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BEYOND A TECHNOCRATIC SOLUTION: IRAQI FARMERS AND LOCAL CLIMATE ADAPTATION

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About the study

This study is part of the Arab Reform Initiative's project DIRAIA, "Knowledge" in Arabic, short for "Developing Inclusive Research through Activism and Informed Advocacy". Focusing on fieldwork and multi-method research in Iraq, Lebanon, Morocco, and Tunisia, DIRAIA explores how frontline communities and organizations are mobilizing around environmental grievances as they intersect with socio-economic and political injustice across the region. DIRAIA is part of the network of Knowledge Alliance for Environmental Defenders (KALLIED), which brings together 32 organizations from 22 countries across the Global South and is funded by Canada's IDRC.

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Cover photo: Al Musharrah, Iraq - Iraqi rice farmers, June 2018.

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Executive Summary and Policy Recommendations

The government of Iraq and international organizations operating in the country have taken a technocratic approach to climate change adaptation. In the agricultural sector, the government has provided incentives for farmers to adopt sustainable farming methods in the form of subsidies and loans for the purchase of drip irrigation systems and solar panels. The government also buys wheat at a slightly higher price from farmers who use sustainable farming techniques. For their part, international organizations have both shaped the Iraqi government's policies on climate adaptation and equipped small numbers of farmers with solar and drip irrigation systems. They have also endeavored to provide training to farmers in sustainable farming techniques and in maintaining renewable energy systems.

These technical approaches have failed to address the socio-economic inequalities and political hierarchies that farmers must navigate to practice agriculture, and which makes some social groups more vulnerable to climate change than others. Many farmers cannot afford to take out loans to purchase sustainable agricultural systems and corruption at various levels continues to hamper the efforts of both international organizations and the Iraqi government, limiting the effectiveness of these schemes. Moreover, the post-2003 neoliberalization of the Iraqi economy and the fact that the country's political elite and affiliated militias have captured the agricultural sector has left Iraqi farmers without a market for their produce.

In response, Iraqi farmers have adopted unstructured, spontaneous local adaptation strategies to try to navigate extreme weather conditions, political corruption, and neoliberalism. For example, to manage water scarcity, farmers have begun to dig wells and use groundwater for irrigation purposes. While well-digging risks depleting groundwater reserves, it is also a means for farmers to circumvent centralized, regularly politicized water allocations. In the face of extreme weather events, farmers have begun to grow new types of drought-resistant crops, planting more than one type of produce, so that if a particular crop fails during a season, they are still able to harvest and sell others. Yet often, they select crops they believe will be better able to compete with cheap imports from neighboring states.

Iraqi farmers' adaptation strategies point to the need to move away from mere technical solutions and to challenge existing structures in a bid to achieve transformative adaptation; that is, a system-wide transformation that addresses the root causes of vulnerabilities to climate change, taking into consideration socio-economic factors and a fairer distribution of political, cultural, and institutional power in society.[1]

Based on the findings of this study, the following actions are recommended:

To the Government of Iraq:

- Work with farmer organizations and civil society to amend Article 11 of Law No.15 of 2013 on the Registration, Certification, and Protection of Agricultural Varieties so that it protects farmers' rights to exchange and save seeds.

1 UN Framework Convention for Climate Change (UNFCCC), "Defining and Understanding Transformational Adaptation at different Spatial Scales and Sectors, and Assessing Progress in Planning and Implementing Transformational Adaptation Approaches at the Global Level", 5 November 2024, FCCC/TP/2024/8, https://unfccc.int/sites/default/files/resource/tp2024_08.pdf

- Embed, set targets for, and incentivize the uptake of generative approaches, such as permaculture and agroforestry, in the Ministry of Agriculture's annual plan.
- Strengthen domestic markets for Iraqi farmers, including reopening and utilizing national factories that were closed following the 2003 invasion.

To International Organizations:

- Invest in researching new adaptation strategies, including transformative adaptation, and utilizing long-term monitoring and evaluation processes to ensure the effectiveness of these strategies before they are implemented on a wide scale.[2]
- Leverage expertise to support the Iraqi government in amending Law No.15 of 2013 on the Registration, Certification and Protection of Agricultural Varieties and to bring it in line with international standards, including the International Treaty on Plant Genetic Resources for Food and Agriculture.[3]
- Act as a neutral third party to support in the identification of a feasible pathway towards the strict implementation of import bans on seasonal produce into Federal Iraq and the Kurdistan Region. Such a strategy should be developed in cooperation with all actors involved in controlling the country's borders and trade routes, including armed groups allied with Iran, merchants, senior security officials, and civil servants.[4]

To Civil Society Organizations and Researchers:

- Generate critical discussions about dominant value systems, rules, and practices, especially in relation to market systems and Iraqi society's relationship to nature, in order to open pathways for different types of adaptation and development strategies.
- Support the creation and strengthen farmer cooperatives, which may help the most marginalized farmers share both the monetary cost of purchasing sustainable agricultural systems as well as the risk burden of extreme weather events.
- Create a coalition of civil society, farmer organizations, and academics in the field of agriculture, and reformist civil servants within relevant ministries to advocate for the amendment, adoption, and implementation of Law No.15 of 2013 in its revised form.

2 Giacomo Fedele et al., "Transformative Adaptation to Climate Change for Sustainable Social-Ecological Systems", Environmental Science and Policy 101 (2019) pp. 116–125, https://doi.org/10.1016/j.envsci.2019.07.001

3 UN Food and Agricultural Organization (FAO), "International Treaty on Plant Genetic Resources for Food and Agriculture", n.d., https://www.fao.org/plant-treaty/en/

4 For more information of the limitations of approaches that do not include all actors, see Hayder Al-Shakeri and Renad Mansour, "How Supply Chains Fuel Transnational Conflict in the Middle East", Chatham House, 22 January 2025, https://www.chathamhouse.org/2024/11/how-supply-chains-fuel-transnational-conflict-middle-east [Al-Shakeri and Mansour, "How Supply Chains Fuel"]

