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Weaponizing Water: Forced Evictions and Ecocide in the Iraqi Marshlands

Issamaldeen A. Majed

Abstract
The Mesopotamian Marshes represent one of the world's most distinctive indigenous homelands, where environmental systems and cultural identity co-evolved for millennia. This paper examines the near-total destruction of this ecosystem in the late twentieth century and argues that large-scale hydrological engineering, coupled with state-directed repression, constituted a deliberate strategy of forced eviction and environmental destruction. Drawing on United Nations assessments, demographic data, historical reports, and interviews with a small sample of local inhabitants, the paper demonstrates that the drainage of the marshes was not merely ecological degradation, but a form of weaponized environmental violence that undermined indigenous self-determination, dismantled communal housing rights, and threatened the survival of an ethnic group. The analysis examines how these actions produced a partly irreversible ecocide and highlights broader failures of multilateral governance to protect vulnerable populations in ecologically sensitive regions. Nevertheless, the paper provides evidence of positive repopulation trends over the last decade and argues that the Marsh Arab voices need to be heard. By integrating ecological evidence with a human rights framework, this study advances a reparative agenda centered on land restoration, economic compensation to affected families, legal recognition of communal tenure, and cultural revitalization. The findings call for national and regional policy approaches that recognize the weaponization of water as a human rights violation and position indigenous agency at the forefront of environmental governance, local development, and post-conflict reconstruction. In doing so, the paper contributes to the growing discourse on ecological justice and the need to link environmental protection with housing rights, cultural autonomy, and self-determination of local communities.

Keywords: *Mesopotamian Marshes; Ecocide; Forced Eviction; Environmental Justice; Reparative Justice*

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Introduction

The Mesopotamian marshes of southern Iraq - historically a distinctive ecological, cultural, and economic landscape - were systematically transformed in the late twentieth century through policies involving large-scale water diversion, drainage and targeted repression. This transformation, which may initially appear as a technical project of irrigation and land reclamation, was in fact the outcome of a deliberate strategy of social control and counterinsurgency by Saddam Hussein's regime after the Shia uprising of the early 1990s. This engineered assault inflicted profound environmental damage - a form of ecocide - and resulted in the mass displacement and systematic denial of housing rights of the indigenous Marsh Arabs (*Ma'dan*). The legacy of this violence translates today into a significant human rights crisis, characterized by issues of land tenure precarity, vulnerability to seasonal drought and to climate change, and the unfinished work of justice and restitution.

This paper argues that the systematic destruction of the Iraqi Marshlands should be interpreted as a form of political violence and environmental warfare that continues to undermine human rights and comprehensive restoration efforts in contemporary Iraq. The long-term viability of marshland restoration programs, supported by national and multinational organizations, is contingent upon integrating ecological recovery with a comprehensive reparative justice agenda that secures housing rights and communal tenure. The paper contributes to the human rights debate by moving beyond technical descriptions of environmental damage and framing large-scale hydrological engineering as a critical tool of political violence, thereby outlining a clearer policy pathway toward accountability and rights-based restoration.

The researcher began gathering preliminary information about the marshes through documents and satellite images. and environmental science to establish the mechanisms and scale of environmental destruction. This ecological evidence has been integrated with contemporary reporting by NGOs and UN assessments, and recent local demographic data (e.g., population volatility in the *Al-Chibayish* district), to distinguish political violence from apparent technical failures in safeguarding this ecosystem. A recent demographic trend of population returns, particularly after the admission of four wetlands in Southern Iraq to UNESCO's World Heritage Sites by UNESCO, shows a willingness among local people and Iraqi institutions to value these sites of natural biodiversity and cultural significance. Nevertheless, positive perspectives for the future are contingent upon the willingness of institutions and communities to deal with past

violations and analyze what went wrong in the massive investments in top-down hydrological re-engineering programs.

The researcher employed a descriptive approach in this article, beginning by describing and analyzing the marshlands. This involved collecting information and data related to the marsh inhabitants and their lives before 1991 and after 2003. The research utilized various methods, including interviews and questionnaires. The interviews provided a narrative account of the period prior to the deliberate draining of the marshes. The researcher did not pose specific questions, relying instead on the participants' recollections. The questionnaire consisted of 13 questions, distributed to 20 individuals (13 males and 7 females), as per the attached questionnaire, and included recording environmental observations related to water pollution.

The analytical approach was used to analyze and interpret the data collected through the descriptive method. This involved analyzing the questionnaire results and using percentages, as well as taking water samples from the marshes and comparing them to local and international standards. The analysis also aimed to determine the relationship between water pollution and its impact on public health in the marshlands.

The structure of this paper is designed to build a comprehensive case for reparative justice. *Section 1* traces the socio-ecological history of the Marsh Arabs, documenting the mass displacement and destruction of communal housing to establish the context of eviction and housing rights violations. *Section 2* focuses on the politics of reconstruction, analyzing the drainage program as an instrument of social control and discussing adequate approaches to constrain violations. *Section 3* describes the results of a local survey among indigenous people to assess the memory and perceptions or structural violence and current priority needs. *Section 4* addresses cultural survival, memory and everyday repair, focusing on the non-hydrological dimensions of restitution, to secure dignity and self-determination for the *Ma'dan* community. Finally, *Section 5* draws some concluding remarks.

1. The Marshes Memory of Political Violence

The Mesopotamian Marshes have historically constituted a dynamic landscape characterized by an intrinsic link between community and environment, situated at the confluence of the Tigris and Euphrates. Flood pulses, sediment deposition, and tidal influence from the Persian Gulf combined to establish a mosaic of permanent and seasonal marshes, reed beds, shallow lakes, and channels. This heterogeneity supported a broad spectrum of species, ranging from endemic fish and resident and migratory birds to

plant life adapted to varying salinity regimes. The marshes' productivity was not solely biological but also socio-economic: the hydrological regime regulated grazing cycles, reed growth for construction and craft, and fish migration patterns upon which local communities depended (Leonard and Vinez 2006,121). For millennia, the Marsh Arabs (*Ma'dan*) developed a seasonal rhythm of life adapted to the marshes' flooding and drying cycles, relying upon reed houses (*Mudhif*), buffalo herding, fishing, and intricate watercraft technologies that facilitated mobility, trade, and worship across a watery terrain. These marshes were not merely an ecological niche but a cultural common where knowledge of craft, kinship, and landscape was transmitted through embodied practice and oral history (Thesiger 1964,51).

Figure 1: Villages of the Marsh Arabs in southern Iraq in 1967, photographed by Tor Eigoland.

