



**Journal of Engineering Sciences**  
**Assiut University**  
**Faculty of Engineering**  
**Vol. 48**  
**No. 1**  
**January 2020**  
**PP. 65–81**



## **CLASSIFICATION AND ANALYSIS OF URBAN AND ARCHITECTURAL HERITAGE BUILDINGS IN EMARITE OF JAZAN IN KINGDOM OF SAUDI ARABIA**

**Salma I. Dwidar**

*Architecture Department, Faculty of Fine arts, Alexandria University, Alexandria, Egypt*  
*Architectural Engineering Department, Faculty of Engineering, Prince Sultan University, Riyadh, KSA*

Received 26 June 2019; Accepted 7 July 2019

### **ABSTRACT**

Jazan is considered one of the most important emirates in the Kingdom of Saudi Arabia. Its Architectural heritage is divers due to its wide spread. The heritage buildings in particular represent a huge cultural and heritage wealth and must be preserved by documentation, as the Kingdom is witnessing rapid development and a marked increase in the rates of civil and urban growth, and emerged architectural patterns that are far from their environment. This led to the abandonment of its Architectural heritage, which stems from its specificity, its originality, and is characterized largely by the development of the local characteristics. This represents the need to study and explore the urban heritage in the region, to achieve the local identity of Jazan and to benefit as much as possible from the remaining heritage experiences.

In this research, several heritage buildings and urban in Jazan are being categorized and structured, because this type of building and urban fabric gives us a broad and comprehensive idea of how social, economic and political life were pursued.

This research is concurrent with interest on the official and popular level towards the case of Jazan in general and the state of the historical region in particular.

**Keywords:** Heritage Building, Environmental Buildings, Urban Heritage Fabric, Heritage architecture.

### **1. Introduction**

The urban heritage in the Kingdom of Saudi Arabia is rich in its variety of styles, roles and architectural Buildings, artistic elements. Because of the Kingdom's vastness and varied climate, its architecture varied. Each area has its own environmental characteristics and culture, which is reflected in the Architectural characteristics of each of them in its urban fabric and construction methods. Despite this diversity, there is harmony and accordance in the urban heritage everywhere throughout the Kingdom. This harmony stems from national unity and submission to the same social, cultural and religious conditions. The difference is due to the different climate and the natural environment from one place to another.

Emirate of Jazan is located in the farthest southwest of Saudi Arabia. It consists of thirteen provinces, with its headquarters in Jazan the main port of the region.

Jazan is characterized by its unique diversity and variation of terrain and climate. This diversity has led to differences in the Architectural styles of the buildings, in the urban fabric of the area, in the construction methods used, and in the aesthetic, structural and decorative elements.

**Research Problem:** There has been a growing interest in Jazan region recently after the border statement between the Kingdom of Saudi Arabia and the Republic of Yemen. This interest has led to the removal of many heritage buildings and the re-planning of the city in modern styles. Therefore, the urban fabric changed, and the new currently existing buildings have lost their identity, and it is difficult for a visitor of Jazan to see any old buildings. Due to the lack of research on the urban and Architectural heritage of the area, this study will examine the types of urban and architectural heritage in the aforementioned region.

**The objectives of the study can be summarized as follows:**

First: To preserve the heritage of the old city by making a classification of heritage buildings and urban fabric in the Region of Jazan and laying the structure of it on the basis of Architectural and urban standards, distinguished from contemporary urban construction.

Second: To propose solutions to preserve the rest of this great heritage which is close to extinction due to civil society and expansion. Also to document the heritage buildings in this historical region and invest them as part of the overall development of the city and as an element of internal and external tourist attractions.

Third: To draw attention to the subject, as this scientific research is one of the first studies dealing with the classification and analysis of urban and architectural fabric in the region of Jazan.

**Research Methodology:** Due to the historical nature of the area, and the attempt to analyze it to setup classification and structure of the urban and Architectural fabric of the old heritage buildings, the research methodology used is descriptive and analytical.

In this paper, we will present the results of this study in a concise and focused manner for ease of use to provide documentation standards and serve as the basis that can be followed in architectural or interior design of any building within the old urban area of this region.

## **2. Defining the Region of Jazan and its historical background**

Prior to the analytical study of Jazan region and determining the basis for the classification and structuring of traditional residential buildings; it is necessary to identify the area location, borders, terrain, climate, historical background, archaeological and heritage sites in the region, which illustrates the importance of the region. This step is essential in the process of classifying the buildings in the Emirate of Jazan and the structure and analysis of urban and architectural fabric in the region. In this section we will discuss the location, boundaries, terrain and climate of the Emirate of Jazan and its historical and geographical significance in the Kingdom of Saudi Arabia. [1]

### *2.1. Location and borders*

The Emirate of Jazan lies in the far southwest of Saudi Arabia between the longitudes 41°20' - 43°20' east and the latitudes 16° 20' – 17° 40'.(Fig1) Jazan region includes Jazan which is the administrative capital and the main port of the region, and includes thirteen