Introduction

Iraq is one of the most vulnerable countries to climate change globally.[5] According to the International Energy Agency (IEA), between 2000 and 2023, Iraq's average temperatures increased by 0.48 degrees Celsius (°C) per decade, significantly higher than the global warming average of 0.37 °C.[6] Temperatures are set to rise still and could, in a high emissions scenario, rise by 5.6 °C compared with pre-industrial levels.[7] The country has also seen an increase in extreme weather events, such as droughts followed by periods of heavy rainfall and sandstorms.[8] In addition, drought, salination, and land degradation have displaced rural agricultural communities, resulting in increased migration to cities. The International Organization for Migration (IOM) estimates that as of March 2024, over 140,000 individuals remain displaced across Iraq due to climate-related factors.[9] Farming communities in North and Central Iraq in particular, who faced mass displacement due to the rise of Daesh (Islamic State), have also been slow to return to agriculture due to financial constraints, difficulties in accessing land, and security concerns.[10] The Iraqi government's poor policy planning has exacerbated these issues, especially in relation to water management, resulting in poor water treatment facilities where water is often highly polluted, especially in the Southern regions of Iraq.[11] What is more, Iraq continues to suffer from transboundary water-sharing challenges. This is because it requires binding cooperation mechanisms, such as institutions or agreements, that might enable it to negotiate the shares of water it receives from neighboring states, such as Turkey and Iran, which house the tributaries for both the Tigris and Euphrates rivers on which 90% of Iraq's freshwater supply depends.[12]

Amid this bleak and unrelenting picture, much of the recent grey and academic literature on climate change in Iraq has focused on the macro-level causes and consequences of climate change. This study turns instead to local climate adaptation strategies of Iraqi farmers, exploring how they are surviving amid precarity and an increasingly inhospitable context – as well as how the Iraqi state and international organizations shape and constrain their actions. This focus is inspired by the recent work of anthropologist Munira Khayyat who observes: "For a large number of those we share this planet with, who are less fortunate than us, the end of the world is nothing new."[13] Some people, usually those with the least access to economic, social, and political power, have had to live with precarity, changed climates, and upheaval for all their lives and find ways to survive in these environments.[14] The arguments presented in this study are partly framed by Khayyat's notion of "resistant ecologies", which she defines as "multi-species survival collectives that sprout around agricultural practices sustaining life" through conflict.[15] While Khayyat

5 Sarah Sanbar, "Iraq's Climate Crisis Is a Human Rights Crisis", Human Rights Watch, 2025, https://www.hrw.org/news/2025/03/27/iraqs-climate-crisis-human-rights-crisis

6 International Energy Agency (IEA), "National Climate Resilience Assessment for Iraq", January 2025, https://www.iea.org/reports/national-climate-resilience-assessment-for-iraq [IEA, "National Climate Resilience"]

7 IEA, "National Climate Resilience".

8 IEA, "National Climate Resilience"; Noor Taher, "Iraq: A Rapidly Changing Climate, and Imperative for Coordinated Action", Norwegian Refugee Council, 5 May 2023, https://www.nrc.no/perspectives/2023/iraq-a-rapidly-changing-climate-and-imperative-for-coordinated-action

9 International Organization for Migration (IOM) Displacement Tracking Matrix (DTM), "Climate-Induced Displacement – Central and Southern Iraq", 1-15 March 2024, https://dtm.iom.int/es/node/39131

10 Ahmad Sadiddin et al., "Are Iraqi Displaced Farmers Returning to agriculture?", Food and Agriculture Organization (FAO) and IOM, 14 February 2023, https://dtm.iom.int/fr/node/21776?close=true

11 Mohammed Mahmoud, "The Looming Climate and Water Crisis in the Middle East and North Africa", Carnegie Endowment for International Peace, 19 April 2024, https://tinyurl.com/4b52ezd5

12 Tobias von Lossow et al., "Action Needed: Three Priorities for Iraq's Water Sector", Water, Peace and Security (WPS) and The Clingendael Institute, June 2022, p. 4, https://waterpeacesecurity.org/files/229

13 Munira Khayyat, "Resistant Ecologies: The Life of War in South Lebanon", American Ethnologist 50, no. 2 (2022) p. 186, https://doi.org/10.1111/amet.13110 [Khayyat, "Resistant Ecologies"]; see also Munira Khayyat, A Landscape of War: Ecologies of Resistance and Survival in South Lebanon, University of California Press, 2022.

14 For similar arguments, see Kali Rubaii, "What Displacement Teaches Us about Surviving Changed Climates", The Project on Middle East Political Science, n.d., https://pomeps.org/what-displacement-teaches-us-about-surviving-changed-climates and Juliette Duclos-Valois, "Under the Baghdad Sun", Anthropology News 65, no. 1 (2024), https://www.anthropology-news.org/articles/under-the-baghdad-sun/

15 Khayyat, "Resistant Ecologies", p. 185.

writes about multi-species survival in the context of war in Southern Lebanon – of relevance for Iraq, which has seen decades of active armed conflict – anthropologist Anna Lowenhuapt Tsing shows it is also an applicable framework for thinking about what happens in the aftermath of devastation, whether in the context of global warming or industrial disaster, where she puts it: "We are stuck with the problem of living despite economic and ecological ruination."[16] The solutions that people find in such contexts cannot protect communities from the effects of climate change in the long term, but they reflect the messy and complex ways in which people navigate staying alive in increasingly harsh contexts.[17] Documenting such experiential understandings of the environment is necessary because of the ways in which they differ from policy conceptualizations, as the literature on multispecies survival strategies also suggests. Policy work on climate change adaptation and mitigation often separates nature from society, argue Andrea Joslyn Nightingale et al., from broader socio-economic and political change.[18]

In line with this literature, this study finds that the Iraqi government's climate adaptation interventions have been purely technocratic, often centered on the provision of sustainable technologies to farmers. They have been shaped by international donor organizations, who often steer and fund this work at the policy level, as well as deliver similar technocratic solutions themselves. For its part, the Iraqi government has sought to incentivize the uptake of sustainable agricultural techniques by farmers, primarily in the form of drip irrigation and solar energy systems. International organizations have complimented this strategy by, for the most part, distributing modern irrigation systems and other agricultural equipment and providing training to a small number of farmers. Yet for the farmers centered in this report, weather extremes are only one part of the broader political, economic, and social inequalities they have had to navigate to practice agriculture.[19] Socio-economic inequalities and political hierarchies have hampered governmental and donor efforts that a technocratic approach to adaptation is unable to address. What is required, as Marcus Taylor argues, is a bottom-up approach to climate policies based on lived realities, as opposed to ideas about climate that continue to circulate at the level of governments and international organizations.[20] To do so would mean moving beyond technocratic solutions and towards a more equitable balance of social, political, and economic power in society.

This study also finds that faced with increased precarity, farmers in Iraq have undertaken spontaneous and unstructured behavioral changes to survive rapidly changing climates. However, as interviews with farmers highlight, these strategies have not only been aimed at managing extreme weather events but also with issues entrenched in political corruption and neoliberalism that have increased their vulnerability to climate shocks, As such, these strategies need to move beyond technocratic fixes and towards a transformative understanding of adaptation, which centers and promotes their lived experiences, knowledge, and priorities.

