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EVALUATING THE VIABILITY OF THE ERBIL CITADEL HOUSES FOR ADAPTIVE REUSE PROCESS

Wafaa Anwar Sulaiman Goriel[1], Dr. Erzsébet Zoltán[2], Dr. Tamás Molnár [3]

[1]Ph.D. student, Marcel Breuer Doctoral School, University of Pécs Faculty of Engineering, and Information Technology
wafaa.anwar.sulaiman@gmail.com
[2]Associate professor, University of Pécs Faculty of Engineering and Information Technology
zoltan.erzsebet@mik.pte.hu
[3]Associate professor, University of Pécs Faculty of Engineering, and Information Technology
molnar.tamas@mik.pte.hu

Abstract: *Notwithstanding its potential advantages, adaptive reuse has grown in popularity as a sustainable development strategy across the globe. There is a shortage of studies on the methodology and results of adaptive reuse projects in the Middle East. Erbil Citadel's Houses is a special kind of conservation and adaptive reuse Project.*
The Middle East, particularly in conflict-affected areas, has received very little research on the methodology and results of adaptive reuse projects. The challenge this research attempts to solve is how to preserve historical sites like the Erbil Citadel houses using adaptive reuse as a sustainable development method. This paper tries to answer what are the key aspects of adaptive reuse as a sustainable strategy for historic structures. By analyzing the difficulties and opportunities related to adaptive reuse to address this gap. The findings from this research can help establish best practices for adaptive reuse in comparable situations and guide the formulation for sustainable development in Middle east areas.

Keywords: *viability, Erbil citadel, Adaptive reuse, preservation, sustainable development.*

1. INTRODUCTION

Buildings, monuments, or any historical sites have been aged, and their original use is no longer available it needs to be reused again. Adaptive reuse one of these processes and methods

deals with those old structures to encourage sustainable conservation for that place. Middle East historical buildings as another area might be neglected and decay. To promote sustainable development, adaptive reuse could be the best approach to serve the area's cultural legacy. However, it needs a scientific approach to control these sites through adaptive reuse to achieve this. As it is known, adaptive reuse projects have a lot of challenges and could be a result of many elements on a social level, economic, or even cultural level. Moreover, the viability of the adaptive reuse projects might influence these factors and the place value itself. Although these obstacles are attached to the adaptive reuse projects there are many successful examples of converting some historical buildings, houses, or schools to craft shops or accommodations to save the cultural history of that place.

Meanwhile, adaptive reuse offers a sustainable approach to studying the methods that have been used in the world the aspects that could be required for such projects, and the possibilities of the outcomes to understand the social and cultural criteria of such internationally developed projects that cases could benefit those in the middle east, especially in Iraq, the Kurdistan region. As it is clear throughout history, in some places in the Middle East. Iraq has been affected by the wars, the conflicts, and surely the buildings are the first victims, so adaptive reuse opportunities are needed to protect the historical value of that site.

2. ADAPTIVE REUSE POTENTIALS

Indeed, the Adaptive reuse process has challenges but at the same time a tool to protect the historical buildings and to save the architectural identity of the site, meanwhile reusing the old structure minimizes the effect of the new construction on the environment.

Besides that, the Benefit is a lot, economic- job opportunities, social- tourism attractions, and cultural benefits of Adaptive reuse as the preservation phase is considered a unique approach to knowing about ancient buildings and is inherent for future generations to know about the history.

However, the research will try to review adaptive reuse projects worldwide and evaluate the constraints attached to the historical structures and how could benefit those case studies and especially the houses in Erbil citadel.

The obstacles could be defined on different levels such as the need for professional labor, financial issues, evaluating the building situation, and awareness of the cultural value of that place.

This study will give insight into the two houses' condition as a starting point for the adaptive reuse process and define the identity of the new uses depending on the previous experiences of the international cases.

Therefore, it shows the Adaptive reuse challenges and benefits for the historical Sites and how could this approach offer good guidance and a distinctive way to serve the houses in the citadel.

