

Conflicts & Immigration Impacts on Built Environment: A Case Study of Arab Marshes in Iraq

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Abstract

The importance of water to our lives cannot be overemphasized as it is the source of all living things. Water scarcity is a concern in many Middle Eastern nations due to war and politics. Many people lose their essence due to actions made by their rulers, such as the Marsh Arabs. Water and biodiversity should be considered, and governments should be held accountable for attaining a more balanced lifestyle and reducing immigrant levels. Many academics have also explored the hydro-immigration of marshland residents. They suffer more hazards due to a lack of money, poor education, and social instability than their colleagues who remain in their own country. Furthermore, they have insufficient health care and have difficulty integrating into the new community. This implies that not all nations that receive such migrants can implement programs to assist the immigrants. This research reveals how wars, hydro-politics, and immigration issues have drastically affected architecture and social structures in the Arab Marshes region, leading to ecological destruction, mass migrations, and cultural loss. Therefore, this work focuses on the need to critically investigate all factors covered within the context of this research.

Keywords

Immigration, Hydro Politics, Social and Culture, Ecology

1. Introduction

The purpose of this research is to explore how water influences people's lives due to its indispensability and impact on this planet. Water is essential to life, growth, and prosperity. It also plays a fundamental role that helps people to be productive. Additionally, civilization began and flourished on the banks of great rivers in

Egypt, Mesopotamia and others. Water is mentioned in Quran, Surat Al-Anbiyya (﴿وَجَعَلْنَا مِنَ الْمَاءِ كُلَّ شَيْءٍ حَيٍّ﴾), which means (We have made from water every living thing). This indicates the importance of water as the source of life, and the Quran emphasizes this fact which is proven by science. Unfortunately, many political wars happened because of the scarcity of water.

Recently, a study published revealed how the Middle East\North Africa region is losing its freshwater. This report was prepared jointly by NASA and the University of California, which identifies a range of statistics and the quantities of water loss rates in the region. The satellites between 2003 and 2009 showed that the number of freshwater reserves in the region decreased by 143.6 km square meter during seven years of study. Sadly, this rate is one of the most significant rates of freshwater loss during this period. This loss is roughly equivalent to the area of the Dead Sea. However, this is not surprising because of a complex network of transboundary aquifers underneath this area. Also, there is a severe lack of domestic and international oversight, regulations, and data exchange. The region is exposed to harsh climate conditions due to the lack of effective water management. As a result, there is a need to develop strategies to maintain valuable natural resources. However, if countries do not openly share information about water, how can they survive the severe climate changes?

The issue of withdrawing water from underground reservoirs faster than their natural regeneration rates can significantly affect subsidence and aridity, leading to geological earth problems. Reports have shown that excessive water withdrawals can be traced from countries such as Tehran, Iran, and Iraq. For instance, the Iraqi government had to dig 1000 wells due to the lack of surface water availability.

Furthermore, water in the Middle East has been an issue for many years. Numerous issues accrued, such as water drainage and aridity due to war, conflicts, and other political reasons, which raised several issues like immigration and lack of food resources. Specifically, the marshland in Iraq witnessed drainage due to governmental policies, dehydration, and pollution because of the hydrological decisions made to the world area of Euphrates and Tigris rivers. This paper is an overview of the water importunate and the consequences of the water threats on the Iraqi mud architecture, including its ecological aspects. Wars and conflicts can create a significant impact on the way people live. It can take away their homes, and they might lose their lives. An example is seen in the case of marshland in Iraq and how the people and the architecture of marshland reacted towards this issue in the course of the wars.

It is a fact that climate change is becoming a global issue which causes a significant shift in weather and water sea levels. Cummings (2020) showed that the potential temperature would increase from 2.5 to 10 degrees Fahrenheit during the next century, and the changes fluctuate by country. Nonetheless, there are specific areas on the planet that are more susceptible to the consequences of climate change. Examples are islands such as Tuvalu and Kiribati, which are subject to increasing tides and flooding, and desert zones in the Middle East and North

Africa (MENA) region. The warm weather trend is increasing from 16 days to 80-120 days, and the temperature changes on the heat index are at 165 degrees Fahrenheit. This may mean that the MENA region will become uninhabitable by the end of the century. Due to the worsening of climate circumstances and low living environment, the stories of refugees reflect the problem's scale. This issue has not been handled competently by the U.N. authorities. Consequently, the Framework Convention on Climate Change (UNFCCC) and traditional categories under the 1951 Refugee Convention could not also solve the critical issues of compounding climate risk change. To ensure the protection and wellbeing of those escaping the consequences of climate change, political leaders must take adequate steps to update or replace current treaties. Furthermore, Hashim et al. (2019) explained that the marshes are highly affected by the temperature rise.

