

Climate Motivated Displacement: Baseline

IRAQ

APRIL 2022

INTRODUCTION

The marshlands of southern Iraq account for just under half of the inland waters for the country and have historically been a critical source of livelihoods for households located in Al-Basra, Maysan, and Thi Qar Governorates.¹ In the early 1990s, Saddam Hussein drained the once-thriving marshes when Shiite rebels sought refuge there, causing almost 500,000 residents to flee.² Then, in the early 2000s, less than 10% of the original marshland area was still functioning.³ Despite efforts to restore the marshes in subsequent years, the area is once again at risk of reduced water levels. This is due to a combination of low levels of rainfall in the region, reduced water flows from both Turkey and Iran, and poor infrastructure including aging pipes and illegal siphoning.⁴ The worsening conditions of the marshlands have a negative effect for the populations who rely on them for income from fishing, agriculture, livestock rearing, handicraft production, shelter construction, and other economic livelihoods.⁵

In early 2015, National Geographic reported instances of households migrating due to the deteriorating livelihoods situation in the marshlands. Reasons for this displacement included decreasing water quality, increases in waterborne diseases, worsening tribal relations, and lowering water levels leading to decreased ability to fish.⁶ In 2021, the International Organisation for Migration (IOM) conducted a survey in Basra city where they interviewed migrants from rural parts of neighbouring governorates in southern Iraq. It was reported that the two main drivers for migration to Basra city, the largest urban city in the south, were the lack of economic opportunities (52%) and water scarcity (49%), followed by death of livestock (16%), lack of access to services (13%), and crop failures (10%).⁷ Most migrants surveyed moved to the city with their families, with a few cases of individuals moving on their own.

While these reports are useful in providing insight on the major drivers for urban migration and the integration challenges faced by migrants, they do not provide analysis specifically on how changes in water level have impacted the livelihoods of marshland residents in southern Iraq and their movement intentions, if any. As conditions in the marshlands continue to deteriorate in the short and medium term, additional climate-motivated displacement is likely to occur. However, there is limited information available on the scale of displacement in these areas and the specific drivers which motivate households to move from the area. This in turn limits the ability of actors to consider programmes and activities designed to address these drivers.

The purpose of this report is to provide an overview of the drivers and scope of climate-motivated displacement and the issues facing climate displaced persons in southern Iraq.⁸ In doing so, the report furthermore seeks to inform programmatic interventions as climate change increasingly threatens vulnerable communities in the south, especially in the marshlands of Al-Basra, Thi Qar and Maysan Governorates. Thus, the goal for the assessment is to provide the basis for future climate change projects in the marshlands, which would serve to bring about a positive change for people living in affected areas.

¹ [Classification of The Key Functional Diversity of the Marshes in Southern Iraq](#). Journal of Physics: Conference Series. 2019

² [In Iraq's Marshlands, Researchers are Racing to Document a Disappearing Dialect](#). Equal times, 2021

³ [Drought and Abundance in the Mesopotamian Marshes](#). New York Times. April 2021.

⁴ [As its rivers shrink, Iraq thirsts for regional cooperation](#). Thompson Reuters. September 2021.

⁵ [Land Cover Change and Livelihoods in the Mesopotamian Marshes](#). Reach Initiative. September 2020.

⁶ [Iraq's Famed Marshes are Disappearing – Again](#). National Geographic. July 2015.

⁷ [Migration into a Fragile Setting](#). International Organization for Migration. October 2021.

⁸ Climate displaced persons refers to individuals who must leave their homes and livelihoods behind due to climate stressors such as changing rainfall, heavy flooding, and rising sea levels. [Climate Displaced Persons](#). United Nations University: Institute for Environment and Human Security.

SUMMARY

- The yearly precipitation level in Iraq is around 200 mm. Precipitation is mostly concentrated in the Kurdistan Region of Iraq (KRI).
 - In 2021, Iraq recorded very low levels of yearly precipitation.
- Water levels have reportedly decreased in the marshlands of Mejar Al-Kabir, Al-Chibayish, and Al-Qurna districts, according to key informants (KIs) and focus group discussion (FGD) participants.
 - Surface water levels in the marshlands have fluctuated between 2016 and 2021. However, since 2019, it has been decreasing.
- Climate change, including reduced rainfall and high temperatures, as well as the construction of dams in Turkey and Iran, were identified by KIs as having caused reduced water levels in the marshlands in Mejar Al-Kabir, Al-Chibayish, and Al-Qurna.
- Working community members in the marshlands are predominantly employed in agriculture, aquaculture, livestock rearing, manufacturing, and dairy production. Agriculture, fishing, livestock rearing were sectors reportedly negatively impacted by the reduced marshland water levels. Some of the negative impacts shared included:
 - Increased water salinity, which led to lower fish and crop yields; and
 - Reduced availability of fodder for buffalo breeders
- Marshland resident and climate displaced FGD participants, before they left their areas of origin (AoOs), reportedly experienced a reduction in livelihood opportunities and income. Participants indicated this led to a reduced ability to purchase food and educate children.
- Relocation was a coping strategy some marshland residents were reportedly considering as a result of reduced livelihoods.
 - Some of the reported destinations for relocation included districts outside of the governorate, such as Al-Basra, Al-Nasiriyah, Karbala, Al-Najaf, and Al-Samawah.
- FGD participants in Basra city reportedly relocated to the area for better livelihood opportunities as Basra city was noted to have a strong thriving economy.
- Climate displaced FGD participants already living in Basra city reported that they would not consider moving back to the marshlands as:
 - They have adapted to life in the city;
 - their AoOs lack adequate livelihood opportunities;
 - agricultural lands are damaged; and
 - drought continues to impact marshland conditions
- To facilitate a safe and dignified return, households reportedly required improved access to water, livelihood opportunities, and living conditions, among others.
- To prevent further climate displacement, participants in the marshland FGDs noted that they needed fertilizers for farming, fodder for buffalo rearing, improved transportation facilities, and easier access to loans.