Lack of experience in Adaptive reuse in the Middle East and of it is exit not ideals. All this encouraged this study to run the crucial situations for the possibility of using the process to preserve the existing structure and prevent Faulty reuse experiences. As a useful sustainable tool to help the stakeholders to protect the buildings' history and save them from death,

addressing the gap of the practice in the middle east and identifying the main challenges and the best approach for more successful adaptive reuse circumstances. Since there is a limit of studies, and no clear approach could be applied to case studies around the world, there will be analyzed the most popular projects and to the advantage of their potential, it could as an inspiration process to ascertain the efficient new uses of adaptive reuse.

3. ADAPTIVE REUSE DEFINITIONS: PREVIOUS STUDIES

When an old structure of a historical site is out of date and needs maintenance, Adaptive reuse comes as the second phase to save and cultural heritage of that Place.
Adaptive reuse could work as an Adaptive reuse protection tool against the war or conflict impacts on those buildings.
For example, in (1993) Booker & Stone's book formally defines the design approach for modifying existing structures with the main approaches of Analysis, Strategy, and Tactics. Also, it is necessary to understand those structures to create a new future for the building and those who occupy it. [7]
An overview of the existing theories on adaptive reuse has been presented seen from the perspective of heritage conservation and architecture through an extensive study of scholarly literature and compared and classified according to their approach toward adaptive reuse. [2] So, it distinguished three contemporary approaches: the typological approach, the technical approach, and the strategic approach, and it noticed a strong overlap between the categories presented by the different authors. [2, 4]

Also, the researchers indicated in 2016, that many categories of sociocultural, economic, and physical aspects could affect heritage buildings, [3] All the factors should be taken into consideration in the adaptive reuse decision-making process to find the most appropriate function for the buildings, considering the different dimensions of adaptive reuse and It is not only enough to retain the building physically, originality of the buildings must be preserved by giving appropriate function and appropriate users. [3, 5, 6]
In Alhojaly's study argued that the reused building does not have to be an important piece of architecture for the process to be successful, but it is necessary to respect the building's history and structure when a new function is introduced. [12] adaptation a term addressed by many researchers, means any work building over and above maintenance to change its capacity, function, or performance. [5]
Adaptation is the process(es) of modifying a place for compatible use while retaining its cultural heritage value. Adaptation processes include alteration and addition. [1]
Adaptation means changing a place to suit the existing use or proposed use. [1] another synonym for Douglas conversion, making a building more suitable for similar use or another type of occupancy, either mixed or single use. [5]
Work includes a change in function or changes in use, such as converting an office block and making it suitable for residential use. [8] conversions always affect the structure of a building. They extend the concept of refurbishment to interventions in the load-bearing members and/or the interior layout. [7] see e.g., Figure 1, 2

4. ADAPTIVE REUSE IN EUROPE: HUNGARY

4.1. The Great Market Hall

The Great Market Hall, also known as the Central Market Hall or Nagyvásárcsarnok, is a prominent architectural landmark located in Budapest, Hungary. Built in the late 19th century, it is one of the largest and oldest indoor markets in the city. Over the years, the Great Market Hall has undergone adaptive reuse, transformed its purpose, and preserved its historical significance. [13]

Originally designed as a bustling marketplace, the Great Market Hall served as a vibrant hub for local traders, farmers, and shoppers. The architectural style of the building reflects a blend of Neo-Gothic and Renaissance Revival influences, featuring a distinctive façade adorned with ornate ironwork, colorful ceramic tiles, and a large central dome. [13, 14]

The building was designed and built by Samu Pecz in 1897. The market offers a large variety of stalls on three floors. The entrance gate has a Neogothic touch. The size of the building is 10,000 square meters and is covered by a steel structure. During World War II the market was significantly damaged and remained in a deteriorating condition. [14]

