



UNFARMED NOW. UNINHABITED WHEN?

Agriculture and climate change in Iraq

World Vision 

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منظمة إنقاذ الطفل


OXFAM

Small-scale farmers in Iraq are among the most affected groups in Iraq by climate change and water scarcity. With the reduction of rainfall and soaring temperature, agricultural production is dropping, and farmers' ability to cope is hindered. Affected farmers are exhausted and feel that they are left alone in the face of crisis. Many farmers are leaving their lands and looking for better opportunities away from their land and the urban areas.

Duty bearers need to mobilize resources and political will to support farmers and the agricultural sector through a national strategy with clear vision on the current needs and comprehensive forecast of the impacts of climate change.

While agriculture is at the heart of Iraq's past and present, its position in the country's future is at risk.

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For further information on the issues raised in this paper please email advocacy@oxfaminternational.org

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Cover photo: A plant finds room to grow amongst the parched basin of Iraq's Lake Hamrin. Pablo Tosco/Oxfam in Iraq 2021

EXECUTIVE SUMMARY

Climate change, drought, trans-boundary water governance issues and the need for more effective management and governance of water infrastructure and resources have led to acute problems of water scarcity and water quality in Iraq. These problems threaten to severely affect the livelihoods of thousands of Iraqi farmers and also to significantly hamper the country's development.

The loss of agricultural productivity due to lack of water or sufficient resource allocation to farming is now also affecting the status of the agricultural sector as the second-largest contributor to the country's GDP after oil revenues. This, in turn, further exposes the high level of fiscal fragility in Iraq's economy, which is overly dependent on oil.

This paper finds that, in 2021, farmers were cultivating less of the available land due to the challenges they were facing. Moreover, lower crop yields have fuelled rises in food and fodder prices, which were already increasing due to a sluggish economy following the oil price crash in 2020 and the government's decision to devalue the dinar against the dollar. As a result, hundreds of thousands of people who until now have relied on traditional farming methods and livestock to eke out a living cannot see a future in continuing to do so. The majority of farmers have found that the agricultural sector, which has long been the principal employer of the rural population, can no longer support sufficient and sustainable livelihoods for them.

Available evidence strongly suggests that the combined pressures of water scarcity and loss of livelihoods, and the soaring cost of living, are causing an increase in migration from rural to urban areas. Discussions with farmers show that the majority see no future in remaining in agriculture if the current situation persists. Some families have already started moving to urban areas. This finding is supported by data from the UN's International Organization for Migration (IOM). Separate reports from IOM show that hundreds of the poorest and formerly displaced families from Basra, Diyala and Ninewa have already begun migrating away from their rural home towns.¹

With water scarcity, the loss of livelihoods and rising food prices, there is the potential for rural to urban migration to increase in different areas. Furthermore, there is potential for increased civil unrest across Iraq in the future due to deteriorating access to services and deterioration within the agricultural sector. It is expected that the pressures caused by these issues will result in even more conflict, insecurity, instability and tribal disputes over water resources, especially given the already frayed links between communities who have yet to recover fully from years of war.

To address these challenges, Oxfam in Iraq, World Vision Iraq, and Save the Children Iraq call on the international community to provide timely support for recovery and long-term assistance to Iraq's farmers to help them adapt their agricultural practices in light of current and future needs, while also

considering the impacts of climate change and drought. There is also a need to consider public investment to create non-farm economic opportunities in rural areas. This assistance should not only support farmers' access to livelihoods but also ensure growth of the agricultural sector and help to increase its contribution to GDP. We also urge the Government of Iraq (GoI) and the Kurdistan Regional Government (KRG) to urgently prioritize policies and practices to address barriers to agricultural productivity. Recommendations for how this can be done range from sweeping land reforms to the adoption of economic and technical measures to strengthen the agricultural sector.

THE GOVERNMENT OF IRAQ AND THE KURDISTAN REGIONAL GOVERNMENT SHOULD COMMIT TO UNDERTAKE THE FOLLOWING ACTIONS:

- Make diplomatic efforts to formulate effective approaches to trans-boundary water governance, establishing long-term and multilateral cooperation with neighbouring countries that share the Euphrates–Tigris river basin. Policies need to be developed to sustain equitable and ecologically sound use of water according to each state's water consumption needs, based on the principle of equitable sharing of resources.
- In line with the GoI's current plans, establish and implement a framework for economic diversification to ensure that the contributions to GDP of the agricultural and other sectors are increased and dependency on oil revenues is reduced.
- Increase agriculture's contribution to GDP by allocating resources for development of the sector, supporting rural communities and helping farmers to boost their productivity and resilience against climatic shocks.
- Adopt a national strategy for adaptation and mitigation, with a clear vision of current needs and future forecasts of the impacts of climate change. Such a strategy requires commitment, political will and allocation of resources by the GoI.
- Formulate policies to protect domestic products against competition from imports from neighbouring countries. Such policies need to be adopted and implemented in both Federal Iraq and the Kurdistan Region of Iraq (KRI).
- Draw up a clear plan establishing pricing systems for the electricity and water sectors, to increase efficiency and reduce overconsumption. Such a plan will contribute to increasing the revenue needed for the management of these sectors.
- Address current and potential migration from rural to urban areas with political will and by allocating resources to support well-being and living conditions in rural areas and to help generate economic opportunities both on and off the farm.
- For better management of water resources and identification of needs, engage more closely with local actors from different sectors at the governorate level in decision-making processes.

- Establish early warning systems within affected communities to mitigate drought threats at the local level. Such systems can enhance preparedness, improve water management and reduce crop loss.
- Develop a national action plan to utilize and harvest rainfall, especially in areas prone to flooding, aiming to mitigate the impact of floods while storing water for use in dry seasons.
- Implement policies addressing efficient water management in order to reduce water loss resulting from over-consumption, poor infrastructure, traditional irrigation and agricultural practices and water evaporation, especially from open water surfaces.
- Provide clear support and strategies to help farmers throughout the agricultural value chain, from production to marketing. This can include allocation of resources for storage and processing facilities to utilize produce and reduce product loss and dumping in local markets.
- Prioritize investment in research units, especially those based at universities, to provide research and analysis for strategic plans needed for the development and sustainability of the agricultural sector in Iraq. These units can be utilized to address gaps in data and to support approaches and modalities that can identify adaptation and mitigation measures to tackle the impacts of drought and climate change.
- Conduct awareness-raising campaigns on water scarcity, water management and water use for farmers and communities.

NATIONAL AND INTERNATIONAL ACTORS, INCLUDING RELEVANT MINISTRIES AND DIRECTORATES, AND NGOS SHOULD WORK TO:

- Support the rehabilitation and modernization of irrigation and land drainage systems to manage water usage and challenges of soil degradation and soil salinity. Small-scale solar-powered pumps would potentially be an effective solution to water pumping needs for many farmers, and consideration of long-term operation and maintenance is also vital.
- Support sustainable and efficient water management, including by encouraging drip irrigation and ecosystem approaches to conserving water. In rain-fed conditions, ecosystem approaches aim to maximize water stored in soil within the root zone of crops, for example by minimizing tillage, managing biodiversity and using organic mulch to prevent losses to evaporation. On-farm water harvesting and water run-off management (swales and bunds) can also support farmers in maximizing scarce water resources. Farmers can also consider planting deeper-rooting crop varieties.
- Support farmers' adoption of modern irrigation systems and agricultural methods and increase their access to finance to support such transformation.
- Support the adoption of longer-term sustainable agricultural practices rather than investing in farming practices that maximize short-term returns. This includes supporting farmers in a transition to adopting climate-smart irrigation systems and practices.

- Provide funding and technical support for longer-term outcomes, e.g. communal watershed management and the use of solar energy to operate wells and water pumps.
- Provide farmers with awareness raising, capacity strengthening and technical support to implement activities relating to climate-smart agriculture and agricultural extension services that are tailored to emerging needs associated with drought.
- Enable different platforms, including farmers' associations, to amplify farmers' voices for accountability and participation in consultations and decision-making spaces. Such engagement will ensure the sharing of knowledge and will encourage locally led initiatives to support the sector. In this regard, more attention needs to be paid to ensuring that these platforms amplify equally the voices of female farmers and ensure their effective representation in decision making at different levels of water management.
- Help build the capacity of farmers' unions and associations and ensure their effective participation in responding to needs and decision-making processes.
- Make efforts, including by increasing awareness and through national campaigns, to increase consumers' trust in locally produced crops and products.
- Encourage greater engagement by women in the decision-making process and help challenge social norms that define women's role in the agricultural sector.
- Prioritize child-centred crisis planning and engage children in national climate advocacy. Children are among the groups most affected by droughts and climate challenges, yet they have the least say.
- Employ nexus approaches to programming by addressing urgent needs while also investing in longer-term programming and addressing the root causes of the crisis.
- Adopt a socio-economic plan to address issues of inequality in Iraq. This plan should be used to design holistic programming, taking account of the exacerbated inequalities that exist between different groups and communities. More effort is needed to strengthen the resilience of the most vulnerable groups through tailored interventions that benefit those most in need.
- Ensure increased accountability and transparency in decision making and make sure that national/local civil society organizations have a role in decision-making processes for both response planning and implementation of accountability mechanisms.

INTRODUCTION

The humanitarian context in Iraq remains fragile almost five years after the end of large-scale military operations against Islamic State of Iraq and Syria (ISIS). Iraq has been affected by multiple crises, including decades of cyclical violence, displacement, a contracting economy, the activities of armed groups, poor provision of public services and challenges of governance. The country has witnessed political instability with the recent protests that resulted in the formation of a new government in May 2020 and early elections in October 2021.

