



Urban Landscape Resilience for Al-Kut's City Riverfront

Shahad Abdul Hussein¹, Husam Sachit Senah¹

Affiliations

¹Department of Architectural Engineering
University of Wasit
Wasit, Iraq.

Correspondence

Shahad Abdul Hussein
shahadabd303@uowasit.edu.iq

Received

27-August-2024

Revised

20-September-2024

Accepted

27-September-2024

Doi:<https://doi.org/10.31185/ejuow.Vol12.Iss4.590>

Abstract

Urban landscapes around the world are increasingly facing a large number of challenges, this includes issues related to population growth, environmental degradation, and issues related to climate change. Here, it is important to understand urban resilience as a basic framework for developing cities, and maintaining the integrity of cultural and environmental cities in the face of these pressures. Like in most cities, the riverfront associated with Al-Kut's traditional centre holds great importance for the city due to the diversity of social and economic activities linked to the area. Recent encroachments on the spaces within the traditional centre of the city and near the river have caused the area to deteriorate. This study focuses on the riverfront of the city of Al-Kut in Iraq, a city with a rich historical and cultural heritage closely linked to the river. Through a public survey and local government interventions, like projects connected to the riverfront's open spaces, the study suggests a collaborative strategy that integrates stakeholders' goals and desires to address the area's numerous problems. Accordingly, the study believes that combining the ideas of social justice and ecosystem-based adaptation can accomplish the development of a resilient urban environment that can withstand future shocks and stresses. Enhancing the role of riverbank areas and improving public spaces can strengthen the resilience of urban landscapes along the riverfront of Al-Kut city's traditional centre. Therefore, it is possible to create and enhance plans that prioritize and protect the riverbanks for future generations in a more adaptable and sustainable manner, benefiting both locals and tourists. From there, we can reconnect the city's traditional areas to the river, highlighting the significance of cultural and historical elements in urban planning and design.

Keywords: urban resilience, heritage, Traditional City, sustainable development, Al-Kut, Iraq.

الخلاصة:

تواجه المناظر الطبيعية الحضرية في جميع أنحاء العالم بشكل متزايد عدداً كبيراً من التحديات، ومنها النمو السكاني، والتدهور البيئي، وتأثيرات تغير المناخ. وفي هذا السياق، يبرز مفهوم المرونة الحضرية كإطار مهم للمدن لارتباطها بموضوع التكيف والازدهار والحفاظ على سلامة المدن الثقافية والبيئية في مواجهة هذه الضغوط. وكما في أغلب المدن، تملك الواجهة النهرية المرتبطة بالمركز التقليدي في مدينة الكوت أهمية كبيرة للمدينة بسبب تنوع الفعاليات الاجتماعية والأنشطة الاقتصادية المرتبطة بالمكان. وقد تعرضت هذه المنطقة إلى التدهور خلال الأونة الأخيرة نتيجة للتجاوزات الكثيرة على المساحات الموجودة ضمن المحيط التقليدي لمركز المدينة والقريبة من النهر، تركز هذه الدراسة على الواجهة النهرية لمدينة الكوت في العراق، وهي مدينة ذات تراث تاريخي وثقافي غني يرتبط ارتباطاً وثيقاً بالنهر. ومن خلال استطلاع رأي عام وتدخلات الحكومة المحلية، مثل المشاريع المرتبطة بالمساحات المفتوحة على ضفاف النهر، تقترح الدراسة استراتيجية تعاونية تدمج أهداف ورغبات أصحاب المصلحة لمعالجة المشكلات العديدة في المنطقة. وبناءً على ذلك، تعتقد الدراسة أن تطوير بيئة حضرية مرنة قادرة على تحمل الصدمات والضغوط في المستقبل يمكن تحقيقه من خلال دمج أفكار العدالة الاجتماعية والتكيف القائم على النظام البيئي. وهنا، تفترض الدراسة أن الحالة التاريخية للمدينة ومستوى معيشة مواطنيها ضعيفان حالياً. ومن خلال تعزيز دور مناطق الضفة النهرية وتحسين المناطق العامة يمكن تعزيز مرونة المناظر الطبيعية الحضرية على طول الواجهة النهرية لمركز مدينة الكوت التقليدي. لذلك، من الممكن إنشاء وتعزيز خطط تعطي الأولوية لضفاف النهر وتحسينها للأجيال القادمة بطريقة أكثر تكيفاً واستدامة لكل من السكان المحليين والسياح. ومنها إلى إعادة ربط المناطق التقليدية في المدينة بالنهر، مع التأكيد على أهمية الجوانب الثقافية والتاريخية في التخطيط والتصميم الحضري.

1. INTRODUCTION

Urban centres around the globe are seeing a significant increase in population density and connectivity, surpassing any previous levels. While there are numerous social and economic benefits associated with this, there are also growing vulnerabilities [1]. The current situation necessitates governance models that can effectively manage risks and address rising difficulties. Conventional models of reactive and isolated decision-making will not produce the necessary strength and adaptability required for us to thrive in the presence of sudden shocks and ongoing pressures in the 21st century [2]. It is uncommon for a city to face only one sort of issue simultaneously. However, cities are faced with a mixture of sudden and severe disruptions as well as ongoing and persistent challenges. City systems of Urban resilience ability, businesses, companies, people, and organisations to resist, adapt to, and thrive in the face of constant challenges and unplanned events [3]. By means of bettering its fundamental framework and strengthening its awareness of the challenges to its stability, a city can increase not only its general course but also the welfare of its particular population [4]. It is possible for it to thrive in spite of the growing troubles. Urban resilience is a response to three major global phenomena that are coming together: climate change, urbanisation, and globalisation [5]. Urban resilience necessitates cities to take a comprehensive approach in assessing their capabilities and the hazards they encounter, which includes actively including the most susceptible individuals in society. Performing this task is difficult. To effectively prepare for a resilient and flexible urban future, it is necessary to adopt a location-specific, integrated, comprehensive, risk-aware, and forward-looking approach to tackle obstacles and devise solutions.