Today, the upper levels of the Great Market Hall house a range of establishments, including souvenir shops, eateries, cafes, and even cultural exhibitions. This adaptive reuse approach has not only breathed new life into the historic building but has also created a dynamic space where locals and tourists can explore and experience Hungarian culture, cuisine, and craftsmanship. [13, 14]

The adaptive reuse of the Great Market Hall demonstrates the successful integration of heritage preservation and modern functionality. By repurposing the upper floors, the building has been able to generate additional revenue and attract a broader audience, contributing to its sustainability and continued maintenance. The careful balance between maintaining the original architectural features and incorporating contemporary elements has ensured the preservation of the building's historical character while adapting to the changing needs of the community. [14] see e.g., Figure 1

4.2. The CET Balna Budapest

The Danube was a very important transportation route in the 19th century four public warehouses were built on the Pest side of the river between 1874 and 1881.

A project was launched to refurbish and use the warehouses in ways that meet the requirements of a 21. century, the modern capital city. A Dutch architect, Kas Oosterhuis, was commissioned to design a multifunctional complex from the four buildings preserving some of the original architectural elements.

Construction began in 2009 but the 2011 opening had to be delayed due to legal issues.

The Construction Authority Group of the Ferencváros Municipality issued the final building permit for the CET-Budapest building designed by Kas Oosterhuis. The investment with a total

area of approximately 27,000 m2 will be built in the heart of Budapest, on the Danube bank in Ferencváros.
Using the old warehouses, the complex is an exceptional building that defines the cityscape and fits harmoniously into its surroundings. [15]

The two existing old warehouse buildings are connected by a creatively designed glass shell that spans both the old and new buildings to create a gallery. The building will house a variety of businesses, including tiny boutiques, pubs, and art galleries as well as more substantial companies and restaurants. There is also a performance and event hall on the complex's second floor with enough for 1,050 people. Along with the construction of terraces along the Danube, walking and biking pathways, as well as two levels of parking, the development links the nearby park with the newly rising university zone. For the first time in Budapest, city residents can enjoy coffee, dining, and other activities here. [15]

The Bálna, a hub for culture, cuisine, and commerce, maybe a defining structure and popular tourist site in the city. Restaurants and cafes, as well as commercial and service units, can be situated on the ground floor, while an organic market, as well as an art and antique market, can be created on the minus first level. The Budapest gallery is situated on the upper floors of the building, and an event space is built in the "head" of the Bálna. The design cluster, which combines business and culture, was built there [15] see e.g., Figure 1