Climate change has affected the marshes, and a decline has followed an increase in the annual average high temperature in precipitation. On the other hand, Satellite data can be used in the periodic monitoring of marshes and water bodies because it has a high capacity to detect changes. It is vital to building plans in order to enhance growth. This conclusive remark may not be of value if the government does not strategically take drastic action to rectify the situation. However, there is good evidence that shows the impact of drainage on urban life after restoring water flow. Other evidence has shown that climate change and dams in Turkey, Syria, Iran, and northern Iraq would significantly affect potential water supply (Al-Mukhtar et al., 2019).

In this research, the following research questions were addressed; How do wars, hydro-politics, and immigration conflicts impact the architecture in the Arab Marshes area?, What patterns of response do the immigrants follow to reshape their inflected social structures?, Why is it important to explore this problematic issue regarding ecology and immigration?

Iraq is one of the most affected countries which experienced wars. This led to many water issues, and people had no other choice but to migrate to other places. Changes in marshland extent from 2003 to 2006 were poorly associated with upstream water mass fluctuations. This means that marshland extent was dominated by recovery from previous diversions and pumping, which had been in effect from the 1990s until just before the study period (Becker, 2014). Since the 1980s, the Arab Marshes have been harshly damaged by the draining and diverting water sources for irrigation, oil production, and military defense purposes. International attempts to preserve these marshes have been made. However, due to high soil and water salinities, conservation has been irregular, and the Marshes have become fragmented, threatening the survival of many species and the inhabitants' health (Price, 2018). Most Madan who fled to Iran did so between 1991 and 1994, especially when cross-border travel was still possible but under hazardous conditions. The Iraqi government closed off vast stretches of marshland adjacent to the Iranian border after most of the drainage work was completed in early 1995, and refugee flows dwindled significantly (Human Rights Watch, Briefing Paper,

2003). Water is the source of life that can be seen in many forms, such as waterfalls, lakes, rivers, streams, or rain. Water is seen as life and it symbolizes purity, cleansing, or washing away of sins.

2. Research Methodology

The approach used here is descriptive since it defines the features of the population or phenomena under consideration. This technique focuses on the “what” and “why” of the research topic. This study’s approach focuses on Arab Marshes case study, which illustrates a particular issue’s characteristics. This research utilizes an explanatory methodology approach given its fact-finding and illuminating nature. Hence, this entails gathering a large quantity of secondary data to find patterns and expose the case into a narrowly specified issue. This often focuses on an unusual case that questions assumptions, adds complexity, or reveals something new about a studied topic.

3. Literature Review

3.1. Political Development

3.1.1. Arabs Immigration in the Colonial Period

Wars and political conflicts trigger the pattern of immigration during the colonial period.

At that time, water was not an issue. Nonetheless, the major problem was the fall of the Islamic Caliphate and the conquering of the colonial forces of the Middle East. The Arab world witnessed a massive migration before World War I between 1800-1900. Due to World War I, early immigrants from many Arab countries began to move. For example, about 1500 Syrian immigrants moved to the US looking for a better life and job opportunities, including Lebanese and Palestinians. However, globalization from 1980 and 1990 and the alarming situation for economy and regimes and immigration from south and west of the Middle East have increased dramatically. Due to sociopolitical and economic reasons, many Arab countries experienced migration due to political wars in Palestine, Iraq, Syria, Libya, Tunisia, Yemen, etc. Statistics show that about 5 million Palestinian refugees have been registered since the “Nakba” and the founding of Israel in 1948. Many scholars in Arab, Israel, and other foreign countries documented the plight of Palestinian refugees. Since 1948, Palestinian refugees have been flooding the labour market of the Levant in Saudi Arabia and the Gulf region, among other countries in North Africa and the West.

3.1.2. Potential Conflicts in MENA Region

The importance of water and its fundamental need for all living things must not be overlooked. This is because it is essential for agriculture, industry, and humans. Given its value, the lack of water can create conflicts between countries and become political and diplomatic. It is, however, appalling that the Middle East, e.g., Turkey, Iraq, and Syria, is one of the most unstable regions due to the lack of

resources. The ownership of water from the Tigris and Euphrates rivers has connected Turkey, Syria, and Iraq. Most of the water resource comes from two major rivers, Tigris and Euphrates in Turkey, which descend from the southeast's highlands and the region known as the "fertile crescent." When conflicts happen in these areas, several problems, such as climate refugees, will arise. Due to the conflict between those countries, and the war between Iraq and Iran, many people immigrate to other Iraqi places. The most affected area by this war was the marshland in Iraq.

3.1.3. Dialogue Surrounding Migration

This briefing is the third in many studies that scrutinise specific migration issues from and throughout the Middle East. It offers an overview of the existing analysis and data on migration and displacement in the Middle East due to variations in the environment and climate. The recent discussion about environmental migration and displacement demonstrates the magnitude of the issue. It is important to indicate how little this phenomenon has been studied and considered in the Middle East. It concludes with recommendations for increasing government, humanitarian, and development actors' understanding and preparedness to combat and deal seriously with environmental change. To cope with population movements to the region, towns and communities on the Marshlands' outskirts, such as Chibayish, Suq Ash Shuyukh and AlMudaina, are growing and encroaching on sensitive ecological areas. Though the full extent of urbanisation is unknown, the Marshlands ecosystem's additional pressures, such as increased demand for local water and loss of natural habitat for wildlife, are well documented.

