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Trends in the Reconstruction of Traditional Houses in the Old City of Mosul

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ABSTRACT

Heritage buildings, including traditional houses, represent a visual and intellectual record of the cultural face of a civilization that reflects the intellectual specificity of the social, environmental, and aesthetic systems inherited in societies. Each traditional city was distinguished by its peculiarity over the others as a result of the privacy of these factors, including the city of Mosul. After the events of the occupation of Mosul by ISIS in 2014, many traditional houses were damaged, and most of them were wiped off the face of the earth. After the city's liberation, the city's reconstruction operations began, including the reconstruction of these houses. The parties involved in the reconstruction process varied, including civil society organizations and the individuals who own those houses. For the most part, the new reconstruction did not maintain the traditional house pattern, either in terms of construction technology or spatial organization and even at the level of finishing materials. Thus, the research problem is the unclear approach to knowledge about the trends related to the reconstruction of traditional houses in the old city of Mosul. The most prominent results reached by this research was that there are three trends: reproduction of the original, hybridization, modern style, and renewal and the appropriate approach for the reconstruction of houses in the old city of Mosul is the direction of Renewal appropriate to the needs of the people of Mosul.

1. INTRODUCTION

Wars and conflicts continue to impact the urbanism and architecture of cities. The devastation of various architectural styles in cities, mainly residential architecture, poses significant obstacles to revitalizing these cities after wars and conflicts. This is nowhere more apparent than in the metropolis of Mosul. Between 2014 and 2017, the city of Mosul was subjected to one of the most brutal and destructive assaults on humanity and identity, particularly in the old section of the city, which dates back to the beginning of the Umayyad state. In addition to the war against ISIS militants transforming the city into a battlefield, the residential fabric of the city was a crucial factor in the street war. Most of the devastated urban fabric in the old city of Mosul consisted of houses, culminating in the displacement of an estimated one million citizens. Today, the city continues to suffer from the effects of the conflict, with few attempts to restore the city due to the nation's economic and political difficulties.

On the other hand, attempts to rebuild the city, particularly the residential side, were primarily comprised of individual efforts, the majority of which were represented by two aspects: the first aspect consisted of efforts by several individuals who were affiliated with local institutions of the individual community and took on social responsibility by helping the displaced return to their homes, and the second aspect consisted of efforts by friends. The properties are in the process of undergoing residential renovations. This does not mean we ignore the role that international organizations and UNESCO played in reconstructing buildings and significant architectural monuments (on the residential side, it is represented by several traditional houses, such as the Totenji House). This study will therefore examine the directions for reconstructing traditional housing in the old city of Mosul and define their characteristics.

2. LITERATURE REVIEW

A significant amount of research has been done on the idea of rebuilding Mosul's historic structures. A particular facet of the phenomenon has drawn much attention [1, 2].

Hammoodi and Al-Hinkawi's [1] study addressed the impact of the strategic value of religious centers on the reconstruction of Old Mosul, as this value includes accessibility, proximity, connectivity, and permeability, stressing the need to rebuild urban areas linked to mosques and churches as centers of social life. As for previous study, it focused on the role of architects in reconstruction, considering that restoring the urban fabric, including mosques and markets, is more important than rebuilding individual structures. The study also discussed the Mosul Municipality's proposal to transform these areas into investment centers, analyzing the reasons for their emergence and their role in

modern urban development.

Urban sustainable reconstruction solutions would be included in the strategy [1]. Based on responses to a questionnaire distributed to Old Mosul residents, researchers identified several problem areas and proposed solutions, including "first aid," "selective," "emergence and re-emergence," "sustainable housing," and "sustainable transport." Former research analyzed the needs of families forced to return to their destroyed houses, three optimal housing models were designed to provide for those needs while honoring the area's unique character. The Ministry of Construction and Housing determined the average size of the plot of land, the area of the suggested spaces, and the housing systems, and they were included in the plans. Basic housing needs, optimal space distribution, circulation strategies, and the level of privacy desired by the uprooted family were all addressed in the concepts.

