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The Emergence of Agro-Pastoral Villages in Jordan Hamamet al-Olaimat village as a Case Study

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ABSTRACT This study discusses the Hamamet al-Olaimat village as a case study of the Jordanian agro-pastoral villages, inhibited in the early twentieth century for its geographic location, moderate climate and the archaeological and heritage remains. This study aims to document the architectural heritage of the village, exposing the inhabitants' impact on the existing environment and their role on creating a new urban environment and highlight inhabitants' experience in designing and building their houses. The researchers adopted field research methods to obtain data, analyse and compare them. The study reveals that there is an integrated relationship between the new inhabitants and the original environment, represented in using the archaeological features in forming their new housing. Also, in creating new types of houses with internal and external spaces that fulfil various functions and harmonize with the geographic, environmental characteristics of the location, inhabitants' lifestyle and their social and economic mode. The study recommends to the official parties to set plans to preserve the village and establish suitable projects in order to encourage and assist residents to settle and benefit from them.

INTRODUCTION

Jordan has a distinguished strategic location in the heart of the world, witnessing continuous human settlement of different civilizations along the ages. The diversity of climate, topography, and natural environment resulted in the emergence of various traditional archaeological sites and distinguished building types, in accordance with environmental characteristics, geographical location and inhabitants' living mode.

Many areas of Jordan witnessed early settlement of agro-pastoral groups of Bedouin origins (Abu Al-Sha'er 2010), wandering in these areas by virtue of production and living pattern, which mostly relied on livestock breeding, pasturing and natural farming. These settlements were mostly a result of Ottoman's adoption to settle the Bedouin tribes in Jordan (Bani Hassan and Bani Sakhr) since 1880 (Abu Al-Sha'er 2003), and were mostly in areas characterized by moderate weather and good average of rainfall (Mahmoud 1999). Its geographical nature is characterized with plains, fertile hills for farming and natural pasturing, more significantly containing caves, ruins of ancient civilizations and natural sources of water, such as ponds and springs. All of these resulted in the emergence of a number of villages and societies with distinguished, special and traditional features, reflecting a clear view of living style for the settling societies. One of these villages is "Hamamet Al-Olaimat", which is still prosperous with its inhabitants, despite the various economic, social and other impacts.

The village flourished with its inhabitants and houses, to become a clear model for sites, which have been resettled and reconstructed with housing for groups of agro-pastoral lifestyle. This has contributed to its transcendence of an ancient archaeological and abandoned status (ruins "*kherbeh*") to a modern gathering.

Many other sites in Jordan experienced the same conditions, and evolved over time to flourishing urban of highly populated villages or

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towns. These sites were the focus of interest of anthropological and architectural studies carried out by Jordanian universities and researchers, such as Amman (Al-Refae and Kana'n 1987; Al-Hmoud 2010), Soof (Al-Faqih et al. 1989), Iraq Al-Amir (Khamash 1995), Kafr Khal (Mahasneh 1997), Jaber (Mahmoud 1999) and Hayan Al-Mishref (Mahmoud 2001).

Research Objectives

This research aims at investigating the village of "Hamamet Al-Olaimat", as a case study of agro-pastoral villages in Jordan, to achieve the following objectives:

a. Document and preserve the sources of architectural heritage in general, as a cultural and civic achievement for the societies and nations who produced it and interacted with it.
b. Pointing out the extent of the new inhabitants' impact on the already existing environment and their impact on creating a new urban environment.
c. Highlight inhabitants' experience in designing and building their houses according to the available capacities and construction methods used at that time.

METHODOLOGY

The researchers referred to the related historical references of books, studies and researches. They also conducted a field study to collect data, such as site survey and analysis, field uplifting, observations, interviews, photography…etc. The researchers focussed on measuring and analysing the historical background and general characteristics of the village, as of its geographical location, area and popula-tion, climate, soil and vegetation and water resources.

The study also focussed on the current situation of the village as of its urban and architectural characteristics, such as the urban fabric, archaeological monuments, and geographic, social, and economic factors. It also focussed on housing characteristics, such as types of houses, courtyards and open spaces, building materials and methods of construction, roofing methods, and openings.

RESULTS

The Historical Background of the Village

Physical evidences in the site of the village denote that the history of human settlement was constant and continuous through all the civilizations since the Stone Age, such as water wells excavated in the rocks, caves, as well as grape presses and a cemetery in the northern side of the village. In addition, there are ruins of two churches believed to have been built in the Byzantine ages; one of them is located on the western side and the other on the eastern side of the village. The foundations of the walls of these churches and their stones can still be seen. The church on the eastern side is characterized by a carved arch, and its floor is paved with mosaics, remains of buildings, stone columns and inscriptions dating back to the Greek era. There are also site evidences denoting that the village was inhabited in the Islamic eras. Thus, the village is considered as an integrated urban site since it contains housing, religious buildings (churches) and other vital facilities (Al-Hosan 1999).

