World Journal of Engineering Research and Technology
WJERT
www.wjert.org
SJIF Impact Factor: 3.419

# A DESIGN MODEL OF CLAY BUILDINGS FOR TOURIST ATTRACTIONS IN THE DESERT OF HADHRAMOUT REGION, YEMEN

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**Article Received on 14/03/2016** **Article Revised on 05/04/2016** **Article Accepted on 27/04/2016**

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## ABSTRACT

Hadhrami architectural style has a significant value of clay building interior spaces, which has drawn the creativity of the Hadhrami master builders when they build these buildings. They put a great emphasis on this design to associate with environmental, artistic, social customs, Islamic and cultural values. The master builders today have gained profound expertise and values in the old and new architectural style to shape the functional and spatial value of the clay buildings. This design model has successfully produced artistic and fascinating architectural heritage. Their concern was not only for the interior function of spatial organisation but also the exterior landscape of the building, which created a unique architectural identity for tourist attractions. The aim of this paper is to study the impact of tourism and visual mental photos accumulated by individuals for the desert environment on the acceptance of the idea of moving to establish a new tourist desert areas and the reflection of that on the concepts of their interaction with the desert environment attractions. These Hadhrami clay buildings will be studied through a series of investigations related to design issues and will serve to highlight the construction of their spatial design. Finally, this study seeks for certain guidelines for sustainability of this design model of clay buildings to retain their tourist attraction role in the desert of Hadhramout region.

**KEYWORDS:** Design, Tourism attraction, Clay Buildings, Hadhramout Region.

## INTRODUCTION

Tourism sector is experiencing high growth rate in this modern time in Yemen. This can be seen in two major ways. The first one is the continuing peace process in the Middle East, and the second one is about economic advantages enjoyed by some other Gulf countries including Yemen. It is very important to discuss about tourism in Yemen, because of the complexities of developing the industries. The motivation for government of Yemen to develop tourism is also important. One of the major governorates of Yemen is Hadhramout. It lies in the south eastern part of Yemen. Its geographically integrated terrain reflects diversified rich historical structures, (Figure1). (Shibam, 2nd Edition, 2nd Sep, 2004). The coastal plains on the Arabian Sea are one of its characteristics. Hence, the longest and most fertile Wadi includes Hadhramout among others. Hadhramout has a glorious past and ancient history. Furthermore, studies have shown that Wadi Hadhramout, as the southern Arabian peninsula has been settled by mankind for more that 700.000 years. This is one of the reasons why Hadhramout is one of the oldest Yemen states whose civilization has flourished in the middle of the first millennium BC, (Burns & Cooper,1997).

