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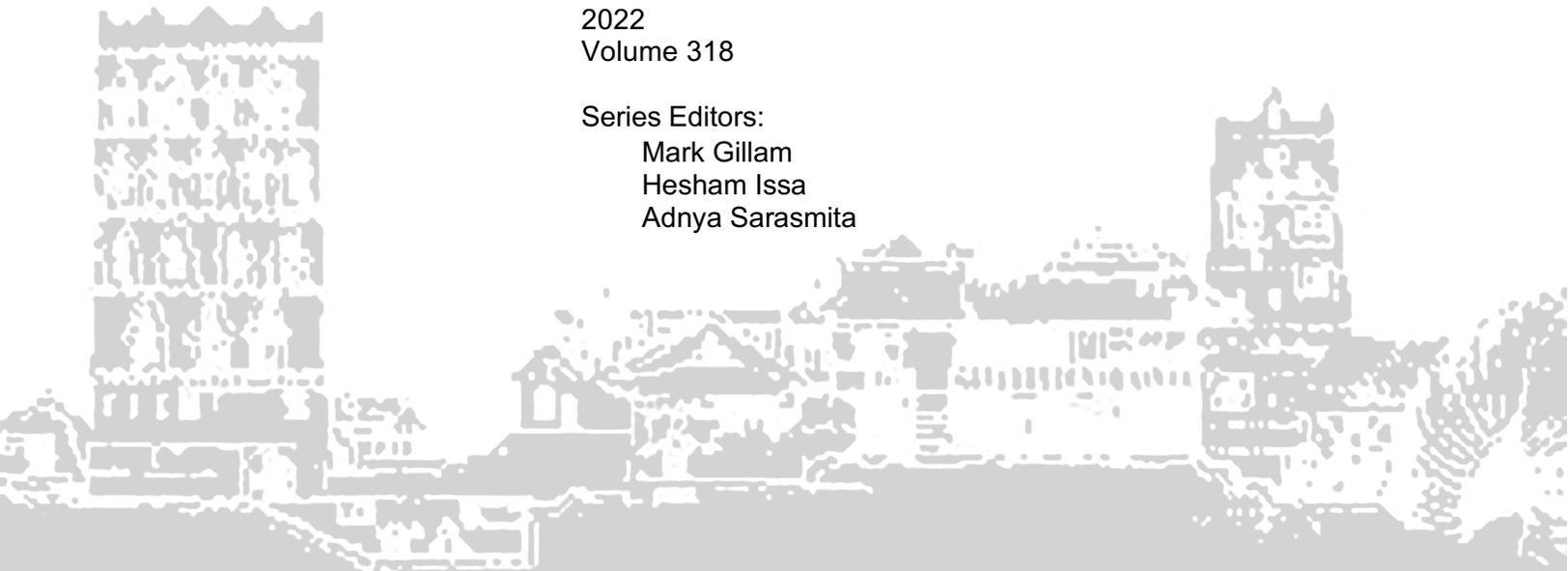
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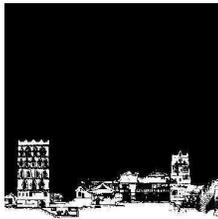
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HISTORY AND TRADITION

- Learning from Desert Vernacular Architecture to Revive Sustainable and Culturally Sensitive Contemporary Architecture** 1
Hisham S. Gabr, Gehan M.S. El-Assal
- Contextualizing the Historic Urban Landscape (HUL) Approach in the Xi'an Muslim Quarter: Taking the Imagine Tool as an Example** 33
Zhaoyang Sun
- From a Private Garden to a Public Park: The 1857 'Devil's Wind', the British Love for the Lawn and the Mutation of the Mughal *Bagh*** 55
Jyoti Pandey Sharma
- Of Earthen Gourbis and Troglodytic Caves: Informality, Vernacular 'Discoveries,' and Their Slippages in Modern Discourses of Tunisian Architecture** 75
Nancy N.A. Demerdash

Traditional Dwellings and Settlements
Working Paper Series

**LEARNING FROM DESERT VERNACULAR
ARCHITECTURE TO REVIVE SUSTAINABLE
AND CULTURALLY SENSITIVE
CONTEMPORARY ARCHITECTURE**

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LEARNING FROM DESERT VERNACULAR ARCHITECTURE TO REVIVE SUSTAINABLE AND CULTURALLY SENSITIVE CONTEMPORARY ARCHITECTURE



This study discusses the possibility of reviving the design values associated with desert vernacular architecture and informing the design of contemporary architecture to enhance sustainability measures and expressions of culture, identity, and community values. The Kharga and Dakbla oases was chosen in the New Valley Governorate in the Western Desert of Egypt to study their design characteristics and measure the extent to which architecture of these oases achieves sustainability and expresses the identity of the oasis community. Desert vernacular architecture in these oases is under threat and users views towards modern is shifting in a way that increase this threat further. This disruption to tradition is alarming. The paper aims to document the current state and investigate sustainable practices and cultural responsiveness in these settings. Fieldwork documented the current situation of vernacular architecture at the study site using photographic documentation, visual views, and architectural measurements. Personal interviews using a questionnaire were conducted with the residents to decipher qualitatively how architecture responds to its environment and inherent cultural values. The results support the sustainable aspects of vernacular architecture that expresses the identity of its society. Results recommend a viable model in modern architecture by integrating the characteristics of vernacular architecture design with the capabilities of modern building technology in improving the properties of materials and increasing their construction quality, as well as saving energy sources and improving the properties of the built environment. The paper stresses on the need to preserve the remaining vernacular architectural heritage as an important source of knowledge of local building technology, and of the principals of traditional vernacular architecture design.

1. IDENTITY, CULTURE, SUSTAINABILITY AND VERNACULAR ARCHITECTURE

Identity is closely related to architecture. Local structural patterns of societies are considered one of the important means of identifying the identity of those societies. Expressions of identity in architecture are affected by several determinants such as the effects of geographic location, the method used in construction, the shape of the building, social traditions as well as economic activities that have a direct impact on the shape, characteristics and uses of spaces. Identity is based on general cultural postulates, which are historically linked to the social, political and economic values of the community ¹. According to Rappaport, identity is the ability to distinguish one element from another, and it is one of the features of the environment that cannot be changed in different situations, and this feature may be physical such as shape, size, construction, decorations, etc., or be activities or certain functions exercised in the environment ²

With the increased rise in environmental problems over the past few decades, sustainable development is not an option, it is the way that allows humanity to share a dignified life on this planet. By studying the design foundations of vernacular local architecture for traditional communities, it is possible to learn about sustainable practices to inform contemporary designs. Traditional architecture deals with design aspects compatible with the environment, such as saving energy, reducing negative effects on the natural environment, reducing carbon emissions and environmental pollution, using natural materials available in the surroundings for construction, meeting the social needs of users, expressing their culture, and

accommodating social traditions. It is the product of the mutual influence between the site, humans, culture and the legacies passed on through generations.

On the other hand, vernacular architecture, which often manifests both identity and sustainability,³ faces problems that threaten its existence. Many traditional societies suffer from deterioration, which deters residents to move away from them, abandon them, or demolish them and opt to replace them with sturdier concrete houses ignoring the significance of those traditional heritage and their inherent values. The disappearance of these architectural models does not mean only the disappearance of distinct architectural forms that are unique to those areas, but it means the disappearance of knowledge of traditional building methods that have been developed through years of experiences to reach successful techniques. It also means the loss of a cultural and social record of the life and customs of the residents in those areas, which was reflected in the architectural forms of their homes and the planning of their villages. John May stated, “It is as a result of changes in users’ views of how they live that traditional vernacular architecture is disappearing worldwide, adding that it is not only building forms that are disappearing but the knowledge, skills and traditions behind the creation of such vernacular buildings”⁴ Vernacular architecture represents tried-and-true sustainable solutions developed over long periods of trial and error using local materials and technology originating from the surrounding natural and cultural environment^{5 6}.

The study aims to document and evaluate the current situation of vernacular architecture in the Dakhla and Kharga oases in the New Valley Governorate in the Western Desert of Egypt, and to determine the design criteria and values for the vernacular architecture of these areas, which can be revived when designing contemporary architecture especially in desert environments through monitoring, documenting and evaluating the current situation of vernacular architecture in the Dakhla and Kharga oases. This includes highlighting the threats to vernacular architecture in terms of its deteriorating condition, its demolition due to the residents' abandonment of old residential communities.

2. METHODOLOGY

The methodology included two week-long field visits to the site to collect data on the conditions of the buildings, the habits and interests of the residents, and the reasons that led some of them to abandon their old homes and live in modern houses of concrete. The researcher recorded information, observations, and took some architectural measurements on the site. Interviews using a questionnaire form to measure the residents' desire to maintain their old homes or move from them to modern housing was designed and conducted. Basic statistics were used to analyze the questionnaire data and report on the results. A convenience sample of several residents living in their own old homes was applied. Some of the issues

measured where the extent to which the vernacular architecture achieves the requirements of the population, the problems faced by the residents in the old houses, the problems of preserving old houses in light of the spread of the construction of concrete buildings in those areas, as well as finding correlative relationships such as the relationship between young age groups and the desire to follow the manifestations of modern civilization by leaving old dwellings and moving to concrete dwellings, or the relationship between older age groups and the desire to move due to the inability to carry out maintenance work due to old age. Features of social and cultural life and its economic activities, and the change in the social structure and habits of the oasis community were also assessed. In summary, the methodology has been divided into three stages: First, Monitoring and documenting the current situation of the old vernacular architecture in the Kharga and Dakhla oases; second, conducting personal interviews with the residents of the study site; third, Analyzing and evaluating an example of contemporary architecture in Kharga and Dakhla.

3. RESULTS AND DISCUSSION

3.1. Characteristics of Kharga and Dakhla Architecture

The characteristics of vernacular architecture studied at the study site by categorizing it into three main categories: environmental, economic and social (Fig.1).

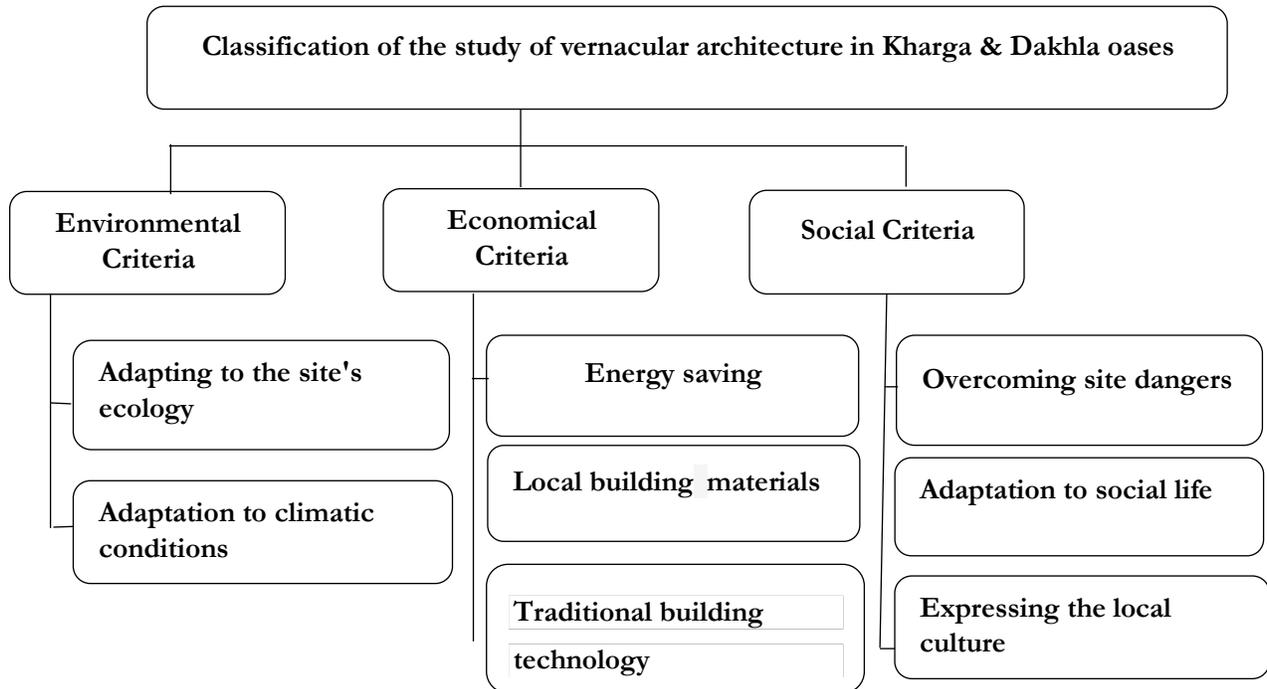


Fig. 1: Characteristics of vernacular architecture in Kharga and Dakhla. (Source: Researcher).

Adapting to the site's ecology is a key environmental characteristic. The desert vernacular in the oases is characterized by a unique natural identity and character that has evolved from the fusion of influences such as the natural desert terrain, climate, terrain and geography, along with cumulative cultural, social, environmental and historical factors ⁷. It was built as if it were sculptural pieces that resemble what nature carved around them from mountains, hills and sand dunes, due to their use of local materials in construction, which gave irregular shapes due to the surface of the clay used. The proportions, colors and configurations of the houses were appropriate for the topography of the desert environment, as well as the use of natural methods to reduce air pollution and the blowing of desert sand by closely converging the houses, opening their entrances to the internal paths, or making an external wall or fence to protect the houses, in addition to the narrow covered streets and cultivated interior spaces. In the courtyards, if found, which helped reduce the rate and size of sand, as well as establish a sense of space and visual balance.

The integrated planning of oases cities have urban mass of contiguous houses built on a high plateau, surrounded by walls-like fortresses that have gates that control entry and exit, and are interspersed with very narrow winding roads in order to protect the population from the successive attacks of desert nomads. Also, to keep the dwellings away from the valleys, from which groundwater springs often flow.

The old urban blocks in the oases are similar in general in that they were built on wide hills to defend against repeated attacks of the Bedouins. In addition to enclosing that urban block with tight walls, entry and exit through gates with special specifications that only allow the entry of the animal with what it is carrying without its passenger. For example, in the city of Al-Qasr, we find that housing construction is compatible with the topography of the village, where it has adjoining and gradual heights units, so we find buildings with a height of one or two floors and may reach three floors in some areas. Many buildings and their connections are in the upper floors of the buildings, thus the village appears as a single building block with internal spaces “courtyards” and external spaces “yards and lanes”. The layout of the dwelling is subject to what is permitted by the shape of the land, the integration of the building block with the surrounding environment.

Due to the harsh climatic conditions of the desert environment, various architectural methods and treatments were used for adaptation. The integrated planning of the streets: the pattern used in almost all villages and cities, is the solution in order to reduce exposure to harsh external climatic conditions as much as possible. In addition to protection from the dangers of the continuous attack on the oasis, as the narrow and numerous streets, especially with thoughtful guidance, lead to reducing wind speed and filtering the sand loaded with air and sent by the desert. Also, the close proximity of the opposite buildings, where they cast a shadow on each other and create air currents in the narrow paths, which leads to softening the heat and reducing direct

sunlight on the external facades⁸. In most cases, the width of the street does not exceed 250 cm, and narrow lanes of no more than 70 cm wide branch from it.

Roofing of roads and corridors between houses is a distinctive feature of the old oasis villages, using palm trunks, trees and palm leaves (Fig.2). The length of the areas covered with roofs of this type varies between 6 to 15 meters⁹. These tunnel-like streets also facilitate the circulation of the air stream and the filtering of sand particles, especially during sandstorms¹⁰. Occasionally, as a sign of increasing social cohesion among people in the oasis, some rooms were built on the roofs of the streets, so-called sheds, to form a common space that connects the residents on the sides of the roads. Usually the shed belongs to a family that owns the two dwellings opposite each other on both sides of the street. Hence, the shed is called by the name of this family, as a definition of its geographical location in the oasis. The shed, which adds to the area of the house, is used by the elderly to take a nap on its terraces located on its sides. The construction on the rising hills has allowed the houses to obtain their right of sun and air, regardless of the height of the house in front of them. It also allowed the general shape of the oasis buildings to appear as one cohesive block that is difficult to penetrate.



Fig. 2: Street roofing methods in the Islamic city of Blat in the Dakhla Oasis. (Source: Researcher).

One of the important advantages of using clay in construction of external facades is its thermal properties. The large thickness of the walls act as passive solar collectors and isolate the building from the rise in heat during daylight hours. At night, that heat that was absorbed slowly is released, so the temperature inside remains constant, no matter what the temperature outside. The large thickness of the walls leads to the absorption of 80% of the external heat of the building and allows 20% to pass inside the building, which

works on thermal insulation and cools the internal temperatures. The facades of buildings are also painted with a thick layer of clay or white lime to reflect the sun's rays. Lime can be mixed with iron oxides to paint the exterior facades, as shown in (Fig.3).



Fig. 2: Painting the exterior facades of the walls with lime or light colors to reflect the sun's rays falling on them, or coating them with a layer of clay to reduce the heat load on the facade. (Source: Researcher).

The facades exposed to sunlight are also solid or semi-solid and devoid of openings, which, if any, have small dimensions and narrow openings that allow the entry of the least amount of sunlight as well as help the exit of hot air from inside the spaces (Fig.4). The number and size of the openings are reduced in the external facades exposed to sunlight in the village of Blat in Dakhla and the village of Bashandi in Kharga, and they are increased in the facades overlooking the internal courtyards or those overlooking the internal covered narrow streets, taking into account the height and size of those The openings also achieve privacy for the people of the house. Small openings are also made above the doors to allow the flow of hot air trapped inside the space.

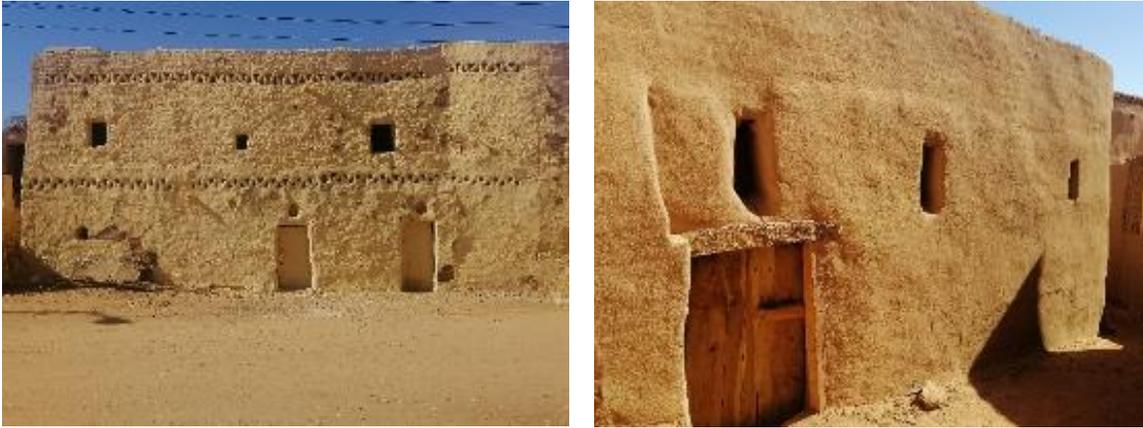


Fig. 4: The facades exposed to sunlight are semi-solid with small openings. (Source: Researcher).

The roofing material plays an important role in reducing heat transfer. The ceilings are a network of timber beams with different sectors and covered by a secondary network of tree branches and palm leaves. It is the method used in the oasis buildings, and these roofs act as a thermal insulator through the material of their composition (Fig.5).



