Environmental Security and Communal Conflict in Iraq

Farhad Hassan Abdullah Mamshai

Dissertation submitted to the faculty of the Virginia Polytechnic Institute and State University in partial fulfillment of the requirements for the degree of:

Doctor of Philosophy

In

Planning, Governance, and Globalization

Ariel i. Ahram (Chair)

Joel Peters

Gerard Toal

Marwa Daoudy

May 5, 2025
Arlington, Virginia

Keywords: Environmental Security, Environmental Peacebuilding, Ethnicity, Communal Conflict, Water Scarcity, Environmental Migration, Iraq.

Environmental Security and Communal Conflict in Iraq

Farhad Hassan Abdullah Mamshai

Abstract

This dissertation argues that ethnicity, what Kahl calls ‘groupness,’ and institutional exclusion affect the perceptions of competing ethnic groups in response to environmental insecurity, mainly the water scarcity and competition of arable lands in the Iraqi disputed territories and the authorities they turn to to govern their environmental degradation. Northern Iraq is a mosaic of ethnic and cultural divisions. The dissertation examines how ethnicity in this region affects the perception and response of competing ethnic groups to environmental insecurity and the likelihood of increasing the risk of communal conflict. The region has experienced environmental and structural scarcity, especially a lack of water security and historical land appropriations driven by state policies. Environmental peacebuilding theory asserts that shared environmental insecurity facilitates coordination between competing ethnic groups. However, this dissertation explains that environmental and structural scarcity is affected by historical and ethnic divisions and exclusion, which makes it harder for groups to work together when facing environmental problems. Employing the environmental scarcity theory, this dissertation elucidates that historical and ethnic divisions and exclusion influence environmental and structural scarcity, thus reducing cooperation between groups when they face environmental degradation. The findings of this study show a contradictory understanding of environmental security and its implications, including communal conflict and environmental migration. The dissertation also shows that the ethnic groups navigate different “arenas of authority” to govern their everyday environmental needs. It also seeks to take a step away from the mainstream literature on environmental security by examining the role of non-state actors, such as social institutions and customary leaders, in everyday environmental governance in Iraq. However, the findings illustrate that vulnerable communities tend to turn to state institutions like the governments of Iraq and the Kurdistan Region, which serve the state-centric environmental security debate. Furthermore, the study uncovers that the elite's understanding of environmental security, such as governing shared water resources, is less competitive within Iraq's environmental federalism framework than anticipated. There is no substantial intergovernmental conflict over shared water resources, and people from different ethnic groups are unsure whether the Kurdistan Regional Government weaponizes water resources and the associated risk of intergovernmental conflict over water administration.

Environmental Security and Communal Conflict in Iraq

Farhad Hassan Abdullah Mamshai

General Audience Abstract

Environmental security in Iraq has been threatened by climate change, misgovernance of natural resources, conflict and political instability, corruption, and environmental policies of upstream countries. The country has also plugged into ethnic and sectarian conflict, especially in the disputed regions like Kirkuk, where Kurds and Arabs, the federal government, and the Kurdistan Region are competing over sovereignty and its natural resources. The intersection of water scarcity and land appropriation has exacerbated pre-existing ethnic and sectarian violence. Drawing on a mixed-methods approach- including roughly 2000 survey questionnaire participants and in-depth semi-structured interviews with government officials, farmers, and community leaders – the dissertation examines how various competing ethnic groups perceive the environment in Kirkuk and how they navigate their everyday environmental needs. The study found that environmentally vulnerable groups remain divided into disputes having common environmental and structural scarcity and tend to turn to state institutions to cope with their environmental needs as they feel more protected.

Dedication

To my loved family: my mother (Ramzya), Shilan, and 3Ls Layad, Lewzha, Lezma, and my brothers Bestun and Bakhtyar.

To my advisor, Professor Ariel i. Ahram—thank you for your unwavering guidance, patience, and belief in my work. Your mentorship shaped this dissertation and my growth as a scholar.

