in the computation of the index of satisfaction (IS) is to express decimally the percentage frequencies for each variable in all the three responsecategorise: Satisfaction, Neutral and Dissatisfaction. For example, if one takes the interviewees' response to the question about satisfaction with the settlement in terms of social life (variable 24)as an example, satisfactory (83%)=0.83; Neutral (5%)= 0.05; dissatisfaction (2%)=0.02.

The second step is to assing the following weights to each of the response categories:+1 for Satisfaction; 0 for Neutral; and -1 for dissatisfaction. The decimal value in each response category is then multiplied by the appropriate weight.The maximum index that a variable can have is +1 when all respondents express dissatisfaction; and 0.00 when all respondents are neutral.

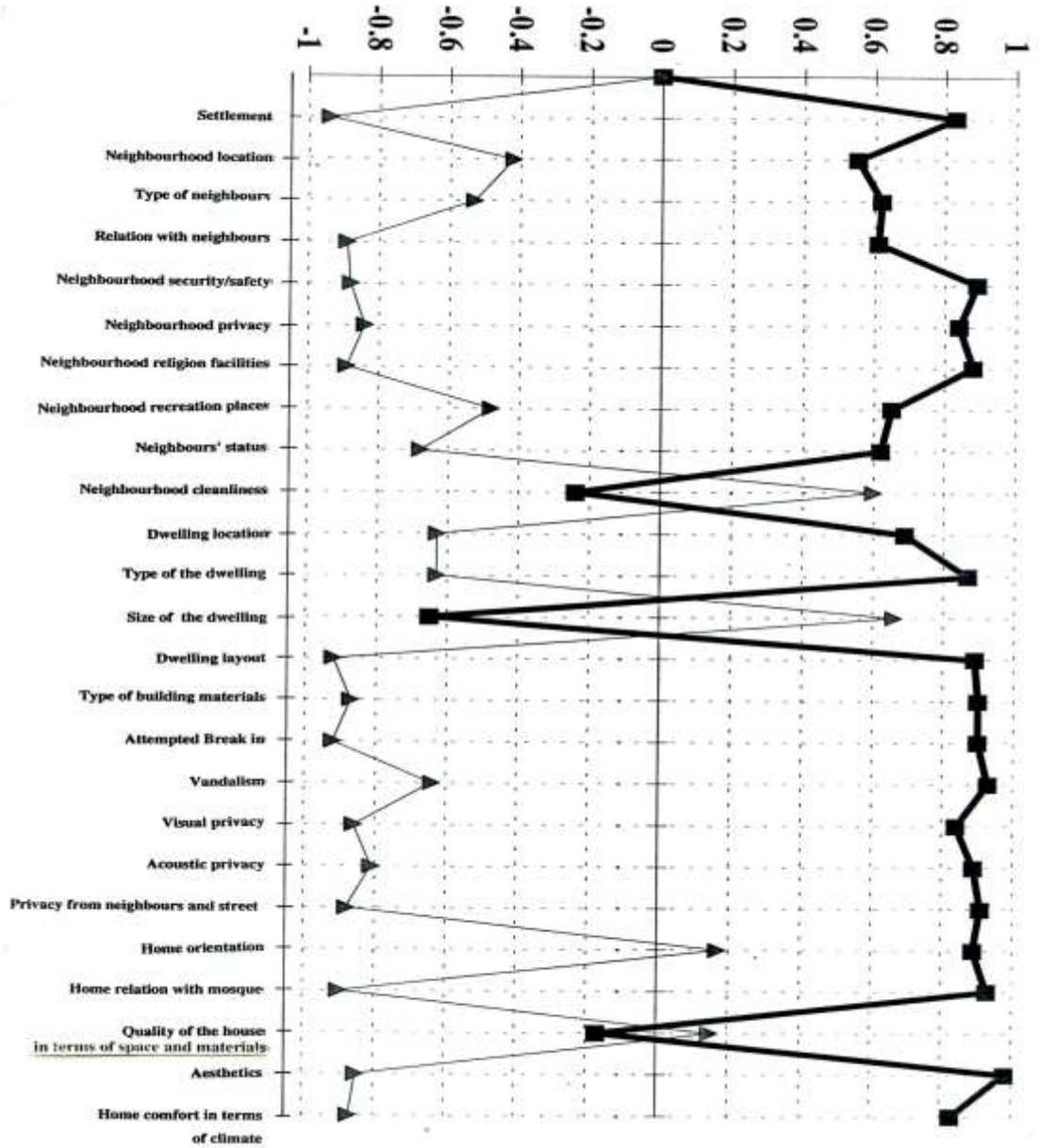
## Main findings

### Co-operation in the choice of the dwelling

Respondents were asked to state their feelings about the opportunities they were given to co-operate in the design decision of their two residential areas both traditional and modern, and if were they satisfied or dissatisfied with them. Eight variables were selected to examine respondents' perception; they were asked about the neighbourhood level in terms of location, type of neighbours, and relation with neighbours, and, at dwelling level about location, type, size, layout and building materials. The analyses indicate that years ago members of housing committees gave their people the opportunity to co-operate in residential area design processes, and in the past people have done better than the Housing Authority today. The high degree of satisfaction with those traditional houses is not surprising; from this study it was found that the majority of respondents were more satisfied with their traditional houses in terms of the choice given to them to co-operate in the selected variables than modern ones (chart 1). Although there are some complaints relating to the physical characteristics of the traditional houses, such as its size, building materials' durability, and inadequacy of the sewage system, these traditional dwellings were considered by the majority of the residents to be satisfactory. Their criticism of their modern dwellings is the result of not being allowed to share in the design process. Ghadamesian households were moved from traditional houses to the modern ones because they needed more space, due to increased households' sizes and there being no development in the traditional housing sector which was left without maintenance or a proper sewage system. These reasons forced occupants to leave their houses in the traditional settlement and to move to the new one. The people who had moved tried to introduce some of the design features which they had liked in their traditional dwellings. For example, balconies were closed so that the space could be used for another purpose, and rooms and entrances were altered so as to make the dwellings conform to their choice. This confirms the findings of Rossi (1985), Ermuth (1973) and Ward (1985): dwellers who have the opportunity to co-Operate in the design processes of their houses are happier and more satisfied than those who have no such opportunity.