It is believed that late in the nineteenth century was the start of a new era of co-existence and settlement in the village, when nomadic tribes frequently visited it, wandering the area searching for water and pasture, erecting tents around. It is certain that the distinctive location of the village in the middle of the surrounding villages, and population's discovery of caves and water wells excavated into the rocks and the remains of the monuments, played a big role in populations' choice to relocate again. The inhabitants found the caves suitable and safe for housing, or shelter for their animals, agricultural crops and farm tools. It is worth to note that these caves have remained used until the mid-nineties of the last century when they were filled because of asphalting the main road in the village, which blocked some of them. Some caves are still called by names distinguishable to the residents of the village at present, such as "*Um serdab*", which can be reached down through stone stairs, characterized by its large size and multiple endless tunnels. Some of them were called by names of those who controlled, lived in or used, such as the cave of "Talab", and the cave of "Megbel".

The thirties period of the twentieth century is considered as the beginning of the official emergence of the village and the start of con-

struction and stability, following the enactment of the "Land Settlement Law", for the clans of Jordan in 1933 (Jordanian Legislations 1933), which mandated the lands of the village for a number of families of "Al-Olaimat clan", which belongs to the pool tribe of "Bani Hassan", where Al-Olaimat clan, led by, at that time, *Sheikh* "Rashed Olaimat", obtained the territory of this village, as his tribal front. The house, which the Sheikh proceeded to build in 1936, was the first house in the village, followed by his brothers' Mohammed and Hussein, their children and relatives in building their homes near that house. Hence, the village got the name "Hamamet Al-Olaimat" since all of the inhabitants were of the same clan.

General Characteristics of the Village

Geographical Location*:* The village is located at about 18 km west of Mafraq city, at the altitude (18$^{\text{Ė}\%}$ 302) east and (36$^{\text{Ė}\%}$ 032) north. A plateau, surrounded by hills and plains from all sides, about (840m) above sea level, with mild atmosphere in spring and summer. It is a popular destination for visitors and hikers to enjoy the picturesque nature. The geographical significance of the site is its location on the southern tip of the main road between "Mafraq" and "Jerash", and its middle location between the ancient flourishing cities and villages, in the region, such as: "Bal'ama", "Medwar" and "Rehab".

Area and Population*:* The area of the archaeological site of the village is about (15 ha), with irregular shape (Fig. 1). According to the census population for 2010, (40) families live in the village, with a total of (318) persons, (167) males and (151) females (Jordanian Department of Statistics 2010). The social structure of the population consisted of a group of "Gor'an", "Othman", and "Qalawneh" descendants of one grandfather of "Al-Olaimat" clan, and some genealogists refer them to "Enezah" tribe (Al-Khawaldeh 1997). They are part of "Al-Mashaqbeh" clan, who used to live together until the thirties of the twentieth century, then separated and formed "Al-Olaimat" clan. Generally, this

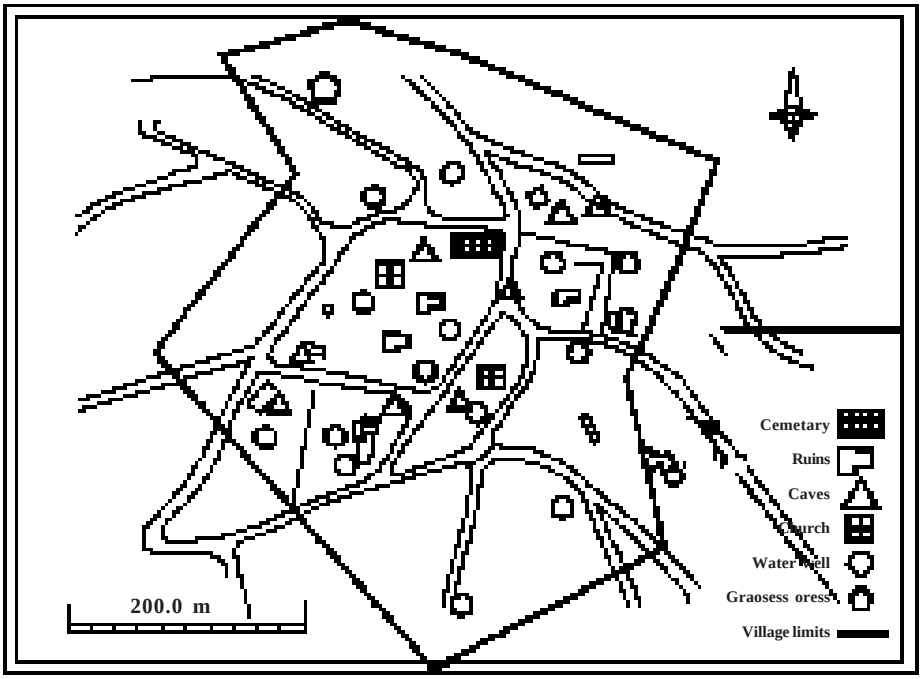

Fig. 1. Village's archaeological map, showing its borders and archaeological sites (Drawn by authors)

clan lives in Mafraq as well as in Zarqa Governorates.

