

Sustainable Dwellings - the case of Eastern Bekaa Valley

Mustapha Hashem El Moussaoui

Abstract— Architecture in its authenticity has always acted as a showcase to our existential phenomenon, a reflection of our adaptation procedure to our surrounding and environment. Moreover, it developed later on to reflect our ideologies, politics, and economy. In the Eastern Bekaa Valley, globalized material invaded their dwellings lately. Residents of the studied region, adapted to their harsh environment by molding materials from their surroundings to their daily use and habits. Architecture in this case didn't only act as a human shelter and an engulfing, but also, it housed the daily material supply, or extension tools. In this paper, we show case the existential foothold of dwellers pre modernized material, and how dwellers created basic sustainable materials to coop with their environment.

Keywords— Sustainability, Dwelling, Bekaa Valley, Authenticity, Vernacular Architecture

I. INTRODUCTION

Architecture, in its authenticity, has always acted as a showcase to our existential phenomenon, a reflection of our adaptation procedure to our surroundings and environment. Moreover, it developed later on to reflect our ideologies, politics, and economy.

Moreover, in the past eras, architecture was a mere reflection of existential habits, materials, and dwellers' traditions. Dwellers weren't abrupt with any globalized material, as they had to use local material, and learn how to mold the environment into their favor. Space formation wasn't only an exterior phenomenon, but also their interior spaces were shaped to reflect their traditions and survival means.

The area studied in the Bekaa valley¹- Nabisheith- has experienced a significant typological change in a relatively small time frame due to two major influences; New material use and a political decision. As with the former, it only experienced new material technology –relatively- usage such as concrete and steel until the late 1960s. Moreover, even a basic electrical connection wasn't established until the late 1960s. Therefore, inhabitants replaced vernacular architecture with new modern materials such as concrete and steel.

Globalized material invaded their dwellings lately. Residents of the studied region adapted to their harsh environment by molding materials from their surroundings to their daily use and

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¹ Bekaa valley is considered to be Lebanon's most important farming region, allocating 42% of all Lebanese arable land (MOA and FOA, 2000). The area served since the Roman empire as the grain source for the roman provinces in the Levant. Sandwiched between two mountains that go up to 3000m; Mount Hermout from the east and Korne sawda from the west, the sediments from both mountains enrich its soil for farming [3].

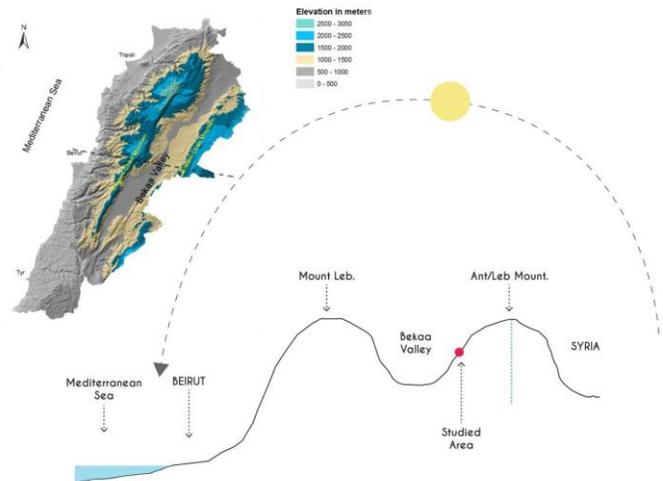


Fig. 1 Geographic location

habits. Architecture, in this case, didn't only act as a human shelter and engulfing, but also, it housed the regular material supply/extension tools. In this paper, we showcase the existential foothold of dwellings during the pre-modernized era, and how dwellers create passive sustainable architecture that adhered and merged with their surrounding environment.



Fig. 2 Exterior wall

II. CASE STUDY

Nabisheith inhabitants migrated and settled in this region centuries ago due oppression in Keserwan during the Ottoman empire². Migrants chose this land for its religious symbol and the geographic factors that acted as a natural defense from the Ottomans.

Due to extreme weather, residents adapted to the area by modifying their surrounding environment to create tools that helped them sustain their daily needs. The adaptation to the surrounding was not only an articulation of the exterior space, but it also molded their interior spaces.

III. THE WALLS

From the exterior, dwellers used local stones from the land itself – different shapes and sizes- to build their façade walls. Exterior walls were usually made of bare stone, without any rendering.