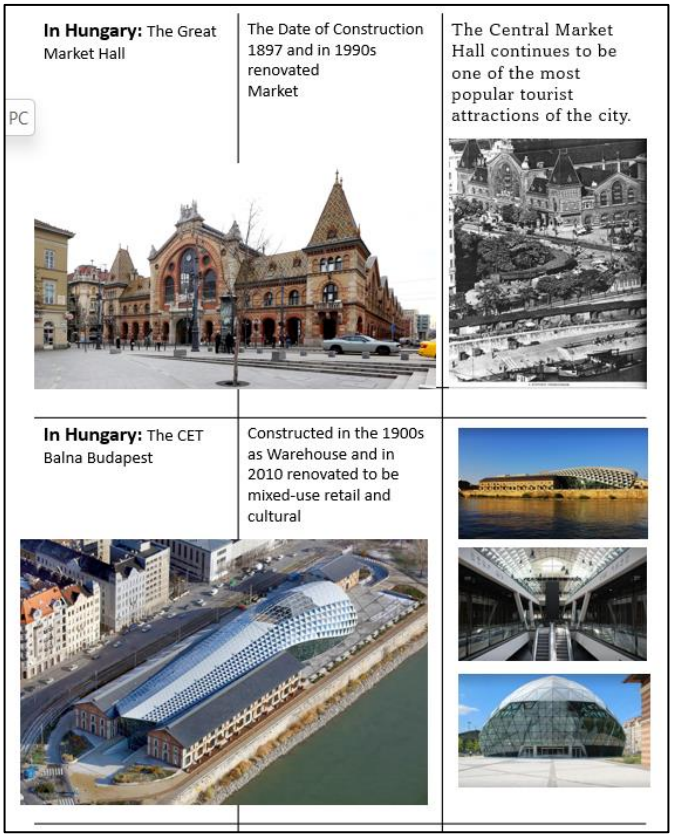


Figure 1: A: The Great Market Hall B: The CET Balna Budapest/ Hungary

5. RESEARCH CHALLENGES, PROBLEM AND QUESTIONS

To due to the investigations, Most of the of the sites with cultural values in the eastern part were in danger because of the lack of adaptive reuse projects especially those in the Middle East. There was in conflict-affected areas by war and it has received a very little research on the methodology and results of adaptive reuse projects, as significant of adaptive reuse could be as useful tool to safe the damaged buildings and sites.

At the same time, the preservation of cultural heritage and sustainable development approach for these areas with a history of instability. It is difficult to identify the most effective methods and roadblocks for adaptive reuse projects that work in these situations without research. This is most likely is the result of several things, including a dearth of funding for study and a lack of knowledge about the possible benefits of adaptive reuse.

The challenge of this research is how to maintain historical buildings such as the houses in Erbil Citadel. By Using adaptive reuse as a strategy for sustainable development which consider as main components of preservation projects. The main question addressed by this study is what are the opportunities and limitations related to the Middle East adaptive reuse projects of the historic buildings.

6. RESEARCH AIMS

The Erbil Citadel's Houses is a remarkable case of adaptive reuse, it is one of the oldest continuously inhabited towns in the world and is situated in the center of the city of Erbil, Kurdistan Region of Iraq. It dates to at least the sixth millennium BCE, the Current Houses adaptive reuse included restoring the old structure and restoring those in good condition to meet contemporary needs.

Most of these houses fate and regarding to the Citadel's stakeholders should be conserved and convert to different proposals of new uses such as housing luxury use, commercial use like shops, and for culture and social uses.

This study aims to examine the adaptive reuse of the Erbil Citadel Houses and pinpoint the essential components of sustainable development plans for protecting historical buildings.

This research aims to contribute to the broader discussion about heritage preservation and urban planning by analyzing the challenges and opportunities associated with adaptive reuse. Specifically, it will focus on the steps involved in the process, such as identifying a suitable structure, assessing its condition, choosing a new use, and operating the building for the new use.

7. ERBIL CITADEL AND ITS OLD HOUSES AS HERITAGE:

7.1. Evaluation of the Current:

Also known as Qalat Erbil, is a UNESCO World Heritage Site and has a history dating back over 6,000 years. The Citadel has undergone various transformations and reconstructions

throughout its existence, and in recent years, efforts have been made to preserve and revitalize this historic site through adaptive reuse.
Several initiatives have been undertaken to revitalize the Citadel. These include the restoration of historic buildings, infrastructure improvements, and the development of public spaces. [4]
It is thought that Erbil Citadel Town, which is spectacularly perched on a man-made, 32-meter-high earthen mound and visibly dominating the vast modern metropolis of Erbil, was in this area.
existence for at least 7000 years without interruption. As a result, it might be said to be the world's oldest continually inhabited settlement. It has escaped multiple sieges and severe assaults thanks to its former walls and sharply sloping mound, which is approximately 45 degrees at some points.
The existing fabric, however, goes back several hundred years but is, nevertheless, extreme Vernacular architectural and urban interest, not only for Iraq but also for humanity at large. [4]

Figure 2: Erbil Citadel: Aerial View/ Iraq
Reference: UNESCO

The current state of conservation of the Citadel, All the buildings that can be seen today in the Citadel represent the most recent occupation periods, generally dating from the mid-eighteenth century to the 1990s. They mainly consist of houses, but 13 public buildings have also been identified. The 587 fired bricks buildings recorded (with few mud bricks or concrete blocks buildings) are generally in a poor state of preservation. In the conservation and

rehabilitation master plan, 97,5% have been graded as in critical condition and only 2,5% as having limited problems. [4]