Climate: The area climate of the village is that of the Mediterranean, hot and dry summer, rainy and cold winter, affected by climate depressions coming from the Mediterranean in winter with rain, and an average annual rate of (300mm) (Al-Ansari 1997). Western and North-Western winds are humid in summer, cold and dry, sometimes coming from the east and south-east (from the desert), in winter. This often results in adverse effects on agricultural crops and livestock. During spring and summer, wind blows from the east causing waves of dust - the *Khamasin winds*. Due to the village's high location above sea level a moderate summer results.

Soil and Vegetation: Village lands are extension of Ajloun Mountains, and interspersed with limestone rocks, of the Upper Cretaceous geological era (Jordanian Natural Resources Authority 1997), with suitable soils for rain watered agriculture. The soil is thick with dark colour in the upper layers, rich in carbonate calcium (Al-Khalaf M 1987), and has the ability to carry water and retain moisture for a long time. Because of the sloping nature, soil is exposed to erosion and drifting, stonewalls were built to identify lands and prevent soil erosion. In the past the village was famous for growing wheat and barley. However, at the present, the researchers notice that most of the village plains are cultivated with olives, grapes and almonds trees. The hills and slopes are deemed as natural pastures, with grasses and various shrubs such as broom, hawthorn and wild almonds for grazing and logging.

Water Resources: Rainwater is considered as the main source to meet the population's needs for household and agriculture, since it has no natural springs. Rainwater also feeds the underground water reservoirs, since it is part of the basin flowing into Al-Zarqa River. Wadi Sabqa runs through the territory of the village and its valley, formed by rainfall on the scattered hills around the village in winter. Therefore, the inhabitants adapted to collect rainwater during winter in wells and ponds, to be used in other seasons. The village is famous for its large number of ancient wells, ponds; some of them are within the living space in the traditional village and others in the western and northern slopes of the village. The ponds are formed in cavities in the rocks allowing rainwater to gather until late spring. The wells are carved vertically in the rocks, and water is extracted through an overhead slot called (bead "*kharazeh*"), and is usually surrounded by a number of stone water-

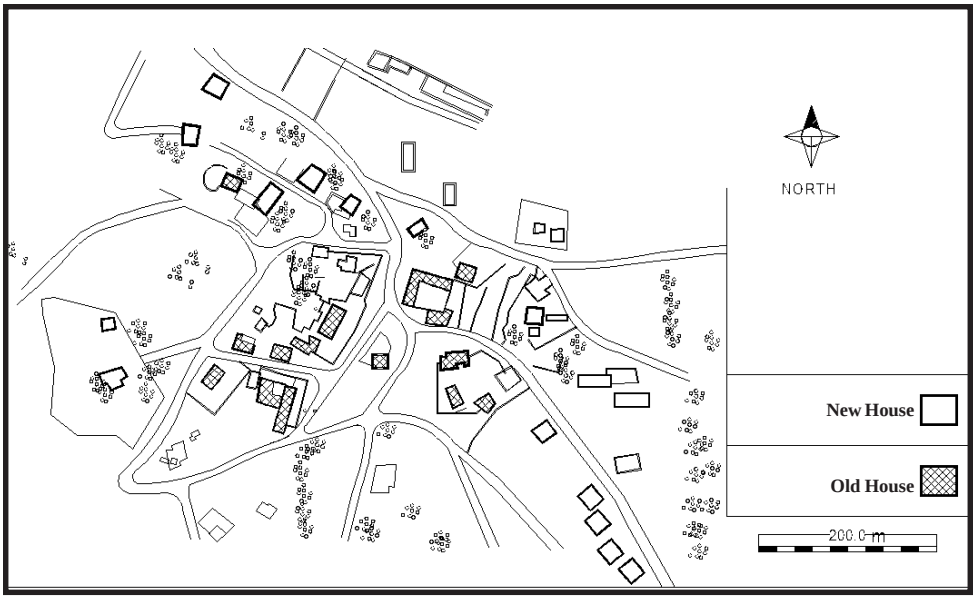

Fig. 2. Village's map showing the old and new housing (Drawn by Authors)

Fig. 3. General view showing the current situation of houses and yards in the village (Photo by authors- 2011)

pots for pouring water in it. In the years of aridity and scarcity of rainfall, some contemporary village residents quoting from their parents, that they used to bring water from the surrounding wells and springs in the villages, such as the well renowned in the area known as the "*Bear Al-Matwi*" in "Nadra" village, or "*Bear Al-Sehri*" in "Al-Medwar" village and others [1].