Research conducted by Abdulrazaq and Guedes [2] that the following decisions be made by government officials to protect Mosul's historic buildings, particularly in the Old City:

•During the cleaning process and debris removal, some locations must be shielded from additional devastation promptly.

•Heritage experts must supervise the cleansing process in these zones. There can no longer be unattended clearance.

•Before continuing debris removal works in some sections of the Old City, teams specializing in cultural damage will assess which structures must be rescued and which heritage artifacts will be transported to a storage facility.

•Without dedicated heritage teams, efforts to clear debris and rebuild homes should concentrate on locations with fewer historical structures and lesser cultural importance.

•Clearance protection zones should be established, and supervised debris removal should commence in certain places. Reconstruction work along the riverside of the square will be halted for now.

•Restrict access to endangered historic sites, close off sections, and cover precious interiors with tarps or other waterproof protective materials to keep off looters and the weather.

•Local authorities might designate certain buildings as historical repositories to reuse historic architectural features in restoration and reconstruction projects.

Although previous studies have addressed various dimensions of Mosul's reconstruction, there is a clear absence of focus on the reconstruction of traditional houses, which constitute an essential part of the city's urban and historical fabric. Attention seems to have focused on religious structures, markets, and comprehensive urban strategies, while the issue of rebuilding traditional houses, in terms of interior space design and restoration of urban identity, remains in need of further research and clarification. The first study focused on the strategic and social dimension of reconstruction, the second presented a sustainable approach to reconstruction, based on questionnaires of residents of Old Mosul, the third addressed the rehousing of displaced families, and the last addressed the preservation of heritage buildings. Although previous studies have addressed various dimensions of Mosul's reconstruction, there is a clear absence of focus on the reconstruction of traditional houses, which constitute an essential part of the city's urban and historical fabric. Attention seems to have focused on religious structures, markets, and comprehensive urban strategies, while the issue of rebuilding traditional houses, in terms of interior space design and restoration of urban identity, remains in need of further research and clarification. Based on previous studies, the research problem emerged the unclear approach to knowledge about the trends related to the reconstruction of traditional houses in the old city of Mosul.

3. THE CONCEPT OF RECONSTRUCTION

The concept of reconstruction refers to the process of rebuilding and repairing an area after a disaster or violent conflict, whether an external or civil war, which causes significant damage to the physical, social and cultural environment [3]. This process aims to restore normal life and develop it sustainably from the urban and social aspects, but it faces humanitarian, administrative, economic and security challenges that require strategies based on achieving security, justice, social welfare and economic development [4]. Reconstruction is also one of the levels of building preservation, as it requires the development of public policies and strategies appropriate to the area to ensure the reuse of the building with the same function or with a contemporary function that maintains its social and cultural value [5]. In this regard, Mosul faces many challenges in this process, such as humanitarian, administrative, and economic challenges, and the need to rebuild security and justice in society after the conflict. This requires comprehensive strategies that include urban and architecture reconstruction, enhancing social welfare and economic stability while preserving the city's cultural identity.

4. TRENDS IN THE RECONSTRUCTION OF BUILDINGS AFTER THE WAR

In post-war reconstruction projects, there are several trends for dealing with post-war or disaster architecture, and each case has its implementation strategies, as follows [6].

4.1 Renewal trend

This tendency is focused on building new architecture that did not previously exist and is not intimately tied to the community's history and identity via modern construction technologies. After World War II, this trend extended extensively throughout European nations to provide shelter [6] (Figures 1 and 2).

Figure 1. Trend of renewal
Source: https://en.wikipedia.org/wiki/Urban_renewal

Figure 2. Revival trend [7]

4.2 Revival trend

This trend entails reconstructing historically significant structures devastated by war in their original form to preserve their existence and the memory and character of the location. This form of reconstruction requires prior and precise documentation of the historical structures to be rebuilt as they were [8].