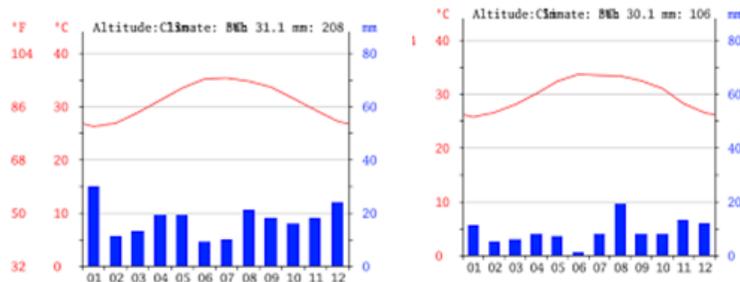
governorates. It is bordered to the north by the region of Assir, from the east and south by Yemen and from the west by the Red Sea. [3] [5]



**Fig. 1.** Location of the Emirate of Jazan in Kingdom of Saudi Arabia

## 2.2. Climate [2]

Jazan region is characterized by its diversity of terrain which provides the climate with a unique diversity. Some parts of Jazan are suitable for a winter resort, and others are considered a beautiful summer resort. [8] The lowlands, which are surrounded by mountains from the east and by the sea from the west, are very hot in the summer, with an average temperature above  $30^{\circ}\text{C}$  with potential to exceed  $40^{\circ}\text{C}$ . (Fig.2) The temperature increases the sense of heat due to high humidity, but the situation improves eastward towards the mountain highlands where the average temperature is  $20^{\circ}\text{C}$ ., [6] [7]



**Fig . 2.** Digram for winter temperature and summer temperature in Jizan Region [9]

## 2.3. Classifying the terrain [1]

The topography of Jazan region is categorized through detailed investigation into three main sections. Through knowing these sections, we can pinpoint their effect on the urban fabric and the shape of the buildings and the raw materials used in construction.

### First: Coastal Plain and Islands

It covers about half the area of Jazan and extends to the Red Sea from the northernmost part of the region to the extreme south. This path is interspersed with some volcanic protrusions.

### Second: Valley area

Jazan region is penetrated by a large group of great valleys, which descend from the high mountains to the west, to pour into the Red Sea. On the banks of these valleys are most of the cities and villages of Jazan and their inhabitants work in farming and cultivation.

### Third: Tihama mountain region

The third section lies to the east of the wide coastal region and is represented in what is called the mountainous region of Tihama, which is a chain extending from north to south, some of which rise more than 700 meters and some of them up to 133 meters above sea level.

#### 2.4. Archaeological and heritage sites in Jazan region [4]

##### First: The features of the city of Jazan

**The Great Mosque:** It is located in the city of Abu Arish, a rectangular shape of dimensions 60 x 35 meters, and the roof consists of 18 domes, The inside of the mosque is divided into 4 Courts separated by 3 rows of columns. The use of deep plaster motifs was adopted in the architectural form. It dates back 300 years. [1] (Figure 3).

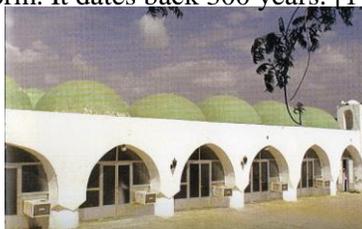
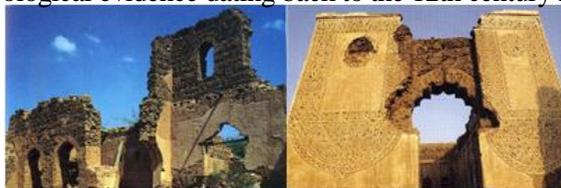


Fig. 3. The Great Mosque

**Military castle of Abu Arish:** It is one of the important fortresses built in the Turkish style, located within the city of Abu Arish. It has a square shape; the length of the side is approximately 40 meters, supported by circular towers in the corners. In the upper part of its outer wall there are openings for observation and defense. Bricks were used in the castle's construction covered by a layer of mortar. The castle dates back 200 to 300 years.

**Location of Sabia:** Sabia is located 40 km to the northeast of Jazan city and 26 km east of the coastline. It consists of two parts which are old Sabia and new Sabia which was devised by Sayed Muhammad Ibn Ali al-Idrisi in 1338 AH in his book, and was recited by al-Bakri in his book (Maajem mastajem), and Yacout Hamwi in (Maajem Al Boldan - Glossary of countries) and Hamdani in (the description of the Arabian Peninsula), And it was mentioned in a poem by Zuhair Bin Abi Salma, suggesting that the city was known in pre-Islamic times. Many archaeological sites of Sabia were excavated and documented near the Red Sea coast, and some sites bear archaeological evidence dating back to the 12th century AH. (Figures 4, 5).



Figs 4, 5. A traditional Building in Sabia

**Al-Dawasri Castle:** A castle dating back to 1225 AH and located on the top of a mountain in the city of Jazan and its horizontal plan contains four circular towers in the corners. The entrance leads to a long corridor that ends with an open courtyard, leading to the eastern entrance and the northern entrance. (Figure 6).