Fig. 5: Using palm tree trunks and leaves in building ceilings. (Source: researcher/researcher group, photo by: Mahmoud Hossam).

Air catchers were used in the buildings of the Islamic village of Al-Qasr, and it is implemented by building the northern (marine) wall of the dwelling in a double way from two walls separated by a distance of about 20 cm (Fig. 6). In the outer wall there are wide windows decorated with wooden intersections, through which the air enters, and it collides with the inner wall, which passes the air through openings at the bottom of each room inside, in order to allow air to escape from the top and distribute it to the building.



Fig. 6: The air catchers on the roof of one of the houses of the Islamic village of Al-Qasr in Dakhla. (Source: Researcher).

The inner and outer courtyards allowed the spaces between the urban blocks to cool off the outside heat, by getting rid of the hot air due to the heat of the sun that the building gained throughout the day and absorbed by the walls and floors, and at the same time it stored the cold air in Walls and floors (Fig.7). The courtyards also play a major role in air filtration, dust removal, and sound insulation of the building from the outside.

The staircase spaces that connect the ground floor to the upper floor serve as an air current to receive cold air currents from outside during the night and get rid of hot air (Fig.8).



Fig. 7 (above left): A courtyard between the houses, semi-private spaces. (Source: Researcher).

Fig. 8 (above right): The interior courtyard of a house are a private space. (Source: Researcher).

Energy saving is a key economic characteristic. Building in the vernacular architecture of the oases leads to a significant saving in the cost of construction and energy consumed because the construction is done with local materials from the surrounding environment, and the manual manufacturing of building materials takes place in the same place. Just as the simple methods used in manufacturing do not need energy sources, people also build for themselves and therefore there is no real cost of labor as families and neighbors help each other

in the construction process, which reduces the overall construction cost. In addition, the use of clay in construction works on thermal insulation, which leads to reducing the cost of energy needed to cool the temperatures inside the buildings. Oasis residents also recycle those natural materials used in construction, either by reusing them again in construction operations or returning them to the soil where they are mixed with them to grow crops. Animal waste is used to make fuel for furnaces, which also saves energy.

The use of mud in construction is one of the most appropriate materials to meet the local conditions in terms of hot and dry climate. Mud bricks are dried in the sun, which are sometimes mixed with straw in proportions that vary according to the type of soil. Clay molds are mixed and poured on site, so there is no need for moving them also allows for production to be doubled as one person can produce approximately more than 600 bricks in 7 working hours ¹¹. Mud has a high ability to retain heat during the day, as it acts as a passive solar collector that effectively insulates against the rise in temperature, and at night the heat that has been absorbed is released slowly, while the temperature outside the building may rise or fall, the indoor spaces remain constant heat significantly ¹². In addition to being easily recycled, bricks can be reused in construction or returned to agricultural soil to grow crops. These clay molds are used in the construction of the internal parts as well to obtain a light construction and also to obtain different forms of contracts or make some inscriptions. This local technique is suitable for the dry climate and the need to reach certain heights, the outer walls are placed in double rows with a thickness of up to 50 cm to improve the ability of structural and thermal accumulation. The upper floors and the inner walls are laid out in rows of brick and a half.

It is the wood of some trees including palm, olive acacia trees that spread in the oasis deserts, whose sticks are used as brackets for ceilings made of palm leaves. The palm leaf after removing its leaves is used intersecting with acacia bearing sticks. The leaves are also used to cover the roof as an insulating layer between the roof of the leaf and the clay layer above it, where it is covered with a layer of clay and sometimes it is placed in a way that is visible from the outside as a decorative form for the roof of the building (Fig.9). Lime is used in facade painting with the use of colored oxides painted with lime Iron oxides (Fig.10).

Plastering has been the dominant method in the region for thousands of years without any change. Wall cladding relies on casting, a material made of clay mixed with saline soil, which gives it hardness and is quick to dry and turns into a light-white color when it dries and the plastering work of the walls and floors was done by the women after the men completed the work of buildings and roofs and the installation of doors and windows.

Social characteristics including adaption to social life are key aspects. Overcoming the dangers of the site suggested that the urban block in the oases to be designed and built as a model for defensive architecture in

the desert. The location of the urban block was chosen on the plateau to preserve the security of the population from raids on the people of the oasis, for easy monitoring of the attack coming from the bottom of the plateau, in addition to erecting fortified walls around the village, which is interspersed with a specific group of gates with insurance specifications. The design of the cities of Balat and Al-Qasr in the Dakhla Oasis indicates the adoption of defensive design methods, so we find the connected concentric streets that connect the inner corridors of the village and the houses are connected to each other through narrow alleys and can communicate through the upper floors. Also defensive walls, semi-solid with narrow openings on the outer facades emphasize this trait. Among the defensive means is also the establishment of door entrances to houses, or the doors of lanes at low heights so that they cannot be attacked by aggressors riding camels or beasts, forcing them to fight on foot, which gives the opportunity to prepare for the people of the place.



Fig. 9 (above left): Using palm leaves for ceilings. (Source: Researcher).

Fig. 10 (above right): The use of lime and color oxides in façade painting. (Source: Researcher).

Social communication habits, privacy, and cooperation play a pivotal role in vernacular design. According to the social legacies and traditions of the oasis community, as well as the importance of social ties, which the residents are keen on, there were many different effects of these values on the design of local vernacular architecture. The privacy in the oases is a mixture of religious influence and inherited cultural norms.

Therefore, it is possible to notice the effect of this factor in the planning and design of all internal and external spaces of buildings and streets, which allow the practice of all social activities through this concept, freely and without restriction. The spaces are designed to range from semi-public spaces to semi-private spaces. For example, women can use the squares in front of their homes, which are covered streets or uncovered internal cavities, for social communication and to finish their daily work and activities without being visible from the outside. Interior open courtyard is used to carry out most of the daily life activities, and the doors of the houses are very simple, made from slices of adjoining tree trunks, and they are often of a

person's height or less because they are the boundary between the outside public and the inside private, and it remains open most times of the day, as its people, women and men, sit on the muddy terraces in front of it. The "Mastabas" that were built in front of the houses as an integral part of the house such as in the village of Balat and the old palace, and it is in response to the social habits of the residents, where they chat (Fig.11, 12).



Fig. 11 (above left): The terraces in front of the houses in the village of Balat in Dakhla. (Source: Researcher).

Fig. 12 (above right): The terraces in front of the houses. (Source: Dabaieh, Marwa, A future for the past of desert vernacular architecture).

The construction process in the oasis community is considered one of the basic activities of life, where housing is built or expanded due to the increase in the number of family members by the hands of the residents themselves and their neighbors, where work and various tasks are distributed among them according to the rules based on local culture and traditions in oases. In the past, the oases were not aware of the phenomenon of hiring construction workers. Rather, the rule was the "Ozuma" system, that is, participation by courtesy, and the crafts of architecture that received a wage were limited to construction, and the carpenter of doors and windows only. Also, building maintenance operations, which are developed and implemented as needed, are a continuous process, and this makes the residents feel connected to the dwelling, interact with it, and pay attention to its repair and periodic maintenance. The woman participated in all stages of construction with the man, and in addition to her social role, she carried out the monthly and annual maintenance and repairs required by the houses. In the oasis community, everyone learns and shares the craft of building. The men are responsible for building the walls, ceilings, and the first layer of whitewash, while the women's role is to help bring water to mix the mud, pour the mud into the molds, and deliver the bricks to the builders while building the house. It is possible to help in the decoration of the external facades of the building with the men. The children also support the pouring of bricks, while the girls help prepare food for the busy family, and the women do monthly maintenance of the floors and walls, where a clean layer of sand is spread on the floors and ceilings, and also the women do periodic maintenance whenever the house needs, especially in the case of cracks (Fig.13). The roof is mostly painted twice a year before the holidays.



Fig. 13: The participation of women in the construction and maintenance work necessary for the house due to the use of mud in construction and its constant need for maintenance. (Source Dabaieh, Marwa, A future for the past of desert vernacular architecture).

Compatibility with privacy and users' comfort is another social aspect. The class differences in oasis architecture are generally less apparent compared to the rural communities in the Nile valley. It is rare to find what is called noble architecture in the oases, with the exception of the old society in some villages of the Dakhla Oasis such as Al-Qasr and Balat, where they were the centers of government wealth, judiciary and science in the early Islamic eras. Most of the houses are built having narrow & small spaces, as well as their internal rooms, especially the bedrooms, with the exception of the living place "the courtyard" and the reception room. This is the only declaration that the house is distinguished from the neighboring houses, whether on the economic or social level. Other than that, all the houses look similar.

At the level of house design, the determinants that builders follow to take into account the culture and traditions of the oases can be clarified by studying the general characteristics of the houses in the Kharga and Dakhla oases. At first, most residents build a "Mastaba" along the wall of the front of the house, and it is used to sit for rest or for the elderly whose health is not able to go out to farm on a daily basis. It is used for tanning or in cases of mourning. The house begins with the main entrance, which is at a low height to protect against any attack on the oasis, which it was exposed to in ancient times, as we see in all the oasis buildings. The traditional dwelling consists of three main parts for a model of the Dakhla Oasis houses. The first part includes the part related to reception and hospitality, and it is directly related to the main entrance, which is at a low height in most homes as a means of protection from encroachment on the people of the house about 3-5 m wide (Fig.14), and there is a mill and a rice mill adjacent to the wall of the hall, and there are also the farmers' daily equipment such as the harvest pickers, sickles and axes, and from this space are distributed the doors of the lower rooms and the yield stores.

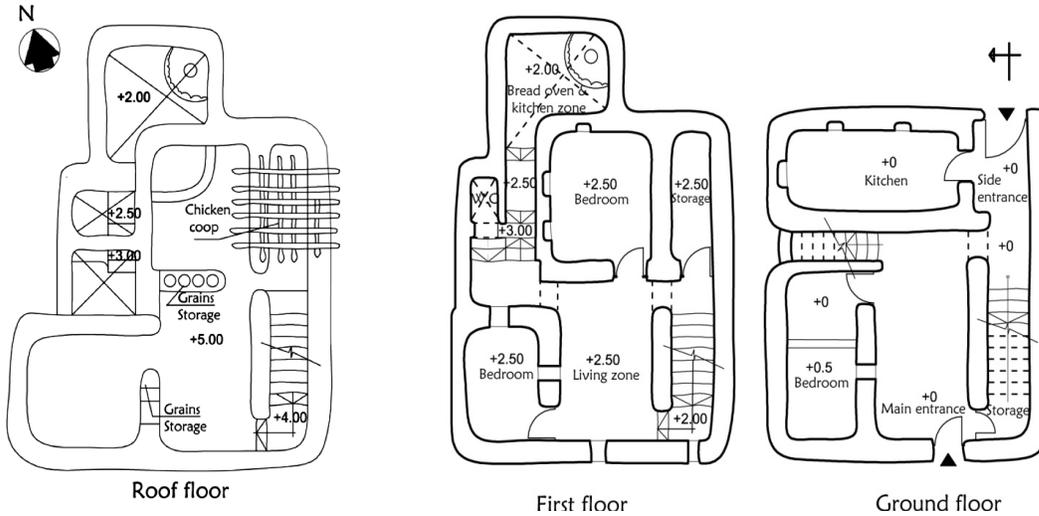


Fig. 14: Oasis lamp house in Kharga. (Source: the researcher).

The ground floor also includes one or two bedrooms for sleeping in the winter and we also find on the ground floor a door that leads to the open area behind the house, which includes the municipal oven (made of bricks and clay), and on the opposite side is the place for raising poultry. The stairs lead to the upper floors next to the entrance or opposite in some houses and the toilet is located on the side of the courtyard far from the housing rooms. In this case, the distribution space is an inner courtyard surrounded by the dwelling rooms. The inner courtyard may disappear in the case of the small size of the house, and it is dispensed with as the roof, which contains places for breeding birds and stores for preserving grain. In this case, the distribution space is facing the entrance and it leads to the rest of the spaces that contain the rooms and the food preparation corner, which contains the oven as one of the basic elements of the old vernacular dwellings. (Fig.15, 16).



Fig. 15 (above left): The ground floor of one of the houses in the village of Balat shows the room designated for cooking, and next to it is an entrance that leads to the rest of the spaces in the house. (Source: Researcher).

Fig. 16 (above right): One of the rooms on the ground floor in a house in the village of Balat in Dakhla, showing the lack of openings and their approach to the ceiling to achieve privacy. (Source: Researcher).

Fig. (17) shows some of the rooms on the ground floor of the Misbah Oasis house in Kharga, which is considered the last remaining house of Darb Al-Sinadiyeh, the most important ancient path of the oasis. It has been preserved and made as a natural museum that conveys an image of the shape of the spaces and their uses in the old dwellings of the oases.



Fig. 17: The rooms from inside the house of Misbah Al-Wahi Kharga. (Source: Researcher).

As for the second part, it is the “Majlis” located on the upper floor, which is more private for the residents of the house, and it is approximately the same area as the lower hall. It is the distribution point of the second floor, and it is considered the living place for family members to eat, and sometimes it has one window on the street. It overlooks upon the doors of the remaining rooms of the house that belong to the sons, their wives and their children, and usually the rooms have an area of no more than 2-3 m² with openings overlooking the area behind the house and have no windows on the street.

The small courtyards in front of a group of dwellings are considered the space separating the private spaces inside the houses, and the public spaces outside, and this space is the means of social communication between neighbors who may be related, as most of the groups of closely and connected houses belong to the same family. As for the third part of the building, it is the roof and the upper elements of the dwelling, which are accessed from the ladder opposite the entrance door to the house or on one of its sides. The roof is for sleeping and sitting in the summer but can have multiple uses. Some prefer to build one room on the roof called the roof porch, which is one of the preferred rooms for its intense ventilation. The roof is bounded on all sides by a wall with a height of 150-170 cm. In the past, these walls were built from palm trees. The roof wall rises to allow activities on the roof without being visible to passersby on the street. It is used for sleeping on summer nights for all family members, and for drying the rice crop on wicker mats and exposing it to the sun before the bleaching process, also in sawing dates in the sun before placing them in earthen pots to

become a paste in what is called pressing dates. Drying clothes, storing crops, and raising birds are placed on the roof in some cases (Fig.18).



Fig. 18: On the right is the roof of one of the houses in the city of Al-Qasr and achieve privacy for sleeping or sitting, on the left is the roof of one of the houses in the city of Al-Qasr and shows the grain silos, while noting the height of the roof wall to achieve privacy.

The openings vary between window openings, ventilation, door openings, and wall openings that have multiple uses. The openings differ in their dimensions and shape, so the openings on the external facades exposed to the sun are few and their dimensions are small, if any, in order to protect against the sun's rays, as the facades facing the sun are semi-solid. There is also a small hole at the top of the entrances to remove the hot air from the house and reduce the temperature inside. It is one of the basic features of homes of different social levels and the status of their residents. The window openings vary according to the physical condition of the owner of the house, so they are irregular in shape, and it is sufficient to make beams of tree branches to cover them in the case of poor houses. As for the houses of the rich, the windows are regular in dimensions with a specific and clear design and their dimensions are relatively large. The same system applies to doors, where the class situation appears through the size of the door or gate in width, height and decoration, and the circumstances of the width of the street or the space in front of the house may dictate the width of the door. Some doors in upper-class houses in the oases, especially Al-Dakhla, are surmounted by wide wooden beams engraved with the name of the owner of the house and his fathers, the date of construction in the Arabic calendar and the name of Al-Banna, in the Naskh or the classical Thuluth script, influenced by the period of Islamic rule, which makes it a declaration of ownership and documentation of the history of the house.

One of the vernacular customs is writing and drawing on the walls, where congratulatory phrases are written to the owner of the house for performing the pilgrimage, or writing phrases of prayer or welcoming visitors

to the house. There are some doors on which the name of the owner of the house, the date of construction, and the name of the person who built it, or some verses of poetry on wooden beams or on the wall above the entrance, as shown in the (Fig.19).



Fig. 19: One of the houses in Dakhla. Expressions of welcome to the guests or honoring the owner of the house. (Source: The researcher's group. Photo: Nour Al-Din Suleiman).

3.2. Interview Results

The results of the personal interviews using the questionnaire show the problems faced by the vernacular architecture in the study site, as well as the problems that the population suffers from, whether in the old vernacular buildings or in the modern concrete buildings. It was also possible to know the change in social and cultural values, which led to the desire of the population, especially of the younger age groups, to follow the manifestations of modern civilization and move from the old dwellings. And also the mutual influence between social changes and the shape of architecture, as the change in social values led to a change in the types of construction and the presence of modern buildings, which in turn affected the habits of social communication between members of the same family or between families and some of them. A large number of residents, especially the elderly, are still clinging to living in their old mud houses, although some of them abandoned them in compliance with the children's desire to leave them and move to modern ones (Fig. 20).

The residents are aware of the advantages of the old houses in overcoming the difficult climate and the severity of the heat, and they sense of the difference between the temperatures in their old mud houses and the temperatures inside the concrete buildings. Some of those who own old houses return to it in the summer with the intensification of the temperature, where the difference between the temperatures inside both houses it is more than 15 degrees Celsius, according to the residents estimate.



Fig. 20: The old vernacular houses - Bashandi village in Dakhla and the conviction of the elderly residents of the preference of these houses over the modern ones that the children want to move to. (Source: Researcher).

Despite the spread of concrete construction, the residents' knowledge of the advantages of building in old ways, especially in overcoming the hot climate and tempering temperatures, made them continue to build in those old ways in some buildings or use some old treatments in modern buildings, and one example of this is the new building in Community Development Association in the village of Bashandi in Dakhla. The Community Development Association is a special complex for providing some services in the village, and it includes an exhibition and a place for making handmade carpets. A new additional building was being implemented inside the complex, and it was built using the old local construction technology in terms of using a mortar consisting of straw, sand and clay (Fig. 21), and it was roofed with tree trunks and linked to palm leaves (Fig.22). The roof was also decorated with the same shape used in the old buildings in the form of hollow triangular slots (Fig. 23), but the slots were made in the modern form of the openings of concrete buildings in terms of using slots organized in shapes and dimensions.



Fig. 21 (above left): The mortar used in construction is a mixture of straw, sand and clay. (Source: Researcher)

Fig. 22 (above center): Wooden roofs. (Source: Researcher)

Fig. 23 (above right): The new building of the Community Development Association in the village of Bashandi. (Source: Researcher).

The presence of a strong desire by the majority of the population to develop their village and preserve the old vernacular traditions of building in the desert if solutions are found for their old homes that would enable them to achieve their desirable living requirements. One resident bought a house, is maintaining it and turning it into something like a museum in order to make it a destination for visitors to the oasis from tourists or students wishing to study vernacular architecture and aspects of social life in the oases (Fig. 24).



Fig. 24: The Oasis Lamp House in Kharga. (Source: Researcher's Group; Photograph: Mahmoud Hossam El-Din).

The state intervened in the maintenance and preservation of some villages, such as the village of Balat and the city of the palace, where the traditions of vernacular buildings and the traditional form of urbanization were preserved, were declared as protected sites. A resident of the city of Al-Qasr reported that his house needs maintenance due to the deterioration of its construction condition. The officials prevented them from demolishing it or continuing to live in it before carrying out the required maintenance in order to preserve them, and to protect the house from demolition, as it is part of the structural fabric of the city of Al-Qasr, which is preserved by the Ministry of Antiquities and officials of the New Valley Governorate, and as an archaeological area with a distinct character.