The Current Situation of the Village

The village features have recently changed, as for most of villages and towns in Jordan, because of the impact of economic and social development on the inhabitants and the urban fact, for various reasons imposed by the nature of the contemporary life and their transformations. Field study and analysis revealed that these changes are due to the following reasons:

·Migration of a large number of village residents, especially the educated young people to the nearby urban centres (Mafraq and Jerash cities), in order to get jobs - whether in the public or in the private sector -, or to take advantage of their educational facilities and other services.

The emergence of some urbanization features since the eighties of the last century, when new houses, main roads, electricity network, telephone cables, and water pipes expansion and constructing began, which had the greatest influence on the disruption of the traditional and social structure of the village, demolishing some heretical houses, as well as landfill of caves and other ancient features in the site of the village (Fig. 2).

Abandonment of traditional houses as a result of building new houses next to them. They converted the traditional houses to barns and fodder for those practicing livestock breeding and farming in the village, or they have been demolished in some cases, which had a significant impact on the deterioration of their condition. (Fig. 3).

Lack of attention of the local authorities, although the area is considered as a protected archaeological site, after the completion of land settlement in the village in 1996 [2]. This has left the monuments and traditional houses in the village liable for reckless and obsessive people, searching for treasures and burials, apart from being neglected, no development no projects and no maintenance for such areas so far.

Urban and Architectural Characteristics of the Village

The Urban Fabric: The current situation of the urban fabric consists of scattered housing

throughout the village, associated with each other by open spaces (courtyards and barns), pathways and routes. A main asphalt road goes through the village, dividing it into almost two parts. At a first glance, we find that the most important characteristic of the architectural structure of the village in general is the spontaneous and free (organic) distribution of housing and courtyards thereto. The researchers believe that several factors have contributed to the formation of the urban structure of the village such as:

Archaeological Monuments in the Village: In building their houses, the inhabitants were influenced by the already existing archaeological monuments at the site, as well as caves, wells and others. Hence, inhabitants selected the features of those places and used them either through restoration and building what was demolished such as roofs, doors, etc. In other cases, they built on what was left of the foundations and walls, or near them, to use the remains of the scattered stones, especially the trimmed and tidy stones, such as door steps, arches, lintels, and sides of the openings (doors and windows), as well as carved stone decoration and graphics with different connotations. This factor played a major role in the formation of houses built on the ruins of monuments, where residents were committed to building on approximately the previous division of spaces and rooms. This means that the monuments may have directly contributed, to a large extent, in guiding the inhabitants towards that formation. Residents were not satisfied with this, but attached some additions to the houses, such as service spaces (courtyards and barns) surrounding the house and rooms thereto, which helped in its formation and linked them to form a unique residential complex, expressing, to a great extent, the nature of residents' social life, lifestyle and production mode.

Geographic Factors: Characterized by its location at the foot of a hill with somewhat acute topography, locations were selected as flat as possible to build their houses. Most of the houses are linear and progressive lines with inclination of Earth's topography heading towards the east or south, to take advantage of sun's access to natural adequate lighting and good ventilation, and to protect the houses from the impact of cold winds from the west and north, especially in winter.

Social Factors: For the relationship of kinship and strong intermarriage among the inhabitants in the village, and the spread of extended families among them, houses and courtyards thereto were concentrated in one area, but varying in size and shape, depending on the social status of the landowner and the financial capacity.

Economic Factors: Due to the simplicity of village life, limited activities and professions of inhabitants at that time, which was limited to the traditional pastoral and agricultural works, sowing, harvest and storage, livestock, production of dairy products, cheese, etc., in addition to housework, carried out by women. Business was limited to livestock business and agricultural products with traders in each of Jerash, Medwar, Bal'ama and Rihab, which were the main commercial centres in the region. This was reflected in the nature of the village structure, associated with large open spaces for dwelling, and those activities.

Housing General Characteristics

A common contribution of the traditional house in the village is the humble dwellings concerning the components, easily fitting multi-uses, appropriate for inhabitant's nature, the way of living and production, to meet their household and seasonal needs. The work's nature often required staying outdoors all day long and even overnight for days. Sometimes they are away for months; thus the house is used for other functions. It is the family shelter, as well as a store for crops, farming tools and a barn for animals, cattle and other livestock.