METHODOLOGY

This assessment employed a qualitative approach that combined the analysis of secondary data with primary data collection in the form of ten semi-structured key informant interviews (KIIs) and sixteen FGDs. These interviews and discussions aimed to highlight the livelihood conditions of affected populations in the marshlands in Al-Basra, Thi Qar, and Maysan Governorates, specifically in Al-Qurna, Al-Chibayish and Mejar Al-Kabir districts, respectively. In addition, the assessment included climate displaced communities in Basra city to understand whether and to what extent changes in the marshlands affected their livelihoods and how it affected and continues to influence their movement decisions.

KIIs and FGDs Conducted Between Feb-Mar, 2022

Governorate	District	FGDs	KIIs	Timeline
Al-Basra	Al-Qurna	4	3	March 25-28
	Basra city	4	2	March 16-19
Maysan	Mejar Al-Kabir	4	3	Feb 19-22
Thi-Qar	Al-Chibayish	4	2	March 3-6

There were four tools used – a KII questionnaire and FGD framework for Basra city, and a separate KII questionnaire and FGD framework for affected populations in Al-Qurna, Al-Chibayish and Mejar Al-Kabir districts. Responses from FGD participants and KIIs were translated into English, transcribed onto an excel sheet to clean and count the frequency of responses, and then analysed in a data saturation grid.

Additionally, geographic information system (GIS)/remote sensing technology was utilized alongside satellite imagery to show the change in water levels and marshland density around northern Al-Basra/southern Thi Qar and Maysan since 1985. This data was mapped and analysed to provide further insight into the scope and impact of climate change as a driver for displacement in the region.

Geographic scope

The population of interest included communities at risk of displacement in the marshlands of the target districts (hereafter referred to as “marshland participants”), specifically those households who utilize the marshlands for their livelihoods

(agriculture, livestock, fishing, etc.) and climate displaced persons who had moved to Basra city in the last ten years from the marshlands (hereafter referred to as “climate displaced participants”). The governorates of Al-Basra, Thi Qar, and Maysan were targeted as the areas with the largest amount of marshland territory in southern Iraq.

The assessment primarily focused on community level data to examine drivers for displacement, particularly those related to climate change. Participants were most commonly asked to speak about conditions affecting their communities more generally, however some interview and FGD questions were asked at the household/individual level.

Sampling strategy

Purposive sampling methods were employed to identify KI and FGD participants. For the identification of KIIs, REACH contacted local mukhtars who had knowledge of the area and its residents, for both the marshland villages and Basra city, to participate in the 10 interviews. Once the initial participants were selected, snowball sampling was used to identify additional residents for the remaining KIIs, as well as the 16 FGDs.

Challenges and Limitations

For this assessment, broad conclusions are being drawn from a small number of FGDs and KIIs. Although the analysis provides important insight into some of the factors that have, or could have, induced movement decisions for households from the marshlands, it is important to note that the findings are indicative.

Equal representation of male and female population groups was a priority for the assessment, however this was not fulfilled at the KI level due to challenges in identifying female mukhtars in the marshland districts and Basra city. The resulting breakdown of respondents by gender was:

- 7 female FGDs vs 9 male FGDs
- 1 female KI vs 9 male KIIs

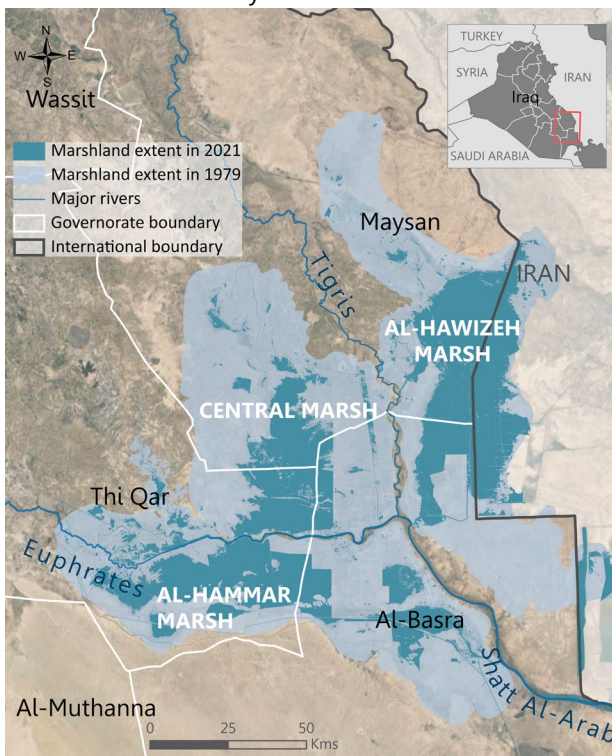
CONTEXT

Water in the Marshlands

Major Events Affecting Marshland Coverage

The marshlands in Iraq have undergone substantial changes over the last 50 years, with major events contributing both positively and negatively to the marshland territory:⁹

- **1977:** Construction of dam and hydraulic power plant in Turkey
- **1980-1988:** Marshlands negatively affected by Iraq-Iran war
- **1990s:** Marshlands drained by Iraqi authorities
- **2001:** Construction of Karkheh Dam in Iran negatively affected quantity and quality of water flowing into Al-Hawizeh marsh
- **2003:** Rehydration process of the marshlands started
- **2005:** United Nations Environmental Programme (UNEP) reported 41% of marsh rehydrated
- **2018:** Highest yearly precipitation recorded within the last 40 years