The residents' desire for urbanization is expressed by the desire to move to modern concrete houses, believing that it leads to improving their lives and making them a better (Fig. 25), (Fig. 26). They consider that the government's provision of basic utilities and services is a major development that has led to the development of their lives. Therefore, paving roads, providing means of transportation, schools, water and electricity networks, health care, and modernizing sewage networks are important steps towards the manifestations of progress that the oases are witnessing gradually since the sixties until the present. The residents also consider that thanks to these services, their lives have become easier and better, and this made

them, especially the young ones, believe that moving to concrete buildings is part of this development and urbanization that the oasis is witnessing.



Fig. 25 (above left): Kharga Oasis - The encroachment of concrete buildings on the old heart of the oasis. (Source: Researcher).

Fig. 26 (above right): Al-Dakhla Oasis - Bashandi Village, showing the juxtaposition of concrete buildings next to the old houses. (Source: Researcher).

Some residents desire for safe houses that are not threatened by water leakage, as many mud-brick houses suffer from cracks in the walls resulting from the soil absorbing water leaking from drainage pipes and water pipes, or water leakage through the foundations of houses after irrigating gardens. The houses in the old village of Balat, the Islamic city of Al-Qasr and the houses of the old villages do not suffer from this problem because the use of water in the old village was limited, as there was no running water.

Desire for buildings with a concrete roof that is not affected by termites that cause wood erosion on surfaces and fibers inside mud bricks, as happens for a house built of mud bricks is another factor cited by some residents. Insects begin their journey under the floor of the house, and penetrate the walls until they reach the tree trunks in the ceiling and erode parts of them. When a house is attacked by these insects, the walls must be repaired and parts or all of the roof reconstructed. The residents also reported that the current solution to this problem is to use a liquid insecticide made specifically for termites, distributed by the Agricultural Department in the area to the population, where the liquid is placed in the holes in which the insects live, but this is not always effective in getting rid of them. However, there is a possibility that termites may reach the concrete building where they come with sand that is brought to be the last layer on which cement, tiles or ceramics are placed to cover the floors of houses. One of the residents said that a successful method for securing buildings from termites is to pour insecticides on this sand before covering the floor with cement and ceramics. Mud brick houses are threatened by heavy rains, despite the scarcity of rainfall in Dakhla, but

sometimes heavy rains occur that cause damage to mud brick houses. Even more dangerous is that any large-scale water seepage can cause homes to collapse.

The concrete building needs maintenance and renewal after about ten years or more, while the old mud building needs maintenance and renewal more than once during the year, which requires effort and time. This includes the restoration of cracked walls affected by water leakage or rain, which leads to cracks in the walls. For example, while oil paint for reinforced concrete walls lasts for years, lime paint for brick walls wears out after a shorter period, as shown in (Fig.27), so they want to avoid structural cracks with less physical effort.



Fig. 27: On the left is one of the houses in Dakhla on the first visit in January 2020, on the right is the same house on the second visit in December of the same year. It is noted that the facade has been affected and the layer of facade paint has eroded. (Source: Researcher).

Other issues included the need for electricity supplies to operate electrical appliances such as computers, stoves and refrigerators and the need for a good supply of water and sewage networks. Also the desire to take advantage of the value of the land and build more than two or three floors, in addition to the modern appearance of their homes and the use of finishing materials that are similar to those in modern housing in cities. Concrete buildings in the form of separate housing units fit the change in the social structure in the oases and the desire of young people to live in independence after forming a family. And the unwillingness to continue living with the large family in the same house, and the inability to implement this in the traditional form of the old vernacular housing. Although the old houses have large areas and help social cohesion, where one family or several families live in them, members of the same family, which is not achieved in concrete buildings. One of the problems that led to the acceleration of the deterioration of the condition of the old buildings is the spread of the construction of concrete buildings, where excavation to make the foundations of the buildings leads to an impact on the structural condition of the old houses.

3.3. Desert Lodge Hotel in Dakhla Oasis, Western Desert

The Desert Lodge Hotel in Dakhla Oasis was selected as a model in the same vicinity to check the plausibility if their design treatment using principles of old vernacular architecture. The hotel is considered one of the ecological hotels that were built in the oases, which mimic the local environment and are inspired by the architectural style of the vernacular architecture found in the oases. The hotel is located in the Dakhla Oasis in the New Valley Governorate. The hotel was opened in 2003, and it is located on a mountainous hill in the Dakhla Oasis and overlooks the Islamic city of Al-Qasr of which it is trying to resemble. It sits on an area of 7500 square meters and includes 3 floors with 32 rooms, including single and double rooms and suites for families. The materials used in the construction process are stones, trees, palms, palm leaves and mud bricks. The hotel represents a good example for integration with the surrounding natural environment (Fig. 28) intended to preserve the ecological balance of the local environment.

The idea of integrated planning for desert architecture was used (Fig. 29), which depends on the convergence of building blocks, which creates internal streets or corridors of movement that works to provide shading on the one hand and protection from the scorching sun, and on the other hand to design air movement including. It works to reduce temperatures naturally.



Fig. 28 (above left): The natural sulfur water spring in the hotel, which was incorporated into the design and preserved. (Source: Researcher).

Fig. 29 (above right): Integrated planning of the ancient villages of Dakhla. (Source: Researcher).

The designers were inspired by the street design of Al Qasr Village, not only in the general design or the shape of the building blocks, but was followed by the vernacular construction in the Oasis villages in general and Al Qasr Village in particular. To adapt to the harsh climate of the desert as well as to prepare the place for daily activities in the oasis environment. Methods of shading the corridors varied between the use of sheds or the use of roofs made of tree wood or palm leaves, in addition to the proximity of the buildings to cast shadows on the external facades. Mud bricks were used in the construction of most of the hotel, and

layers of clay plaster were used to clad the external walls to reduce the internal temperatures of the spaces that reach high rates due to the nature of the climate in the site. The rooms' walls inside and out are covered with a mixture of mud and straw to maintain the hotel's shape to simulate the local environment, which acts as a thermal insulator that keeps the room cool during the day in the summer and warm in the winter (Fig. 30).

The idea of air catchers (Malkaf) was used to ventilate some hotel spaces, to ensure a continuous movement to draw hot air from inside the spaces through the openings on the sides of the catcher towards the outside, which works to reduce the temperature inside the spaces (Fig. 31). The roofs were made of palm leaves and tree trunks, which works on thermal insulation, as well as the use of domes in the main reception building and taking advantage of their properties in thermal insulation and natural ventilation and reducing the thermal loads of the roofs.



Fig. 30: Using mud mixed with straw in wall cladding. (Source: Researcher).



Fig. 31: Using air stencils to provide natural ventilation. (Source: Researcher).

The hotel contains air-conditioned rooms, and despite the intense heat, especially in summer days, there is no urgent need to use industrial air conditioning during the day, and at night it is possible to feel warm despite the low temperature outside, as it can clearly be felt as soon as entering the room (based on the researcher's

observations during the stay in the hotel and also according to the reports from the hotel staff and some guests (Fig.32).

The mud bricks were used in the construction of the hotel at a rate of about 50%, while the red bricks were used in the bathrooms' areas, as the mud bricks are affected by moisture, and the outer walls were covered with a layer of clay plaster mixed with straw in certain proportions, which is left to ferment until it can stick to the wall, and this method is used in cladding the walls of old houses in the villages of Kharga and Dakhla. This system helps to cool the temperature inside the hotel. Also, palm leaves and tree trunks were used to make some ceilings, as is found in the village of Al-Qasr and others, as well as wood and palm leaves were used for shading in many places in the hotel.



Fig. 32: One of the rooms from the inside with simple design and a ceiling fan is sufficient to move the air despite the intense heat in the summer. (Source: Researcher).

The doors are made of acacia trees and the windows are “Mashrabiya” built from tree branches available in the natural local environment (Fig.33). The beds, tables and shelves in the walls of the rooms were also built of mud bricks. Wheels, chairs and some tables were made of palm leaves to simulate the vernacular design in the old vernacular houses (Fig.33).



Fig. 33: The use of wood in openings, mashrabiya, furniture & shading. (Source: Researcher).

Traditional construction methods were followed in most parts of the hotel with the help of builders from the people of the oasis for their experience in traditional building methods as well as in the production of furniture, and the rest of the handicrafts used in the interior design of the hotel. The designers were interested in providing resources to preserve the environment and reduce the negative effects of the construction process. The use of natural materials in construction such as mud bricks and timber is one of the most important factors that reduced the economic cost of the construction process, as well as the use of local labor, the use of traditional methods in construction, and use of kilims, handmade carpets and decorative elements based on local industries (Figs.34, 35).



Fig. 34: Recruitment of local workers from the people of the Oasis. (Source: www.desertlodge.com).



Fig. 35: Local materials, implemented by builders and owners of traditional crafts in the oasis. (Source: Researcher).

In terms of energy savings and following the natural methods of adapting to the oasis climate and paying attention to the appropriate direction for the reception of the wind and its transmission through the narrow corridors of the hotel and the methods of contrast in the areas of heat and cold through shaded and exposed areas led to the provision of natural ventilation and tempering temperatures, which leads to reducing the cost of energy needed for cooling or heating form (Fig.36). Moreover, it used external wall cladding of a layer of

clay for thermal insulation. Finally, work on saving energy using solar energy, as the hotel owns solar panels that produce 45 kilowatts per day and also the use of energy-saving lighting units, and the use of solar energy is an appropriate means for the nature of the site in the desert and its direct exposure to sunlight.



Fig. 36: Corridors, shaded areas and courtyards in front of each group of room buildings to direct air movement, source: the researcher

Preserving the natural site parameters is part of the social sustainability standards. The hotel site contains a natural sulfur spring that has been preserved and clad with natural stone, and employed within the hotel's activities where bathing is done as the people of the oasis used to do.

In terms of adaptation to social life and expressing the local culture, the hotel follows the traditional design characteristics inspired by the traditional architecture of the desert, especially the city of the palace in terms of the shape of the hotel units and simulating the idea of the shed that connected the houses on both sides of the inner streets of the city (Fig.37). In addition to reviving the traditional crafts of the people of the oasis, where the interior design elements of the hotel depended on traditional industries, furniture and openings from local wood, and the use of handmade carpets and kilims in many places in the hotel, as well as pottery and wicker, which the people of the oasis are famous for.



Fig. 37: The lack of openings on the external facades and the implementation of the openings, as in the city of Al-Qasr, using the roofed corridors to connect the buildings and for shading as well as making the spaces and courtyards between the blocks of buildings. (Source: Researcher).

The beauty of the hotel is due to its integration with the surrounding mountains and hills, the local plants and trees in coordination with the site, especially with its construction on a high hill overlooking the entire Dakhla Oasis, as well as its imitation of the traditional environment of the oases in terms of the formation of blocks resulting from the methods of using wood and the forms of openings, which were implemented in the form of mashrabiyyas like what is found in the Islamic village of Al-Qasr (Fig.38).



Fig. 38: Window and door openings in the form of mashrabiyyas to simulate the openings in the Islamic city of Al-Qasr as well as the method of formation. (Source: Researcher).

Also, as is followed in writing phrases welcoming visitors or supplication for the people of the house or writing some wisdom and verses of poetry on the walls, the designer took this idea to directly simulate the local natural environment by writing some phrases on the walls of the interior rooms to complete the revitalization of the local environment (Fig.39). Built-in shelves are also built to put various purposes or make sitting places by building and making holes in the walls, as is the case in the old houses in the Dakhla and Kharga Oasis.



Fig. 39: Graffiti to simulate local vernacular architecture. (Source: Researcher).

4. CONCLUSION

Vernacular architecture in the oases is the physical expression of identity and sustainability. It was built by the residents themselves, and it is the result of long experiences to reach solutions that fulfill the needs of the population according to their social traditions, beliefs and cultural legacies. This brings comfort to them by overcoming the environmental problems and dangers of the local environment. The more architectural forms are integrated with their local environment, fulfill the requirements of the population and are suitable for the daily life activities, satisfy their social customs, and express their vernacular culture, the more they are distinguished from others, and they fulfill the identity of that community.

To follow the principles of vernacular architecture design, it is not necessary to copy those old traditional forms of building, but it is possible to benefit from the essence of vernacular design represented in the design goals in overcoming environmental problems, designing and forming facades and the significance of the forms used, treatment of openings, dimensions, as well as solutions for the climatic conditions that were used to overcome the climatic problems of the site, and the design of the spaces and the gradation of their privacy. These are principles of sustainable design represented by traditional vernacular architecture.

Adhering to the standards of designing vernacular architecture leads to the realization of the identity of the local community in which it was found, which leads to the multiplicity of global identities and thus the expression of different global cultures instead of one modern construction method, most of which do not reflect the differences in the cultures of peoples or the appropriateness of their local environment.

Vernacular architecture can be considered a valid model applicable to modern architecture, where it is possible to combine the traditions of vernacular design, which is compatible with the principles of sustainable design with modern building technology, and the use of modern materials in construction to improve the structural properties of local building materials, or energy and resources can be rationalized by using the principles of vernacular architecture in achieving ventilation and natural lighting, which leads to reducing the cost of energy needed to cool or heat the air, as well as lighting.

In conclusion, design criteria may be followed when designing and implementing projects in desert environments. They were extracted based on the practical study and are summarized in Table (1) as it includes environmental, economic and social design criteria and the means of achieving each of them.

CRITERIA – ITEMS - THE MEANS TO ACHIEVE THEM

I. ENVIRONMENTAL CRITERIA

I.A - Adaptation to the natural environment

1- Integration with the site and its natural environment:

The natural site parameters such as topography, the presence of nature reserves, natural sources of water, natural plants, etc., are preserved

The activity or operation of the building does not negatively affect the surrounding natural environment.

Building's exterior design achieves an integrated visual image with the surrounding natural environment by using building materials and shaping with building blocks, cladding materials, ceilings, and others.

2- Avoiding negative influences on the natural environment of the site:

The use of transportation and construction equipment that does not affect the structural integrity of traditional architecture in the surrounding natural and built environment.

Reducing the pollution resulting from external lighting and studying its impact on the surrounding environment.

Plants from the local environment are used in site coordination, as they are suitable for the desert environment, so as not to consume a large amount of water, so as not to harm the natural environment, as the water in those areas depends on groundwater, whose use must be managed in an orderly manner.

Preserving natural water sources from pollution

I.B - Overcoming the climatic conditions in the natural environment

The integrated planning and design of streets and narrow corridors to protect from direct sunlight and to reduce the openings and their small dimensions on the external facades at the building level.

Roofed and canopy corridors to reduce the impact of sunlight and create areas of pressure difference to direct air movement.

Treating the external facades by using cladding of heat insulating materials, which is preferable to be a traditional method to simulate the local environment.

Designing the openings so that they are compatible with the orientation of the building, receiving winds and natural lighting, and designing the movement of air entering the building and between the external building blocks, so that its openings and dimensions are scaled accordingly.

Air trowels are one of the successful traditional methods of directing air movement and cooling the air.

Interior courtyards are one of the traditional methods that help in directing the air, softening the temperatures and providing natural lighting, as well as providing the appropriate privacy for social traditions and cultural legacies.

The shape of the ceilings, which can vary in design in vernacular architecture in traditional environments, whether by using curved ceilings that distribute heat such as domes, vaults, arches, or ceilings in which tree trunks, palm stems and palm leaves are used for clay plaster, which is characterized by its heat insulation with the possibility of treating it by modern methods to improve the properties of insulation and eliminate the problems that wood is exposed in some areas, and protect against termites.

II. ECONOMIC CRITERIA

II.A - Energy Saving

1- Mandatory requirements

Application of energy efficiency codes.

Consumption control.

2- Reducing passive heat gain

Insulation of external walls and roofs.

Shading the external openings.

Reducing the dimensions of the external openings.

Observe the orientation of the building.

Cover the facades exposed to the sun with heat-insulating materials.

3- Reducing the energy used in cooling by relying on natural ventilation as much as possible

Orientation of the building according to wind directions.

Studying the optimal design for the dimensions of the wind-receiving openings, as well as the inclusion of opposite openings within the same space to achieve continuous air movement.

Use of air catchers.

The possibility of opening to the interior and using the internal courtyards if spaces are available.

Relying on contrast in shaded areas to create areas of pressure difference to aid air movement.

The possibility of using curved surfaces and domes to the extent permitted by the design, requirements and nature of the building.

4- Reducing the energy used in heating and water heating

Through the use of solar energy and the use of solar heaters.

5- Reducing the energy used in lighting

Design of the openings with appropriate dimensions to provide natural lighting throughout the day.

Controlling the external lighting of buildings using automatic cut-off switches

The use of lighting units, devices and equipment that save energy.

Relying on natural means to generate the electric current available in the environment, whether energy generated from wind or others.

Reducing the energy used in construction, operation and maintenance works

II.B - Rationalizing the use of building materials

1- Mandatory requirements

Using materials that do not negatively affect the environment and do not represent a danger at any stage of their extraction, manufacture, operation or maintenance.

2- Using local building materials

As much as possible, while treating it with modern means to improve its properties, in part of the building or in the whole building.

Study the availability of available materials that achieve the least distance between the places of their extraction, manufacture and transportation.

Choosing high-quality materials that are characterized by durability and operating efficiency, which are commensurate with the natural conditions of the desert environment

The use of building materials with thermal insulation properties that can withstand high temperatures and exposure to direct sunlight for most of the day.

3- Recycling of waste and waste

Allocate places to collect waste and store what can be recycled.

Reuse what works, recycle harmless waste, and safely dispose of the remainder.

II.C - Construction technology

Reliance on local labor mainly.

The use of appropriate building systems, taking into account the construction methods used in the surrounding environment, especially the traditional ones, where they can be benefited from

Selection of simple construction technology for ease of maintenance, cost and operation.

Integrating traditional construction methods with modern systems that increase the building's durability and operating efficiency.

Studying the impact of the building technology used on the structural safety of old buildings in the local environment surrounding the building.

III. SOCIAL CRITERIA

III.A - Achieving the convenience of the users

1- Provide security requirements and overcome potential dangers at the site

Providing safety elements in choosing the construction site away from natural dangers such as floods and others, as well as unnatural dangers, if any, such as thefts.

Providing means of safety and protection for all roads and corridors leading to the project.

2- Attention to achieving environmental quality

Not to use any materials that have harmful emissions to the environment and users, whether building materials or architectural finishing materials and others.

Preserving natural site parameters and incorporating them into the design, such as the presence of gradients in the levels or the presence of natural elements such as natural water springs or distinctive landscapes

Achieving visual comfort by integrating the design with the surrounding environment in terms of heights, colors, building materials and facade design.

Attention to the orientation of the building according to the site.

Providing shaded areas outside the building to protect from direct sunlight and to cool off the heat during daylight hours.

Paying attention to the design of the air movement using the inner courtyards.

The interior design of the building with all its openings, voids and proportions, and all solutions used to achieve thermal comfort and natural ventilation appropriate to the climatic conditions of the site in which the project is located.

Maintaining water quality and protecting it from pollution and using feeding pipes that provide clean water suitable for drinking and for various uses.

III.B - Expressing the social and cultural values of society

Paying attention to sites of cultural and historical importance and adhering to the traditional design determinants used in building those sites

Relying on local labor and reviving local traditional crafts by using them in interior design, site coordination, or in the construction processes themselves

Paying attention to the prevailing traditions and customs of society during design, such as providing privacy.

Taking into consideration the requirements of society and its social habits, such as the habits of social communication by providing outdoor spaces and seating places in front of buildings and between each group of buildings

Taking into account the proportionality of the heights of the buildings with the widths of the street and surrounding roads.