3.1.4. Impacts on Migration and Human Security

Marshland or Madan has a long history. In the southern part of Iraq, both Tigris and Euphrates rivers meet. In Arabic, they call it جنة عدن, which means Garden of Eden. It is used as a metaphor due to flora and fauna found during ancient times in the eastern part of the marshland (Foster, 1998). Fifteen years ago, around 250,000 Marsh Arabs lived on 20,000 Sq-Km. of water canals and marsh, an area as large as any big city. The series of wars that Iraq was involved in and many other hydro political reasons indicate how politics can ruin habitable places and the lives of people. The migration of the Marsh Arabs from their land after the 1991 gulf war and the draining of water they witnessed is very devastating. More than 40,000 Marsh Arabs escaped as refugees to Iran and some other destinations. However, the Iran government limited their access. As a result, their lives never returned to normal, and they continued to suffer. Although they could now return home to their original land, they could only see drained water and a destroyed environment.

The Marsh Arabs are from the northwest of Basra along both rivers. It is the largest wetland ecosystem in the Middle East. The marshlands function as a habitat for many waterfowl species and other birds migrating from Serbia and Africa.

Historically, the marshland faced the golden era during the successful irrigation to grow crops. More so, the oldest city in the world, Ur, was at the marshes edge. This was the nearby city of Nasiriya.

Life in marshlands is very atmospheric and calm. People travel by boats and pass by the imposing reed houses and mosques. Fishing and growing rice and dates is a means of livelihood. It is a unique culture that formulates a different dimension of living and creating. Inhabitants of the marshes were punished by the government, which led to food shortages and health crises.

In 1993, the government completed the waterway to cut the Tigris and Euphrates' water to prevent it from spreading into the marshlands. This was supposed to create new agricultural land, but it destroyed the land itself. According to human rights reports, most of the Marsh Arabs had no choice but to leave their homes. This led to about 10,000 of them migrating to other regions of Iraq. However, more than 40,000 crossed the border and migrated to Iran. Also, they lived there as refugees in camps.

The displacement condition in the marshlands during the 1990s is still a mystery.

Brooking Institution-SAIA Project on International Displacement estimated that 100,000 Marsh Arabs migrated from Iraq and took southern Iraq residency. Some of them also moved to the Kurdish areas, and about 45,000 live in Iran in camps.

Khalid Suleiman is the author of an Arabic book titled "the guardians of water". His book tackles the time when Iraq and other countries in the region faced many threats. However, Arab governments have neglected how dangerous these problems are, such as water, security, floods and torrents, and have taken no actions to prevent them from happening. During an interview with Kahlid Suleiman, the journalist asked him the following question:

"In addition to politically and economically devastating their homelands, corrupt Arab politicians are also destroying the environments of their homelands. How do private farms, fish-breeding lakes, monopolised investment projects, stolen water, and artificial tributaries that support the private projects of politicians and their properties harm the environment?"

His answer was very variable and transparent. He mentioned a few things, and his conclusions were shocking to people. Many politicians in power stole water for their benefits and farms. Iraq's politicians do not care about its environment or biodiversity; they turned it into a warehouse for Turkish and Iranian food products. It's no longer a productive country as it used to before 2003. We have witnessed hard times economic conditions when the global price of oil fell. He also mentioned that he asked many people about the importance of water protection and biodiversity while writing his book. They reacted by saying that these questions should be addressed to the consecutive government after the Iraq occupation in 2003 since they are the ones who violate nature. This problem is not only because of the exploitation of water by politicians but also due to the lack of

legislation that protects Iraq's environment. During his interview, he spoke about a fragile ecosystem in Iraq based on killing and hunting by referring to a researcher who said, "you can kill anything that moves, and no laws are preventing this". As a result, the government is not acting responsibly. The interview reveals the anger from different sects of people in Iraq, which is not surprising. The observation of this interview provokes another question. If this area were rehabilitated, there would be serious issues that would probably affect the rehabilitation process, such as pollution, lack of water, and poor quality government policies. More so, even if the first two issues are solved, how would the pollution of the soil be solved?