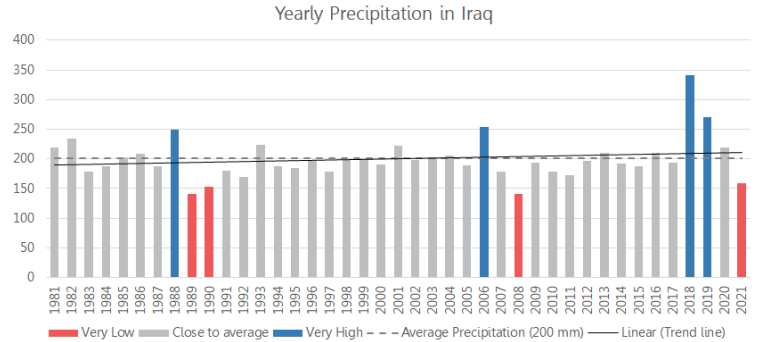


Map 1. GIS imagery illustrates the extent to which the marshland coverages has reduced between 1979 and in 2021

⁹ [The Mesopotamian Marshlands: Demise of an Ecosystem](#). UNEP. 2021; [The Restoration Potential of the Mesopotamian Marshes of Iraq](#). Richardson et. AL. 2005; [Iraqi Marshlands Observation System UNEP Technical Report](#). UNEP. 2005; [Long-Term Precipitation Pattern in the Euphrates-Tigris Basin](#). REACH. February 2020.

Precipitation Levels in Iraq

While 2018 marked the highest yearly precipitation within the last 40 years, precipitation levels, specifically rainfall, have since been declining, with very low¹⁰ levels recorded in 2021.



Graph 1. Climate Hazards Group Infrared Precipitation with Station data (CHIRPS)

Over the past several decades, the average yearly precipitation level in Iraq has been around 200 mm, however, rainfall is typically concentrated in northern Iraq in the Kurdistan region. Levels in these areas can reach up to 1094 mm, which is significantly higher than the south, where levels can be as low as 62 mm. The distribution of precipitation in the country highlights potential environmental vulnerabilities that can worsen if rainfall continues to decrease.



Map 2. GIS imagery illustrates distribution of precipitation in Iraq

¹⁰ "Very low" for the purposes of this report is used to refer to yearly precipitation less than 20% of 200 mm.

FINDINGS

Impact of Changing Water Levels in the Marshlands

This section of the report highlights participants' observations on changes to marshland water levels over the last five years¹¹ and beyond. In particular, the findings highlight the impact these changes have had on livelihoods and daily life for marshland communities.

Marshland Water Levels

Findings from each FGD conducted in Basra city showed that before climate displaced participants, primarily from Maysan and Thi Qar Governorates, left their areas of origin (AoO), they noticed a *reduction in marshland water levels*. They also believed that this reduction had continued since their relocation.¹²

Similar accounts of reduced water levels were shared by current marshland residents in FGDs in Mejar Al-Kabir, Al-Qurna, and Al-Chibayish districts, as well as by all KIs in these locations. In the last five years, Mejar Al-Kabir and Al-Qurna districts reportedly saw a *"significant decrease"* in water levels, according to few KIs. However, *fluctuations in water levels* were also noted in a few Mejar Al-Kabir FGDs during this period.

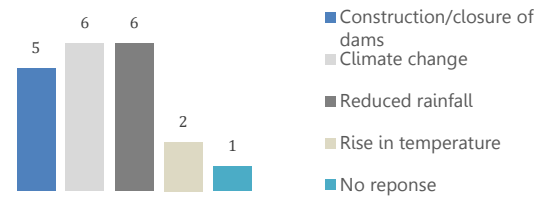
"The marshlands were being threatened with gradual disappearance" (Al-Qurna FGD)

"The marshlands are currently 50% of what they used to be" (Mejar Al-Kabir FGD)

"Water at zero level" (Basra City FGD)

Climate change-related issues, such as reduced rainfall and increased temperature, were seen as contributing factors for reduced water levels by both climate displaced persons and marshland residents participating in FGDs. For marshland resident participants, the construction and closure of dams was also frequently cited as affecting the water level, as displayed in Graph 2. In some FGDs, participants reportedly perceived that dams in *neighbouring countries*, such as Turkey and Iran, were *affecting*

water coming from the Tigris and Euphrates rivers, as the dams regulate the flow of water down stream into the marshlands.¹³



Graph 2: Frequently reported reasons for decreased water levels in the marshlands in Mejar Al-Kabir, Al-Qurna, and Al-Chibayish (from 8 KIs interviewed)

In addition to these contributing factors, climate displaced participants from an FGD in Basra city also noted that the continued decrease in water level, since their household relocated, was also due to the unequal distribution of water inside Iraq.

Changes in Marshland Livelihoods

Livelihoods in the Marshlands

In the marshlands, KIs reported that the majority of working community members in the three assessed districts were employed in informal jobs. These mainly covered jobs in:

- Agriculture;
- Aquaculture (namely fishing);
- Livestock rearing;
- Manufacturing (handcraft production); and,
- Dairy product production.

The three most commonly reported reasons behind most of the working community members selecting the above-mentioned employment sectors were:

- Availability of natural resources, such as land and water to promote agriculture;
- Lack of skills and experience that community members had in other sectors; and,
- Lack of alternative job opportunities available in the area.

Additionally, most KIs reported that these economic activities were equally rooted in culture and traditions, as well as being a family business.

"Livelihood activities are culturally rooted and inherited by families and who have lived in this area for a long time" (Al-Qurna KI)

¹¹ The "last five years" refers to the time period between 2016 and 2021.

¹² Participants in 2 FGDs arrived in al-Basra before 2016, and participants in 2 FGDs arrived after 2016.

¹³ Graph 2. illustrates responses from multiple choice questions where respondents can select more than one option.

Reportedly, the majority of these economic activities, namely, agriculture and aquaculture, are water intensive in nature, and, therefore, have diminished with reduced quality and quantity of water.

