



Integrative Conservation for Recovering the Riverfront of Mosul Town

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ABSTRACT

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Mesopotamia has seen the emergence of the dawn of civilizations and the establishment of the first cities on the banks of the Tigris and Euphrates rivers, where many ancient societies have grown from Babylonian, Assyrian and then Islamic to the present time; this requires the conservation of the most prominent historical monuments. The riverfront of the city of Mosul, with its unique and distinguished urban fabric and inhabited until the period before the last war in 2014 AD, was one of the most prominent products of those civilizations. This research attempts to develop a policy to preserve the spirit of the place by reviewing the most critical trends and policies of urban conservation, analyzing many global experiences and explaining international charters. The integrative conservation strategy was adopted by activating community participation. The research applied the method of expert interviews and questionnaires to a sample representing an educated group of society and close to decision-making sources, academics and the private sector to obtain qualitative and quantitative data to be statistically analyzed. The research's result was that the policy of conservation and restoration is the closest, followed by the approach of rehabilitation and then urban redevelopment and to the exclusion of the urban renewal policy.

1. INTRODUCTION

There have been many theories and trends of urban conservation since its beginnings, and they witnessed various concepts and currents starting with the trend of (Restoration), which is returning heritage or historical site or facility to a previous known state by removing accumulations or reassembling the existing elements in the place without introducing new materials, (Preservation) which means maintaining a place in its present condition and striving to delay deterioration [1], the (Sustainable Conservation) approach which deals with four important aspects which are environmental, economic, social and political aspect [2], (Preventive Conservation) approach which is one of the most diverse approaches in specializations because it deals with multiple aspects of knowledge from materials sciences, construction sciences, chemistry, physics, biology, systems and management sciences in addition to technical fields [3], (Planned Conservation) which transfers interest in heritage as a fixed origin to a process of preservation that represents an opportunity to increase intellectual capital that gives it the advantage of management easiness more than traditional model [4], and the integrative conservation approach which emerged during the period of changing the idea of protection from artistic heritage and antiquities to old historical cities that require an integrative dealing which takes in consideration the role of the community for the purpose of harmonizing the urban renovation process with protecting the architectural, cultural and historical values of the site [5]. conservation defines as protection from loss and depletion of tangible and intangible elements, so historical conservation helps extend the places and values of the past to the present [6]. Riverfront is part of the urban fabric overlooking the water, whether it is

a river, lake, sea or ocean, [7]. Riverfronts represent the most important historical part in the old cities, which witnessed attempts to preserve that adopted multiple methods and directions based on varying degrees of intervention which is in turn based on the current state of heritage and its requirements [8]. What distinguishes the integrative approach from other trends and currents is that it presents the idea of regulating the relationship between the private and public sectors to ensure the success of investment in heritage, and it provides a practical balance between the necessities of development and the heritage value, and that it emerged as a result of the successive development of conservation trends, as Amsterdam Declaration 1975 has also participated in its foundation, in addition to its focus on the tangible and intangible aspects of heritage.

The problem of the current research is the absence of previous studies or knowledge about the application of standards and indicators of integrative conservation and its efficiency as one of the directions for preserving historic riverfronts. The research adopted the comparative analysis approach of the conservation trends and intervention mechanisms, including integrative conservation, and analysed several relevant global studies, with analysing the international conventions concerned with conservation to reach the most critical standards of integrative conservation and what it can achieve an effective approach of the policies adopted in urban conservation by obtaining qualitative data from a group of experts specialized in the aspects of urban conservation and urban renovation, as well as obtaining quantitative data using the questionnaire method by designing a set of questions following the method of Likert five-scale and analysing them using Microsoft Excel 2010, and applying

them to the case study represented by the riverfront of Mosul Old City, then discuss the results and reach the most important conclusions.

2. POLICIES OF DEALING WITH URBAN FABRIC

Policies of dealing with the urban fabric vary according to a number of factors, including its type, importance, value and the type of using the land, and these policies vary in terms of their objectives and requirements. One of the most important policies is the Restoration and Preservation policy, which includes preserving and protecting areas that are consistent with the comprehensive plan of development [9]. Restoration aims at reviving the origin of the idea, restoring all the details that depend on preserving the original materially, its archaeological evidence and its original design to achieve integration between the missing parts and the original [10]. Urban Preservation includes maintenance, repairs and stabilization [11], as this policy is often supported by archaeologists and historical architects, especially in old towns

and valuable historical buildings. As for the Policy of Rehabilitation, it is the possibility of contemporary reuse while preserving the features of heritage value to be physically and visually harmonious with the original, provided that it is easy to distinguish from it, and it is one of two types, either continuous use of the same original function or adaptive reuse [12]. The Urban Redevelopment Policy often relies on methods of demolition and reconstruction and includes owning large parts of the site, then demolishing and rebuilding according to a comprehensive development plan, as this option is resorted to when other methods are useless and do not achieve the desired purpose [9]. The historical parts of the fabric are preserved as groups or spaces by removing entire blocks and modernizing the area. The Urban Renewal Policy is used to repair and renovate housing, roads and services by creating new roads or converting existing roads into pedestrian corridors, including certain interventions such as removal, restoration and preservation [13]. Conservation policies vary among themselves according to the aspects that they deal with, as shown in Table 1.