That the design fits with the economic activities and daily life of the community.

Simulate the traditional environment of the site as much as possible using construction systems, building materials, cladding for the building envelope, or site coordination elements.

The use of elements of formation and architectural vocabulary related to the local environment and expressing the culture of the community to achieve the connection between the building and the users and the surrounding local environment

Table (1) Environmental, economic and social design criteria and the means of achieving them

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Traditional Dwellings and Settlements

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CONTEXTUALIZING THE HISTORIC URBAN LANDSCAPE (HUL) APPROACH IN THE XI'AN MUSLIM QUARTER: TAKING THE *IMAGINE* TOOL AS AN EXAMPLE

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CONTEXTUALIZING THE HISTORIC URBAN LANDSCAPE (HUL) APPROACH IN THE XI'AN MUSLIM QUARTER: TAKING THE IMAGINE TOOL AS AN EXAMPLE



The stagnation of the research on the Historic Urban Landscape (HUL) approach shows an urgent demand for its practical study. This study will thus examine the adaptability of an HUL tool, the Imagine, in a new context. Through an experimental activity in the Xi'an Muslim Quarter, the study examines the transferability of this tool by answering: (1) How can the tool help learn the residents' thoughts?; and (2) What are the challenges and opportunities of adopting this HUL tool in a new context? The results will enrich the operationalization of the HUL approach, enabling its further development theoretically and practically.

1. INTRODUCTION

Nowadays, with the role of cities becoming dominant in world operation, how to make cities grow sustainably has drawn more attention. By owning rich cultural properties, historic cities face the challenges of balancing heritage protection and urban development. Viewing historic cities as dynamic layers of history and development, the Historic Urban Landscape (HUL) approach, adopted by UNESCO in 2011, aims to make heritage an engine for urban development¹. It shifts the focus from monumental architecture to the urban value that underpins city life and believes proper change can make development contribute to both quality of life and heritage conservation. To achieve this, the HUL approach also introduces a series of operational principles, ranging from the HUL toolkit to a six-step action plan². Among them, humanism is a necessary principle³. It means the HUL advocates a human-centered approach, which can help to integrate heritage conservation into urban development to achieve sustainable urbanism as the Faro Convention⁴ and the Florence Declaration⁵ state.

Over ten years have passed since the HUL was promulgated, though the concept of the HUL has been widely recognized, the theoretical gap between conservation and development, as well as planning and management, still exists. Although these topics are among the most common terms appearing in publications, they are not closely connected, impeding the development of the HUL approach and its practice⁶. Hence, more practical studies on contextualizing the HUL approach are urgently demanded⁷. Among them, as a tool aimed to achieve a comprehensive survey which is the first step of the HUL's six critical steps⁸, the Imagine would probably be the first and most important one to be tested.

As a participatory tool guided by the HUL approach, the Ballarat Imagine was created in 2013 by practitioners in Ballarat, Australia. It aims to solve the difficulty of developing a community vision for the city's future by asking citizens and stakeholders three questions: 1) What do you love about Ballarat? (Values and attributes); 2) What do you imagine for Ballarat? (Future scenario); and 3) What do you want to retain in Ballarat? (limits of acceptable change)⁹. Instead of focusing directly on the what and where of change, this tool uses the city's

traits that its local residents value as a departure point for change. Through adopting this Imagine tool, public opinions were broadly collected to help further planning and strengthen the city's distinct identity with a more collaborative and long-term vision¹⁰. However, right now this participatory tool has only been applied in two cities: Al Ain in the United Arab Emirates ¹¹ and Lijiang in China ¹². The research on this Imagine tool is limited, making it hard to implement it in other contexts and release its great potential in participatory heritage conservation advocated by the HUL approach.

Thus, this research will take a pilot study to examine the adaptability of this Imagine tool in a new context. The data will be collected through an experimental activity in the Xi'an Muslim Quarter, a famous living heritage site with typical tensions between conservation and development in China. It will testify to the transferability of this participatory tool by applying it in the survey about the conservation of the Muslim Quarter. The effectiveness of the Imagine tool will be examined by asking (1) How can the tool help find out the residents' values and expected changes in the Xi'an Muslim Quarter? and (2) What are the challenge and opportunities of adopting this HUL tool in this new context? The tailor-made questionnaire, interviews, and participant observations will be used to answer these questions. Thus, this study will hopefully enrich the operationalization of the HUL approach, enabling further development of this approach theoretically and practically.

2. THE CONSERVATION OF XI'AN MUSLIM QUARTER

As a protected area with its own identity in the world-famous historic city of Xi'an, located in the middle of China (Fig. 1), the Muslim Quarter is known for its vibrant and distinct landscape. However, this landscape has faced significant challenges due to rapid urbanization for a long time. With the current flow of urban renewal in most cities in China, the long-lasting tension between heritage conservation and urban development is highlighted again. Thus, managing thoughtful changes to achieve sustainable urban development becomes an essential and urgent task for managers of the Muslim Quarter to deal with.



Fig. 1: The location of the city of Xi'an in China (Source: author)

2.1. Overview

Xi'an Muslim Quarter is also called Hui Fang by local people, which shows that it's a traditional business place for Muslims (also known as Hui people in Chinese). First arrived in Xi'an through the Silk Road from Central Asia, Muslims then became powerful merchants who facilitated trade between Xi'an, China, and Central Asia. Over the centuries, Xi'an Muslim Quarter has evolved into a collection of densely populated streets packed with shops, restaurants, and residential buildings¹³. Today, eleven mosques are still scattered here, in an area of 0.7 km² and comprised of eight historic streets. More than 30 thousand Muslims retain their traditional life and customs of "living around the mosque, doing business together"¹⁴. As a community with its own religion and habits, the Muslim Quarter shows an identity distinct from the Han people surrounded in the city center of Xi'an. It is a relatively independent place where 80 thousand Muslims live, trade, associate, and engage in religious activities.

Besides being a living place, Xi'an Muslim Quarter is more renowned for its tourism. Since the 1990s, the quarter has become a popular tourist destination known for its halal cuisine, Islamic architecture and cosmopolitan flavor (Bock, 2019). More than 2500 shops sell over a thousand products, such as ethnic food, dried fruits, groceries, and traditional clothing and costumes. The Muslim business here is primarily small-scale, with a total turnover of 500 million yuan (0.6 million pounds) annually. Tong Sheng Xiang's mutton steamed buns, Jia San's soup dumplings, and Old Tong's cured beef have become representatives of Xi'an's food culture, which have been included in the National Intangible Cultural Heritage List. As a must-visit attraction in Xi'an, the Muslim Quarter has received thousands of tourists from all corners of the country every day prior to the

pandemic. There is a saying, "when you arrive in Xi'an, if you have not been to the Muslim Quarter, then you can't say you've ever been to Xi'an ¹⁵." In 2019, the Muslim Quarter received more than 38 million tourists, making it one of Xi'an's hottest scenic spots (Fig. 2). This popularity has also made the Muslim Quarter attractive to people across the country who do business here.



Fig 2: The Crowded scene in Xi'an Muslim Quarter (Source: <https://www.yumchinesefood.com/images/restaurants/xian/muslim-street.jpeg>)

2.2. The appearance of problems

Compared with its booming tourism, the living conditions here are at a standstill. Since the 1990s, the city center within the Xi'an city wall began to undergo reconstruction. Extensive renovation has caused heavy losses to the historical features of the old town. However, the Muslim Quarter has been preserved for various reasons. In 2002, the Muslim Quarter was designated a historic protected area for the first time. In 2005, the Xi'an government formulated the Imperial City Restoration Plan. The plan proposed to spend 30 years and 50 billion yuan to move out all residents in the city center and reconstruct the area into a large resort. It aims to revitalize Xi'an's prosperous era as an ancient capital and the center of Chinese civilization ¹⁶. From then on, a series of renovation activities were taken place in the Western Street, Eastern Street, Shuncheng Alley and the City Wall. Luckily, the Muslim Quarter survived during that reconstruction, but the cost is that it lost local authorities' support to improve their living conditions ¹⁷. As a result, issues like road congestion, backward infrastructure, and fire hazards in the Muslim Quarter have gradually become prominent, causing a gap between the Muslim Quarter and its surrounding reconstructed environment. Consequently, the Muslim Quarter became ill-famed among the local people as a seedy enclave filled with poor, chaotic and uneducated Hui Muslims ¹⁸.

These problems weren't raised anymore by local authorities until 2017. In November 2017, the Lianhu District Government organized an international academic seminar on conserving the Muslim Quarter named Xi'an Vision 2017, inviting more than 30 well-known experts, scholars, and designers in architecture, planning, anthropology, sociology, art, and culture. In January 2018, experts came back and continued to discuss the protection and improvement of the Muslim Quarter. The outcome was an attitude of being "respectful, prudent, open, and foresighted" towards the renovation of the Xi'an Muslim Quarter. All attendees reached a consensus on several points: no demolition and construction at large; Start with partial and protective promotion; advocate for a participatory and bottom-up approach while taking into account holism; more cross-border partnership and multi-dimensional collaborative research; and no domination by a single building or plan. This concept is quite close to the HUL principle. However, the further operational plan expected to be released in May was shelved.

Whatever the motivation of this session being held, the achievement from the expert discussion is laudable. It shows the spirit of a living heritage approach applied once in Hoi An in Vietnam, which considers the reciprocal influences between the site and its primary lived-in community. Though advocated earlier by academics¹⁹, it's this time that the participatory view was first explicitly raised by the local governance, which was supported widely by the public, who resolutely opposed any form of large-scale demolition and construction projects. Both experts and many citizens have realized that a people-based, interdisciplinary conservation approach with multi-sector collaboration should be adopted. Though far from achieved, it points to what the Muslim Quarter should be in the future.

2.3. Current improvements and policy trends

Recent years have seen many improvements in facilities in the Muslim Quarter. As partial tasks preparing for hosting the 14th National Games of 2021 in Xi'an, the renovation of the Muslim Quarter, including old residential buildings, back streets, and alleys, has been improved. However, as an important historic and cultural district in Xi'an and even across the country, achieving a balance between heritage protection and tourism development is still an endless task that the Muslim Quarter needs to face. *The Xi'an Historic City Conservation Planning (2020-2035)* puts forward the protection requirements for the Muslim Quarter as follows:

*Protect the traditional layout and historical features of Xi'an's traditional commerce and residence. Protect the spatial scale of the historic streets and lanes; control the height, volume, style, and colour of the buildings on both sides of the roads and lanes. Protect the cultural heritage since the Sui and Tang Dynasties. Inherit the traditional cultural customs, etc. Strengthen the display of folk culture.*²⁰

While the plan emphasizes protecting the physical space, it also considers the Muslim Quarter's intangible characteristics. However, it stresses only preservation while paying no attention to coordination between protection and development.

In addition, the plan has incorporated "formulating the protection plan for the Muslim Quarter" into the recent tasks. Comparatively, it can be seen from another published block planning, the *Sanxuejie Historical and Cultural Block Conservation Plan (2021-2035)*, that balancing protection and development will be the main task in the following years:

(1) Effectively protect various historical and cultural resources in the block, maintain the overall historical features, streets, and architectural textures, maintain the continuity of life, facilitate scientific protection, protect and inherit the history and culture of Xi'an, and defend the dignity of the city's history and culture.

(2) Properly handle the relationship between protection and renewal, improve the living environment, let the neighborhood residents feel cultural pride, and improve the living environment level.

(3) Promote the integration of the block into regional economic and social development, highlight local characteristics, and promote the region's development scientifically and sustainably with block protection.

(Xi'an Municipal Bureau of Natural Resources and Planning, 2021)

It's easy to find that this planning concept is consistent with the HUL principle of integrating heritage conservation into urban development. Besides, another official document suggests, "By 2025, a historical and cultural center with prominent historical and cultural heritage, full-equipped service facilities, and outstanding urban characteristics will be initially formed."²¹ Therefore, it can be seen that the coordination of heritage protection and development has become the focus of the Xi'an government's work on the traditional environments at this stage, which will be an essential issue for managing the Muslim Quarter.

It can be seen that the conservation of the Xi'an Muslim Quarter is facing significant challenges and opportunities. The long-lasting conflict between tourism and residents' life is becoming prominent, urgently needing to be dealt with. However, current research about the Xi'an Muslim Quarter focuses more on its tourism and minority identity (E.g. Jie *et al.*, 2012; Yang, 2020). Few researchers are interested in exploring what the residents' main concern is, which is critical to achieving a more sustainable urban growth. With the human-centered principle being a trend in heritage conservation and public policy, it will be necessary to learn residents' thoughts and opinions and enable more sustainable decision-making towards conserving the Xi'an Muslim Quarter. However, the latest investigation on residents' demands was conducted 14 years ago which needs to be urgently updated²². In this case, the challenge of current preservation-development dilemma and the

opportunity of the HUL-like conservation policy make the Xi'an Muslim Quarter a suitable case to examine the feasibility of the HUL approach.

3. METHODS

To test the adaptability of the *Imagine* tool, an experimental activity was conducted from October 6th to October 17th 2021, in the Xi'an Muslim Quarter. The questionnaire, interview, and participant observation were conducted to collect qualitative and quantitative data which ensure a holistic understanding of residents' thoughts. The participants were recruited from shopkeepers staying over two years in the quarter. They were first asked to fill in a questionnaire with three questions offered by the *Imagine* tool: 1) What do you love about the Muslim Quarter?; 2) What would you want to change about the Muslim Quarter?; and 3) What would you like to retain in the Muslim Quarter? Each question was multi-choice, with nine options based on the former research findings in Lijiang, Yunnan. These nine options are A. Heritage buildings, streets and bazaars; B. Traditional conventions and rituals; C. Parks and grasslands; D. Community services and facilities; E. Tourist services and facilities; F. Community economic activities and employment; G. Public transportation, pedestrian and parking spaces; H. Schools and educational institutes; I. Others²³. After filling in the questionnaire, the participants were asked for feedback on those questions, such as "Please tell me more about each of your answers." and "Any suggestions on our questionnaire?".

However, the questionnaire's low response in the first few days saw residents' indifference towards this method, the reason of which is also noteworthy and will be discussed in the following section. In this case, while viewing the questionnaire results as a reference to learn a rough picture, the survey then shifted the focus to only using semi-structured interviews based on the three questions from the questionnaires, but with open-ended responses. This turned out to be a great success in the following investigations. Though time-consuming, semi-structured interviews based on the same questions from the questionnaire helped collect much more detailed information about residents' thoughts on conserving the Muslim Quarter, during which the observation method was also applied.

In the end, among 48 valid questionnaire surveys, five participants accepted further interviews and gave feedback. In addition, 25 more shopkeepers selected randomly were conducted for semi-interviews. Aged from 18 to 70, the participants were recruited to ensure variation in gender and cultural backgrounds, including local Muslim, non-local Muslim, local Han people, and non-local Han people, to allow for contrasting opinions. Besides residents in the Muslim Quarter, 15 Xi'an local people from various careers were also interviewed informally. While helping the researcher better understand the local context, these participants also helped supplement and testify to the residents' opinions, enabling the study to be more objective.

All the qualitative data from interviews were noted after each discussion and then transcribed and coded in Nvivo with observational data from everyday field notes. A set of analytical categories emerged from a thematic analysis based on a coding and re-coding process using similarities and variations in the material ²⁴. Besides, the quantitative data from the physical questionnaires transcribed from Excel to Nvivo were also taken as a reference.

4. THE STRENGTH: THE QUESTIONS HELP LEARN RESIDENTS' VALUES AND EXPECTATIONS

The study shows that these three specific questions can help learn residents' values and expectations fast in the Xi'an Muslim Quarter. Results show that the sense of place is what residents value most and want to retain in their life. Meanwhile, backward infrastructures, a deteriorated tourism image, and unpolished policy implementation are what they most want to be improved.

4.1. Sense of place: what residents value most

The sense of place was first defined as the meaning and connection to a location held by a person or community ²⁵. It has since become an auspicious, promising way to understand people–place relationships ²⁶. It describes the beliefs, meanings, interpretations, attitudes, and behaviors people associate with a particular place ²⁷. Previous research has shown that a sense of place encompasses at least three narrower concepts frequently mentioned in human geography and environmental psychology, including place attachment, place identity, and place dependence ²⁸. Although the terms above overlap, they still have distinct features that correlate to emotional, cognitive, and conative aspects. These three elements are all embodied in this research.

(1) Place attachment

Place attachment refers to people's affective connection to a place and is an important term for emotional human–place relationships ²⁹. The questionnaires and interviews show that the mosques and traditional Muslim communities and cultures have given the residents here a strong sense of community:

Our family has lived there for three generations. My grandfather did business here. My father, too. And now me. I think it's a kind of passing on.

We love our Muslim community and our place, that's why we insisted on staying here when the local government once wanted to demolish our houses.

Most people living here are Muslims, and we tend to rent our houses to those who are also Muslims. We know our neighborhoods well and always help each other, which makes me feel really reassured.

(2) Place identity

Place identity is part of people's cognitive identity to their physical surroundings³⁰. It can shape people's personal identity, which is formed or influenced by the physical and symbolic characteristics of the places they live³¹12/3/22 9:58:00 AM. The research discovers that all Muslim residents, whether grown locally or from other provinces, are proud of the Muslim Quarter as a well-known scenic spot with specific characteristics:

The Muslim Quarter is a special card of Xi'an. In China, who doesn't know the Muslim Quarter?

During Ramadan, all Muslims in Xi'an will have suboor together in the Muslim Quarter. At that time, you can see everyone having breakfast at 2 am here, the scene of which is really spectacular and unforgettable. You must have a see in your lifetime!

We Muslims are proud of our religious belief, which is more rigid than the law in our nation. If some Muslim doesn't behave well, our god Allah will punish him.

Place attachment and place identity offers the residents a sense of belongings and community pride, making them feel they are part of the community. Except for direct expression, their particular affection towards their place can be discovered through observations, when they behaved more hospitable and feel proud and willing to talk more once when referring to their Muslim culture.

(3) Place dependency

Place dependence refers to people's views of whether or not they can meet the demands in a specific area against all other regions³². As a famous scenic spot around the country, the Muslim Quarter is a place that attracts people from all corners to come and make a living. The place dependency is the main reason many foreign business people come and invest here:

My hometown doesn't have many tourists, so I came here and rented a store.

There are mosques and big Muslim communities here, satisfying our demands of worship and living habits, so we are not willing to go anywhere else.

Most rich business people from Zhejiang province rented the store at a high price at the drop-off point of the sightseeing bus to make a considerable profit.

Among three elements that shape the sense of place, what's worth noting is that those residents who have stayed there longer are more concerned about place attachment and place identity. While people that have stayed there for a short time are more focused on the place dependency of their quarter. This discovery also

shows that the character of place attachment and place identity requires more time to shape and accumulate. While the sense of place is what the residents value most, the *Imagine* tool also helps to find out what they most want to change.

4.2. Infrastructures: what residents most want to change

Differ from the consistent response of what they value, residents' opinions on change are much more diverse. Among them, the infrastructures in the Muslim Quarter are the most frequent topic the residents raised regarding what they want to change. Main issues regarding infrastructure include living conditions, traffic congestion, and education problems.

(1) Outdated living conditions

Though the façade and facilities in most residential buildings built by the local government have been renovated, many houses built by the residents still have no natural gas, and some lack toilets. As a result, the residents who gained enough money in the Muslim Quarter have almost moved away, and some come to do business during the day while living outside the quarter. Locals report that a few years ago, government officials and experts came and investigated several times, but nothing changed.

