

## SPATIAL DEVELOPMENT PLAN OF HERITAGE BUILDING STRATEGIC INVESTMENT OF ADAPTIVE REUSE IN NORTHERN JORDAN "SAMAD VILLAGE" VS ALULA IN SAUDIA ARABIA

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### Abstract

*This study focuses on the traditional heritage buildings in northern Jordan in the village of Samad, and Alula in Saudia Arabia, the study investigates the traditional heritage buildings management, restoration, intervention, reuse, and revitalization of these buildings to serve as a model for the neighboring villages. The preservation of traditional architecture is an important for adaptive reuse. The process is complex due to its intrinsic characteristics, charter and custom that are associated with its setting. In the study, the authors are contemplated different examples in which they tried to present a decisive conservation plan to restore the traditional buildings respecting their integrity relying on the adaptive reuse strategy with the scope of a holistic approach to safeguard the significance of the building's material and intangible properties. It addresses the unique values of each individual building, its context, the conservation of its material properties, its historical, and its aesthetic values. This work aims to take this conservation issue into the future to manage the maintenance of vernacular buildings in Samad. This is a dialectical process between pre-existence and the critical attitude taken to give these heritage buildings a new and much needed for re-functioned adaptive reuse. In other words, the positive variation lies in the different perspectives on the building materials and their implications. As for the restoration/intervention dilemma, the study analyzes the different adverse action methods within international charters and conventions. Finally, the title refers to the Samad case study, i.e. the analysis of a building that is a focal point for the rehabilitation of abandoned houses and this work takes one house as a representative of all the houses in the village. The house is located in the historic center of the village, which will be the main landmark and will give others a great opportunity to start restoring their own houses. The authors during their frequent surveys have a great chance to discover the studied house and explore it during their reconnaissance visits to compare it to the villages in northern Saudia, Alula as example. This comparison area will be the first start in northern Saudia, where Alula village is located.*

**Keywords:** Historical Building; Conservation; Vernacular; Jordan; Limestone; Adaptive reuse; Green environment; Water up take value; Samad; Alula

It is interesting to note that despite the increase in academic studies and research on preserving modern architectural heritage, many important works have been lost due to a lack of historical perspective, particularly in northern Jordan. Digitization can play a vital role in

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preserving this architectural heritage, and we should not hinder efforts to do so. Unfortunately, many people do not consider these buildings to be historically significant due to their recent construction and mistakenly believe that traditional methods of restoration cannot be applied to them. This often leads to disrespectful interventions in attempts to restore cultural property. The village of Samad serves as a prime example of the importance of preserving these buildings and the temporal identity they represent for generations to come.

Modern architecture is increasingly closely associated with cultural heritage in recent years. This recognition has enriched the overlapping field of heritage and architecture where disciplines intersect for the sake of constructive work to conserve the vernacular building according to international conventions and charters. The interaction of the fields led the academics to continue to deal with this matter to link heritage and modernity for preserving this architectural heritage. The ICOMOS has issued charters and documents that aim to guide or define guidelines for the preservation of modern architectural heritage [1]. Examples of such documents include the widely disseminated Venice Charter and the latest Madrid convention, as well as other documents dealing with conservation and preservation [1].

Samad village is located in Northern Jordan within the Irbid Governorate (Fig.1), the old Town of Samad stands as a testament to the rich historical heritage of the region. Serving as hubs of cultural significance, these historical centers and heritage spaces encapsulate the vibrant socio-cultural tapestry of Jordanian traditional villages. It is imperative to acknowledge the historical essence of these areas, recognizing their dynamic role as integral parts of political, economic, and social life, despite being plagued by daily actions inconsistent challenges.



**Fig. 1.** Map shows the location of Samad in Jordan

Preserving the traditional architecture, techniques, and materials endemic to each community's cultural heritage is a collective responsibility incumbent upon its inhabitants. Thus, a comprehensive conservation management plan has been devised for the revitalization of the local community of the old Town of Samad, aimed at conserving its unique architectural treasures. These vernacular buildings, emblematic of Northern Jordan's distinctive architectural style, are central to the community's identity.