Hydro Politics Influence, according to reviews by Allen (2007) and Bulloch and Darwish (1992), showed severe military conflicts. The Middle East's water crisis has steadily grown worse due to demographically elicited water consumption. Hence, this has contributed to the development of the pervasive concept that water shortages result in armed conflict. During the sixties, there were minor conflicts as there were no armed conflicts over water. However, those analyzing the Middle East's water resources during the Nineties had witnessed changes and had to measure the evolving discourse and be ready to explore the shift of views. Within the last decade of the 20th century, the Middle East has endured a significant worsening of its water resource position. This is vital because Allen mentioned the peace treaties and the Jordan River Basin's water dispute management within the Nineties. A new reconciliation occurs between the upstream and downstream banks within the Nile River Basin. More advanced technologies also promise cost-efficient solutions. In some of the hydro political cases mentioned by Al Ansari (2016) and Kut (1993), freshwater is essential for life, socioeconomic growth, and political stability in the Middle East. Turkey, Syria, and Iraq dominated the Tigris-Euphrates basin as riparian countries. This is a result of the dominant role it plays.

Turkey has long been the riparian hegemon. Lower-lying countries in the basin include Iraq and Syria. Furthermore, some countries have also tried to find common ground on water issues between the major three riparian countries since 1920. However, those countries have signed no agreement yet. Today, the condition is turbulent in Syria and Iraq, where thousands of people have no access to water, and farmers are leaving their land because of drought, which might raise tension or lead to war. To avoid this, a mediator who can bring all countries concerned to the negotiation table is required. Syria and Iraq adopted a prudent strategic plan based on resources development theory to ensure adequate water management and minimum water losses.

3.2. Ecological Issues

3.2.1. Historical Development of Arab Marshes in Iraq

The most direct approach to dealing with nature is using local resources to make humans comfortable with a minimum of mechanical equipment through the

available facility. The Sumerian reed mudhif, one of the oldest monumental kinds known, is the earliest known example of this architecture that is still in use. These Mudhifs were created by a civilisation that developed the world's earliest city with their vast ziggurats and temples of mud-brick; it also invented writing to keep temple records. Besides the maintenance of the towns, the farming communities were, of course, to be encircled. Thus, houses were built entirely of reeds in the ponds. The latter was sculpted on temple walls and a sculptural gypsum cavern of Ancient Uruk dating from 3200 BC, and it is now in the British Museum (<https://www.witpress.com/>).

3.2.2. Water and Environmental Issues

Empirical evidence shows that loss, destruction, or altered distribution of water supplies can be considered a potential danger to states' protection. This is the case of Israel/Palestine populations, depending on the context and differing degrees (Lowi, 1999). On the other hand, changes in water supplies have not always resulted in interstate conflict, although they have been a contention point in the past.

Aggravating circumstances in a crisis are a part of violence. Therefore, it is essential to investigate the environmental aspect of violence and to pay attention to the elements and their interconnections because understanding only the complexity and mediating events will resolve disputes. Nonetheless, since environmental conditions are neither required nor adequate in causing state dispute, it will be a misplaced priority to focus resources on addressing the environmental aspect.

3.2.3. Environmental Rehabilitation

In the 1970s, the Iraqi government allowed the marshes to drain by reclaiming wetlands for agricultural purposes and advancing growth from wetland to the desert, which is the scheme based on British theories. From the 1950s, when the Iraqi Irrigation Development Commission released a paper by British engineer Frank Haigh in the Euphrates and Tigris, Adriansen (2006) suggested building a system of canals, dams, and sluices to channel saline and dirty water away from the irrigated land between the two rivers. It will be possible to restore the marshes for cultivation in this manner. In Haigh's opinion, it is a massive waste of valuable water to let it seep into the marshes instead of using it for drainage. This initiative has the advantage of gaining influence over this wild environment as a side effect. The marshes refer to an inaccessible region that has eluded government protection, allowing Iraq enemies to take shelter there. Nevertheless, there is even a fair possibility of reclaiming the property and putting it to other uses. As a result, these proposals focused on drainage and irrigation channel development to expand arable land. The aim, however, was not to eliminate livelihood opportunities. The marshes are essential for wildlife protection and preserving the Marsh Arabs' ancient culture. Therefore, it was necessary to observe the marshes from security.

3.2.4. Traditional and Environmental Crafts

Old Mesopotamian builders are educated on buildings that can do specific

necessary tasks and consider all sites and environmental circumstances. The ‘Mesopotamian Marshes’ or Arab Marshes, a wetland zone in southern Iraq and a part of South-West Iran, are the first area to be explored. They make use of natural resources to erect their cities. The building materials were the most critical building element that affected the conformation of the habitats from the Iraq–Iran area. This research is focused on the effects of ecological and energy-efficiency processes in creating vernacular habitats and selecting optimal building systems and materials in this part of the world, which can be an essential point for sustainable environmental building processes in the future. Reeds, clay, Straw, bricks, and wood were the most popular building materials builders from this region. The environmental impact of building materials is the most important technique for determining sustainable usage. In addition, conventional constructive materials successfully used in the environment can encourage people to use them. The influence of surroundings on building systems provides an essential aspect for this research. The primary objective here is to ensure that it is beneficial to the designers and construction engineers to identify optimal and competent solutions for unique local micro-climates that utilize conventionally sustainable and ecologically sustainable design approaches. Thus, specific materials of construction specified for human occupation should be constructed as it proffers a logical solution for the architects to simulate the influence from the human body. In the selection process of construction material, builders from this area have picked three different categories which are mineral, organic, and mixing materials (Korydon & Miguel, 2012).