Table 1. The most important aspects that conservation policies deal with (The researchers)

Policies	Visual aspect	Functional aspect	Social aspect	Degree of intervention
Preservation and Restoration	<ul style="list-style-type: none"> - Removing accumulations or reassembling existing items without introducing new material. - Preserving the original materially, its archaeological evidence and its original design. - Integration between the missing and the original. 	<ul style="list-style-type: none"> - preserve, protect and maintain the areas compatible with the plan of development 	<ul style="list-style-type: none"> - Reviving the origin of the idea - Preservation: preserving the place in its current state and delaying deterioration 	<ul style="list-style-type: none"> Maintenance Repairs Stabilization
Rehabilitation	<ul style="list-style-type: none"> - Preserving the features that have heritage value. - Ease of visual distinction of the addition to the original. 	<ul style="list-style-type: none"> - Raising the urban and environmental level of the urban fabric. - Infrastructure rehabilitation. - Balancing the density of occupancy. - Repairing the fabric and architectural elements that have heritage value. - Partial removal of some worn-out buildings and restoring them. 	<ul style="list-style-type: none"> - Preserving the heritage assets. - Development in the local economy. - Meeting the basic needs of the population. 	<ul style="list-style-type: none"> - Continuous use of the original function. - Alike reuse. - Adaptive reuse.
Urban Redevelopment	<ul style="list-style-type: none"> - Improving landscapes. - Preserving and restoring the visual characteristics of the heritage elements without the fabric as a whole. 	<ul style="list-style-type: none"> - More efficient use of land. - Increasing transportation improvements - Encouraging investment and partnership between the private and the public sectors. - Enhancement of public places. - Focus on housing. - Re-planning the targeted areas. 	<ul style="list-style-type: none"> - Providing new jobs. - Promote new business - Generating new homes. - The disintegration of the social fabric. 	<ul style="list-style-type: none"> - Partial preservation - Partial restoration - Adaptive reuse
Urban Renewal	<ul style="list-style-type: none"> - The comprehensive destruction of the old areas and the loss of the distinctive visual characteristics of the urban fabric. 	<ul style="list-style-type: none"> - Rationalization of land use. - Removing dilapidated buildings and building new ones - Preserving the individual buildings that have heritage value 	<ul style="list-style-type: none"> - Compensating the citizens whose houses have been expropriated. - Providing affordable housing for tenants. - The disintegration of the social fabric. 	<ul style="list-style-type: none"> - Individual preservation of some buildings. - Redevelopment. - Very limited rehabilitation.

3. ARTICLES OF INTERNATIONAL CHARTERS AND INTEGRATIVE CONSERVATION

The Athens Charter for the Restoration of Historic Monuments 1931 was concerned with protecting the surrounding areas of historical sites, respecting the heritage of all different historical periods while occupying the buildings to ensure their continuity and their use in a manner consistent with their historical value [14]. The 1964 Venice Charter stated that the preservation process achieves a social benefit through the continuity of the job with some modifications that do not change the origin of the provenance, the necessity to stop interfering when evaluation starts, and the old work must be distinguished from the new addition when using modern technologies and only for necessity while respecting the relation with the surroundings [15]. The 1987 Washington Charter emphasized promoting harmony between the private and the public sectors, restoring collective memory, preserving authenticity, and diversifying functions while encouraging community participation, improving housing, and controlling traffic without affecting the historical fabric by improving accessibility to the historic site and enhancing its connectivity, the charter has also confirmed the importance of the permeability factor [16]. The Nara Document of Authenticity (1994) focused on the principle of cultural diversity, and the relation of the whole to the part in terms of the collective cultural heritage and that authenticity is a qualitative factor related to the value of aspects of form, design, materials, use, function, traditions, techniques, location, spirit and feeling [14]. Borra charter (1992) emphasized the possibility of changing the use with the least possible amount of intervention without affecting the cultural significance, which is embodied in the place itself, its texture, the nature of use, meanings, associated places, and elements found in other places, but they affect the personality of the first place while providing the factor of flexibility in Compatible use with the original use, the use of traditional techniques with the possibility of accepting modern materials for necessity, and meeting the needs and requirements of the owner [4]. The Amsterdam Declaration of 1975 called for the importance of a common awareness of heritage, an emphasis on social quality in

preserving the local social fabric, supporting the private sector and the relation with the public sector, and the recommendation for integrated preservation [17]. By reviewing and analyzing the paragraphs of previous international charters and determining what is related to integrative conservation, it can be noted that the most important details or aspects emphasized by these charters are authenticity, continuity, social quality, flexibility in use, connectivity, accessibility, housing quality, Permeability, diversity, and the relation between public and private sectors.