**Qal'at Al-Atraak (Castle of the Turks):** located north of the governorate's current headquarters, about 400 m away, above a mountain. It occupies A strategic military location, which overlooks most of the coast of the island. The military fortress consists of a

rectangular building and the length of its southern wall is 17.7 m. It has its main entrance and overlooks the current governorate headquarters. Its eastern side is 12.75 m. The walls were built of rough stones, covered with plaster from inside and outside, with thickness of 65 cm. All of the castle's walls contain small slanting

openings that wide from inside and narrow from the outside which are used to fire in defense of the castle and in response to enemy attacks, they are called "Al-Mazaghel" (in Islamic times). On the eastern side of the citadel, there are two small rooms adjoining the walls, which are covered with Chamaerops wood, and the height of the ceiling is no more than two meters. One of the rooms is used as a warehouse. The main entrance faces a slightly elevated deck on its eastern side, and stairs leading to a room that ascends the roof. It is noted that the walls of the upper roof are filled with openings for monitoring and similar to the lower openings. (Figure 7)



**Fig. 6.** Al-Dawasri Castle

**Fig. 7 :** Castle of the Turks

**The house of Al-Garman:** in the island of Kammah, located to the south-west of the island of Fursan, is located a place on the coast known as the House of "Al-Garman" or the German castle. The historian Mohammed Ahmed Al-Aqli says: The construction of this building in the implementation of 1901, during the German Turkish alliance. The purpose of the construction was to use it as a reservoir of coal used as fuel for ships crossing the Red Sea between the Suez Canal in the north-west of the Red Sea and Bab al-Mandab in the south-east, due to the strategic location of the island near the international crossing point of the Red Sea. The building is a rectangular building, the length is 107 m, the width is 32m and the height is about 4 m. It has three entrances from the north side opposite the coast with a width of 3.2 m, and the fourth door in the middle of the eastern wall is 8 m wide. The building is by the coast about 50 meters away. Built with stones, there are two rows of balanced columns; each row contains 20 square columns to carry the ceiling of the building, which was designed in a pyramid shape to be a warehouse. It was not completed, perhaps due to the defeat of the Germans and their Turkish allies in World War I in 1918. [4]

## **Second: Features of the Forsan islands**

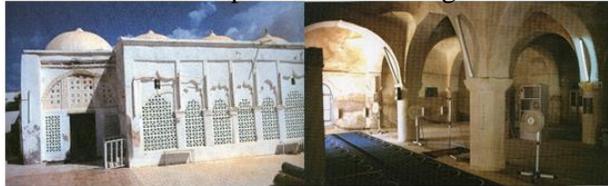
**House of Ahmed Manoor Refai:** The house is located in the center of the governorate headquarters, built by Manoor Refai, one of the largest pearl dealers in Farasan in old times. It contains a sitting hall and its extensions, with a sitting desk from the west. As for the northern side there is "moroosh مروش" covered with the building's dome which is made of rock. The most important characteristic is the sitting hall, which rises from the outside to about 6 meters. Its walls were covered with exquisite geometric plasterwork in the shape of cornices and ribbons. The windows have recessed decorative arches. On the external on facade top of the door there is a strip of writing verses of the Quran beginning with Basmalah, and the beginning of Surat Al-Fath. The interior of the hall is filled with decorations covering all four walls. In the middle of the wall top of the entrance and the windows is a frieze of plaster, with high relief writings representing the verses of the Holy Quran. In the middle of these inscriptions the word

"Allah" is surrounded by colored glass. The small upper windows that are located on top of the writing frieze were executed with plaster and imported stained glass, while the ceiling of the hall is built with imported wood with geometric patterns. All construction materials are local except stained glass, ceiling wood and dyes which are imported from outside the Kingdom, The plaster engravings and decorations are local.



**Figs. 8, 9.** House of Ahmed Manoor Refai

***Ibrahim Al-Najdi Mosque:*** Located in the center of the province, surrounded by houses from all sides and built in 1347 AH, built by Ibrahim Al-Najdi from Najd, One of the largest pearl dealers in Farasan. The mosque is a rectangle, the length is 29 m, the width is 19.4 m. It consists of the prayer hall, and an open courtyard which has two entrances leading to it: one to the west, and the other to the east, and the fence of the courtyard is about a meter high. There is also a foundation of octagonal minaret in the south-east of the mosque. To the right of the eastern entrance is a place for ablutions. The prayer hall is covered with 12 domes, all of which are decorated with multiple colors, with only a few remaining. The prayer hall has two entrances on the southern wall, overlooking the prayer courtyard. This wall is filled with decorations from the outside. It is reported that the mihrab and platform were brought from India. (Figures 10, 11).



**Fig. 10, 11.** Ibrahim Al-Najdi Mosque

***The house of Hussein bin Yahya al-Rifai:*** It opposes the house of Ahmad Manwar al-Rifai from the north. It is a building built from refined stone blocks. Its heritage and artistic value is concentrated in its rectangle main gate to the west side. The right side of the gate is covered with relief writings most which of has fallen. The upper half of the gate is filled with plaster relief decoration with an archway in the middle, leading to a small corridor leading to the courtyard of the house. On the southern side of the courtyard there is a Seating area surrounded by a corridor connected to the yard. The south-eastern corner of the building has been used as a water cycle, while the seating area from the outside is interspersed with a door and a window on both sides of the door, overlooking the open yard. The house needs renovation and attention. It is an important heritage sites in the province and is currently abandoned. (Figures 12, 13)



**Figs. 12, 13.** The house of Yahya al-Rifai

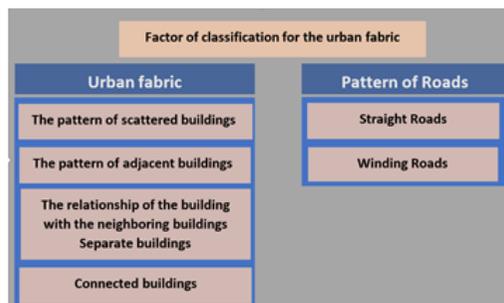
### 3. Foundations followed to classify and structure the urban fabric of the heritage buildings