3.2.5. Building Materials Classification

1) Material of Organic Construction: This is the first substance in the construction process used by humans. It originates from renewable sources and is quickly gained by people. Also, it can be utilised in the construction process as an environmental material with many positive characteristics. It is an essential aspect of human life. It is a popular construction material because of its environmental friendliness and strong energy qualities. The significant advantages of such materials are their low cost, predominance, and good thermal and acoustic insulation characteristics.

2) Reed: This has good resistance to water activities and is an organic construction material. Its high silicone ratio makes its technological activity and structures to be robust and flexible. Nevertheless, it is flammable. This material is unappealing to insects because of the high levels of Silicon in the rods. Reed fulfils all the needs for an efficient isolator. The shape of the stem enables it to work in any way. It is an ideal material for thermal and acoustic insulation. The construction of walls with reeds is needless hard work compared with other materials such as brick, adobe or stone. Reed construction fosters individual inventiveness and leads to climate-friendly and energy efficient final structures. However, it has a few drawbacks. Its inherent durability is lesser than wood, and preservatives must

be applied in exposed places.

3) Straw: This is a very thermal efficient material. It has a considerably superior R-value of 36 percent cellulose, 26 percent pentoses, and 17 percent linen, wax, protein and ash depending on the kind of straws, a composition very close to wood. It has the same R-value as other conventional structures. The straw also has good insulation characteristics. The biological activities of straw include its water axis. Therefore, the strawbales are ideal for transferring humidity, thereby regulating inside humidity, as long as open screens and coatings support them. Straw's vulnerabilities include a danger of long term, high moisture content, insects or rot refraction. Straw can give much-enhanced comfort and substantial savings in energy compared to more expensive traditional buildings since smaller heating and cooling systems in typical households are possible due to increased insulation. Such constructions have a special significance in harsh regions when energy is costly.

4) Wood: This is a natural cellulose fibre. It is an organic substance that is incorporated in a compression-resistant matrix (strong in tension). Cellulose (40% to 50%) and hemicellulose (15% to 25%), lignin (15% to 30%), as well as other materials including sugar, starch, and protein are the main components of wood. The technique of wood depends heavily on its kind and humidity. It also includes different components based on the kind. There are two types of wood, softwood and hardwood, split into several categories. However, the high calorific for wood is considerable (12.5 MJ/kg and 20.1 MJ/kg). It is not troublesome to thermally reuse untreated and uncoated wood. If the wood is removed without harm, reuse is feasible. Untreated aged wood may traditionally be utilised as raw material. In some parts of the globe, converting wood into a sustainable renewable resource as a significant building material could be advantageous.

3.2.6. Components of Building Materials in the Arab Marshlands

1) They are homogenous inorganic solid materials of natural occurrence having a distinct crystal structure and a specific chemical content. Constructors from the area have identified suitable local neighbourhood construction materials. Two essential construction materials, clay and brick, were chosen in the construction process which is close to the needed human scale.

2) Clay offers the only realistic prospect for building the five hundred million houses required in the coming years. A mass of clay has outstanding formability and robustness. Excellent adhesion and bonding forces count as the main properties of clay.

3) Brick is a principal building material from zone "I". The typical house from the Sumerian age was a one-story construction made from baked or sun-dried mud-brick. The family house included the following structure functions: a living room, kitchen, open courtyard, servant's residences, etc. A brick-building element has excellent thermal resistance.

The material is highly energy-efficient and can be accepted as a bio-ecological

material, particularly in Western Asia. Clay brick is a thermally inert material with comparatively minimal chemical reactions. The impact of green homes is restricted. Tone brick recycling may be a challenging procedure because of the inevitable mortar, render, and plaster residues that tend to stick to the bricks, especially if the cement concentration of these materials is high. Nonetheless, older brick may be recycled more easily since most of it has been built with limestone.

4) Mixture of Building Materials: Clay and straw is an old known construction method. Clay is odourless, non-toxic, and pleasant to combine with straw which produces a mixture of tone and vegetable fibres made with soft and pulpy straw. This may be used for the filler in panels or pressed into moulds to make brick and patterned tiles. Prepared mixtures are also currently on the market. In the combination construction material, tone and straw are 1200 - 1700 kg/m³. A combination of clay and straw is a heterogeneous material with excellent thermal characteristics.

3.2.7. The Housing Mechanism

It is a historical place that dates to the Sumerian era. The dwelling configuration was first established in “Ur” city, where the original housing settlement was established. Basra, which constitutes one of the most significant areas of distinct ecological types globally, is considered a monument by UNESCO. The number of people living in symbiosis with many uncommon species is minimal. On the “artificial island” in the north of Basra, the home was constructed with a low stream in water. On the other hand, the habitat unit consists of reeds and a combination of clay and straw. There are two different approaches to make the island ideal for building. While one approach selects good soil, the other makes it fit for a specific situation.