Acknowledgments

Academic journeys require the support of others because no one completes them alone. The successful completion of this dissertation depends on my personal work and the essential support from several individuals and institutions, who provided their valuable support and guidance. I begin by expressing my deepest gratitude to Professor Ariel I. Ahram, who guided me as my advisor throughout the entire dissertation process. He provided complete backing throughout my health issues, delivered important feedback, and demonstrated outstanding mentorship. His dedication throughout the most challenging periods has impacted my academic and individual development. I feel privileged to have had him as my academic advisor.

I want to thank my committee members, Professors Gerard Toal, Marwa Daoudy, and Joel Peters, for their essential guidance, thoughtful feedback, and generous support throughout this process. The three members of my committee each contributed a distinctive background and knowledge that enhanced the quality and depth of this dissertation. I am deeply grateful for their time, mentorship, and encouragement.

I would like to express my appreciation to my friends Dr. Qaraman Hasan and Dr. Hawre Hama for their academic support, continuous guidance, and helpful advice. Their support throughout this period has been both personally and intellectually beneficial. I would also like to thank my research colleagues—Shukriya Bradost, Dr. Amina Mozaffarija, Julie Schupp, and Dr. Gopi Bhamedipathy—for their friendship, collaboration, and continued support. I want to thank the EMU library for sharing their resource and space with me during my wrting, and everyone who has supported me, even if I unintentionally left someone out. Throughout this journey, I have been fortunate to receive much wisdom, support, and encouragement. If there are any errors, misjudgments, or oversights in this work, they reflect my own limitations—not those of the people who generously guided me.

Table of Contents

List of Tables

List of Figures

List of Maps

List of Abbreviations

ECFR	European Council on Foreign Relations
EP	Environmental Peacebuilding
ES	Environmental Security
GoI	Government of Iraq
KDP	Kurdistan Democratic Party
PUK	Patriotic Union of Kurdistan
KRG	Kurdistan Regional Government
KRI	Kurdistan Region of Iraq
IOM	International Organization for Migration
ISIS	Islamic State of Iraq and Syria
MoAWR	Ministry of Agriculture and Water Resources (KRG)
MoWR	Ministry of Water Resources (GoI)
NRC	Norwegian Refugee Council
NSAs	Non-State Actors
PMF	Popular Mobilization Forces
QCA	Qualitative Comparative Analysis
UNAMI	United Nations Assistance Mission for Iraq
UNEP	United Nations Environment Programme
UNFCCC	United Nations Framework Convention on Climate Change

Chapter One

Conceptual and Theoretical Framework

1.1. Introduction

Environmental security literature has emphasized for decades the impact and limited role of renewable resources in shaping political and ethnic violence, especially in newly developed and ethnically divided societies (Homer-Dixon, T. F., 2010; Barnett, J. 2000; Kahl, C. H., 2006). Groups in these communities instead rely on environmental resources such as agricultural land and water to provide food security for themselves and their livestock. Environmental stress, such as water scarcity, droughts, and desertification, affect the human security of vulnerable communities (Barnett, J., & Adger, W. N., 2007). Groups are forced to take several measures to cope with environmental stress, including adaptation or migration, which can increase the risk of violent conflict. If groups adapt to climate change and remain in place, resource scarcity still leads to competition and violent conflict. If groups leave their area, it can put pressure on scarce resources in the host community, which may lead to ethnic conflict.