Yet, the gradual destruction of the town's morphological landscape poses a significant threat to its authenticity and character, risking the loss of its intrinsic essence in the vernacular buildings patterns. To counteract this trend of removing traditional buildings and replacing them with modern houses, collaborative efforts with local municipalities and local communities are both essential. Together, we can not only safeguard cultural heritage in Samad but also address economic, social, and historical concerns in the surrounding region.

The overarching goal is to foster innovative solutions that stimulate interest in heritage and tourism of the studied area. By adhering to municipal charters and conventions of cultural heritage or vernacular buildings, the aims to protect the region's identity while creating sustainable management models conducive to long-term preservation. Despite the region's historical underinvestment, a strategic approach can unlock its potential, ensuring the enduring legacy of Northern Jordan's cultural heritage. Therefore, we took the village of Samad as a model to be followed and to be an example of all heritage buildings in Northern Jordan.

### **Historical Background**

Samad stands out as an attractive, distinctive and culturally rich Jordanian village located amidst the picturesque landscape of northern Jordan. It is located about 16 kilometers south of Irbid, 6 kilometers southwest of the city of Al-Hosn, and 25 kilometers north of the ancient city of Ajloun. Its geographical location on beautiful hills places it in the heart of the northern region, and it is a haven for those searching for the building heritage of solid lime stones cut from the surrounding quarries. But unfortunately, it is deserted and has no more than a hundred people. During our visit to the village in the winter of 2024, we saw from the highest area with a large number of villages spread in various directions, Samad finds itself close to Habka village in the northwest, Al-Zaytouna village in the south, and Al-Mazar area in the northeast. Samad is administratively affiliated with Al-Mazar District and Irbid Governorate. Archaeological and anthropological studies have focused much attention on the ancient history, extending to the roots of the of Samad [2]. Excavations and surveys indicate that the traditional village was established on an ancient archaeological site. A large group of pottery sherds were collected during many surveys conducted in the area belonging to different eras. Moreover, the presence of many water wells spread throughout it confirms the importance of the historical village, it shows the succession of people inhabiting it. They serve as vital reservoir for watering the community and their livestock, and irrigating the trees, figs, olives and grape [3, 4].

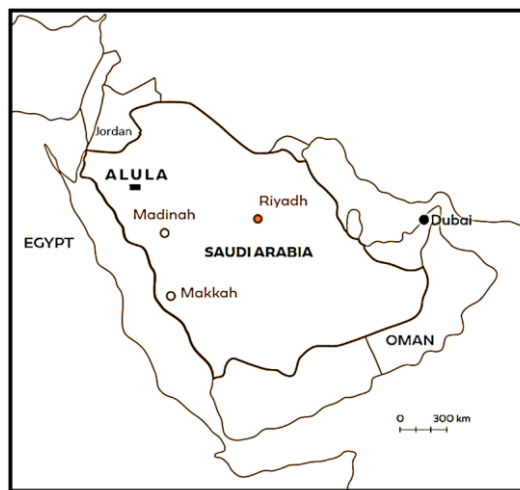
This seamless fusion of cultural heritage breathtaking natural scenery renders the village of Samad paramount destination for both cultural and natural enrichment within the region and calls for exploration and scientific research both into the architectural heritage of northern Jordan in general and Samad in particular. This is to shed light on the past so that researchers continue to uncover the secrets of its past, and the village of Samad remains a testimony to the rich cultural, archaeological and social fabric of the Kingdom of Jordan to maintain the continuity of research and investigation at the same time.

Samad was inhabited by Muslims and Christians fifty years ago, but most people headed to the city and traveled outside Jordan, but nowadays the city of Samad has become deserted and a small number of families still live in it. The Muslim families are Al-Omari, Al-Bedor, Abu Dalu and Al-Rawabdeh, and the Christian families are Al-Nimri and Amish, but their houses exist until now, but all are abandoned. Muslims and Christian families were accustomed to living together in peace and great tolerance in a narrow area in which there were the mosque adjacent to the church, the Christians were Christian by religion, but they were Muslims in their culture and dress.

Samad village is distinguished by the diversity of its building system. Design options vary for building configuration, depending on the economic and social status of the owner, but most of these buildings consider as great wealth for the region.