4. LITERATURE PRESENTATIONS

4.1 Aspects of integration in the urban fabric

Several studies have been presented on the concept of urban integration, including Al-Qaisi's study in 2017, which defines urban integration as the linkage that achieves the continuity of the constructive relationship between the elements of the urban structure and the users, which is the whole that functionally, visually and structurally unifies the material and immaterial elements. The studies have indicated five sections of integration, which are site integration of the urban structure, functional integration, holistic integration, spatial integration, as well as visual integration [18]. The study of the Asian Bank of Development said that the comprehensiveness of urban integration is achieved through the application of four characteristics: Accessibility, Affordable housing, Resilience, and Sustainability [19], while Ellin's study (2006) reviewed the concept of integrated urbanization as an important sign for a more sustainable urban environment through five basic characteristics of integration, which are Hybridity, Connectivity, Porosity, Authenticity and Vulnerability [20]. Madloul's study in 2018 has presented the concept of urban integration as a systemic behaviour of the city as a system consisting of several secondary systems linked to each other by relations that result in the final form of the city, making it a comprehensive system, and these secondary systems include the physical system, the movement system, the cognitive values system, and the production system [21].

Table 2. Extracting criteria for integrative conservation from previous studies (The researchers)

Permeability	Diversity	Affordable Housing	Connectivity	Accessibility	Resilience	Social Quality	Authenticity	Criteria for Integrative Conservation Previous studies
								(John Mullin, 2000)
								(Wang, 2001)
								(Sanoff, 2003)
								(Geambazu, 2014)
								(İLHAN, 2014)
								(Shamsuddin, 2015)
								(SitiZalehaDaud, 2016)
								(Rahman, 2016)
								(Damanik, 2017)
								(Keyvanfar, 2018)
								(Bahreldin, 2020)
								(Karteek, G, 2020)
								(Djukic, 2020)

Table 3. Criteria and indicators of integrative conservation (The researchers)

Criteria code	Criteria	Indicators	Indicators code
A	Authenticity	Keep on the original design	A1
		Integration with the setting	A2
		Using local materials	A3
		Quality of work and using local workmanship	A4
		Preserving relations with the place/sense of belonging	A5
		Keep a job / original use.	A6
S	Social quality	Empowerment and ability to participate in the decision-making of the local community	S1
		The connection between population and place	S2
		Promote volunteer work	S3
		Strengthening local identity	S4
R	Resilience	Resilience of Transportation	R1
		Resilience of using the existing structures	R2
		Resilience of investment opportunities in diverse activities of conservation	R3
		The ability to restore collective memory, whether in the presence of the heritage element or through its impact on the place	R4
C	Accessibility	Safe access to events	C1
		Respect privacy	C2
		Relatively short arrival time	C3
		Low cost of access	C4
		Correlation between sectors	C5
O	Connectivity	Continuity of motion axes	O1
		Continuity of visual axes	O2
		Possibility of participatory activities	O3
		Preserving the human scale	O4
		Attention to associated places that affect the identity of the original place	O5
		Attention to associated elements found elsewhere but affecting the identity of the original place.	O6
F	Affordable housing	Housing ownership (owned/rented)	F1
		Public-private partnership	F2
		Opportunities for jobs and employment	F3
		Access to public services (schools, hospitals, public parks, kindergartens, quality of transportation systems)	F4
		Livelihood for the most vulnerable groups in society	F5
		Stimulating local crafts and industries	F6
		Quality of municipal services and administration	F7
		The Efficiency of saving energy in houses	F8
		Safety (low crime rate)	F9
D	Diversity	Diversity of use	D1
		Environmental diversity	D2
		Social diversity	D3
P	Permeability	Possibility to penetrate spatial boundaries	P1
		Interconnection between open spaces	P2

4.2 Previous studies

Several studies and global experiences in the field of riverfront conservation have been achieved, including the study of Geambazu in 2014, which aimed to achieve a clear understanding of the dimensions of governance and planning, the top-down impact of the governance approach, and mechanisms to empower the societal base from the bottom and up in the decision-making process [22]. Bahreldin's study in 2020 has adopted the seven principles of "Karta" as a criterion for the development process, and the vision provided functional features of affordable housing, collective use, facilitating accessibility, enhancing pedestrian and bicycle paths, and also included suggestions about cultural heritage [23]. The study of Damanik in 2017 dealt with the adoption of a modification of the theory (Tori 1989) and (Ren 1983) for development, which is a very successful experiment that should have continued until the end of the research to provide strategies organized and arranged according to the sequence of theoretical contents. In addition, the presentation of the idea of

authenticity as being physical and functional, which is linked to the activity of tourists, needs to be reconsidered since authenticity is generated from the strength of the connection with local variables, so the visitor will be affected by it and not affecting on it [24]. Study G 2020 confirmed the importance of restoring and protecting riverfronts to improve water quality and achieve balance with emerging human requirements and taking into account the sanctity of rivers for the Indian people and their transformation into cultural symbols [25]. The study by Wang in 2001 said that local communities are one of the most important stakeholders and that they have the most prominent role in heritage management and participation in conservation activities, and considered that the way of life is an integral part of the urban heritage value of historical cities [26]. Rahman's study in 2016 focused on enhancing the understanding of the river's potential to improve the quality of life for the neighbouring community as well as activating the role of social participation [3]. ILHAN study 2014 aimed to make the riverfront the focal point of daily life and create a sense of local identity that cannot be achieved unless dealing