In view of the large number of people whose lives are affected by their housing it is desirable to make an effort to consult as many as possible when considering house design. Meetings should be arranged with individual groups wherever possible and opinions could be made and published. The purpose of such consultation would be to co-ordinate the work between architects and users, which helps to rationalise to construction and consequently avoids demolishing or modifying parts of the dwelling as a result of mistakes.

Index of satisfaction (IS)



— Traditional house

- - - Modern house

Chart 1 Comparative users' level of satisfaction of 24 environmental variables within their traditional and modern Houses

Source :Fieldwork (2013)



### **Security/safety considerations**

'A good environmental image gives its possessor an important sense of emotional security' (Lynch, 1960, p.4). The desire for protection against street crime and the ensuring of the safety of their possessions from crime was found in almost all of the respondents in Ghadames. The traditional houses are designed according to their majority of Ghadamesian people were very satisfied with their traditional houses where they lived in the past and did not take any additional security measures there. People in traditional houses live together according to their blood relationship, which increases the level of security and provides suitable places for schools, children's play areas. Moreover, the presence of greenery, vegetation and trees around the houses, increased the people's sense of security. However, most were dissatisfied with their modern dwellings and took important security measures such as inserting an additional metal door and/ or metal grille on their windows. The lack of homogeneity between neighbours, and the absence of children's play areas were the most important factors affecting security and vandalism levels in the modern settlement.

It was discovered from the empirical evidence collected, how the right decision was made about the most preferred dwelling design in terms of security/safety. Taking into consideration the housing experiences of dwellers in both traditional and modern houses, people preferred the traditional neighbourhood and house rather than the modern, particularly in terms of security and the prevention of crime and, at neighbourhood level, traffic accidents and, at dwelling level, attempted break in and vandalism (chart 1). The main reasons why the modern dwelling was unacceptable to the users were that the people expressed anger, feelings of vulnerability, grief for lost and damaged things, many children were suffering and some had died from car accidents. This causes a psychological impact on the person's relationships with others and affects the general level of satisfaction with the residential area design.