Source: https://www.aramcoworld.com/articles/2023/all-the-lands-were-sea

Anthropogenic hydrological transformation started well before the late 20th century. Large-scale upstream irrigation, damming throughout the Tigris–Euphrates basin, and agricultural intensification gradually modified flow regimes. Throughout the 20th century, water management policies favored the expansion of irrigation for agricultural modernization, often without integrating downstream ecological requirements. Reduced peak flows and altered timing disrupted the marshes' natural hydrological rhythms, fragmenting habitats and increasing vulnerability to salinization as evaporative concentration rose in isolated water bodies (Leonard and Vinez 2006,149). By the 1970s and 1980s, the marshes were already under stress, but it was the engineered drainage of the 1990s that precipitated the most rapid ecological collapse. Under the rule of Saddam Hussein, hydrological shifts coupled with political violence to repress the Shia uprising against the regime, produced demographic collapse and mass displacement. Large-scale hydrological interventions were executed in a manner that served political objectives: rendering marsh-based refuge and subsistence untenable, thereby

effecting mass evictions (HRW 2003,359).[1] Eyewitness reporting, UN and NGO assessments, and satellite analyses document the use of canalization and diversion projects to displace populations. These actions—the burning and bulldozing of *Mudhif* dwellings, the blocking of channels, and the conversion of reed islands to saline flats—caused both immediate loss of housing and longer-term barriers to re-occupation (salinized soils, destroyed reed stocks, altered property relations). Eviction here entailed not only forced movement but also the destruction of the material and institutional conditions necessary to exercise housing rights: secure tenure, safe water access, and livelihood-linked shelter (Human Rights Watch 2003, 359).

Population estimates vary significantly by source and year; however, available documentation indicates dramatic declines: while numbering approximately 250,000 people as recently as 1991, the Marsh Arabs were reported by Human Rights Watch (2003) and other observers to be far fewer in their ancestral homeland within a decade following the 1991 uprisings. Some authoritative accounts estimate that the marsh population decreased from nearly half a million in the 1950s to as few as 20,000 in the 1990s, before a partial return in the 2000s. More recent local data from the *Al-Chibayish* district further document this volatility, showing a sharp population drop from 90,514 in 2010 to 28,348 in 2014, attributed primarily to environmental deterioration (*marsh drying*) and associated security and economic instability. This decline was dramatically reversed by 2022, when the population surged to 113,917, reflecting a growth rate of approximately 302%, followed by continued moderate growth to 116,815 in 2023 (Human Rights Watch 2023,31)[2].

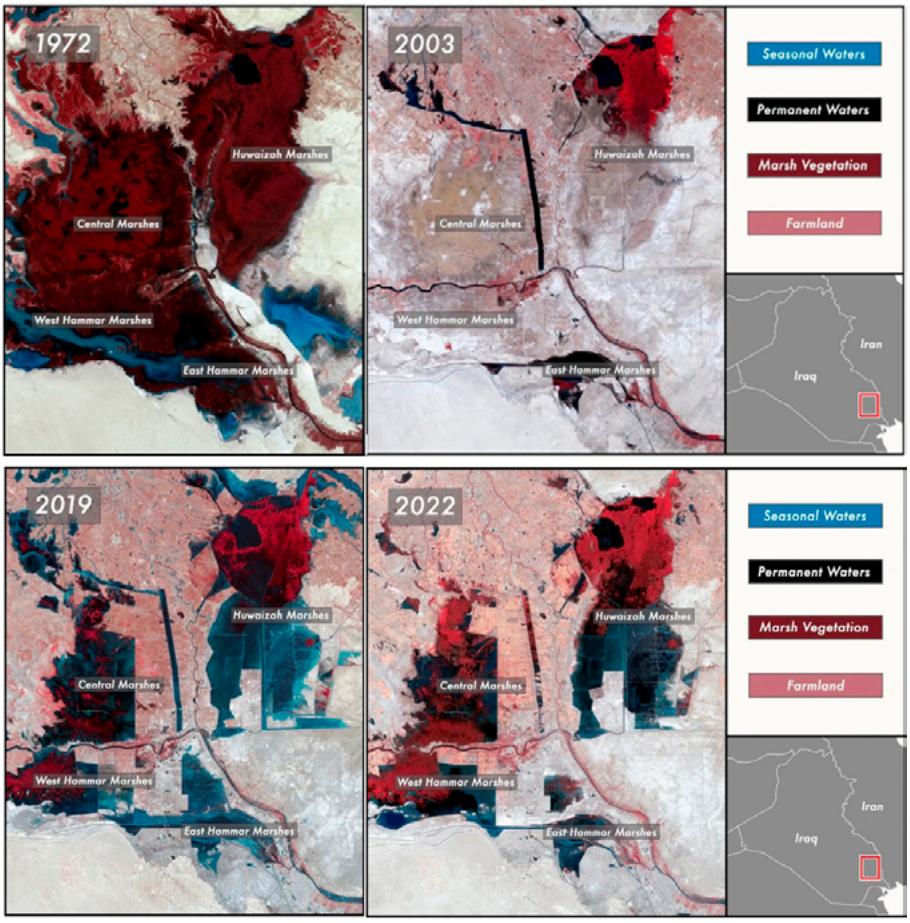
These demographic figures are significant as they record mass evictions, forced displacement, and the destruction of communal housing and livelihoods on a regional scale, succeeded by a complex, multi-factor return process. The engineered drainage implemented in the 1990s combined canal-building, dike construction, and intentional water diversions, converting the marshes into salt flats and exposing reed villages. This deliberate program of landscape transformation functioned as an instrument of eviction and repression against the insurgents who had fought against the regime during the Gulf War of 1990-1992. Since thousands of fighters were hiding in the marshes, protected by local people, dwellings and islands that had sustained

[1] Human Rights Watch (2003), p. 359; UN and NGO reports from the 1990s summarized in UNEP (2001), p. 44.

[2] HRW summarizes earlier reporting and cites population estimates, noting "Numbering some 250,000 people as recently as 1991, the Marsh Arabs today are believed to number fewer than 40,000 in their ancestral homeland". See also demographic analysis by Minority Rights Group (2023) and Crisp (2023), p. 31.

generations were intentionally rendered uninhabitable, resulting in internal and cross-border displacement and severe violations of housing rights (UNEP 2001,44).

Figure 2: False-color satellite images of the Mesopotamian Marshes in 1972; in 2003, after being drained by Saddam Hussein; in May 2019, after being partially restored; in May 2022, third year of a severe drought.



Source: Crisp 2023

International observers, UN assessments, and NGOs documented the systematic removal of populations, the burning and bulldozing of dwellings, and the denial of access to the traditional water and grazing resources necessary to sustain housing security and community life (Human Rights Watch 2003, 450-456). Following the suppression of the 1991 uprising, most of the Marsh Arabs were forced to leave their lands. By 1995, "almost all the

Marsh Arabs had been displaced," forcibly resettled in areas under military control. Those displaced outside Iraq dispersed to various parts of the Middle East (West Asia and Southwest Asia) and Europe (UNHCR, 1996).