Methodology

The findings of this study are primarily based on 34 interviews, conducted between April and May 2025, with farmers, civil society activists and organizations (CSOs), government officials, and international organizations across Kurdistan (Erbil, Akre, Choman) and Northern, (Al-Hamdaniya, Mosul), Central (Baghdad, Fallujah), and Southern (Zubair, Madiana, Hartha, Basra City, Chibayish) Federal Iraq.[21] These locations were chosen to ensure that the study was as representative as possible, especially given the diverse effects of climate change and conflict-related pollution and displacement across different parts of the country.[22] Participants were included in this study on the basis of the following criteria: government officials working on agricultural issues, including provincial,

16 Anna Lowenhuapt Tsing, The Mushroom at the End of the World: On the Possibility of Life in Capitalist Ruins, Princeton University Press, 2015, p. 19.

17 Khayyat, "Resistant Ecologies", p. 190.

18 Andrea Joslyn Nightingale et al., "Beyond Technical Fixes: Climate Solutions and the Great Derangement", Climate and Development 12, no, 4 (2019) pp. 343–352, https://doi.org/10.1080/17565529.2019.1624495

19 Marcus Taylor, "Rethinking Climate Change Adaptation", in Climate, Science and Society: A Primer, Zeke Baker, Tamar Law, Mark Vardy and Stephen Zehr (eds.), Routledge, 2023, pp. 207–213. [Taylor, "Rethinking Climate Change"]

20 Taylor, "Rethinking Climate Change".

21 Thanks especially to Yaseen Mousa Jundi in Madiana, Northern Basra, for assisting in setting up interviews with farmers in the area.

22 IEA, "National Climate Resilience".

ministerial, and executive levels; agricultural CSOs or associations or those that run agricultural programs; and small-holder and large commercial farmers with and without government contracts who grow different types of crops across different regions of Iraq. Data collection carried out for this study is contextualized by a further 30 interviews carried out with activists, CSOs, academics, and journalists as part of an earlier published report, Navigating the Challenges of Environmentalism in an Increasingly Authoritarian Iraq, as well as a literature review of policy reports, media articles, and academic papers on climate adaptation in Iraq.[23] To ensure the safety of participants, the names of all interlocuters in this study are anonymized.

The selection of participants was carried out through purposeful and gatekeeper sampling. For the most part, interviews were carried out one-on-one with organizations and individuals working on issues such as climate adaptation and agriculture in Iraq, already familiar to the author. Snowball sampling was used after initial contact to diversify the participants and to limit any biases in the author's network. To conduct interviews with farmers based in rural and hard-to-reach areas, local people and organizations from those areas in question put the author in touch with farmers. In these instances, interviews with farmers were often conducted in groups, allowing for more efficient data collection. In terms of the breakdown of the interviews, 10 were conducted in Northern Iraq and the Kurdistan Region, 19 in Southern Iraq, and five in Central Iraq. Handwritten notes were taken during all the interviews, and, upon the agreement of participants, some interviews were also audio recorded. Interviewees were asked a similar set of questions, adapted based on their profession – for example, government official, farmer, or international donor – and the answers they gave. Broadly, the questions asked included how climate change had affected farmers' agricultural practice, how they had dealt with these challenges, whether they received support from the government or international organizations, and the extent to which this was helpful and why. The interviews were then transcribed and analyzed for common themes.

23 Taif Alkhudary, "Navigating the Challenges of Environmentalism in an Increasingly Authoritarian Iraq", Arab Reform Initiative, 6 February 2025, https://tinyurl.com/mptveasv

Technocratic Adaptation in the Agricultural Sector

In recent years, the government of Iraq has drafted various documents, which set out its climate resilience and adaptation strategies, particularly in high-risk sectors such as water and agriculture. Among the most important of these is its first Nationally Determined Contribution (NDC) plan, which was developed in collaboration with UNDP and submitted in 2022.[24] Iraq's NDCs lay out a variety of technical interventions to address how key sectors will adapt to climate change. In relation to farming, the government sets the aim of developing climate resistant crops and encourages the use of modern farming techniques, including the use of plastic houses, with an aim to improve food security and a view towards economic diversification. In relation to water, the government's focus is to expand its water infrastructure through building dams, desalination projects, modern irrigation techniques, and ensuring sustainable ground water use.

Among the major issues facing Iraq is that between 75-80% of all water used goes towards agriculture and yet this only makes up 2% of gross domestic product (GDP).[25] Farmers continue to use outdated and water-intensive irrigation techniques, such as flood irrigation using open canals. To reduce water use in agriculture, the Ministry of Water Resources imposed strict water quotas on farmers and introduced several schemes to encourage the uptake of modern irrigation to ensure greater efficiency.[26] In addition, the government subsidizes

24 UNDP and the Iraq Government Ministry of Environment, "National Determined Contributions of Iraq (NDC)", 2021, https://faolex.fao.org/docs/pdf/irq205646.pdf. In 2025, Iraq also launched its Green Climate Fund (GCF) country program, designed to support the implementation of its NDCs, see GCF, "Country Programme: Republic of Iraq", April 2025, https://tinyurl.com/55zw8er7; The Kurdistan Region of Iraq also has its own local adaptation plan, which largely reiterates the targets of Iraq's countrywide NDC plan, see UNPD and the Government of the Kurdistan Region of Iraq, "Local Climate Adaptation Plan for Kurdistan Region – Iraq", May 2024, https://www.undp.org/sites/g/files/zskgke326/files/2024-08/kurdistan_lap_-final_-_english.pdf

25 Fanack Water, "Water Use in the Middle East", 6 December 2022, https://water.fanack.com/iraq/water-use-in-iraq/

26 Safaa Khalaf and Julia Choucair Vizoso, "Mobilizing for the Environ-

the purchase of modern irrigation techniques by 30% for farmers willing to invest in them, and buys wheat from them at a slightly higher price than framers who irrigate their crops using traditional methods.[27] In recent years, the government has also been testing a new variety of hybrid rice that can be watered using sprinklers, as opposed to flood irrigation. Following a two-year ban on rice cultivation due to water scarcity, the government plans to roll out these hybrids across the country as a means of increasing food security.[28]