Limestone is a versatile and widely used material in construction building of Samad due to its aesthetic and physical properties. Samad quarries produce very hard limestone. The limestone was used in the construction of walls and facades.

There are also some Saudi villages close to the Jordanian border, an important heritage village in northern Saudi Arabia called Al-Ula (Alula) that is designed and modeled after Samad's heritage but with different materials. Alula is located in the northwestern part of the Kingdom of Saudi Arabia, 370 km north of Medina (Fig. 2), and is considered one of the most important cultural centers in the Arabian Peninsula, because it is located on the trade route that connects the south of the Arabian Peninsula with Egypt, the Levant in the north and Iraq, and archaeological and historical sources have proved that it dates back to the 6th century BC or earlier. Century BC or earlier, and its name is mentioned in Assyrian writings, in addition to a number of ancient Arabic writings, and includes several ancient monuments, including: Madain Saleh, Dadan, the ancient city, Mabiya and others [5-8].



**Fig. 2.** Map shows the location of Alula in Saudi Arabia

This region located in Medina province in the northwest of Saudi Arabia, rich of an exceptional natural and cultural heritage, is subject of an ambitious and innovative national project, turned towards a cultural and eco-responsible development of the city. This project includes urban and territorial development objectives based on the use of local resources (heritage, building materials, local Saudi companies) and on the enhancement of the strong tourism potential of the whole area. The development of Alula is supervised by the Royal Commission for Alula (RCU) established following a royal decree (No. A/29 6) in 2017, in line with the Kingdom's 2030 vision. AFALULA is mobilizing the expertise that can contribute to this ambitious project.

The architectural heritage in Jordan and Saudi Arabia presents a clear picture of the country's history and civilizational heritage throughout the ages. The conditions of the successive environments, whether geographically, socially, or climatically, have left an undeniable imprint on both countries' architecture. The Saudi and Jordanian cultural heritage is full of vernacular buildings with a very rich legacy, especially those that reflect the Islamic

heritage since the dawn of the first Islamic state and its capital, Medina, as well as Mecca, where the Kaaba and the Mecca Mosque in Saudi Arabia and the trade caravans that passed through Jordan towards the Levant. The two countries are full of old heritage buildings in various regions, especially mosques. These mosques are characterized by two distinct spaces: an interior space and an exposed exterior space. This is evident in the courtyards, which combine simplicity with architectural artistry. And we cannot forget the old residential houses that bear the unmistakable signs of the Arab-Islamic civilization and its rich architectural heritage.

## Discussion

Great strides in general have already been made in the past ten years in Jordan in the field of heritage conservation. When the beginnings of interest were noted, Jordan was lucky, and the city of Salt in central Jordan was placed on the World Heritage List, by the efforts of the local community and the state. The example of Salt, in turn, gave the attention of the local communities in Jordan and the Jordanian government to other heritage villages in the country. Samad is an example for the attention of heritage managing in Jordan. The city of “Salt” complies with the standards emanating from international agreements and heritage convention and charters, to leads our heritage village in this field.

The first houses in Samad have been changed drastically, and it is necessary to protect the heritage village quickly and sustain research and investigation in order to bring it back to life.

Generally, in recent years, the preservation, protection and rehabilitation of cultural heritage has received a new impetus by the effort of the local community supporting's. It is clear that this interest in heritage is linked to both cultural and natural values, because heritage can become, and in fact is, an incentive for the development and reusing of communities to revive them in an integrated manner, and each house plays an important role in bringing people back to the almost deserted village. For some time now it has been proven that good management in the field of cultural heritage favors the rise of economies, and opens new horizons and possibilities for local people, whether through handicrafts, new professions, cultural tourism etc. Which aims to rural development and encourages new local sustainable development strategies, where the assessment of cultural heritage takes special importance by reviving and restoring buildings in Samad.

Since there is a significant lack of ethnographic data about the historical village of Samad, the researcher spoke to the residents on 22/01/2024 to learn more about the history of a particular house. It turned out that this house was built in 1946. It was inhabited by Abdul Halim Al-Aqeel Al-Rawabdeh, from the village, and one of them was the notables of the village of Samad. The house was abandoned 30 years ago after it became dilapidated due to water entering it and lack of maintenance. As a result, its residents were forced to leave the house and move to the new Samad village. Since then, the house has become neglected, dilapidated and missing some parts.