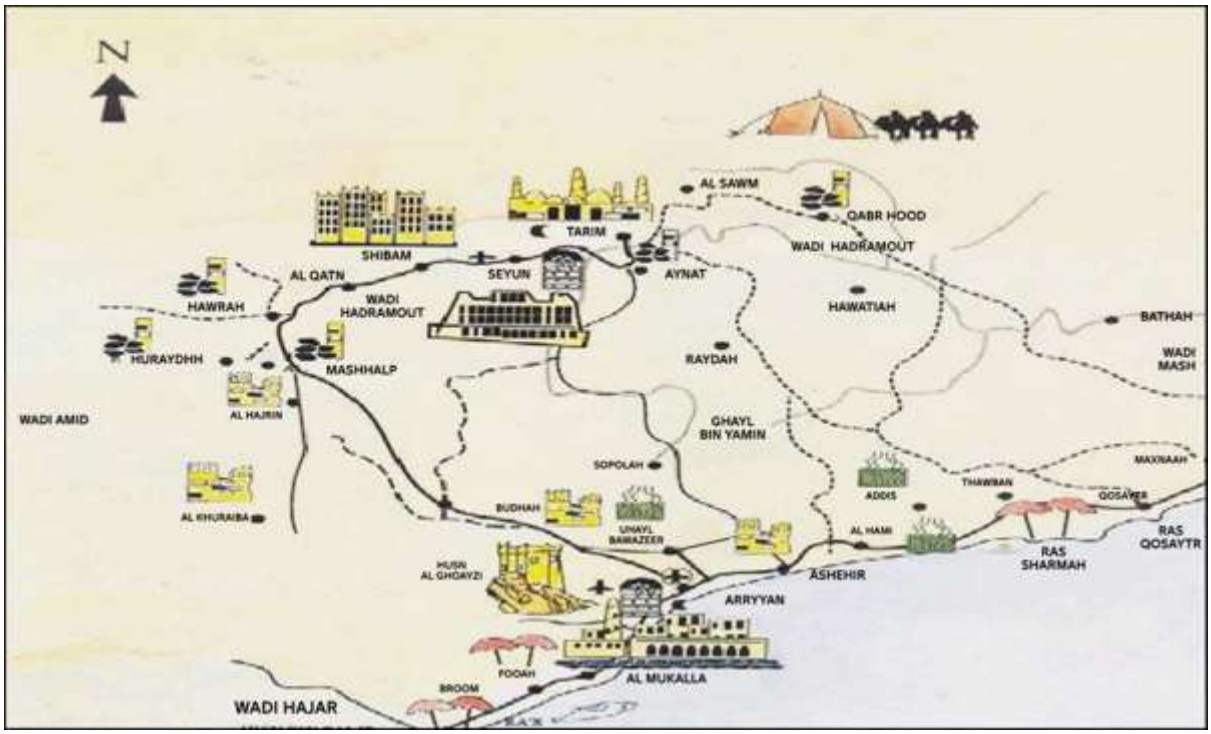


**Figure1: Map of Tourist Monuments in Desert of Hadhramout Region**

## THE PROBLEM OF TOURISM SECTOR IN YEMEN

Any study of the architecture of the desert should begin to understand the desert. Is it the hard environment? Is it the hot areas? Is it the barren environment? Is it the non-populated areas?

Is the visual message of desert architecture based on urban culture, or the culture of the desert? And each has its components and psychological needs that are necessarily reflected on the physical requirements. For example, construction of mud supports the idea of traditional architecture and impose this as a method suitable for construction in the desert environment. Some approaches planning to study the deserts, for example, deal with the desert as deserted regions resulting from scarcity of water resources and the necessities of life. Then their fundamental attention is concerned about ways to attract people to those areas through the attempts to create ways of life in those regions and provide the economic infrastructure and ways of moving and essential life services for the attraction of population and tourism.

## METHODLOGY

To achieve the aim of this paper, the descriptive, documentary and analytical method has been utilized to identify the concepts ranked by visual photos of the architectural style of clay buildings in the field study so that appropriate visual approaches can be educed to deal visually with desert architecture and study the effect of visual imagery as a supporter of the attractions of tourists in the desert.

## ARCHITECTURAL HERITAGE CITIES IN HADHRAMOUT REGION

Contemplating on the Hadhrami architecture, there has a display and an exhibit on its story in chapters and units for its plains, highlands and valleys of its geographic and historic extension. Hence, we find that the most surprising and attractive thing is that the Hadhrami architecture and its techniques are internationally famous and proverbial. Day by day, it has attained much more interest locally and formally. Consequently, it has occupied a very important and progressive role that has brought on three Hadhrami cities as an architectural and international heritage to be registered among the international heritage. These three cities are: Shibam, Tarim, and Sayoun.

The city of Shibam is situated in the core of Wadi Hadhramout above ruins of the ancient city of Shibam, (Figure 2). It was built on a small mound or on a podium and not like the ancient Babylonian and Sumerian cities. The city was named after its king Shibam bin Al-Harith bin Hadhramout bin Saba Al-Asghar. However, the date in which it originated has not been clearly established. Shibam played a crucial role as the political capital of Wadi Hadhramout between the fourth BC, especially the time Himyarites burnt down the old capital Shabwah during the period AD 1520 /Ah 927. It is also viewed by its position as an important

commercial canter since the pre-Islamic times. Its commercial capital became meeting points for caravans of the various tribes of the valley and those up north, Damluji, (1992).