4.3 Hybridization trend

In this direction, there is a process of combining the use of old building methods and the revival of the old style with the use of modern building methods in order to preserve historical architecture while also keeping pace with the spirit of the times and adapting to the rapid and complementary needs and the difficulty of using the old methods and patterns in an absolute method [9] (Figure 3).

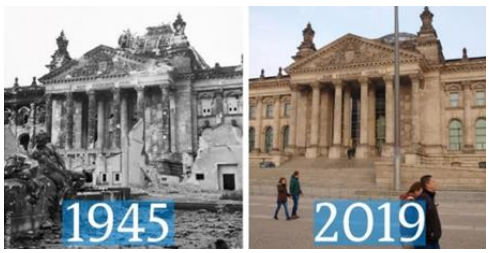


Figure 3. Trend of hybridization [10]

4.4 Symbolic trend

This trend highlights the event's significance and symbolism more than the building's significance. Cultural and historical. This trend is only appropriate for buildings with special symbolism and compelling reasons to remain constant. Many specialists and experts select them from various disciplines and developments. An example of this trend is the reconstruction of Notre Dame Cathedral, which is a cultural and religious symbol that reflects France's identity and Gothic heritage. Its reconstruction is not just a restoration, but an affirmation of the continuity of the cultural heritage despite disasters (Figure 4) [6].

Figure 4. Notre Dame Cathedral - during its fire (left) and during its reconstruction [11]

5. TRADITIONAL HOUSE IN THE CITY OF MOSUL

The term "Traditional house" in Mosul refers to the homes inside the city of old. Since the establishment of Mosul until the present day, residents have repeatedly reconstructed their dwellings. They maintained the same building materials, techniques, and architectural elements [12].

5.1 Traditional house elements in the city of Mosul

The research employs these four traditional housings to identify elements of traditional architecture [13]:

•**Al-Jalili house:** Built-in 1748 A.D., this is one of the most notable residences in the city of Mosul, with a plot area of over 1161 square meters, 36 rooms, 6 Ewans, 45 gallery pieces, 5 Rah-rahs, two stables, three courtyards, and a sizable culinary zone [14].

•**Totonchi house:** This house is even more significant than its antecedent; it was built on a 2602-square-meter lot in 1815 A.D. The exterior serves primarily as a guesthouse; the interior, known as the Haram, contains most of the house's components; and the expansive culinary zone. The majority of the structure has been demolished or replaced with new structures.

•**House of Abdoni:** With approximately 650 square meters, this residence is smaller than the first, although it is still quite spacious. It was built in 1740 and ceded roughly 200 square meters to a neighboring residence.

•**The Zyadah house:** It is about 533 square meters and was completed in 1870 A.D. [15].

For organizational purposes, the research will divide the architectural elements into physical and spatial elements.

5.1.1 Elements of physical architecture

These are the material items that define the building's actual appearance. For the traditional house of the city of Mosul, the following are included:

•**Walls:** The house's essential structural components. Their structure comprises indigenous natural materials, is reinforced to support the building's weight, and provides effective isolation for interior spaces. Some walls are pierced with door and window openings, while others contain recesses that match the window shapes and arrangement.

•**Columns**: They are vertical elements of the structure of a house, built from local marble and covered with various carvings. The columns in a traditional Mosul house consist of a base, a body, and a canopy. They vary in cross-section (circular, square, or octagonal), height (1.5 m to 4 m), and proportion (dense to slender) based on their location and the weight they bear. It can be found in the courtyard buttressed with the Iwan or with the arcades, or it can be found as supports within the walls in the inner rooms [16] (Figure 5).

Figure 5. A group of columns in the Mosul house in different locations

•**The staircase:** This component is essential for vertical communications. The space beneath the staircases served as a service storage area. Consequently, the area containing the staircases can also be regarded as a spatial element (Figure 6-A) [17].