Environmental scarcity weakens state institutional capacity, increasing the likelihood of violence. However, it should be noted that the relationship between environmental scarcity and conflict is not direct nor deterministic. It is mediated by several pathways and social structures, especially in a divided society where ethnicity determines access to environmental resources such as arable land, water, and irrigation services. Consequently, water scarcity and competition for agricultural land can easily reinforce ethnic boundaries among groups and lead to communal competition over scarce environmental resources, producing what Philippe Le Billon (2001) calls a “greed-driven resource war” that is a form of conflict driven by the motivation for control of resources. However, Billon argues that political and identity factors are the main drivers of conflict,

yet control of scarce natural resources influences the agendas and strategies of parties (ibid., 581). Hence, natural resources are not only a material asset but also a political and symbolic one combined with identity, power, and historical experience that can shape the understanding of competing ethnic groups on environmental security (ES).

Ethnicity and identity polarizations are expected when state institutions are weak and exclusive, as groups, mainly minorities, experience marginalization and lack access to environmental resources (Gleick, Peter H., 2014). Ethnic polarization also facilitates 'resource capture' by dominant elites and ethnic groups, increasing the risk of conflict. Colin H. Kahl (2006) discusses the lack of environmental resources and the emergence of violence, arguing that countries with 'high levels of groupness' (a division of groups based on identity) and 'low levels of institutional inclusiveness' are highly susceptible to the risk that lack of resources leads to conflict and violence (Kelley, C. P., Mohtadi, S., Cane, M. A., Seager, R., & Kushnir, Y., 2015, 6). The state-led marginalization and exclusion from accessing environmental resources increase the "group-level grievances," which shape the perception and attitude of ethnic groups on ES. In other words, the ethnic perception of ES can be shaped by historical political experience and state policies and behavior, transforming environmental stress into an identity-framed conflict and hindering ethnic groups from coordinating in handling environmental issues.

Iraq is increasingly facing severe environmental stress and ethno-sectarian conflict. The political situation in Iraq has become more unstable because of governance problems and ethnic and sectarian conflicts that are connected. The combination of water scarcity and poor water governance and infrastructure has interacted with unresolved sectarian and ethnic issues to increase the risk of ethnic and communal conflict. Despite the growing literature on ethnic and sectarian conflict and competition over natural resources like oil, the existing research often overlooks the impact of ethnicity on ES, mainly water scarcity and land governance. The gap stems from how competing ethnic groups perceive ES.

The field of ES receives extensive global research, but the connection between ES and ethnic politics and federalism in Iraq remains underexamined. The field lacks sufficient research on the cooperation and competition of ethnic groups during environmental stress. This dissertation fills the gap by examining the role of ethnicity in shaping perceptions of vulnerable ethnic communities in Iraqi disputed territories, including Kirkuk, and areas under the Kurdistan Regional Government (KRG) jurisdiction. It examines how ethnic groups navigate environmental governance in their areas. By integrating ES with theories on ethnicity and governance, this study contributes to ES by building a specific theory to understand the relationship between environmental stress and communal conflict in the ethnically divided society of Kirkuk. Thus, this dissertation seeks to answer the broader puzzle:

How does ethnicity affect environmental security? Can different ethnic groups coordinate in dealing with environmental stress? Can cooperation happen among these groups?

By using Kirkuk and the disputed territories as the case study, this dissertation also aims to answer some specific research questions, including:

1. How does environmental security operate in Iraq?
2. How does environmental cooperation affect the federal political dynamics in Iraq?
3. How do ethnic prior experiences and beliefs affect people's attitudes toward ES in Kirkuk?
4. How do people approach environmental governance (EG) in Kirkuk, and why do people prefer the Government of Iraq (GoI) versus KRG or traditional authorities for environmental governance?

1.1. Environmental stress in Iraq

Iraq has been considered a fragile state for a long time; according to the Fund for Peace, the nation is still in an alert stage, with 93.8 index points in 2022 (FFP, 2022). The situation in the country has become more complicated due to water scarcity and drought, according to the UN Environment Programme (UNEP), which reported that Iraq continues to be "the fifth most vulnerable country to climate change" (2019), the UNCIF also reported as "the fifth most vulnerable country to water and food shortages and extreme temperatures" (2023). The social contract in Iraq has already been degraded due to corruption, lack of services, insecurity, lack of economic opportunity, and misgovernance, and climate-related water scarcity worsens the situation by intensifying inequalities, which increases the risk of social unrest and instability (The World Bank, 2022; Ardovini, L., & O'Driscoll, D., 2023).