with environmental and cultural features of heritage, social system and collective memory in the planning and design stages [27]. Shamsuddin's study in 2015 discussed the methods of renovating the riverfront and their impact on the contextual integration of the cities of Malacca and Georgetown in Malaysia and using quantitative and qualitative methods to determine the common and distinctive characteristics of each area [28]. The study of Sanoff in 2003 represents an application of participatory techniques such as awareness methods (newspaper topics, articles and newsletters), collective interaction methods (focus groups, games, the Karet process) and indirect methods (surveys, questionnaires and interviews) for riverfront development [29]. Keyvanfar's study confirmed that developing the riverfront is a successful strategy for conserving the urban heritage and enhancing identity and authenticity [30]. Djukic's study in 2020 indicated that the socio-economic transformation of post-socialist countries into the capitalist system had a significant impact on the projects of developing riverfronts [31].

The previous studies related to the development of the riverfronts of global cities show the importance of adopting several criteria within the policy of dealing with them, as they focused on several criteria such as authenticity, social quality, flexibility, accessibility, connectivity, affordable housing, diversity, permeability, and as shown in Table 2.

4.3 Indicators and criteria of integrative conservation

As a consequence of what has been discussed in international charters and the analysis of urban integration and urban conservation studies, and through the analysis of studies done on the development of riverfronts globally, a set of criteria and indicators can be deduced to achieve integrative conservation, and as shown in Table 3, as it includes each of the Accessibility criteria, which represents the flow of movement and ease of access for all groups of society to various activities without using the car as much as possible [32]. Affordable Housing, as the ratio of the family's monthly income to housing expenses, should not exceed (25 to 35 per cent) of the monthly income [33]. Resilience is the ability to restore the urban system after disturbance and to maintain desired functions [34]. Diversity, through the adoption of a variety of activities that stimulate social interaction among people, which can achieve characteristics that blend events as a system involved in the urban landscape [20]. Connectivity is the linking force between the volume of pedestrian traffic and the degree of street integration, and it is positive if it succeeds in attracting a larger number of users, and connectivity is either kinetic or visual or both together and may be functional [35]. Permeability, which is the mutual access through permeable axes while preserving the unity of formation, which is the ability of one thing to move through another thing [35], and the permeability of any system depends on the number of alternative ways that the system provides from one point to another [36]. Thus, permeability determines the extent of the local and holistic integration of urban space [37]. Authenticity is defined as the thing that preserves itself and its stability, in addition to having self-esteem and authority, and authenticity refers to something creative, a product or something that has a deep identity in form and content, and the basic indicators for assessing authenticity in historical places include Location, Design, Setting, Materials, Workmanship, Feeling, Association, Function and Use [38]. It is important to note that heritage buildings that have lost their original function may

still carry cultural, historical, spatial and economic values [39]. Social quality is a concept that integrates with economic performance as a supporting criterion in the development assessment process [40]. This concept confirms the importance of community participation and social interaction in achieving a distinctive local identity and social sustainability that stems from a real awareness of the dangers of globalization on intangible societal values, which was confirmed by the UNESCO Universal Declaration on Cultural Diversity [41]. Table 3 shows the most important indicators of integrative conservation.

5. THE RIVERFRONT OF THE OLD CITY OF MOSUL, A CASE STUDY

Water is an important natural resource that directly affects the growth and development of human settlements as rivers became one of the basic ingredients for the emergence of the first cities on their banks, which establishes an integrative relation between the city and water throughout history [42]. Riverfront is defined as the part of the city that is in direct contact with the water, whether it is a river, lake, sea, or ocean [2]. The Old City of Mosul has a high local symbolism because of its cultural heritage and important heritage landmarks, as shown in Figure 1, the most important of which is the distinguished urban fabric of the riverfront, which was completely destroyed during the military operations in 2017, with the absence of a clear policy and a long-term action plan for its reconstruction now. This city area includes hundreds of traditional and heritage residential houses and a group of religious buildings located on a high plateau. These buildings cumulatively overlap, forming a distinct urban panorama with overlapping elements and parts. Residential houses often contain an inner courtyard facing the river, which makes this combination unique among the cities of the Arab-Islamic world on both architectural and urban levels.