Iraq has also been affected by two significant shocks to its economy, the COVID-19 pandemic and the drop in oil prices in early 2020, which have contributed to growing socio-economic vulnerabilities. It is one of the countries most dependent on oil: over the past decade, oil revenues have accounted for more than 99% of its exports, 85% of the government's budget and 42% of gross domestic product (GDP).² This over-dependence on oil contributes to instability within the Iraqi economy, and discourages investment in other sectors. With these recent shocks, the government's fiscal revenues fell by 47.5% year-on-year in the first eight months of 2020, leaving it with limited financing options and with high levels of expenditure.³ Furthermore, the COVID-19 pandemic has affected access to livelihood opportunities and basic services. All these factors have pushed more people into poverty and have deepened vulnerabilities in the country.⁴

The context in Iraq is characterized by protracted displacement, large numbers of returnees and incomplete housing rehabilitation and a lack of essential services and livelihood opportunities for communities. There are more than one million internally displaced Iraqis, with a slow rate of spontaneous return in most areas. Two out of every five Iraqis who have returned home do not have adequate access to essential services, economic self-sufficiency or proper housing.⁵

Iraq is also facing a severe water crisis shaped by many factors, including rising temperatures, declining rainfall, concerns over trans-boundary water governance, limited water management capabilities and deteriorating infrastructure. These factors have contributed to a growing crisis of water scarcity that has directly translated into drought conditions affecting over seven million people.⁶

The impact of water scarcity can lead to the loss of livelihoods, threatens food security and affects progress towards gender equality. It also threatens the full enjoyment of human rights, and can lead to internal displacement and precarious migration; threats which affect women, children and young people the most.⁷ Iraq is one of the countries globally that are most vulnerable to climate change; it is the fifth most vulnerable country to reduced water and food availability, extreme temperatures and associated health problems.⁸ It is also facing a 1°C rise in overall temperatures and a 20–30% reduction in the availability of fresh water by

2050.⁹ Recent data show that its temperature is rising compared with the historical average (2015–20).¹⁰

In addition, poor-quality infrastructure in the water sector leads to massive water losses through evaporation and declining water quality due to pollution and contamination. According to a report by Chatham House, up to 8bn cubic metres of water are lost to evaporation every year, and 70% of Iraq's industrial waste is dumped directly into water bodies.¹¹

Paradoxically, water continues to be undervalued in Iraq. The insufficient political appetite for reform, economic challenges and the increased need to have a more effective regulatory frameworks have led to the cost of water being artificially low, as well as to a decline in water quality.¹² Meanwhile, Iraq's rapid urbanization and population growth are continuing to increase demand for water. This will rapidly make water scarcity as much of an urban problem as it is a rural one, especially when compounded with waves of migration from rural to urban areas. Water scarcity also means increasing competition between agricultural and urban household usage.

Poor governance and protracted conflicts have also contributed to gendered urban and rural inequalities and to a national oil dependency that has seen rural development deprioritized. This has disproportionately affected smallholder farmers, as national policy making favours oil exports and food imports and there is little public investment in water and other forms of rural infrastructure. This has contributed to the current levels of environmental degradation, risking droughts and food insecurity, despite Iraq's natural wealth.¹³

This policy brief sets out to analyse the impact of drought and the water crisis on farmers in Iraq and to show how rural communities are at risk of devastation unless they are prioritized as part of a holistic response to climate change and drought. It analyses qualitative data collected from different stakeholders in different communities. The analysis focuses on the challenges facing farmers and rural communities and how these challenges affect their livelihoods. It provides an analysis of the impacts on the agricultural sector and investigates the correlation between drought and migration, especially from rural to urban communities, and potential civil unrest in different governorates in Iraq, now and in the future. It uses this analysis to provide insights on the actions needed to address the crisis, while setting out recommendations put forward by and discussed with the various stakeholders who took part in the research process. The recommendations are presented on two levels – the technical level and the policy level.

METHODOLOGY

From September to December 2021, Oxfam in Iraq, World Vision Iraq and Save the Children Iraq conducted an assessment of the impact of drought on rural areas of Iraq with a focus on implications for farmers. The assessment was carried out in seven governorates (Baghdad, Anbar, Kirkuk, Salah Al-Din, Ninewa, Diyala and Basra). A total of 17 focus group discussions (FGDs) were organized with farmers in agricultural communities during the data

collection process. The gender distribution of the FGDs was eight groups of female farmers and seven groups of male farmers, and two mixed groups. In addition, 25 key informant interviews (KIIs) were conducted with representatives of local and federal authorities and of national and international non-governmental organizations (NGOs), and with mukhtars (community leaders, who can also be the head of a village or tribe) and farmers' associations. Special efforts were made to include government representatives from the Directorate of Agriculture, Directorate of Water and Directorate of Water Resources in the data collection process. The data analysis was supported by a comprehensive desk review of existing data and recently published reports and research.

The assessment focused on providing female and male farmers the space to state what the impacts of drought on their livelihoods, communities and the agricultural sector as a whole have been. It took a qualitative approach through a comprehensive assessment tool that considered gender, economic and social dimensions. During the data collection process, many similarities in the impacts of drought were apparent across different communities, and there was agreement among different stakeholders on the root causes exacerbating its impacts on rural communities.

THE DILEMMA FOR FARMERS

THE AGRICULTURAL SECTOR IN IRAQ

Iraq is an agricultural country practising mainly rain-fed agriculture, in particular grain and livestock production, with a considerable proportion of its farmland dependent on irrigation.¹⁴ The agricultural sector accounts for 5% of the country's gross domestic product (GDP) and is the second largest contributor after the oil sector. Agriculture is strategically essential for food production and as a source of income for millions of Iraqi families; data from 2018 show that the sector employs 18.7% of the active workforce, and that 23.3% of those employed are women. Around 22% of the land in Iraq, or 9.5m hectares, is suitable for agricultural production, yet only about 5m hectares are currently cultivated. Small-scale farming dominates the sector and typically it uses traditional farming methods which depend on surface irrigation and have a high dependency on farmers and low usage of technology, with minimal capital investment, which results in low levels of productivity.¹⁵ Over the years the sector has faced many challenges, including ineffective policies, mismanagement and conflict. There are currently 1.4 million internally displaced persons (IDPs) in Iraq whose primary income before displacement came from agriculture. However, they cannot return to their sources of livelihood without a considerable amount of assistance to ensure that their lands are safe and productive.¹⁶ In the winter of 2021, the Government of Iraq (GoI) had to approve an agricultural plan to reduce planting of winter crops in irrigated areas by 50% because of water scarcity and low water revenues¹⁷ further cutting production. With

the reduction in cultivation activities, there has been a direct decline in food production. The UN Food and Agriculture Organization (FAO) estimates that wheat production will be 70% lower by the end of the season and that barley production will be negligible.¹⁸ The World Programme (WFP) has already found that marginalized rural communities are adopting negative coping strategies to manage the decline in food availability by eating less.¹⁹

In 2018 the GoI launched its five-year development plan (2018–22).²⁰ In relation to the agriculture and water resources sector, the strategy includes the following objectives:

- Increase the agricultural sector's contribution to GDP (for non-oil activities) from 4.5% in 2015 to 5.2% in 2022 and achieve growth in the sector in the target year of up to 8.4%.
- Achieve sustainable food security.
- Secure water supply to meet annual demand for sustainable use in the agricultural, industrial and municipal sectors and achieve water balance, with the possibility of reducing demand by 500m cubic metres annually.
- Work toward providing sustainable water resources.

The plan also identifies a number of challenges facing the sector, including trans-boundary water governance by upstream countries and the impacts of climate change.

Data show that in the first half of 2021 the electricity and water sectors contracted by 0.5%. Both sectors are highly subsidized, and shortages are exacerbated by overconsumption. These shocks, combined with the second-lowest levels of rainfall in 40 years, are disrupting the agriculture sector. As a result, agricultural value-added contracted by 3.3% in the same period. Such trends will have severe impacts on food security, especially for poor communities living in rural areas. Farmers have also been affected by rising costs of agricultural inputs and by a lack of support in terms of financial and marketing services, combined with delays in payments promised by authorities in return for growing strategic crops.²¹

CLIMATE CHANGE, DROUGHT AND THE WATER CRISIS IN IRAQ

Iraq is one of four countries that depend on the Euphrates–Tigris river basin for its water supplies; the others are Turkey, Syria and Iran. Over the years, the river basin has experienced high levels of water stress and environmental degradation, which has led to increased water scarcity, directly affecting the countries that depend upon it.²² With the impacts of climate change, drought is increasing in duration and intensity and desertification is growing, with more frequent sandstorms and flash floods, affecting agricultural yields.²³

In May 2021, the Iraqi Ministry of Water Resources (MoWR) announced that over the past year water supply from both the Tigris and Euphrates rivers, Iraq's two primary water sources, had decreased by 50%. In addition to

climatic conditions, as a downstream country Iraq is vulnerable to upstream water use and damming in other countries.²⁴ It has one of the lowest water productivity rates with the highest water withdrawal for agricultural use per capita. According to the National Strategy for Water and Land Resources in Iraq 2015–35, freshwater resources per capita are likely to fall to 1,000 cubic metres per person per year by 2030. The strategy states that by 2016 Iraq would not have water in sufficient quantity or quality and called for significant reforms to change this ‘alarming’ trajectory. It also forecast that, by 2050, a decrease of 10% in precipitation and an increase in temperature of 1°C would cause a 20% reduction in the availability of fresh water, which means that nearly one-third of irrigated land in Iraq will have no water by that date.²⁵

Iraq’s complex water crisis is expected to persist, with the potential for implications at different levels, including the humanitarian, economic, security and social levels, and the risk of population movement. In water supply, priority is always given to public water consumption and to other vital sectors such as agriculture. However, with population growth the demand for food has grown, making the agricultural sector the largest consumer of water.²⁶

In a situation like this, farmers, among many other groups, are facing multiple challenges that affect their livelihoods and their ability to cope with different shocks and crises. Farmers who took part in the research for this paper indicated that they had seen a gradual deterioration in their livelihoods and in their capacity to sustain their incomes from agriculture and also a deterioration in their ability to cope with the different shocks they are facing. During the data collection process many challenges were identified by farmers, representatives of national and international NGOs, farmers’ representatives and government officials from different directorates. These challenges are being driven by different factors, including a deterioration in economic conditions and the impacts of climate change and drought; they are explored in greater detail in the sections below.