Prior to the classification of the urban fabric of the heritage buildings in the Emirate; and because of the breadth and diversity of the topography, several global researches that deal with the process of classification of Architectural and urban fabric of heritage buildings were reviewed. Several factors were found and considered as the basis of classification. These factors will be shown and reviewed, and then the methodology used for classification shall be determining, which corresponds to the type of these buildings and the historical period. The factors are as follows:

#### 3.1. Factor of Classification in terms of urban fabric depending on the terrain

The urban fabric is classified as follows: [11] Diag.1

- Urban fabric: Different geographical and climatic zones
  - a) The pattern of scattered buildings
  - b) The pattern of adjacent buildings
  - c) The relationship of the building with the neighboring buildings Separate buildings.
  - d) Connected buildings
- Patterns of roads
  - a) Straight roads
  - b) Winding roads



**Diagram 1:** Factor for the Urban Fabric

#### 3.2. Architectural classification factor [10]

Historical and heritage buildings are categorized according to physical factors. Historians and architects design and divide them according to the aesthetic and architectural factors of each era, taking into consideration cultural, economic and technological aspects. The academic factors that determine the types and forms of different historical dwellings in a specific era are divided into the following: Diag 2

- The size of the building. (Core volume)
- Architectural design and shape of the building (building form)
- Plastic elements (diagnostic elements)
- Construction methods and materials
- The exterior design of the building



**Diagram 2.** Architecture Calcification

#### 4. Classification, structure and analysis of urban and architectural fabric in Jazan region

The Architectural and urban fabric of the heritage buildings, which have been visited in Jazan city, are classified according to the following principles: Classification and structure of the Architectural and urban fabric of the heritage buildings as in item. 3. Studies of site, borders, terrain, climate, historical background, and heritage in the region, as in item [2].

##### 4.1. Characteristics of urban fabric in the Emirate of Jazan

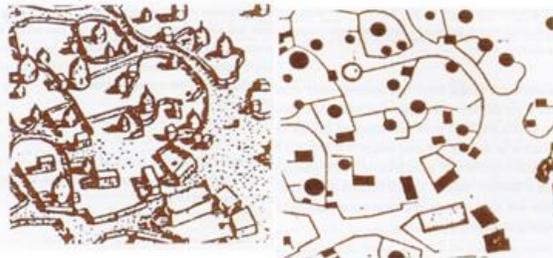
The urban fabric of the city of Jazan varies greatly depending on the different terrain in the city and therefore can be divided into: Urban fabric in the coastal plains, in valleys and in mountains.

##### **First: The Urban Fabric in the Coastal Plains**

As we head south from the Jazan region, there is a different urban pattern from the mountains and plateau. The houses in the plains are characterized by the pattern of scattered buildings and winding roads. (Figure 14)

##### **Second: The Urban Fabric in the Valleys**

The Architectural style of this area is similar to the coastal areas where the houses are scattered, separated and the roads are winding. A new type of housing was built during the Ottoman rule and the Idrisid rule of this region, which bears the Turkish character of the buildings, with internal courtyards. We see the traditional stone house and the mud house - Al Ousha - side by side. (Figure 15)



**Figs. 14,15.** Urban fabric of scattered buildings and winding roads

##### **Third: The Urban Fabric in the Tihama area (highlands)**

These stone buildings are of great height and consist of two different types of urban fabric:

- The pattern of scattered buildings:

The buildings are located on the agricultural terraces and are in the form of castles spread on farms where each family establishes their home near their agricultural lands to protect them. The style is also prevalent in the Fifa Mountains. (Figure 16)

- The pattern of adjacent buildings:

As for the villages in the high mountains, the buildings are adjacent without large spaces between them with narrow and winding corridors. These villages were established either in outposts or in the foothills of the mountains, and the villages are seen from a distance like a military fortress. This pattern shows the effect of the security aspects on the urban planning of the buildings. (Figure 17).



Fig. 16. The pattern of scattered buildings and winding roads



Fig. 17. The pattern of adjacent buildings and straight roads

#### 4.2. Characteristics of the design of traditional buildings in different areas in Jazan

The design of traditional buildings in the Emirate of Jazan varies from region to region due to the influence of environmental and civilizational factors, especially the terrain, climate and building materials. Three types of traditional buildings were found, each type is in a different area according to the former division of the topography of the region.

##### First: Types of traditional buildings in the coastal plains

**Reed House (Al Ushah):** This type of mud huts spread in the plains. It may have moved to the region from the continent of Africa through trade, cultural communication and geographical proximity. The Straw roofed round building consists of one floor, the main room is used for sitting, receiving guests and sleeping. The kitchen (Al Benayah), is built away from the hut to avoid danger and contains a set of fireplaces (Tanur). There are livestock pens; and depending on the size and potential of the family, the housing complex might be comprised of multiple huts.