The population of the marshlands, which numbered over 250,000, dwindled to less than 40,000. Approximately 1,100 were displaced within Iraq, and 40,000 fled to Iran as refugees. They endured the worst forms of repression under the previous regime. The impact wasn't limited to human suffering; the marshlands, which once covered an area of 20,000 square kilometers and were characterized by their rich environmental, economic, and social diversity, shrank considerably (Human Rights Watch, 2003, P.3). Cultural practices intrinsically tied to the marsh environment, such as reed-weaving, buffalo husbandry, and seasonal movement patterns, faced erasure as younger generations pursued education and employment in settings far removed from the reeds and watercraft of their ancestors. The loss of housing rights (secure tenure, access to water-based livelihood support, and the ability to rebuild settlements) has limited full community restitution, even in places where water subsequently returned (Al-Khafaji 1992, 15-21).

The nature of displacement and return is also deeply connected to traditional livelihoods, particularly the unique requirements of buffalo husbandry. Marsh dwellers, unlike some rural agriculturalists who can relocate their animals to the city's outskirts, face profound difficulty migrating to urban centers. Buffalo require an environment with abundant water and specific forage (reeds and papyrus); urban relocation frequently necessitates the forced sale of herds or the maintenance of a splintered family presence to manage the remaining animals in the marsh. This constraint highlights the mechanism by which the degradation of the water-based environment operates as a complete and effective denial of livelihood, rendering the eviction of buffalo-herding families especially severe.

Environmental and restoration narratives that emerged following the political changes of the early 2000s have been complex and contested. Following the 2003 change of regime, water returned to portions of the marshes, and some communities began to reoccupy reed islands and rebuild *Mudhifs*. International conservation groups and Iraqi scholars documented both promise and constraints, such as: After 2003, the flooded area reached 20% of the pre-drainage marsh area in 2004, rising to approximately 44% of the total area of the southern marshes by the end of 2005 (Abu Jari, 2007, p. 2). Local residents breached the earthen embankments the government had constructed to drain the marshes, which had been designed to hold back the water. As a result, water flowed and flooded a portion of the marshes. To expand the waterlogged area, the Ministry of Water Resources developed a plan to revitalize 75% of the marshes, bringing them back to their 1973 levels

(Al-Rikabi, 2016, p. 38), while hydrological reflooding produced striking ecological recovery in certain areas, full restoration was restricted by altered upstream flows, salinization, and the fragmented nature of landholdings and governance. Moreover, the social fabric of marsh communities had shifted: returnees often encountered contested property claims, divergent livelihood patterns, and a younger cohort whose aspirations were shaped by urban life and modern education.

2. The Politics of Reconstruction

The Mesopotamian Marshes have been viewed by various actors in vastly different ways: as a strategic frontier to be controlled by state and military actors like Saddam Hussein's regime or colonial administrators, who saw the landscape as a rebellious territory requiring drainage and surveillance; as a fragile ecosystem in need of technical rescue by international organizations like UNESCO and scientists focused on hydrological restoration; and as a homeland by the indigenous Ma'dan (Marsh Arabs), who maintain unique forms of local knowledge tied to water buffalo husbandry and ancient reed-building traditions. Therefore, whether the marshes are seen as a security threat, a conservation project, or a living cultural space depends entirely on the observer's agenda and relationship to the land. Yet any intervention that privileges a single register, risks reproducing earlier forms of dispossession. Restoration efforts that focus exclusively on water without rebuilding social institutions, cultural transmission, and local governance will likely yield only partial recovery. Conversely, approaches that center local voices, recognize customary practices, and support livelihoods in tandem with hydrological rehabilitation stand the best prospect of producing enduring outcomes (Richardson, Curtis and Hussain 2006, 1307–1311). The history of the Mesopotamian Marshes constitutes a lens for broader questions concerning environmental justice, eviction, and housing rights.

How do states and external actors reckon with legacies of deliberate environmental harm? What responsibilities do scholars and practitioners bear when documenting loss that may become a precursor to cultural nostalgia rather than reparative action? And how might marsh communities themselves define the terms of their recovery, insisting that measures of success must encompass cultural vitality, autonomy, and secure housing and land rights? These are ethical and political questions regarding who determines the marsh's future and whose voices are privileged in shaping that future (UNEP 2001, 34-35).

If the marshes offer any enduring lesson, it is that the landscapes are co-constituted by human practices and ecological processes. Whereas the re-flooded reedbeds and returning species indicate ecological resilience, resilience devoid of justice risks becoming a mere rhetorical device detached from tangible material repair. For scholars, policymakers, and communities seeking to chart a different path forward, the imperative is to combine ecological restoration with cultural restitution and housing security: to foster spaces where knowledge-bearers, elders, and youth collaborate on sustainable livelihoods; where legal frameworks protect communal rights and prevent re-eviction; and where the marshes' narratives—both of flourishing and of atrocity—are preserved within living communities rather than relegated solely to archives (Leonard and Callum 2006, 45–68).

A sound restoration approach acknowledges the irreversibility of some ecological damage. Canalization and large diversions converted wetlands into dry surfaces, where exposed peat and organic-rich sediments oxidized and subsided, leading to soil degradation. Salts accumulated in soils and residual water bodies. This makes, nowadays, the reestablishment of freshwater reed beds challenging, even where water eventually returns. Ecological succession in rapidly drained landscapes favored xeric species and invasive salt-tolerant plants, effectively modifying the marshes' baseline ecological conditions (Richardson et al. 2005, 477–489).

Restoration ecology in the marshes has therefore had to address a complex set of constraints: altered basin hydrology beyond local control, changed sediment dynamics, and the legacy of soil salinization and subsidence. In areas where inflows were sufficient, reed beds and water birds returned quickly, demonstrating the remarkable regenerative capacity of marsh systems when hydrological connectivity is reestablished. Yet in numerous locations, physical and chemical alterations to soils and water, as well as socio-political obstacles to managed rewetting, constrained ecological recovery (Jones 2008, 60).