The rooms of the house in Samad are distinguished by their low ceilings, about three meters high, and are covered with reed wood and iron bridges, some of which are made of wood, most of which are prominent. Some of these ceilings contain stones and a system of knots. As for the windows and doors, they are surrounded by decorative stone frames. The Iwan, in turn, opens onto a spacious courtyard in the middle of which is a wide-open courtyard, surrounded by olive trees and ornamental basins. Sofas or ornate chairs are placed for the comfort of the residents. The family gathers in the courtyard, as can be seen from some of the floors (Fig. 3).



**Fig. 3.** Shows the Al-Rawabdeh house with courtyard, the arrangement of door and windows and lined stone

As for the Iwan, it is a room without a fourth wall shown in figure two that opens onto the courtyard and has an arch called the crown of the Iwan. As for the interior sections of the walls in the rooms, they are covered with wood and clay to make the clay cupboards which the people of the house used to hide the wheat, and it is called a kwara (see Fig. 10). The walls are covered with white plaster, these houses are divided into four sections, which are the first one for men, and the second one is a forbidden area intended for women, and the third one is a place for those who work in agriculture (Haratheen) of the owner of the house, and the fourth dedicated to animals. The house is designed for adaptive reuse and storage of materials need for inhabitation, as well as the animal that needs for farming or transportation, the designed is shown house is shown in figures 4 and 5.



**Fig. 4.** 3D rendering of the expected drawing after restoration for adaptive reuse



**Fig. 5.** 3D landscape of the expected drawing after restoration showing storage room and water well



The courtyard, as in all houses in Samad village, is the focal point of this type of house. This means that the house develops and functions around an inner courtyard that connects all the functions of the house from the barn to the animal shed to the chicken coop. In the summer, the courtyard was also used as a threshing floor, where the first stage was to remove the wilting of the wheat stalks, followed by "threshing" the stalks and taking the grains out and storing them in places called kwara, which, as one person told us, were hidden for fear of the Turkish army, which would take the largest share of the wheat. The first stage was the removal of the corn kernels, followed by the "threshing" of the wheat stalks, which consisted of the process of separating the wheat kernels from the spikelets, which was done in ancient times manually and then mechanically using a threshing machine. Threshing machine once the wheat was threshed through a wooden board impaled with basalt stone cubes, it was left to dry in the courtyard and later, at the end of the summer, it was used both to feed the animals and to grind and make flour to make bread. Other flour was made from corn, among other functions associated with feeding the family living in the house. The courtyard was a convenient functional element for the practices of most hunting and farming practices of the owners of this type of house, as well as providing privacy for its inhabitants.

### Foundation System

According to *L.P. Bengtsson and J.H. Whitaker* [4], a building's ability to support its structural integrity and support the weight of the loads it bears depends on having a strong foundation. Furthermore, foundations facilitate the transfer of loads to stable load-bearing subsoil by acting as the anchor points to which walls are attached. Foundations are susceptible to various forms of deterioration, including moisture infiltration from sources such as rain, surface water, or groundwater, as well as potential damage from rodents, termites, and, to a lesser extent, wind. Consequently, it is imperative for foundations to possess sufficient strength to uphold the weight of walls and their associated loads, as emphasized [6-9].

As demonstrated by the building methods in Samad village, especially with regard to Al-Rawabdeh House, specific foundation materials, like stone, are frequently utilized. This unique building was carved out of the bedrock to follow its natural contours. Dressed stone leveling courses were used to keep the walls at the proper level and ensure that they fit precisely into the sloping terrain (Figs. 6 and 7).