The thatch roof (Al Sabl), traditionally comes to a point in the center of the structure and hangs over the sides. It is where the kitchen utensils are placed along with a small stove for making coffee. There is also a shed used during the day to spend time drinking coffee and tea. The housing complex is surrounded by a light wall of wood and straw and called (Masharej). The housing complex enclosed is called (Dara). (Figure 18)



Fig. 18. A sample housing complex (Dara) of the plains of the Emirate of Jazan

**Architectural Design:** The horizontal plan is circular with a radius that varies between 3m - 5m. The external facade takes the conical shape. The hut has two entrances that are perpendicular. One of which is to the west, where the favorable winds blow from the sea. This design makes the utilization of the area greater and better than the two opposite doors. The hut does not contain any other openings.

- **Structure and building materials:** Tree trunks, branches and leaves of some plants are used, and the bottom half is painted with a layer of clay and plaster.

- **Aesthetic elements and Architectural form:** treatments used include inscriptions on the walls of images of animals and plants and forms of the surrounding environment, suspension of colorful dishes to cheer the hut, covering the floor with a layer of clay with handmade engravements on it. (Figures 20, 21).



**Fig. 19.** Mud Nest (Al Ousha) in Jazan Province

- **Bioclimatic Performance (environmental control):** The mud hut is considered one of the most suitable buildings for the environment of Tihama plains for the following reasons:
  - a) The walls are constructed of tree logs and mud taken from the natural environment; they are not affected by the heat of the atmosphere in the region.
  - b) The height of the roof provides thermal comfort for the humans inside, as hot air rises, and cool air replaces it.
  - c) The presence of two perpendicular Entrances one of them to the west where the favorable winds coming from the sea, and the other to the north or south, helps significantly to distribute the air inside the hut and facilitates ventilation of the building.



**Figs. 20, 21.** -Suspension of colorful dishes to decorate the walls

**The Quadrangular Mud Hut (Al Arisha):** It consists of one floor; the main room is used for sitting, receiving guests and sleeping, as in (Al Ousha), but the horizontal plan is rectangular. Generally, this type was uncommon, (Figure. 22, 23). Due to the nature of the building material, it has very short expected life span of about three or four decades.



**Figs. 22, 23** - The Rectangular Mud Hut (Al Arisha) in Jazan Province

**The Farasani House (Al Bait Al Farasani):** This pattern is prevalent in the coastal areas such as Jazan and the islands, especially the island of Farasan. In previous historical eras, the island was inhabited by a group of wealthy people engaged in pearls trade in the

Middle East, especially in India. Oriental arts and inscriptions affected their architectural ideology. This is reflected in several wealthy homes on the island such as Rifai House.

**Architectural Design:** The horizontal plan is rectangular. The upper half of the main gate is filled with plaster motifs. The entrance is a central arch leading to a small corridor, leading up to an open courtyard. There is a seating area surrounded by a corridor connected to the courtyard. The south-eastern corner was used as a water cycle, and the western side has a small storage room.

- **Structure and building materials:** The building material used is a mixture of fine stone built in the form of layers. Wood is used as a building material specifically in roofing. Floors, interior walls and exterior walls are covered with plaster.

**Aesthetic elements and Architectural form:** Geometric patterns and reliefs are used in the form of friezes and straps for the cladding of external and internal walls. Sometimes in the form of tapes written from the Quran verses at the top of entrances and facades of the seating area. Wood carvings and calligraphic decoration beautify internal and external facades. Different types of archways were used for the entrances and windows, covered with beautiful colored glass. (Figures 24, 25)



**Fig. 24.** The use of plaster in the aesthetic composition inside the house

**Fig. 25.** The use of calligraphic decoration in the main entrances of houses

- **Bioclimatic Performance (Environmental Control):**

- The use of small external openings reduces thermal transfer from the outside to the inside
- The height of the ceiling provides thermal comfort for the humans inside, as hot air rises, and cool air replaces it
- The use of thick walls reduces the thermal transfer from the outside to the inside

## **Second: Types of traditional buildings in the Tihama valleys [8].**

**Reed House and Quadrangular Huts (Al Ushash) and (Al Arisha):** (discussed in the previous item)

**Traditional stone buildings:** Many buildings were built during the Ottoman rule and the Idrisid rule of this region, which bears the Turkish character and the character of the buildings in the Arab Maghreb, the primary habitat of the Idrisid . Dwelling units consist of a single-story and differ from the stone house in the mountainous areas, as the topography and the very cold climate in the mountainous areas played a major role in the construction of the mountain stone house, while the good economic situation of the person played a role in building the stone house in Tihama.

- **Architectural Design:**

The horizontal plan of the house consists of two rooms: a large and spacious room that is designed to receive guests. the other room is small and used for sleeping. The housing complex is surrounded, either by a wall built of stone and bricks, or by a plant fencing

called "Sajf". Thorns may be added to provide a kind of protection and in this case, it's called "Zerb". The windows are with a pointed arch.

- **Structure and Building Materials:**

The building materials used are a mixture of volcanic stone brought from the volcanic mountains, in addition to regular burnt clay bricks. Wood is used in roofing. The floor and interior walls are coated with plaster. External walls are covered either with plaster or clay, according to the owner's budget. (Figure 26).

- **Aesthetic elements and Architectural form:**

Plaster is used in the cladding of the walls.

Geometric patterns and plant reliefs are used in decoration. The decorations start from the middle of the interior walls to the top.

In some cases, the decoration may be placed in the upper parts near the ceiling. The plaster may be painted with light blue shade, giving a blended color with white. Sometimes paints and other colors are used. (Figure 27).