Mixed outcomes underscore a central principle from wetland science: while hydrology is the master variable, it does not exclusively determine ecological outcomes; historical legacies and human institutions are also profoundly influential (Richardson 2005,477–489; Ochsner 2010,1307–1311).[3] Understanding and managing these ecological dynamics thus requires basin-scale cooperation (to ensure predictable flows), local adaptive management (to tailor rewetting strategies to on-the-ground soil and vegetation conditions), and meticulous attention to livelihoods, community access and tenure (so that restored hydrology supports reed harvesting, fishing, and

[3] Richardson et al. (2005), pp. 477–489 ; Ochsner et al. (2010), pp. 1307–1311.

grazing without generating new conflicts over access) (Ochsner 2010,1746–72; UNEP 2001,34-35).[4]

After the fall of Saddam in 2003, political openings towards Shia-majority areas in the South of Iraq allowed for partial environmental and social recovery yet rebuilding justice and securing the rights of marsh communities required more than physical reflooding. Issues of land tenure, reparations, political representation, and the reinvigoration of social institutions remained unresolved. In many cases, local elites, new land claims, and state-level reconstruction priorities shaped the terms of return in ways that did not automatically restore preexisting communal arrangements. The political economy of reconstruction in the last decades—in which resources, authority, and development projects have been unevenly distributed—constrained many communities' ability to control their futures within the marsh landscape(Ochsner 2010,14811; Leonard and Vinez 2006,121–149).[5] So far, restoration policies have not succeeded in combining basin governance (to limit downstream vulnerability to upstream abstractions), domestic legal reforms (protecting communal tenure and outlawing forced eviction without due process and restitution), and local capacity-building (to reconstitute customary institutions and enable community-led restoration that secures housing and livelihoods) (Ochsner 2010, 457–463; UNEP 2001,21).[6]

As noted in the first section, the trend of displacement, which brought the population of *Al-Chibayish* district under the 30,000 units in 2014, was subsequently reversed: by 2022, the district population reached 113,917, a resurgence largely driven by improved security, the return of displaced families, and marshland revitalization projects following the international recognition of the Mesopotamian Marshes as a unique heritage. Indeed, in 2016, four wetlands of southern Iraq were listed as a World Heritage Site by UNESCO. UNDP and other multilateral organizations played a positive role to this end, but the return was mainly supported by increased job opportunities in the ecotourism and fishing sectors and appointments in state departments and security ministries, which offered stable income and security—factors that often outweighed the precarious livelihoods of traditional agriculture and buffalo husbandry (HRW 2003,450-456; MRG 2023,197; Crisp 2023,17).[7] What is still missing is a rights-based reparative agenda: restitution of land

[4] Restoration case literature in Ochsner et al. (2010), pp.1746–72. And management recommendations in UNEP (2001), pp. 34-35.

[5] Ochsner et al. (2010), p.14811; Leonard and Vinez (2006), pp. 121–149.

[6] For policy proposals linking basin governance and domestic reforms, Ochsner et al. (2010), pp. 457–463, and UNEP (2001), p. 21.

[7] Human Rights Watch (2003), pp. 450-456; Minority Rights Group (2023), p. 197; Crisp (2023), p. 17.

and housing, legal recognition of communal tenure, and reparations for destroyed homes and livelihoods (UN *CESCR*,1997, 3-4).

3. A Survey on Local Perceptions

The analysis of the first two sections of this paper has been discussed with a group of 20 people aged 70 and above living in the South of Nasiriya, in a village called Abu Subat (Al- Chibayish District). There are 13 men and 7 women selected among families directly affected. After collecting, processing, and analyzing the data from the study sample, the percentage of responses to each question was determined. (The Percentage = Part / Whole * 100) These percentages varied depending on the question, the individuals, and the diversity of perspectives and circumstances of each person in the sample, and the way of living. They are fishermen/women, buffalo raisers, and handicraftsmen/women who either took part in the uprising against Saddam in person or have family members who did, and some of them helped by hiding the revolutionaries at that time or by providing shelter, food, or weapons. Most of the Marsh Arabs are Shia, and many of them were against the regime or affiliated with Iranian groups. Saddam's entourage accused them of treason and called for their punishment.

3.1. Historical Events, 1991 onwards.

Out of 20 survey participants, 16 (80%) reported living in the marshes in 1991 and in the years immediately after the war, but some later sought refuge across the border in Iran or in other Iraqi cities. They remember that, when the war against Kuwait started, many Marsh Arabs did not want to be part of it and fight for the Iraqi army. The regime accused them of treason and started the drainage, immediately followed by forced evictions of indigenous people. According to their narrative, those events provoked not only a major shift in their lives but also in the environment itself, as they began altering the geological balance of the marshes in ways that are partly irreversible. The other 4 individuals interviewed moved to the Marshes after the 1991 uprising or were serving in the army and were stationed in other regions at that time, which prevented them from protecting their families. If they tried to leave the army and return, they would be arrested for insubordination or executed.

When individuals were asked if they or their families were subjected to forced evictions or displacement during the 1990s, 18 people (90%) replied positively. They moved to different areas, both within and outside Dhi-Qar Governorate, and faced numerous challenges in finding a job and supporting

their families. Some were forced to rely on aid from residents in their new locations for periods exceeding six months until they found employment as farmers in the central provinces or other jobs within the cities they relocated to. However, some continued to move between provinces for many years in search of a sustainable livelihood. Given the economic sanctions and the embargo imposed on Iraq by the international community in the 1990s, the Iraqi economy was stagnant, and displaced people found it very hard to survive with dignity.

Respondents who were directly displaced described how the geographical composition of the marshlands played a pivotal role in the regime's decision to implement forced eviction policies. The dense proliferation of reeds and papyrus created a natural fortification, effectively functioning as a nearly impenetrable "forest" environment for conventional military forces. The vast, interconnected waterways provided a sanctuary for revolutionary elements and political dissidents. Soldiers recruited from northern and western governorates faced significant challenges navigating the unfamiliar, labyrinthine terrain. This lack of logistical control necessitated a shift from traditional military engagement to a scorched-earth policy. Beyond the physical landscape, the regime's repressive measures were driven by the perceived ideological threat posed by the marshland population. The marsh Arabs maintained diverse affiliations with prohibited political entities, most notably the Islamic Dawa Party, thereby positioning the region as a bastion of anti-regime sentiment. The marshes served as a strategic refuge for participants of the 1991 (Al-Intifadah Al-Shabaaniyah) uprising. The government's inability to capture these individuals through standard law enforcement led to the classification of the entire civilian population as collaborators. Testimonies from residents confirm that displacement was not a byproduct of conflict, but a deliberate, state-mandated strategy. These actions, characterized by direct executive orders, constituted systemic violations of international human rights standards, fundamentally altering the demographic and ecological landscape of southern Iraq.

In evaluating the ecological repercussions of the drainage operations, the research findings indicate a unanimous consensus among the respondents (100%, n=20) that the marshland environment underwent a holistic and systemic transformation. Rather than observing isolated environmental shifts, the local population characterized the post-drainage landscape as a complete departure from its original ecological state. This collective perception aligns with the scientific understanding of marshlands as highly integrated ecosystems, where complex biophysical processes are fundamentally interdependent. The respondents noted that the disruption of the hydrological cycle triggered a cascade of interconnected effects, leading to the sequential

collapse of various ecological niches. From their perspective, the transition was not merely a reduction in water volume but a comprehensive breakdown of the ecosystem's integrity, demonstrating how the forced alteration of a single primary variable—water availability—triggered an irreversible chain reaction across the biological and environmental spectrum.