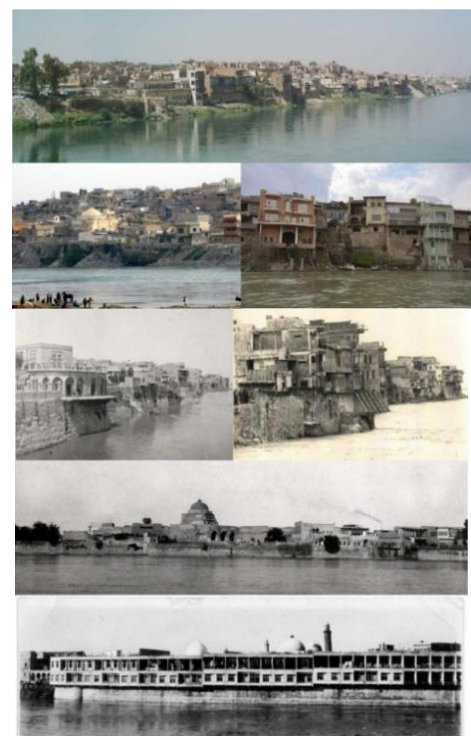


Figure 1. Riverfront of the Mosul old city [43]

6. PRACTICAL PART

This research was determined within the spatial boundaries of the riverfront of the Old City of Mosul, extending from the Old Iron Bridge in the south to the Bab Al-Shat area in the north and the Tigris River in the east to a depth of 200 meters in the traditional fabric of the city in the west. As for the temporal constraints, they are the period from 2014 to 2022. The objective constraints are represented in the criteria, indicators and requirements of integrative conservation. Through the analysis of the policies used in dealing with the urban fabric in comparison with the indicators of integrative conservation (Table 4), and to find out the closest policies to achieve the criteria and indicators of integrative conservation for the reconstruction of the historic riverfront of the Old City of Mosul, a set of methods were carried out as follows:

6.1 Interviews of experts

Interviews were conducted with ten experts in the field of

urban conservation and renovation. During each interview, a number of questions were asked about the possible policies and their intersection with the requirements and criteria of integrative conservation to identify the policy closest to the four possible policies (Appendix 1).

6.2 Questionnaire

A questionnaire was designed and directed to a homogeneous sample of (101) individuals consisting of those interested in the field of urban heritage, including planners, architects, historians and engineers, in order to ensure a degree of compatibility and accuracy in adopting an effective policy to deal with urban heritage on the riverfront of the Old City of Mosul. The questionnaire was designed according to the five-factor Likert model, which is universally approved in many similar types of research, calculating the arithmetic mean of the values with the standard deviation and applying the T-Test as well as determining the direction of the sample, see Appendix 2.

Table 4. Matching urban fabric conservation policies with integrative conservation indicators (The researchers)

Urban Fabric Conservation Policies				Integrative Conservation Indicators		
Rehabilitation	Preservation & Restoration	Urban Renewal	Urban Redevelopment	Indicators Code	Criteria	Criteria Code
Excellent	Excellent	X	X	A1	Authenticity	A
Excellent	Excellent	X	Poor	A2		
Excellent	Excellent	X	X	A3		
Excellent	Excellent	X	X	A4		
Excellent	Excellent	X	X	A5		
Good	Excellent	X	Poor	A6		
Excellent	Excellent	X	X	S1	Social quality	S
Excellent	Excellent	X	X	S2		
Excellent	Excellent	X	X	S3		
Excellent	Excellent	X	X	S4		
Good	Poor	Excellent	Excellent	R1	Resilience	R
Excellent	Poor	X	Good	R2		
Excellent	Poor	X	Poor	R3		
Excellent	Excellent	X	X	R4		
Good	Poor	Excellent	Excellent	C1	Accessibility	C
Excellent	Poor	Good	Good	C2		
Good	Excellent	Excellent	Excellent	C3		
Excellent	Excellent	Good	Good	C4		
Excellent	Excellent	Poor	Poor	C5		
Good	Poor	Excellent	Excellent	O1	Connectivity	O
Excellent	Poor	Excellent	Excellent	O2		
Excellent	Good	Poor	Good	O3		
Excellent	Excellent	Poor	Poor	O4		
Excellent	Excellent	X	X	O5		
Excellent	Excellent	X	Poor	O6		
Excellent	Excellent	Good	Good	F1	Affordable Dwelling	F
Excellent	Poor	X	Poor	F2		
Excellent	Good	Excellent	Excellent	F3		
Excellent	Poor	Excellent	Good	F4		
Excellent	Good	Poor	Poor	F5		
Excellent	Excellent	X	Poor	F6		
Excellent	Poor	Excellent	Excellent	F7		
Excellent	Excellent	Poor	Poor	F8		
Excellent	Good	Excellent	Excellent	F9		
Excellent	Poor	Excellent	Excellent	D1	Diversity	D
Excellent	Good	Excellent	Excellent	D2		
Excellent	Poor	Poor	Poor	D3		
Excellent	Poor	Poor	Poor	P1	Permeability	P
Excellent	Excellent	Poor	Poor	P2		

7. RESULTS AND DISCUSSING

Integrative conservation has three main aspects, the functional, social and visual aspects, which are affected at the urban level by eight basic criteria: authenticity, social quality, flexibility, accessibility, connectivity, affordable housing, diversity and permeability. The interview and questionnaire process specialized in the social aspect of integrative conservation, as the questions posed were linked to the indicators of integrative conservation, as follows:

7.1 Experts interviews results

After unpacking the contents of the experts' answers and comparing their answers with the policies of dealing with the urban fabric and the requirements of the standards of integrative conservation on the riverfront fabric of the Old City of Mosul, it was found that the closest policy is the policy of rehabilitation and to a lesser extent the policy of conservation and recovery, then the lowest policy which is the policy of urban development. Methods of urban renovation policy are rarely adopted. Experts' opinions emphasized the importance of the riverfront as an expression of the local identity of Mosul city in particular and of the Arab and Islamic cities in general, as it cannot be neglected for any reason and the necessity of long-term integrative planning to keep it as an example of an alive heritage at the present time and in the future.