Al-Kut, in eastern Iraq, is a small town surrounding 5700 m of river frontage and forming a natural and pleasant landscape setting. The river is the reason for the town's existence and has played a central role in the lives of its people. A short distance to the north, the river is joined by a small tributary. It was at this point, known as Al-Kut's Traditional City Centre, over a period of almost 120 years since the foundation of modern Al Kut, the town has developed in a linear fashion along the river's edge. The riverfront has always been popular with the townspeople as a place for relaxation, socializing with others, and enjoying the attractive natural environment. The river's great importance to the region cannot be overlooked, as it provides areas for hiking and entertainment in addition to its vital role in preserving the original commercial activities along with other activities related to the river. The city of Kut, like other cities, suffers from many problems related to urban flexibility. The change in the natural landscape will affect the society and also the culture and heritage that exist within it. Here the aim of the study is to highlight the possibility of enhancing the urban landscape resilience along the Al-Kut riverfront by reconnecting the city with its historical and environmental roots. The research aims to create a framework that enhances the preservation of culture, environmental sustainability, and community well-being by conducting a comprehensive assessment of the current state of the riverfront, engaging stakeholders in identifying problems, and providing the appropriate vision to develop strategies related to urban resilience and sustainable planning for the area. It emphasizes the importance of integrating the historical context with modern urban needs, ultimately leading to the enhancement of a vibrant and sustainable environment for both current residents and future generations.

Environmental sustainability and social well-being intersect. For Al-Kut, the riverfront's historical and cultural significance presents an opportunity to harmonize traditional values with modern urban demands. By enhancing the connection between the city and its natural landscape, this research investigates how Al-Kut can adapt to environmental, social, and economic pressures. The study explores strategies to foster resilience, preserving cultural heritage while ensuring sustainable development for a thriving future.

2. METHODOLOGY

The proposed measurement A tool used to measure and evaluate urban resilience associated with landscapes along the banks of the Kout River includes a mix of quantitative and qualitative indicators, organized within a structured framework. We conducted a quantitative survey of the area using a questionnaire design, focusing on accessibility, safety, environmental quality, and cultural significance of the riverfront. Additionally, we collected qualitative feedback from local stakeholders, including businesses, community organizations, and residents, regarding the proposed initiatives. It included a thorough analysis of the literature on urban adaptability, cultural heritage, and environmental sustainability. This provided a fundamental framework for understanding the challenges and opportunities facing the banks of the Kout River. We compared the study results with successful case studies from other cities that implemented similar initiatives to revitalize the riverfront. This criterion facilitated the identification of effective strategies and outcomes tailored to Al-Kut's City Riverfront needs.

3. LITERATURE REVIEW RESILIENCE URBAN LANDSCAPE

3.1 Resilience Urban Landscape

Scientists who study the environment say that a system is resilient if it can easily change its structure and dynamics after something outside of it changes them. It is possible for a complex system to be resilient if it has backup plans, the ability to quickly self-regulate, the ability to learn new skills during a crisis, positive feedback loops that are tight, and social capital or social competence. In the economic sciences, the intellectual approach considers a society to be resilient if it will have the capabilities of rebounding and renewing developments after a crisis and even growing stronger over time [6]. Consequently, ecological sciences focus on bounce-back resilience, while economic sciences consider rebound and renew resilience [7]. However, the resilience concept adopted in the present research combines these two complementarities, allowing for structures, feedback, cognition, and learning characteristics for society in the context of a crisis or extreme situations [8]. Urban landscape resilience (ULR) is defined as the probability of the landscape to persist over time, with respect to the expected future conditions, including potential disturbances. It is what gives the landscape the capacity to absorb changes and still persist. Closely related to the concept of ecosystem resilience, it is an emergent property of landscapes which is influenced by the attributes of the constituent biota and abiotic features that vary across space and time [9]. This includes the ability of the landscape to learn and adapt to a range of shocks and disturbances and, in the extreme, to transform to a different state which can still provide the goods and services required by human societies. Collapses in function of urban landscapes ability and provide for human societies have been evident following recent global events such as Hurricane Katrina [10].

A subsequent uptake in research has furthered the understanding of ULR to reduce the vulnerability of urban settlements to drastic changes as well as to enable better management of urban landscapes and the provision of services for human societies [11]. To harness this groundbreaking potential, urban ecosystems must adapt and innovate to accomplish it. To enhance urban resilience and foster a sustainable future, one might promote nature-based behaviours and maintain biodiversity to boost urban ULR (Urban Liveability Rating). Collaborative efforts can enhance ULR and preserve urban environments for the benefit of generations to come [12]. With the support of scientific understanding, new technologies, and citizen participation, cities may overcome difficult problems, become less vulnerable, and enhance their services. The increasing number of urban disasters and risks has become a major area of interest at the international level. Most metapopulation centres in developing countries are considered to be highly vulnerable to catastrophic events [13]. Urban spatial expansion contributes to these risks by making land and soil uses susceptible to nearly all types of natural disasters [14]. Urban land use and land cover changes might lead to the sharp enhancement of drought severity, depletion of available freshwater resources, and soil erosion and desertification [15]. Urban land use and land cover changes also heighten the susceptibility of urban areas to environmental disasters like floods and landslides, which can significantly disrupt daily life in an urban setting [16]. In addition, cities represent powerful attractors of natural disasters. Their demographic concentration and the development of high-added-value activities have generated significant growth in human and financial assets. But the driving process of vulnerability is the lack of resilience of urban agglomerations. Hence, the notion appeared only very recently in theoretical and practical fields. Therefore, urban resilience requires innovation, nature-based solutions and collaboration to mitigate vulnerabilities, manage urban risks and ensure sustainable development amidst increasing environmental challenges.