‘In some cases, farmers could own land and could have a well, but they don’t have the capital needed; hence they won’t farm, even if they wanted to.’ – Male farmer, Kirkuk

‘Farmers can’t develop. Farmers now feel crushed and defeated, as they are held back and are suffering.’ – Female farmer, Kirkuk

ACCESS TO FINANCE, LAND AND AGRICULTURAL INPUTS

According to a farmers’ representative in Salah Al-Din governate, before 2003 agriculture was seen as a prestigious occupation. The government helped farmers with fertilizers, seeds and loans from the agricultural bank. Some people were even moving from urban to rural areas to take up farming in the area. Some of this support was available up until 2014 – for example,

loans to fund modern irrigation systems. Now, however, this level of support no longer exists.

Farmers said that they had been severely affected by insufficient support in terms of accessing agricultural inputs; mainly, they said that the government provided little or no support with subsidized inputs, even though prices of inputs in local markets were increasing. This indicates farmers' dependency on the subsidized agricultural inputs previously provided by the GoI, which allowed them to cultivate their lands every season. Over the years they have seen a reduction in the support provided which, along with other factors, has led to them farming less of their lands. Many farmers are planting crops such as barley, wheat and corn, which are considered strategic as they are an essential part of the Iraq food basket or they provide materials for certain industries, including food processing, and livestock fodder. The Ministry of Agriculture supports the planting of strategic crops, including by providing access to inputs such as seeds, pesticides and fertilizers. The government also purchases strategic crops directly from farmers and pays a higher price than they would get in the local market. However, farmers reported that sometimes government payments are delayed. This was a common issue for farmers in all the governorates included in the study, though in some governorates they reported that payments had eventually been made. Late payments affect farmers' ability to meet financial obligations when preparing for the coming season. In some cases, farmers said that they would sell their crops in the local market rather than sell them to the government, even when market prices were lower. As explained in interviews, farmers believed that it was better to have a guaranteed payment immediately rather than higher prices but with long delays in payment.

Farmers also stated that increases in the prices of agricultural inputs were putting these out of their reach. Most farmers buy the inputs they need on debt, and they usually know the suppliers in their local markets, who supply them on the understanding that the farmers will pay them back when they harvest and sell their crops. Farmers also pointed out that buying inputs on debt was more expensive than paying the full price upfront. In Diyala, farmers said that on average prices were 20–30% higher when buying inputs on debt. However, this option comes with a high level of risk. Farmers reported that their ability to meet these commitments was being hindered by crop failure and lack of rainfall and the fact that they were unable to sell their crops in local markets at a competitive price. Many farmers rely on debt from local suppliers, and in most cases such an arrangement works if there is trust between the supplier and the farmer or if the farmer has someone who can act as a guarantor. Nevertheless, many farmers said that they had accumulated debt either to suppliers or to governmental financial institutions.

In terms of accessing their land, many farmers reported that they could not do so due to safety concerns as their lands were remote, making them insecure for both day-to-day farming and future investment. In addition, many farmers said that they had lost assets and agricultural infrastructure due to conflict in recent years. They stressed their inability to restore these assets as they had lost their income and compensation was lacking. In Anbar, female farmers said that they had been displaced during the conflict

with ISIS and when they returned to their lands and homes they had to start all over again, as most of their agricultural assets had been destroyed.

CLIMATE CHANGE, DROUGHT, WATER SCARCITY AND DETERIORATION IN WATER QUALITY

It was clear during the research process that the impact of drought is affecting individual farmers in different ways. One main difference noted at the individual level derives from the location of lands and farmers' access to water resources, either open water or underground resources. The farmers most affected are those who are located a long distance away from open water resources and who have no means of accessing efficient irrigation infrastructure. Farmers who are financially insecure are also among the worst affected as they do not have the financial means needed to secure alternative access to water, such as by digging wells. Many farmers reported that digging wells was one of their immediate coping strategies when affected by water scarcity. However, this always carries the risk of either finding no water or finding water with a high level of salinity, which can only be used for specific crops. Another burden is the high capital cost of digging a well and the ongoing running costs that need to be covered, including maintenance and fuel. Fuel-powered pumps are a necessity, with power cuts identified as being one of the main challenges facing farmers. Respondents said that they were now digging deeper than they did before to reach underground water. In the Salah Al-Din governorate, for example, farmers used to dig up to 100 metres down; now they are digging to a depth of 150–180 metres and more.

'We have dug a well in the backyard because we lacked access to water. The water we are getting is salty and unsuitable for human consumption or agriculture. It is only for domestic use... Migration started recently because of drought, and it will increase if the situation remains as it is. Farmers are looking for income.' – Male farmer in Diyala

Another major challenge facing farmers is the deteriorating quality of the water supply. Iraq's water resources are affected by degradation of quality of both surface and underground water sources. Water quality is affected by the two main problems of salinity and pollution, which often related to municipal, industrial and agricultural activities.²⁷

MARKETS, PRICE FLUCTUATIONS AND COMPETITION FROM IMPORTS

Two linked challenges are falling prices for produce in local markets and competition from imported products. Many farmers complained that local markets were flooded with products imported from neighbouring countries, including Turkey and Iran. Imported crops are, in most cases, cheaper than

those produced locally and, in some cases, more popular with consumers. Revenues barely cover the high costs incurred by local producers. Many farmers said that they have continued to farm their land as they have no other choice. Some felt that there were insufficient governmental policies to protect their products from competition from imports in local markets.

'The current policies are killing agriculture, especially allowing imports from other countries.' – Mukhtar/farmer, Mosul

According to data collected by Oxfam in Mosul in 2021, Iraq is constrained by poor marketing, poor organization of farmers and the absence of a comprehensive and integrated vision of farming, from production to marketing. Farmers are not connected with all the different actors involved, especially dealers supplying inputs and others engaged in production, processing and marketing. In particular, one of the key challenges that farmers are facing is a lack of processing facilities. Due to conflict most processing facilities in Iraq have been damaged, especially facilities for producing wheat flour, tomato paste and pickles and large-scale dairies; hence most of the output spoils. Farmers confirmed this during the data collection process and stated the need for more processing facilities that can absorb the crops produced, especially when the market is saturated.

AGRICULTURAL EXTENSION SERVICES

While many farmers indicated that they had good indigenous experience in the field and that they made use of the strong expertise that existed in their communities, they also highlighted the vital role played by government in providing agricultural extension services. Such services vary from increasing farmers' knowledge of best agricultural practices to encouraging them to adopt more modern farming methods, boosting their productivity and dealing with the challenges that they might face, such as agricultural pests and the protection of crops.²⁸ Respondents explained that they used to receive extension services from government representatives, which helped to increase their productivity. Farmers also received or sought such services from suppliers selling different agricultural inputs. Some farmers stressed their need for such services now, with new challenges from drought and climate change. A representative of an international NGO in Kirkuk stated that relevant authorities provide basic guidelines, though not necessarily customized to farmers' needs. These guidelines also mostly reach farmers located close to population centres, excluding farmers in remote areas. In some areas this was attributed to a lack of resource allocation and capacity on the part of government. Another essential point was that, while these extension services are intended to target all farmers, both female and male farmers believed that they are mostly provided to male farmers. Even in informal spaces where farmers exchange their experiences, male farmers usually dominate, meaning that women's specific needs and challenges are overlooked.

IMPACTS

One of the biggest and most critical challenges facing farmers is the lack of stability and lack of resilience to shocks. Farmers are increasingly seeking a future for their children away from agriculture, as they want them to obtain more stable jobs. The impact of this crisis is more evident in the case of farmers who are wholly dependent on agriculture as their primary source of income. The main impacts are set out below.

IMPACTS ON FARMERS

Many farming families depend mostly or wholly on agriculture as their primary source of income. In one FGD, farmers said that agriculture took up most of their time every day, which did not allow them to invest in establishing other sources of income. Furthermore, many farmers said that the only knowledge and skills they had were related to farming, mostly gained from working on their family lands.

Asked if the current situation would force them to leave agriculture and migrate, some farmers said no, especially as they felt a sense of loyalty and belonging to their lands and their occupation. However, they acknowledged the challenges they were facing, which forced them to question the viability of the occupation. Many other farmers, on the other hand, said that if the current situation worsened, they would most likely leave their lands. Already, agriculture is less popular among the younger generations. Of 52 farmers asked if they wanted to see their children working in agriculture, 44 said no. Instead, they wanted them to graduate from university and obtain a government job with a stable income. This was seen as a necessity for their children's future and for the well-being of the family by diversifying its sources of income.

Similarly, many daily workers involved in agriculture are looking for job opportunities in urban areas. For daily workers, shifting from one sector to another is relatively easier to do because the tasks involved require fewer skills. Overall, people perceive that urban areas offer more job opportunities, higher wages and a greater diversity of sectors. In contrast, options in rural areas are limited to agriculture,²⁹ and this makes shifting from a rural area to an urban one more attractive.

In many governorates farmers have cut back on the amount they produce, with some reducing it to little more than what they need to meet their own consumption. The livestock sector has been severely affected; many farmers and livestock owners reported the reduced availability of green grazing areas, combined with high prices for fodder. This has resulted in farmers selling off some of their livestock so that they can afford to purchase feed for the rest. According to a study, conducted on November 2021, by the Norwegian Refugee Council on the impact of drought on farming communities in Iraq, up to 37% of households have lost livestock in the past six months due to insufficient water and livestock feed or because of disease.³⁰ In addition, many farmers are selling their livestock at lower prices because of the market situation.