**Fig. 26.** Building materials used from volcanic mountains and bricks

**Fig. 27.** The use of plant motifs as a decorative element in buildings in the boys' area

- **Bioclimatic Performance (Environmental Control):** [2], [8]

- a) The use of small external openings reduces thermal transfer from the outside to the inside
- b) The height of the ceiling provides thermal comfort for the humans inside, as hot air rises, and cool air replaces it
- c) The use of thick walls reduces the thermal transfer from the outside to the inside.

### **Third: Types of traditional buildings in the mountainous Tihama area**

**Mountain stone buildings:** The buildings on the mountains are characterized by vertical orientation. It consists of three to four floors and may increase. Traditional buildings in the highlands differ in their shape, exterior appearance and architectural details and are of a unique nature. It is noted on the traditional mountain buildings that they were built on precise grounds geographically and geometrically to meet the needs of the past; such as the availability of security, defense and protection from environmental conditions.

The types of buildings in the mountainous area are divided into three types of buildings:

- **Al Maftoul:** It is mostly circular in shape and similar to the towers and is located on a rock high so easy to defend and protect them from the enemies (Figure 28)
- **The village:** A group of houses connected to (Al Maftoul), on its main cane in a circular shape, or squares attached to the house's rampart, so that the facade is united, with one entrance. This type of housing is used for large and affordable families (Figure 28)



**Fig. 28.** A group of Al Maftoul houses on Fifa Mountains

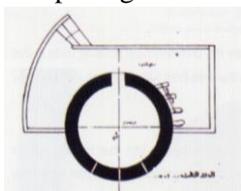
- **Al Marbo'a:** They are square or rectangular houses, which were very few in the past. These houses are characterized by: confirming the structure to ensure its strength and durability, lack of windows except for small ones for lighting and ventilation in a high position that does not reveal the interior. It is also noted that the lower floors of the houses do not contain windows for security reasons. The locations of the houses are carefully selected so that they are in places that overlook the surroundings and are difficult to reach by enemies.

**Architectural Design:** The design of the stone buildings is distinguished by the vertical movement between its different spaces

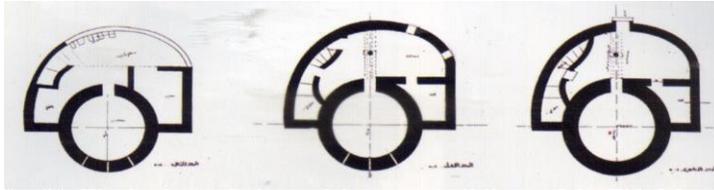
It consists of three to four floors and may increase. The population moves between the elements of the house distributed on the floors of the building through the stairs, and the rooms on the floors often open directly to the stairs. The design of the stone building spaces in the highlands depends on the number of floors, where each floor is assigned to a specific usage as follows

**The ground floor:** It has the main entrance to the building and sometimes another entrance to livestock, and the main entrance leads to the stairs. The ground floor contains a place to house livestock and grain stores. **First Floor:** If it is a full circle, it is mostly used as the main sitting hall and guests' reception for a large family. A part of it may be allocated to store agricultural yields, and another as a passage to other floors. **The second floor:** It is half the building - half the circle or slightly more, one third is used as a kitchen, and called "Al Satha", the remaining two-thirds are used as a room for sitting, dining, and sleeping. It is called a "Mashraha" which can accommodate three or four beds. **Third floor:** It is about a quarter of the house area and is called "Mashraha" and if in a big house is called "Gharabah". It is used to store important things, including weapons and precious furniture, which is rarely used. Next to this Mashraha, there is a place for bathing and washing, it is called "Masraba" (Figures. 29, 30).

There are some slight differences in the design of stone buildings from one location to another, in terms of size, area and height of the house, and the names of spaces inside the building may vary. For example, there is a special room for the head of the family at the top of the building in the third or fourth floor, in addition to the open space on the roof for observation and the presence of small openings that are used for shooting in times of war.



**Fig. 29.** Top floor horizontal plan, in a the stone buildings in the mountains of FIFA



**Fig. 30.** The horizontal plans of the stone buildings of the Fifa Mountains

- **Structure and Building Materials:**

The building material used in these buildings is the stones available in the mountains, and the wood is used specifically in roofing. The interior is painted with a layer of clay or plaster and the building method is according to the following steps:

- after selecting the site and preparing it and providing building materials of stones and wood, the area of the building shall be determined, its dimensions, number of rooms, its usage and its shape, whether it will be quadrilateral or cylindrical. The foundations are built to the surface of the earth using the largest possible stones.
- Confirming the construction is to ensure its strength and durability so that the wall is built with large stones intertwined in a construction type called the "rasm".

The wall is two or more cubits thick in the ground floor. The thickness of the wall decrease as the number of floors increases . The gaps between the stones are then filled with chips of small rocks so that all the spaces are blocked to prevent air from penetrating the wall.

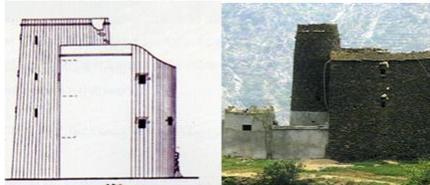
- Slots are often small and this is due to defensive purposes, (Figure 31, 32).
- The roof is covered with wooden boxes called "Alasla" as well as reeds and is called locally"
- Then cover from the outside with a layer of clay and lime slime to protect against rainfall.