4. Description of the Construction of Arabic Mudhif

A typical mudhif with bundles of sheds bowed in parabolic arches are lined along an axis and magnificently retreat inside like the arches of a large Gothic cathedral. The Mudhif's arches were not only built up of rubble bundles; they were composed of reed mats as well. The lateral walls are carved into their roofs with their flat facades. There may be shingle bars with small vertical or diagonal holes that allow regulation of sunshine and air. Breezes can be placed in the lower walls (Part of the Archive for Research in Archetypal Symbolism (ARAS) REPOSITORY).

1) The reeds are found growing in heavy clusters of the brackish marshlands in southern Iraq.

2) The women are black-screened and have giant, newly picking Reeder armored reeds in preparation for construction. The shoulder mattresses, already woven, are laid in round rolls in the foreground on the left.

3) Arab men bind tall reeds with ropes into long bundles around a core of old reeds, which is taken from recently demolished mudhif. The men work on waist-

high rack constructed of three pairs of vertical reed bundles and each pair supports one horizontal bundle.

4) Initial Stage of Actual Building: Seven-try of reed bundles are roughly washed-up a foot-and-a-half into the ground in 2 parallel rows. This is an already completed shanty that is visible in the background to the right.

5) Every row of vertical reed bundles is connected by a single slender horizontal reed bundle that is 2 feet on top of the ground. Massive packing crate is positioned between the initial try of vertical bundles in preparation for the next section of construction.

6) The ropes are controlled by the men standing on the ground. The initial try of reed bundles square measure is brought along to make an arch, while the employees stand in position on packing crate with the ropes.

7) The second pair of reed bundles is shaped into arch. The workman standing on the floor to the left holds the lengthy pole, which is fixed to ropes and pulled through by the second worker (head seen at the back of crate). The pole prevents the rope from slipping.

8) All seven pairs of bundles are shaped into arches.

9) Workers with reeds form narrow bundles which are lashed horizontally to arches that are more or less one-and-one-half-foot intervals. Unmarried period of rope serves to lash the whole collection of bundles to at least one aspect of 1 arch.

10) The framework of the reed bundles is covered with mats that are woven of giant split reeds. The first layer of mats is placed downward, at the right side (that shows the glossy outsides of the reeds), so that it can be seen from inside the mudhif. Each mat overlaps the one below.

11) The second layer of mats is placed above the first with the right side out. Mats are put in place by tying the rope to one mat attached to the framework. This is further arranged with two horizontal bundles by joining a vertical bundle at each edge.

12) A man kneeling on the ground passes a giant needle threaded with rope back and forth to a second man squatting inside, effectively sewing the whole construction together.

13) Mudhif Finishing Touches: End wall of reed mats above and screen of giant cross crossed reeds below is lashed to the frame of vertical and horizontal reed bundles. This is set in position and connected to an arch at mudhif's end. The workman secures this connection with an extra massive arch on the exterior of the structure and on the Interior of a similar mudhif. This is followed with a barrel-vault of reeds, cross-bundles, and mats. End wall reed screens allow light and air circulation. The rugs hang from the ceiling and walls, while the reed mats are placed on the floor. As for the construction material, there are two construction materials that are accessible in the Tigris and Euphrates River basins and the low-lying intervening plain. The omnipresent clay-like soil and the equally great reeds border the banks of every watercourse and increase in the outlying marshes. Reeds were readily available and affordable for quick construction as the mudhif could

be built in less than two days. However, it could be dismantled and moved by the owner to a new place (see 2Bc.036). Reed was the first building material used in ancient Mesopotamia. The traces of reed buildings, sometimes plastered with mud, have been discovered in the lowest strata of various sites. Reed structures that are strikingly like the modern mudhif are depicted on prehistoric ritual vessels (see, for example, 2Bc.011, 2Bc.034, 2Bd.007); and the survival of terms for reed structures in many later texts predate. The time before creation is described in terms of the absence of various elements which are regarded by the Mesopotamians as essential to the character of life in the Babylonian creation epic. The earliest Mesopotamian shrines resembled the present Iraqi mudhifs in appearance. They were modest replicas of human dwellings meant as living places for the holy temples. They provided a pleasant house befitting divinity, which was constructed from the most easily accessible materials. Although the house was resistant to rain, it was open to the light of day and the cooling summer winds. This became grandiose temples that raised a step beyond the ordinary dwellings of men. Their floors were covered in beautifully patterned rugs and their spectacular sequence of arches draped with the brightest fabrics. The sanctity of an old temple which fell into disrepair and had to be rebuilt was probably carried over into the new structure. Its old and pliant reeds form the center of each new reed bundle, which is the very backbone of the refurbishment. This is a custom that still survives among the modern Marsh Arabs.