Impact of Changing Water Levels on Marshland Livelihoods

Marshland resident and climate displaced participants consistently reported that marshland livelihoods have been negatively impacted within the last five to ten years. In all FGDs conducted in Basra city, climate displaced participants stated that before their households left their AoOs, their income levels had decreased. Furthermore, since leaving the marshlands, they perceived that households in their communities of origin continued to experience a decrease in income level.

Marshland resident and climate displaced participants in almost all¹⁴ FGDs reportedly experienced a reduction in livelihoods, with some participants in Al-Chibayish and Mejar Al-Kabir districts claiming that reduction in water level had *“significantly affected livelihood opportunities”*.

Reportedly, the sectors specifically affected were:

- Livestock rearing, specifically for buffalo breeders;
 - Increased food prices for livestock
- Fishing; and
- Agriculture production.¹⁵

These accounts of changes in income level were affirmed by marshland KIs. All KIs noted a decrease in average income for most households in their community within the last five years, with some also reporting that there had been a *“significant reduction”*. Additionally, all marshland KIs reported that there had been a change in average income for most households in the community as a result of changes in water level.

The majority of KIs noted that the negative impact on major economic sectors relying on marshland water and resources, such as agriculture, aquaculture (namely fishing), and livestock rearing, contributed to reduced income levels over the last five years. For livestock rearers, e.g. buffalo breeders, a few KIs shared that decreased water levels led to a reduction in animal feed, which hindered overall income.

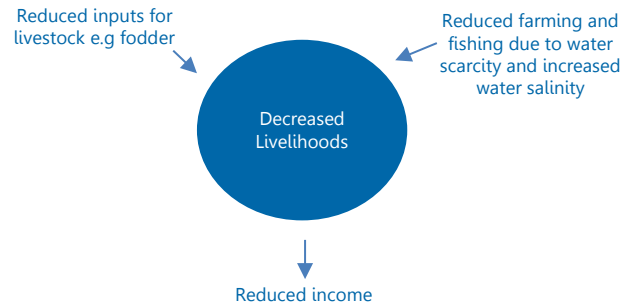


Figure 1. Frequently reported reasons for reduced income by KIs in Mejar Al-Kabir, Al-Qurna and Al-Chibayish (8 KIs)

Coping Strategies for Changing Livelihoods

To address some of the reported negative impacts of the changing livelihoods environment, marshland resident participants in most FGDs reported that their households considered working multiple jobs. However, the lack of livelihood opportunities, relevant skills and experience, and low income levels were cited as barriers for sufficient income.

Marshland participants in a few FGDs also reported that their households would potentially change their livelihood sectors, however the lack of relevant experience and not having access to diverse job opportunities prevented this from happening. Participants also identified relocation as a potential coping strategy, with respondents from the majority of FGDs stating that their households were considering such action.

Changes to Food, Water, and Education Access

Changes in Daily Life

As a result of the changes to income level and natural resource levels, marshland resident participants from the majority of FGDs further reported negative impacts on daily life, in terms of access to food, water, and education, within the last five years for their households.

While in all FGDs in Basra city, climate displaced participants claimed that their households experienced changes in daily life before they left their AoO, participants who were displaced in the last five years noted that their household's daily life conditions worsened before relocation.

¹⁴ Response from one FGD in Mejar Al-Kabir was not recorded.

¹⁵ In marshland FGDs it was reported that salinity and low water levels affected the availability of fish and agricultural production (due to soil degradation).

However some current marshland participants, namely in Mejar Al-Kabir, shared that their households have not experienced changes in daily life within the last five years.

Access to Sufficient Quantity and Quality of Food

In all Basra city FGDs, climate displaced participants shared that before their displacement, they did not have access to sufficient quantity and quality of food for their households. Participants in a few FGDs further claimed that the lack of access to food worsened prior to their displacement.

Worsening conditions to access sufficient quantity and quality of food were also reported by marshland resident participants from several FGDs. The affordability and availability of produce was specifically reported as an issue. Some participants shared that *“they used to buy all kinds of fruits, vegetables, [and meat], and now they cannot...”*.

In all Mejar Al-Kabir FGDs, however, marshland participants stated that access to food for their households remained the same throughout the last five years, as consumption items were still *available in the market* at the time of data collection.

Access to Sufficient Quantity and Quality of Water

Climate displaced participants from all Basra city FGDs reported reduced water access for their households when they lived in the marshlands. Some further shared that in their AoO, they had no access to drinking water. These changes were also reflected in FGD responses shared by marshland resident participants. In several FGDs in the three marshland districts assessed, participants claimed that in the last five years, the quantity and quality of water for drinking and domestic purposes for their households worsened.¹⁶ Some of the reported reasons for this were the salinity of the water¹⁷ and the fact that access to water for drinking and domestic purposes depended on marshland water.¹⁸

Marshland participants in almost all Mejar Al-Kabir FGDs shared that access to water for drinking and domestic purposes remained the same for their households. Participants in one FGD in Al-Chibayish

district also reported improvements to water access, which can likely be attributed to the construction of water stations in the area.

“We buy drinking water, but washing water we get from the river near the village and from the marshes” (Al-Chibayish FGD)

“The possibility of obtaining drinking water has improved after installing [water] stations.” (Al-Chibayish FGD)

“We buy water for... the buffalo because the salinity of the water kills the buffalo, causing a great loss to all families” (Al-Chibayish FGD)

Access to Education

All marshland KIs reported that most children in their communities in Mejar Al-Kabir, Al-Qurna, and Al-Chibayish districts had access to functioning schools. However, they also noted the presence of children who did not attend school, due to:

- Schools being too far away;
- Lack of transportation;
- Needing to work to support the family;
- Transportation costs; and
- Other reasons, e.g. higher education not being available.

These barriers to education were also reflected in responses from most marshland FGDs where participants reported having children. Participants from several FGDs shared that they could not send their children to school due to them working to support the family and schools being too far away, among other reasons seen in Figure 2.