•**Arches:** The purpose of these components is to distribute and transmit the weight to columns. Their primary curved elements are created from local marble and covered with plant-shaped decorations; the spaces between arches and other elements are filled with limestone and completed with plaster [14] (Figure 6-B).

•**Shanshool:** the expected rise of windows or balconies. This element's primary function is to enhance house ventilation. In addition, it is used to correct the irregular room shape by extending the room's corner(s) toward the exterior and enhancing the exterior facade's aesthetic value (Figure 6-C) [14].

•**Qantara:** This unique element represents a connection between two homes, belongs to one of them, and traverses an exterior alley. It is a chamber located above the arched passageway (Figure 6-D).

•**Malqaf:** A vertical tube cavity within a wall that permits ventilation between the roof and the room(s).

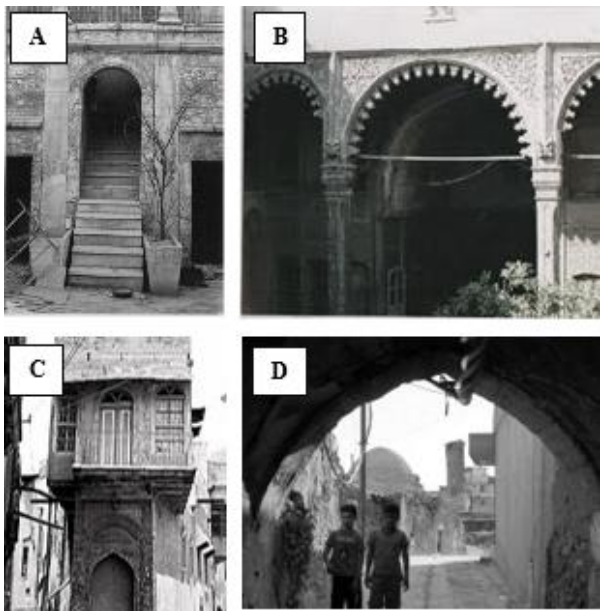


Figure 6. A group of elements of physical architecture

5.1.2 Architectural elements spatial

Due to its orientation toward the interior, the traditional Mosul house contains various spatial elements. This characteristic was the original character of old buildings. This type of organization includes these components [14]:

•**The entrance:** It has the main house gate, the outside door, and an arched passageway leading from the outside to the interior areas of the house. The principal entrance may be of average size, as in the Abdoni and Zyadah houses, or relatively large, as in the Al-Jalili home.

•**The in-between space:** The Mosul house is distinguished by the presence of this space that connects the courtyard and the entrance. The presence of this element refers to the mechanism of spatial and communicative linkage between the point of the exterior (the door) and the interior space (the courtyard), and it is usually broken to achieve privacy in the interior spaces, as we notice when we analyze the plans of the traditional connecting houses.

•**The courtyard:** Located in the middle of the traditional home and surrounded by other elements, the courtyard serves as the primary spatial feature. Because it exposes directly to the sky, the courtyard space connects the house's interior to the exterior environment. Consequently, it provides natural illumination and ventilation for the home. Additionally, it is essential on the spatial level, as it serves as the primary entrance to other spatial elements [18].

•**The Ewan:** an essential aspect of Mosul's traditional architecture. This semi-open space faces the courtyard and distributes rooms to its side elevations via doors and windows. Ewan's height reaches the house's topmost levels. Its ceiling is arched or tapered, and its floor is at least 40 centimeters higher than the courtyard floor [19].

•**The arched galleries:** This component is a semi-open longitudinal passageway. It divides the courtyard from the apartments opposite it. A gallery with arches consists of columns supporting arches with apertures on the courtyard side, chamber wall, and opposite side. Small domes with tapered tops and arches enclose its ceiling. The Ewan serves an essential function in the environment as it protects from moisture and shade from the summer sun [20].

•**Other spatial elements:** The arrangement of spaces in a traditional house begins at the entrance and closes with various room types, Rah-rah, and the basement. The majority of a home's activities occur in these rooms. They have at least one opening in the courtyard or other partially-open volumes. The ceilings are tapered or dome-shaped [21, 22].