In addition, the government gives out loans to farmers at low interest rates for agricultural purposes, including for the purchase of plastic houses, drip irrigation, and other agricultural equipment, and for the improvement or reforestation of orchards and date palm forests.[29] However, there is no publicly available data regarding how many farmers are part of this agricultural plan or how many make use of these services. Moreover, since 2022, the Ministry of Electricity has also run several schemes in cooperation with the Central Bank, giving out loans for solar panels used for operating irrigation machinery.[30] According to interlocuters, the Ministry of Agriculture also provides a few additional, very limited services to farmers at the provincial level, including advisory services, providing small amounts of pesticide, and distributing wheat kernels annually to farmers who are part of the agricultural plan at a subsidized rate of 70%.[31]

Similarly, the work of international organizations operating in the country, such as the United Nations Development Fund (UNDP), the Food and Agricultural Organization (FAO), IOM, and the Norwegian Refugee Council (NRC), has mainly focused on equipping a limited number of farmers with tools to ensure more efficient water use and sustainable farming practices. The most common interventions are distributing drip irrigation systems and equipping farms with solar panels to power water pumps. According to staff at these organizations, this type of programming serves a twin purpose: decreasing farmers' costs by saving on diesel; and in areas liberated from Daesh, encouraging conflict-displaced farmers to return to their homes by showing them a source of income.[32]

International organizations have also provided farmers with additional equipment, such as plastic houses, fishing nets to discourage electrofishing, small tractors, pesticides, plastic water tanks for irrigation when rainfall is limited, and in marshlands in particular, they gave out fridges to ensure cheese and other produce from buffalo herders would not spoil due to a rise in temperatures.[33] Often, this equipment was left with the agricultural directorate or in newly created local centers, as a means of ensuring the largest number of farmers possible could borrow them for short periods of time.[34]

International organizations also play a large part in the provision of trainings and capacity building, especially among young people, including in the use of modern irrigation techniques, sustainable farming practices, the use of composting to create and sell fertilizer, and how to use and maintain solar energy systems.[35] To some extent, they also do some limited work in helping to rehabilitate water infrastructure, through for example, lining and extending water canals and reconstructing water treatment plants in areas liberated from Daesh.[36]

The final key area of intervention for international organizations working on climate adaptation in

ment in Iraq", Arab Reform Initiative, 25 October 2024, https://www.arab-reform.net/publication/mobilizing-for-the-environment-in-iraq/

27 Interview with advisor to the Prime Minister on agriculture in Baghdad, 7 May 2025; Amna Al-Salami, "Agriculture: Modern Irrigation Techniques to Cover an Area Exceeding 1.4 million dunums" [Arabic], Iraqi News Agency, 13 December 2024, https://www.ina.iq/223578--400-.html

28 Reuters, "Iraq Resumes Rice Cultivation after Two-Year Ban with New Climate Friendly Strain", Arab News, 22 July 2024, https://www.arabnews.com/node/2554101/middle-east

29 Interviews with farmers in Hartha and Madiana in Northern Basra, 3 and 6 May 2025, respectively; Interview with advisor to the Prime Minister on agriculture in Baghdad, 7 May 2025; NRT, "With Low Interest Rates…the Ministry of Agriculture Announces New Loans for Farmers" [Arabic], 6 September 2024, https://www.nrttv.com/ar/detail3/32811

30 Israa Al-Samaria, "Loans for Farmers to Buy Solar Energy Systems" [Arabic], Al-Sabah, 6 May 2025, https://alsabaah.iq/114011-.html; Al-Arabiya Magazine "Monthly Instalments of 51,000 dinars to Facilitate the Instalment of Solar Power Plants in Homes" [Arabic], 20 May 2025, https://tinyurl.com/5bexnp8r

31 Interview with farmers in Madiana, Northern Basra, 6 May 2025; Interview with civil servant at the Fallujah Agricultural Directorate, 10 May 2025; Mohammed Nasir, "The Ministry of Agriculture Allocates 1,000 tonnes of Wheat Kernels to Basra Farmers" [Arabic], Iraq News Agency, 31 October 2024, https://www.ina.iq/220378--1000-.html

32 Interview with international organization employee in Baghdad, 10 May 2025.

33 Interviews with farmers in Chibayish, 5 May 2025.

34 Interview international organization employee in Erbil, 1 May 2025; Interview with environmental activist from Basra over WhatsApp, 2 May 2025. Interviews with farmers in Hartha, Northern Basra, 3 May 2025.

35 Interview with civil society activist from Fallujah over WhatsApp, 15 September 2024.

36 Interview with Agricultural Association in Baghdad, 10 May 2025.

Iraq is in afforestation initiatives, particularly in the Kurdistan region where they have been instrumental in supporting campaigns to create substantial green belts in the region, including plans to plant 20,000 olive trees and one million oak trees.[37]

However, a substantial number of these projects have been left incomplete or have been halted altogether due to cuts in development aid, particularly by the United States following the closure of USAID in January 2025.[38] This means that such projects are only set to shrink further in coming years, and it is difficult to replicate them given the huge costs they entail, particularly those that seek to implement modern irrigation methods and solar panels.

Limitations of the Technocratic Approach

The technocratic approaches to climate adaptation fail to take into consideration socio-economic precarity. For example, farmers who take out loans to purchase modern irrigation systems often struggle to make monthly repayments.[39] Farmer precarity is exacerbated by the competition from imported goods and the increase in extreme weather events, which has meant that crops are more likely to fail. As a result, farmers are likely to sell off parts of these irrigation systems if their crops fail or they go through a period of low productivity. What is more, both irrigation and solar power systems are expensive to maintain and require a dedicated budget for their upkeep and repair. The Iraqi government's lack of quality assurance and regulations exacerbate these costs, which means that some of the equipment purchased by farmers is low quality and needs constant replacing.[40]

In some areas, farmers cannot afford the large solar panel systems needed to generate enough electricity for irrigation.[41] As a community leader in Al-Hamdaniya, Northern Iraq, explained:

> *There are some people [in the villages] who are using solar panels now, but this is very limited, and it has a lot of issues. They installed solar panels that were supposed to operate the water pump, but it didn't work. It needs 50 amps; the solar panels could only provide 15 amps. Just to generate this small amount cost them 4,000 USD in terms of start-up costs. It is very expensive.*[42]

He went on to explain that the cost to install drip irrigation in a medium sized farm amounted to around 45,000 USD. While it is difficult to find accurate figures for the average salary made by farmers across Iraq, NRC conducted a survey in Basra in 2022 showing that on average farmers made 280,000 IQD (191 USD) per month, a figure that falls far below the amount needed to install and use sustainable farming technologies.[43] Moreover, tenant farmers interviewed in Basra also complained that often there is no follow up on loans given out by the government, which means land owners can take these loans and use them for other purposes. For example, they would build houses or start other businesses, instead of improving agricultural land or outfitting them with modern equipment or machinery.