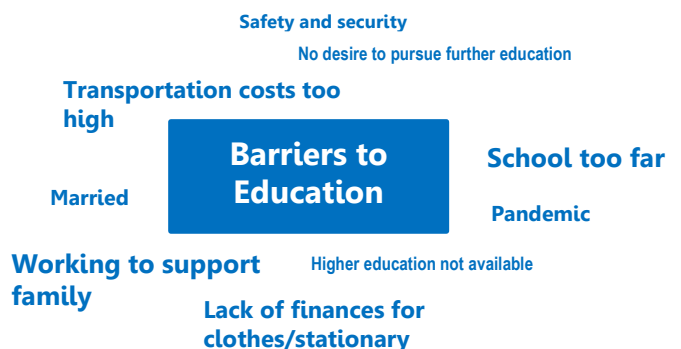


Figure 2. Frequently reported barriers to education for children in Mejar Al-Kabir, Al-Qurna and Al-Chibayish (12 FGDs)

¹⁶ Reported in all FGDs in Al-Qurna and Al-Chibayish districts.

¹⁷ Reported in one FGD in Al-Qurna and two FGDs in Al-Chibayish districts.

¹⁸ Participants in half of the FGDs conducted in the marshlands also reported that they purchased water.

Financial constraints experienced by households in the marshlands were reportedly a key barrier preventing access to education. This was exemplified in the response of one climate displaced KI in Basra city, who noted that *“45% of school-aged children went to school, while others supported their families”* in their AoO. Furthermore, participants from some Basra city FGDs claimed parents did send their children to school even though they faced financial difficulties.

Coping Strategies for Changes in Daily Life

Participants from a number of marshland FGDs reported that households’ spending power had decreased in the last five years. One reported reason for this was the elevated prices for animal feed, which particularly affected livestock-rearing households. In a few FGDs, it was also noted that spending to cover basic needs, such as food, clothing, housing, medical expenses, etc., had increased

“[Household] expenditure has changed due to the high prices of items such as buffalo feed and flour” (Al-Qurna FGD)

“[Household] expenditure for my family and neighbouring families increased [to cover] the large number of basic needs like clothes, food and medical expenses” (Al-Chibayish FGD)

While taking out loans can be a coping mechanism for households in need of income, in most marshland FGDs, participants claimed that their households did not take out loans to address changes in expenditure. Commonly reported reasons for this were due to strict *government requirements, high bank interest rates, and the inability of households to repay*. It was, however, noted in one FGD in Al-Chibayish district that marshland participants did take out loans, and they did so to buy fodder and flour for livestock.

Participants from all FGDs across the three districts reported that their households had multiple individuals who worked, including children and women, as a means to address changes to their economic situation. Participants in a few FGDs relayed that children were working to sell products in the market, as well as in livestock rearing, fishing, dairy production, and reed collection. Women who worked for their households were reportedly

involved in livestock rearing, fishing, and dairy production.

To cope with changes to daily life, including access to food, water, and education, most participant households reported plans to leave their current area. In the majority of FGDs, participants also noted that there were households who had already departed to seek better conditions elsewhere.

Pull Factors for Basra City

Climate displaced participants noted that the deterioration of environmental and financial conditions in their AoOs negatively impacted their livelihoods and daily lives, ultimately leading to their displacement. It was further shared that drought, reduced water levels, increased salinity, reduced income level, high fodder prices, damage to agricultural land, and the lack of support from government/local authorities were all contributing factors for displacement. Thus, as reported in all Basra city FGDs, relocation was a coping strategy employed by participant households.

Climate displaced participants from half of the FGDs reportedly perceived that the conditions which influenced their displacement decisions had worsened after their departure. Conversely, the other half reportedly believed that conditions in their AoO continued to remain the same after they relocated.

Given these issues, many participant households relayed that their decision to leave the marshlands and move to Basra city was mostly motivated by financial circumstances following climate induced issues. Climate displaced participants from all FGDs in Basra city stated they relocated for better livelihood opportunities with a good, stable income as the city had a *strong thriving economy in the south of Iraq*. Moreover, the marshlands reportedly lacked livelihood opportunities and had poorer living conditions.

Participants from all FGDs in Basra city whose households used to work in agriculture, fishing, livestock rearing, or milk production in their AoO reportedly transitioned to work as daily labourers. More specifically, participants in Basra city FGDs noted that climate displaced households now worked in construction, as domestic cleaners, and as mechanics. Some participants also noted the presence of climate displaced individuals working in

transportation and other occupations, including shopkeeping, tailoring, etc. Participants from one FGD also noted that some displaced households begged in the streets for money.

Durable Solutions for the Marshlands

Remain, Relocate, Return

Movement Intentions for Marshland Residents

According to some marshland key informants in Al-Qurna and Al-Chibayish districts, between 50 and 100 households left the area since 2016. Additionally, over 400 households had reportedly left Mejar Al-Kabir district, according to a number of KIs.

When discussing their future movement intentions, marshland resident participants in almost all FGDs reported that their households intended to relocate in the future, although in several FGDs, other participants also reported no intention to do so.¹⁹ In addition, some households were reportedly undecided about their future intentions.

Frequently reported reasons in marshland FGDs for households to relocate were:

- Depleting marshes;
- High price of fodder for buffalos; and,
- Lack of agricultural products.

In terms of where to relocate, participants in marshland FGDs noted that many households intended to relocate to a city center, to areas with more water in the marshlands, and districts outside of the governorate, such as Al-Basra, Al-Nasiriyah, Karbala, Al-Najaf, and Al-Samawah.

Movement Intentions for Climate Displaced Persons in Basra City

Participants in all Basra city FGDs reported that climate displaced households in the community would return to their AoO in the marshlands if water levels, and subsequently livelihood opportunities, improved. However, participants in the same FGDs also reported that in their community, the majority of households would not return to their AoO as these changes were not likely to occur.