**Fig. 6.** Shows the elastration rows of stones and their reinforcement with small stone on continuous bedrock

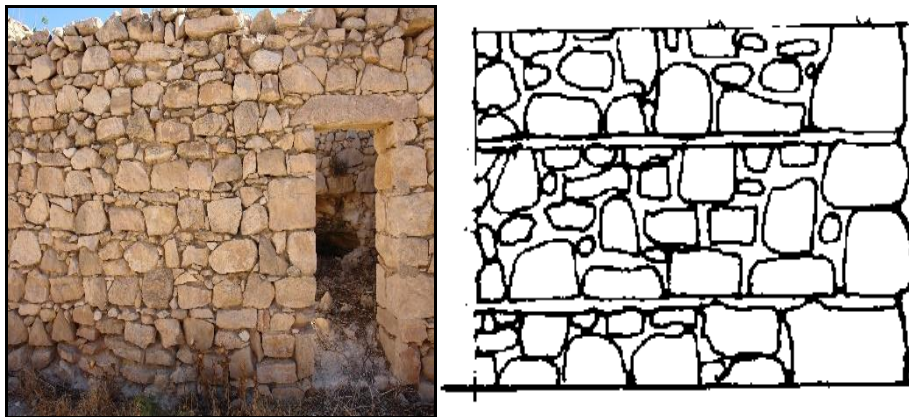


Fig. 7. Illustrate the layout of rubble rows and their reinforcement with small stone

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The load-bearing walls distinguish the structure and indicate their vital function in supporting the building and its loads. Additionally, there are two different types of walling systems that are used: random rubble inconsequence and random rubble arranged as rows. The arrangement of the stones is what mostly separates them with clay mortar (Fig.8).



Fig. 8. Schematic illustration of wall component with two outer layers and gravels filler in between

### Roofing System

The building under study is considered important in the region for its style similarity to the most of houses particularly in Samad and generally in northern Jordan [11]. It should be noted that the outer walls, as shown in figure 8, are made of limestone cut from neighboring



quarries in Samad. On the inside, the inner walls are made of mud mixed with wheat straw and a plastered of lime to give the white color. More specifically, we go into more detail about the materials and construction techniques that were used in northern Jordan in general and particularly in Samad, where limestone is abundant. The roofs in Samad were built with the development of wood flat roof trusses to iron square rod bridges with sugarcane wood carried on horizontal iron girders bridge. The old houses have other roof styles which carried cypress wood. A type of sugarcane that was widely used at that time, which covered both the gable roof, as shown in figure 9a and b. They placed the beam in a horizontal line while placing the reeds next to each other vertically, then applied a layer of straw to close the voids and another layer of clay mixed with straw. Regular maintenance of the roof was done every year, and they kept in mind to make the roof surface sloping to allow water to move towards the nozzles or the so-called gutter (Mizrab). They would lay a layer of stone fragments and then add a concrete layer on top of the clay and straw layers to prevent water from seeping into the house. As a result of the heavy load on the roof and lack of maintenance, the roof began to fall off and the remains of the reeds and the sugarcane beams are still present in the rooms.



a.



b.

**Fig. 9.** Showing iron bridge carrying the sugarcane wood beams and another component in the roof:  
a. showing wooden bridge carrying sugarcane wood on Arch-shaped structure;  
b. Iron bridge caring sugarcane beam on a regular flat roof

## Structural Properties of Clay Pavers

The nature of the materials that make up the soil in which the floor of the houses is paved with granules is to have voids between them as a result of the irregular shape of the granules, for example gravel or sand granules are circular or in irregular shapes, and if the soil is not cohesive, the clay is mixed with wheat straw to increase tenacity with smaller granules to increase the cohesion of the mixture after it dries, so that it fills the voids between them, and this process can be continued until the voids are largely filled, and this process can continue until the voids are largely full filled, which will lead to increase the friction between its components, this is what happens in the case of walls built with pressed clay. But this method aims to increase the consistency of the soil (Fig. 10). This process makes it difficult to flat, and in order to be smoothed, the material must be in a state of fluidity that is easy to pour and form without increasing the amount of water it contains. So, another method had to be found. The material becomes softer and more liquid and allows it to be poured and molded, after pouring the floor and sprinkling it a little with cement material and putting oils in the form of dots to facilitate the smoothing of the rooms floor, which is what was used in the past.