Data collected from respondents indicates that environmental degradation represents the most significant long-term loss, according to 60% of the sample. This ecological shift persisted even after the re-inundation of the marshes in 2003, suggesting a fundamental alteration of the ecosystem's resilience. Those interviewed explained that the contraction of reed and papyrus beds led to a catastrophic decline in the buffalo population, the cornerstone of the local economy. The marshes historically served as a critical gathering spot for migratory birds moving between the northern and southern hemispheres. Habitat loss has significantly reduced these populations and, according to local observation, altered perceived seasonal cycles. The qualitative and quantitative depletion of fish populations remains a critical issue. Post-drainage water quality and the disruption of breeding grounds have prevented the industry from returning to pre-drainage benchmarks. The destruction of the marshland environment directly led to the erosion of traditional livelihoods. The other 8 respondents (40%) stated that the death of family members had the greatest impact on their lives, as a result of direct state violence, including summary executions and death sentences carried out during imprisonment. These events created a lasting legacy of trauma that complicates the social reintegration of the marshland communities.

A critical finding of this study is the marked absence of formal recognition regarding the systematic violations perpetrated by the former regime. While the draining of the marshes is often cited as a major ecological disaster, the specific human rights violations against the inhabitants of Dhi Qar have not yet attained the institutional status of "officially recognized harm." This lack of designation has historically hindered residents' ability to seek justice or comprehensive reparations from the government. The response from domestic authorities, specifically the Ministry of Migration and Displacement, has been described by residents as sporadic and insufficient. Rather than a structured program of economic recovery, the assistance provided was largely symbolic and failed to address the systemic loss of human lives and livelihoods (fishing and herding. Monetary aid was restricted to a narrow demographic, with payments ranging from 2 million to 2.5 million Iraqi Dinars per family, which was inadequate for long-term recovery. Material support was primarily humanitarian rather than developmental, consisting of basic household items such as kitchen utensils, mattresses, bedding, and blankets. Furthermore, the investigative findings

reveal a significant distributional gap. A substantial portion of the affected population reported receiving no assistance whatsoever. This inconsistency in aid delivery suggests administrative inefficiencies and a lack of a comprehensive database to track and compensate the victims of the 1990s displacement policies. Consequently, the current local population remains socioeconomically vulnerable, as the aid provided has failed to compensate for the environmental degradation and the profound loss reported by the community.

The survey findings show a bifurcated perspective among the residents of the Al-Chibayish marshes regarding the most effective means of achieving justice for what they categorize as "environmental and human annihilation." When presented with multiple options for restorative redress, a significant majority of respondents (70%) identified individual financial compensation as the primary mechanism for justice, reflecting a persistent need to mitigate the long-term economic precariousness resulting from the destruction of personal property and traditional livelihoods. The remaining 30% of the sample emphasized the necessity of regional reconstruction as the most urgent form of collective compensation. This group argues that the benefits of structural development extend to the entire community and enhance the area's burgeoning potential as a global destination, particularly following its designation as a UNESCO World Heritage site. By prioritizing marsh rehabilitation to accommodate the growing annual influx of tourists, this minority view seeks a sustainable, communal recovery that leverages the region's unique ecological and cultural heritage to ensure long-term prosperity.

Table 1: The method of providing justice to those affected, from the respondents' point of view.

Answer	**Count**	**%**
Financial compensation	14	70
Reconstruction of the areas	6	30
Documentation of crimes, cultural, and moral support		
Other		
Total	**20**	**100**

3.2. Current Situation

The current hydrological situation in the Iraqi marshes represents a critical convergence of geopolitical, climatic, and human factors, resulting in a comprehensive water crisis. This collapse is attributed to a sharp decline in transboundary water flows from Turkey and Iran, coupled with rising global temperatures and decreasing rainfall. Quantitatively, the combined flow of the Tigris and Euphrates rivers plummeted from 49.67 billion cubic meters annually (1,575 million cubic meters per second) during 2019–2020 to a mere 31.24 billion cubic meters (990 million cubic meters per second) by 2020–21. This supply-side imbalance reached its most catastrophic low between 2021 and 2025, and the resulting drastic reduction in volume has led to widespread environmental degradation across the region. The southern marshes, recognized as a UNESCO World Heritage Site since 2016, have shrunk dramatically, with surface water levels plummeting following a remarkably dry rainy season in 2024/2025. Alongside the marshes, other vital water bodies have faced similar droughts; Lake Hamrin has lost nearly 70% of its water, with storage volume dropping from 3 billion cubic meters in 2018 to just 350 million cubic meters, while Lake Sawa has dried up completely. These physical changes underscore a consensus that a hydrological imbalance has fundamentally altered the Iraqi landscape. The socioeconomic consequences of this drought are dire, following a grim mathematical relationship: every billion cubic meters of water lost leads to the loss of 260,000 dunams of arable land. As a result, the national agricultural plan, which initially aimed to cover 493,000 dunams, was reduced to just 135,000 dunams—a decrease of over 50%—leaving only 219,000 dunams of arable land. Local shortages exacerbate the problem, particularly in Dhi Qar Governorate, where demand is 122 million cubic meters per second (mcg/s) but only 67 mcg/s is available. This figure is further strained by the mandatory allocation of 16 mcg/s to Maysan Governorate. Water-dependent livelihoods have virtually disappeared, as evidenced by the complete collapse of the fishing sector in Al-Chubayish, where daily production plummeted from approximately 100 tons to zero, forcing the country to rely on imports. The livestock sector suffered a similar catastrophe, with the region recording the deaths of 4,234 buffalo, 434 cattle, and 2,062 sheep. In Al-Chubayish alone, the death of 1,500 buffalo represents a 12% decrease in the total local population. Ultimately, the transition from the severe drought of 2021 to extreme drought in 2025 has entrenched a state of perpetual crisis, threatening the survival of both the ecosystem and the communities that depend on it. This has led 80% of the surveyed population to classify current supplies as “very scarce,” while the remaining 20% described them as “scarce.” (Hameed, 2025, P.566-567)

Complementing the quantitative decline is a profound deterioration in water quality, driven by reduced hydraulic pressure and the unmitigated discharge of untreated sewage into the Tigris and Euphrates systems. As volumetric flow decreases, pollutant concentrations intensify, particularly in the southern reaches, because the diminished current lacks the force to flush contaminants effectively. This environmental degradation is manifested in altered water color, offensive odors, and elevated salinity levels, rendering the water largely non-potable and unfit for domestic use. The findings reveal that 90% of respondents observed a substantial decline in water quality, a change that forced residents into economic hardship by requiring them to purchase treated water, while those unable to afford it faced significant health risks. This qualitative collapse of the water supply is a primary driver of the ongoing systemic lack of safety and stability in the marshland community.