As outlined in the previous section, international organizations have tried to redress socio-economic inequalities to some extent through the provision of some equipment to farmers free of charge, as well as giving workshops in their maintenance. Nevertheless, these initiatives remain small-scale, short-term, and lack legitimacy among beneficiaries. In one case observed while conducting a field visit in Nasiriyah, a small-scale initiative entailed giving out around a dozen water tanks, which on the Iraqi market cost only around 20,000 IQD (15 USD) each.[44] According to interlocuters, the aim of such projects was to give the appearance that the organizations were working this area, without actually providing

37 Interview with civil society organization in Erbil, 1 May 2025; Interview with civil society organization from Kurdistan over WhatsApp, 4 May 2025.

38 Interviews with international organization employee in Erbil, 1 May 2025, and Baghdad, 8 May 2025. Interview with civil society organization in Erbil, 1 May 2025.

39 Hussein Mishbak, "Assessing the Impact of Agricultural Policy on Food Security in Iraq: The Case of Dhi Qar", Institute of Regional and International Studies, 12 February 2025, https://tinyurl.com/ybw8su4x

40 Interview with international organization employee in Baghdad, 8 May 2025.

41 Interview with deputy head of civil society organization in Erbil, 1 May 2025.

42 Interview with Community leader in Al-Hamdaniyia, 30 April 2025.

43 Caroline Zullo, "From Farm to Fork with Iraqi Farmers in Basra", Norwegian Refugee Council, 9 August 2022, https://www.nrc.no/perspectives/2022/from-farm-to-fork-with-iraqi-farmers-in-basra

44 Interview with head of environmental organization in Chibayish, 5 May 2025.

any substantive benefits.[45] An interlocuter who previously worked for an international organization argued that the drip irrigation equipment being distributed was also inadequate: "They gave out one-inch hoses which were six meters long, with 6-10 extra branches and no water pumps. How are people supposed to use these hoses for irrigation?"[46] In his view, although international organizations allocated large sums of money to climate adaptation projects, the vast majority of this funding ended up being spent on NGO staff accommodation and flights as opposed to helping beneficiaries, thus limiting the effectiveness of aid.

The farmers' ability to adapt to changed climates is also limited by the failure of technical interventions to address widespread, politically sanctioned corruption in Iraq. When the initial round of loans for solar panels was announced in 2022, only certain companies linked to political parties could purchase this equipment. This meant that much of it was of poor quality.[47] In fact, the head of the parliamentary electricity committee made a public statement in which he claimed that individuals within the Ministry of Electricity had purposefully attempted to delay the rollout of solar panels because they wanted contacts to go to companies with which they had ties. Due to this form of corruption – along with the hurdles posed by the complexity of the application process – of the one trillion dollars the Central Bank allocated for this project, only 250 million dollars had been spent by 2025.

Many of the farmers interviewed also suspected that subsidies and other government services were disproportionately awarded to farmers with political connections. According to them, farmers with such connections are able to use these advantages to cultivate large swathes of land, with the Iraqi government increasingly purchasing produce from them at the expense of the portions allocated to smaller farmers.[48] While there are syndicates that are officially meant to be independent representatives in the interests of farmers, they are known to be closely aligned with various government ministries and use their positions to gain investment opportunities within the agricultural sector.[49]

The marginalization of Iraqi farmers has been exacerbated further through the neoliberalization of the Iraqi economy following the U.S.- and UK-led 2003 invasion. Crucially, Iraq's post-2003 seed patent laws – originally brought in through an order by the Coalition Provisional Authority (CPA) that amended the patent law of 1970 – allowed international seed companies to patent seeds in Iraq and prohibited farmers from saving and multiplying their seeds.[50] While this law was repealed in 2013, it was replaced by a new one, which primarily protects the rights of seed breeders, and criminalizes farmers for exchanging and saving patented seeds.[51] Taken together, these factors have worked to perpetuate dependence on international companies that produce and import the seeds to Iraq and trap farmers in a cycle of debt accumulation. What is more, as Naiomi Klein argues, the CPA sought to "remake" Iraq into "the widest-open market anywhere", opening its border to unfettered trade within a month of the invasion, while dismantling national production and social security nets.[52] Both Iraq's borders and the agricultural sector have since been captured by the country's political elite, who often have links to armed groups allied with neighboring countries, such as Iran, allowing them to import large amounts of agricultural produce that flood the Iraqi market.[53] As a result, depending

45 Interview with head of environmental organization in Chibayish, 5 May 2025.

46 Interview with civil servant in Basra, 6 May 2025.

47 Interview with member of an NGO in Erbil, 8 September 2024.

48 Interviews with farmers in Hartha and Madiana, Northern Basra, 3 and 6 May 2025; Interview with international organization employee in Baghdad, 8 May 2025.

49 Baghdad Today, "Farmers' Associations…the Third Hand of Corruption Ravaging the Agricultural Sector…and Its President Faces Judicial Decisions" [Arabic], 27 September 2022, https://baghdadtoday.news/201653-.html

50 Schluwa Sama and Ansar Jasim, "Imperialism and Iraq's Agricultural System", Alameda Institute, 2024, https://alameda.institute/dossier/imperialism-and-iraqs-agricultural-system/ [Sama and Jasim, "Imperialism and Iraq"]

51 Iraqi Ministry of Justice, "Law No. 15 of 2013 on the Registration, Certification, and Protection of Agricultural Varieties", https://faolex.fao.org/docs/pdf/irq179248.pdf

52 Naomi Klein, The Shock Doctrine: The Rise Of Disaster Capitalism, Penguin, 2007, p. 339; Alaa Al-Tulaibawi, Pablo de Frutos Madrazo and Pedro Antonio Martín Cervantes, "Analysis of the Impact of Agriculture Goods Dumping in Iraq Using ARDl Methodology", Edelweiss Applied Science and Technology 8, no. 6 (2024), https://doi.org/10r4č.55214/25768484.v8i6.3048

53 Since at least 2013, both the Kurdistan government and the Iraqi Federal government have banned the import of certain agricultural products, particularly during harvest season, as well as placed heavy tariffs on others, as a means of attempting to incentivize and protect local production. However, agricultural produce continues to be smuggled in from countries such as Iran and Turkey. For more Al-Shakeri and Mansour, "How Supply Chains Fuel", and TII Team, "Kurdistan Bans Imports of Agricultural Products from

on the area, there is either no market whatsoever for the produce of local farmers or they have to sell their produce at very low prices.