Due to the great difficulties in house renovation, many residents hope the local government can expropriate their houses, give them compensation and resettle them, which is quite common in China. During interviews, many residents expressed this hope:

Are the questions you ask relevant to the local government's demolishing plan?

I hope our house in the Muslim Quarter can be demolished; thus, we can get compensation from the government to buy a new flat outside. But I know it's impossible.

The Muslim Quarter was planned to be rebuilt in the 1990s. Several houses were demolished at the beginning. Then after some groups of experts and leaders came, the demolishing plan was stopped. We just can do nothing if the local government is unwilling to demolish.

(2) Chaotic traffic

In addition to living conditions, chaotic traffic is the most concerning issue for residents. The width of roads in the Muslim Quarter is around 3-7 meters³³, and two-way driving is allowed on the already narrow roads. As a result, traffic is always at a standstill by various vehicles, including large and small cars, tuk-tuks, and bicycles (Fig. 3). When asked what they felt the Muslim Quarter needed to change, most shopkeepers pointed to the front road and said: "*The heavy traffic jams need to be changed. The cars passing by are blocked all day, and the horns are*

really noisy." Also, the remaining, who did not raise this issue at first, would suddenly be excited when explicitly asked about the traffic here: *"Definitely! This traffic is terrible! The local government must fix this problem as soon as possible!"*



Fig. 3: The traffic jam on Muslim Street (Source: author)

(3) Poor education quality

Many residents mentioned the poorness of the current education quality in the Muslim Quarter. Residents who have children of school age stated it was one of the main reasons many of them moved out of the Muslim Quarter:

Our parents only valued doing business in the past. They felt that it was not essential for us to study as long as we could read and write because we would eventually do business with them in the future anyway. But the concept has changed from our generation, and we no longer want our children to be like us. My daughter works in Beijing now.

Every day I take my kid back and forth twice to go to school outside the city center, which is quite exhausting. Who wants to bother like this if there is a good quality of education here?

The results above show that questions offered by the *Imagine* tool can help learn residents' values and expectations fast in the Xi'an Muslim Quarter. Residents value most and want to retain the sense of place,

including the unique place attachment, place identity, and place dependence. Meanwhile, they mainly want to change the backward infrastructures, including living conditions, traffic congestion and education problems.

5. THE CHALLENGE: LOW INTEREST IN THE AUTHORIZED SURVEY

The experimental activity has seen residents' general negative attitudes towards the authorized survey. To hear the authentic voices from the grassroots and avoid being sheltered by the dominant small interest groups³⁴, participants were selected randomly in the Muslim Quarter without being introduced by local government officials or any other experts. Each survey was taken place in the participants' stores to make them feel more comfortable. However, an apparent weakness of this method is the difficulty in engaging the participants.

5.1. Consultancy fatigue

To avoid bothering their business, the researcher only accessed shopkeepers with no guests to look after. However, once the researcher showed the questionnaire and introduced herself, many shopkeepers just refused the questionnaire directly. Some of them said they were busy and continued playing with their phones, while others expressed their disinterest in participation:

These questions are too professional, and you should ask experts instead of me.

I'm just a housewife and not able to answer these questions. My husband will come this afternoon, maybe you could ask him!

Also, among 48 valid questionnaires, only 5 participants gave details of their responses. Typical refusing responses are:

I'm low educated and not able to explain my choice.

I have done you a favor; please don't ask me to do more.

I think I have helped you finish your task, and I'm afraid it's enough.

The ineffectiveness of the questionnaire survey can also be reflected by interviews with citizens of various careers outside the Muslim Quarter. Results show that the questionnaire survey is not a helpful way to gather information from the grassroots, which are based not only in the Muslim Quarter:

When our company asks us to fill in a questionnaire, we just fill out it randomly because what we choose does not affect the result.

Questionnaires doesn't really work.

Think about it in another way. If you are asked to fill in, would you like to do it carefully?

Because the top-level leaders of large groups rarely consider the opinions raised by the bottom, participants found their voices shown in the questionnaire can't bring about change. Gradually, they lose hope in participation. In addition, some residents also raised the issue of consultancy fatigue in the Muslim Quarter:

You must be a student, right? I know your research work is hard, but we have to cater to big groups of academics like you twice or thrice every year. They ask us questions and leave with nothing to change.

As far as I know, there have been five versions of the development plans for the Muslim Quarter in the past ten years, though none of them has been implemented. I don't know what these experts and officials are thinking about.

5.2. Fear of power

It can be seen that the rarely considered opinions can make residents feel the engagement is useless and are not eager to express themselves anymore. Gradually, they become having no choice but obey. More seriously, some people willing to express their dissatisfaction often tend to be punished by the government with the excuse of destroying social harmony and stability. Therefore, the public tends to be vigilant and not bother themselves with public issues to avoid being punished. That's why the residents rejected to fill in questionnaires:

.....You can't blame them for not doing the questionnaire for you. Doing this questionnaire doesn't benefit our residents, but it may also lead to disaster. Even if you said it is anonymous, who knows if you will mark it after you leave? Asking residents to fill in this can make them feel like signing, which is likely to be the evidence that they may get fined by the local authority someday.

Towards the failure of questionnaire surveys, a resident also gave the researcher suggestions on how to do it successfully, which vividly shows the public's fear and the local government's power:

Next time, don't carry your bag like a student. Wear more formal clothes with an emblem of the Communist party on it. Don't speak too much, just show them the questionnaire and say 'the top (leader) asks you to fill it out in a serious and insist tone. Follow my advice, and you will make it.

This ridiculous-sounding suggestion shows the residents' obedience to the local authority. In light of previous research (e.g. ³⁵) and other participants' responses towards the local government, this advice can show residents' fear rather than trust towards the local government. They feel scared of the local government's assertive power, so they have no choice but to obey the government. However, this compulsive engagement, or 'manipulation' in Arnstein ³⁶'s words, is meaningless. It is based on fear of punishment and the willingness to please the authority, which undoubtedly leads to a worthless process and invalid outcome.

The biggest challenge of applying the *Imagine* tool in the Xi'an Muslim Quarter is the residents' low interest in authorized surveys due to their distrust of the local government. It is understandable for the residents to have this attitude towards the local government because the latter did not always perform responsibly and credibly in fixing the residents' issues, consequently making them lose confidence in the mechanisms of power. Thus, the residents' distrust of the local government can be a challenge in achieving community engagement when implementing the *Imagine* tool in the Xi'an Muslim Quarter.

6. THE OPPORTUNITY: THE IMAGINE TOOL IS ACKNOWLEDGED BY PARTICIPANTS

Although indifferent to the questionnaire, participants interviewed showed their acknowledgement of the *Imagine* tool within its localization by the practitioner. The activity shows that asking questions directly as informal chats and introducing the researcher's background later can help engage participants. Meanwhile, asking about the residents' values and referring to heritage can be an excellent way to rapidly close the distance and facilitate a more profound discussion on their opinions and expectations. Understanding and respecting interviewees' heritage and culture during the interview can help build a friendly and trustworthy relationship. As a result, many residents show their passion and ability to participate in conserving the Xi'an Muslim Quarter. The *Imagine* tool can help experts and officials hear residents' opinions and advice easily, enabling a better understanding and more sustainable decision-making.

6.1. Informal interviews

Considering the failure of the questionnaire, the researcher decided to follow a local friend's suggestions and asked questions directly instead of introducing herself when starting each interview. "*There's no need to introduce yourself at first. Rather, you should provide opportunities for them to ask you (who you are). Providing them chances to raise questions can make them more engaged.*" With the local guidance, things proceeded more efficiently and successfully. When directly asked, "What do you love about the Muslim Quarter?" many participants were puzzled initially, then considered things for a while. Once hearing the provided sample of mosque and religion, almost all the participants chose them as their favorite without hesitation. All of them then explained to the researcher why they liked them naturally:

I love the mosques and our religion! Do you know that we Muslims go to the mosque to worship six times a day?

Heritage is the most prominent character of the Muslim Quarter!

Surprisingly, none of the participants who answered the first question rejected the following interviews. Some may ask about the researcher's identity or why she asked such a question. After knowing the researcher was doing research, many became more engaged and offered more details. They tended to wait for more questions patiently and curiously and explained their attitudes and concerns in detail, even without needing guidance from the researcher. All of them just engaged actively, showing the effectiveness of the tool.

6.2. Show understanding and respect

Besides being an excellent topic to start conversations with residents, showing an understanding of interviewees' heritage and culture can help build trust with interviewees. During conversations, when mosques, religions, or relevant Muslim culture were raised as topics, it was found that participants suddenly became delighted and comfortable. Many then began to proudly introduce to the researcher more about their Muslim culture, like their pursuit of being clean, not using a towel after washing hands, adoring honesty, and never cheating customers in business. Showing knowledge and respect for their heritage and culture made the participants feel understood and approved and helped to build a friendship that benefits the research proceedings. In the surveys, some interviews lasted over a few hours due to participants' enthusiasm. At the end of the interview, many participants felt the conversation was too short and expressed their willingness to engage further in the following activity. Rather than respond to some presupposed questions from experts, the tool gave residents a chance to freely express their opinions and expectations, which won many participants' support:

We really need someone like you to listen to our thoughts.

Your research is pretty valuable Don't worry! You won't run into a wall if you interview like this.

Everyone here will be willing to talk to you.

Just come and ask me anytime when you have questions! Though I know little about elsewhere, I can confidently say that I can give you much information about here where I grow up! It's my pleasure to help with your research!

Although residents are not engaged in questionnaire surveys, they show their huge interests in informal interviews with the practitioner's active listening and guidance. The understanding and respect towards the participants make them feel comfortable, which is helpful to learn their thoughts and conduct follow-up interviews.

6.3. The unexpected engagement

What's unexpected is that the residents show their potential ability to participate in conserving the Xi'an Muslim Quarter in this experimental HUL activity. In a friendly and informal atmosphere, besides answering what they value and want to change, they also raised suggestions on how to fix the issues, many of which seemed quite creative and operational. Towards backward infrastructures, in terms of outdated living conditions, residents preferred to resettle in or near the Muslim Quarter. For chaotic traffic, residents agreed to set a fixed time to control the cars driving inside. For poor education, teacher exchanges are highly welcome:

The car should be restricted. For example, we can let cars pass this street before 8 am and after 10 pm.

Can we invite teachers from top middle and primary schools to regularly exchange with those in the schools in the Muslim Quarter to improve the quality of education here?

The government should support the Muslim Quarter to develop the street business. Not everyone pursues expensive and posh. People come to the Muslim Quarter just because it's delicious and inexpensive. If you want to go to the high-end, there are too many shopping malls outside the city center like SKP and SAGA. The city center should be down-to-earth so that people who are not rich can still afford it, and the high-end industry should be developed in the new district. It can also leave a way for the small vendors to live in the city center.

The local government should support time-honored brands to avoid adverse effects on product quality caused by their changing management. Meanwhile, these time-honored brands should at least be found on major online platforms such as Baidu Maps. Visitors should at least know which ones are the most delicious.

Besides great interests shown in the last section, residents in the Xi'an Muslim Quarter also have the potential ability to participate in their heritage conservation. Therefore, the *Imagine* tool can play as a facilitator to help achieve participatory conservation of the Xi'an Muslim Quarter, which can benefit decision-making and further enable the more sustainable development of the Muslim Quarter.

It can be seen that the *Imagine* tool has great potential in facilitating community engagement within its localization by the practitioner. The straightforward and thought-provoking questions encouraged residents in the Xi'an Muslim Quarter to reflect on what they cherish and want to change in their living place. Showing understanding and respect for interviewees' heritage help create a friendly atmosphere for building trust and further survey. As a result, the passion and ability shown by many participants embody their acknowledgement of this participatory tool. This welcome shows the great potential of the *Imagine* tool in engaging residents in conserving the Muslim Quarter.

7. CONCLUSION

This experimental HUL activity in the Xi'an Muslim Quarter shows the adaptability of the *Imagine* tool in learning residents' views on heritage conservation. It demonstrated that the questions designed by the *Imagine* tool could effectively help to learn residents' thoughts towards conserving their life place. The biggest challenge of applying this tool in this new context is residents' low interest in authorized surveys. Nevertheless, it still shows its great potential in facilitating community engagement through its localization by the heritage practitioner.

The results suggest that the questions designed by the *Imagine* tool can assist in discovering residents' values and expectations in the Xi'an Muslim Quarter. Inhabitants most value and desire to keep their sense of place, including the distinctive place attachment, place identity, and place dependence. On the other hand, they most want to fix the ageing infrastructures, including backward living conditions, transportation congestion, and educational issues.

A major challenge of using the *Imagine* tool in the Xi'an Muslim Quarter is the residents' lack of interest in authorized surveys, which stems from their distrust of the local administration. The residents have such an attitude towards local authorities because the latter hasn't always acted appropriately and convincingly when resolving their difficulties, causing them to lose faith. As a result, while applying the *Imagine* tool in the Xi'an Muslim Quarter, the citizens' distrust of the local government creates difficulties in achieving community engagement.

Despite low local interest in authorized surveys, the *Imagine* tool still shows great potential to foster community involvement within the practitioner's localization. This simple but thought-provoking set of questions prompted the residents to ponder what they value about their place and what they would like to change. It also revealed that the understanding and respect towards interviewees' heritage and identity can help build trust and create a friendly atmosphere for further surveys. As a result, the enthusiasm and knowledge shown by many interviewees toward problem-solving exemplify their appreciation of this participatory tool. This acknowledgement demonstrates the opportunity of the *Imagine* tool to engage residents in protecting and developing the Muslim Quarter.

7.1. Discussion and the way forward

This study verifies the adaptability of the *Imagine* tool based on an experimental activity in the Xi'an Muslim Quarter. The effectiveness of the three questions for learning the communities' thoughts regarding conservation and growth was validated, which is consistent with the existing research³⁷. However, the small sample size due to limited time and its experimental nature may affect the identification of diverse thoughts

and demands. The following research should enlarge the sample capacity to testify to the representativeness of current findings on the residents' values and expectations. Meanwhile, the similarities and differences between different sub-groups could be further explored to discover the potential community vision.

Meanwhile, an important discovery is that informal interviews may seem more effective than authorized questionnaires when preliminarily implementing the *Imagine* tool in a new context. While enriching the research on the operationalization of the HUL approach, this method of interviews is far more time-consuming compared to the questionnaires. Therefore, how to balance the two methods to achieve the efficiency of data collection should be further explored. Also, the difficulty of the traditional survey on public participation was rarely discussed in the previous research because most of the past HUL surveys were conducted with the support of the local authority. This official kind of practice conceals the impact of the local government on community engagement. However, according to this study, the local government may largely influence the residents' engagement and the authenticity of the data collected from residents in some contexts. Further research can focus on how the local government may impact residents' participation in heritage conservation or, more broadly, what makes the *Imagine* tool effective or ineffective in different contexts. These explorations can help rethink the HUL approach and take a more profound step in identifying the opportunities and challenges of participatory heritage conservation.

Nevertheless, this study still confirms the opportunity of the HUL approach in the Xi'an Muslim Quarter by stressing the active role of the practitioner. It also shows the residents' passion and ability in a specific way by displaying their specific suggestions, which provides concrete evidence of how the *Imagine* tool is welcome by the residents. In particular, further research could explore the feasibility of these suggestions and to what extent the local government will adopt them. Meanwhile, the role of experts should be further reflected. All these research directions can take a further step forward to help integrate heritage protection into urban growth.

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**FROM A PRIVATE GARDEN TO A PUBLIC PARK:
THE 1857 'DEVIL'S WIND',
THE BRITISH LOVE FOR THE LAWN
AND THE MUTATION OF THE MUGHAL BAGH**

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FROM A PRIVATE GARDEN TO A PUBLIC PARK: THE 1857 ‘DEVIL’S WIND’, THE BRITISH LOVE FOR THE LAWN AND THE MUTATION OF THE MUGHAL BAGH



Set against the backdrop of the 1857 uprising against British colonial rule, the Paper focusses on the impact of the tumultuous events on one significant constituent of the pre-colonial urban landscape, the Mughal era Bagh (garden). It examines the transformation of the Bagh from a private space meant for leisure or veneration of the deceased, into a public park. As the British emerged victorious, the post-uprising era witnessed the crafting and implementation of an agenda of urban retribution to tame the insurgent city. Delhi, the traditional seat of the Mughals was the uprising’s epicentre and the prime recipient of the ensuing spatial reprisal measures that significantly impacted its Mughal era Baghs as they took on a new meaning in the post-uprising era. The Paper examines the transformation of Delhi’s two Mughal Baghs into public parks and demonstrates that the seemingly innocuous armoury of horticultural weapons, dominated by the lawn, employed to alter the private Bagh into a metropole inspired public park were as effective as the spatially violent measures that were executed by an aggressively assertive colonial regime to penalize and tame the insurgent city. Further, the Paper also draws attention to the afterlife of these Baghs-turned public parks to underscore the perpetuation of the colonial era horticultural approach as a legacy in independent India as it became an integral part of park design and remains so to this day.

1. INTRODUCTION

Among the most visually dominant architectural remnants in the Indian city’s urban landscape is the Mughal spatial ensemble of the *Qila-Masjid-Bagh-Haveli-Bazaar* (Fort-Mosque-Garden-Mansion-Commercial Street) combine. The journey of these built-form types from their Mughal era origin to the contemporary times has been long and eventful. The Paper examines the evolutionary trajectory of one spatial constituent, the *Bagh*, by positioning it in the tumultuous political events of the subcontinent’s nineteenth-century colonial history whose watershed event was the 1857 uprising against British colonial rule. It examines how the Mughal garden space, essentially private, whether for indulgence in languorous and sensual leisurely pursuits or for solemn contemplation and veneration as a funerary setting, was impacted by the uprising that swept across large parts of northern and central subcontinent, rupturing it politically and culturally. The uprising fragmented the nineteenth century itself by creating two distinct chronological entities, the pre-uprising and post-uprising eras. The Paper positions the *Bagh* in the pre-colonial, pre-uprising era and presents its evolutionary trajectory as it mutated into a public park following the uprising. It examines the case of Delhi, that was not only a former Mughal stronghold manifested as the seventeenth-century *Badshahi Shabar* (imperial city), Shahjahanabad, but was also the epicentre of the uprising and a foremost recipient of the colonial regime’s post-uprising urban retribution programme whose compendium of spatial weaponry produced among others the metropole inspired public park. The Paper focusses on the city’s two Mughal imperial *Baghs* patronized by women of the royal family – a little talked about subject in the Mughal

architecture discourse that is dominated by male patronage – one designed for leisure and the other, a leisure-turned funerary garden, and traces their respective evolutionary trajectories from a private realm into a public space. The Paper concludes by discussing the afterlife of the Mughal *Baghs*-turned public parks to underscore the endurance of the colonial leisure ideal in independent India to this day.

2. THE 1857 ‘DEVIL’S WIND’

The sentiment of disgruntlement among a section of Indian soldiers in the British colonial army, eventually took the form of an uprising against British colonial rule. The uprising was called the Mutiny by the British, while it was referred to as *Baghavat/Ghadar* (revolt) by the Indians, who popularly described it as the ‘Devil’s wind’ that ‘arose, and blew with most destructive violence’.¹ The sporadic gusts of opposition against the British coalesced into a searing ‘wind’ on 10 May 1857, when a band of disgruntled soldiers from Meerut cantonment, descended unannounced in Delhi, the traditional seat of power that was being shared by the Mughals and the British East India Company. The soldiers arrived in the Mughal *Qila* to seek the blessing of the incumbent Mughal ruler, Bahadur Shah ‘Zafar’-II to oust the British from the subcontinent and to reinstate Mughal authority, with Bahadur Shah ‘Zafar’-II crowned as the *Badshah* (Emperor). While this act transformed what had been a few local, anti-British outbursts into a full-fledged revolt, the place chosen by the soldiers to orchestrate their intent, made Delhi the uprising’s epicenter that attracted a motley of rebels from various parts of northern and central subcontinent to the city to fight the British. From May to September 1857, the rebels and the British fought several battles in walled Delhi and its hinterland that finally resulted in British victory.