7.2 Results of the questionnaire

1. Question No. (12) is related to the following indicators of integrative conservation (A2, A5, S2, S4, R4, O2, O5, O6) which is (Does the reconstruction of historical monuments such as the Al-Hadbaa' Minaret, the domes of mosques and churches, the distinctive traditional markets of the city positively affect the identity and integrity of the riverfront?): We find that 86.4% of the sample strongly agreed with the positive impact of the reconstruction of distinctive historical monuments on the identity and integration of the riverfront.

2. Question No. (6) is related to the following indicators of integrative conservation (A1, A5, A6, S2, S4, R2, R4), which is (Do you consider the openness of the inner courtyards of the houses overlooking the river is something unique for them among the rest of the historical cities?): We find that 81.2% Of the sample have agreed with the unique feature of the riverfront represented by the opening of the central courtyards to the river.

3. Question No. (11) is related to the following indicators of integrative conservation (F4, F7) (Do you support making a separate plan to develop the infrastructure services for the old city as a whole before starting development?): We find that 86.2% of the sample answered strongly in agreement on the importance of initiating restoration of the infrastructure first.

4. Question No. (16) is related to the following indicators of integrative conservation (A1, A2, A3, A4, A5, A6) (Do you agree that the authenticity criterion is the most important in the process of restoring the riverfront?): We find that 86% of the Sample have strongly agreed with the importance of the authenticity criterion.

5. Question No. (9) is related to the following indicators of integrative conservation (A1, A2, A5, S2, S4, R1, R4, C1, C2, C3, C4, O1, O2, O3, O4) (Do you think that the intersections and complexes in the region work on the existence of a visual sequence in the urban landscape, which generates a sense of

architectural fabric within the riverfront?): We find that 76.8% of the sample answered in agreement with the importance of intersections and complexes in creating a woven visual sequence of the urban landscape on the riverfront.

6. Question No. (1) is related to the following indicators of integrative conservation (A1, A2, A3, A3, A4, A5, A6, O4, R4, R2, S4, S2, S1, F6) (Do you prefer to rehabilitate this area by preserving Its historical identity through reusing large parts of it and using the same traditional building materials and techniques?): We find that 81.6% of the sample answered in agreement with the adoption of the rehabilitation policy on the riverfront.

7. Question No. (7) is related to the following indicators of integrative conservation (S4, A2, A3, A4, A5, R4, O4, F6) (Do you support the reconstruction of the facades of the internal alleys of the area with the same old details and proportions using new materials compatible with the old materials?): We find that 74.6% of the sample answered in agreement with the use of the same details and proportions using new materials compatible with the old materials.

8. Question No. (18) is related to the following indicators of integrative conservation (A1, A2, A3, A4, A5, A6, S2, S4, R4, C5, O1, O2, O3, O4, F2, F8, D1, D2) (Do you feel comfortable when passing through arched passageways distributed in the city's alleys?): We find that 81.4% of the sample answered "agree" to feeling comfortable when passing through the arched passageways.

9. Question No. (10) is related to the following indicators of integrative conservation (O1, O2, O4, C1, C2, C3, F9) (Do you think that the complexes and intersections on the riverfront allow clear movement within the area?):

We find that 71.6% of the sample agreed with the importance of the complexes and intersections in the clarity of movement on the riverfront.

10. Question No. (14) is related to the following integrative conservation indicators (A2, A3, A4, A6, S4) (Do you support the use of modern technologies with old designs for the reconstruction of the riverfront according to a long-term plan?): We find that 71% of the sample answered agreed with the use of modern technologies with old designs for the reconstruction of the riverfront according to a long-term plan.

11. Question No. (5) is related to the following indicators of integrative conservation (F1, F2, D3) (Do you think that the residential houses in the riverfront area will suit the level of the middle or poor class if they are newly renovated?): We find that 63.6% of the sample answered "neutral" that the residential houses in the riverfront area would suit the level of the middle or poor class if they were newly renovated.

12. Question No. (2) is related to the following indicators of integrative conservation (A2, A5, S1, R3) (Do you prefer to develop specific blocks of the area by achieving contemporary requirements, using modern materials and technologies, and preserving heritage buildings as parts of the fabric and not individually as urban evidence and landmarks?): We find that 69.6% of the sample answered agreed with the preference for developing specific blocks of the area by achieving contemporary requirements, using modern materials and technologies, and preserving heritage buildings as parts of the fabric and not individually as urban evidence and landmarks.