5. Social System and Hydrology

5.1. Social Changes during the Period 1968-2003

The geographic barrier of the Arab Marshes was dried for military defense purposes to stop any chance of attack from the Iranian hostility and to protect the Iraqi land. However, the environmental consequences must not be underestimated as there was a drastic change in the area's habitat. The inhabitants in their environment had to scatter other replacements inside Iraq. This displacement urged people to adopt new patterns of life that are strange to them. The people who left the dried Marshes suffered immensely because of the drastic change in their lives. In post-2003, the government began to allow water into the Marshes. However, the Turkish and Iranian governments stopped the flow of water into the Marshes area. The problem of the people living in the marshes persisted with no real solutions due to the weak political regime (After 2003) in preserving the rights of Iraq according to the United Nations Charter.

5.2. Social Changes during the Wars: Iraq, Turkey, and Syria

In 1980, Iraq, Turkey, and Syria had close relationships. This is because these countries were dealing with separatists and guerrilla movements. However, Iraq was busy defending its territory during the Iran-Iraq war 1980-1988. This is why Iraq needed Turkey as an outlet to transfer its oil. The 1990 Gulf War raised tension between them, and Turkey indirectly took sides with the United States against the

Iraqi government. During this period, Iraq complained that Turkey did not follow the 1987 water agreement and supply enough water. In 2003, the U.S. war led to further conflicts between Turkey and Iraq. The Iraqis also continued to complain over the quantity of water delivered to the downriver, addressing desertification in Iraq as proof to support their argument against Turkey not providing enough water. Over the years, their relationships became neutral but not as connected as they used to be. However, in December 2013, tensions started to rise due to the completion of oil pipelines between the Kurdistan Regional Government and Turkey and the spread of oil that was independent of the Iraqi central government. Historically, the Turco-Syrian relationships have been on hostility and conflict. Syrian rapport for the Kurdistan workers party was the source of extreme tension. As a result, in 1988, the two countries went to war. Turkey and Syria today have several shared water projects. Nonetheless, the conflict between these countries significantly impacted marshland's life in Iraq.

5.3. Iran-Iraq Conflicts

The conflicts between hostile Iran and Iraq greatly affected the marshland severely. Marshlands in the south of Iraq are fed by the Tigris and Euphrates rivers. The marshlands produce space for anglers and serve as a home for birds and natural habitat. Moreover, they are a common platform for thousands of birds migrating between Siberia and Africa. It is known that the marshland was fertile to smuggling of for weapons and drugs. This was considered a threat to civilian peace and was dangerous according to the vision of the Iraqi government. Even before the war, there was something suspicious about that area that led to cutting off the water on them. This conflict had a drastic influx on the Arab Marshes. Between the 1950s and the 1990s, the Mesopotamia Marshes were drained for various purposes such as clearing land for cultivation, irrigation, reducing mosquito breeding grounds, and facilitating untapped petroleum reserves. The three significant sub-marshes of Hawizeh, Central, and Hammar Marshes were drained at different times. Internally displaced persons (IDPs) or environmental refugees deported to other countries were the fates of the ancestral Marsh Arabs. Some of the exiled Marsh Arab groups returned to the Marshes in 2003 and they did not sustain staying due to continuous droughts (atlas, n.d.).

5.4. Iraqi Marshland in the Eyes of Experts

Al Tamimi (n.d.) explains that the Iraqi marshlands are an uneven collection of tiny islands made of alternating layers of reed mats and mud scraped from the marsh bottom. This makes up one of the world's most exciting places. Due to their extensive history that dates to Sumerian culture, Iraqi marshes are fascinating research settings that examine how the marshlands' socio-organization and landscapes are shaped culturally to specific knowledge among the Marsh Arabs long-term. It also gives a complete picture of marshland society, including how it maintains continuity and changes to its environment to raise the knowledge of Iraq's

cultural landscape. Iraqi wetlands were virtually obscure to the public until 1992. In addition, archaeologists and Mesopotamia academics were well-versed in understanding the built environment of Iraqi marshlands and its relationship to space which offers a place for Marsh Arabs. It provides a comprehensive picture of marshland society, including how it maintains continuity and adapts to changes in its surroundings. Iraqi wetlands were practically unknown to the public until 1992. However, archaeologists and Mesopotamia scholars knew everything there was to know about them.

Artificial Island on Wheels Dibin or Dubun outlines two types of settlements. They are made from a base of reeds, rushes, and soil-forming raft-like floating platforms. They each have a home and a herd of water buffalo. Water buffalo breeders utilise them as portable houses that may be moved from one location to another. The many types of homes found in the marshes differ in building material, location, and function. Many houses are built of reed.

The following are examples of marsh dwellings:

1) Sarifa is made of reeds and rushes and is regarded as one of the oldest and most prevalent forms of housing. Each Sarifa is identical in structure and look, with a rectangular form and a curving roof that covers around 25 m².