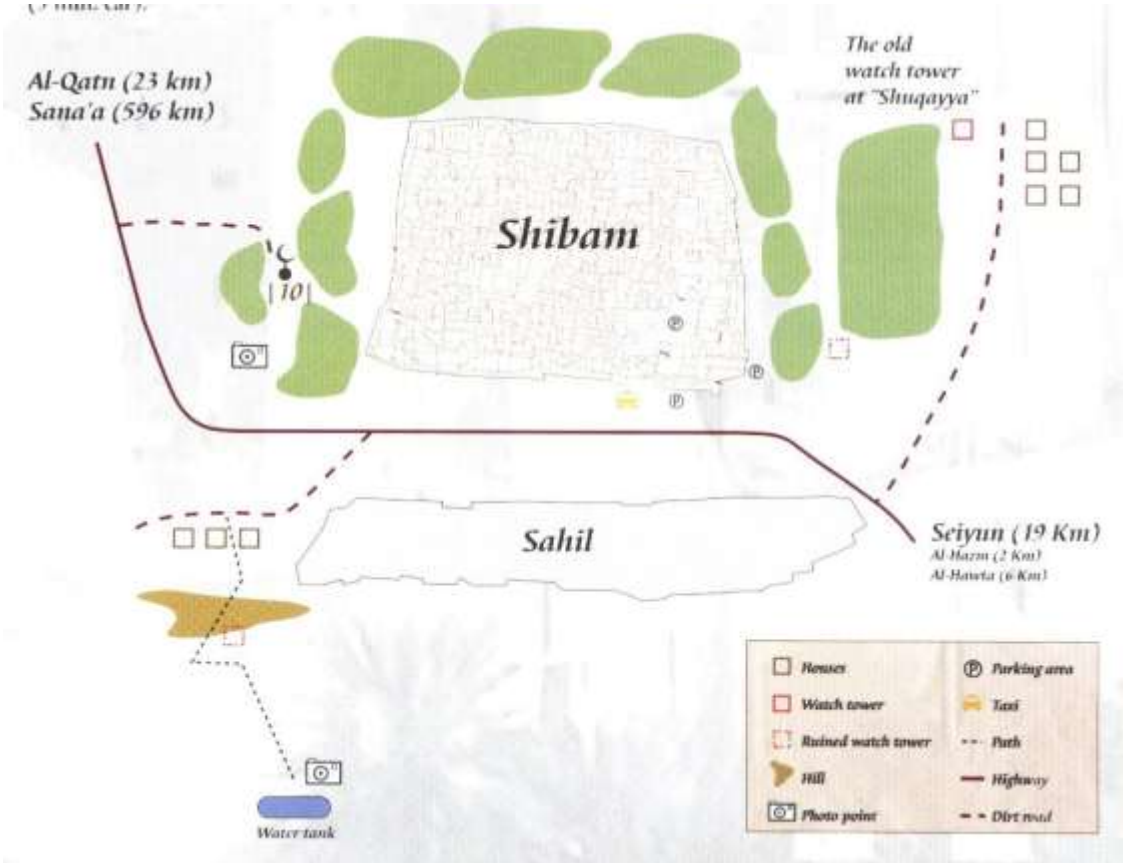


**Figure 2: Map of Shibam City**

Having burnt down Shabwah, the commercial routes taken by incense-carrying caravans diverted their ways. They had to carry the incense from areas of production in Dhofar and Al-Mahrah through Shibam to their destinations rather than through Shabwah as it used to be. Although some of the buildings in Shibam are as old as 150 years, most of them were constructed around 100 years ago. A few of them are also about 200 years old. However, the Jarhum house is as old as 300-400 years. Therefore it is very difficult to give the exact dates for the construction of Shibam's buildings. This is because; most of them are reconstructed or renovated. In fact, a common practice in Shibam's construction process is to pull down a whole building which has been damaged beyond repairs. It is then rebuilt in the same position and on the same principle of design without any major changes, (Damluji, 1992).