To prevent heat exchange between the exterior and the interior, two construction methods were performed, first by leaving a gap between the exterior and the interior stone walls, while filling it with mud, pebbles, and vegetal fibers. In this first method, the interior walls were rendered with lime paint made from limestone extractions found in the land itself. (fig 3).

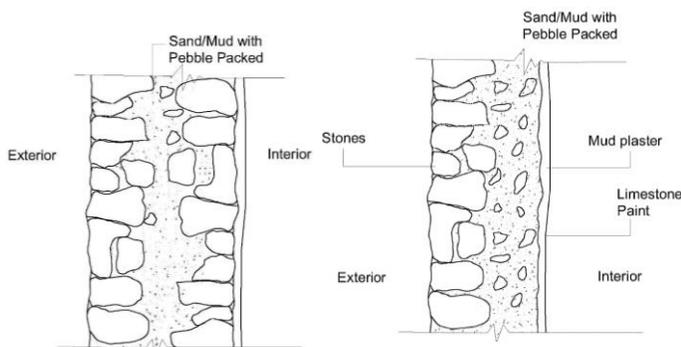


Fig. 3 Exterior wall type 1

Fig. 4 Exterior wall type 2

The other method also consisted of an un-rendered stone façade, while the gap in the middle is widened enough to act as a thermal barrier. Moreover, you will find more pebbles and small stones in this mix of mud, pebbles, and vegetal fibers. (Fig 4).

IV. CEILINGS

Vernacular methods are also applied to the ceiling structure and finishing. The ceiling structure consists of wooden beams raised and held by a series of wooden columns. Secondary wooden beams are on top, holding the mud ceiling. The ceilings are made of mud, pebbles, and vegetal fibers mix. This method required constant ceiling renovation, by running a “Mahdale” to compress the mud ceiling, and prevent water leakage. (Fig 5)

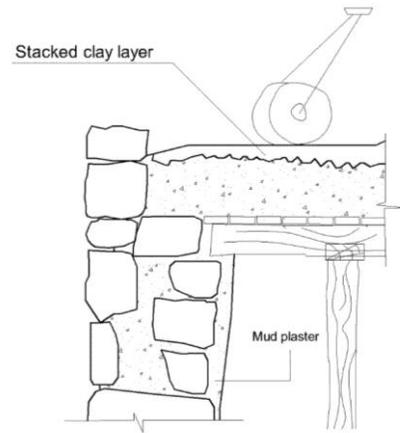


Fig. 5 Ceiling and wall section

As we have mentioned earlier, in the mid-1960's, new construction materials were introduced to the region. Although residents didn't have the financial means to start new constructions, they instigated adaptive techniques to integrate new materials with vernacular construction methods. Dwellers started pouring a concrete and pebble mix over the mud ceiling to avoid the tiring process of constant ceiling refurbishing, moreover, to strengthen the ceiling, and preventing any collapse. (fig 6)



Fig. 6 Concrete introduction to existing structure

V. INTERIORS

The material exploitation of the surrounding environment didn't only comprise the dwelling's exterior, but also it influenced directly their interior spaces. They molded the interior spaces to accommodate their existential habits. Due to the long and harsh winters, dwellers had to dwell and adapt to their environment actively, hence, creating passive sustainable methods. The lack of food in winter, especially meat and beans, led to applying new methods of food storage. The mud's ability to absorb humidity while keeping a cold temperature, residents

² Humada, S, 2012, Tareekh Al- Shiaa Fi Lobnan, Dar Al-Khayal lil Nashr wal Tibaa, Beirut, p183

molded the material into closets and spaces that stored their winter food supply.

The system created consisted of raised mud partitions that acted as air filtration, allows dense cold air to pass through the invented articulations. The cold air keeps the food fresh, while the mud's ability to absorb humidity allows long livability for the stored food supply. These kind of articulations are introduced to the sides of the main living space creating a rear passage, that allows air to ventilate space.