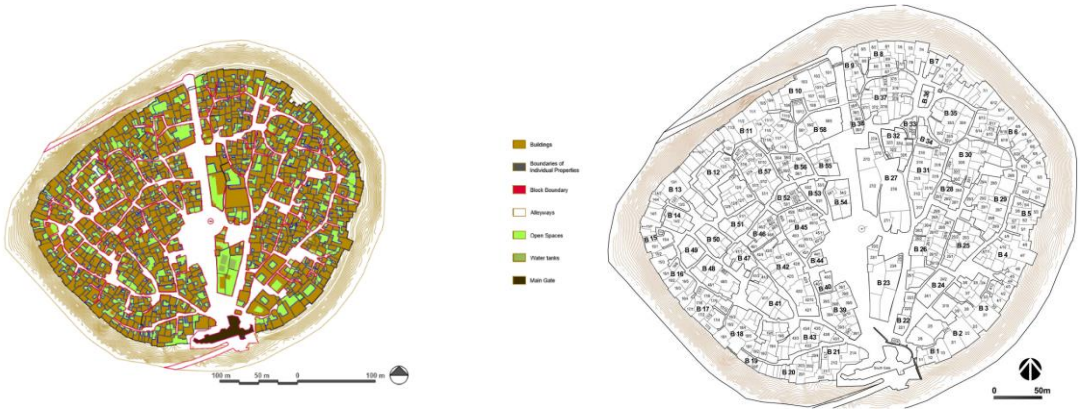


Figure 3: Erbil Citadel Houses renovations work. Reference: [4]

Figure 4: Erbil Citadel Houses renovations works. Reference: [4]

Since there are so many variables that need to be considered with an integrated strategy, the adaptive reuse of heritage buildings is a difficult process. Buildings of historical significance should have their current fabric thoroughly examined before being given new uses. Physical preservation of the structure is not sufficient; the original design of the building must be maintained by assigning appropriate uses and functions.

7.2. The Citadel's Houses Maintenance and Challenges

The research provides a comprehensive review of the adaptive reuse issues and the factors that affect decision-making that could benefit Erbil Citadel in the future.
Meanwhile, at the same time, constraints are attached to the adaptive reuse of the Erbil Citadel houses structures: [4] These challenges Such as:

- **Legal and Regulatory Restrictions:**

  Regulations and laws in the Middle East related to Adaptive reuse have limitations, especially in some countries and regions that need to have experts to follow up the restorations and preservation process.
- **Conservation and Structural Integrity:**

  Integrations are needed in all restoration and conservation Processes and structural stability in all reusing phases.

- **Sociocultural Elements:**

  The Social and Cultural aspects have a role as well in ensuring the process goes smoothly, especially the reuse project should simulate the community and the traditions and values of that society.

- **Financial Resources:**

  The finding is one of the main factors that could hinder the work. Adaptive reuse projects need government financial support to have the best results with restoration and conservation techniques.

Collaboration across a range of parties, including the government, preservation organizations, local communities, architects, and investors, is necessary to address these difficulties. By overcoming these obstacles, adaptive reuse can be a potent tool for maintaining Middle Eastern historic buildings and advancing sustainable development.