British victory was accompanied by an orgy of retributory violence that was unleashed on cities identified by the victorious colonial regime as major centres of the revolt, i.e., Delhi, Lucknow, Kanpur, Jhansi and Gwalior. The colonial regime, popularly referred to as the *Raj* in the post-uprising era, devised a strategy to penalize and tame the insurgent cities, with Delhi being the foremost recipient of the ensuing retribution. This entailed initiating administrative actions including deployment of the military and robust policing as well as crafting and implementing spatially violent reprisal measures directed at urban restructuring to transform the insurgent city into a modern city that was safe; healthy and genteel like its Victorian counterpart. A slew of military; civic and industrial spatial interventions were devised to cast the mantle of modernity over the insurgent city.² The subject of the Paper, the public park, formed an integral part of civic interventions aimed at making the city healthy and genteel while reinforcing the new colonial order. The interventions were predominantly represented by a novel spatial ensemble, i.e., the Town Hall-Library-Menagerie-Museum-Public Park combine. Indeed, as the *Raj* implemented its vision of a modern subcontinent, the public park leisure paradigm was here to stay as municipalities in the subcontinent’s cities conceded that while ‘it is

impossible to make the city itself altogether healthy, the next best thing is to provide a healthy place near at hand for air and exercise'.³ However, upon this metropolitan import's arrival in the subcontinent, it encountered the pre-existing Mughal *Bagh* and the resultant east-west cultural entanglement produced a hybridized garden type that transcended its role as a public space to underscore the *Raj*'s authority.

3. GARDEN VERSUS GARDEN: THE MUGHAL *BAGH* VERSUS THE ENGLISH PUBLIC PARK

The *Bagh* formed an integral constituent of the Mughal spatial ensemble, typically represented by the *Qila-Masjid-Bagh-Haveli-Bazaar* combine, that found a place in the urban landscape ranging from that of the *Badshahi Shabar* to that of the provincial town. The Mughal *Bagh* was based on the Persian archetype, the *Chahar Bagh/Char Bagh* (henceforth *Char Bagh*) garden type with a cross-axial layout based on the four-fold division of the plot. Broadly speaking the *Char Bagh* was laid out as a space of repose, i.e., the leisure garden, and as a place of interment, i.e., the funerary garden. In her extensive scholarly examination of the Mughal *Char Bagh*, Koch has spatially categorized it into three types, with each type being built as part of the imperial garden building exercise in Shahjahanabad and its hinterland: the 'canonical cross axial chahār bāgh' represented by the funerary garden of *Badshah* Humayun; the 'terrace garden, a linear composition planned in steps along a longitudinal axis' represented by Shalamar Bagh; and the 'waterfront garden (...) a configuration of a river-front terrace upon which are placed the main symmetrically arranged buildings, and a chahār bāgh on the landward side' represented by *Qila* gardens like Hayat Baksh Bagh.⁴ In spatial terms, the *Bagh* was an introvert, private space whose walled enclosure shielded its occupants from the outside world. It relied on a compendium of natural and humanmade elements to create an ambience for sensual and languorous repose in case of a leisure garden or solemn contemplation and veneration in case of a funerary garden. These elements included among others manipulation of landform; planting including groves of fruit and flowering trees, shrubs and seasonal flowering plants; water; built-forms like apartments, pavilions, screens, terraces, reservoirs, pools and walkways; soft furnishings; aromatic oils and incense; music and dance as well as gastronomical delights. It was this private world of the walled garden that the *Raj*'s Foucauldian 'specialists of space' i.e., the municipality's horticulturalists encountered as they were tasked with laying out a leisure circuit of public parks in cities in the post-uprising era.⁵

The metropolitan, public park ideal was a product of the nineteenth-century consciousness that looked at leisure beyond the notion of physical rejuvenation to keep disease in check to encompass a wider canvas of total wellbeing.⁶ In fact, it could be argued that the nineteenth-century public park movement, that emerged in Victorian Britain in the 1830s, was a sort of a precursor to Antonovsky's 'Salutogenic' approach that was centered on enriching human emotional and cerebral faculties besides addressing the issue of physical wellbeing

through disease control.⁷ This invested the public park with the responsibility of offering all classes of city dwellers ‘a moral, intellectual and physical sanatorium for the ailments that unavoidably attack crowded communities’.⁸ In spatial terms, the public park, was extrovert and extended into the urban realm and its users indulged in various leisurely activities, in full public view as the park became a theatre for the display of their material possessions. Typically, the public park had design elements including planting; lawns; water features; avenues and serpentine walks; garden objects like statues and canopies; furnishings including drinking water fountains, benches and railings; and built-form types like bandstand, greenhouse, teahouse, library, museum, menagerie and sports ground with provision for tennis, cricket and croquet among others. This ideal arrived in the subcontinent post 1857.

Public parks were laid out in the subcontinent primarily by the municipality as botanical gardens; zoological gardens; archaeological gardens; memorial parks and municipal parks.⁹ They could be typically envisioned as a new venture or could result through a remodelling of an existing Mughal *Bagh*. The latter case entailed large scale alteration of not just physical space but also the *Bagh*'s original meaning and context and the negation of worth in entirety as a historic site. To the extent it was practically possible, the endeavour was to make the subcontinent's version as close to their English counterparts to create some semblance of home and at the same time bolster the *Raj*'s presence in the urban landscape whose most dominant inscription was via spatially tyrannical, military and industrial measures. The making of a public park, on the other hand, relied on a seemingly innocuous armoury of horticultural weapons to transform the private *Bagh* into a public recreational space. This armoury included English garden design elements dominated by the ubiquitous grassy lawn as the ground cover to act as the setting for the pre-existing architectural remain that itself was treated as a garden object. Further, a compendium of elements including walks, drives, planting, water features and built-forms like museum, reading room, menagerie and grounds for cricket, tennis, croquet, shooting, bowling and archery, among others, were introduced to enable the *Bagh* to cater to its new requirements as a public park. More often than not, these elements were employed to emphasize the centrality of the garden object, i.e., the ruin set in a verdant lawn as the remodelled *Bagh*'s centrepiece. Indeed, while the ruin was recognized as a historic object, even though decontextualized, its setting, the *Bagh* was not considered as historic and therefore was a recipient of interventions in keeping with the public park ideal. The range of interventions, dominated by lawn building, was central to the *Raj*'s agenda of taming the insurgent city, as urban spaces in general and not just *Baghs* alone were planted with grass. This tendency to plant the lawn everywhere is very aptly expressed by the comment of Elihu Jan of Lucknow, who had previously served as an attendant of the former Queen of Avadh and following the uprising was employed to serve a British officer posted in the city. Witnessing the taming of insurgent Lucknow, another important centre of the uprising, in a manner akin to Delhi, Jan observed how entire *Bazaars* were being demolished and as her spouse lost his shop to the demolition, she wryly commented that the ‘English like grass better than

bazaars'.¹⁰ This indiscriminate tendency to plant grass across the city and thereby stake claim on city space that in its un-grassed state was also used by its *Shaharis* (citizenry) transformed this horticultural tool into a symbol of spatial tyranny that permitted access to a chosen few..

Municipalities zealously laid out public parks in insurgent cities that formed a leisure circuit comprising newly laid parks and remodelled *Baghs*. While no formal guidelines were issued for park design in the post-uprising era, the 'specialists of space' had enough Victorian metropolitan archetypes to seek inspiration from, besides the peculiarities of the site dictated the interventions. Delhi, Lucknow and Kanpur took pride in their parks that benefitted not just their prime users, i.e., the British and India elite, but the open space also acted like a lung that aerated the densely built, unhealthy, so called 'Native City' in the colonial lexicon. However, even as the public park paradigm was being unanimously lauded as a harbinger of wellbeing, trenchant criticism came from most unexpected quarters. Constance Villiers-Stuart, a *Memsabib* (English woman in local parlance), painter, writer and spouse of a *Raj* military official posted in the subcontinent in the early twentieth century, was typically expected to extol the public park, while she strolled on its winding walks; played a game of tennis to stay physically fit; sketched its ruin; visited the museum and wandered through the menagerie to whet her intellect. Instead, Villiers-Stuart not only publicly declared her love for the Mughal *Bagh* but also had nothing but reproach for her compatriot, the horticulturist's remodelling endeavours. Lamenting the *Baghs*' transformation, she came down heavily on the use of the lawn as ground cover that she attributed to 'our English landscape gardeners' and their 'fixed belief in the universal virtue of mown grass'. Further, she went on to criticize the other interventions as 'incongruities of the Anglo-Indian landscape gardener' that 'reign[ed] supreme' with 'bare acres of unhappy-looking grass, ugly bandstands, hideous iron railings, and forlorn European statues; wide, objectless roads, scattered flower-beds, and solitary trees, and, worst of all in a hot country, lack of fountains and running water'.¹¹ Declaring that the public park had taken over the *Bagh*, she noted that 'the old gardens [*Baghs*] are by no means easily to be found, and the mid-Victorian landscape park in the arid climate of Central and Upper India is, frankly, not a success. Unfortunately that has not prevented its imitation, and the consequent neglect of the far more suitable and infinitely more beautiful Indian water garden'.¹² This trenchant criticism notwithstanding, *Raj* officials went about remodelling Mughal *Baghs* and building new parks. A decade after Villiers-Stuart's comments, the by now, well established public park building approach received official sanction as the Archaeological Survey of India – custodian of the subcontinent's past including its architectural remains – notified its official position for 'restoring ancient gardens' stating unequivocally that while it was essential to 'pursue the essential character of the original', it was however 'not necessary to reproduce with pedantic accuracy the original appearance of the garden in all its particulars. (...) Since the days of the Mughals, horticulture has made immense progress, and now-a-days it would be as absurd to refuse to grow Marechal Niel or other modern roses in a Mughal garden on the ground that such roses were not known to the Mughals, as it would be to substitute the old fashioned Indian

beaten earth in place of a far more beautiful lawn of grass. In these matters concessions are rightly to be made to modern taste and the wishes of the community who frequent the garden. An officer should endeavour to observe the happy mean between antiquarian accuracy on the one hand and aesthetic beauty on the other.¹³ This official sanction for the 'far more beautiful lawn' made the latter an essential intervention in the Archaeological Survey of India's endeavours to create its archaeological gardens that included a remodelled Mughal *Bagh* or an architectural ruin conserved in a garden setting where none existed originally. Further, whether it was the municipality or the Archaeological Survey of India or even the military laying out what were called soldiers' gardens, the horticultural armoury, underpinned by the lawn, was here to stay as was the public park that symbolized a paragon of genteel modernity.

4. POST-UPRISING DELHI AND THE PUBLIC PARK LEISURE CIRCUIT

The British wrested control of walled Delhi from the rebels in a decisive battle fought on 14 September 1857 and the resultant British victory marked the beginning of the end of the uprising across the subcontinent. Delhi was penalized administratively by relegating it to the status of a provincial town in Punjab and was subjected to the *Raj's* urban retribution agenda. The *Raj's* 'specialists of space' restructured the city's urban landscape by carving out military; industrial and civic enclaves to create a tamed, modern city.¹⁴ The public park was an essential constituent of Delhi's civic landscape that was dominantly represented by the Town Hall-Library-Menagerie-Museum-Public Park combine. Delhi Municipality established in 1863 was entrusted with laying out the city's public park leisure circuit.

In 1874 the colonial government transferred *Nazul* (imperial estates) land, belonging to the Mughals that had been seized after the uprising, to Delhi Municipality. This land corpus contained the imperial *Baghs* built since the seventeenth century both within the walled city and its extensive hinterland, notably in the north and north-west (Fig.1). While some Mughal era gardens like the seventeenth-century Angoori Bagh; Buland Bagh and Gulabi Bagh that had foregrounded the *Qila* were lost to demolitions undertaken by the military to develop its garrison in the Fort (the *Qila* was repurposed as a garrison in the post-uprising era and was thereafter referred to as the Fort). Gardens within the Fort, Hayat Baksh Bagh and Mehtab Bagh were under the charge of the Archaeological Survey of India that developed the former as an archaeological garden that was not open to the public but was reserved for official functions as its Mughal era pavilions were appropriated to serve as instruments for the *Raj's* power orchestration exercises.¹⁵ Mehtab Bagh, on the other hand, became part of the garrison's military infrastructure with a parade ground and services yards for soldiers. Others imperial gardens across the city and its hinterland were remodelled into public parks and formed part of the city's leisure circuit that Delhi Municipality developed for the leisure of Europeans residing in the city's cantonment and civil lines.¹⁶ Additions to this circuit included new public parks that

commemorated the British victory over the rebels. These included Nicholson Memorial Garden, laid out by Delhi Municipality to honour the memory of Delhi's Mutiny hero, Brigadier-General John Nicholson; the eighteenth-century Qudsiya Bagh, used as a base by the British forces to launch the final attack on the city, that was conserved as a site commemorating British action of September 1857 with its Mughal era origins, represented by surviving architectural remains, undermined as well as pre-colonial era sites on the Ridge – home of the British forces as they strategized to take control of walled Delhi – like Chauburji Masjid and Pir Ghaib that saw action that resulted in British victory. The sites on the Ridge were originally not part of gardens but their association with the British during the events of 1857 made them hallowed spots that resulted in the creation of the horticulturist's lawn to envelope the site and transform it into Mutiny memorabilia. Delhi Municipality's interventions while being dictated by the metropolitan public park paradigm were also equally dependent on the specific site realities of the garden as the two cases that the Paper examines will demonstrate.

Delhi boasted of a large network of public parks that offered a range of activities to the users. The parks were listed in official records like the gazetteer and were described in travel guidebooks as places recommended for a visit by tourists. Further, they were also prominently marked on post-uprising maps of the city and its environs. Delhi's prominent public parks included Queen's Garden, Delhi Bank Garden and King Edward Park in the walled city and Roshanara Garden, Tees Hazari Garden, Qudsiya Garden and Nicholson Memorial Garden in the hinterland. Collectively they formed the city's leisure circuit and were frequented by Europeans. Of this circuit, King Edward Park and Nicholson Memorial Garden were new park building venture undertaken by Delhi Municipality, the remaining were Mughal *Baghs* remodelled as public parks. Of the latter, barring Tees Hazari Bagh (literally garden with ten thousand trees) that is often popularly credited to *Badshah* Shahjahan – while some sources credit *Begum* (titular address for elite women including those from the royal family) Jahanara as its patron – the rest were all laid out by women of the imperial family.

The Mughal dynasty's penchant for building is well known and has been a subject of scholarly examination since the colonial era. However, this discourse has been dominated by the building patronage of Mughal rulers, men, with women of the imperial family being highly understudied, the sole exception being *Begum* Nurjahan, *Badshah* Jahangir's consort, who was a prolific builder. The Paper specifically draws attention to the garden building enterprise of women, consorts and progeny of *Badshah* Shahjahan who himself is recognized as a builder par excellence and whose architectural enterprise dominates both popular literature and academic scholarship. These imperial women patronized not just gardens, the focus of the Paper, but also built *Bazaars*, mosques, palaces, retreats, *Serais* (rest houses) and *Madrasas* (schools of Islamic learning) among others and were also connoisseurs of literary and fine arts.¹⁷ A bulk of their patronage was concentrated in and around

seventeenth-century Shahjahanabad. The Paper examines two gardens, Begum-ka Bagh and Roshanara Bagh, laid out by *Badshah* Shahjahan's daughters, *Begum* Jahanara and *Begum* Roshanara respectively, that were inducted into post-uprising Delhi's leisure circuit as remodelled public parks. However, Delhi Municipality's remodelling approach while sharing the larger ambit of the metropolitan ideal, remained steadfastly site specific as both sites presented themselves with their own unique characteristics that determined their remodelling.



Fig.1: Map showing Delhi and its hinterland in the immediate uprising aftermath prior to the remodeling of the *Baghs* into public parks. (Courtesy: National Archives of India).
[Note: To be inserted after seeking third party permission.]

5. BEGUM-KA-BAGH TURNED QUEEN'S GARDEN

Begum Jahanara was a Mughal princess and the eldest daughter of *Badshah* Shahjahan. A prolific patron of art and architecture, the *Begum* contributed significantly to the building of the imperial city. Among her building enterprise was the Begum-ka Bagh that was laid out in the heart of the walled *Badshahi Shabar*.¹⁸ It formed the second largest open space after the *Qila*, in the otherwise densely built imperial city and also acted as its lungs. The garden was a *Zenana Bagh* i.e., a ladies' garden, meant for the use of elite women from the imperial family and *Umara* (nobles in the Mughal court) households. While the *Qila* and the *Havelis* of the *Umaras* had extensive gardens within their walled enclosures, Begum-ka Bagh was a standalone *Bagh* that offered the option of an outing into the city to its women users. Indeed, while elite men promenaded along the city's famous Chandni Chauk (Moonlight Square) Bazaar – also built by the *Begum* – displaying Mughal *Adab* (etiquette), Begum-ka Bagh provided a similar opportunity to women, albeit within its highly private, walled enclosure, where women could be free of *Purdah* (veil) even though temporarily.

The *Bagh* was prominently sited along the *Badshahi Shabar's* most famous avenue, the Chandni Chauk Bazaar street and to its immediate south stood Begum-ki Serai, a rest house also built by the *Begum* for overseas merchants bringing luxurious items for sale (Refer Fig.1). No information is available on the *Bagh* as it was used in the seventeenth century owing to its use as a space for elite women. However, the *Bagh* as represented in detail in a mid-nineteenth-century map of Delhi and referred to as 'Bagh Chandni Chawk' permits its reconstruction.¹⁹ As can be inferred from the said map, Begum-ka Bagh was a walled garden that subscribed to the *Char Bagh* layout as adapted to a rectangular plot. It was watered by a branch of Shahjahanabad's imperial *Nahr* (canal), the Nahr-i-Bihisht (Stream of Paradise) that traversed along its entire east to west expanse and further branched into smaller water channels that flowed throughout the garden. Running alongside the *Nahr* that widened into pools at some points, were *Khiyabans* (walkways) for strolling. Other additions included planting that in all likelihood typically comprised flowering and fruit bearing trees, shrubs and plants; garden structures like *Baradaris* (pavilion with twelve arched openings, usually four on each side); rich upholstery as furnishings and reliance on music, dance, poetry and gastronomical delights as props facilitating repose. The *Bagh's* natural and humanmade elements came together to create an ambience that allowed its users to indulge in sensual and languorous leisure.

Begum-ka Bagh suffered from neglect owing to the political upheavals of the eighteenth century and remained in dilapidated state in the nineteenth century following the British occupation of the city. In all likelihood, a section of the *Bagh* on the east was carved out as a plot that was gifted in 1806 by the incumbent Mughal ruler, Shah Alam-II to *Begum* Samru, ruler of the principality of Sardhana, near Delhi (Refer Fig.1). The *Begum* built a *Kothi* (stylistically hybrid mansion) on the plot that became a famous landmark of Delhi. Meanwhile the rest of the garden remained in a state of neglect.