Iraq, known as the 'land between the two rivers,' has enjoyed easy access to water since the beginning of recorded history. The Euphrates and Tigris Rivers, originating in neighboring countries, provide ninety-eight percent of Iraq's water supply. The UNDP (2023) reported that Iraq receives less water than it did in the past, from around 30 billion cubic meters in 1933 to about 9.5 billion now, threatening its water security. Due to a rising disparity between supply and demand, which is anticipated to rise from roughly 5 billion to 11 billion cubic meters over the next ten years, Iraq is expected to run out of water. In the best-case scenario, 479 cubic meters of water are available per person annually, far less than the WHO standard of 1,700 cubic meters. Water scarcity threatens human security and worsens the country's political and economic issues, which increases the risk of inter- and intra-communal tensions (The World Bank, 2022; UNSDA, 2022; LOOTSMA, 2023; CIVIC, 2022).

Water has also severely impacted the security situation of the northern provinces in Iraq, such as Ninewa, Kirkuk, Salah Al-Din, and Diyala (IOM, 2022. 12). According to the European Council on Foreign Relations (ECFR), Iraq's water scarcity helped to drive the growth of jihadist terrorists, as reported in its early iterations. ISIS responded to

extreme weather events by offering support to disadvantaged rural communities. This included distributing food during a drought in 2010 and handing out cash following dust storms that destroyed agricultural fields near Kirkuk in 2012. Consequently, farmers were among the most prominent early supporters of ISIS (Younis, 2022, 9). Although it is hard to claim that environmental degradation was linked to the rise of jihadist terrorism in the country, this example illustrates how non-state actors have stepped in to govern environmental stress where state institutions have remained dysfunctional.

Severe drought in northern Iraq threatens food security, generates climate-migrant groups, and increases the risk of communal violence. The UN's Food and Agriculture Organization (GIEWS, 2021) reported that drought in the country's north reduced cereal production, which caused likely income loss, skyrocketing feed prices (FAO, 2023), and increasing import requirements. Climate-induced water shortages and drought have generated climate migration and human movements from rural to urban areas due to crop failures (Monitor, 2022) and animal losses like buffalo, goats, and sheep (NRC, 2021). A definite pattern of environmental-related migration from rural areas to urban towns to pursue employment and economic possibilities can be seen. The ECFR reemphasized this: "Land suitable for farming shrinks and rural jobs disappear, and ordinary Iraqis are moving to cities in search of work" (Younis, 2022). Climate-related internal displacement has been recorded across eight governorates, as 3,000 families suffered these environmental consequences (IFRC, 2023). Due to climate change, a violent contestation between "climate-vulnerable asset holders," like farmers, herders, rural inhabitants, governmental bodies, and units, as Colgan et al. put it (2021), is already an observable issue, particularly conflict over water (USAID, 2017). These environmental issues interact with ethno-political challenges, increasing the risk of communal conflict.

1.2. Disputing Prevailing Assumptions in Literature

This dissertation explores the influence of ethnicity on ES and examines whether it contributes to communal conflict. The link between water scarcity, land competition, and drought in ethnic strife and demographic pressure has been widely discussed in the ES

literature (Homer-Dixon, 2010; Femia, F., & Werrell, C., 2012; Gleick, P. H., 2014; Kelley, C. P., Mohtadi, S., Cane, M. A., Seager, R., & Kushnir, Y., 2015). Nevertheless, these arguments have remained skeptical, and for someone like Dably, they "are often misleading," mainly due to the claim that negative environmental change directly generates interstate conflict. Recent scholarly contributions have challenged this argument, primarily discussing those who focused on individual case studies like Syria (Selby, J., Dahi, O. S., Fröhlich, C., & Hulme, M., 2017; Dalby, S., 2018, 42; Daoudy, M., 2020).