3.2 Key Concepts and Definitions

The first obvious question when dealing with the topic of urban landscape resilience is what the terms urban landscape and urban resilience exactly mean. The term urban landscape is often understood in a very comprehensive way, encompassing the entire range of spatial urban elements, from transportation system through large buildings to small-scale green spaces. From this perspective, the urban landscape is the sum of the forms formed by human and nature that collectively fulfils many interrelated purposes in modern society, varying from the functional (supplying our water, containing scattered production and distribution of goods and services, providing space for recreation and relaxation, and attracting a creative and dynamic population) to the spiritual and inspirational (contemplation and aesthetic pleasures). The urban landscape is a large man-made creation, with the concept of urban identity trying to capture the essence of these cities and metropolitan areas that we humans have painstakingly built and have maintained through careful nurturing over time.

Resilience depends on the ability of urban landscapes to respond, evolve and provide innovative solutions in the face of evolving conditions. We can include sustainable practices as an essential part of the process. Cities can strive

to enhance the level of maximum response (ULR) and pave the way for a more resilient and sustainable future, thereby enhancing their quality of life [17]. Urban resilience offers a practical framework for diminishing the various risks encountered by cities and communities, guaranteeing that sufficient resources and capabilities are established to mitigate, prepare for, respond to, and recover from diverse shocks and pressures [18]. Planning should view urban resilience as a continuous process that continuously identifies issues and strives to design strategies that promote adaptability, creativity, and collaboration. Local communities are purportedly transmitting and integrating urban resilience more successfully, but current action programs are increasingly reverberating globally and shaping the language [19]. Entities like the United Nations and the World Bank, along with a growing number of organizations, organize the Global Resilience Project with the aim of enhancing urban resilience and sustaining the urban economic framework.

Resilient thinking is concerned with understanding the complex dynamics of many systems, and revolves around the ability of systems to fully absorb changes and disturbances and adapt while maintaining patterns of space configurations. It delves into the very essence of urban systems, meticulously examining their capacity to uphold the integrity and functionality in the face of a diverse array of shocks and events. Indeed, a system is deemed truly resilient if it can effectively preserve its precisely defined structure and regulate crucial variables with remarkable acuity. Resilience is also characterized by the ability to learn and organize. The consequences of ignoring resilience can be on various aspects of the city fabric itself, from population migration, loss of open space, land use change, and more. As a result, the city may find itself stripped of its ability to provide the same level of basic services. Therefore, the goal of studying resilience is to provide a deep understanding of urban systems and landscape patterns that serve the city and link them to the topic of sustainability.

3.3 Relationship between Urban Landscape Resilience and Sustainability

Agarwal (2012) suggests that resilience is a 'necessary precursor for sustainability'; through successful adaptation and maintenance of function, the system is being sustained [17]. This suggests that a system cannot be sustained if it cannot cope with the outside stresses and disturbances which threaten its structure and function. Walker and Salt (2006) suggest that a sustainable system will have a level of resilience in order to maintain the system's defined development and conservation [20]. It is here, where a sustainable system is subject to disturbances and change from outside influences, where sustainability and resilience are seen as working together [19]. However, the statement that supports the idea of sustainability means the necessity of meeting contemporary needs without compromising the ability or rights of future generations and without compromising our present requirements. (WCED, 1987), an unsustainable system that has failed to provide the requirements of the times often have used resilience as a means to maintain function, when the system was not in the best interest of the people [21].

To The importance of the central urban axis stems from the fact that it is the crucial linear element that controls the entire urban environment. This axis is located within a broad urban fabric or context. The main axis plays the largest role in organizing and controlling as the backbone of urban space due to its ability to support the main urban functions and support the spatial structure of the city. Thus, the main axis and other associated axes play a major role in moving parts of the city. It contributes effectively to determining the main direction of development and growth in the city, and contributes to activating the urban flexibility of the city [22].

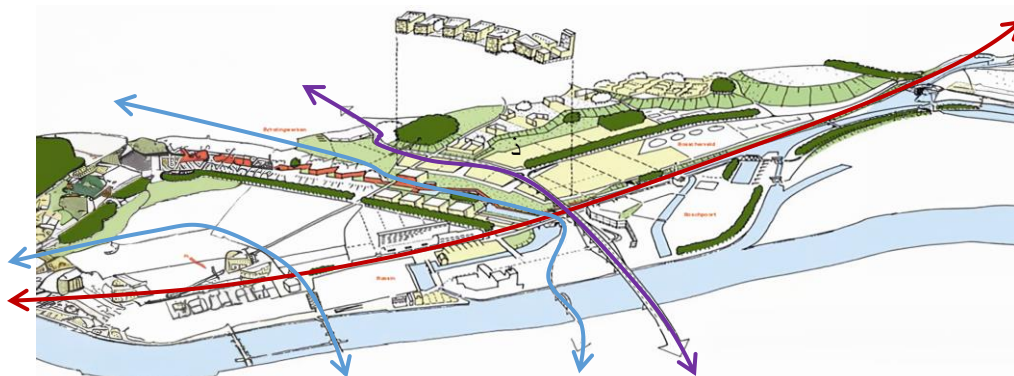


Fig.1. An imaginative representation of the importance of the motor and visual axes adjacent to the riverbanks.

The Liberty bridge is the third public road bridge in Budapest. This lovely green colour bridge located at the southern end of the inner city of the capital. There have been tram lines running through the bridge from the beginning of its

story and they still do nowadays as well. In recent years one summer when they were renovating the tram tracks on the Liberty bridge [23]. It was closed for traffic, but opened for pedestrians on the weekends, so people started organizing all kinds of picnics and events on the bridge and it was like this the next summer, too. It became a popular spot for locals and travellers. Fig.2.



Fig.2 Budapest Danube River: The idea of pedestrians being higher than cars is to create a view and connect the river to open spaces.