6. RESEARCH DESIGN

The current quantitative study attempts to reveal trends in reconstructing traditional houses in the old city of Mosul. The research applies quantitative tools in collecting data from the current situation (10 sample). Therefore, a theoretical framework was designed to assess the reality of the existing situation, according to what was presented in the theoretical study of the research as a preliminary stage (Table 1). The second stage is to narrow the scope of the search by conducting live interviews with the residents of traditional houses (for ten other samples) that have been reconstructed and inhabited again to find out the suitability of the new constructions with their needs and requirements and their conformity with the selected samples. This is done by making a questionnaire and analyzing its results through the (question-pro) software to develop the appropriate reconstruction directions for the traditional houses in the old city of Mosul, which are suitable for the residents in that area.

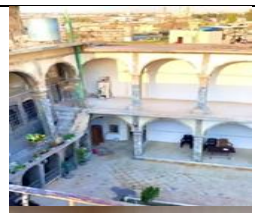
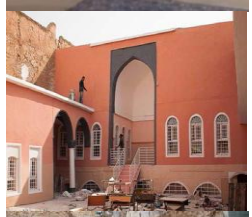
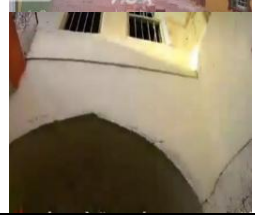
7. METHODOLOGY STRATEGY

The research samples were selected from the old city of Mosul (the study area). The reasons for selecting 10 samples are that, according to the field survey conducted by the researcher, it was found that these samples had been completely reconstructed up to the stage of writing the research, in addition to containing symbolic and aesthetic values, and that all of these houses include the basic components of the Mosul house, which was referred to in paragraph No. 5. In order to validate the data collected for the current paper, two main methods were employed. The two procedures are (Tables 1 and 2):

Table 1. Theoretical framework indicators

Sample No: Elements of the Traditional House		Reconstruction Contributor: Reconstruction Trend				
		Renewal	Revival	Hybridization	Symbolic	Removal Element
Physical	Wall					
	Column					
	Arches					
	Well					
	Staircase					
	Qantara					
	Shanshool					
	Malqaf					
Spatial	Entrance					
	Courtyard					
	Ewan					
	Arched galleries					
	Other spatial elements					

Table 2. The selected research samples for the purpose of the practical study

Sample No.	Name House	Image Photography	The Authority Responsible for Reconstruction	Sample No.	Name House	Image Photography	The Authority Responsible for Reconstruction
X1	Beit al-Tutunji		UNESCO	X6	Beit al-Twalib		Old Mosul Voluntary Organization
X2	Beit Abo Rajab		Old Mosul Voluntary Organization	X7	Beit Abo Mohmood		Old Mosul Voluntary Organization
X3	Beit Abo Ali		Muhammad Bahgat Organization	X8	Beit Alsanjary		The owner of the property
X4	Beit Baba Al Jablen		Old Mosul Voluntary Organization	X9	Beit Baba Al Jaded		Tatawa Maana Voluntary Organization
X5	Beit Suleman Alsaeg		UNESCO	X10	Beit Amo Albaqal		U Tatawa Maana Voluntary Organization

7.1 Interviews and field visits

Visual observation is a method used in quantitative research that includes visits, data collection, and photographing reconstructed structures. The data type in the present study consists of site-collected (visual) images documenting traditional houses in the old city of Mosul. This was accomplished by selecting specific homes in the old city of Mosul using ten samples and several field visits.