## THE TRADITIONAL CLAY BUILDINGS

The prominence of the skilful ability of the Hadhrami architect, which is built from one substance and two designations as well as technical constructions, made up the occupations

for its need and functions providing comfort and relaxation for her. Its strength reflects her spiritual desires through its beauty, (Figure 3). This is because of the production of her profound perception in the way of making up architectural occupations between the perception and awareness that deals with changes, place and time. In addition to this, it provides characteristics of specific and changeable places, climate and social settings. On the other hand, the changeability of time, specific effectiveness, as a result of the same belief and social harmony and the Hadhrami spiritual traditions in different regions are all attractions that make Yemen a unique place to live, (Al-Shibany, & Al-Madhajy,2000).

**Figure 3: Facades, Plans and interior Space of Clay building**

The clay has been progressed in the building for its spiritual and social proprieties, and its formulation of the relationship and spiritual dialogue between the man and the clay, Allah says in the holy Qura'n: "He created man from sounding clay likes unto pottery" (Surah Al-Rahman) verse14. Moreover, the prosperities of the clay which are structured in the architectural space can be translated in its isolation for the heat and sound. This can be seen in the feeling of the comfort from heat weather when one lives in it.

The master builders solely depend basically on traditional methods. Therefore, they use low-technological methods, which pre scientific–based on locally available materials and technology. Hence, there is no likelihood of developing the traditional techniques. This is because; the methods used in the infra-structural process are transferred from one generation to another. This conservative way of building has slightly transformed from adapting material, methods and skills due to social and physical circumstances through successive generations. As such, new materials or implements may become available and suitable some

particular requirements a certain group of traditional people. With this in view, there needs to be innovative ways to force the master builders and building owners to use the limited materials or skills economically.

Two basic examples explain the traditional architecture in the remote parts of the Arabian Peninsula. They portray an evolution of shelter that has transformed the way in which construction was initially carried out. However in both cases, the tradition has become a combination of old and new architectural styles. The traditional building can be viewed as a dynamic process where builders might consciously change their way in designing the building. This does not necessary mean that they have lost their tradition. Scarcely found in situations where rigid traditional material or techniques have limited the workflow of contemporary master-builders.

On this note, the changes are more likely to use limited resources at our disposal and the ways that governs the suitability for a particular economy. Innovations therefore are useful mainly in socially affordable areas before real application takes place. In an effort to adapt to modern design of building, builders are currently using techniques of earth construction to suit the changing of the society. Due to the shortage of existing materials, Hadhramout, a region in Yemen, has developed new techniques of earth construction. As a result of this, tradition forms of building have been greatly preserved, (Figure 4). Hence, social and economic changes have influenced the building development in the urban and the rural areas. Majority of the country's population live in the rural areas of the midland and highland settings. At the eastern part of the region shows sub-tropical lowlands, which borders with the vast desert of the empty quarters Seasonal rains or ground water (oasis) characterizes settlements in these areas.

**Figure 4: Type of Clay Decorative Places in Tarim City**

This provides sustenance of cultivation beside the stream beds which drains eastwards towards the desert. Materials for construction of buildings are also acquired from the alluvial soils of these valleys. This area is sparsely populated and separated from other parts of the Hadhramout highlands. Throughout these highlands, groups in this field exhibits a well defined control over the territories between which land rarely changes the field. It also provides shelter and storage point from which to control crops in the fields.