Tourist transportation activities are the most important cultural mediators of a place because they bring people and the landscape together. However, their presence affects the preservation of the archaeological and monumental heritage, which reveals how people lived and worked in an area in the past. In addition, the organization of this kind of activity and the promotion of the place are relevant factors for the development of the local economy, especially in a period in which mass tourism declines drastically due to the economic crisis, insecurity in tourist destinations, and changes in demand. We could use Alghero as an interesting case study for this type of tourism activity. However, we need to examine the existing tourist resources in the municipal area and their potential to determine whether they drive the reorganization of the urban structure or the urban environment throughout the year. Urban planning must enhance its function and role in addressing today's urgent and intractable human and societal problems. From globalization to climate change, from the environmental crises to the economic and financial routes, the resilient city seems to be the new capstone expected to amalgamate different visions of the city and, through experimental practices, to contribute to shaping a sustainable future for the city.

4. CASE STUDY

Kūt (Arabic: الكوت, romanized: al-Kūt), The anticipated population in 2018 is around 389,400 individuals. It serves as the administrative centre of the province, formerly referred to as Al Kut [24] but has been renamed Wasit since the 1960s. The U-shaped curve gives it the characteristics of a peninsula [25] It is clear that the average annual temperatures in Kut are higher than others, and may reach 23.4 °C (74.1 °F). Urban expansion and development along the riversides have led to destruction of the landscape and an attenuation of the river's ecosystem; this has led to a disconnection of the city from the river. Fig .3 shows the location and boundaries study area [26]



Fig.3 From left to right: 1- Iraq Map showing the Kut city, 2- The boundaries of the city of Kut, 3- The boundaries of the study area (the river and its relationship to the city center).

Due to the strategic location of this region, the British invaded and occupied Kut during World War I. This occupation was the scene of a battle in which the British suffered, to seize control of the city, a siege that lasted about 147 days, during which 13,000 soldiers were killed.

Kut has its own traditions, as the Kut community, especially young people and children, used to spend their free time on the river bank. Children and young people can no longer play in the river due to the dangerous riverbank

and deep stream, and must use a boat as it is no longer within accessible distance. All these events raised questions about the resilience of the traditional city of Kut[24]. Can it survive this change and preserve its traditions, or will it be completely transformed into a new urban area that has absolutely nothing to do with the old city and its traditions? mainly to the region's value, the river bank was chosen as a case study to implement the concept of urban resilience to investigate the feasibility of connecting the city centre with the river bank [27]. This was done in response to the numerous interventions and unregulated additions made by government agencies and individuals involved in development. These distributions preserve enormous areas of undeveloped land, creating an integrated ecosystem that integrates administrative, residential, commercial, and recreational activities, improving regional welfare [28]. River activity dispersion reveals several important conclusions: Balancing many goals: The land use distribution suggests a balance between government, residential, business, and recreational activity. It creates a cohesive atmosphere that meets visitor and resident needs. The value of open space: Open space received the most (531,310 square meters), indicating a strong desire to preserve green spaces. Commercial activity is limited to 14,580 m², which may indicate that the location is not a major commercial hub. Based on this distribution, there appears to be a trend towards achieving a balance between urban growth and preserving natural spaces, with a focus on providing a comfortable and enjoyable living environment for residents and visitors. The study area is characterized by the diversity of its uses and activities, which reflects the diversity of its functions and development. The total area of the area is 931,890 square meters. The table.1 shows distributed over several main areas:

Table.1 Distribution of areas and land uses 2024 according to the researcher’s site survey.

Topic	Details
1 Government (160,070 m ²) 17%	This area includes a vital centre for government activities and administration, including administrative offices, various buildings, service canters, and buildings affiliated with the public administration.
2 Residential (114,510 m ²) 12%	It is an important area that includes residential activities for individuals and families, with a small number of multi-storey residential buildings and apartments.
3 Commercial (14,580 m ²) 2%	It is the most important area for providing various goods and services to individuals, including commercial centres and shops, in addition to a mall and some supermarkets.
4 Entertaining (80,520 m ²) 9%	It includes recreational facilities, gardens, as well as sports centres and some social recreational activities.
5 Open space (531,310 m ²) 57%	Despite the presence of these large open spaces, they do not contain important activities, they are only open and subject to abuse.
6 Street area (30,900 m ²) 3%	The streets and roads parallel to the river that connect the area are the vital artery for accessing the river area, but they are insufficient with the interruption of the main movement axes perpendicular to the river.

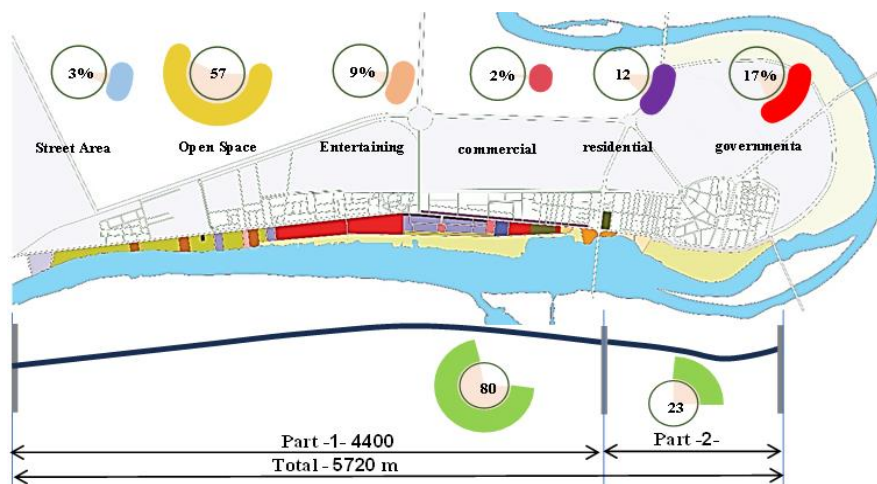


Fig.4 above: Functional zoning of the study area, the river bank of the traditional city center of Kut, below: shows the boundaries of the study area along with the length of the river front.

This is not true, as the reality of the situation is the presence of open spaces other than their commercial places, and this indicates a disconnect and isolation between the river and the city centre. This is very important and must be focused on. So, the problem is that there is separation and isolation between the activities located on the river and

the city centre, and relying on or planning the principles of urban flexibility can contribute to the process of linking these activities to the traditional centre of the city.