Types of Houses: The comprehensive study of all houses in the village showed that there is an evident diversity in the types of planning, structure and number of rooms and spaces distribution there in. Analysis of models enabled the researchers to distribute patterns of them as follows:

Separate House Unit: Simple house, consisting of one room with dimensions (400cm X 600cm), approximate area (24 m^2), attached to a paved terrace from the front (entrance), surrounded by a surrounding yard. Although this type of housing consists of one space, but it contains internal divisions, terraces, and cavities in the walls for the storage of food, which

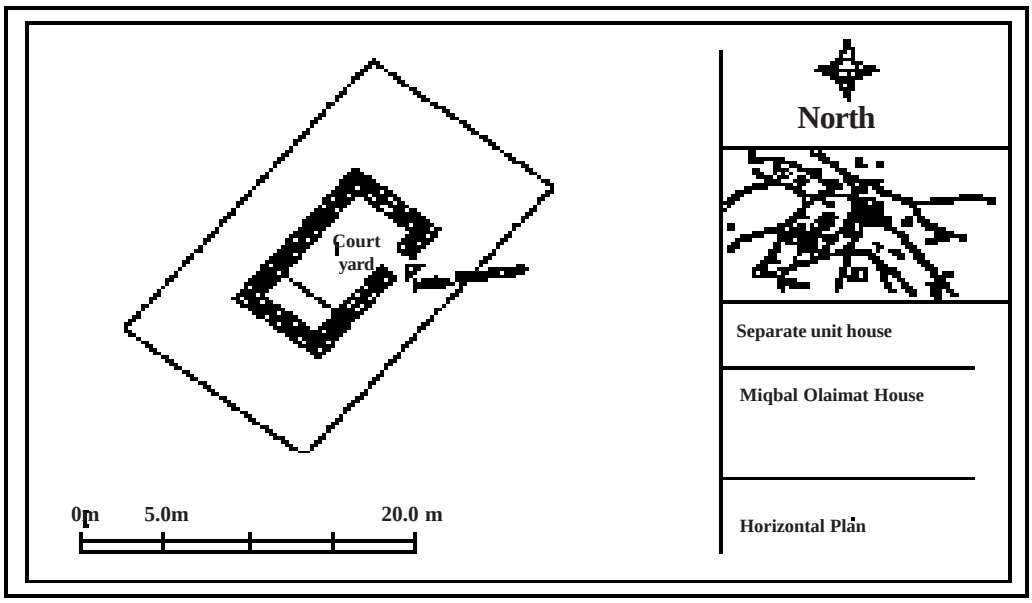

Fig. 4. The horizontal plan of Meqbel Olaimat house as a case of the separate house unit (Drawn by authors)

Fig. 5. The image of Meqbel Olaimat house (Photo by authors- 2011)

means that this space is multi-functional. This unit is considered as the basis for later house expansion according to the increase of family demands and financial capability. There is substantial evidence indicating that most of village houses started with such a unit, then expanded by adding new units gradually over the years. This pattern gives the status of flexibility and ability to expand in the future, and thus a concrete example of the concept of Core House,

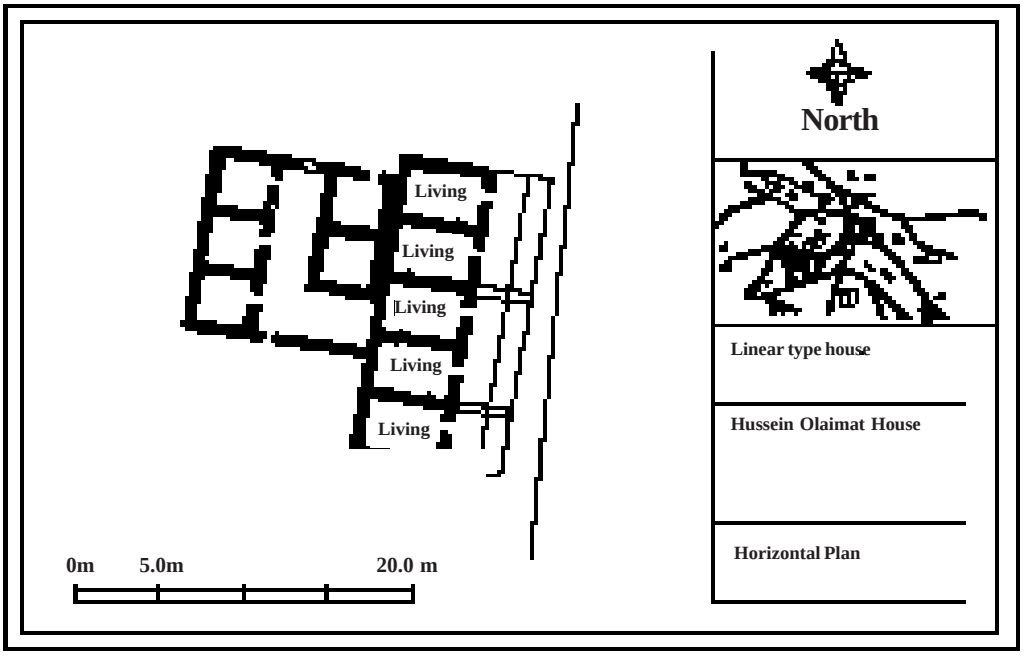

Fig. 6. The horizontal plan of Hussein Salameh house as example of linear house (Drawn by authors 2011)