### **Preservation of household privacy**

Informal discussion which took place during interviews, revealed that the influence of the physical characteristics of a neighbourhood and dwelling on the residents' perception of the level of privacy inside and outside the dwellings, was important. The arrangement of the exterior space where social activities could take place, as well as internal space, such as location of the guest room, main entrance, women's section and kitchen, and placement of openings in relation to the street, passers-by or neighbours, have to be considered with care. It is important to say that the preservation of privacy of the household members (women and men) constitutes an essential prerequisite of Islam, particularly in Arab society. Analysis of data suggests that Ghadamesian people preferred the traditional house design because it is a direct interpretation of their privacy patterns by taking into account their need for privacy in the areas immediately outside the dwelling (at neighbourhood level), visual and acoustic privacy inside the dwelling and privacy from neighbours and street. For example, its interior space arrangement and placement of the openings were the result of the privacy convention. From observation of the traditional residential area design and interviews with its residents, the major types of privacy which Ghadamesian household are concerned about are:

1. Places for meeting at neighbourhood level, for carrying out the daily activities such as playing cards, drinking cups of tea under the shade of trees, and squares, where social activities such as wedding or funerals could take place and sitting without disturbing others
2. Household visual privacy between made guests and household quarters, particularly the female section, was found to be most important quarters, particularly the female section, was found to be most

important factor determining dwelling design in Libya. This was found to be affected by the interior space arrangement such as the placement of the main entrance, guest room, bathroom, female section and location of kitchen.

3. Acoustic privacy and avoidance of sound transmission between male visitors and household quarters was found, by an overwhelming majority of respondents, to also be an important aspect of privacy

4. The need to prevent passers-by and neighbours looking into the house and the need to keep out noise. Findings showed that in the traditional houses of Ghadames, house openings were usually made to avoid looking into the neighbour's dwelling and internal space, and the height of these openings, especially windows, was above the level of a man passing-by and these were not positioned where they could be overlooked by people in the street or by neighbours.

### **The concern of religious needs**

"The mosque should be considered the major dominant element in the designing of residential areas or towns. As a symbol of religion and the place where prayers are offered and as a centre of daily life of Islamic communities, it should be given the utmost consideration and highest priority in various planning projects" Ibrahim (1979p.66)

The Islamic religion has influence on the built environment, especially in Saharan communities, such as Ghadames. This study examined the level of satisfaction in both house types (traditional and modern), and it appears that the traditional houses are totally responsive to their users' religious needs, but the respondents in the modern dwellings complained that there was a lack of any relationship between dwelling design and religious values. The majority of Ghadamesian people prefer the traditional dwelling because it successfully responds to their religious needs, particularly in terms of neighbourhood religious facilities, dwelling relation with the mosque and orientation, unlike the modern one (Table1). The following were the factors which concerned people about the necessity for adapting their dwelling to meet religious needs

1. Mosque system; every neighbourhood should have its own small mosque, or moaque, depending on the population. A central mosque is larger and more imposing, and is often provided and maintained by endowment to serve a wider area. This is sometimes called the Jumah, or Friday mosque, as people from the whole settlement gather to make their Friday prayers.

2. The dwelling relationship with the mosque is the most important variable. This process could be seen in the Ghadames traditional houses where religious trends translated into a practical design; houses were concentrated around the mosque and in close relationship with the mosque, but the modern dwelling has no such relationship.

3. The dwelling orientation: People are not concerned too much about their dwellings' orientation because no specific rule or recommendation exists for this. However, users in our study were concerned about the orientation of bathroom 'siphonic water closets'. The user of the bathroom prefers not to turn his back of face away from the direction of the holy Makkah, which means that water closets must be correctly positioned in accordance with their users' religious needs.

### Users' desire for Prestige

The need for prestige or self-esteem involves the desire for self-respect, a sense of personal worth, and the esteem of others (Maslow, 1970). Prestige is an important value and planners and architects must take it into account when designing any residential area. The analysis of data shows that people get respect from other groups, particularly those from outside of the settlement, according to the degree of their neighbourhood's recreation places, cleanliness and neighbours' status as well as the dwellings' aesthetic quality and climatic comfort. Respondents in the sample preferred the traditional house design because it met their prestige needs better than modern design in terms of satisfaction with these aspects (Table 1). The study revealed that people living in Ghadames' traditional houses survived the summer months without mechanical ventilation, and the winter without heating, by gently migrating around the house. However, they recorded dissatisfaction with respect to the quality of the home in terms of building materials and space. Experience of traditional house design definitely influenced people's perception about their present dwelling design. The users desired the modern built environment whilst having the traditional house design. Despite this, they had some complaints about the traditional house which they felt needed some improvement in terms of an increased amount of interior space, better building materials and a more efficient sewage system. It is obvious from the findings of the study that the following variables were found to be relatively strong and to have a significant relationship with prestige