2) A hut is similar to the sarifa, except its walls are constructed with mud instead of reed. It has a rectangle or square shape with a curving roof and is regarded as one of the simplest types of housing in the marshes. In the marsh, huts are not constructed. They can be found along riverbanks and on the outskirts of wetlands, where flooding is less prevalent.

3) Sitra refers to an animal-keeping structure built of reeds and mud. It is usually situated adjacent to a family's home, and there is occasionally no barrier between the two.

However, the book titled "Reed Shaken by the Wind" identifies the Marsh Arabs who live in the southern part of Iraq, which is an isolated and neglected community. Maxwell was the explorer of the marshland who tried to describe the Marsh Arabs' behaviour and way of living, their tribes' structure, and the indigenous architecture they inhabited as homes over the rivers (Maxwell, 1957). An anthropologist's eye views this book, and they typically describe societies according to their observation. However, a considerable part can miss out on the truth and reality. This is because an outsider cannot reveal all the layers that the community handles.

5.5. Threats to Inherited Tradition and Skills within the Marshlands

Skilled builders of Mudhif suffered while drying the marshes in Iraq. The inherited tradition was at risk due to the ecological changes in the area. The Mudhif is a tribal symbol for the people living in the Marshes and their surroundings. It is the club of the tribe where they meet regularly to exchange speeches, poems, and solve conflicts that are all controlled by the Sheikh, who is the head of the tribe.

The tribes of the Marshes are proud of this symbol, and it is clear from the description by a poet who said “Tbarak ya Ibn Alaam, Ma Gharranna AlTbooga”, which means “Blessing on you my cousin bricks do not conceit you”. It shows how proud they are of their culture and their love for the Mudhif. In the video mentioned, a builder explains the stages of building the Mufef.

The process comprises of five stages: planning the layout, digging the pits, fixing the poles, arching, and netting the parts (as explained earlier).

- 1) Rapping and tying the reeds (Alshabba) together makes it become like a pole.
- 2) Dig several pits in the ground to fix the poles (AlShabba Pole).
- 3) Fix the AlShabba into these pits so that the other end becomes free to reach the opposite AlShabba to continue the arch. (You need 10 - 15 people to lift the heavy AlShabba and fix it into the pit.)

It seems that the skills in building Mudhif did not fade away since those builders kept building the Mudhif in other surroundings. This is because those who migrated were still attached to the old culture of having a Mudhif for the tribe. In the video, the builder is in his forties and holds good experience as he looks very confident. I would say the threat was associated with the weakness of the building movement, but the skill of craftsmanship was deep-seated within the tribes.

6. Conclusion

The status of water in the Middle East has initiated problems in the region. Climate change, scarcity, irrational usage of water, and wars have triggered many issues and created a new situation that needs action. This research explored all the reasons associated with this complicated situation. The case of the Arab Marshes in Iraq is one crucial outcome for the matters mentioned here that needs attention. There is evidence of poor habitat which led to the destruction of ecological life, migrations, and demographic changes. The instability of inhabitants caused the weakening of cultural fabric and loss of a stream of 5000 years of accumulated historical and cultural legacy. Therefore, the study and investigation of all surrounding issues is necessary to initiate solutions and help decision-makers adopt policies that will help the people in these areas. In conclusion, water is essential in our life and is the source of every living thing. Many countries in the Middle East region face water problems due to conflicts and politics. Many people lose the essence due to decisions that have been taken by their rulers, such as Marsh Arabs. Water and biodiversity should be considered, and governments should be responsible for achieving a balanced life and fewer immigration numbers.

Many scholars have also discussed the hydro-immigration of inhabitants from the marshland. They face various risks associated with deficient scarcity of money, limited schooling, and social instability than their counterparts who stayed in their country. In addition, they have inadequate health coverage and difficulties in integration with the new community. This means that not all countries receiving those migrants can provide programs which help the newcomers.

Based on the interview with Khalid Suleiman, which was issued in marshland is still suffering, it is time for the decision-makers to act on this issue. Moreover, despite the amount of information available about the marshland water issue, the people responsible have failed to act and solve the problem. Thus, there is need to change the focus from looking at the problem as an ecosystem problem to proffer solutions from a regional to local or even national level. This environmental issue is the type that needs to be solved on a local scale. However, agitating the Marsh Arabs should be viewed from a regional perspective.

This research exposed facts about the influx of wars on inhabitants of the Arab Marshes in Iraq. There is reasonable evidence that the lives of those inhabitants change drastically. Their lifestyle and day-to-day activities changed due to variations in the ecological system. The social system also was fractured as people needed to adapt to new behavior patterns. It is noticed that people have a deep-seated culture that makes them closely attached to what they are used to practicing. Thus, they persisted in transferring their ways and methods to build Modif and still, they are proud of their inheritance of the architectural design and materials used in their built environment.

Conflicts of Interest

The author declares no conflicts of interest regarding the publication of this paper.

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