7.2 Data analysis

The investigation employed two distinct data analysis techniques based on the data classifications. Formal analysis using the theoretical framework questionnaire to determine the trend in reconstructing each element of a traditional Mosuli

house based on visits to the selected samples in their respective cities (Table 3). The second quality involves calculating the percentage of the reconstruction orientation that the traditional house received to determine the most prevalent orientation among the traditional houses of Mosul (Figure 7). The most important justifications for removing some elements such as the Iwan and the inner courtyard are: Contemporary functional needs: In many cases, traditional elements such as the courtyard and the Iwan may not be fully suitable for modern uses. For example, the traditional courtyard may be limited to a certain area that may not meet the requirements of the interior space in modern buildings that require a different distribution of rooms or facilities, in addition to the high price of land and the availability of mechanical air conditioning, which has become a substitute for the natural lighting and ventilation which is provided by the courtyard and the Iwan.

7.3 Field interviews and the questionnaire

The questionnaire was created through the (question-pro) program and distributed to ten owners of traditional houses who lived in them before and after the reconstruction, and that was distributed through 10 questions (in Arabic - the language of the region's speakers), and the quantitative results were analyzed through the same program Which allows the possibility of this and as we can see in Figure 8.

Table 3. The calculate the percentage of the trend of the traditional house's reconstruction based on the selected samples

Renewal	Revival	Hybridization	Symbolic	Removal Element
20%	18%	3%	0%	35%

Sample No: x1		Reconstruction Contributor:				
Elements of the Traditional House		Reconstruction trend				
		Renewal	Revival	hybridization	symbolic	removal element
Physical	Wall		1			
	Column		1			
	Arches		1			
	well		1			
	staircase		1			
	Qantara		1			
	Shanshool		1			
	Malqaf		1			
Spatial	Entrance		1			
	Courtyard		1			
	Ewan		1			
	Arched galleries		1			
	Other spatial elements		1			

Sample No: x2		Reconstruction Contributor:				
Elements of the Traditional House		Reconstruction trend				
		Renewal	Revival	hybridization	symbolic	removal element
Physical	Wall	1				
	Column	1				
	Arches					1
	well					1
	staircase	1				
	Qantara					
	Shanshool					1
	Malqaf					1
Spatial	Entrance	1				
	Courtyard			1		
	Ewan		1			
	Arched galleries					1
	Other spatial elements					1

Sample No: x3		Reconstruction Contributor:				
Elements of the Traditional House		Reconstruction trend				
		Renewal	Revival	hybridization	symbolic	removal element
Physical	Wall	1				
	Column	1				
	Arches	1				
	well	1				
	staircase	1				
	Qantara	1				
	Shanshool					1
	Malqaf					1
Spatial	Entrance	1				
	Courtyard					1
	Ewan					1
	Arched galleries					1
	Other spatial elements					1

Sample No: x4		Reconstruction Contributor:				
Elements of the Traditional House		Reconstruction trend				
		Renewal	Revival	hybridization	symbolic	removal element
Physical	Wall	1	1			
	Column			1		
	Arches					1
	well					1
	staircase	1				
	Qantara					1
	Shanshool					1
	Malqaf					1
Spatial	Entrance	1				
	Courtyard		1			
	Ewan		1			
	Arched galleries					1
	Other spatial elements					1

Sample No: x5		Reconstruction Contributor:				
Elements of the Traditional House		Reconstruction trend				
		Renewal	Revival	hybridization	symbolic	removal element
Physical	Wall	1				
	Column	1				
	Arches					1
	well					1
	staircase		1			
	Qantara					1
	Shanshool					1
	Malqaf		1			
Spatial	Entrance	1				
	Courtyard		1			
	Ewan		1			
	Arched galleries		1			
	Other spatial elements		1			

Sample No: x6		Reconstruction Contributor:				
Elements of the Traditional House		Reconstruction trend				
		Renewal	Revival	hybridization	symbolic	removal element
Physical	Wall	1				
	Column	1				
	Arches		1			
	well					1
	staircase	1				
	Qantara					1
	Shanshool					1
	Malqaf					1
Spatial	Entrance					1
	Courtyard			1		
	Ewan		1			
	Arched galleries		1			
	Other spatial elements					1