4.1 The river and Al-Kut's Traditional City Centre

The city of Kut is distinguished by its distinctive view on Tigris River. The town of Al-Kut was built up in the traditional Iraqi style. The town centre is based around a tightly knit web of alleyways and streets lined with shops and market stalls. Radiating out from the town centre are the residential districts, which are divided into quarters containing the homes of different groups of people.

4.2. Importance of the Riverfront Al-Kut's Traditional City Centre

The history and cultural heritage accumulated on the riverfront are considered to be invaluable essentials in the identity and pride of the local residents. The older generation's folklore of settling the town, pushing up from the southern marshes to escape the continuous threat of flooding, impending earlier settlements, and personal recounts of various historic occurrences form a significant essence of the town's history [29]. The riverfront created a strong sense of place and is still an area that is held in high sentiment; this becomes apparent when questioning the older generation and requesting their opinion on the town, their responses inevitably lead to descriptions of the riverfront during its heyday. Riverfronts have frequently been deemed as essential structures in several attempts to invigorate town cores and reclaim a sense of place [30]. In the instance of Al-Kut, the riverfront holds the distinction of being both the geographical and socio-cultural focal point of the community. The traditional city core and its riverfront is where Al-Kut identifies itself. Within this particular city form, the riverfront is the primary source of recreation, social interaction, and economic activity; the very characteristics of a vibrant public realm. It is these aforementioned traits that the town hopes to instil into their current public spaces and into the new development.



Fig.5. The latest update to the Hudayriyah Corniche area on the river bank, trying to take advantage of the open spaces along the river bank adjacent to the residential area. From the top left: a hotel under construction, shops, residential areas, below: a panoramic image of the development area. Photo by the Seeker, 4/8/2024,

The area is known for its winding streets, plethora of old houses with interior courtyards, and historic mosques. During this time, many of the buildings along the riverfront were constructed, and the area around the river was used as a social gathering place with numerous restaurants, teahouses, and small hotels [14]. The riverfront has always been the symbolic centre of the city, and the construction of "new Kut" in the 20th century did little to change this. Despite the considerable damage to the old city, it is currently undergoing tremendous expansion and continues to function as a local market and administrative hub for the lower Wasit regions. The period of damage caused by the regime and subsequent war means that the city has no real historical continuity with its past, and the marshes which were so central to the city's identity are now gone. The city is often seen as part of a greater urban community which still revolves around the marshes, and today it is the site of a proposed administrative centre for those marshlands that are now being reflooded.

4.3. Role of the Riverfront in Al-Kut's History

Historically, the city's riverfront served as the link between the cities of southern Iraq and the Persian Gulf. The riverfront was the transportation network of the past; all goods and people that entered and left the city generally did so over the Tigris. The riverfront in its prime was a lively place full of merchants, fishermen, and travellers [31] It was the arrival point for the city's guests and the point of departure for Kut's pilgrims making their way to the many religious sites located throughout the city. During the 20th century, especially after World War II, increased road construction and the implementation of modern transportation has led to a decline in the river's importance as a means of transportation. As a result, the riverfront and the old city have lost much of their historical importance due to neglect and overlooking by the various governments of Iraq. Another short-term goal is to make the river a more usable place for city residents. This means the establishment of riverfront parks at already vacant areas of public land, plus the improvement of surrounding areas to create a continuous public walkway along the river. The parks are to be simple in design, planned based on the current conditions of the areas to avoid major landscape alteration and high maintenance costs [28] A feature of the parks is the integration of traditional and natural elements (e.g. building designs, date palms) into new developments so that local cultural and environmental identity are maintained. This is in contrast to new housing and commercial developments which have minimal local identity and are not catered to the lower income sectors of society [32] To increase public accessibility to the river, there are plans for the establishment of small boat rentals and river taxi services. These will eventually be self-sustaining; however, a temporary form of subsidization, the employment of river taxi drivers by the Al-Kut municipality, is an idea to promote the use of the services by demonstrating their suitability to travel of all city residents.

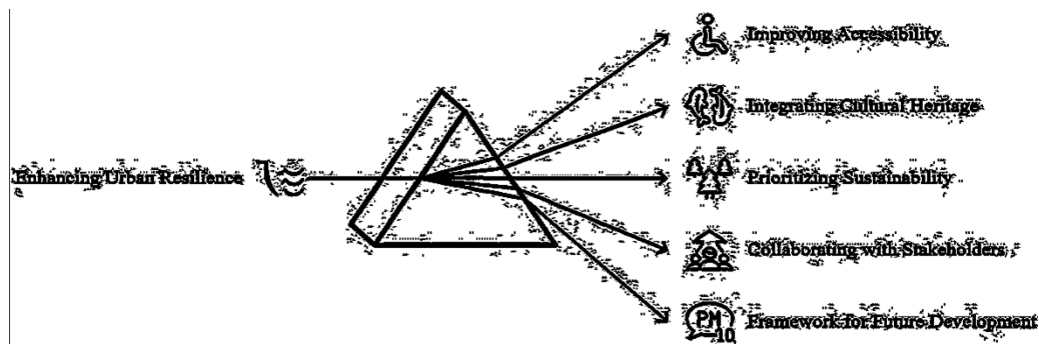


Fig.6 The five elements that make up urban resilience.

A part of the short-term strategy is to fix areas of the river that are in a state of degradation. The first step in the development process has been to commission a detailed riverfront survey for the entire river section of the city. Future development plans for the Al-Kut traditional city centre's riverfront have been based on the need to preserve the identity and culture of the area, and to create a sustainable environment that can be used by everyone resident throughout the city. There is a recognition that the river is an important asset to the city and future development possibilities should not be at the expense of the people who currently live on the river, the poor, squatters, and the various ethnic groups.