7.3. Salih Chalabis's House

House which dates back to the late-Ottoman period, previously consisted of two storeys elevated over a semi-basement, resulting in a greater number of rooms compared to other houses within the Citadel. However, the upper storey situated above the north and south wings was dismantled during the 1950s or 60s. The primary south-east wing is adorned with a three-bay Mosul-alabaster portico and comprises two spacious rooms connected by an open doorway. The central room boasts two gypsum shelves, with the higher shelf being the more ancient of the two. The house also features two side wings, each housing a single room. The staircase leading to the upper floor of the entrance wing ascends over a large arch in the south-western wing. The external northeast facade gracefully curves to accommodate a small room and the curved staircase that once led to the aforementioned upper storey. [4]

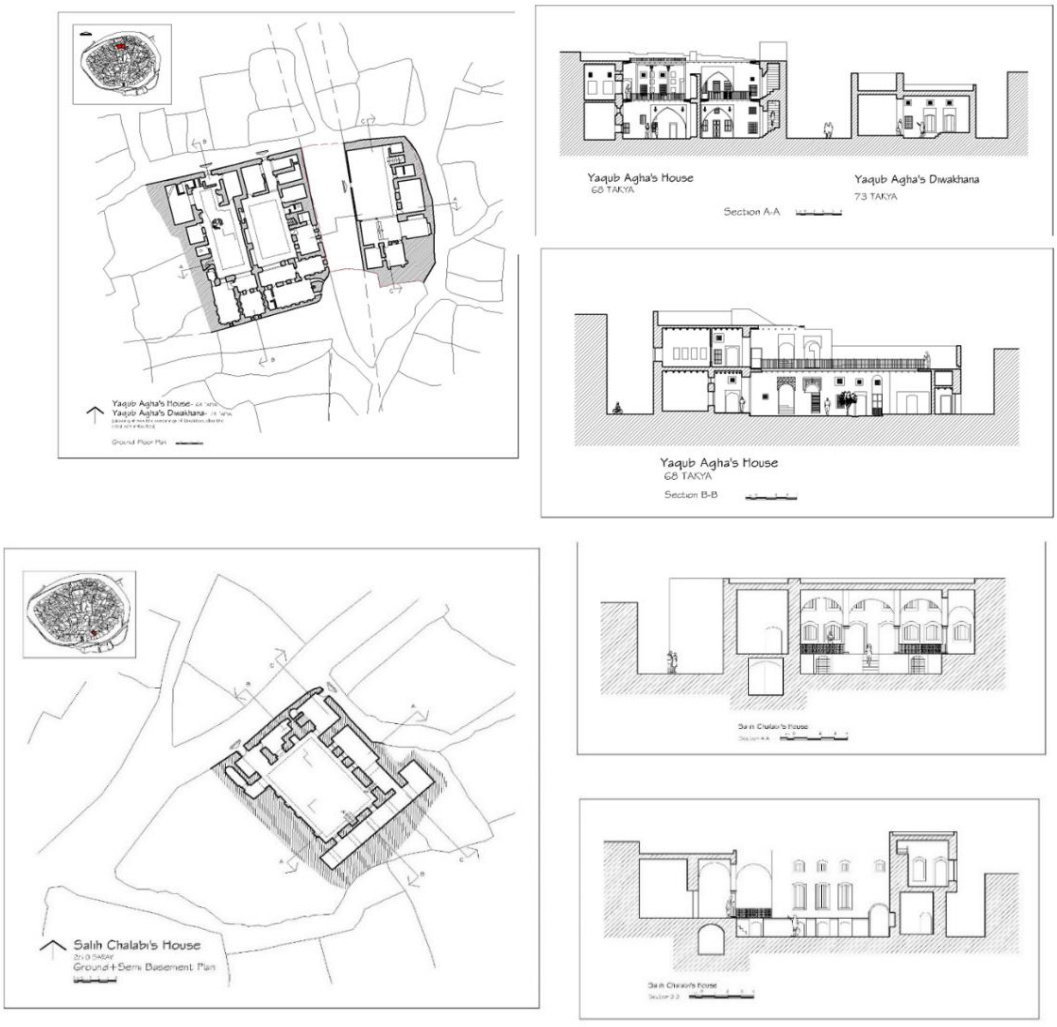


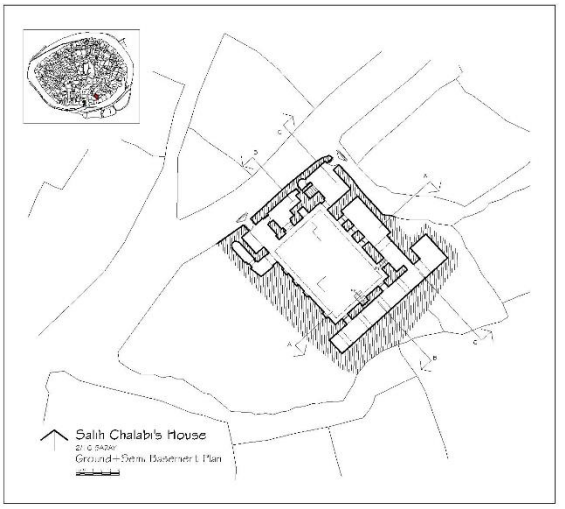
Figure 5: Erbil Citadel Houses documented and in a good situation. Reference: [4]

For the ERBILE CITADEL house, as shown below, Salih Chalabis's House: Ground Floor.

The author has many site visits and meetings with Local Engineers of the Citadel m discussing the main Aspect it could take in consideration as it is

Adaptive reuse is considered the key element of saving the house, especially the house in a good situation and finding new uses to contribute to the preservation and align with sustainable needs and demands.

Chalabis's House



Main Aspects Related to Adaptive Reuse and Investigated from the Previous:

1. Historical and Cultural Significance

After assessing the historical value of the Citadel, it understood it related to 5000 B.C. therefore it is significant in Local and international contexts.

2. Architectural and Structural Analysis