1. The upkeep of the neighbourhood has been recognized as a very important factor influencing satisfaction with neighbourhood environment. A similar conclusion was reached by Lansing et al (1970, p.130): 'Upkeep of housing estates has been recognized as a very important factor influencing satisfaction with the housing environment'.
2. The spaciousness and size of the guest rooms as well as the size of the kitchen, the size of space for female household members and visitors, and the size of the storage area and other rooms were related to the users' desire for prestige and satisfaction with their dwelling. The result confirms the findings of Tognoli's (1985) study, which noted that room size is one of the features of the dwelling likely to be associated with the users' level of satisfaction.
3. From the findings of this study, it appears that the aesthetic aspect of the dwelling are strongly influenced by the amount of decoration (which represents the household's status and prestige), the choice of building materials, texture and the amount of greenery outside and inside the dwelling. These are the most important factors linked with the residents' level of satisfaction with the aesthetic qualities of traditional and modern dwellings.
4. Users' opinions showed the importance of flexibility and the ability to design houses to conform to climatic needs. This means dwellings should be able to provide protection against the harsh climate.

### Conclusion

The findings of this investigation lead to the conclusion that the success of the traditional houses of settlement, neighbourhood and dwelling is the result of successfully consulting with the users during the design and construction processes, and dealing with their socio-cultural values. The modern design failed to adapt to the social life needs of the Libyan household. Turning back the clock is not possible because modernity has affected some aspects of the residents' lifestyle,

and changes in furniture and new household domestic technology have caused specialized room usage and created the need for more regularly shaped and bigger rooms. Moreover, the use of new systems of transportation, such as cars, need new road systems, particularly in terms of width, and the new sewage system also needs different space dimensions caused by the use of new fittings and equipment. However, lessons can be learned from the traditional housing design system and from the residents' experience with it. For example, through spatial analysis, it was shown that respondents accepted the traditional design system but they recommended some change in the dwelling's physical components, such as the sewage system inside and outside. On the other hand, they desire more spacious housing, particularly in regard to the amount of interior dwelling space. They would also like to improve the traffic system according to their present lifestyle needs.

### **Bibliography**

- Ahmed, A.** (1985), PHD thesis, University of Krakow: Krakow, Poland.
- Awotona, A.** (1988), 'The perception of housing conditions in Nigeria by the urban poor', *Habitat International*, vol. 12, no. 1, pp. 75-96.
- Been Swessi, A.** (1993), 'The development of the City of Ghadames: Between the lost identity and the search for meaningful and productive rural architecture', Hassan Fathy Conference, Cairo, Egypt, 1993, paper presented.
- Eldblon, L.** (1968), *Structure fonciere, organization et structure social: Une etude comparative sur la vie socioeconomie dans les oasis Libyennes Deghat, Mourzouk, et Parti Culierment Ghadames*, Meddelard fran Lund Universities Geografiska Institution: Lund. In French.
- Ermuth, F.** (1973), *Urban environmental preferences*, University of York: York.
- Hassan, M.A.** (1982), *Understanding the traditional built environment: Crisis change and the issue of human needs in the context of habitations in settlements in Libya*, PHD thesis, University of Pennsylvania.
- Ibrahim, H.** (1979), 'Planning standards for mosques.' *Albenaa Magazine*, Vol. 1, pp. 66-69.
- Lansing, J. Marans, R. W. ET AL.** (1970), *Planned residential environments*. Ann Arbor Institute of Social Research, University of Michigan.
- Lynch, K.** (1960), *The image of the city*, MIT Press: Cambridge, MA.
- Maslow, A. H.** (1970), *Motivation and personality*, Harper & Row: New York.
- Piccioli, A.** (1935), *The Magic Gate of the Sahara*, Methuen: London. Translated from the Italian by Angus Davidson.
- Rossi, P. H.** (1985), *Why family move*, Sage: London.
- Shawesh, A. M.** (1992), 'Traditional settlement in the oasis of Ghadames in the Libyan Arab Jamahiriya.' *Libyan Studies*, Vol. 26, pp. 35-47.
- Tognoli, G.** (1985), 'Residential environment,' in Stokols, D. and Altman, J. (eds). *Handbook of environment psychology*, vol. 1, Chapter 7.
- Ward, C.** (1985), *When we build again*, Pluto: London.