13. Question No. (15) is related to the following indicators of integrative conservation (A1, A2, A3, A4, A5, A6, S2, S4, R4, O4, F6) (Do you support the use of traditional techniques with old designs for the reconstruction of the riverfront according to a long-term plan?): We find that 64% of the

sample answered “neutral” to the use of traditional techniques with old designs for the reconstruction of the riverfront according to a long-term plan.

14. Question No. (3) is related to the following indicators of integrative conservation (O1, C3, C1, R1) (Do you agree with renovating and modernizing the area in a contemporary and modern way similar to what was done on the other side of the Old Bridge (Corniche Street), and making use of it?): We find that 50.6% of the sample answered disagreed with the renovation and modernization of the area in a contemporary and modern way, similar to what was done on the other side of the Old Bridge (Corniche Street).

15. Question No. (4) is related to the following indicators of integrative conservation (A1, A2, A3, A4, A5, A6, S2, S4, R4, O4) (Do you agree that the entry and exit process within the riverfront area is clear and does not confuse the visitor in terms of design if it was returned with the same old layout of its old alleys?): We find that 65% of the sample answered “neutral” that the entry and exit process is within the riverfront area is clear and does not confuse the visitor in terms of design if it is returned with the same layout of its old alleys.

16. Question No. (13) is related to the following indicators of integrative conservation (R1, C1, C2, F7) (Do you support the use of modern technologies and rapid methods for the reconstruction of the riverfront as soon as possible?): We find that 62.4% of the sample answered “neutral” to the use of modern technologies and rapid methods for the reconstruction of the riverfront as soon as possible.

17. Question No. (17) is related to the following indicators of integrative conservation (R1, C1, F2, F7) (Do you want to have a tourist hotel or a commercial mall on the riverfront?): We find that 64% of the sample answered “neutral” to the desire of having a tourist hotel or commercial mall on the riverfront.

18. Question No. (8) is related to the following indicators of integrative conservation (exactly opposite to the indicators of authenticity) (Do you support the reconstruction of the inner alleys' facades of the area with new and modern details, proportions and materials?): We find that 53.8% of the sample answered with the disapproval of the reconstruction of the inner alleys' facades of the area with new and modern details, proportions and materials.

8. CONCLUSIONS

8.1 Literature presentation

Integrative conservation is one of the types of urban conservation that seeks to protect the tangible and intangible heritage elements in a manner that enhances the social and economic aspects within administrative frameworks aimed at enabling local communities to actively participate in the conservation process from the early stages of planning to the stage of occupancy, monitoring and evaluation. Integrative conservation has three main aspects: the social, functional and visual aspects and each aspect is affected to varying degrees by the basic criteria of integrative conservation, and these criteria are authenticity, social quality, resilience, accessibility, connectivity, affordable housing, diversity and accessibility, as each criterion has several indicators that work to achieve its objectives. By comparing the criteria and indicators of integrative conservation with the policies of dealing with the traditional urban fabric, it turns out that the urban renewal

policy is the most excluded, while the rehabilitation policy and then the preservation and recovery policy approach with the indicators of integrative conservation, followed by the urban development policy to a lesser extent.

8.2 Experts interviews

Through a series of interviews with experts specialized in the aspects of urban conservation and renovation and to obtain qualitative information that can be adopted as general guidelines for dealing with the urban fabric of the riverfront of the Old City of Mosul and in comparison with the possible policies that intersect with the standards and indicators of integrative conservation, the experts unanimously agreed on the exclusion of the urban renewal policy, for its profound impact on the loss of the historical identity of the city. While most of them confirmed that preserving the area's authenticity is the first requirement, provided that it is carried out within the limits of the possible and available economic, social, political and administrative capabilities and available or obtainable documents. They adopted the idea of a viable heritage city that meets the needs and requirements of its current residents without losing its attractiveness and historical splendor. Most of them mentioned that the Old City and its riverfront have unique features that cannot be compensated in the event of its loss and must be used in the reconstruction process as it is the civilizational identity of the country as a whole.

8.3 The questionnaire

As for the questionnaire's outputs, it was found that the unique features of the Old City should be preserved and retrieved as indicated by the two questions (6 and 12), with the necessity of providing infrastructure services as in question (11), and agree to the aspects that accept both conservation and restoration or rehabilitation in a way that preserves spirituality of the Old City as in questions (16, 9, 1, 7, 18, 10, 14). Also, the neutrality in questions (4 and 15) towards strict conservation (the museum) is justified by the fact that the city is alive and still inhabited. There is neutrality towards development that approaches the limits of renovation, as well as neutrality towards renewal, which amounts to a declared rejection of renewal (questions No. 8 and 3).

Finally, it can be said that the policies closest to the standards of integrative conservation are mainly rehabilitation, preservation and recovery, followed by redevelopment and as much as possible to maintain the criterion of authenticity, and there is a wide exclusion of the policy of renewal. It considers the limits of the objective study represented by the criteria of integrative conservation and the spatial limits represented by the urban fabric of the riverfront with a depth of 200 meters, the temporal determinants represented by the last post-war period from 2014 to 2022 AD. It is possible to expand the limits of objective and spatial research in future studies.