In the scattered populated areas, small towns have developed their markets to serve the needs at the people. For instance, houses in the oldest part of the town structure as high as to six storeys. These buildings are separated from smaller alleys. They are just wide enough to allow people to walk through as a passage. Hadhramout as a nation has a conservation structures of buildings that remains unchanged all the time. Hence, they try as much as possible not to spoil the tradition and culture of the country which greatly contributes towards its potential tourist attractions.

The buildings of the city were constructed in such a way that it could serve for defensive purposes. This is the way why it functioned as very high, close-packed defensive fortresses, (Figure 5). It could be immediately closed off and isolated when the need arose. They are be only accessed the ground floors through the main entrance of the building. These stores were used as store buildings for grain, wheat and dates. It therefore permitted each family to stock up provisions that could last for up to one year. There are no windows on the walls of the ground floors, except for a few openings on the ceilings for ventilation purposes.

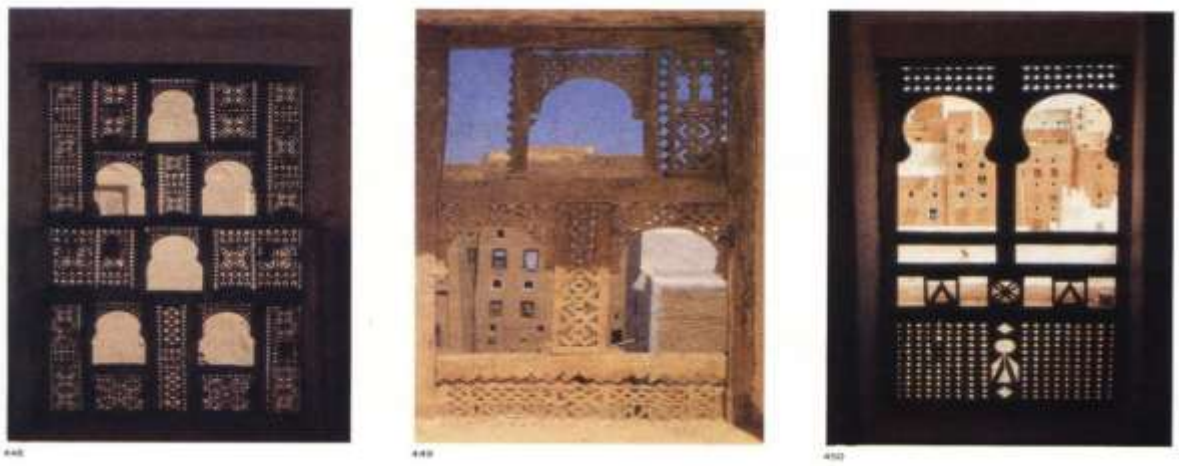

**Figure 5: Facade and Type of Windows of Shibami Buildings**

The passages which connected the upper floors adjacent to the building served two main purposes. It facilitates the passage ways for women from one floors to another floor allocated for them *(marawih*). It is not publicly exposed and in times of war and siege, enabled the men to move around freely from one building to another. Similarly, the architecture in Hadhramout reflects to the social hierarchy within the city and influenced by the characteristics of the principles of city-design. Most houses have their entrances with un-opened courts, whose wall are covered with thorn scrub to prevent intruders. Doors at the external ends are protected to give a structural stability to the door jambs.

There is only a single door which leads to the staircase from the entrance. It was always situated against the external walls. A massive mud was created to leap around the staircase which runs throughout the height of the buildings. For security reasons, gates in the walls on the lower floors are limited to narrow ventilations. The ground and the first floors are usually reserved for storage purposes. Opened rooms were off a central landing on each floor. There is specific use of family rooms and the same space can serve as eating, sleeping or to conduct business at different periods. On the upper floor there is a large hall called "*dewan*" which is not always used by the family. It is reserved for entertainment and for special occasions. In many houses this rooms has small washing area at one corner and it is separated from the rest of the space. It is normally used for prayers or eating. A small part of the area is also constructed for ablution purposes.