Reasons for remaining in displacement included:

- Households having resettled and adapted to life in Basra city;
- Lack of livelihood opportunities in AoO;
- Damaged agricultural land; and,
- Drought.

That said, the top reasons to return to AoOs for climate displaced households were reported as:

- Returning to traditional livelihoods;
- Feelings of nostalgia;
- Desire to return home/to the land of their forefathers; and,
- Not assimilating with Basra city residents.

"[We would return] because of the nostalgia for the areas of origin; the job opportunities that are not good in this area; the humiliation, and the undignified life we live here; the constant threat of forced displacement; and, being forced to return to the areas of origin." (Climate displaced participant in Basra city)

Participants from all Basra city FGDs reported that they would not relocate to other areas outside of their AoO.

In most FGDs where climate displaced participants shared their intention to return, the reported timeline was to be within 3-6 months following data collection. In many cases, participants reported that their plan to return depended on conditions in their AoO. Additionally, in one FGD, participants reported the intention to return in one year following data collection.

In order to facilitate a safe and dignified return, climate displaced participants in Basra city noted that their households and households like theirs needed:

- Improved access to water;
- Access to livelihood opportunities;
- Access to housing;
- Improved living conditions; and,
- Lower food prices.

¹⁹ It was reported by marshland resident participants in eight FGDs that they did not intend to relocate.

Movement Considerations

In order for marshland resident participants to remain in their AoO, a number of necessary improvements were suggested in FGDs conducted. These included:

- Access to loans;
- Resources (e.g. fertilizers, fodder etc.) for farmers, livestock owners, and fishermen;
- Establishing facilities for dairy farmers;
- Construction of schools and hospitals; and,
- Improvement of transportation facilities.

In addition to the list of basic goods and services highlighted by marshland FGD participants, several KIs suggested improving the available irrigation systems and providing water to improve agricultural inputs as well as increased support from the government and humanitarian organisations, vocational trainings, and access to electricity as factors that would influence marshland community members in their area to remain.

Needs identified by marshland FGD participants and KIs for households to remain were similar to those shared by climate displaced participants in Basra city to return to their AoO. Respondents in Basra city FGDs stated that some of their needs could be addressed by:

- Government and humanitarian organisations providing aid;
- Construction of residential homes;

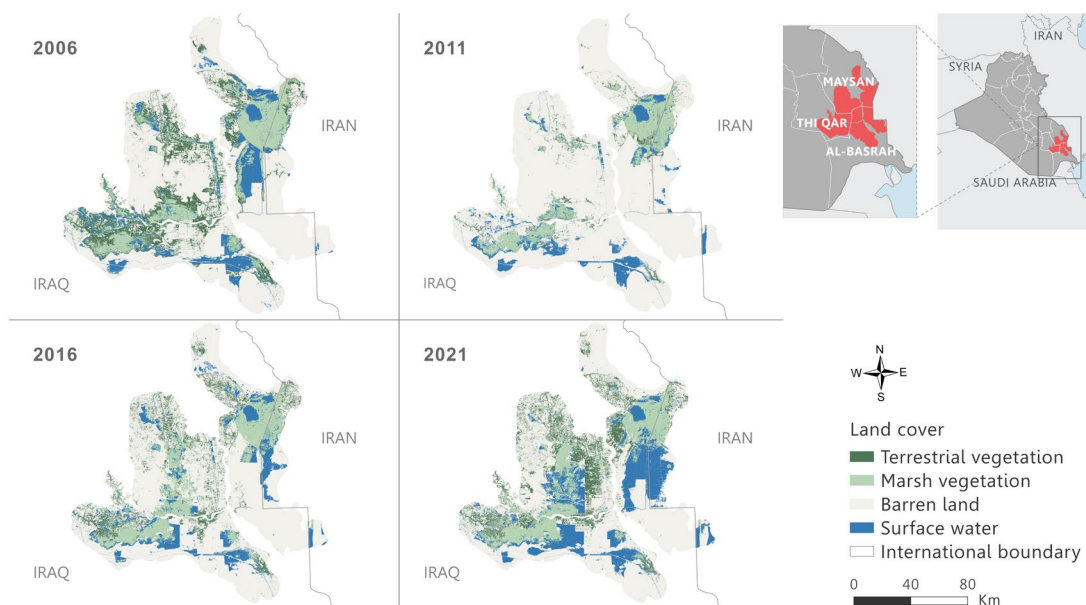
- Improving access to water;
- Providing basic services;
- Construction of hospitals/factories/parks; and,
- Providing livelihood opportunities.

How has Marshland Coverage Changed?

Investigating Environmental Changes in the Marshlands

Marshland and climate displaced participants frequently reported a reduction in marshland water level over the last five to ten years. However, contrary to these accounts, satellite images depicting changes in the marshlands between 2006-2021 in Map 3. show that water levels in the marshlands have not consistently decreased. On the contrary, water levels have increased overall since 2011 according to satellite-based remote sensing data.

While remote sensing data is useful to visualise change in geographical data, it has limitations as it needs to be triangulated with other complex analysis. On its own, it is not a sufficient proxy as it cannot distinguish between saline, brackish and fresh water on land. Furthermore, it does not reflect soil quality and/or movement in groundwater. These are important considerations given the numerous adverse impacts of climate change, some of which have been observed and reported by FGD participants and KIs e.g. changing water levels and increased salinity of water and soil.