In contrast, environmental peacebuilding (EP) scholars consider the possibility of cooperation and coordination among vulnerable communities during environmental stress instead of continuing with this argument. Conca and Dabelko argue that they want to "challenge dominant construction of environmental scarcity, ecologically induced violence, and state failure by asserting cooperative potential rather than violent conflict inevitabilities…peace rather than [conflict]" (2002, 4-5). Furthermore, more recent scholarship from Ashok Swain, Joakim Öjendal argues that "although environmental threats can foster violent conflict in some contexts, they can also serve as motivators for cooperation, thus providing catalysts for peace" (Swain, A., & Öjendal, J. (Eds.)., 2018).

Tobias Ide notes EP literature claims that "groups in conflict can put aside their differences and cooperate in the face of shared environmental stress, thereby facilitating more peaceful relations between them" (2019a). He argues that environmental coordination can help reduce violence within states (inter-communal violence) and promote symbolic reconciliation (identity construction) both within and between states by "improving the environmental situation, increasing understanding and trust, cultivating interdependence, and building institutions" (Ide, T., 2019, 332). However, he believes that these positive outcomes depend heavily on specific contextual factors being in place.

Ide (2019) identifies three key assumptions that link environmental stress to peace, including (1) common environmental stress building bridges for communication and collaboration among parties in conflicts; (2) environmental cooperation sets a ground for

regional cooperation, which facilitates a further enhancement of intergroup relations; (3) environmental coordination can be an effective tool for reducing tensions, broadening cooperation, fostering demilitarization and promoting peace. Thus, he believes that environmental cooperation contributes to negative peace, “absence of violence,” and positive peace, “integration between social and ethnic groups (Ide, T., 2019). This conclusion aligns with Conca, K. and Beevers, M. who note EP can take place in all stages of the “conflict cycle, including conflict prevention, conflict management, conflict resolution, and post-conflict recovery” (2018, 54).

The EP refers to building peace among competing parties via environmental coordination. Tobias Ide defines EP as “all forms of cooperation on environmental issues between distinct social groups, which aim at and/or achieve creating less violent and more peaceful relations between these groups” (2019, 229). Such peaceful relations can be met “through environmental cooperation, natural resource management, climate change adaptation, and disaster risk reduction” (Ide, T. 2020, 1). The EP is also described as “the process of governing and managing natural resources and the environment to support durable peace,” this process encompasses initiatives to “prevent, mitigate, resolve and recover from violent conflict, and involves renewable natural resources (land and water), non-renewable natural resources (oil and gas), and ecosystem (climate change and ecosystem services)” (Bruch, C., Jensen, D., & Emma, M., 2021, 10). Bruch et al. are looking for “cooperative triggers of peace that [they believe] common environmental stress might make available, rather than seeking to pinpoint the environmental triggers of conflict.” They asked: “How can environmental threats not only play a role in conflict but also adaptively motivate toward cooperation and peacebuilding efforts? Can environmental cooperation foster peace and regional stability? Can regions progress along the “peace continuum”?

EP claims reasons exist to include environmental resources in peace agreements among competing groups. These include grievances over natural resources contributing to conflicts like in Sudan and Nepal; natural resource revenue can finance conflict in countries like Colombia; natural resources were damaged by conflict (DRC, Darfur, and

recently Syria); finally, and most importantly, environmental resources can be used collaboratively to build trust among communities (Bruch, C., Jensen, D., & Emma, M., 2021, 16). The author also adds another reason from recent scholarship on environmental weaponization, like Marcus D. King (2015; 2017) and Marwa Daoudy (2020), who illustrated that the water resources and infrastructures have been weaponized during conflict (Syria and Iraq).