Sample No: x7		Reconstruction Contributor:				
Elements of the Traditional House		Reconstruction trend				
		Renewal	Revival	hybridization	symbolic	removal element
Physical	Wall	1				
	Column					1
	Arches					1
	well					1
	staircase	1				
	Qantara					1
	Shanshool					1
	Malqaf					1
Spatial	Entrance	1				
	Courtyard					1
	Ewan					1
	Arched galleries					1
	Other spatial elements					1

Sample No: x8		Reconstruction Contributor:				
Elements of the Traditional House		Reconstruction trend				
		Renewal	Revival	hybridization	symbolic	removal element
Physical	Wall	1				
	Column					
	Arches	1				
	well					1
	staircase	1				
	Qantara					1
	Shanshool					1
	Malqaf					1
Spatial	Entrance	1				
	Courtyard		1			
	Ewan		1			
	Arched galleries		1			
	Other spatial elements					1

Sample No: x9		Reconstruction Contributor:				
Elements of the Traditional House		Reconstruction trend				
		Renewal	Revival	hybridization	symbolic	removal element
Physical	Wall	1				
	Column	1				
	Arches			1		
	well					1
	staircase	1				
	Qantara					1
	Shanshool					1
	Malqaf					1
Spatial	Entrance		1			
	Courtyard		1			
	Ewan					1
	Arched galleries					1
	Other spatial elements					1

Sample No: x10		Reconstruction Contributor:				
Elements of the Traditional House		Reconstruction trend				
		Renewal	Revival	hybridization	symbolic	removal element
Physical	Wall	1				
	Column	1				
	Arches			1		
	well					1
	staircase	1				
	Qantara					1
	Shanshool					1
	Malqaf					1
Spatial	Entrance	1				
	Courtyard					1
	Ewan					1
	Arched galleries					1
	Other spatial elements					1

Figure 7. Number of times each element of the Mosul heritage house achieved the type of reconstruction trend
Source: Researchers

The questionnaire section	The number of repetitions	The percentage of repetitions
Q1		
Is the current housing the same as the previous one?		
Yes	4	40.00%
No	6	60.00%
Q2		
Most of the architectural elements that were removed and I wish they were there		
Arcades	2	20.00%
Iwan	5	50.00%
Courtyard	4	40.00%
Arches	2	20.00%
Q3		
Does the new construction meet your needs?		
Yes	7	70.00%
No	3	30.00%
Q4		
Do you wish to move to a new house that is not traditional?		
Yes	4	40.00%
No	6	60.00%
Q5		
An element that I wished to remove during the reconstruction		
Iwan	2	20.00%
Courtyard	5	50.00%
Arcades	2	20.00%
Basement	1	10.00%
Q6		
Do you agree that the building should be new and not contain the traditional elements?		
Yes	7	70.00%
No	3	30.00%
Q7		
Do you agree to keep part of the destruction as a memory of the event (the war)?		
Yes	2	20.00%
No	8	80.00%
Q8		
What do you prefer?		
Roof House (West)	5	50.00%
Open House in the Courtyard (East)	5	50.00%
Q9		
Was the arrangement of the spaces of the house changed after the reconstruction?		
Yes	5	50.00%
No	5	50.00%
Q10		
Would you like the house to be open to the outside with your window?		
Yes	5	50.00%
No	5	50.00%

Figure 8. The questionnaire was created by the question-pro software and shared with samples of old Mosul residents who had returned to their housing

8. RESULT AND DISCUSSION

Through the samples collected in the field, we notice that the most frequent trend for reconstructing traditional houses is (the trend of Renewal) 20%. We note that 35% of the traditional elements in the old Mosulian house have been deleted or developed, especially the roofed courtyard element. He justifies this through what was conducted through the interviews, that the courtyard is an element in the eyes of the residents of those houses that is unnecessary and must be roofed to protect from weather conditions, as well as the element of the Iwan in their belief that it is an element that does not provide privacy for them and the possibility of rebuilding it as a roofed architectural space that is used to meet the needs Those residential families. We also did not notice the presence of a symbolic orientation in the reconstruction of those traditional houses (according to the interviews) that the residents do not want to recall those painful events for them.