- **Esthetic elements and Architectural form:**

A kind of local white stone is used to make decorative frames for windows from the outside. The interior is painted with a layer of plaster or clay with some decorations and colors that beautify the interior, this is usually is an individual effort of the housewife.

- **Bioclimatic Performance (Environmental Control):**

- Small external openings are used, which reduces the thermal transfer from the outside to the inside
- The height of the roof of the building provides the humans inside with thermal comfort, where the hot air rises up and cold air replaces it
- The use of environmental raw materials available in the area and thick walls reduces the thermal transfer from the outside to the inside.



**Fig. 31.** The facade of a stone building in the mountains of FIFA

**Fig. 32.** The external façade shows the use of white stone as an ornamental window frame and also to protect buildings from rain

## 5. Conclusions

### 5.1. Results

1. The establishment of the foundations for the classification and structuring of the urban fabric and Residential heritage buildings in Jazan city and in the south of Saudi has been achieved.

#### - Factor of classification for the urban fabric: [11]

##### Urban fabric: Different geographical and climatic zones

- a) The pattern of scattered buildings
- b) The pattern of adjacent buildings
- c) The relationship of the building with the neighboring buildings Separate buildings.
- d) Connected buildings

##### Patterns of roads

- a) Straight roads
- b) Winding roads

#### - Factor of classification for the architectural heritage buildings:

- a) The size of the building. (Core volume)
- b) Architectural design and shape of the building (building form)
- c) Plastic elements (diagnostic elements)
- d) Construction methods and materials
- e) The exterior design of the building

2. The establishment of classification of the urban fabric in the Emirate of Jazan has been achieved and the structure of it has been linked to the different climatic environments and the diver's topography of Jazan, which is divided as follows. (Diag.3)

**First:** the scattered urban fabric and winding roads in the coastal plains

**Second:** the scattered urban fabric and winding roads in the valleys

**Third:** The urban fabric in the mountainous Tihama region (highlands), which consists of two different types of urban fabric:

-The pattern of scattered buildings in the mountains of FIFA

-The pattern of adjacent buildings in the high mountains



**Diagram 3.** Architectural Fabric in Jazan

3. The establishment of classification of the Residential heritage buildings design in the Emirate of Jazan has been achieved, and a structure has been established for it, linking it to the different climatic environments and the architectural diversity in the Emirate of Jazan, which is divided as follows:

**First:** Types of Residential buildings in the coastal plains

- a) Reed House (Al Ushah)
- b) The Mud Hut (Al Arisha)
- c) The Farasani House (Al Bait Al Farasani)

**Second:** Types of traditional Residential buildings in the Tihama valleys

- a) Reed House (Al Ushah)
- b) The Mud Hut (Al Arisha)
- c) Tracditional stone buildings:

**Third:** Types of traditional buildings in the mountainous Tihama area

- a) Al Maftoul
- b) The village
- c) Al Marbo'a

*5.2. Recommendations*

1. The Emirate of Jazan is one of the oldest regions in the Kingdom which still has residential buildings dating back to ancient times. These buildings have a great variety of different architectural designs; therefore, they must be preserved. It is important to consider the preservation of the residential character of the old city and its employment in tourism.
2. It is important to emphasize the documentation of heritage buildings as one of the most important processes of preserving the heritage of human civilization. Documentation should begin with the most dilapidated and vulnerable buildings and steps should be taken to restore and maintain them.
3. The few remaining heritage buildings in the Emirate of Jazan must be surveyed and listed on tourism map of the Emirate, the Ministry of antiquities authority must offer more heritage project in jazan to highlight the heritage buildings and save them.
4. These heritage buildings located in the region can be employed to carry out a cultural tourism project by re-employing these buildings and establishing a large cultural complex including a library, an exhibition and craft workshops that attract foreign and domestic tourism. Local community will benefit from the project and it shall be complementary to the region.
5. Any type of renovation and restoration carried out by the residents of these heritage dwellings should be supervised by the eligible engineers of the antiquities authority, to avoid distortion of the original features of the buildings.
6. The Governor of the Jazan Region and his deputy should invite businessmen and investors to introduce them to the mountainous governorates, create investment opportunities and facilitate obstacles to them. The municipality and the secretariat of the Jazan region and the Tourism Development Board were coordinated with the Municipality of Jazan and the Tourism Development Council. The municipality will be located at the bottom of Mount Munjid, and will be a tourist destination for visitors to the province, which helps to visit and identify heritage buildings and buildings
7. The proposal to create a museum to collect the heritage of the province, which has a large popular heritage seeks to preserve it to make it easier for tourists to access and know the history of the province

## REFERENCES

- [1] ALshakh , A., Shira, F., Aljatali, I. and Alhanatal,S., (2010). Architectural Heritage of The Kingdom of Saudi Arabia. Ministry of Municipal and Rural Affairs, KSA.