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APPENDIX

Appendix 1. Expert questions

Procedural definitions of the study:

Preservation & Restoration Policy: Restoration is restoring the structure to its original and valuable condition in which it was originally built. Preservation is restoring the structure to its last distinct condition, protecting and preserving it.

Rehabilitation policy: Raising the urban and environmental level of the urban fabric by preserving the features, characteristics and elements of heritage value and modernizing facilities harmoniously and homogeneously, physically and visually with the original, while striving to achieve contemporary requirements.

Urban Redevelopment Policy: It depends on the methods of removal and reconstruction of entire areas of the urban fabric and includes owning large sites from the total site and then rebuilding in a contemporary and modern style for these areas while keeping other areas.

Urban Renewal Policy: Restructuring and planning the targeted areas, removing the fabric of the old areas, except for some important historical buildings, and rebuilding in a modern, contemporary style.

The riverfront of the old city of Mosul means the part between the ancient bridge on one side and the fifth bridge on the other, with a depth of 200 meters.

-Is there a decision or measures adopted about a specific policy for the reconstruction of the old city in general, with the identification of one of the closest policies, if possible?

-Is there a specific vision or selected policy for the reconstruction of the riverfront sector and the improvement of infrastructure in particular, with the identification of one of the closest policies, if possible?

-What are the constraints of reconstructing the riverfront area as it was originally with improving infrastructure?

-Would the rehabilitation of this area prefer preserving its historical identity but by reusing large parts of it and using the same traditional building materials and techniques? And why?

-Do you prefer to develop specific parts (urban blocks) of the area in a way that achieves contemporary requirements and uses modern materials and technologies while leaving several heritage buildings as parts of the fabric and not individually as urban evidence and landmarks?

-Are you in favour of renovating the area and modernizing it in a contemporary and modern way, similar to what was done on the second side of the old bridge (Corniche Street), and benefiting from the investment and commercial potential of the area while compensating the people of the area to live in areas on the outskirts of the city?

-In your opinion... What are the most important features (formal, social, functional, and environmental) of the riverfront area of Mosul before its destruction?

-How can the participation of the local community be enhanced in the reconstruction of the riverfront of the ancient

city of Mosul? Is community participation a viable process now? What are its limitations, if any?

-Is it necessary to change the land uses within the riverfront sector? If the answer is yes... What are the types of uses (residential, commercial, recreational, administrative, educational, mixed) that you consider appropriate for this part, and which support the adopted or proposed policy?

-What are the most important difficulties and constraints in dealing with the reconstruction of this region?

-In your opinion, what is the best alternative in the reconstruction of the riverfront area currently in terms of building materials and techniques: Is it using the same materials, designs and original techniques? Or using new materials with the same original design? Or the use of new materials and new designs for important parts and specific areas or confined between certain alleys? Or using new materials and new designs for the region in a contemporary and modern way?

- About land ownership, which of the following policies do you think is most appropriate in the current situation after the destruction of the area: Is it compensating the owners of the house with sums of money instead of the damage done and rebuilding it as it was under the supervision of the specialized institutions? Or by compensating the owners of the houses with sums of money instead of the damage caused and reconstructing them in a manner compatible with the neighbouring environment, but by modernizing and changing the use of parts of it? Or by compensating the owners of the houses for some parts with sums of money instead of the damage caused and reconstructing them in a contemporary way with investment and modernizing the other parts in a way that ensures the economic sustainability of the region? Or by acquiring lands in this area by the state and compensating their owners in other areas, or with a financial allowance and transferring them to investment projects?

Appendix 2. Questionnaire questions with statistical analysis table

question rank	sample direction	percentage	standard deviation	SMA	size sample	no, strongly	no	neutral	yes	yes, strongly	No. q
1	yes, strongly	86.4	0.84	4.32	101	0	7	4	40	50	12
2	yes, strongly	86.2	0.73	4.31	101	0	4	4	50	43	11
3	yes, strongly	86	0.74	4.3	101	0	3	8	46	44	16
4	yes	81.6	0.91	4.08	101	0	10	8	47	36	1
5	yes	81.4	0.73	4.07	101	0	5	9	61	26	18
6	yes	81.2	0.73	4.06	101	0	4	12	59	26	6
7	yes	76.8	0.66	3.84	101	0	3	22	64	12	9
8	yes	74.6	0.82	3.73	101	1	8	21	58	13	7
10	yes	71.6	0.66	3.58	101	0	5	37	54	5	10
12	yes	71	0.99	3.55	101	1	17	25	41	17	14
15	yes	69.6	1.13	3.48	101	6	16	21	40	18	2
19	neutral	65	1.03	3.25	101	5	22	24	43	7	4
20	neutral	64	0.95	3.2	101	1	28	29	36	7	15
21	neutral	64	1.22	3.2	101	10	22	22	32	15	17
22	neutral	63.6	0.95	3.18	101	2	29	22	45	3	5
23	neutral	62.4	1.33	3.12	101	15	22	17	30	17	13
27	no	53.8	1.1	2.69	101	12	42	15	29	3	8
28	no	50.6	1.22	2.53	101	21	40	11	23	6	3