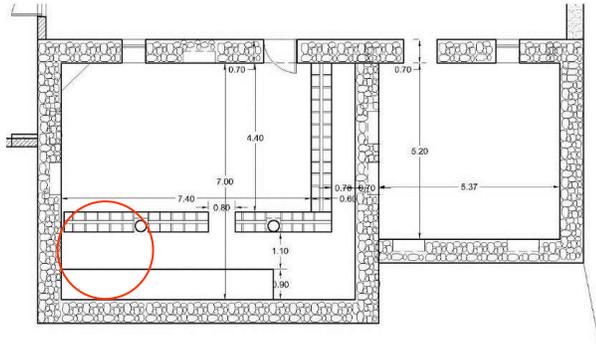


Fig. 7 Plan example of dwellings in the Nabisheith

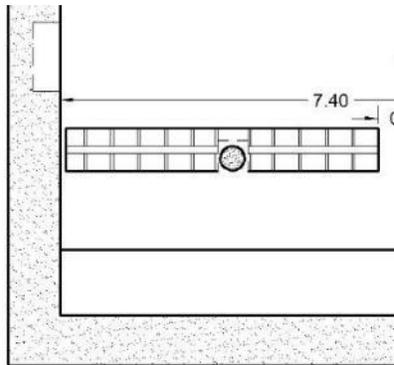


Fig. 8 Close up on the interior articulation

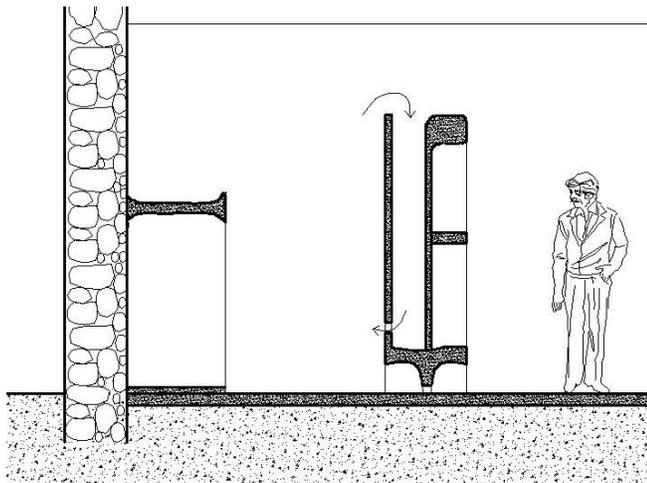


Fig. 9 Section



Fig. 10 Photo of the zoomed in spot

This 1-meter comprehensive partition consisted of closets that are open from its upper sides to insert food, while from the bottom small opening are kept and clogged with a piece of cloth. During winters, dwellers unplug the opening drop their daily need of food supply, and block it back again.

The food shortage in winter led the residents to adapt food supply to their advantage actively. Such food creation –that was either invented or adapted- is considered food heritage. Such food inventions vary from “Keshek,” “Makodous,” “Kwarma,” “Labne,” or other dried fruits (mostly figs).

VI. ORIENTATION

The orientation of this house is relative to the location. The door generally opens on the valley. In Békaa, it turns its back to dominant winds. In mountain areas, it follows the topography.

As the studied area sits on the Anti/Syrian mountains, dwellers adapted to the steepness of their land, using the slope to their advantage. Thus part of the dwelling is built on the lower part of the hill while using the upper part as a residential space. On the other hand, the lower part is used as a barn. Moreover, the ceiling of the barn is used as a terrace that overlooks the Bekaa valley. [9] (Fig 11).

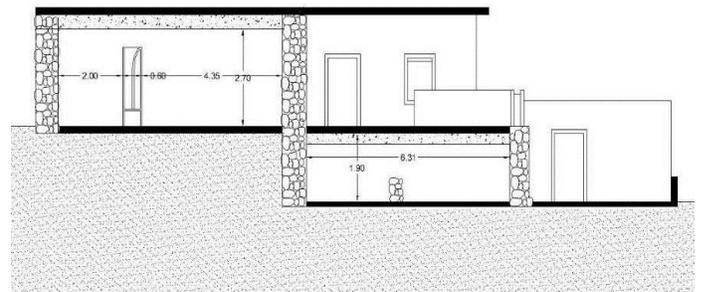


Fig. 11 Section of the studied house



Fig. 12 Another interior space articulation

Many of the remaining traditional dwellings are extremely hard to find due to their blending quality with their natural landscape and environment. The stone molds perfectly into its original land, making it appear as if it is an extension of its designated landscape.

Furthermore, ventilation is ensured through openings on the façade, while heating it by means of decorated earth hearths, braziers, and fireplaces, using the coal. The smoke is evacuated by small openings, generally on the top windows.