4.4 Survey Questions:

First Question Regarding the Location of a River in the Heart of the City: Is the existence of a river in the heart of a city anything that influences your decision to live there or visit?

1. 1, yes: People value the existence of rivers, according to most replies.
2. 2. Some participants do not think it is very important.
3. Thirdly, if some respondents are uncertain, I am also uncertain.

Second Question: In your opinion, does the presence of the river contribute to creating the aesthetics of the city and contribute to the prosperity of tourism and the strengthening of the economy?

1. The increase in tourists affects economic costs and land prices.
2. Few people said "no," as tourism is a source of livelihood for many families, a recreational area, and an outlet for the rest of the areas outside the centre.
3. I am not sure about the evaluation and I do not have experience.

Question Three: Do you believe in the importance of having non-traditional activities on the banks of rivers? Our inquiry into your interests in water-based recreational activities is the third one that we have made into your interests in such activities.

1. 1.Canoeing and sailing are two of the most popular leisure sports that attract a huge number of people throughout the year.
2. 2.It is not the case that every individual that takes part in the research project is of the opinion that they are entertaining.
3. 3.Regarding the third point, I have a feeling that some of the replies are either neutral or ambiguous. This is something that I have a gut about.

Fourth Question. With respect to question number four, which option would you choose for proximity to the river? If given the chance to reside or relax in a location that immediately faces the river, which of the following options would you choose?

1. A large percentage of residents are negatively affected by activities overlooking the river.
2. A few prefer to enjoy the river and not live near the river.
3. Few are unsure about their choices and preferences.

5.RESULTS AND DISCUSSION

The majority view access as difficult or unsafe: The very high percentage of respondents who answered “no” (53%) indicates that the majority of survey participants believe that public spaces on the river are not easily accessible or unsafe. A small percentage considers ease of access and security: The percentage that indicated ease of access and security (35%) is considered a smaller percentage compared to the percentage that indicated difficulty or lack of security. The presence of an unsure percentage: There is a percentage of 12% of participants who were unable to answer conclusively, which indicates that there is some uncertainty or lack of information about this topic among this segment of participants.

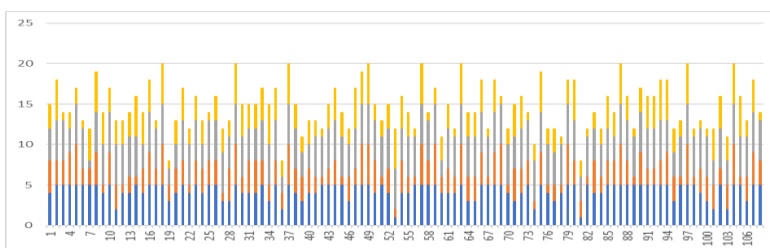


Fig.7. Indicators of cultural identity on the banks of rivers

Table.2. Percentages of respondents’ answers.

Topic	Details	Percentage
1 Preservation Importance	In your opinion, how important is it to preserve the cultural identity and vitality of the riverbank?	60%
2 Beneficiary involvement	How do you assess the level of participation by beneficiaries in planning processes related to the riverbank?	44%
3 Environmental impact	How important is the presence of green spaces, concepts and applications of sustainability along the riverbank of the study area?	81%
6 Innovation potential	How do Measuring the suitability of the environment available along the riverbank for activities of creativity, interaction, learning, and connection to culture?	29%

In the framework of sustainable urban development, the preservation of history entails ongoing endeavours to save buildings & sites in traditional centres, enabling contemporary society to appreciate & benefit from its historical and cultural legacy. These findings indicate that there are impediments to accessing public spaces along the river. These areas may be impeded by physical or environmental impediments, such as the absence of specific pedestrian or bicycle corridors or pollutants in the water. Personnel may experience feelings of insecurity in regions where security concerns are present due to factors such as inadequate illumination, insufficient security patrols, or objectionable activities. It is evident that the infrastructure surrounding the rivers must be fortified, and services such as restrooms and seats should be enhanced. Additionally, security surveillance should be intensified, and illumination should be increased.

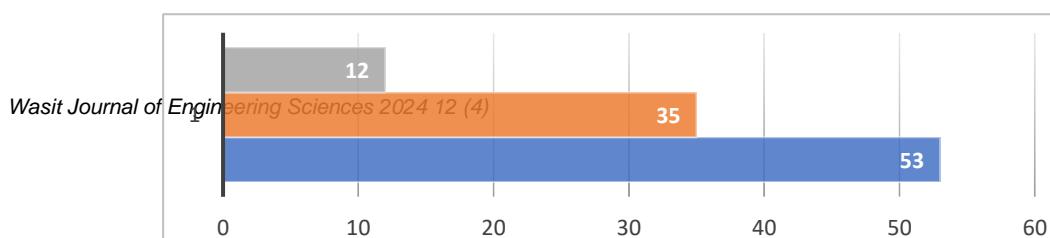


Fig.8 impediments to accessing public spaces along the river and access according to the questionnaire.

The survey focuses on the importance of preserving cultural identity in river banks and factors associated with it. The results indicate a strong focus on environmental sustainability and recognition of the need for improved community engagement. Limited capacity to: Relatively low levels of innovation and learning (29%) suggest that the current environment may not be optimally conducive to promoting new ideas and approaches to cultural preservation. The fact that the majority of river banks are comprised of green areas and infrastructure that is friendly to the environment is proof of the strong desire for sustainable development and the knowledge of the significance of river banks to the environment respectively. You may see evidence of this fact in the form of vegetation spots along the riverbanks. The low participation rate of 44% and the small number of people who might benefit from the planning procedures both point to a possible absence of community engagement. This indicates the need for increased local input into the decision-making process. Chemicals of the utmost importance for conservation: The vast majority (60 per cent) of respondents considered it necessary to preserve the cultural and vital identity of the river bank. This demonstrates a strong awareness of the cultural value of river banks.