'We are forced to farm; we don't have any other option.' – Male farmer in Kirkuk

'The drought has affected our income and everything, even us as people... The villagers are tired. Now it's like the saying "you have dinner but no lunch".' – Female farmer in Diyala

IMPACTS ON WOMEN

Women play a crucial role in agricultural production. Many female farmers reported that mainly they perform the more physical farming activities, while men are engaged more in marketing produce, consultations and obtaining the supplies they need. The customs and norms of Iraqi society reduce work opportunities for women or restrict them to working in sectors deemed more suitable for their gender, such as the agricultural sector. Studies show greater participation in agriculture by women, but still they often work only on their family farms.³¹ Women's work in agriculture is most often regarded and legitimized as a continuation of their household work – invisible, unrecognized, unsupported and full of hard work. In some contexts, changes in policy have begun to recognize and re-evaluate women's agricultural work, admitting that they have been neglected in terms of support for farming activities. The impact of external stress on households, and in particular for women, is one that requires further emphasis and response.

While female farmers participating in the study reported that they were sometimes consulted on decisions relevant to farming activities, they were not part of the decision-making process. Many respondents indicated that men were responsible for making decisions, going to markets and negotiating with suppliers. Female farmers in Hawija district said that women had knowledge of many agricultural practices due to their long experience in the field, yet they clearly had little participation in decision making. Even in the case of female-headed households and farmland owned by women, many farmers said that a male family member should be the one to deal with suppliers in the market. In Hawija, male farmers will support widowed female farmers, volunteering to get agricultural inputs from the market for them. While this seems to be the case generally, there are some areas where women in female-headed households make the decisions. It is worth stressing that there are many spaces in which women are not usually found in Iraq, such as farmers' groups where farmers gather to discuss issues of concern and consult one another on the challenges they face. On a number of occasions the researchers attended meetings of farmers' associations, and noted an apparent absence of women participants.

Women are among the groups most affected by the impacts of drought. They usually have the double responsibility of caring for the household and working in the fields. Also, some of the women encountered by the research team felt that they would have to be the ones to find solutions if incomes

were low and provide for their families' needs. In the event of migration, women can be affected in two ways. If the whole family has to migrate, they are affected by the loss of their social networks and struggle to secure work opportunities in urban areas. With the conservative norms of Iraqi society, the loss of social networks restricts women's mobility and participation. Conversely, if male members of the household migrate to other areas for work, women will in most cases be solely responsible for meeting their families' needs.

IMPACTS ON CHILDREN

Children are also among the groups seriously affected, as migration can lead to families adopting negative coping strategies that can have severe impacts on children. Many respondents reported that children were dropping out of school, in some cases to help provide income for their families. As drought affects families' abilities to secure their needs from agriculture alone, children will go into work to diversify sources of income to meet their daily needs.

Our children left school and went to work; it is all because of the deterioration in agriculture.' – Female farmer, Mosul

FARMERS' VOICE AND REPRESENTATION

In many governorates, farmers and their associations stressed the need for farmers' voices to be heard by decision makers. As they pointed out, farmers are the ones best placed to identify the challenges they are facing. Farmers do not feel that they are represented in decision making or in the design of national strategic plans by relevant ministries. At a meeting of a farmers' association in Ramadi city in Al Anbar, members stressed that they were among the most qualified to identify farmers' needs and challenges, but they felt excluded from the decision-making process. It is worth stressing here the need for equal representation of female farmers, as it was evident during the data collection process that the voices of male farmers dominated over those of female farmers.

'Farmers are not consulted; farmers' unions are not consulted, and farmers' voices are not heard.' – Male member of farmers' association, Al Anbar

OVERALL IMPACT ON THE AGRICULTURAL SECTOR AND ON THE ECONOMY OF IRAQ

Food production in Iraq is based on smallholder agriculture, which traditionally has met the needs of its population. However, over the years the sustainability of the agricultural sector has been undermined by many factors, including conflict, neglect and mismanagement. Local policy makers and the international community emphasize the high potential of

the sector, but they also point to the challenges it faces, including its low productivity levels, which are related to the smallholder system of farming, which does little to encourage competencies and skills among farmers.³² Still, small-scale farms are vital to the agricultural sector and are an essential source of employment in rural areas.³³

Furthermore, small-scale farmers are the most affected by shocks, including drought; larger-scale farmers are better able to adopt more modern farming practices and shift to climate-smart irrigation systems. Small-scale farmers participating in the study indicated that they would be willing to do the same, but they are held back financially and are unable to make this shift. They also said that the high levels of competition they faced from imported crops might hinder their ability and willingness to invest in their land.

Iraq's economy is slowly recovering from the COVID-19 pandemic and the oil shocks of 2020, but it is now being challenged by the spread of new COVID-19 variants and factors associated with climate change.³⁴ Economic modelling indicates that its real GDP could fall by 4% compared with 2016 levels, with demand for unskilled labour in the agricultural sector falling by 11.8% in the scenario of a 20% reduction in water availability and a climate change-induced decline in crop yields.

IMPACTS ON MIGRATION AND CIVIL UNREST

Would you continue farming? Answers to this question differed from one location to another and from one group to another. When groups of older farmers were asked this question, their immediate response was yes. They saw agriculture as part of their inheritance from previous generations and also as their legacy. They also highlighted the sector's importance for farming communities and for the country as a whole. In many groups, participants declared that agriculture was the real oil of Iraq and, being part of a generation that has witnessed many changes, they spoke about previous eras when the farmer was king. On the other hand, many of the farmers acknowledged the deterioration in the sector and the overall deterioration of the country, stressing that they were unable to make the most of their lands. Many of them stated that if the situation remained as it was and the agricultural sector continued to deteriorate, they would not be able to farm in the future. For this reason, and as farmers attempt to diversify their sources of income, many governorates are witnessing a trend of people migrating from rural to urban areas, seeking work opportunities and better livelihoods.

Internal displacement is not new to Iraq; over recent decades it has seen waves of displacement caused by many different factors, including ethnic and sectarian tensions, armed conflict and recently the war against ISIS. As large-scale operations against ISIS wound down, rates of displacement diminished and many people started returning to their homes.³⁵ Since the beginning of the Iraqi displacement crisis in 2013; in December 2017, some 3.2 million people were recorded as returnees, more than the number of people who had been displaced, at 2.6 million. By the end of October 2018,

more than four million displaced people had returned to their homes, with data indicating slowing rates of return, and there were still more than 1.9 million IDPs.³⁶ Another factor contributing to the movement of IDPs was the decision of the GoI to close or reclassify 14 formal IDP camps as informal sites between October 2020 and mid-January 2021.³⁷ According to the IOM's Displacement Tracking Matrix (DTM), by December 2021 there were a total of 1,186,556 IDPs and 4,952,232 returnees.³⁸

When analysing the implications of climate change and drought for migration and civil unrest, there are clear indications of these factors causing instability, with intermittent demonstrations in different governorates and waves of migration that range from labour migration at the individual level up to the migration of whole families from rural to urban areas. Some migration trends tend to be temporary in response to immediate shocks or needs, but some appear to be more permanent. The impact of drought is pushing many Iraqis to move from dry zones to areas with more water availability, such as cities, and will continue to do so. This can lead to the abandonment of rural areas and can add to stress on living conditions in urban areas.³⁹ In 2012 around 20,000 individuals, mainly from agricultural communities, were displaced because of drought. In 2019, similar impacts due to drought were seen in the southern and central governorates, with 21,314 individuals internally displaced due to the high salinity content of water and/or outbreaks of waterborne disease, in both urban and rural communities.⁴⁰

There is also a clear pattern of drought-induced migration among young people aged 15–24 from farming communities, in search of jobs and economic opportunities in towns.⁴¹ Many farmers highlighted the fact that youth are moving away from agriculture, with the younger generation preferring to study or to work within the public sector for a more stable income. This is caused by many factors, according to farmers, including increased instability in the agricultural sector and its deterioration year after year. Some farmers still saw some feasibility in agriculture, but said that if the situation remained as it was or deteriorated further, there would be more migration from rural to urban areas.

'I've been a farmer forever. I got this land from my grandfather. There is no water now, so we cannot work on this land. My sons are now working as labourers.' – Male farmer, Diyala

Looking at civil unrest, water scarcity, among many other factors, sometimes contributes to increasing levels of ethnic and tribal tensions in Iraq. Scarcity of resources, combined with a lack of effective government action, has the potential to ignite tension and conflict, especially when a rural–urban divide overlaps with economic disparities.⁴² A UN factsheet published in 2013 reported a number of incidents in Baghdad and water-related conflicts in Kirkuk between different ethnic groups.⁴³ Such tensions still exist in different governorates, demanding government action to address disruptions to electricity and water supply and the lack of job opportunities. Climate change can also act as a conflict threat multiplier. Such threats can affect fragile ecosystems and strain the coping abilities of local communities, increasing tensions over natural resources. Climate change does not inevitably lead to conflict, but it can exacerbate resource

scarcity, leading to conflict when combined with political, economic and social factors.⁴⁴

A government official in Mosul interviewed for this study provided an example of tension of this kind over water resources. Authorities in the city were aware that a particular village was facing challenges in accessing water resources. Their response was to construct a well to provide water to residents; however, this action was not implemented as people from a neighbouring village, concerned that the well would affect their own water supply, armed themselves and prevented the authorities from digging it.

In some areas, the establishment of informal settlements has been identified as a challenge. In Salah Al-Din, respondents in KIIs said that informal settlements were being built in urban areas as people moved in search of better job opportunities, and that these might become a point of tension. The same was noted in Diyala, where unplanned informal expansion has been taking place, putting more pressure on already sparse services.

'If livelihoods are interrupted, people can't produce what they eat, and with no source of income people will go onto the streets, and some conflict will happen.' – Representative of international NGO, Mosul

A dry road to civil unrest: examples from previous years.