Concerning the questionnaire, it is clear that what was extracted in measuring the samples is consistent with the results in question (3) (Does the new building suit your needs). The answer was 70% of the samples that were questioned, and this indicates that the Renewal approach suits the needs of the residents in question (1). We note that the current housing does not match the old one by 60%. We also noticed through the questionnaire that the new building requires the removal of the courtyard and the Iwan, as indicated by question No. (2) and (5). In addition, the reasons behind the disparity in these percentages are:

Local residents' preferences: residents preferred to rebuild in a "renovation" style to meet their modern needs, such as expanding the interior spaces and replacing the courtyard with closed rooms, which reduced their reliance on "hybridization".

Costs and resources: "Hybridization" requires the integration of traditional and modern techniques, which increases costs, while "renovation" is more economical

because it relies on locally available materials and techniques.

Lack of comprehensive planning: Individual efforts and local and international organizations led to direct reconstruction without architectural strategies that support hybridization between the old and the new.

Modernization of architectural functions: Traditional elements such as the Iwan and the interior courtyard were modified or removed to suit modern needs, which limited the application of the hybridization principle.

Roles of stakeholders: International organizations focused on restoring heritage houses as cultural sites, while civil society organizations and residents preferred to rebuild in a practical way that meets daily needs.

9. CONCLUSIONS

The study concluded that the appropriate approach for the reconstruction of houses in the old city of Mosul is the direction of Renewal appropriate to the needs of the people of Mosul, and according to what was developed through a theoretical framework that was applied 10 samples selected from the traditional houses of Mosul and tested on 10 samples from through a questionnaire. It was concluded that most of the traditional elements are no longer suitable for human needs in the view of the residents. The Iwan was converted in most of the samples into a space room that meets the needs of residential expansion for the inhabitants of the traditional house, and the courtyard element was converted into an interior hall.

The study also found that most of the reconstruction by civil society organizations tends to meet human needs by choosing the regenerative orientation. In contrast, the existing reconstruction by UNESCO and international organizations tends to meet the needs of the spatial identity to enhance the spatial memory and Maintain it from their point of view. Therefore, most of the traditional houses they reconstruct are transformed into a museum or a typical example of the traditional Mosulian house.

There is no symbolic orientation within the old city of Mosul concerning residential homes since people do not prefer the painful memories resulting from the war and its details.

10. RECOMMENDATIONS

The study suggests explicit recommendations for policymakers and urban planners which should be adopted to balance renewal with heritage conservation:

To achieve a balance between renewal and heritage preservation in the reconstruction of Mosul, the following strategies can be adopted:

10.1 Develop integrated planning policies

Establish a clear regulatory framework that guides reconstruction operations to ensure the preservation of architectural identity.

Adopt comprehensive plans that combine modernity and heritage elements according to sustainability standards.

10.2 Encourage hybridization between the traditional and the modern

Use modern materials and techniques that are compatible with the local environment without compromising the traditional character.

Integrate original architectural elements such as vaults and arcades within modern designs.

10.3 Encourage community participation

Involve residents in the decision-making process to ensure that designs are compatible with their needs.

Provide financial incentives to owners who rebuild according to standards that combine authenticity and renewal.

10.4 Strengthen the role of research and technical institutions

Support research on sustainable reconstruction and develop design guides for traditional structures.

Employ digital technologies (such as 3D modeling) to document and reconstruct heritage details.

10.5 Invest in international and local cooperation

Strengthen partnerships between UNESCO and national institutions to create projects that preserve urban heritage.

Financing projects to revive traditional markets and residential areas through targeted loans and grants.

10.6 Stimulating strategies for the private sector

Providing tax exemptions for projects that adopt a heritage style mixed with innovation.

Encouraging real estate investment in old neighborhoods while adhering to urban preservation standards.

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