Post uprising, both the *Bagh* and its adjoining *Serai* were confiscated as part of *Nazul* land and were integrated into the restructured city's civic landscape. In fact, Delhi Municipality that owned the *Bagh* remodelled it based on the English public park ideal, while the *Serai* was demolished to make way for a cultural institute, called the Delhi Institute (also called the Lawrence Institute after John Lawrence, Chief Commissioner of Punjab and later Viceroy) that subsequently became Delhi Municipality's office. Together the remodelled *Bagh* and the Delhi Institute, punctuated with urban embellishments inspired by the metropole like a statue of Queen Victorian and a clocktower, constituted the modernizing city's new civic hub (Fig.2). It was perceived as a genteel civic space that replaced the *Qila* and the *Jami Masjid*, the city's seventeenth-century landmarks. Begum-ka Bagh was renamed Queen's Garden after Queen Victoria – who became the Empress of the subcontinent post-uprising – and was popularly called Company Bagh (Company being a reference to the now defunct British East India Company). The former exclusively women's garden now admitted men thus

not only altering its original character but also denying an open space to the city's female, non-European citizenry that they could call their own.²⁰



Fig.2: Section of a post-uprising Map showing Queen's Garden as part of post-uprising Delhi's novel civic hub. (Courtesy: Archaeological Survey of India).

[Note: To be inserted after seeking third party permission.]

The *Bagh's* transformation into a public park can be reconstructed through the examination of a set of survey maps that were produced following the commissioning of the first detailed record of the city and its hinterland by Delhi Municipality in 1910 and through a fieldwork based examination of the surviving remains (Refer Fig.2).²¹ The *Bagh's* original size was retained but its enclosure wall was redesigned and provided with 'very handsome gates'.²² Further, the *Nabr* was also retained along with some trees that had lined it originally to create a pleasant promenade.²³ Two *Baradaris* were repurposed as a library and a menagerie, the latter being very popular among the *Shaharis* whose entry to the garden premises was regulated. Two wells were also retained for irrigating the garden. New interventions were dominated by the carving out of lots for different leisure activities with the felling of groves of trees that typically characterized a Mughal *Bagh*, and planting the grounds as lawns punctuated with strawberry beds and potted plants.²⁴ Traversing the lawns was a network of curvilinear paths, that replaced the *Khijabans* and had provision of lampposts at regular intervals for lighting, that divided the garden into different areas. Space for sports included a grassy cricket pitch and ground that was allocated in the garden's eastern edge. Two tennis courts, one formally named 'Aitchison Tennis Courts' after C.U. Aitchison, the then Lieutenant Governor of Punjab, were also built in the garden's north-eastern and north-western corners. The garden also had a large nursery that housed exotic plants. It was also embellished by the addition of garden ornament set in the lawns to create points of interest. In the absence of a prominent ruin to lend the garden a sense of history, two Mughal era objects from the *Qila*, a marble basin and a sculpture of an elephant with a rider, were installed in its lawns, but were subsequently removed and sent back to the *Qila* (Fig.3) Further, an ornate circular bandstand was another point of attraction where the military band regularly. The Delhi Institute, built in the Neo-classical style and standing in the midst of its own island of green, was linked directly to the garden that abutted its north (Fig.4). A straight walk, punctuated with a water channel with fountains and lined with palms and beds of flowers, led from the Delhi

Institute and culminated at the bandstand (Fig.5). In 1902 a road linking the railway station to Chandni Chauk street made its way through the garden to facilitate movement. Named, 'Clarke Road' after R. Clarke, former Delhi Commissioner, who had originally mooted this proposal and equipped with a 'very handsome' 'wrought iron' gate, 'Clarke Gate' it further opened up, what had originally been a private space as a thoroughfare.²⁵ While Villiers-Stuart was generally critical of the horticulturist's English park design interventions, she singled out the road in particular, stating that it 'ruined the Queen's Garden. (...) the winding drives cut up the garden with their broad bare gravel sweeps'.²⁶ Regardless of this opinion, Delhi Municipality took immense pride in Queen's Garden and regularly allocated a portion of its annual budget for maintaining it. The Queen's garden was by far the most significant public park in Delhi and vied with Lahore's Lawrence Garden, also a public park, as the best public park in Punjab.

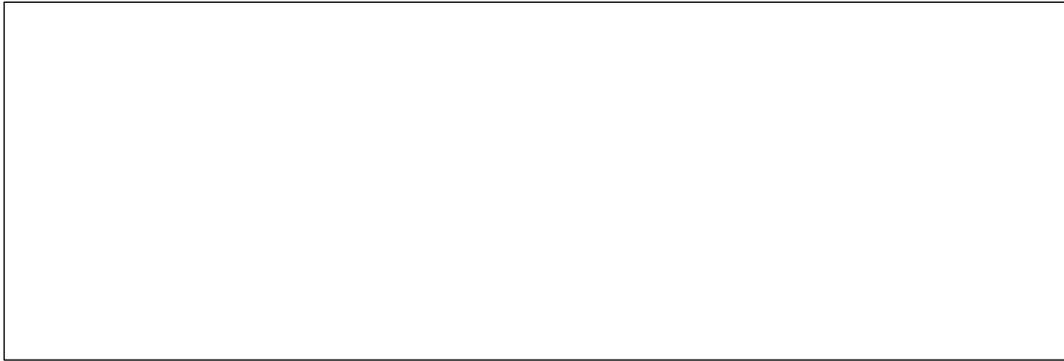


Fig.3: The installation of a sculpture of an elephant and its rider as a garden object in Queen's Garden. (Courtesy: Archaeological Survey of India).

[Note: To be inserted after seeking third party permission.]



Fig.4: Remnants of Queen's Garden's focal area with the Delhi Institute building in axial alignment with it. (Courtesy: Author).



Fig.5: Remnants of Queen's Garden, renamed Mahatma Gandhi Park, with the statue of Mahatma Gandhi replacing the colonial era bandstand (Courtesy: Author).

Indeed, it would hardly be an exaggeration to assert that Queen's Garden was the metaphorical 'Jewel in the Crown' in the context of Delhi's public parks. It epitomized the metropolitan ideal as it catered to the physical, moral and intellectual wellbeing of the users through its assortment of spaces. The nature of its remodelling was determined by several factors including its ownership by Delhi Municipality; location in the walled city that gave it convenient access from the British enclaves; large area that allowed provision of facilities; presence of existing garden structures that could be repurposed while adding a sense of history and also its original purpose as a leisure garden that permitted a certain degree of interventional liberty as opposed to a funerary one in the post-uprising era when it became politically expedient for the *Raj* to project itself as a custodian of the subcontinent's architectural past.

6. BEGUM ROSHANARA BAGH-TURNED ROSHANARA GARDEN

Begum Roshanara was the younger daughter of Badshah Shahjahan. Like her elder sister, *Begum* Jahanara, she too was a patron of the arts and architecture. She is credited with building a leisure garden, named after her as Roshanara Bagh, that also became her final resting place as per her wish. The garden was built in the imperial city's north-western hinterland and formed part of a compendium of imperial and sub-imperial gardens built

by the Mughals and *Umaras* for leisure where they retreated to get away from the hustle and bustle of city life (Refer Fig.1). Among the other prominent hinterland gardens were Tees Hazari Bagh attributed contentiously to the *Badshah* as well as to *Begum* Jahanara; Shalamar Bagh built by the *Badshah's* consort, *Begum* Akbarabadi and Sirhindi Bagh built by *Begum* Sirhindi, another consort of the *Badshah*, that was in close proximity to Roshanara Bagh. The north-western hinterland was watered by the imperial *Nabr*, while making its way to Shahjahanabad, that provided abundant irrigation for gardens to flourish. Together these gardens created a seventeenth-century equivalent of the colonial era's post-uprising leisure circuit of public parks, as members of the imperial family frequented them for leisurely sojourns; as places of refuge during outbreaks of epidemics in the city and as halting places on imperial journeys to the northern part of the empire.

Roshanara Bagh is somewhat difficult to reconstruct compared to Begum-ka Bagh. This is due to not just lack of seventeenth-century archival sources, but also being in the city's north-western hinterland, it was relatively less frequented by visitors including notably Europeans in the eighteenth and nineteenth centuries resulting in a paucity of eyewitness accounts. Furthermore, it was also not drawn in detail in colonial cartographic sources that tended to focus on the walled city. Surviving remains and scanty archival sources nevertheless, allow its reconstruction. Roshanara Bagh was a walled garden with a large, surviving gateway on the east for access. It covered a vast area that was laid out as an orchard and also had a large tank (Refer Fig.1). Designed as a retreat by its patron, it was expected to fulfil the prime function of a leisure garden, where natural and humanmade elements contributed to the creation of an ambience that catered to stimulating all the senses. The most significant garden structure, that survives to this day, was a *Baradari*, built in the Shahjahani style that contained a series of interconnected spaces enveloped by an arched colonnade (Fig.6). Aligned with the eastern gateway, it stood in the middle of a rectangular tank lined with fountains. A wide water channel, axially linked the gateway and the *Baradari* (Fig.7). In fact, Villers-Stuart observed the existence of four channels that led to the *Baradari* from cardinal directions in keeping with spirit of a typical *Char Bagh* layout. Further, the *Baradari* was also linked via another water channel to the tank that stood in alignment with it on its west, that according to Villiers-Stuart had pavilions for repose built along its edge. The *Bagh* was used as a retreat by its patron while she was alive and who wished to be interred in the *Baradari* after her demise. In accordance with *Begum* Roshanara's wish, her mortal remains were laid to rest within the *Baradari* in an open *Qabr* (grave). An enclosure of Shahjahani style inspired baluster columns carrying ornamented cusped arches with floral paintings, enveloped the *Qabr*. Following the *Begum's* demise, the retreat transformed from a languorous leisure space into a solemn funerary space.

Roshanara Bagh remained in relative obscurity attracting very few visitors in the politically unstable eighteenth century and also following the British occupation of Delhi. Post-uprising, the garden was taken over by the *Raj* as part of *Nazul* land and was handed over to Delhi Municipality for management. Delhi

Municipality inducted it into Delhi's public park leisure circuit. In fact, Roshanara Bagh and the adjoining seventeenth-century Sirhindi Bagh were merged together into a large public park named Roshanara Garden. During the course of its remodelling, undertaken in 1875 on the direction of Colonel Cracroft, the then Commissioner of Delhi, all garden structures, except the *Baradari*-turned tomb, water channel and the eastern gateway, were demolished and the *Bagh* was 'modernized' into a public park.²⁷ Post-uprising cartographic sources indicate the garden as a large expanse of green punctuated with planting and winding walks, while its most significant built-forms included the *Baradari*-turned tomb, water channel and gateway and the large tank to their west. The *Baradari*-turned tomb also doubled as a 'refreshment room' for visitors who indeed ventured thus far.²⁸ Delhi Municipality made continuous improvements to the garden over decades, however both the garden's location coupled with fact that it was not owned by the Municipality as opposed to Queen's Garden, made the interventions low key. In fact, they were largely confined to the introduction of the lawn that covered a large part of the former orchard, with the *Baradari* in particular standing in a swathe of verdant green as the garden's main attraction. This was followed by introduction of both ornamental and fruit trees, the latter with a view to make the garden self-sustaining. Winding walks that cut up the original orchard into sections were introduced to allow visitors to walk through the grounds. The large tank also received interventions in the 1884-1885 as it was desilted; its depth increased to fifteen feet; its edges were smoothed and turfed. Further, it was made attractive with the introduction of 'Gold and Silver fish' that were sourced from the public gardens that had been developed at Taj Mahal in Agra.²⁹ Villiers-Stuart who visited the garden bemoaned that the garden's approach 'has been altered to a carriage drive' and relocated, that had not only made its original, eastern gateway redundant but also completely altered the garden experience. Further, 'once inside, (...) the whole effect is spoilt by (...) the loss of three of the four canals' whose vestiges remained. Furthermore, 'the trellis walks and old symbolic avenues are gone though one neglected path is still shaded by a broken pergola of vines.' Advancing further Villiers-Stuart noticed that 'the terraced walk beside the water can hardly be distinguished; (...) the great tank beyond has lost its three pavilions, and almost lost its form' and 'everywhere winding roads driven through the old garden have cut up and completely spoilt the beauty of the original design'.³⁰ By far the most significant intervention in the garden made in 1917-1918 was the allocation of a large part of its grassy lawns as a cricket ground and the building of a cricket pavilion. Delhi Municipality officially described this intervention as an 'improve[ment]' and a 'great boon to the cricket loving public'.³¹ Thereafter, the garden hosted cricket matches with regularity that became its major attraction, while the rest of the garden notably its Mughal era historic object, *Begum* Roshanara's *Baradari*-turned tomb languished in obscurity. Further, following the expansion of Delhi's railway network, plots were carved out of the garden by Delhi Municipality and handed over to the railways for their operations, completely negating the garden's worth as a historic site. In 1922, about 22 acres of the garden to

the west of the *Baradari* and beyond the tank were allocated to the newly founded Roshanara Club, that survives to this day and has replaced the original Mughal *Bagh* as a city landmark.



Fig.6: *Baradari*-turned tomb in Roshanara Bagh (Courtesy: Author).



Fig.7: *Baradari* foregrounded by a water channel (Courtesy: Author).

Indeed, while Roshanara Garden was part of the public park circuit, it largely remained intervention free specially when compared to its counterpart under discussion in the Paper. The *Bagh*'s remodelling was yet

again based on empirical concerns like its ownership that did not vest with Delhi Municipality as it only managed the garden; its relatively inaccessible location in the city's north-western hinterland, specially post 1911 when the focus shifted to Delhi's southern hinterland that became a site for raising the new capital city of British India, New Delhi and the site's original purpose as a leisure-turned funerary garden in all likelihood dissuaded even the most zealous public park advocators from making drastic interventions. Perhaps that was the reason why despite having a large area, the garden primarily catered to physical nourishment via walks, drives and a game of cricket while also offering a ruin to satiate the aesthetic urge of those relatively few visitors interested in the city's past. Delhi Municipality's relative absence of built-form intervention, in fact permitted the garden to retain its character as a *Bagh* to a large extent making it among the least intervened upon Mughal gardens in the city.

7. THE AFTERLIFE OF DELHI'S NINETEENTH-CENTURY PUBLIC PARKS

Following India's independence, the country's public parks became a colonial inheritance with several surviving to this day. They are carriers of the colonial paradigm, epitomized by the lawn and ornamental planting, that continues to have relevance to this day, even as public parks have been altered over time. Alteration began with renaming i.e., their colonial era names were replaced with names that reflected the country's independence from colonial rule, and was followed by new interventions. Delhi's Mughal *Baghs*-turned public parks under consideration in the Paper, also witnessed changes over the decades. Queen's Garden was renamed Mahatama Gandhi Park, after the most prominent figure in the country's struggle for independence from British rule, whose statue, enveloped by a lawn, was installed at the spot formerly occupied by the bandstand. The garden had fallen from its position as Delhi's most popular public park even prior to Indian independence when New Delhi's extensive network of public parks and archaeological sites turned into gardens, in its southern hinterland, became the city's new leisure spaces. Queen's Garden was encroached upon and was parceled into smaller lots that functioned as small patches of grassy plots with some planting, as well as hosted incompatible uses like parking lots and markets. More recently, the main section of the garden that had been in alignment with the Delhi Institute – functioning as the headquarters of the post-independence avatar of Delhi Municipality, i.e., Municipal Corporation of Delhi – lies in a neglected and dilapidated state as the former Delhi Institute building has been vacated with the Municipal Corporation of Delhi moving to new premises.³² As for Roshanara Bagh, its premises had already been encroached to cater to the needs of the railways in the colonial era. After Indian independence, the *Baradari*, water channel and gateway survive as monuments under the care of Archaeological Survey of India, all standing in a verdant grassy setting maintained with regularity by its custodian. In the 1960s, a section of the garden was redesigned as a Japanese style garden completely disregarding its original character. Roshanara garden is still an attractive

place for walks amidst its old surviving trees but receives very few visitors. On the other hand, Roshanara Club, among Delhi's oldest clubs continues to function as a club and is regarded as a city landmark.

Several former *Baghs*-turned-Public Parks, symbols of the colonial paradigm, continue to survive as sites of visitor interest across India. Archaeological gardens of the post-uprising era have remained largely unaltered as their custodian, Archaeological Survey of India, also inherited the colonial conservation approach as a legacy and continues to maintain the architectural remains in a verdant grassy setting. Those built by municipalities have been overlaid with new layers drawing from several design influences but one element has remained constant, the lawn and its ornamental planting. The lawn's attractiveness lies in the fact that it is more often than not the only open space in the densely built and overcrowded Indian city. Indeed, the lawn continues to act as a setting for the ruin or other built-forms in the park, while allowing the users to walk, stroll, play and picnic on the green making it a much cherished space. However, even as the lawn, viewed as a symbol of gentility, has found a place across the entire urban spatial spectrum of landscape design in India, from the modest house garden to the city park and everything else in between, the story of its evolution as a post-uprising design element lies buried in time. In order to create an enriching visitor experience, it is imperative to revisit and include the latent, post-uprising era narrative in the garden's evolutionary tale for the public park's holistic interpretation.

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'DISCOVERIES,' AND THEIR SLIPPAGES IN MODERN DISCOURSES OF TUNISIAN
ARCHITECTURE**



This paper will critically reassess modernist discourses of both the gourbi (an earthen structure in indigenous Tunisian landscapes) and troglodytic dwellings in twentieth-century Tunisia. In doing so, the paper asks two key questions: What were the epistemological relationships between the vernacular and the informal in the context of postwar Tunisia? And how were vernacular and informal building practices conflated in ethnographically informed French architectural historiography, contemporary to the period? The paper presents a North African case study which demonstrates the fabricated slippages and moralizing distinctions between the vernacular and the informal, in their aestheticization and theorization during this timeframe.

Occupied by German and Italian Axis forces from November 1942 to May 1943, Tunisia's Sahelian (coastal) cities of Bizerte, Tunis, Sousse, and Sfax suffered considerable destruction, particularly in their infrastructures and public works. Declared a French protectorate since the Treaty of Bardo was signed in 1881, Tunisia during World War II had been colonized in fact on two fronts—by both the extant French colonial administration and the invading Axis troops.

World War II rendered Franco-Tunisian relations far more precarious. Postwar (post-WWII) reconstruction in Tunisia ushered in a new era of architectural and spatial planning, during the late French protectorate period. The chief motivation underlying reconstruction—staving off the real potential for civil unrest—forwarded the overt goal of sustaining and giving shape to an already fragile protectorate.

Beginning in June 1943, the following Provisional French Government hired a team of young architects to assess and take inventory of the damages in these cities. In the years that followed, this cosmopolitan, and professionally and educationally diverse team comprising Bernard Zehrfuss (Chief Architect of Services), Jacques Marmey (Director of Studies and Works), Jason Kyriacopoulos, Lu Van Nhieu, Jean Le Couteur, Jean Drieu la Rochelle, and Paul Herbé would design an expansive œuvre of civic structures to remedy, in part, much of this wartime loss. All were graduates of the École des Beaux-Arts in Paris.