The neoliberalization of Iraq's economy has also made agricultural workers and farmers increasingly precarious. However, interlocuters suggested that international organizations continue to tackle the root causes of this. For example, as an interlocuter who previously worked with an international organization on agricultural issues explained:

> *We have a project with an international organization on commercial fishing. As part of the project, we gave out 27,000 fishing nets and released 10,000 fish eggs. This is to stop people from using electrofishing, which depletes the stock of fish. We also did five awareness raising campaigns. But what do you do when someone tells you: "You're telling me about the right way to fish, but how do I live? Electrofishing gives me 4-5 kilos of fish and using the net only gives me 3-4 kilos." Awareness is not enough for a person who is hungry, you can't educate him if he doesn't have food.*[54]

As this account suggests, climate adaptation is less likely to be effective if it is conceptualized apart from political-economic issues that makes some farmers more vulnerable to the impacts of climate change than others. As such, instead of simply providing beneficiaries with equipment, interventions should tackle the reasons why some farmers find themselves living in poverty in the first place and are forced to use environmentally harmful techniques to survive.

Local Adaptation Strategies

Through examining the local adaptation strategies adopted by Iraqi farmers, the links between nature and society become ever more present. While these strategies are to an extent in line with the government and international organizations' technical solutions, what really comes through in interviews with farmers is that for them these fixes are adopted both as a means of navigating extreme weather events and of negotiating social and political economic inequalities that compromise their ability to survive changed climates.

Resisting Drought and Neoliberalism

As a result of the combined impacts of poor policy planning, climate change, and unfettered imports from neighboring states, many farmers have chosen to leave agriculture as their primary activity because they can no longer rely on it as the main source of their livelihood. Instead, they seek out government jobs, work as day laborers, or join the army.[55] However, even when they pursue these new occupations, interlocuters suggested that they do not necessarily abandon their land, instead they often scale down their production and rely on the land for subsistence.[56] Thus, for example, in 2021 rice production in Akre – a city in Northern Kurdistan famed for its rice – was down threefold due to diminishing water levels.[57] Water scarcity in the region has led some farmers to abandon the cultivation of rice, turning instead to growing a limited number of fruit trees, including figs, walnuts, and pomegranates, which they use to feed their families before selling the rest on the market. Interlocuters in these areas suggested that figs were particularly profitable because of their unique taste – achieved by growing them at high altitudes – making them competitive with imported produce.[58] In addition, they explained that figs are chosen because fig trees are particularly hardy and resistant and can withstand the increasingly frequent, extreme weather events in the area.[59]

In Southern Iraq, as areas in the marshlands have dried up, families who had previously relied on the marshes for their subsistence moved to areas such as Zubair in Basra.[60] There, they work as tenant

Iraq", The Insight International, 30 July 2016, https://theinsightinternational.com/kurdistan-bans-imports-iraq-2016-07-30 [TII Team, "Kurdistan Bans Imports"]

54 Al-Shakeri and Mansour, "How Supply Chains Fuel"; TII Team, "Kurdistan Bans Imports".

55 Interviews with farmers in Akre, 29 March 2025, in Madiana, Northern Basra, 6 May 2025, and in Baghdad, 9 May 2025.

56 Interviews with farmers in Akre and Choman, 29 March 2025.

57 Naif Ramazan, "Akre Rice Production Decreases Threefold amid Water Shortages", Rudaw, 19 August 2021, https://tinyurl.com/yf4bytmy

58 Interviews with farmers in Akre and Choman, 29 March 2025.

59 Interviews with farmers in Akre, 29 March 2025; +964 Media, "Resilient Yellow Fig Trees Defy Winter Chill in Kurdistan's Qadirawa Village", 15 December 2023, https://en.964media.com/5747/

60 Interview with activist over WhatsApp, 24 April 2025.

farmers, using their agricultural skills to plant tomatoes and sharing the profits with landowners during the harvest, sometimes making as little as 750,000 IQD (570 USD) per season. This is well below the national poverty line which, according to a 2021 World Bank survey, was 110,811 IQD (85 USD) per month.[61] Other farmers in the area have begun to transform drought-stricken marshland areas into agricultural land, where instead of cultivating water-intensive crops that were previously grown there, such as different varieties of melon and rice, they started to produce vegetables that require relatively little amounts of water.[62] For example, in Chibayish, Dhi Qar province, and in Northern Basra, some farmers have begun to concentrate on planting okra. As an interlocuter explains, it only needs to be watered once every 72 hours when compared to every three to four hours for some varieties of fruit.[63] What is more, because of increases in temperature in both areas, farmers have begun to plant vegetables, such as okra, in the winter using low tunnel farming systems and harvested in spring, allowing for an extension of the season.[64] This means that during the summer months, they can plant summer crops such as corn, which can be used for animal fodder.[65] In the marshes in particular, fodder is in high demand due to a decline in green pastures on which buffalos graze. This forces many locals to buy fodder at an inflated price, with many of them having to sell at least part of their livestock to afford it. The increased turn to agriculture in these areas has also provided a means of employment for the people of the marshlands who lost their traditional modes of subsistence, such as rearing buffalos, fishing, and hunting. This is particularly important for the women for whom it is especially difficult to find work in urban areas due to patriarchal gender norms.[66]

Increasingly, farmers in the south of Iraq are also turning away from the very water-intensive palm trees that also require a lot of investment and upkeep. Due to the destruction of palm trees native to Iraq and the rise in salinity and desertification, farmers are increasingly importing trees from the United Arab Emirates and genetically modified varieties from the U.S. and the UK – believed to be more productive and more likely to withstand Iraq's changed climate.[67] While Iraq was once home to 600 varieties of date palms, these more recent practices have created a monoculture, which in turn has made Iraq's date palms more susceptible to epidemics.[68] Moreover, the rise in aridity and water scarcity has led to an increase in some diseases.[69] For example, many of the farmers interviewed explained that their palm trees had been infested with dust mites, which prevent infected fruit from growing or ripening and can lead to 50-80% loss of yield.[70] As one interlocuter put it: "We began to realize that the money we were spending on trying to keep the trees alive was much more [than] the profit that we were making from selling the dates."[71] As a result, many farmers in the South have now turned to cultivating Sidr trees instead, which according to interlocuters, tend to be more productive and make a better financial return than date palms.[72] In addition, they can be harvested within two years of being planted, whereas palm trees require five years for the trees to bear fruit. Sidr trees can also better withstand salination, which can even lead to better tasting fruit, and need less water compared to palm trees, which often end up dying because of high salinity levels and drought.