2018: No water or electricity: why southern Iraqis are at breaking point

- In 2018 major protests erupted in a number of Iraqi cities due to cuts in water and electricity services. The protests began in the southern region of Basra and then spread to Karbala and Baghdad, with protestors blaming the shortages on corruption and poor management by the authorities. 'It's not rare for us to go four or five days without a single drop of water coming out of the tap,' an Iraqi man from Basra was reported as saying. These protests were not the first to occur in Iraq around lack of access to services. However, in 2018 lack of access was exacerbated by a severe drought, which reduced the availability of water.

Sources: A. Ershad. (2018). No water or electricity: why southern Iraqis are at breaking point. France 24/The Observers. <https://observers.france24.com/en/20180724-water-electricity-iraq-south-basra>; and M. Salim and L. Sty. (2018). Widespread unrest erupts in southern Iraq amid acute shortages of water, electricity. The Washington Post. https://www.washingtonpost.com/world/widespread-unrest-erupts-in-southern-iraq-amid-acute-shortages-of-water-electricity/2018/07/14/b9077b90-86c2-11e8-9e06-4db52ac42e05_story.html

2020: Kurdistan Region farmers trample own tomatoes in protest at low value of produce

- In 2020 farmers in Erbil, Kurdistan Region of Iraq (KRI), dumped their tomato harvest in the street in protest at a drastic reduction in the value of their produce. One farmer was reported as saying: 'I brought one dunam [2,500 square metres] worth of product here. The cost of the production was 5,000,000 dinars. And I sold it only for 100,000 dinars. Who is supporting me?'

Source: Rudaw Media Network. (2020). Kurdistan Region farmers trample own tomatoes in protest of low product value. <https://www.rudaw.net/english/business/07072020>

2021: Tomato farmers say they're making a loss

- In 2021 farmers in KRI described how challenging the year had been for them as they struggled with water shortages and with finding markets for their produce. While some farmers were switching to smart irrigation systems, they still had to compete with cheaper imported products. 'A kilogram of tomatoes costs an estimated 550 to 600 dinars to produce. Currently, it sells for between 200 and 300 dinars,' one farmer was reported as saying.

Source: Rudaw Media Network. (2020). Tomato farmers say they're making a loss.
<https://www.rudaw.net/english/business/22092021>

2022: Protests in Dhi Qar against water scarcity

- In 2022 dozens of residents of Al Azrej and Khafajah villages closed the northern public entrance to Nasiriyah, the capital of Dhi Qar governorate in southern Iraq, in protest at the scarcity of water in their villages. Protesters set fire to tyres and cut off a main road north of the city, demanding solutions to water shortages after they were unable to complete their agricultural season.

Source: AlSharqiya Live. (2022). Demonstration in Dhi Qar protesting the water scarcity.
<https://www.alsharqiya.com/en/news/demonstration-in-dhi-qar-protesting-the-water-scarcity>

GOVERNANCE, POLICIES AND TRANS-BOUNDARY WATER CHALLENGES

When asked about the root causes of the water crisis, participants in the study highlighted the following issues: 1) actions taken by upstream countries; 2) the need for more support for farmers and for policies to reduce mismanagement and increase the allocation of resources; and 3) drought and shortages in rainfall. The Middle East has historically been affected intermittently by drought, and over the last 50–60 years Iraq, Syria and their neighbours have witnessed exponential losses of water. The situation today is shaped by challenges stemming from the state of infrastructure development, conflict and climate change.⁴⁵ As far as upstream countries are concerned, most respondents said that the policies on water adopted by Turkey and Iran affected Iraq's share of the water supply. They also acknowledged that both of these countries were also affected by climate change and drought, which indirectly affected Iraq as they took action to manage the impact of drought on their own populations. An official from the Directorate of Water Resources in Anbar said: 'As a country, we are affected by the dams that were built in the upstream counties, which means that our water revenue is less.'

Many respondents said that there was a need for more strategic action at the national level to reduce water loss, especially from open-surface water bodies, which lose water due to evaporation, and to reduce the misuse of water resources, especially at the household and community levels. In addition, there is a need for strategic plans to harvest and store rainwater and water from floodplains, especially in flood-prone areas, and then to reuse it in dry seasons. However, though they are badly needed, these steps are likely to take time and will call for the allocation of resources. Several government officials pointed to the mismanagement of water resources by farmers as a problem. Officials also said that greater capacity was needed to monitor violations, including unlicensed wells, in addition to the need to provide farmers with more information on improving their water management knowledge and skills. There is also a need to increase awareness at the community level to improve people's understanding of the need to manage water resources and ways of doing this, as many household and community practices are also contributing to water loss.

Also at the national level, the GoI acknowledges that climate change is taking place in a global context of energy transition that will have implications for the Iraqi economy, with an expected fall in demand for oil and gas; hence the Iraqi economy as it stands is unsustainable. The GoI recognizes the need to address climate change and its long-term financial and economic impacts as a national priority. It sees opportunities to transform the economy while adapting to the effects of climate change through the Mesopotamia Revitalization Project, an action plan it has set out that aims to provide better living conditions for future generations.⁴⁶ Early in 2021 Barham Salih, the President of Iraq, approved the country's accession to the Paris Agreement on Climate Change, stating that this was a step towards countering the threat of climate change.⁴⁷

The GoI has also finalized its report on nationally determined contributions (NDCs), which focuses on measures to mitigate and adapt to climate change and ensure environmental integrity and transparency.⁴⁸ In November 2021 Jassim al-Falahi, the acting environment minister, said that Iraq was hoping to obtain \$10bn from the global Green Climate Fund (GCF) to support its fight against climate change.⁴⁹

CASE STUDIES

'A gradual but consistent decrease in water flow and water quality over the last decades' – the case of Basra⁵⁰

The effects of environmental degradation have been felt strongly in the southern governorates of Iraq in the shape of a gradual but consistent decrease in water flow and water quality in recent decades. This means that agriculture, the primary employer in rural areas, has been less able to guarantee sustainable livelihoods for rural communities. One consequence of this has been the migration of rural populations, usually towards nearby urban areas, in search of better livelihood opportunities. These climate-related migration trends are also linked to the overall degradation of the economic situation and governance that is affecting both rural and urban populations. Basra is the largest urban area in the south of Iraq and has great economic, social, and political significance. Historically it has been a destination for migration inflows. It is also one of the areas most affected by water salinity.

The primary source of surface water in Basra governorate is the Shatt al-Arab river, which is used for different purposes including irrigation and fisheries. The river is formed at the confluence of the Euphrates and Tigris rivers as they flow from Iraq into the Arabian (or Persian) Gulf.⁵¹ The extended salt tongue in the Shatt al-Arab is due to a number of factors, including climate change, drought and human water drainage. Saltwater advance has affected vital sectors of the economy, including agriculture.⁵² Recent research conducted in Iraq by IOM shows that migrants in Basra are typically from rural areas of neighbouring governorates and that migration is most likely not temporary or seasonal. Most respondents indicated that they had relied on agriculture for their incomes before they migrated. Most did not have any savings to facilitate their movement and so they had sold their assets, including houses, land and livestock.⁵³

In 2018 the impacts of the water crisis led to civil unrest when massive protests erupted in the city, with residents, especially youth, demanding improvement in access to public services. There was also an outbreak of waterborne diseases resulting from increased use of polluted water. The deterioration of public water supplies in the governorate has been attributed to decades of armed conflict, under-investment and dysfunctional government.⁵⁴

'Time is not on our side' – the case of Diyala

Diyala is one of the governorates worst affected by the drought crisis due to its reliance on Lake Hamrin, fed by the Diyala River, which originates in Iran. In recent years, water levels in the lake have fallen significantly and its surface area has shrunk by half, affecting agriculture. In 2021 the MoWR prevented most farmers in Diyala from planting summer crops due to concerns about diminishing water levels.⁵⁵ The Ministry of Agriculture announced the exclusion of the Diyala Governorate winter plan for 2021–22, due to the critical scarcity of water resources there.⁵⁶ According to media reports, the decision was made partly because tributaries of the river had been blocked off on the

Iranian side.⁵⁷ Mahdi Rashid al-Hamdani, the Minister of Water Resources, was reported as saying: 'The Iranians have not shown any [positive] response and still cut off water from the Sirwan, Karun, Karkheh and Alwand rivers and streams, causing severe damage to the residents of Diyala who rely on water coming from Iran.'⁵⁸ The ministry said that it had filed a lawsuit against Iran at the International Court of Justice, with Al-Hamdani accusing Iran of trying to alter the natural course of water flows.⁵⁹

Officials from different directorates in Diyala said that they were able to meet water demands last summer, but that without a good winter and a decent amount of rainfall, they would not be able to do so in the coming season, as currently there were no reserves of water. In one area, Muqdadia, authorities were able to secure water to meet the needs of the city but not those of surrounding villages. Officials also reported an unfair distribution of water resources due to instability in the security situation and tribal disputes. There was a risk that people from a number of villages would migrate as they had lost their primary source of income from agriculture. Other areas also face serious threats of migration as they lack water services and are entirely dependent on wells for their water supplies.

According to local authorities, directorates' drought response plans focus mainly on meeting short-term needs based on available water resources, with priority being given to the provision of water at household level and then to agriculture and other sectors. In the longer term, the governorate has plans for alternative water resources that involve building carrier lines from the Tigris River and wider adoption of smart irrigation and farming methods. In addition, the government hopes to raise awareness of proper use of water resources at the community level. Although needs assessments have been conducted and are ongoing, there is still a lack of action and a lack of resources to address different needs, especially on the part of the central government. In the KIIs, a number of officials called for the governorate's needs to be prioritized by central government and for the resources required to be allocated, while also making diplomatic efforts to pressure countries upstream.