Quickly shifting urban demographics became an urgent problem to deal with as well. Mass rural-urban migrations occurred in the last decade of protectorate rule, although many rural emigrants returned to the *bled* (villages). In the southern zone of the country, and particularly in the semi-desert steppes, depopulation was the marked trend from 1946-1956, in part due to the instability of agricultural production¹. This led to an unforeseen surge of informal settlements, particularly on the outskirts of Tunis (e.g. the mix of so-called *bidonvilles* and *gourbinvilles* of Djebel Lahmar, Taoufik, Melassine, En-Neja, Saida Manoubia, Zitoun el-Djerbi,

and Bel Hassan)². This migratory flux was inarguably a widespread phenomenon throughout North Africa³. Algiers, by comparison, faced its own urban boom after the war⁴. Colonial demographic documents reveal that this population explosion, especially among autochthonous groups, worried the administrations⁵. Yet it was partially due to this unexpected urban growth that reconstruction efforts fell tremendously short of their initially projected plans.

Once Tunisia was “liberated” in May of 1943, M. René Mayer, then the Minister of Public Works, met with Bernard Zehrfuss in Algiers to discuss preliminary plans for rebuilding, and really much of the postwar plans for the protectorate’s built environments hinged on Zehrfuss’s vision. Having attended the École Nationale des Beaux-Arts (atelier Pontremoli) from 1928-1939, and winning the Premier Grand Prix de Rome in 1939, Zehrfuss served as a Lieutenant in the war until 1942, engaged with the F.F.L. A fresh young architect, he was initially hired as the Architect en Chef du Gouvernement Tunisien, in 1943, and from 1945-1948 he served as Commissaire Adjoint à l’Habitation et au Tourisme⁶.

For Zehrfuss—and other foreign architectural experts and technocrats operating in North Africa at the time—assessing and addressing the basic needs of accommodation and habitation required a re-examination of vernacular building typologies, and necessitated an approach that was hybrid both in its analysis and methodology. Often straddling ethnography and geography, postwar French architectural discourse strained to define the notion of habitat, which had almost comparable usage with terms like *logis* (dwelling), *machine à habiter* (machine to inhabit) or *fonction d’habiter* (residential function)⁷. But locating the vernacular went far beyond semantics, and indeed, this confused terminology actually reflects a civilizational concern or implication for what it means to build, inhabit, or dwell.

Across North Africa and the Global South, habitat projects led by the mostly European architects, were designed with indigenous dwelling typologies in mind, but largely without the consultation or participatory input of colonial subjects⁸. The seemingly innocuous notion of ‘habitat,’ as it was used with reference to housing, particularly that of the working class, dominated social science discourses of the prewar colonial Maghreb. Inasmuch as colonial social housing programming throughout the Maghreb served needs of shelter, it also functioned as a politics of landscape and boundaries, to control the movements and migrations of people—rural, urban, nomadic and otherwise.

Habitation, and the ever-pressing *crise du logement*, or housing crisis, troubled the protectorate administration, and métropole, greatly. In 1946 a specialized bureaucratic unit, the Commissariat à la Reconstruction et au Logement, was created to streamline the process of reconstruction; in Tunis, by 1950 Le Fonds d’Aide à la Construction d’Immeubles d’Habitation (F.A.C.I.H.) was instituted to speed the construction of residential

complexes, financed through government grants, proceeds of sold buildings, and credit institutions⁹. The surveyed estimate of dwellings significantly damaged amounted to approximately 8,000, whereas the total number of completely uninhabitable homes—including *gourbis*—totaled 18,000¹⁰.

Stylistically, the tensions of regionalist and modernist dialectics were architecturally articulated in the postwar building program of Tunisia—between imitation and invention, cultural continuity and deviation. Jacques Marmey spent time with Moroccan artists and builders to restore the University of al-Qarwiyyin in Fez. Collectively, Zehrfuss and Marmey and their team of architects engaged with, and, revised Tunisian vernacular forms based on transregional North African study, producing a repertoire of public buildings that was self-consciously mindful of the cultural context at hand. In Morocco as in Tunisia, Marmey’s professional practice relied heavily on the expertise of the “*ma’alem*,” local masons and craftsmen. Their familiarity with ‘noble materials’—stone, cedar wood, earthen bricks—guided multiple construction decisions. “I would go like a *mablem* [sic] to choose my stone and wood,” states Marmey, “we would install our makeshift offices on site. Designs to be executed were reworked and corrected on the spot, according to the dimensions and shapes of the materials.”¹¹ Other materials appear in their structures as well, such as rubble (*moellons*), hollowed bricks (*briques creuses*), plaster, hydrated lime (*chaux hydraulique*), non-hydrated lime (*chaux grasse*), cement, mounting rails (*fers profilés*). Overall, the scarcity of materials, and skilled artisans and craftsmen, were just some of the many issues that these architects confronted¹².

For Zehrfuss and his team, it was the vernacular form that took on a discursive and decisive role; his readings of the country’s built history offer insights to his team’s architectural repertoire. Delivering a speech to the Institut Technique du Bâtiment et des Travaux Publics, Zehrfuss himself recognized the value of Tunisia’s many historical layers, though unlike his colonial administrative predecessors, he seemed to rhetorically place the country’s Roman and Islamic imprints on equal grounding (the printed text shows parallel images of the amphitheater of El Djem and the cemetery at Kairouan). He states, “We cannot speak of Tunisia without invoking its past, a prestigious past marked by the quality of grand civilizations of which the most striking are the Roman and Muslim civilizations. The number of Roman cities constructed number more than one hundred and fifty based on excavations to date; this gives an idea of the exceptional importance of the Romans’ urbanistic efforts.”¹³ Referencing such Roman sites as the amphitheater at El Djem, the city of Carthage, Bulla Regia, or the theaters and temples of Dougga, Though Zehrfuss forefronts this heritage, he later notes that Tunisia’s “...Islamic cities and monuments are perhaps the most important lessons.”¹⁴ He prizes the Great Mosque of Kairouan as “the summit of Islamic art in the Mediterranean”¹⁵ while also praising the “harmonious proportions” in the architecture of the town of Gabès with its palm pilotis, or that of Hergla, with its fisheries and *marabout*, or Sidi Bou Saïd where every home overlooks the sea. “Toute cette architecture est vivante, humaine, et son échelle exacte.”¹⁶ Attentive to the ubiquitous presence of Islam in

Tunisia's urban landscape, he notes that “the majority of the important cities possess Islamic foundations, like Tunis, Sfax, Kairouan, Mahdia, and Monastir”; this landscape, like so many landscapes throughout the Islamic world, reflects the palimpsestic layering of imprints left by numerous generations of ethnically, religiously, and linguistically diverse peoples.¹⁷ It is this plurality of vernaculars that is so insistent to extract and draw forth.

In his discussion of this architectural heritage, Zehrfuss also considers “*rhorfas*” (sic. *ghorfas*)—aerated, vaulted rooms used for the storage of grains, olives, and cheese. Even in his own collection of personal photographs, one can see Zehrfuss’s preoccupations with and surveys of Tunisian vernacular forms. Not unlike Le Corbusier, who turned to indigenous Algerian forms for inspiration,¹⁸ Zehrfuss examined Tunisia’s indigenous dwellings as well, pooling essential similarities together instead of recognizing the differences in domestic variation¹⁹. An aerial view over Metameur (in southern Tunisia, near Médenine) exhibits the impressive honeycomb-like, layered effect of the *ghorfa*²⁰, which are built enclosing a communal courtyard. Similarly, Zehrfuss took prodigious photographs of the mound-like *ghorfas* in Médenine²¹, and the earthen, clay homes of Matmata²². The aerial photograph confirms a kind of fascination or concern with the ways that congestion and population density that is highlighted by the troglodyte *ghorfa*.

A single issue of *L’architecture d’aujourd’hui*, from 1948, was dedicated to the subject of reconstruction in Tunisia, with much attention given to the *ghorfas* of Matmata, Metameur, and Médenine. Indeed the very same original photographs included in Zehrfuss’s archival files appear here, republished in slick arrangements and juxtapositions, aestheticizing this indigenous typology. And yet, the thatched structures seen in the foreground here—ostensibly *gourbis*—deliberately highlight the whitewashed, minimalist school in the distance, sitting against the rocky cliff in the background. The same page features an ethnographic photograph of the women and children of the community, in an effort to demonstrate not simply the role of schooling in enabling these children’s presumed evolution, but in underscoring the architecture’s role in civilizing these subjects themselves. In the design of a new quarter for habitation in the coastal city of Bizerte, new housing projects featuring clean lines, quasi-*mashrabiyya*, quasi-*brise soleil* facades, are replacing, as the caption reads, the “primitive habitations”; a cloaked young girl stands next to the patchwork tent that is her family’s *gourbi*. So here, we see efforts at illuminating the binary of so-called primitive, indigenous nomadic dwelling (the *gourbi*) in clear contradistinction to supposedly civilized, sedentarized modern living. Be they earthen structures or tent-like formations, the indigenous typology of the *gourbi* was conceptualized as fundamentally insalubrious, un-aesthetic, uncivilized; the French sought to demolish them wherever possible. By introducing modern living, not just in terms of infrastructure (e.g. running water, electricity, etc.) but in terms of modern interiors, replete with furniture and other trappings of Western living spaces, it was though these fixtures might in turn bring about a ‘social evolution.’ It was the *gourbi*—and the inhabitant of *gourbis*—who needed to evolve.

These representational framings and theoretical formations of the distinctions between the *ghorfa* and the *gourbi* had posed lasting legacies beyond the Protectorate period. It is the originary myth of the primitive that not only stands to connect these typologies but actually forwards the evolutionizing and racializing threads that run through the regionalist discourses on habitat and habitation as well. Upon political independence, the national project of *dégourbification*—the demolition of the old *ghorfas* and *gourbis* constructed by this disenfranchised, and otherwise homeless class—contributed to the much grander task of modernization, stalling the specter of so-called underdevelopment. *Dégourbification* had ramifications for the transformation, and merging, of the countryside as well as the urban centers. At the height of these systematic *gourbiville* demolitions, many homeless inhabitants hailing from the Sahelian steppes and other regions of the hinterland, often fled to the center of the medina in Tunis, as opposed to the usual formation of a perimeter around the city²³.

Stylistically, the architecture defining postwar Tunisia often oscillated between the forward-looking rhetoric of modernism and a program based on the rootedness of place. Forms and typologies directly borrowed from both an indigenous and Islamic building vocabulary were expected to respond to not only the needs and dire repercussions of wartime destruction, but to various patterns of social life. Taken together, in Tunisia's postwar reconstruction program, we see a discourse emerging that grapples with the very weighty, complex, and confounding socio-political stakes of vernacularism²⁴.

NOTES AND REFERENCES

¹ Mahmoud Seklani, "Villes et campagnes en Tunisie: Évaluations et prévisions," *Population* (French Edition), 15e Année, no. 3 (June-July 1960): 485-512; 490. "Un fléchissement notable de la moyenne des accroissements des populations des zones devait entraîner une atténuation du mouvement migratoire vers Tunis et les villes du Nord. Une bonne fraction des émigrants des campagnes retournaient au "bled." On s'achemine vers un lointain "équilibre démographique" entre les zones, la zone de Tunis exceptée. Au Sahel, le développement des villes côtières, l'installation d'industries et la commercialisation de l'agriculture dans cette région ont atténué l'exode en général. Dans la zone du Sud, le dépeuplement se poursuit. Sa stagnation pourrait être attribuée en partie à l'abandon des oasis par suite du sous-équipement économique et social. Qui plus est, le tarissement des nappes aquifères de la région renforçant cette désolation a permis aux sables des confins sahariens de gagner les steppes semi-désertiques. Le reflux des populations vers la zone du Centre s'explique par le fait que cette région est très instable dans son rendement agricole et dans son peuplement. Il suffit qu'il y ait deux ou trois années successives où les pluies sont relativement abondantes pour qu'elle donne des récoltes extraordinaires dépassant de beaucoup celles du Tell. Ce qui explique le retour à la terre d'un bon nombre de ruraux partis ailleurs à la recherche du travail avant cette période."

² Richard Lawless, "Housing Needs and Policies in Tunis," *Ekistics: The Problems and Science of Human Settlements* vol. 53, no. 318-319 (1986): 157-161. Built forms are vehicles for social mobility; they are the very sites of

political struggle. Modes of inhabiting or settling fixed in power relations further entrench populations in certain social practices.

³ Julia Clancy-Smith, *Mediterraneans: North Africa and Europe in an Age of Migration, c. 1800-1900* (Berkeley: University of California Press, 2011).

⁴ J. Pelletier, *Alger, 1955* (Paris: Belles Lettres, 1959), 6-7. Citing Pelletier, Sheila Crane notes that “the city’s population grew from 214, 520 in 1931 to 357,753 in 1954, a seventy-five percent increase.” Sheila Crane, “On the Edge: the Internal Frontiers of Architecture in Algiers/Marseille,” *The Journal of Architecture*, 16:6, 941-973; 971.

⁵ *État des opérations du plan de modernisation et d’équipement à la fin de 1950* (Paris: Commissariat Général du Plan de modernisation et d’Équipement, 1951), 7. “Cette progression s’est poursuivie au cours des dernières années, notamment au sein des éléments autochtones de la population, et c’est aujourd’hui un bloc de 21,5 millions d’habitants dont il s’agit d’assurer la promotion, sur le plan économique comme sur le plan social. On connaît l’ampleur et la valeur de l’œuvre déjà réalisée par la France, dans le passé, en Afrique du Nord; on sait aussi que c’est grâce à ces efforts et aux résultats remarquables qui en sont découlés que les trois pays d’Afrique du Nord on pu, tout particulièrement depuis la fin des hostilités, connaître un essor économique et social exceptionnel. Cette évolution récente n’a été possible que grâce à l’appui financier considérable que la métropole a pu consentir, en faveur de ces pays, notamment au cours des dernières années. Elle laisse toutefois subsister encore un déséquilibre important entre le développement économique et social de ces pays, d’une par, et leur progression démographique, d’autre part.”

⁶ “Notice Biographique de M. B. Zehrfuss,” (Boîte 70, Fonds Zehrfuss 358 AA), Cité de l’architecture et du patrimoine (Centre d’archives d’architecture du XX^e siècle), Paris.

⁷ Monique Eleb, “An Alternative to Functionalist Universalism: Écochard, Candilis, and ATBAT-Afrique,” in Goldhagen and Legault, eds., *Anxious Modernisms*, 55.

⁸ Serhat Karakayali, “Colonialism and the Critique of Modernity,” in Tom Avermaete, et. al., *Colonial Modern: Aesthetics of the Past, Rebellions of the Future* (London: Black Dog Publishing, 2010), 44.

⁹ Sebag, *Tunis: Histoire d’une ville*, 526.

¹⁰ Gérard Blachère, “Reconstruction and Housing,” *Tunisia 54: Encyclopédie Mensuelle d’Outre-Mer*, Special Issue (1954): 168.

¹¹ Exposition announcement, realized by the Institut Français d’Architecture, 1982. “J’allais tel un mahlem, choisir mes pierres, mon bois. Nous installions des agences de fortune sur les chantiers. Les dessins d’exécutions étaient réélaborés et corrigés sur place, en accord aux dimensions, aux formes des matériaux.”

¹² Resident General Mast, “Tunisie: Urbanisme d’Urgence,” *L’Architecture d’aujourd’hui*, “France d’Outre-Mer,” 3:16 Année (Septembre-Octobre 1945), 41. “Aujourd’hui les villes sont prêtes pour l’édification de nouveaux quartiers, les projets passent à la réalisation, les chantiers commencent à se multiplier. Je veux dans cette Revue Technique de réputation mondiale, signaler que nous avons besoin d’aide, car les moyens d’exécution vont manquer et nous nous heurtons déjà au problème très grave de la pénurie de matériaux.”

¹³ Bernard Zehrfuss, “La Construction en Tunisie,” *Annales de l’Institut Technique du Batiment et des Travaux Publics*, No. 135, (June 1950): 2.

¹⁴ *Ibid.*, 4. “...ses villes et ses monuments musulmans sont peut-être encore plus riches d’enseignements.”

¹⁵ *Ibid.*

¹⁶ Ibid.

¹⁷ Ibid.

¹⁸ Çelik, *Urban Forms and Colonial Confrontations*, 97-103. See also Zeynep Çelik, “Le Corbusier, Orientalism, Colonialism,” in *Assemblage* 17 (1992): 59-77.

¹⁹ Sheila Crane, “Mediterranean Dialogues: Le Corbusier, Fernand Pouillon, Roland Simounet,” in Lejeune and Sabatino, eds., *Modern Architecture and the Mediterranean*.

²⁰ Hédi Ben Oueddou, *Découvrir la Tunisie, de Matmata à Tatouine: Ksour, jessour et troglodytes* (Tunis, 2001), 37-41.

²¹ *L'architecture d'aujourd'hui* included a write-up on Matmata: “L’agglomération de Matmata est située dans une chaîne montagneuse de moyenne altitude à proximité de Gabès. C’est un exemple étonnant d’urbanisme et qui rejoint par certains côtés la doctrine de Le Corbusier, en ce sens que le sol est planté et libre de toute construction, la totalité de celles-ci étant enterrée: c’est ainsi que la vue d’ensemble de Matmata offre l’image d’une palmeraie étendue, très vallonnée. Ce n’est que par avion ou en s’approchant de la ville que l’on aperçoit une multitude d’étranges cratères dont chacun est une maison d’habitation. Les habitants ont profité d’une topographie assez mouvementée et d’une nature de sol favorable pour creuser chacun leur habitation en ayant soin de ménager au niveau du rez-de-chaussée de celle-ci une entrée accessible de l’extérieur par une galerie couverte ou un chemin encaissé. Toutes ces habitations sont sur plan circulaire: au centre un large patio autour duquel sont disposées les différentes pièces: chambre, magasin, étable. Il existe même à Matmata une mosquée construite suivant les mêmes principes.”

²² Udo Kultermann, *New Directions in African Architecture* (New York: G. Braziller, 1969). Kultermann suspects that this type of dwelling dates to prehistoric times.

²³ Hédi Eckert and Jalal El-Kefi (Atelier d’Urbanisme de l’Association Sauvegarde de la Médina), “L’Espace traditionnel de la ville de Tunis (la médina et les deux Rbat faubourg ou gourbiville?)” *Les Influences Occidentales dans les villes Maghrébines à l’Époque contemporaine: L’urbanisation au Maghreb Systèmes culturels et systèmes urbains, Actes du Colloque d’Aix-en-Provence, Mai 1970* (Centre de Recherches et d’Études sur les Sociétés Méditerranéennes: Editions de l’Université de Provence, 1974), 230. “Djebel Lahmar, Ras Tabia et Somrane-Khaznadar au nord-ouest, Najâh, Mellassine et Sayyeda Mannoubîya à l’ouest, Zitoun el-Djerbi et Bordj ‘Ali Râïs au sud et Bîr el-Bey et Ech-Chouk à l’Est, ils investissent avec leur 160,000 habitants le périmètre urbain dont ils regroupent le troisième tiers, soit 34% de la population communale... Notre récent sondage de solvabilité qui a également couvert 5 gourbivilles nous a permis de constater des similitudes fondamentales entre les populations de la Médina centrale et celles habitant dans les gourbivilles, toutes deux essentiellement composées d’immigrants d’origine rurale... Il sont immédiatement suivis par les gens originaires des Hautes Steppes du centre-ouest, puis par les Sahéliens des Basses Steppes du Sahel de Sousse.”

²⁴ Umbach and Hüppauf, *Vernacular Modernism*, 9. “...the term ‘vernacular’ expressed a tension between the closed domestic sphere and the public sphere. Vernacular referred to the endemic, signifying characteristics of belonging to a specific region, of ethnic qualities, of a disease restricted to, or of a language spoken in, an area with discernible borders. To ‘vernacularize’ used to be a verb for adapting to or making someone adapt to the specificity of a region, to make the person feel at home.”



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HISTORY AND TRADITION

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