Carl Bruch et al. (2022) argue that EP supports all five key areas of peacebuilding. It can improve security and safety by protecting resource-rich sites and restoring access to them. Politically, it helps by promoting fair sharing and redistribution of benefits and revenues. Economically, it creates sustainable and meaningful livelihoods. It also supports basic needs by helping provide services like clean water and food. Finally, it strengthens social ties by creating spaces for dialogue and building trust among different groups and stakeholders (Bruch, C., Jensen, D., & Emma, M., 2021, 13).

EP advocates establishing peace through environmental coordination, with two main objectives: first, to examine the conditions under which ecological stress can create a chance for peace; second, to identify “conditions and institutional forms” needed for such a sort of cooperation to be realized successfully. EP examines two principal pathways through which environmental cooperation generates peace. The initial approach decreases immediate tensions such as “mistrust, uncertainty, suspicion, and divergent interests” between competing groups by establishing “a level of trust and mutual commitment,” creating additional cooperation opportunities. The second pathway, which Ide (2019) mentioned, is to “build up institutions” to examine how regional environmental initiatives might shift attention from traditional state-centered objectives toward broader social connections between societies. The expanded role of global civil society emerges as a key factor for developing new governance structures that move beyond the conventional nation-state model (Conca, K., & Dabelko, G. D. (Eds.). 2002; Ide, T., 2019, 327).

Most of the EP case studies have remained focused on inter-state cooperation. Despite having reasonable coordination among some countries with historical rivalries, such as India, Pakistan, Bangladesh, Nepal, and Bhutan, on water governance, Ashok Swain (2002) argues that “the prospects for environmental cooperation still appear to be encouraging” (Conca, K., & Dabelko, G. D. (Eds.). 2002, 61-62). However, Larry Swatuk (2002), who studies environmental cooperation in Southern Africa, argues that “there are great difficulties in achieving peace and security through environmental cooperation … which are in part historical” (Conca, K., & Dabelko, G. D. (Eds.). 2002, 154-155).

The failure of EP might be related to its adverse outcomes, what Ide (2019) calls the “dark sides - Six Ds” of EP, which include “depoliticization” (ignoring the root cause of issues), “displacement” (involuntary migration by damming and natural reserve projects), “discrimination” (who benefits from and who is negatively affected by EP, and reproducing existing socio-economic hierarchies and divisions); “deterioration into conflict” (escalate rather than de-escalate conflict situations if other Ds are met), “delegitimization” of the state (indirectly via other five Ds, and directly undermine core functions of the state); and finally “degradation of the environment” (EP unintentionally might cause overuse or unsustainable exploitation of natural resources).

The dissertation questions the environmental peacebuilding literature by claiming that the premises of environmental peacebuilding are not totally validated by the environmental security conditions in Iraqi disputed territories where water scarcity, drought, desertification, and some structural scarcities like land appropriations are among the severe ecological challenges competing ethnic groups in the regions have been tackling with. There is also persistent conflict among Kurdish, Turkmen, and Arab farmers on agricultural lands during the rain and harvest seasons. However, the perceptions of ethnic groups remain divided in terms of governing environmental stress, its implications, and navigating the authorities in handling their everyday environmental needs. Thus, this dissertation argues that despite experiencing severe water scarcity, drought, and land issues, understanding and perceptions of ES remain divided across ethnic lines in Iraq.

Findings from qualitative and extensive quantitative survey questionnaires illustrate that the ethnic groups in Kirkuk have more polarized perceptions of water scarcity, drought, and land competition in the disputed territories in Iraq. One of the explanations is rooted in the historical political experience, inequality, and deprivation of environmental resources among ethnic groups. Unresolved historical land confiscation and associated conflict between the ethnic farmers remain an issue. During the Ba'ath rule until 2003, millions of dunams of arable land were captured from non-Arab farmers in the disputed territories. They were partially given to the Arab farmers from other parts of the country and are still a source of everyday conflict between the local agrarian communities.