In evaluating the chemical composition of the marshlands during the 2022/2023 season, empirical sampling from Al-Amalaq, Abu Subat, and Al-Sanaf reveals a critical breach of international safety benchmarks. The mean concentration of Total Dissolved Solids (TDS) reached a staggering 6,985 mg/L, nearly five times the maximum threshold of 1,500 mg/L established by the World Health Organization (WHO). This hyper-salinity was most acute in the Al-Sanaf region, which recorded an average of 14,290 mg/L.[8] Such degradation is fundamentally linked to reduced hydraulic flow in the Tigris and Euphrates, which has diminished the rivers' traditional silt-based buffering capacity. This deficit, compounded by the unchecked discharge of industrial, domestic, and agricultural effluents, has resulted in a seasonal hydrological cycle characterized by extreme instability; water levels fluctuate between snowmelt-driven peaks and severe evaporation-induced troughs during periods of high temperature.

The intersection of quantitative water scarcity and qualitative decline has caused a significant public health crisis within the marshland community. Investigative data suggest a direct correlation between contaminated water sources and an increase in waterborne illnesses, particularly gastrointestinal distress and dermatological conditions. While 80% of the surveyed population explicitly reported a surge in disease incidence, the remaining 20% did not acknowledge this trend—a discrepancy potentially attributable to limited health literacy regarding the causal link between environmental pollutants and symptomatic illness.

[8] Empirical sampling data on water quality in 2022-2023 have been sourced by the researcher at the Marshlands Research Center of the University of Dhi Qar (unpublished data).

Epidemiological data from the Dhi-Qar Health Department corroborate these concerns, documenting 2,895 clinical cases of diarrhea in the marshlands during the first half of 2023 alone. When contextualized within the 38,328 cases recorded governorate-wide during the same period, the data underscores a localized health emergency. The persistence of intermittent diarrheal outbreaks within families serves as a longitudinal indicator of the systemic biological threats facing this vulnerable population, highlighting a critical need for immediate humanitarian and environmental intervention (Hameed 2024, 50).

In concluding the investigative study, the researcher evaluated potential restorative interventions through the lens of those directly impacted. While the researcher proposed a multifaceted suite of recovery measures, the respondent pool unanimously identified (100%, n=20) the augmentation of water allocations as the singular, foundational prerequisite for restoration. The participants posited that the solution resides fundamentally in high-level diplomatic and administrative action: increasing inflows from upstream nations and strictly regulating internal diversions to ensure that sufficient volumes reach the southern termini. From the residents' perspective, water is not merely a resource, but the primary driver of socio-economic, social, and cultural stability; its continued absence threatens to escalate beyond a localized crisis into a significant political challenge for the state.

The primary objective of this questionnaire and the subsequent interviews with this cohort of twenty witnesses was to document the "living truth" of a community victimized by both a repressive regime and environmental catastrophe. These narratives serve as vital eyewitness accounts that provide granular detail to the broader historical record of the destruction of the Iraqi ecosystem, a region historically revered as the *Garden of Eden*. This study highlights that this demographic represents a much larger, disenfranchised community whose fundamental rights and dignity were systematically eroded by an authoritarian system.

Ultimately, the data suggest that for these indigenous people, restorative justice begins with formal recognition. Unlike other communities that faced similar fates, the marshland inhabitants remain in a state of unresolved grief, with many still searching for the remains of loved ones lost to political violence. By documenting these testimonies, the research emphasizes that the 1990s displacement was not merely a tactical maneuver, but a deliberate act of "horror and suffering" executed for political gain. Restoring the marshes is, therefore, framed by the survivors not just as an environmental project, but as a moral imperative to honor a free people who chose resistance over subjugation, ensuring that their families may finally achieve a sense of peace and a viable future in their ancestral lands.

4. Future vision

Figure 3: Sunset in the Marshes 1951, photographed by Wilfred Thesiger

Source: https://www.aramcoworld.com/articles/2023/in-the-marshes-of-iraq

4.1. Restoration, Governance, and the Limits of Technical Fixes

Restoration initiatives within the Mesopotamian Marshes started with technical interventions—specifically the re-engineering of hydraulic channels, the mitigation of saline intrusion, and the regulation of seasonal flow regimes—which were foundational to restoring hydrological connectivity in viable locales (Leonard and Vinez 2006, 3-4). The subsequent documentation of ecological rebounds, such as the recolonization of reed beds and the recovery of avian and aquatic biodiversity, facilitated a potent narrative of resilience. This narrative, while empirically grounded in biological recovery, served a strategic function: it galvanized international visibility and secured the external capital necessary to sustain restoration efforts within a volatile hydro-political landscape (Richardson et al. 2005, 437-485).[9]

Despite these advancements, the realized achievements remained geographically uneven and inherently partial, as the long-term viability of the marshes was constrained by macro-scale determinants of water availability - including international negotiations over transboundary waters in the Tigris–Euphrates basin - and increasing climate variability. In instances where hydrological restoration occurred, the resulting ecological assemblages altered by degraded soil chemistry and modified landscapes frequently deviated from historical baselines. Furthermore, a critical tension

[9] Conservation and rebound reports summarized in Leonard and Vinez (2006), pp. 3-4; Richardson et al. (2005), pp. 437-485.

emerged between the ecological endpoints prioritized by international actors, such as avian biodiversity and reed density, and the immediate socio-economic requirements of local inhabitants, including customary land tenure, grazing rights for water buffalo, and the restoration of traditional common-pool resource management. While external donors often emphasized abstract conservation metrics or ecotourism potential, residents prioritized the tangible economic utility of the wetland ecosystem. Nevertheless, the 2016 designation of the Mesopotamian Marshes as a UNESCO World Heritage Site served as a pivotal inflection point: this international recognition catalyzed state investment and support for sustainable development programs, which directly facilitated the significant demographic return observed in the Al-Chibayish region post-2014 (Ochsner et al. 2010, 1718–31).[10]

Prof. Nadhir Al-Ansari described in his articles a possible roadmap for strategic water management in the marshes. An ideal long-term "Integrated National Water Master Plan" should be designed by all concerned government sectors (Al-Ansari 2016, 140-172): the Ministry of Water Resources, the Ministry of Municipality and Public Works, the Ministry of Agriculture, Water Resources, together with university researchers, the private sector, NGOs, and representatives of concerned regional and international organizations. The rehabilitation of infrastructure - including water treatment plants, power plants, and pumping stations – needs to be planned alongside a public awareness program so that all people appreciate how each issue is being addressed. A special training program for farmers should be established on new irrigation techniques suitable for the climate emergency, and an institutional agenda to foster local employment would be necessary, considering both supply and demand in the labor market. Moreover, new non-conventional water resources (water harvesting, treated wastewater) must be valued. The private sector must be involved in investment generation, and inter-ministerial coordination should function smoothly to save time, effort, and money. Finally, greater decentralization would be crucial for budgeting decisions on irrigation, water supply, and sanitation (Al-Ansari 2020, 466-486).