'If there is no more water, the community will revolt against us.' – Official in Diyala

'We want our children to be farmers, but if there is drought we will have to migrate.' – Farmer in Diyala

Interviews conducted in Diyala in June 2021 with community leaders and households, including children, showed that children's psychosocial well-being was deteriorating due to them worrying about the problems caused by droughts and the possibility of having to leave their houses and be displaced to other areas.⁶⁰

'If things don't change, I will leave' – Mohammed's story

Mohammed (49) is a crop farmer living in Diyala. He was displaced for three years during the conflict with ISIS, and he is now again considering leaving his land with his family because of the water crisis.

Mohammed explained that the family has to buy drinking water because there is no other way of accessing it. He said: 'This is the hardest year we have ever had. I live off farming, and now our condition has got way worse.' He told researchers that they had not harvested any crops this season, adding: 'This land is a troubled area. Living here is hard, so I'm thinking of leaving for Kurdistan. Our family consist of six children, their mother and me. All eight members of our family will be affected.' In Kurdistan they will face language barriers, and none of the children speak Kurdish. However, Mohammed concluded: 'I think we will leave our land again due to lack of water supply. We can't work here; you saw the situation – there is no work here. I'm old, and I can't work anymore. If things don't change, I will leave. In this situation, we can't do anything... everything is dead now. The weather is very hot; it wasn't like this a few years ago. Water wasn't a problem before.'



Mohammed Adnan, a crop farmer in Diyala, Iraq, did not plant on his land the past season due to the lack of water. © Pablo Tosco/Oxfam in Iraq 2021.

ACTION NOW AND IN THE FUTURE

The evidence shows that most small-scale farmers in Iraq are exhausted, in debt, and that they lack trust in the current situation and in the future. Yet they remain hopeful of improvement as they believe that the sector still lies at the core of the Iraqi economy. Farmers are in clear need of support to ensure that they are able to continue with their livelihoods and meet their basic needs. They also need to adapt to the changing conditions caused by drought and climate change.

MODERNIZING AGRICULTURAL PRACTICES

Rural areas have a need for more strategic planning and management of available resources and to ensure the adoption of modern farming techniques, including climate-smart agricultural practices and smart irrigation systems. At present, however, farming communities face barriers and gaps in their knowledge, skills and resources to make such a transformation.

The main challenge to adopting these methods identified by farmers were their lack of financial resources and the inadequate support provided by the government and by humanitarian and development actors. These perceptions were based on the fact that historically the government has provided support for farmers and on farmers' understanding of the role of humanitarian and development actors, specifically the need to assist farmers. However, subsidized assistance and support of this kind – primarily from the government – raise the question of farmers' increased dependency on such support and its lack of sustainability. According to an official from the agricultural lands department, the government supports modern irrigation systems, providing 50% of support in some areas, including technical support. Kirkuk, SAD and Rabia are areas that provide good examples of this. Farmers in the Daquq area of Kirkuk expressed their satisfaction with an irrigation system established by the government, which has enabled them to secure the water they need to irrigate their lands.

The Gol's policy is to promote the transformation of agriculture using modern practices. In 2021 it claimed that modern techniques of water management and preservation of resources could reduce total water demand for irrigation by 30–40% over the next 3–5 years. One change mooted by the government is to shift its current programme of subsidies for agricultural output, e.g. buying wheat at prices higher than the international price, to subsidizing modern irrigation and agricultural production methods instead.⁶¹

COPING STRATEGIES

There is a pressing need to analyse the coping strategies adopted by farmers and the responses adopted by other actors. As the data collection exercise showed, for farmers the main principle is that agriculture is their primary source of income and so they must maximize their profit from it. This can lead to mismanagement of resources, such as digging more wells. Most of the farmers and government officials taking part in the study reported that water in the majority of wells already had high levels of salinity and was unfit for human consumption. Without sufficient rainfall to recharge them, over-extraction will eventually exhaust underground water supplies. Many respondents said that digging wells was a negative coping practice (e.g. in Mosul), but others suggested it as a solution (e.g. in Diyala). Several officials stated that some areas had good levels of underground water that could be used for agricultural and household purposes, but noted the need for better understanding of the quality and location of underground water and how it could be used without over-extraction, given the poor recharging of reserves. This indicates a need for more strategic planning at the local and national levels to ensure proper monitoring and management of underground water reserves. Monitoring is also needed in areas with

inadequate irrigation networks, where water scarcity forces farmers to break the law, for example by digging wells without an appropriate licence from the government. According to an official from the Directorate of Water Resources, there are some legal frameworks and laws to stop this practice and to issue warnings and penalties to such farmers, but the problem goes beyond the existing laws. Enforcing laws and monitoring violations requires resources within the relevant authorities, and this is not always the case, at least not on the scale required. Security was also raised as an issue. For example, one official in Diyala stated that instability and insecurity in the governorate was affecting the authorities' ability to monitor violations.

Another coping mechanism resorted to by farmers is taking on high levels of debt in order to access agricultural inputs. This comes with a serious risk that farmers will be unable to repay these debts. Furthermore, many farmers are being discouraged from investing in farming their lands or adopting more modern practices as they are witnessing a deterioration of the overall situation, and in particular competition from imported produce and reductions in the prices they can command. All these factors are leading to a shrinking of farmers' incomes, which is affecting their ability to meet their needs and is further increasing their vulnerability to future shocks. Many farmers are spending most of their income and also their savings on immediate food needs, with food vendors reporting increases in the prices of some essential food commodities.⁶²

IDENTIFYING AND RESPONDING TO THOSE MOST IN NEED

The complex crisis in Iraq affects vulnerable groups by adding ever more stressors while also pushing other groups into vulnerability. To properly understand the impact of drought, it is essential to identify and understand the characteristics of the groups that are most affected. Drought is affecting whole communities but, as the evidence shows, those worst affected are small-scale farmers who are dependent primarily on rain-fed agriculture. In particular, farmers who are located further away from open water sources, such as rivers, are faced with the need to find and pay for alternatives. Areas remote from rivers, and the communities who live in them, are also among the worst affected and most at risk of desertification, with no proper irrigation or access to water networks. Farmers who depend entirely on agriculture are the most affected of all as they lack access to diversified sources of income, putting them among the most vulnerable to the need to migrate in search of better incomes.

Drought affects groups across Iraq unequally and exacerbates the vulnerabilities that already exist among specific groups such as displaced populations, who prefer not to return to their place of origin as they have lost their assets, services and livelihood opportunities. A 2021 analysis of the cross-sectoral impacts of climate change looked at the connection between deficits in rainfall and population data for IDPs and returnees. It found that the IDP population was the most vulnerable to climate change, with around 74% of IDPs estimated to be living in high-deficit zones. More

than half of people in informal sites are also living in high-deficit zones, as are 44% of returnees.⁶³

Drought also has particular impacts on women, who are already vulnerable and socially constrained. Such vulnerabilities are further deepened in the case of internal migration, especially from rural to urban areas, while putting more stress on the capacities of urban areas to absorb the increasing needs and demands of new arrivals.

CONCLUSION

When speaking with different actors – farmers, government officials or members of civil society – it appears that the majority of them are seeing the impacts of drought now but talk about the need for solutions as a future issue involving better planning and management. While future changes are indeed important, action is needed now to prevent the collapse of communities and further increases in the vulnerability of affected groups. Both national and international actors are responsible for addressing current needs and for designing more tailored and sustainable interventions that build the resilience of the agricultural sector while making the most in future of Iraq's diminishing water resources. The evidence shows that needs are already greater than the available resources. During the research process, it became clear that farmers did not fully understand the scale of the impacts of climate change and saw drought rather as a seasonal issue; in some seasons, they might see more rainfall than in previous years and in others less. Nevertheless, they see drought as an immediate problem that requires an immediate solution. Most farmers assume that if the government supports them with agricultural inputs and the move to smarter and more modern methods of irrigation, and supports product prices in local markets, all the issues relating to drought and climate change will be solved.

It is also clear that there is strong agreement in official circles on the impacts of drought and climate change and on current and future needs, but that any solid political will has yet to emerge to adopt the strategies and actions needed in either the short or the long term.

The situation is predicted to worsen in the coming period. During data collection, many respondents said that unless there were diplomatic efforts to engage with upstream countries and political will on the part of the government to take action and allocate resources for strategic interventions, the situation will continue to deteriorate, affecting all groups across communities. Year after year, more farmers are seeing agriculture as unviable. The younger generations are witnessing the struggles that farmers face today and are already moving away from the sector, looking for stability and more secure livelihood opportunities, which are no longer associated with agriculture. As climate change and drought in the region worsen, agriculture will be directly affected. Without the interventions needed in both the short and long terms, the sector's ability to fill Iraq's

food basket and generate employment will be at risk. Many farmers are already at risk of being no longer able to farm their lands, and this in turn affects the availability of food in the market and contributes to the escalation of prices. This could potentially mean increased dependency on imported food, further affecting local production. With resources becoming scarcer, there could potentially be an increase in disputes over resources and civil unrest, especially if the government is unable to provide improved access to services, including water and electricity. As mentioned, there have already been demonstrations in recent years in protest at the inadequate of service provision and the impacts of the deterioration in the agricultural sector. Migration from rural to urban areas is already happening, with people in search of better incomes. These trends seem likely to accelerate in the near future if the situation remains as it is or gets worse.

As stated in a recent government white paper on economic reform,⁶⁴ approved by cabinet in 2020,⁶⁵ the GoI needs to build trust with farmers while aiming to modernize laws in the agricultural sector, including institutional reforms and the revision of current regulations. The white paper also points to the need for comprehensive rural development and increased allocation of resources for irrigation systems, and stresses the need to protect local agricultural produce, based on the agricultural calendar. In addition, it recommends improving the entire agricultural value chain and working to increase the contribution of the agricultural sector to Iraq's GDP.