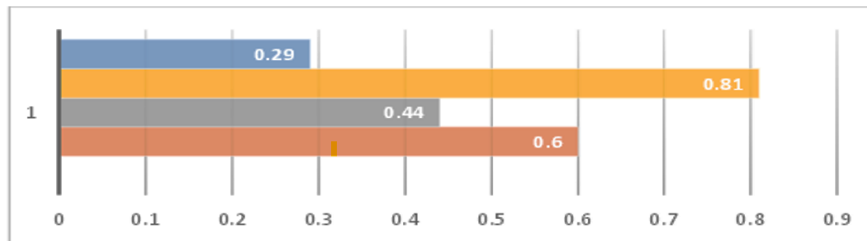


Fig.9 Preferences for and access to public spaces along the river according to questionnaire.

Here it is necessary to factors contribute understanding to the deterioration of their circumstances, such as financial conditions, insufficient awareness, and others. General Importance of a River: Most people consider the presence of a river as important when choosing a place to live or visit. Aesthetic Contribution: The vast majority believe that a river adds to the city's aesthetic appeal. Enjoyment of Activities: While a large proportion enjoys water activities, there is a noticeable segment that either does not or is indifferent. Three important strategies can be followed regarding the riverfront interfaces and open spaces along the riverbank of the city of Al-Kut:

- The strategy for reusing open spaces: such as garages and unused river spaces, including the river basin.
- Spatial adaptation strategy according to the nature of use: it pertains to green areas as an interactive space that accommodates other riverine activities.
- Influence Circle Strategy: Every new function represents pressure on the areas, and thus it should have an influence circle that must not exceed the permissible limits to reduce pressure on riverine areas.

These violations varied between ill-considered planning of the area, as well as the construction of commercial buildings, restaurants, medical clinics, hospitals, as well as schools, etc., which affected the traditional character of the city, and the loss of traditional cultural elements and historical continuity on the one hand, and created major challenges related to urban flexibility and the disruption of communication between the river and the city centre on the other hand. The Kut riverfront has historically served as a lively centre of social interaction, economic activity and cultural expression. However, over the years, urbanization and neglect have significantly degraded this core area, creating a disconnect between the city and its landscape. The loss of accessibility and deteriorating environmental quality not only diminished the role of the riverfront in the community, but also threatened the preservation of Kut's unique cultural identity.

6. CONCLUSIONS

1. Balancing uses and activities is not sufficient to achieve urban flexibility. Rather, the focus on urban flexibility comes from paying attention to open spaces and movement axes and taking into account the urban functions of the region.
2. Accessibility is an important part of the flexibility of open spaces.
3. The longer part of the river, which has a length of (4400), is less flexible than the smaller part, which has a length of (1320), due to the lack of attention to the main axis and the weak connection between the axis parallel to the river and the axes perpendicular to the river.
4. The more attention is given to the flexibility of the river area, the better the city centre will be, given that the river bank belongs to the entire city and not just to the residents.

5. Government interest in the region is good, but it does not take into account urban flexibility optimally.
6. The uses are good now that there is a visual and movement interruption that requires us to focus on flexibility by providing spaces and using the river space.
- 7.

7. RECOMMENDATIONS

1. Cities may benefit from resilience by preventing and lessening the effects of shocks and pressures on their people, economy, infrastructure, and natural environment through solutions created through resilience techniques.
2. Paying attention to urban flexibility by linking the new Corniche project to the main axes to increase urban flexibility.
3. Observe privacy as much as possible in the new open areas for residents, in exchange for providing open spaces for visitors from outside the area.
4. Taking advantage of the river bank, creating temporary places, and accommodating new activities by creating floating or fixed platforms attached to the corniche.

REFERENCES

1. S. Taraglio *et al.*, 'Decision support system for smart urban management: Resilience against natural phenomena and aerial environmental assessment', *International Journal of Sustainable Energy Planning and Management*, vol. 24, pp. 135–146, Nov. 2019, doi: 10.5278/ijsepm.3338.
2. X. Zeng, Y. Yu, S. Yang, Y. Lv, and M. N. I. Sarker, 'Urban Resilience for Urban Sustainability: Concepts, Dimensions, and Perspectives', Mar. 01, 2022, *MDPI*. doi: 10.3390/su14052481.
3. G. Datola, M. Bottero, and E. De Angelis, 'Enhancing Urban Resilience Capacities: An Analytic Network Process-based Application', *Environmental and Climate Technologies*, vol. 25, no. 1, pp. 1270–1283, Jan. 2021, doi: 10.2478/rtuect-2021-0096.
4. 'View of Decision Support System for smart urban management_ resilience against natural phenomena and aerial environmental assessment'.
5. B. Cohen, 'Urbanization in developing countries: Current trends, future projections, and key challenges for sustainability', *Technol Soc*, vol. 28, no. 1–2, pp. 63–80, 2006, doi: 10.1016/j.techsoc.2005.10.005.
6. Mrak, D. Ambruš, and I. Marović, 'A Holistic Approach to Strategic Sustainable Development of Urban Voids as Historic Urban Landscapes from the Perspective of Urban Resilience', *Buildings*, vol. 12, no. 11, Nov. 2022, doi: 10.3390/buildings12111852.
7. K. Gupta, P. Kumar, S. K. Pathan, and K. P. Sharma, 'Urban Neighborhood Green Index—A measure of green spaces in urban areas', *Landsc Urban Plan*, vol. 105, no. 3, pp. 325–335, 2012.
8. E. D. Ekkel and S. de Vries, 'Nearby green space and human health: Evaluating accessibility metrics', Jan. 01, 2017, *Elsevier B.V.* doi: 10.1016/j.landurbplan.2016.06.008.
9. N. Bautista-Puig, J. Benayas, J. Mañana-Rodríguez, M. Suárez, and E. Sanz-Casado, 'The role of urban resilience in research and its contribution to sustainability', *Cities*, vol. 126, Jul. 2022, doi: 10.1016/j.cities.2022.103715.
10. Abdillah, R. A. Buchari, I. Widianingsih, and H. Nurasa, 'Climate change governance for urban resilience for Indonesia: A systematic literature review', *Cogent Soc Sci*, vol. 9, no. 1, 2023, doi: 10.1080/23311886.2023.2235170.
11. Abdillah, I. Widianingsih, R. A. Buchari, and H. Nurasa, 'Implications of urban farming on urban resilience in Indonesia: Systematic literature review and research identification', *Cogent Food Agric*, vol. 9, no. 1, 2023, doi: 10.1080/23311932.2023.2216484.
12. M. Suárez, E. Gómez-Baggethun, J. Benayas, and D. Tilbury, 'Towards an urban resilience index: A case study in 50 Spanish cities', *Sustainability (Switzerland)*, vol. 8, no. 8, Aug. 2016, doi: 10.3390/su8080774.
13. S. K. Mallick, 'Prediction-Adaptation-Resilience (PAR) approach- A new pathway towards future resilience and sustainable development of urban landscape', *Geography and Sustainability*, vol. 2, no. 2, pp. 127–133, Jun. 2021, doi: 10.1016/j.geosus.2021.06.002.
14. 'Challenges and opportunities for building urban resilience'.
15. N. Kapucu, Y. 'Gurt' Ge, Y. Martín, and Z. Williamson, 'Urban resilience for building a sustainable and safe environment', *Urban Governance*, vol. 1, no. 1, pp. 10–16, Nov. 2021, doi: 10.1016/j.ugj.2021.09.001.