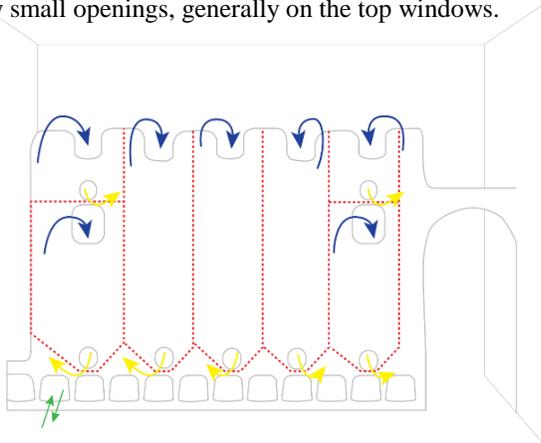


Fig. 13 How it works

VII. PHILOSOPHICAL PERSPECTIVE

In this paper we deliberated the architecture phenomenon and its physical performance with its natural surroundings, but the adaptive procedure isn't only mirrored on its architecture, it also reflects the dwellers' existential habits.

The daily contact with nature is a perfect manifestation of the existential and dwelling emergence into one. The authenticity of living in this area represents the philosophical dimension of Martin Heidegger's attitude towards the relation between the existential "I", with its physical manifestation of "Dasain". that will in turn condition man's apprehension of the world and of his life. The following establishes ground for fundamental distinction Between "authenticity" and "Inauthenticity" of Dasein, which will be determined by its relation and its "presence" to being, or being there.

According to Heidegger, an authentic relationship between building and dwelling is to be found in the etymology of those words. As Heidegger has suggested, both words share the same root origin in the Old German. This was not a surprise to him as both words were previously understood as one and the same thing.

On the other hand, building and dwelling, combined together, are central to human existence. The existential I of where we belong 'I am' and 'you are' 'ich bin' 'du bist' means I dwell, you dwell. He is suggesting that building and dwelling sit in the core of existence. Living in a house and nurturing the house is an affirmation of being. According to his etymology, when we mention the 'I am', 'you are', 'we are', we are reassuring the extreme importance of building and dwelling through human existence. Therefore, construction and land cultivation are another form of acknowledgment to human existence in languages. Later on after stating the etymology of the word 'bauen', he explores the interrelated word 'wohnen' 'dwelling'. [8].



Fig. 14 Another interior space articulation

Norberg-Schulz mentions in his book "Towards a Phenomenology of Architecture", that dwelling is synonym to "existential foothold". Moreover, the purpose of architecture in an existential sense is "to dwell". Implying it is more than a physical "shelter" but it is a space where life occurs. Real architecture has been an answer to our existential need of shelter, creating spaces to shelter our emotions and daily habits. Such architecture wasn't designed and built according to a pure aesthetic disposition following an 'international style', but rather designed according to how the material and structure performed under a specific environmental circumstances [7]. Dwellings built in the Nabisheith had certainly a certain aesthetic, as forms shaped express the need to exist, as an object by itself. Hence, the aesthetics formed due to an existential function, and not a mere economic luxury. Such architectonics resembles the human structure built to perform ultimately in its designated environment.

CONCLUSION

In the Bekaa valley, residents adapted to their surrounding environment by local tools, demonstrating their vernacular architecture. Such adaptation expresses the sustainable means that humans invent in-order to dwell in an area existentially. The exteriority of the built habitat reflects the materials found in the region provides architecture with the quality to blend in perfectly with nature. Although non-formal engineers or architects performed any construction in that area, the human will-power to survive in such harsh environments drives towards an active creation of architecture and extensions that allows residents to survive in their designated environment. Resident's creative imprint did not only reflect on the exterior facades, but also it reflected their interior spaces which were molded to satisfy their daily habits.

The studied region of Nabisheith clearly illustrates how residents invented new construction methods to adapt to their environment. Residents used sustainable means such as a mixture of mud, pebbles, and vegetal fibers, to create their walls, ceilings, and interior partitions, while finished with lime paint. The designated mixture of mud and fibers acts as a humidity absorber, hence, prohibiting food from decaying. This interior space articulation was formed in a way to allow dense cold air to continue circulating between the "storage" partitions and the living space. Moreover, residents didn't only mold their physical space to their advantage, they also adapted and invented new food traditions.

The studied phenomenon in this area represents the authenticity of "Dasein," and the active existential means of being in space. Moreover, each space represents the owner's personality and their existential adaptive behavior. Therefore, a vernacular architecture showcases the authentic, sustainable means to live with the environment. Hence in this research we observe a connection between vernacular architecture and authentic living.

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