RECOMMENDATIONS

THE GOVERNMENT OF IRAQ AND THE KURDISTAN REGIONAL GOVERNMENT SHOULD COMMIT TO UNDERTAKE THE FOLLOWING ACTIONS:

- Make diplomatic efforts to formulate effective approaches to transboundary water governance, establishing long-term and multilateral cooperation with neighbouring countries that share the Euphrates–Tigris river basin. Policies need to be developed to sustain equitable and ecologically sound use of water according to each state's water consumption needs, based on the principle of equitable sharing of water resources.
- In line with the GoI's current plans, establish and implement a framework for economic diversification to ensure that the contributions to GDP of the agricultural and other sectors are increased and that dependency on oil revenues is reduced.
- Increase agriculture's contribution to GDP by allocating resources for development of the sector, supporting rural communities and helping farmers to boost their productivity and resilience against climatic shocks.
- Adopt a clear national strategy for adaptation and mitigation, with a clear vision of current needs and future forecasts of the impacts of

climate change. Such a strategy requires commitment, political will and allocation of resources by the Gol.

- Formulate policies to protect domestic products against competition from imports from neighbouring countries. Such policies need to be adopted and implemented in both Federal Iraq and the Kurdistan Region of Iraq (KRI).
- Draw up a clear plan establishing pricing systems for the electricity and water sectors, to increase efficiency and reduce overconsumption. Such a plan will contribute to increasing the revenue needed for the management of these sectors.
- Address current and potential migration from rural to urban areas with political will and by allocating resources to support well-being and living conditions in rural areas and to help generate economic opportunities both on and off the farm.
- For better management of water resources and identification of needs, engage more closely with local actors from different sectors at the governorate level in decision-making processes.
- Establish early warning systems within affected communities to mitigate drought threats at the local level. Such systems can enhance preparedness, improve water management and reduce crop loss.
- Develop a national action plan to utilize and harvest rainfall, especially in areas prone to flooding, aiming to mitigate the impact of floods while storing water for use in dry seasons.
- Implement policies addressing efficient water management in order to reduce water loss resulting from overconsumption, poor infrastructure, traditional irrigation and agricultural practices and water evaporation, especially from open water surfaces.
- Provide clear support and strategies to help farmers throughout the agricultural value chain, from production to marketing. This can include allocation of resources for storage and processing facilities to utilize produce and reduce product loss and dumping in local markets.
- Prioritize investment in research units, especially those based at universities, to provide research and analysis for strategic plans needed for the development and sustainability of the agricultural sector in Iraq. These units can be utilized to address gaps in data and to support approaches and modalities that can identify adaptation and mitigation measures to tackle the impacts of drought and climate change.
- Conduct awareness-raising campaigns on water scarcity, water management and water use for farmers and communities.

NATIONAL AND INTERNATIONAL ACTORS, INCLUDING RELEVANT MINISTRIES AND DIRECTORATES, AND NGOS SHOULD WORK TO:

- Support the rehabilitation and modernization of irrigation and land drainage systems to manage water usage and challenges of soil degradation and soil salinity. Small-scale solar-powered pumps would potentially be an effective solution to water pumping needs for many farmers, and consideration of long-term operation and maintenance is also vital.

- Support sustainable and efficient water management, including by encouraging drip irrigation and ecosystem approaches to conserving water. In rain-fed conditions, ecosystem approaches aim to maximize water stored in the soil within the root zone of crops, for example by minimizing tillage, managing biodiversity and using organic mulch to prevent losses to evaporation. On-farm water harvesting and water run-off management (swales and bunds) can also support farmers in maximizing scarce water resources. Farmers can also consider planting deeper-rooting crop varieties.
- Support farmers' adoption of modern irrigation systems and agricultural methods and increase their access to finance to support such transformation.
- Support the adoption of longer-term sustainable agricultural practices rather than investing in farming practices that maximize short-term returns. This includes supporting farmers in a transition to adopting climate-smart irrigation systems and practices.
- Provide funding and technical support for longer-term outcomes, e.g. communal watershed management and the use of solar energy to operate wells and water pumps.
- Provide farmers with awareness raising, capacity strengthening and technical support to implement activities relating to climate-smart agriculture and agricultural extension services that are tailored to emerging needs associated with drought.
- Enable different platforms, including farmers' associations, to amplify farmers' voices for accountability and participation in consultations and decision-making spaces. Such engagement will ensure the sharing of knowledge and will encourage locally led initiatives to support the sector. In this regard, more attention needs to be paid to ensuring that these platforms amplify equally the voices of female farmers and ensure their effective representation in decision making at different levels of water management.
- Help build the capacity of farmers' unions and associations and ensure their effective participation in responding to needs and decision-making processes.
- Make efforts, including by increasing awareness and through national campaigns, to increase consumers' trust in locally produced crops and products.
- Encourage greater engagement by women in decision-making processes and help challenge social norms that define women's role in the agricultural sector.
- Prioritize child-centred crisis planning and engage children in national climate advocacy. Children are among the groups most affected by droughts and climate challenges, yet they have the least say.
- Employ nexus approaches to programming by addressing urgent needs while also investing in longer-term programming and addressing the root causes of the crisis.
- Adopt a socio-economic plan to address issues of inequality in Iraq. This plan should be used to design holistic programming, taking account of

the exacerbated inequalities that exist between different groups and communities. More effort is needed to strengthen the resilience of the most vulnerable groups through tailored interventions that benefit those most in need.

- Ensure increased accountability and transparency in decision making and make sure that national/local civil society organizations have a role in decision-making processes for both response planning and implementation of accountability mechanisms.

NOTES

¹ International Organization for Migration. (2021). *Realities of Climate-Induced Migration in Iraq's Southern Cities: New IOM Report*. IOM press release, 21 October 2021. <https://reliefweb.int/report/iraq/realities-climate-induced-migration-iraq-s-southern-cities-new-iom-report-enar>

² World Bank. (2021). *The World Bank in Iraq: Overview*. <https://www.worldbank.org/en/country/iraq/overview#1>

³ World Bank Group. (2020). *Iraq Economic Monitor: Protecting Vulnerable Iraqis in the Time of a Pandemic, the Case for Urgent Stimulus and Economic Reforms. Fall 2020*. <https://openknowledge.worldbank.org/bitstream/handle/10986/34749/154260.pdf>

⁴ OCHA. (2021). *Humanitarian Needs Overview: Iraq*. February 2021. <https://reliefweb.int/sites/reliefweb.int/files/resources/Iraq%20Humanitarian%20Needs%20Overview%20%28February%202021%29.pdf>

⁵ Ibid.

⁶ Norwegian Refugee Council. (2021). *Water crisis and drought threaten more than 12 million in Syria and Iraq*. Press release, 23 August 2021. <https://www.nrc.no/news/2021/august/water-crisis-iraq-syria/>

⁷ United Nations Iraq. (2021). *As Iraq joins Paris Agreement, UN calls for further support to help the country adapt*. Press release, 1 December 2021. <https://iraq.un.org/en/161240-iraq-joins-paris-agreement-un-calls-further-support-help-country-adapt>

⁸ UN Environment Programme. (2019). *GEO-6: Healthy Planet, Healthy People*. UNEP: Sixth Global Environmental Outlook Report. <https://www.unep.org/resources/global-environment-outlook-6?qa=2.118495561.1336518399.1641386645-2043264144.1641103432>

⁹ World Bank Group. (2021). *Iraq Economic Monitor: The Slippery Road to Economic Recovery. Fall 2021*. <https://documents1.worldbank.org/curated/en/981071637593726857/pdf/Iraq-Economic-Monitor-The-Slippery-Road-to-Economic-Recovery.pdf>

¹⁰ WASH Cluster. (2021). *Precipitation and Temperature Change in Iraq – November 2021*. <https://reliefweb.int/report/iraq/wash-cluster-precipitation-and-temperature-change-iraq-november-2021-enar>

¹¹ Chatham House. (2020). *Same Old Politics Will Not Solve Iraq Water Crisis*. <https://www.chathamhouse.org/2020/04/same-old-politics-will-not-solve-iraq-water-crisis>

¹² *Running Dry. The impact of water scarcity on children in the Middle East and North Africa*. (2021). <https://www.unicef.org/mena/reports/running-dry-impact-water-scarcity-children>

¹³ World Bank. (2014). *The Labor Market for the Poor: The Rural–Urban Divide*. Chapter 7 in *Iraq – The Unfulfilled Promise of Oil and Growth: Poverty, inclusion and welfare in Iraq, 2007–2012*. https://www.worldbank.org/content/dam/Worldbank/document/MNA/Iraq_unfulfi

lled promise report chap7.pdf; M. Al-Aloosy. (2021). *Iraq's Water Crisis: An Existential But Unheeded Threat*. The Arab Gulf States Institute in Washington. <https://agsiw.org/iraqs-water-crisis-an-existential-but-unheeded-threat/>; and V. Vilardo and S. Bittar. (2018). *Gender Profile – Iraq*. Oxfam International/UN Women. <https://oxfamilibrary.openrepository.com/bitstream/handle/10546/620602/rr-gender-profile-iraq-131218-en.pdf>

¹⁴ UN Food and Agriculture Organization. *FAO in Iraq: Iraq at a glance*. <https://www.fao.org/iraq/fao-in-iraq/iraq-at-a-glance/en/>

¹⁵ FAO. (2021). *Agricultural value chain study in Iraq: Dates, grapes, tomatoes and wheat*. <https://reliefweb.int/sites/reliefweb.int/files/resources/WFP-0000125470.pdf>

¹⁶ Ibid.