16. T. Beatley, *Blue biophilic cities: nature and resilience along the urban coast*. Springer, 2017. Accessed: Jan. 16, 2024.
17. Z. Liu, C. Xiu, and W. Song, 'Landscape-based assessment of urban resilience and its evolution: A case study of the central city of Shenyang', *Sustainability (Switzerland)*, vol. 11, no. 10, May 2019, doi: 10.3390/su11102964.
18. D. Qiu, B. Lv, and C. M. L. Chan, 'How Digital Platforms Enhance Urban Resilience', *Sustainability (Switzerland)*, vol. 14, no. 3, Feb. 2022, doi: 10.3390/su14031285.
19. S. Mitrović, N. Vasiljević, B. Pjanović, and T. Dabović, 'Assessing Urban Resilience with Geodesign: A Case Study of Urban Landscape Planning in Belgrade, Serbia', *Land (Basel)*, vol. 12, no. 10, Oct. 2023, doi: 10.3390/land12101939.
20. H. A. A. Mohy and K. G. Rasheed, 'Morphological Perspective of Urban Resilience Through Eco Urban Landscape: Iraq -Basra as a Case Study', *International Journal of Design and Nature and Ecodynamics*, vol. 17, no. 6, pp. 807–821, Dec. 2022, doi: 10.18280/ij dne.170601.
21. Y. Shi, T. Zhang, and Y. Jiang, 'Digital Economy, Technological Innovation and Urban Resilience', *Sustainability (Switzerland)*, vol. 15, no. 12, Jun. 2023, doi: 10.3390/su15129250.
22. S. Shamsuddin, 'Resilience resistance: The challenges and implications of urban resilience implementation', *Cities*, vol. 103, Aug. 2020, doi: 10.1016/j.cities.2020.102763.
23. J. Bush and A. Doyon, 'Building urban resilience with nature-based solutions: How can urban planning contribute?', *Cities*, vol. 95, Dec. 2019, doi: 10.1016/j.cities.2019.102483.
24. H. M. Hasan, 'Article ID: IJCIET_10_02_215 Cite this Article: Haider Majid Hasan, the Importance of the Availability of Urban Enhancements Necessary to Achieve the Health City Al-Kut City as a Study Area', *International Journal of Civil Engineering and Technology (IJCIET)*, vol. 10, no. 02, pp. 2167–2175, 2019.
25. Z. Mohammed, A. Ziboon, A. Kamal, and M. Alfaraj, 'Urban air quality evaluation over Kut city using field survey and Geomatic techniques', in *MATEC Web of Conferences*, EDP Sciences, Mar. 2018. doi: 10.1051/mateconf/201816205023.
26. Jasim, H. M. Hasan, S. L. Farhan, and K. H. Bahat, 'Evaluating the urban structure of Al-Kut city according to sustainability', in *IOP Conference Series: Earth and Environmental Science*, IOP Publishing Ltd, Jul. 2021. doi: 10.1088/1755-1315/779/1/012021.
27. Abbass Jasim, S. Lafta Farhan, and S. Kareem AL-MAMOORI, 'Smart Government: Analysis of Shift Methods in Municipal Services Delivery: The Study Area: Al-Kut-Iraq'.
28. S. F. Balket and N. M. Asmael, 'Selecting the best route location for bus rapid transit using geographic information system (gis): Kut city is a case study', in *Journal of Physics: Conference Series*, IOP Publishing Ltd, Jun. 2021. doi: 10.1088/1742-6596/1895/1/012029.
29. H. S. O. Aldelphi, 'المثنى للهندسة والتكنولوجيا . Urban Visual Quality Of Traditional Kut City Center', vol. 57, no مجلة .pp. 57–64, 2019, doi: 10.18081/mjet/2019-7/57-64, 7
30. Hussam S. O. Aldelphi, 'The Role of Urban Morphological Indicators to Improve Commercial Streets of Alkut City Center', *Diyala Journal of Engineering Sciences*, vol. 13, no. 3, pp. 44–57, Sep. 2020, doi: 10.24237/djes.2020.13305.
31. R. J. Al-Shammari and A. Na'im Mohsin, 'Visual Sustainability in Urban Renewal Projects Traditional kut City Center as a Case Study', *Wasit Journal of Engineering Sciences*, vol. 12, no. 1, Jan. 2024, doi: 10.31185/ejuow.vol12.iss1.516.
32. R. Al-Anbari, A. Alnakeeb, and S. Lafta Farhan, 'Appraisal Criteria-Space in some Residential Urban Areas for Al-Kut City', 2014.