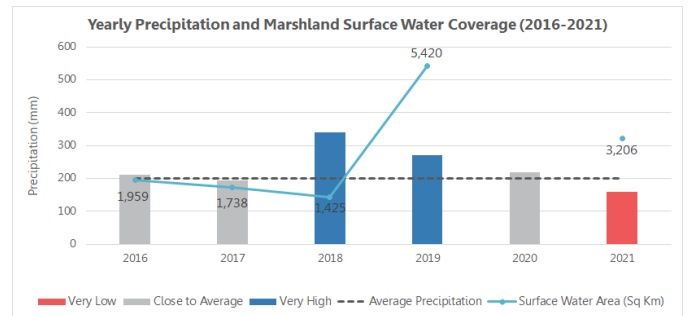
Map 3. Change in surface water level and vegetation in the marshlands every five years from 2006-2021.

Thus, to this extent, it is likely that the contradiction displayed in Map 3. is not undermining the consistent water scarcity reported by marshland residents and climate displaced persons but rather highlighting that the situation in the marshland has not been consistent over the last five years. Therefore, there is a need for further investigation to understand FGD participant and KI accounts of reported environmental changes. In this section, the analysis seeks to highlight some of these accounts, while providing further insight into the changes taking place in the marshlands, not captured through the remote sensing data.

One likely explanation for this discrepancy between the FGD participant and KI accounts of reduced water levels in the marshlands versus satellite images for 2016 to 2021 can be found in the surface water coverage and precipitation data points in Graph 3. Overall, the marshland surface water coverage for 2021 is higher compared to five years ago. However, this increase is mostly a result of higher than average rainfall in 2018 that offset low water levels that were caused by severe drought in the summer of that year.²⁰ More specifically, the rainfall that took place in 2018 resulted in water coverage reaching *“its largest springtime extent since at least the early 1990s”*.²¹ So, while drought and dry spells have been recorded in subsequent years, the baseline water table was overall higher.

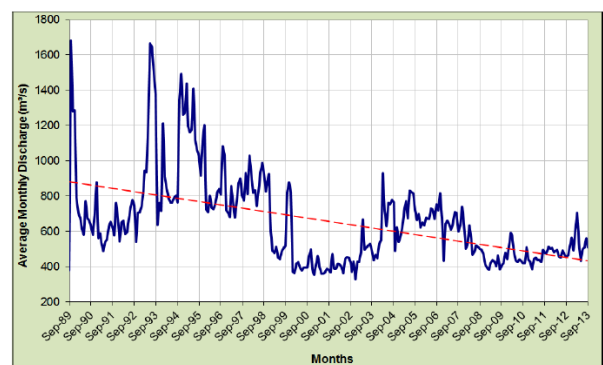
In most cases, there is a positive correlation between precipitation and marshland surface water coverage. As precipitation increases, the surface water coverage also increases, and conversely as precipitation levels decrease, so too does the surface water. Although there is a lack of concrete surface water coverage data for 2020, the Conflict and Environment Observatory reported that the marshlands were *“approximately 30% lower in summer 2021 than in 2020”*. Therefore, we can deduce that as precipitation levels have decreased since 2018, so too has surface water in the marshlands, alluding to a downward trend. When marshland and climate displaced participants and KIs were reporting a decrease in water levels in recent

years, it is probable that they were referring to the last three years.



Graph 3. Precipitation levels and marshland surface level coverage from 2016-2021

Moreover, as surface water levels have fluctuated in recent years, so too have fresh water flows. The Euphrates and Tigris rivers are the main sources of fresh water for the marshlands, and the flow is regulated by dams both inside and outside Iraq.²² ²³ Between 1989 to 2013, there was a decreasing trend of monthly discharge, i.e the monthly water flow of the Tigris river, at Sarai Baghdad²⁴, as seen in Graph 4. This highlights the decreasing water pressure of one of the main fresh water sources for the marshlands. As pressure from fresh water flows has decreased over the years, seawater intrusion from the Arabian Sea continues to take place.²⁵ The subsequent mixing of fresh and salt water in turn has made the marshland water saltier.²⁶ Thus, it is equally possible that when referring to water available in the marshlands, KIs referred to available *fresh* water over the last three years.



Graph 4. Trend line for the average monthly discharges at Sarai Baghdad for the period 1989–2013. Source: Flow of River Tigris and its Effect on the Bed Sediment within Baghdad, Iraq. De Gruyter Open, 2015.

²⁰ [The past, present and future of the Mesopotamian marshes](#) Conflict and Environment Observatory. September 2021

²¹ *ibid*

²² “Turkey contributes an estimated 40-65% of the [Tigris] river’s annual discharge, Iraq 10-40%, while Iranian headwaters and tributaries are estimated to contribute between 5% and 25% to Tigris river flow”.

[Inventory of Shared Water Resources in Western Asia](#). UN-ESCWA and BGR, 2013.

²³ “Turkey contributes 90% to the Euphrates whilst Syria contributes 10% to the water flow” [Turkey, Syria and Iraq: Conflict over the Euphrates-Tigris](#) Climate Diplomacy. N/A.

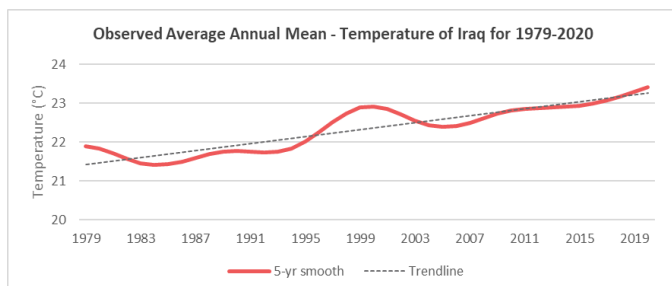
²⁴ Sarai Baghdad is a discharge gauge station for the Tigris river.

²⁵ [Investigation of seawater intrusion in the Dibdibba Aquifer using 2D resistivity imaging in the area between Al-Zubair and Umm Qasr, southern Iraq](#). Environmental Earth Sciences. September 2018.