While both cases – the turn to agriculture in the marshlands and the move away from date palms in Southern Iraq – represent strategies for coping with

61 World Bank Group. "Poverty and Equity Brief Middle East and North Africa: Iraq", April 2021, https://tinyurl.com/3xhevswh

62 Interviews with farmers in Chibyash, 5 May 2025.

63 Interviews with farmers in Chibyash, 5 May 2025.

64 Interviews with farmers in Chibyash, 5 May 2025; Interview with environmental activist from Basra over WhatsApp, 2 May 2025; +964 Media, "Winter Okra Farming Increases in Northern Basra with Increased Yields", 30 November 2024, https://en.964media.com/28427/

65 Interview with farmers in Chibayish, 5 May 2025.

66 Interview with head of environmental organization in Chibayish, 5 May 2025.

67 Ulf Laessing, "Iraq: 70,000 Date Palms to Baghdad", Reuters, 27 June 2018, https://tinyurl.com/bp6h4jhr

68 Salman Amin, "Iraq's Date Palms: Rescuing a National Icon", Al-Monitor, 17 July 2022, https://www.al-monitor.com/originals/2022/07/iraqs-date-palms-rescuing-national-icon

69 Interviews with farmers in Hartha, Northern Basra, 3 May 2025, and in Baghdad, 9 May 2025.

70 Ibrahim J. Al-Jboory and Taha M. Al-Suaide, "Effect of Temperature on the Life History of the Old World Date Mite, Oligonychus Afrasiaticus (Acari: Tetranychidae)", in Trends in Acarology: Proceedings of the 12th International Congress, Maurice W. Sabelis and Jan Bruin (eds.), 2010, pp. 361–363, https://doi.org/10.1007/978-90-481-9837-5_58

71 Interview with environmental activist from Northern Basra over WhatsApp, 2 May 2025.

72 Interview with farmers in Hartha, Northern Basra, 3 May 2025, and in Chibayish, 5 May 2025; Mohammed Aty, "In Iraq, Water Crisis Leaves Farmers Clinging to Sidr Trees", Reuters, 28 March 2025, https://tinyurl.com/5dmmwh3u

changed climates, they also represent a loss of Iraq's cultural heritage. In the marshlands in particular, the change also represents a turn to settled modes of agriculture, a practice that people in this area have resisted at least since the early 20th century. This has long been seen as part of colonial and authoritarian attempts to destroy their way of life.[73]

The rise of extreme weather events has also reduced crop yields and made harvests increasingly unpredictable. To cope, some farmers in Basra, particularly tenant farmers, have turned away from crops such as tomatoes, which are costly to produce and often sold at low prices due to imports competition, squeezing farmers' profit margins. Instead, some interlocuters explained that they began planting herbs because they are cheap to produce, can be sold all year around, and if one crop fails or the Iraqi market is suddenly flooded with a particular crop from abroad, they have others that they can rely on for their livelihoods.[74] While the meagre profits they make from selling these herbs does little to combat the increased precarity they find themselves in – farmers stated that they made 2,000 IQD (1.5 USD) for every ten bunches of herbs sold. This strategy seemed to be particularly useful for small-holder farmers and tenant farmers, who cannot compete with large farmers that mass-produce particular crops. Similarly, a farmer interviewed in Akre, Northern Iraq, explained that he had begun raising sheep as livestock so that he could sell their milk or meat in years when there was not enough rain for him to plant rice.[75] Other farmers explained that they supplemented their incomes through creating plant nurseries, which can provide a more reliable income for them than the sale of agricultural produce. Areas such as Al-Gherai'at in Northern Baghdad – known for its date palm tree forests and for growing agricultural produce, such as ginger, carrots, aubergines, and tomatoes – have been totally transformed into plant nurseries.[76]

73 Ariel I. Ahram, "Development, Counterinsurgency, and the Destruction of the Iraqi Marshes", International Journal of Middle East Studies 47, no. 3 (2015) pp. 447–466, https://doi.org/10.1017/S0020743815000495

74 Interviews with farmers in Hartha, Northern Basra, 3 May 2025.

75 Interviews with farmers in Akre, 29 April 2025.

76 Interview with farmer in Baghdad, 9 May 2025.

Navigating Water Scarcity and Political Hierarchies

Farmers have also adopted various techniques to conserve water and manage its scarcity. In Northern Iraq some farmers created rainwater harvesting pools for their livestock as a means of dealing with unreliable rainfall.[77] Others explained that that they reused irrigation drainage water.[78] For example, the runoff from water used to irrigate rice is sometimes captured and mixed with fresh water and reused a second time.[79] Unlike recycled water, however, this water is not treated and can sometimes be contaminated or contain high levels of salinity, which may lead to reduced crop yields, pose a danger to the health of humans and livestock, or contribute to the pollution of water sources.[80]

However, the most common way for dealing with water scarcity among farmers is through digging water wells. As of 2023, Iraq has a total of 110,000 registered water wells.[81] A community leader in Al-Hamdaniya, Northern Iraq, explained that people in the area know where and at which depth to dig through knowledge passed down over generations.[82] However, he also explained that initially wells were dug for the purpose of drinking water, and it is only in the last decade that they have been used for agricultural purposes.

In areas such as Najaf and Karbala, Central Iraq, the practice of using ground water for irrigation has increased substantially, with the government leasing desert land to farmers at the price of 4 USD per hectare to grow wheat.[83] The turn to groundwater is an interim solution that enables the price of staple foods such as bread to remain

77 Interview with civil society organization in Erbil, 1 May 2025.

78 Interview with farmer in Baghdad, 9 May 2025.

79 Abdel Karim Abdullah Bilal, "Potential for Using Wastewater in Iraq" [Arabic], Tareeq Al-Shaab, 16 January 2023, https://www.tareeqashaab.com/index.php/sections/articles/6390-2023-01-16-19-49-12

80 Economic and Social Commission for Western Asia (ESCWA), "Term: Drainage Water", n.d., https://www.unescwa.org/ar/sd-glossary/مياه-الصرف-البزل

81 Timour Azhari and Ahmed Saeed, "Desert Wells Help Iraq Harvest Bumper Wheat Crop as Rivers Dry", Reuters, 30 May 2023, https://tinyurl.com/ycxhevuz

82 Interview with community leader in Al-Hamdaniya, 30 April 2025.

83 France 24, "Iraq's Drought-Doomed Farmers Turn to Groundwater to Boost Agriculture", 25 April 2025, https://www.france24.com/en/live-news/20250425-iraq-farmers-turn-to-groundwater-to-boost-desert-yield

low and keeps farmers in work. However, for some farmers, it also represents a form of decentralization in so far as it means that they do not have to rely on unpredictable rainfall or government allocations of water. This is particularly important because the issue of who gets water allocations and how much is politicized lies with politicians – sometimes portions of water are redirected to particular provinces as a means of calming unrest and appeasing their voters in the run up to elections.[84] In fact, even the issue of whose wells are considered legal is often tied to farmers' connections with the country's political and financial elite. Yet the use of groundwater for irrigation is also a short-sighted strategy that has already resulted in over-extraction and decreased groundwater levels in some areas.[85] What is more, in areas such as Zubair, where farmers have always depended on wells for irrigation, hydrocarbon elements increasingly pollute the groundwater as a result of the oil industry's activities, making it unfit for human consumption.[86]

Towards a Transformative Approach?