Governance dynamics have emerged as a central determinant in the sustained recovery of the marshland ecosystems. Effective stewardship necessitates establishing robust institutional frameworks that mediate between local customary practices and formal state legal structures to ensure equitable water allocation and the resolution of communal land claims. The historical legacy of displacement and landscape fragmentation has significantly eroded these governance structures; thus, successful

[10] Critical reflections on technocratic restoration in Ochsner et al. (2010), pp.1718–31.

revitalization has increasingly relied on inclusive, participatory processes that integrate the perspectives of elders, women, pastoralists, and youth (Ochsner et al. 2010, 483–99). Empirical evidence suggests that restoration outcomes are notably more durable when community-driven models such as locally administered water management and the legal formalization of communal rights are prioritized. A salient example of this shift is the transition from top-down hydrological engineering in some government master plans to the participatory methodologies adopted by NGOs like Nature Iraq. By engaging tribal councils in the co-management of the Al-Chibayish National Park and the protection of traditional harvesting rights, these initiatives address the socio-political underpinnings of conservation. Conversely, where technocratic, top-down models persist, ecological gains remain precariously vulnerable to reversal and continue to exacerbate underlying social tensions (Leonard and Vinez 2006,6-10).[11]

An additional dimension of governance involves the influence of external funding and the international conservation community, whose interventions often introduce agendas and performance metrics divergent from indigenous conceptions of recovery. While providing essential resources and technical expertise, projects structured around biodiversity targets or ecotourism risk commodifying marsh culture, potentially undermining the practical reproduction of local livelihoods. For instance, the development of natural reserves often requires restricting access to primary fishing grounds to minimize anthropogenic disturbance to wildlife, thereby marginalizing subsistence fishers and creating friction between conservation enforcement and local economic needs. This tension underscores a fundamental principle of environmental remediation: while external capital and expertise are facilitative, long-term legitimacy and socio-ecological success are contingent upon the alignment of interventions with local values and communal rights. Crucially, effective governance must integrate housing and land tenure security into the foundational design of restoration initiatives. The reconstruction of traditional reed dwellings (*Mudhif*), the preservation of access to reed harvests for artisanal construction, and the legal safeguarding of communal islands and grazing lands are not merely peripheral cultural objectives; rather, they constitute essential components of a durable, integrated ecological and social recovery (Thesiger 1964,62-64).[12]

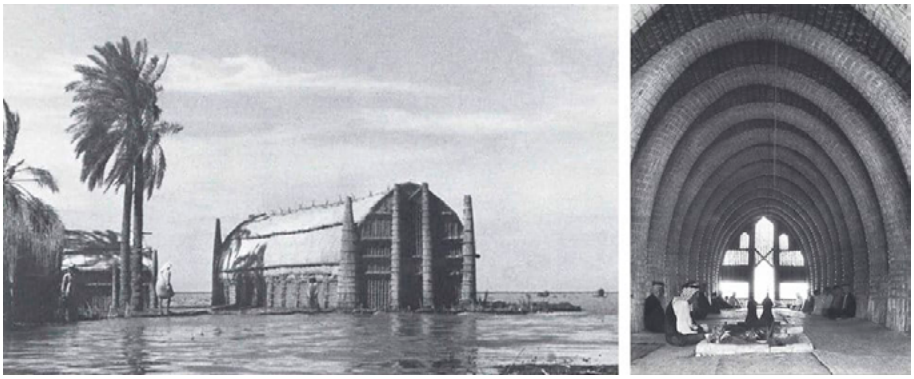
[11] Governance case studies in Leonard and Vinez (2006), pp.6-10; Ochsner et al. (2010), pp. 483–99.

[12] Cultural-housing linkages discussed in ethnographic literature (Thesiger 1964), pp. 62-64.

4.2. Cultural Survival, Memory, and Everyday Repair

Beyond the technical spheres of hydrology and governance, the long-term viability of the Mesopotamian Marshlands is fundamentally contingent upon a cultural endeavor: the systematic transmission of skills, collective memory, and social structures that anchor populations to their geographic context. Cultural practices, including vernacular reed architecture, traditional boatbuilding, and buffalo husbandry, are not merely decorative historical remnants but are constitutive of the local economy and indigenous ecological knowledge. Reviving these practices requires institutional investment in apprenticeships and intergenerational knowledge exchange, facilitated through community centers and cooperative enterprises. Recent initiatives, such as workshops dedicated to the reconstruction of the *Mashoof* (traditional canoe), exemplify how the preservation of technical craftsmanship reinforces communal identity while simultaneously bolstering local transport and artisanal fishing economies.

Figure 4: Traditional Mudhif 1951, photographed by Wilfred Thesiger



Source: https://www.aramcoworld.com/articles/2023/in-the-marshes-of-iraq

Furthermore, integrating gender dynamics is essential to this socio-ecological recovery. Women serve as the primary custodians of reed-based crafts, domestic knowledge, and kinship networks; their labor in mat weaving and dairy processing constitutes the foundational backbone of the household economy. Restoration strategies that neglect these gendered labor patterns risk compromising both household resilience and cultural continuity. Consequently, effective programming must be gender-responsive, ensuring that women maintain agency in decision-making and exert control over the capital generated from revitalized industries. Concurrently, the aspirations of youth, often shaped by urban educational and labor markets,

reflect a demographic shift that may diverge from traditional livelihoods. Sustaining youth engagement requires the creation of economically viable, culturally resonant pathways, such as community-managed sustainable fisheries and collective reed enterprises, that bridge traditional practices and contemporary economic needs (Leonard and Vinez 2006, 3-4).[13]

The process of memorialization, specifically the formal commemoration of displacement-related violence and the institutional acknowledgment of communal resilience, is a critical component of post-conflict recovery. Practices that prioritize survivor testimonies, document systemic loss through oral history initiatives, and integrate indigenous narratives into educational curricula serve vital restorative functions. However, symbolic memorialization must be linked with material restitution: recognition in the absence of distributive justice risks producing a superficial "symbolic justice" that leaves underlying structural inequalities unaddressed. Genuine reparation requires that collective memory informs institutional and legal reforms, ensuring that the historical legacy of displacement actively shapes contemporary land-use policies and resource allocation. Within the Mesopotamian context, reparative justice necessitates the formalization of land and resource rights, equitable compensation frameworks, and robust institutional support for community-led reconstruction (Human Rights Watch 1993,306).

4.3. Lessons learned

The history and partial recovery of the Mesopotamian Marshes offer a set of durable lessons for scholars, practitioners, and policymakers working at the intersection of environment, culture, and politics:

- Hydrology is necessary but not sufficient. Restoring water flows constitutes a precondition for ecological recovery, but historical legacies of soil change and social dislocation necessitate that those hydrological fixes be complemented by social and institutional repair, including explicit measures to restore housing rights.
- Environmental interventions can be weaponized. The marshlands' drainage demonstrates that infrastructure and environmental projects are not neutral: they can serve coercive political ends. Governance frameworks must therefore incorporate protections against the instrumentalization of ecosystems for repression and clear prohibitions on forced eviction.