- [2] Talib, K.,(1984). Shelter in Saudi Arabia. Martin's Press, New York.
- [3] Ishteaque , E. Alsaïd , F. (2008). The Native Architecture of Saudi Arabia. King Fahed national library cataloging-in-Publication Data, Riyadh, KSA.
- [4] Rashid, Saad bin Abdul Aziz, (2003) .The Monuments of the Jazan region, the series of the effects of the Kingdom of Saudi Arabia, Al-: Ministry of Education - Agency of Antiquities and Museums, KSA.
- [5] Evan, M. (1980).Housing, Climate, Comfort. London. The Architecture Press,
- [6] Konya A., (1984). Design Primer for Hot Climate. The Architectural Press, London
- [7] Brown, G. , (2001). Sun, Wind & Light. John Wiley & Sons Press, New York. ed 2.
- [8] Hamoda , N., (2002). Solar radiation and architecture in desert areas. *Symposium on Urban Development in Desert Areas and Building Problems*. Ministry of Public Works and Housing, . Kingdom of Saudi Arabia
- [9] Facey , W., (1997). Back to earth Adobe Building in Saudi Arabia. Al Turath, Riyad, KSA.
- [10] Nobles, A. (2014). Vernacular Buildings. I.B. Tauris & LTD, London.
- [11] Perez, J., Fusco, G., .Building Typologies for Urban Fabric Classification: Osaka and Marseille Case Studies. "International Conference on Spatial Analysis and Modeling". September 2018, University of Tokyo.

## تصنيف وتحليل مباني التراث العمراني والمعماري في إمارة جازان بالمملكة العربية السعودية

### الملخص العربي:

يعتبر التراث العمراني في المملكة العربية السعودية غني بتنوع طرزهِ ووظائفهِ وعناصرهِ المعمارية والفنية ، ونتيجة لاتساع المملكة وتنوع مناخها تنوعت طرز العمارة فيها ، فلكل منطقة خصائصها البيئية وحضارتها الأمر الذي انعكس على الخصائص العمرانية لكل منها سواء في نسيجها العمراني، أو طرق البناء المستخدمة والعناصر الجمالية والشكلية والزخرفية ، وبالرغم من هذا التنوع فإنه يوجد توافق وانسجام في التراث العمراني يشتهى أنحاء المملكة . وهذا التوافق نابع من الوحدة الوطنية والخضوع لنفس الظروف الاجتماعية والثقافية والدينية، أما الاختلاف فإنه يرجع لاختلاف المناخ والبيئة الطبيعية من مكان لآخر .

تقع إمارة جازان في أقصى الجنوب الغربي من المملكة العربية السعودية وهي تضم ثلاثة عشر محافظة وعاصمتها مدينة جازان وهي العاصمة الإدارية والميناء الرئيسي للمنطقة.

تتميز جازان بتباين التضاريس وتنوعها وتنوعاً فريداً لمناخها ، وهذا التنوع في التضاريس والمناخ أدى بالتبعية للاختلاف في الطرز المعمارية للمباني وفي نسيج المنطقة العمراني وطرق البناء المستخدمة والعناصر الجمالية والتشكيلية والزخرفية .

**مشكلة الدراسة:** نظراً لبدء الاهتمام بمنطقة جازان مؤخراً بعد تقرير الحدود بين المملكة العربية السعودية وجمهورية اليمن ، ولكن هذا الاهتمام أدى إلى إزالة الكثير من المباني التراثية وإعادة تخطيط المدينة على الطرز الحديثة ، وبالتالي تم هدم العديد من المباني التراثية وتغير نسيجها العمراني وأصبحت المباني الجديدة الموجودة حالياً بدون هوية ومن العسير على زائر جازان أن يرى أي مبنى قديم، ونظراً لقلّة الأبحاث الدراسية عن التراث العمراني والمعماري لتلك المنطقة ، فسوف تتناول الدراسة أنواع التراث العمراني والمعماري فيها

**أهداف الدراسة:** مما سبق يمكن إيجاز أهداف الدراسة فيما يلي :

أولاً: المحافظة على الطابع التراثي للمدينة القديمة من خلال الوصول لتصنيف المباني التراثية والنسيج العمراني بإمارة جازان ووضع هيكلتها على أسس ومعايير معمارية وعمرانية، حيث إنه لا يمكن تصنيفها على غرار تصنيف المباني والنسيج العمراني المعاصر .

ثانياً : محاولة اقتراح حلول للمحافظة على المتبقي من هذا التراث العظيم الذي شارف على الانقراض بسبب المدنية. ومحاولة توثيق المباني التراثية في هذه المنطقة العريقة واستثمارها كجزء من التنمية الشاملة للمدينة ككل واستخدامها كعنصر من عناصر الجذب السياحي الداخلي والخارجي.

ثالثاً: وتكمن أهمية البحث في أنه من أولى الدراسات والأبحاث العلمية التي تتناول تصنيف وتحليل النسيج العمراني والمعماري التراثي في منطقة جازان .

**منهجية الدراسة:** نظراً للطبيعة التاريخية للمنطقة ، ومحاولة تحليلها والوصول لتصنيف وهيكلتها النسيج العمراني والمعماري للمباني التراثية القديمة، فإن منهج البحثي المتبع بالدراسة هو منهج وصفي تحليلي .

وسوف نعرض في هذه الورقة البحثية نتيجة هذه الدراسة بصورة ملخصة ومركزة ليسهل استخدامها والاستفادة منها، لتكون بمثابة الأسس والمعايير توثيقية يمكن إتباعها سواء في عملية التصميم المعماري أو الداخلي لأي مبنى داخل الحيز العمراني القديم لتلك المنطقة .