Fig. 7. The image of Meqbel Olaimat house (Photo by authors 2011)

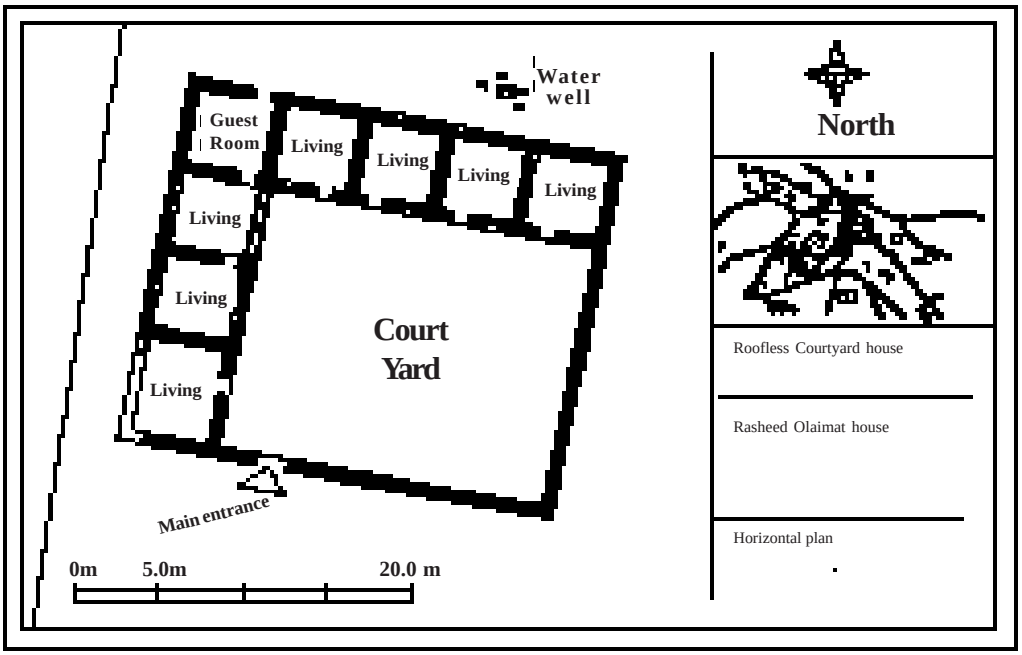

Fig. 8. Horizontal plan of Rashid Olaimat house as example of courtyard house (Drawn by authors)

Fig. 9. The Rashed Olaimat house from inside the court (Photo by authors 2011)

considered as one of the fundamental concepts that underlie the policies to resolve housing problem in the world, such as Meqbel Al-Olaimat house (Figs. 4, 5).

Linear Shape House Unit*:* In this case the house unit consist of several rooms, ranging in size from two to six rooms attached to each other in linear form (strip), which are extended on the axis from north to south, and the entrances overlooking towards the east or south- east, linked by terraces at the entrances in the yard, surrounded by all sides as well. This type was the most common in the village and in the region in general, since there is such a type in most of the nearby villages, for example, Hussein Salameh house (Figs. 6, 7).

Courtyard House Unit: It is a distribution of rooms around the inner courtyard, with closed sides, as an originated case of the traditional courtyard in other house units. The pattern is considered as one of the evolving patterns in the village, which indicate the high social status of its owner and a clear expression of his financial capability. This pattern is unique in just one house in the village, which is the house of Sheikh Rashed Al-Olaimat (Figs. 8, 9), who was the head of the clan, enjoyed political and economic influence in the region, and used to live with his wives, four sons and their families. Due to the uniqueness of this house and its pattern, the researchers gave it an in-depth study and highlighted the following characteristics:

a. The house is located in the centre of the village, and considered as one of the largest houses regarding space area and number of rooms.

The house contains seven rooms attached to each other forming (L) shape; all rooms are open to a square courtyard, surrounded from south and east by remains of a high wall with a two- meter wide gate from the south. The courtyard played a systematic role for the movement of residents and a wide arena for practicing most of household activities.

b. It seems obvious that the house was built in three successive phases, as noticed by the diversity of architectural elements, different building materials and roofing techniques were used at every phase. The walls of the four rooms built in the first phase -located on the north side- are built of relatively big irregular stones, roofed by trunks of trees, reed and mud, while the stones of phase II and III rooms were medium-sized, regular and good trimming, with relatively modern roofing style, like cement and metal beams (I beams). It is believed that these rooms were built by the remains of ancient stones at the present location, or they were dilapidated, and some maintenance and repairs were made to be habitable.