[13] Gender and youth analyses in Leonard and Vinez (2006), pp. 3-4, and related ethnographic studies.

- Center local knowledge, tenure, and rights. Durable restoration is contingent upon recognizing customary systems, protecting communal rights, and financing community-led initiatives that integrate ecological and cultural goals. Participatory governance and legal recognition of communal tenure yield superior ecological and social outcomes compared to top-down technocratic models.
- Connect memorialization to material restitution. Documenting atrocity is necessary, but justice requires restitution—legal, economic, and political—to rebuild the conditions for cultural survival. Reparative frameworks should ensure that commemoration is paired with compensation and secure housing.
- Attend to gender and generational dynamics. Policies must prioritize women's roles and address youth aspirations through livelihood strategies that are both sustainable and culturally resonant, thus preventing cultural erasure through economic displacement.
- Work across scales. The marshlands' fate is intrinsically linked to river basin politics that extend beyond local or national borders. International cooperation regarding transboundary water management, climate adaptation, and basin-scale planning is vital to ensure predictable flows and to buffer communities against variability.
- Resist simple narratives of recovery. Celebratory images of return may obscure ongoing vulnerabilities and complex, multi-factor drivers of demographic change. While the population resurgence post-2016, driven by World Heritage listing, ecotourism, and security-sector appointments, signals a major success for the region, this recovery remains vulnerable to environmental challenges such as seasonal drought, salinity, and the continued precarity of traditional livelihoods, such as buffalo herding.

Impartial assessments, sustained long-term commitment, rights-based governance structures, and adaptive management protocols are requisite for translating ecological recovery signals into enduring social and environmental well-being. Ultimately, the ethical horizon for marshland policy demands a rejection of reductive narratives that celebrate ecological "rebounds" while marginalizing the ongoing socio-political labor required to secure the dignity, legal rights, and self-determination of the marsh inhabitants (Ochsner et al. 2010,15-16)

5. Conclusions

The Mesopotamian Marshes remain a critical site of learning regarding how landscapes are created and reshaped by human power, resistance, and care. Their partial revival stands as testimony to ecological resilience and

human determination, yet it also draws attention to the unfinished work of justice. Local inhabitants interviewed by the researcher in Chibayish District ask for the restitution of housing and tenure rights, reparations for eviction, and institutional reforms to prevent future abuses. For scholars and practitioners committed to equitable environmental repair, the marshlands offer both a cautionary tale and a hopeful laboratory: cautions regarding the ease with which power can desecrate ecosystems and cultures; hope that, with rights-based, locally grounded, and politically informed interventions, damaged worlds can be reknit—though never exactly as they were—into forms that sustain both life and memory.

The dynamics of population change in the Chibayish District illustrate the broader socio-economic transformations occurring in the marshlands. The data showing an increase above 100,000 inhabitants by 2023 suggests a significant turnaround, driven by improved conditions and revitalization efforts. This demographic rebound is not merely numerical; it reflects the resilience and adaptability of marsh communities that, despite substantial challenges, continue to strive for a sustainable future. This paper argued that, as these communities rebuild, it is crucial to ensure that their voices are central in discussions about their land, rights, and future. Recovery efforts must prioritize not only ecological restoration but also the social and cultural dimensions that define the identity of the Marsh Arabs. Engaging local knowledge and practices in restoration initiatives can foster a more inclusive approach that respects and nurtures the marshlands' unique heritage.

The Mesopotamian Marshes, in an area known as the "Cradle of Civilization", tell a story of resilience in very adverse circumstances. They challenge us to think critically about environmental justice, the impacts of state policies on vulnerable populations, and the pathways to genuine recovery that honor both ecological integrity and human dignity. While climate change risks erasing this World Heritage forever, humanity can still cooperate to ensure water continues to flow into the lower basins of the Tigris and Euphrates, allowing, in turn, the Marsh Arabs to protect their ecosystem.

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Statement of AI-Assisted Language Refinement

The author utilized AI-based language tools, including Grammarly and Gemini, to assist in the linguistic polishing of this paper. To incorporate data and qualitative evidence drawn from regional resources and references, these tools were used to ensure clarity, grammatical accuracy, and stylistic consistency in the English manuscript. The conceptual framework, data analysis, and final synthesis of the research were conducted solely by the author, who remains responsible for the original content and the final version of the paper.

Appendix 1
Questionnaire Form

Dear Sister/Brother, this form includes several questions that will help us write the scientific article (Weaponizing Water: Forced Evictions and Ecocide in the Iraqi Marshlands) to understand the challenges the marshes' inhabitants faced in the past and to assess their current situation. Therefore, I request that your answers be accurate, scientific, and objective. The data will be kept confidential and used for scientific purposes only.

Thank you very much.

Name: Issamaldeen A. Majed

1. Did you live in or near the marshes during or after the 1991 war?
    - Yes.
    - No.
2. Do you remember the arrests, draining, or displacement that took place during that period?
    - Yes.
    - No.
    - I heard about them from others.
3. In your opinion, what was most affected during that period?
    - People (displacement and killing).
    - Environment (draining of the marshes).
    - Buffalo, birds, reeds, and papyrus.
    - Heritage and culture.

4. Were you or any member of your family forcibly evicted or displaced during the 1990s?

   - Yes.
   - No.

   If yes, specify the party or the reason, if possible: _____
   _____

5. How would you describe the changes in the marshes after the draining?

   - The entire ecosystem changed.
   - Partial drying up.
   - Slight change.
   - I don't know.

6. What are the most significant effects of those events on your life today? - Loss of land/home

   - Loss of livelihood.
   - Loss of family.
   - Permanent environmental degradation.
   - Other _____

7. Did you receive any support or official recognition of the harm you suffered during that period?

   - Yes.
   - No.

   If yes, what type of support? _____

8. Do you consider what happened during that period to be "environmental or human genocide"?

   - Yes.
   - To some extent.
   - No.
   - I don't know.

9. In your opinion, how can you, as victims, be given justice today?

   - Financial compensation.
   - Reconstruction of the areas.
   - Documentation of the crimes.
   - Cultural and moral support.
   - Other _____

10. How would you describe the water situation in the marshes in recent years?

    - Very sufficient.
    - Sufficient.
    - Scarce.
    - Very scarce.

11. Have you noticed any changes in water quality (color, odor, salinity)?

    - Yes, significantly.
    - Yes, slightly.
    - No.

12. Have you noticed an increase in cases of certain diseases, such as diarrhea and skin diseases, in recent years?

    - Yes.
    - No.

13. What is the first step to restore the marshes now?

    - Increasing water allocations.
    - Water reclamation projects.
    - Supporting the local community to adapt to water scarcity.
    - Reducing or preventing pollution.