In addition to the individual adaptation strategies outlined above, Iraqi activist networks working both locally and transnationally have collaborated with farmers to encourage the use of more sustainable and holistic farming practices. For example, through mobilizing Iraqi diaspora resources, a group of farmers and businessmen bought 20,000 acres of land in Samawah, Southern Iraq, and set up a pilot farm to test and demonstrate sustainable farming practices. Along with a number of farms in Baghdad, they utilize the principles of permaculture and organic farming as a means of encouraging more sustainable farming, including the use of organic fertilizers (composting) and livestock (camels) to regenerate soil and grow different types of trees, including support trees as a means of decreasing the salinity.[87] Other activists are working with local farmers on agroforestry, where in addition to planting crops, they also plant trees and shrubs on their land that can contribute to both improving soil health and yield.[88] Farming practices such as agroforestry and permaculture might be thought of as transformative because rather than focus on efficiency and scale – as agricultural strategies tend to do – they focus on environmental health and resilience.[89] At the same time, these practices have socio-economic benefits, including helping farmers to avoid debt in times of need through the sale of firewood, fodder, and fruit.[90]

What is more, a U.S. bombing raid in 2003 destroyed Iraq's central seed bank, which held around 1,400 seed varieties. A collective of activists emerged to bring heirloom seeds into the country from seed banks all over the world.[91] They shared these with the farmers and exchanged knowledge about seed extraction and propagation – much was lost as a result of agricultural centralization during Saddam Hussein's rule and the ensuing corporate control over agriculture after 2003.[92]

This bottom-up initiative provides a potential glimpse into what a transformative approach to climate adaptation might look like. It allows farmers to challenge hierarchies that might prevent them from accessing such resources, including a lack of political connections that have been – since at least the 90s – central to survival in the agricultural sector, and imperialism that led to the destruction of Iraq's agricultural heritage. Crucially it does so horizontally and outside a framework, which leaves farmers dependent on the whims of the government,

84 Hayder Al-Shakeri, "Tackling Barriers to Climate Change in Iraq", Kalam, 1 March 2024, https://kalam.chathamhouse.org/articles/tackling-barriers-to-climate-reform-in-iraq/ [Al-Shakeri, "Tracking Barriers"]

85 Al-Shakeri, "Tracking Barriers".

86 Wasan S. Al-Qurnawi et al., "Investigation of the Hydrocarbon Contamination of the Dibdibba Aquifer in Al-Zubair Area, Southern Iraq", IOP Conference Series: Earth and Environmental Sciences 1300, Third Scientific Conference of Iraqi Desert Geology, 13-15 December 2023, Ramadi, Iraq, https://iopscience.iop.org/article/10.1088/1755-1315/1300/1/012023

87 Interview with founder of civil society organization over WhatsApp, 1 October 2024.

88 Interview with head of food sovereignty network in Baghdad, 14 September 2024.

89 Sam J. Buckton et al., "The Regenerative Lens: A Conceptual Framework for Regenerative Social-Ecological Systems", One Earth 6, no. 7 (2023) pp. 824–842, https://doi.org/10.1016/j.oneear.2023.06.006

90 Amy Quandt, Henry Neufeldt and Kayla Gorman, "Climate Change Adaptation through Agroforestry: Opportunities and Gaps", in "Adaptation to Climate Change in Food Systems", Helen Gurney-Smith, Toshihiro Hasegawa and Rachel Bezner Kerr (eds.), special issue, Current Opinion in Environment and Sustainability 60 (2023), https://doi.org/10.1016/j.cosust.2022.101244 [Quandt, Neufeldt and Gorman, "Climate Change Adaptation"]

91 Quandt, Neufeldt and Gorman, "Climate Change Adaptation".

92 Sama and Jasim, "Imperialism and Iraq".

corporations, and market-driven value systems that commodify seeds. In this way, the initiative shifts power structures, reduces farmers' vulnerability, and addresses the socio-economic inequalities farmers face. At the same time, it contributes to combatting climate change as heirloom seeds reduce the need for the use of chemical pesticides and help increase biodiversity.

Conclusion

In the face of a rapidly changing climate, the government of Iraq and international organizations operating in the country have adopted a view of nature as separate from society. This has led them to approach adaptation in technocratic terms, often focusing on the provision of sustainable farming equipment, but without fully addressing how political, economic, and social issues shape agricultural practices. Local adaptation strategies adopted by farmers, however, demonstrate that weather extremes are only one part of the broader structural inequalities that must be traversed to survive increasingly hostile environments.[93] This is why in their calculations, the adoption of climate resistant crops cannot be thought about apart from a political-economic system, a system that has left farmers without a domestic market for their produce. Water scarcity cannot be addressed without tackling the corruption that has led farmers to look for mal-adaptive solutions. In recent years, various activist collectives have also emerged – both in country and in the diaspora – attempting to rethink and put into practice alternative value systems and approaches to nature that challenge existing power structures that has made some farmers more vulnerable to climate change than others.

The individual survival strategies of farmers and activist collectives pursuing holistic approaches, then, push towards an understanding of the environment as co-produced with, as opposed to divorced from, society, revealing the need for more equitable economic, political, and social structures in Iraq. Thus, instead of merely adopting top-down technocratic approaches to climate adaptation, this perspective urges rethinking how Iraqi society itself is produced. In light of this, future research would do well to examine how other individuals and groups, particularly in the food sovereignty movement, are experimenting with the premises of transformative adaptation, and the feasibility and potential for cooperation and widespread adaptation of these approaches across the MENA region.

93 Taylor, "Rethinking Climate Change".

About the Arab Reform Initiative

The Arab Reform Initiative is an independent Arab think tank working with expert partners in the Middle East and North Africa and beyond to articulate a home-grown agenda for democratic change and social justice. It conducts research and policy analysis and provides a platform for inspirational voices based on the principles of diversity, impartiality, and gender equality.

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