**THE BUILDING CONSTRUCTION**

The building construction of the traditional building comes with common architectural styles throughout the highlands of Yemen. In general, the responsibility of the construction's work

is steered by a builder (*Usta*). This person normally has served as an apprentice on traditional buildings for about ten years. He then works as a labourer *(Shoggi*) up to serve under a master builder *(muallam*) in order to learn his craftsmanship. The responsibility of the builder is to hire and supervise labourers, (Figure 6), where as the owner will arrange for the supply and transport of the materials. Therefore the *(Usta*) will act as foreman for the owner and he is occasionally responsible for the design and layout of the buildings. In most cases the basis of the plan stems from family houses occupied by new clients. In some cases the client may specifically state the number of rooms that he/she require. This gives the reason why some masons follow a particular architectural style in their configuration in order to suit the client's taste. This action is viewed as a source of pride by the builders and owners. Most importantly, the skill of the builder lies in his ability to design the required spaces around the central stair way without encountering huge costs, (Leslise, 1991).

**Figure 6: Labourers Preparing of Clay Bricks by Traditional Methods and Skills of Builders in Constructing Buildings.**

Another responsibility of the builder is to estimate and control the cost of the construction. This is because most owners do not have ideas about the cost involved in the construction process. It is therefore uncommon to build complete house in one phase. Hence construction will only proceed when the owner can afford to do so. The work process might be carried out on a contractual basis. It is always the master who saves out the prices for various stages of the house construction right from the foundations to the roofing stage. It needs to be noted that there are strict rules about the orientation of the house, but they are often constructed to face the fields so the crops can easily be seen and protected. Builders do not only consider the advantages of west-facing rooms in winter but also the northern aspects of the summer. The

process of house-building is initiated with the setting out of the ground plan with string or lines of gypsum. Nothing is usually drawn on paper however; the proposed plan might be discussed with the owner.

The composition of earth and water are sometimes with a quality of straw. This is prepared near the site by unskilled labourers. The mud is treated for several hours before it is judged to be consistently correct. On the next day, the mix is laid by hand on the foundations. In fact, some of the builders prefer to finish the whole *(midmak*) on the walls within a day. This is mostly determined by size of their labour force on the site. In the process of construction, the earth mix is continuously treated to maintain its consistent mixtures. The brick mud is then formed into ball-shaped structures by tossing it from hand to hand. The balls are thrown to an assistant who is the construction worker to further build the wall. Mixing and lying method is often done in accordance with a rhythmic chant, set up by me worker inviting a chorus of responses from the others, in time to their respective tasks. The wet mixture is laid by hand and kneaded down with fingers. The *(midmak)* sides are shaped by hand or with a flat stick in order to form building profile. The first (*midmak)* is laid on the level foundations, with distinct corners that are raised in particular forms and is followed by succeeding levels.

In fact, the motives of this pattern are unclear and investigation shows that it is the pattern that is inherited until the present times. Each *(midamk*) is left to dry for about two days before subsequent layers are laid on top of them. The process of preparing mixture for this phase begins while the time of the foundation is left to dry up. With respect to the walls, they are built by laying stripped poles or swan timber joists directly on the wall head. Smaller tree branches that are shaped like reinforced steel bars are laid between the joists as purlins. These purlins are made wet and pressed down onto the layer through the above floor. The floor and roots are normally 10 to 15 centimetres thick. Regular additional resurfacing of fresh each is put on the roots before the season rains to enable a greater depth of building overtime.

Many buildings have parapets and upper floors with distinctive projection showing on the outside phase. These are, in effect made in smaller buttresses and supported by short lengths of timber that protrude about is centimetres from the face of the wall. They therefore serve to enhance the parapet and also provide some protection from rain to the mud walls below,( Figure 7).