²⁶ *ibid*

Although remote sensing data was useful to capture changes in land cover at the macro level for this report, it did not capture the changes described by FGD participants and KIs at the village/district level. Hence, this may be another possible explanation for accounts of reduced water levels in the marshlands that was not shown in Map 3. Some marshland resident participants reported that if they relocated, they would do so in marshland areas that have higher water levels. This would suggest that there are changes in water levels in certain marshland areas, not necessarily all. Thus, remote sensing data at the village/sub-district level could better highlight these changes in the assessed areas.

When discussing surface water level, understanding soil typology is important, as it relates to the rate at which water is absorbed.²⁷ From 1979 to 2020, the yearly average temperature in Iraq increased at a rate of around 0.045°C per year, resulting in an increase in the yearly average temperature of just under 2°C during this period. It is likely that rising temperatures, as a result of climate change, altered the soil composition in the marshlands.²⁸ This in turn could have decreased the rate at which water is absorbed. This may explain why there are higher than expected surface water levels recorded in 2021, despite the above average rainfall that took place in 2018 and 2019.



Graph 5. Observed average annual mean temperature of Iraq for 2016-2021. World Bank.

Although surface water data is useful to understand the availability of water in the marshlands, further investigation on underground water level would provide more insight into how much water is penetrating past the layer of soil in the marshlands. In doing so, this would also highlight, to some degree, the level of salinity in the water, which also affects water absorption by the soil.

Furthermore, with regards to analysing the quality of soil, desertification is another factor which has likely contributed to its degradation.²⁹ Human and natural developments have been noted as being major causes of desertification in the country.³⁰ Rising temperatures, inconsistent rainfall, and farming practices, to name a few, have contributed to desertification in southern Iraq.³¹ These environmental changes indicate the deteriorating quality of soil and its ability to absorb water. As the soil becomes more bare, water runoff becomes more severe as a result of its reduced ability to absorb water.³² As marshland residents reportedly rely on natural resources for livelihoods opportunities, changes in soil will continue to negatively affect inhabitants. Moreover, from accounts shared by marshland FGDs participants and KIs, changes in water and soil have hindered agricultural production, which further complicates access to livelihoods.

²⁷ [Effects of soil temperature on some soil properties and plant growth](#) Adv Plants Agric Res. January 2018.

²⁸ Ibid

²⁹ [Effects of soil temperature on some soil properties and plant growth](#) Adv Plants Agric Res. January 2018.

³⁰ [Iraq's growing Desertification Problem Planetary Growing Desertification Problem](#). May 2021

³¹ Ibid

³² [Ecoengineering practices for soil degradation protection of vulnerable hill slopes](#) Computers in Earth and Environmental Sciences 2022/21

CONCLUSION

The purpose of this report was to highlight some of the drivers, potential mitigating factors, and scope of climate displacement in southern Iraq, particularly in the marshlands of Al-Basra, Thi Qar, and Maysan governorates, in relation to climate change. "Iraq is classified as the fifth most vulnerable country in the world to decreased water and food availability and extreme temperatures"³³ which, together with the risk of further desertification, and hence degradation of marshland conditions, could lead to further displacement.

With regards to water levels in the marshlands in recent years, assessment findings suggest that water levels in 2021, and thereby surface water coverage, were higher compared to 2016. This was most likely due to the net benefit of above average precipitation in 2018 and 2019, which resulted in a significant spike in water level in 2019. However, as precipitation and water levels are interlinked, reduced precipitation levels since 2018 have similarly resulted in decreased water levels in the marshlands following this peak period. Accounts shared by marshland residents, as well as climate displaced persons, reflect these findings.

While surface water levels partly describe some of the changes taking place in the marshlands, upon further investigation, changes in yearly average temperature, desertification, water quality, and soil quality are important considerations.

The subsequent negative impact of changes in the marshlands on livelihoods and daily life has been shared by marshland residents and climate displaced individuals living in Basra city. Reduced livelihood opportunities for households dependant on marshland resources, such as fishermen, livestock rearers, and farmers, have negatively affected income levels for families in recent years. For climate displaced individuals interviewed in Basra city, the lack of livelihoods was a push factor to leave their AoOs; and for marshland residents, this was one of the major considerations influencing their future movement decisions.

Commonly cited reasons in FGDs to leave the marshlands for marshland residents and climate displaced individuals were:

- Depleting marshes;
- High price of fodder for buffalos; and
- Lack of agricultural products.

Nevertheless, there are key factors reported by participants which could influence marshland community members to remain and to encourage climate displaced communities in Basra city to return. Some of these overlapping considerations included:

- Access to livelihoods (including support for farmers, livestock rearers, fishermen etc);
- Access to housing;
- Construction of schools and hospitals;
- Improved living conditions; and
- Improved water conditions.

As climate change emerges as a strategic priority in southern Iraq, particularly in the marshlands, the needs and challenges highlighted in this report give an overview of some of the primary issues which can be addressed to mitigate human impacts on the environment. It is, therefore, important to first assess the extent of ongoing environmental changes, followed by the identification of needs and challenges as essential steps toward not only helping to prevent further displacement of marshland community members but also to encourage possible returns for climate displaced individuals who have already relocated.

Profile cover photograph credit: REACH Iraq GIS team

About REACH

REACH facilitates the development of information tools and products that enhance the capacity of aid actors to make evidence-based decisions in emergency, recovery and development contexts. The methodologies used by REACH include primary data collection and in-depth analysis, and all activities are conducted through inter-agency aid coordination mechanisms. REACH is a joint initiative of IMPACT Initiatives, ACTED and the United Nations Institute for Training and Research - Operational Satellite Applications Programme (UNITAR-UNOSAT). For more information, please visit [our website](#). You can contact us directly at: geneva@reach-initiative.org and follow us on Twitter @REACH_info

³³ In Iraq, desertification leads to multiple sandstorms UNEP Sep 2020