¹⁷ Shakir, L., *Iraq to reduce winter crops area by half: ministry*. (2021). <https://www.rudaw.net/english/middleeast/iraq/18102021>

¹⁸ FAO, IFAD and OCHA. (2021). *Food Security in Iraq: Impact of COVID-19 with a special section on water shortages and adaptation..*

¹⁹ WFP. (2021). *WFP resilience projects respond to water shortages in Iraq*. <https://reliefweb.int/report/iraq/wfp-resilience-projects-respond-water-shortages-iraq-enarku>

²⁰ Republic of Iraq Ministry of Planning. (2018). *National Development Plan 2018–2022*. https://www.iraq-iccme.jp/pdf/archives/nationaldevelopmentplan2018_2022.pdf. The full document in Arabic can be accessed here: <https://mop.gov.iq/static/uploads/8/pdf/1545899649c7e32a25a82e0dd6ae58c5531ceec1d2--%D8%AE%D8%B7%D8%A9%20%D8%A7%D9%84%D8%AA%D9%86%D9%85%D9%8A%D8%A9%20%D8%A7%D9%84%D9%88%D8%B7%D9%86%D9%8A%D8%A9%202018-%202022.pdf>

²¹ World Bank Group. (2021). *Iraq Economic Monitor: The Slippery Road to Economic Recovery*, op. cit.

²² F. Aamer. (2021). *Joint Working Group on International and EU Water Diplomacy – In Focus: The Euphrates-Tigris River Basin*. The Stimson Center. <https://www.stimson.org/2021/joint-working-group-on-international-and-eu-water-diplomacy-in-focus-the-euphrates-tigris-river-basin/>

²³ Y. Hamid. (2020). *Mitigating Conflict over Water in the Euphrates-Tigris Basin*. Arab Center Washington DC. <https://arabcenterdc.org/resource/mitigating-conflict-over-water-in-the-euphrates-tigris-basin/>

²⁴ OCHA Iraq. (2021). *Humanitarian Bulletin: May 2021*. https://reliefweb.int/sites/reliefweb.int/files/resources/may_2021_humanitarian_bulletin.pdf

²⁵ World Bank Group. (2021). *Iraq Economic Monitor: The Slippery Road to Economic Recovery*, op. cit.

²⁶ A.H. Elaiwi, K. Hasan and M. Al-hadithi. (2020). *Management of Natural Iraqi Water Resources, Aims and Challenges*. IOP Conference Series: Materials Science and Engineering 881 012181. <https://iopscience.iop.org/article/10.1088/1757-899X/881/1/012181/pdf>

- ²⁷ World Bank Group. (2021). *Iraq Economic Monitor: The Slippery Road to Economic Recovery*, op. cit.
- ²⁸ Iraqi Ministry of Agriculture - Department of Agricultural Extension and Training. Accessed on March 2022
<http://zeraa.gov.iq/index.php?name=Pages&op=page&pid=143>
- ²⁹ Ground Truth Solutions. (2021). *Falling through the cracks: Iraq's daily workers live without security, savings or support*.
<https://reliefweb.int/sites/reliefweb.int/files/resources/Falling-through-the-cracks--GTS--CCI-2021.pdf>
- ³⁰ Norwegian Refugee Council. (2021). *Iraq's drought crisis and the damaging effects on communities*. <https://www.nrc.no/globalassets/pdf/reports/iraqs-drought-crisis/iraqs-drought-crisis-and-the-damaging-effects-on-communities.pdf>
- ³¹ Ground Truth Solutions. (2021). *Falling through the cracks*, op. cit.
- ³² J. Jongerden et al. (2019). *The Politics of Agricultural Development in Iraq and the Kurdistan Region of Iraq (KRI)*. *Sustainability* 11(21), 5874.
<https://www.mdpi.com/2071-1050/11/21/5874>
- ³³ Jongerden, J.; Wolters, W.; Dijkxhoorn, Y.; Gür, F.; Öztürk, M. The Politics of Agricultural Development in Iraq and the Kurdistan Region in Iraq (KRI). *Sustainability* 2019, 11, 5874. <https://doi.org/10.3390/su11215874>
- ³⁴ World Bank Group. (2021). *Iraq Economic Monitor: The Slippery Road to Economic Recovery*, op. cit.
- ³⁵ International Displacement Monitoring Centre (IDMC). *Iraq*. <https://www.internal-displacement.org/countries/iraq>
- ³⁶ OCHA. (2019). *Humanitarian Needs Overview 2019: Iraq*.
https://reliefweb.int/sites/reliefweb.int/files/resources/irq_2019_hno.pdf
- ³⁷ OCHA. (2021). *Humanitarian Needs Overview: Iraq*, op. cit.
- ³⁸ IOM Displacement Tracking Matrix (DTM). *Iraq*. <https://dtm.iom.int/iraq?page=25>
- ³⁹ UN Iraq. (2013). *Water In Iraq Factsheet*.
<https://reliefweb.int/sites/reliefweb.int/files/resources/Water-Factsheet.pdf>
- ⁴⁰ IOM Iraq. (2020). *Water Quantity and Water Quality in Central and South Iraq: A Preliminary Assessment in the Context of Displacement Risk*.
<https://reliefweb.int/sites/reliefweb.int/files/resources/Water%20quantity%20and%20water%20quality%20in%20central%20and%20south%20Iraq%20-%20Final.pdf>
- ⁴¹ Norwegian Refugee Council. (2021). *Iraq's drought crisis and the damaging effects on communities*, op. cit.
- ⁴² Y. Hamid. (2020). *Mitigating Conflict over Water in the Euphrates-Tigris Basin*, op. cit.
- ⁴³ UN Iraq. (2013). *Water In Iraq Factsheet*, op. cit.
- ⁴⁴ FAO, CGIAR, CARE. (2021). *Deploying a humanitarian-development-peace nexus approach: Exploring, strengthening and reviving dryland ecosystems*. Forestry Discussion Paper. <https://www.fao.org/3/cb6917en/cb6917en.pdf>

- ⁴⁵ E. Cherry. (2021). *Iraq's Water Politics: Impacts of Drought, Mismanagement and Conflict in the Middle East*. Brussels International Center. <https://www.bic-rhr.com/sites/default/files/inline-files/Iraq%27s%20Water%20Politics.pdf>
- ⁴⁶ Iraqi Presidency. (2021). *Mesopotamia Revitalization Project: A Climate Change Initiative to Transform Iraq and The Middle East*. <https://presidency.iq/EN/Details.aspx?id=3437>
- ⁴⁷ Iraqi Presidency. (2021). *Iraqi President Approves Iraq's Accession to the Paris Agreement on Climate Change*. <https://presidency.iq/EN/Details.aspx?id=2169>
- ⁴⁸ United Nations Iraq. (2021). *As Iraq joins Paris Agreement, UN calls for further support to help the country adapt*, op. cit.
- ⁴⁹ K.F. Dri. (2021). *Iraq requests \$10 billion from global climate fund: official*. Rudaw Media Network. <https://www.rudaw.net/english/middleeast/iraq/13112021>
- ⁵⁰ IOM. (2021). *Migration Into A Fragile Setting: Responding to Climate-Induced Informal Urbanization and Inequality in Basra, Iraq*. <https://reliefweb.int/sites/reliefweb.int/files/resources/IOM%20Iraq%20Migration%20into%20a%20Fragile%20Setting-Responding%20to%20Climate-Induced%20Informalization%20and%20Inequality%20in%20Basra.pdf>
- ⁵¹ A.H. Al-Muhyi. (2016). *The Challenges Facing Shatt Al Arab River in Present and Future*. *Marsh Bulletin* (2)2016. <https://www.iasj.net/iasj/download/249b2d1d8387cfa1>
- ⁵² B.R. Yaseen et al. (2016). *Environmental Impacts of Salt Tide in Shatt Al-Arab-Basra/Iraq*. *IOSR Journal of Environmental Science, Toxicology and Food Technology*, Vol. 10, Issue 1. <https://portal.arid.my/Publications/e0b668ae-f88a-4c.pdf>
- ⁵³ IOM. (2021). *Migration Into A Fragile Setting*, op. cit.
- ⁵⁴ A. Al-Rubaie, M. Mason and Z. Mehdi. (2021). *Failing Flows: Water Management in Southern Iraq*. *LSE Middle East Centre*. [http://eprints.lse.ac.uk/110973/2/Failing Flows_003_.pdf](http://eprints.lse.ac.uk/110973/2/Failing_Flows_003_.pdf)
- ⁵⁵ OCHA Iraq. (2021). *Humanitarian Bulletin: May 2021*, op. cit.
- ⁵⁶ <http://zeraa.gov.iq/index.php?name=News&file=article&sid=9469> Shakir, L., *Iraq to reduce winter crops area by half: ministry*. (2021). <https://www.rudaw.net/english/middleeast/iraq/18102021>
- ⁵⁷ <https://www.ina.iq/139393--.html>
- ⁵⁸ A. Jawad. (2021). *Iraq urges Iran to respect its water rights amid dispute*. Anadolu Agency. <https://www.aa.com.tr/en/middle-east/iraq-urges-iran-to-respect-its-water-rights-amid-dispute/2301119>
- ⁵⁹ D. Sirwan. (202). *Iraq will discuss water issue with Iran, Turkey at 36th FAO Regional Conference*. Rudaw Media Network. <https://www.rudaw.net/english/middleeast/iraq/08022022>
- ⁶⁰ Save The Children, 2021. *Drought Summary Report, Diyala Governorate, Sci, June 2021*.(internal document).
- ⁶¹ Iraqi Presidency. (2021). *Mesopotamia Revitalization Project*, op. cit.

⁶² Norwegian Refugee Council. (2021). *Iraq's drought crisis and the damaging effects on communities*, op. cit.

⁶³ WASH Cluster. (2021). *Precipitation and Temperature Change in Iraq – November 2021*, op. cit.

⁶⁴ Emergency Cell for Financial Reform. (2020). *White Paper: Final Report*. <http://iraqieconomists.net/en/wp-content/uploads/sites/3/2020/10/Iraq-White-Paper-Complete-En.pdf>

⁶⁵ Government of Iraq. (2020). *Cabinet approves the White Paper for economic reforms*. <https://gds.gov.iq/cabinet-approves-the-white-paper-for-economic-reforms/>



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