**Fig. 10.** Showing the clay floor of the house and the front of the photo is a wheat storage called Kwara

Doors are indispensable in any house; they are for protection and give the first impression of the house. In addition to its function, the variety of entrance models also brings elegance and luxury to help highlight the decorative style in different cultures and transform the facade. Since doors are important safety elements, it is also necessary to check some points regards when choosing. Paying attention to the entrance style, the locks compatible with each type. Whether the door is inward or outward, it is essential to pay attention to all these details so that you can make the right choice for your house and fill it with excellent materials that will last longer and provide more security for your house and its inhabitants and animal (Fig. 11 a).

There are a variety of door and window types in Al-Rawabdeh house and Alula houses (Fig. 12). The doors of the main entrance to the house from the outside in the form of a lintel and from the inside in the form of an arch, consisting of a large door and the middle of a small door, so when people enter, the small door remains open, but the whole door opens if a large animal enters, such as cows and camels. While the doors of the building are simple rectangular in shape.





**Fig. 11.** At the top, General view of the house landscape showing the remaining part of the house wall and the main outer entrance, below, general view of Alula village in Saudia



**Fig. 12.** A collection of door patterns in the village showing how the arches are built and the doors are made of wood and iron

Protect the stone surface from biological deterioration, acid rain and other deterioration factors. Generally polishing and washing the surface layers with sprayed water and sand to get rid of dirt on the stone surface.

In architectural restoration procedures, diagnosis constitutes a set of tests and investigations in order to scrutinize and assess the condition of heritage building, in most cases prior to the choice of intervention and work site, which allows for a deeper knowledge of the pre-existing heritage building and its state of conservation. Thus, the correct design of the diagnostic phase can lead to an accurate definition of overall conservation project, avoiding or minimizing variables during the work and ensuring that the physical integrity of the heritage building is preserved at the same time. Diagnostics in a conservation project assumes its own validity when compared to other fields of analysis (survey, historical research, analysis of deterioration mechanisms). In this way we can the threshold of knowledge of the heritage building being worked on be increased and the limits of direct observation, which nevertheless remains an indispensable stage. In this way it is desirable to clean. Reinforce and protect the stone surface patina, therefore the elimination of the effects caused by the presence of water (for capillary rising water coming from ground level, by dehumidification that prevents and inhibits the rising of water in the stone bores) [12-13]. Compaction by minimal grouting using adhesive materials made of synthetic resins mixed with hydraulic lime combined with crushed powder stone to use as stone coating (Fig. 13).



**Fig. 13.** Shows the condition assessment of Al-Rawabdeh building and the extent of deterioration of the front facade

Types of existing homes might be of most interest from the point of view of the local community and municipality to create job opportunities and make the village bustle with people again.

Thematically, Samad Village will be the link to northern Jordan in the heritage village restoration process [14]. This study in the area is basically a precursor to village rehabilitation that will take advantage of the more centralized areas of the region and integrate the villages around Samad with other villages. Rehabilitation is essential to provide opportunities for investors in the area of rehabilitating heritage villages and creating new job opportunities in the region [15] and especially in Samad which needs to be reintegrated have been depopulated since the 1980s, so there is actually a return to these areas.

## Conclusions

The purpose of the work is to stimulate the aspects that allow a return to these incentives regarding the promotion of the importance of heritage and conservation at different levels, from the granting of licenses to the occupation of public spaces to the establishment of restaurants, the authorization to occupy public spaces to the establishment of a construction site, as well as to council property tax relief and so on until homeowners are encouraged to return.

Adaptive reuse nowadays plays a crucial role in preserving heritage buildings and finding a suitable reuse method for their sustainable development [16-17]. The heritage buildings in northern Jordan are of great cultural, historical and architectural value. Adaptive reuse of heritage buildings allows them to be revitalized at a time when many of their owners are building new buildings in their place. The reuse and maintenance of these buildings must be accelerated, preventing their deterioration, neglect or demolition. By finding new uses for heritage buildings, we can ensure that they continue to contribute to the cultural fabric of the community and retain their unique identity, which is one of the most important features of buildings and their design and use in Northern Jordan and Samad. will be an example to follow.

Adaptive reuse promotes sustainable development by maximizing the use of existing resources in the surrounding area. Instead of constructing new buildings, adaptive reuse enables the revitalization of existing buildings by creating a new use for them. This reduces the consumption of materials, energy and land associated with new construction, minimizing the environmental impact of living in a green environment required by most modern policies.

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