**Figure 7: Tourist Chalets of Hayd Al-Jazil In Wadi Daw'an**

Openings in the walls are formed simply by opening the *(Midmak*). Shuttered windows near the floor level of the rooms also provide a view. More so, the arched openings with fixed glazing windows provide background illumination to the interior space when the shutters are closed. In older buildings, version thin sheets of alabaster for glazing purposes are still in used in contrast to newer buildings; glasses are commonly used to cover the windows. Between the upper arches and smaller openings often used to hinge the casements to provide ventilation. Windows and doors of the buildings are often decorated with broad bands of ochre white colour applied to the outside walls. The entrance door may be framed with a rectangular style of similar brands which is often extended to cover the entire lower walls of the building. With the interior section of the houses, and green stripes in oil paint are applied around the windows of the family rooms.

Some builder's later coat flats the exterior walls with lime water. Water is normally added to the lime to cause hydration as it is mixed with a smooth paste by beating with long brush or used as a thin water-resistant plaster. In some houses, a more durable plaster called "*malsa"* which is made from line is used internally on floors, walls as well as stairs. Lime plasters also come in waterproofs called "*qadad*" with volcanic ash, as an aggregate and they are traditionally used in the roofing of mosques and public baths, (Damluji, 2007).

## CONCLUSION

In conclusion, it can be realized that the old architectural decorations of the modern buildings have overlapped the Islamic decorations. This is also true in terms of functions and shapes. Bricks are the main substance for construction. Subordinate substances used are clay, lime as well as wood. The main and external construction is load-walls and the system of construction is column free from arches. The building is normally designed in such a way that they join with other quarters that provide services like mosques and yards. The main front of the building is structured to provide room for street or yard. The external decorations consist of simple frames and shapes around the windows. In general, they have rectangular or squared shapes and they are opened outside. The measure is suitable for in habitants who wish to satisfy their needs among the population and social environment.

It is an unavoidable fact that perceived advantages of some modern materials or methods should be exploited by those who may still regard it as traditional builders. Looking at the increasing demand for non-indigenous materials with the corresponding money earned by the local architects who have returned from abroad, it can be concluded that commonly-used items are now available in all areas. Migration from the rural areas has labour shortages, and the expensive manpower are now of utmost importance in construction of new building. Hence, less-costly materials and diversely produced methods are being incorporated into common techniques that were previously not regarded. In some cases, the process has resulted in a total transformation (and a near-replacement) of the way buildings are put up and built. Tradition of builders generally acknowledges the poor performance of modern buildings thermally as compared to the use of indigenous materials in traditional buildings construction. This provides a better future for traditional buildings as against modern ones. However, there is the need for one to be careful and not carried a ways by the above statement. This is because a technique that to outside eyes may seem appropriate and beautiful but might be of little current value to the user. People in many parts of Yemen believe in the idea that non-indigenous materials possess modernity and change. However, this is not yet the case in more remote parts, but it may be an inevitable result of the transformation of traditional lifestyle.

## RECOMMENDATION

Visual mental image is the result of understanding the visual connotations of the physical form and is subject to the automatic reaction, and there is an inevitable correlation between

the visual image of the shape of the architect and the intellectual sense it reflects which makes the architectural styles of cultural value associated with the concepts of identity and character of architectural in addition to the visual value.

Physical component of visual mental images is influenced by two sets of determinants; the first is the physical limitations (climatic conditions, construction materials and methods of construction) and the other one is the cultural determinants, which deal with the physical component as a natural response to the psychological needs of individuals. visual mental image of the architecture can support the psychological encouragement of the idea of moving the tourist to stay in the recently developed desert communities.

Optical image of the desert architecture must be linked with the cultural types of the target groups to be moved to the new desert communities through close study of the culture of these groups so the visual styles of that group can be determined and how they interact with any other patterns of different tourist attraction.

When preparing any perceptions for development in desert areas, the role of visual mental images should be highlighted as a supporter for the tourist attraction in those areas.

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