The citadel under restoration and renovation work, is to be evaluated for the next step for the adaptability of structures.

3. Functional Relevance

Most of the houses in the citadel are courtyard-type, traditional Iraqi Houses and for the new function, it needs to check the potential of compatibility with the old structure.

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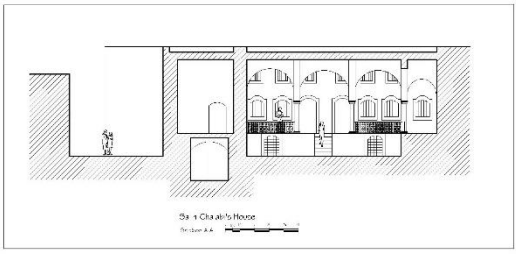


4. Sustainability Considerations:

Local material used for restoring old houses is available in the local Market it is eco-friendly and saves energy and it is considered a sustainable Practice on the site.

5. Economic Feasibility:

In any case, reusing these old structures again for a proposed use

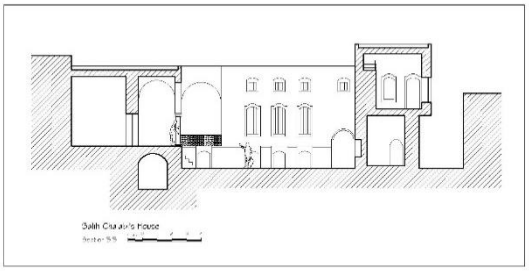
will be this structure as a funding source for the citadel.	
6. Stakeholder Engagement This Point and seems that Erbil Citadel under the World Heritage List in 2014, all the stakeholders and governmental authorities, organizations together work to make a decision that contributes to the conservation process.	

Figure 6: Chalabi's House: Ground Floor. Main Aspects of Adaptive Reuse. Reference: Authors

8. CONCLUSION

The study's goal is to pinpoint the crucial elements for sustainable development plans that save historic structures like the Erbil Citadel Houses by looking at these characteristics. These proposals will probably combine restoration, research can help establish best practices for adaptive reuse in comparable situations,
guide the formulation of legislation for sustainable development in Middle East areas, and create best practices for adaptive reuse in related situations. adaptive reuse, and sustainable techniques to maintain the historical value of the structures while addressing modern requirements.

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