The house contains peculiar space that does not exist in other houses, locally called "*Lewan*," located at the north-west corner of the house. This space belongs to the second phase part of the house. It is a semi-open space linked to the courtyard on its east side by a stone arch, and a large stone, decorated with a regular uniformed shape and size, with concrete topped by a canopy extended from the ceiling. The *Lewan* is annexed, at its northern part, with a room with a door that opens to the northern outer space. It is believed that this room used to function as a guest room (*madafah*), because it is located at the house corner with a door that leads to outside and annexed to the house through the *Lewan*, making a connection with the outside, at one hand, and giving kind of privacy for the family, on the other hand.

Courtyards and Outdoor Yards: It is noticed that most of the houses rely on the outdoor yard (spaces) for some of the families daily activities, since they provide privacy, provide greater degree of security and safety, in addition to using these spaces as shelters for domestic animals or to store crops, fodder, etc.

The floors were paved with stones or dirt, surrounded by a wall of untrimmed stones or mud bricks, with almost two meters high. Courtyards consist of all materials and equipment needed by the agro-pastoral family, such as piles of dry grass, mangers, livestock water buckets, and arbores of large twigs to accommodate livestock and protect them from sun and rain. There are spaces to store manure and cattle dung used as organic fertilizers in agriculture or for heating. Courtyards also contained traditional home appliances, such as manual mill (molar), stoves for cooking and bread (tin or *taboun*). All these heritage items and household appliances constitute the agro-pastoral community needs, to meet most of its basic needs from the local and surrounding environment resources, and seek to achieve a kind of self-sufficiency and independence to the greatest possible extent.

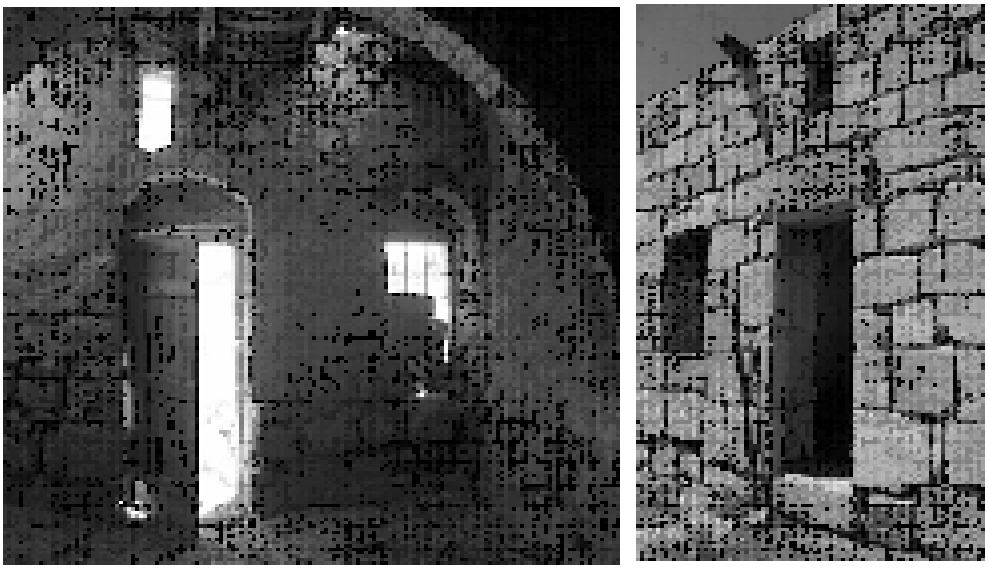

Fig. 10. The openings (doors, windows, vints) from the inside and outside the room (Photo by authors 2011)

Building Materials and Methods of Construction: The natural environment provided major building materials used by the inhabitants in constructing their houses with processed and formulated harsh limestone, as well as mud, which was devised by the inhabitants themselves, consisting of dirt and straw in addition to tree branches, and other materials available at site. Already trimmed stone blocks at site, those deemed appropriate in size and form, were re-used in building traditional houses by the inhabitants. The outside view of the houses look simple and modest, and characterized by their front stonewalls with doors, windows and vents above. Stone shapes vary in size according to the interfaces and high bonds. Pre-carved stones found at site or brought to site, from archaeological sites, were used in prominent places such as entrances, steps for doors and windows. The existence of such stones in a house gives certain significance of the social or economic status of the proprietor, or as an ornament and other outlook. At the front side of the house, appear some architectural details such as rainwater drainage channels of roof (gutters), as well as the handmade steel protection shield on the outside windows.

Doors and Windows: Doors and windows in the houses are distributed such that each room of the house has one door as a main entrance, and one window, relatively broad view at the entrance. Frames of doors and windows are made of trimmed stones with relatively sharp angles. Sizes of stones varied, according to the phase when used. Stones of the first phase were of large size, topped with one piece of a large size stone (lintel), of the ancient monuments' remains. As for the threshold and opening arcs, they are usually implemented by using limestone, since they are more solid, either the already cut or newly cut. It was more popular that doors are made in the form of arcs, and windows in the form of a rectangle; with width is less than height (Fig. 10). For several reasons, including constructional, due to the weakness of the stone, generated by the loads on the openings (Tensile Stress), width of windows' openings were made narrow. They could not do the same for the doors, for its functionality is in easy access. The constructional solution was to use the stone arc since it distributes pressure and stress above it and on both sides of the wall openings.

Roofing Methods: The study shows that houses gained an obvious diversity in the methods of roofing, according to the period it was built in and materials used. Investigations revealed that there is diversity in the style of roofing even at the level of one unit housing as well. The researchers determined that roofing methods were as follows:

- Roofing in traditional style inherited from past civilizations, depends on arc constructions (trimmed stone arcs) leaning on the side walls of ground level, based on the large trunks of trees. It bears a compact row of reeds, topped with a layer of mud mixed with straw (hay) of (30) cm thick. Thickness of this layer increases by repetition of maintenance carried out by house owners to strengthen it and prevent rainwater leakage. This method of roofing is noted in the residential units constructed in the first period of village foundation.
- Roofing by using iron beams, obviously brought from the nearby Hejaz railway station, were erected on the outer walls, topped with wooden beams, surmounted by a compact row of cane trees, and followed by a thick layer of mud. It is noted that a thin layer of concrete has increased some of roofs in subsequent periods to solve the problem of water leakage permanently.
- Roofing is based directly on the bearing walls, or on arches in the middle of the first unit's room, consisting of large trunks of trees, a compacted reeds and branches covered with a layer of packed mud, replicating the roofing system used in the older traditional house.
- All ceilings in all houses were flat, with approximately (300-400 cm) height.

DISCUSSION

Hamamet al-Olaimat is considered as a unique model of agro-pastoral villages in Jordan, an important reference to study and analyse in the field of Jordanian traditional architecture. It is a vivid example of resettled sites, and the construction of traditional houses depending on the natural and historical contents of the site, especially that they retain the architectural and urban character, reflecting the true image of the society at that time.

Despite the great difference between these environments and modes, most of them conform to the environment and carried out in accordance with the inherited traditional building methods among the area inhabitants. They also provided architectural solutions and design, fulfilling users' needs and the expected functions in simple and humane at that time, since the producing society was related directly with its living environment, and completely dependent on its available sources to achieve the various needs, including housing.

The nature of the site and its contents of archaeological and natural features, and inhabitants' social and economic characteristics had an influence on the formation of urban structure of the village and housing patterns, as well as construction and materials methods used.

CONCLUSION

The study shows that the traditional types of the investigated houses in this village, from the constructional and architectural view, have been carried out in a manner appropriate to the natural environment. At the same time, they were harmonious with the pattern of life of the inhabitants, in terms of construction systems, building materials used, urban and architectural design, and the use of appropriate architectural elements. This means that it has achieved innovative applications of the concepts of sustainable development, green architecture, and others. This clarifies the necessity of adopting the ideas and lessons from the traditional architecture from this perspective, then be studied, developed and employed in modern residential projects, in line with the needs of contemporary human, scientific and technological progress in construction materials and systems. The general characteristics that distinguish these houses are:

a. Affected by the archaeological sites in terms of location, composition and distribution of spaces, being built on the ruins next to the monuments, caves and wells, discussed above.
b. Built out at different times, according to expansion needs, such as the increase of the number of family members, marriage and the emergence of new and extended families in the same dwelling. This is observed through the presence of a clear difference in the methods of construction, roofing, shape and size of the stones used, as well as the construction of clear intervals between the outer walls in the same single house.
c. Similarity in the use of traditional methods used in the construction and building materials available, such as stones, mud and twigs and other materials.

In spite of destruction and abandonment of the village and buildings, a large part of traditional houses still retain the urban heritage and reflect its situation since its inception. This means that the opportunity still exists to maintain and make use of them, after restoration and maintenance. They can also be induced in the appropriate tourism and development projects, for the great significance of the village in this aspect.

RECOMMENDATIONS

The study recommends the following:

- Highlight the significance of Hamamet al-Olaimat since it is characterized with historical origins and constructed on distinguished historical archaeological site, similar to other sites in Jordan.
- Make use of the experience of the village inhabitants in forming and improving their housing environment by utilizing site characteristics and the traditional structural methods, available natural building materials, and designing their houses in various types suitable to their living mode, financial capacities and social circumstances.
- Recommend to the official parties in setting plans that guarantee preserving the village environment, its urban tissue and buildings by restoring and rehabilitating them and establish suitable development projects in order to encourage and assist residents to settle and benefit from them.

NOTES

(1) Based on an interview with villager Mr. Ghasab Olaimat on 15 Feb 2011.

(2) Based on an interview with the head of Department of Antiquities of Mafraq Governorate on 15 Apr. 2011

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