Furthermore, the disputed territories and northern regions have experienced intense and prolonged ethnic conflict, including the Anfal genocide, the Halabja chemical bombing, and ethnic cleansing and demographic changes, which make the cooperation, at least on the grassroots level, hard to accomplish. It should be noted that, except for the South Asia example, the majority of cases studied in recent EP literature, including Conca, Ken, and Geoffrey D. Dabelko, Eds. Environmental Peacemaking (2002) refers to low-level conflict situations where regional cooperation is likely reasonably easy to accomplish (Nixon, H., 2006).

1.3. Literature Review

In the 1990s, with the release of "Our Common Future," which highlighted environmental stress as a catalyst for conflict, and discussions on ES emerged, scholars like Homer-Dixon began to explore evidence linking ES and conflict. He argued that the scarcity of renewable resources had negative social repercussions and could trigger indirect civil strife and ethnic clashes (T.F. Homer-Dixon, 1991b, 1994b; Buhaug & Von Uexkull, 2021). Homer-Dixon contends that environmental scarcity likely leads to five types of conflicts: those resulting directly from local ecological degradation; scarcity-driven interstate wars over water; North-South disputes regarding climate change mitigation and adaptation; civil strife; and ethnic conflicts triggered by population migration, which exacerbates existing social divides stemming from environmental scarcity (1999, 5). The

last two types - civil strife and ethnic tensions driven by population migration - are particularly relevant to this study. The dissertation explores how ethnic politics affect the governance of environmental stress, such as water scarcity, agricultural issues, and land degradation, and how these factors increase the risk of communal tensions and conflict.

Three interlinked sources cause environmental scarcity: (1) resource depletion (supply scarcity) as the resource pie diminishes, (2) population growth (demand scarcity) exacerbates this issue, as a growing population divides a static resource pie into smaller slices for various groups. Additionally, (3) unequal resource distribution or accessibility (structural scarcity) worsens when some groups receive disproportionately large slices of the pie while others receive inadequate portions. These factors have the most significant social repercussions and, when intersecting, fuel unrest, including insurgencies and interethnic conflicts (T.F. Homer-Dixon, 1999, 15; T. Homer-Dixon, 1994a).

Colin Kahl (2006) echoes Homer-Dixon's argument by asserting that demographic and environmental stress can contribute to civil conflict as they cause state disintegration and facilitate state exploitation. According to Kahl, the occurrence of conflict within a society is contingent not only upon the severity of environmental and population pressures but also on two additional critical factors: the extent to which communities and individuals identify themselves with particular groups, which is referred to as "groupness" and the "institutional inclusiveness" (ibid., 29). The Iraqi population has expanded quickly, with unofficial estimates of 31.6 million individuals in 2009 and official census figures pointing to 45.4 million in 2024 (Lee, J., 2024). However, this study does not delve into the Malthusian argument concerning the connection between demographic shifts and resource limitations. The dissertation focuses primarily on structural scarcity caused by state policies throughout time and how people understand the state's refusal to access environmental resources.

The two ways these structural scarcities interact are shown. The first is "resource capture." A dominant group recognizes that a key resource is becoming scarce because of supply and demand pressures or the state adopts exclusionary policies to deny certain

groups access to environmental resources. Thus, state leaders use their power and position to change the laws and institutions governing resource access in their favor, which imposes structural scarcities on weaker groups. The other type of interaction is "ecological marginalization," whereby growing populations and unequal resource access lead to environmentally induced movements to ecologically marginalized regions, resulting in resource depletion, poverty, and migration to urban areas (Homer-Dixon, T., 1999, 16-18).

This dissertation builds on Homer-Dixon's (1999) framework of ES and violent conflict by analyzing the relations between resource and structural scarcities and ethnic politics in ethnically divided communities like Kirkuk. The research expands upon this framework by examining how populations perceive and respond to environmental stress. It contributes to ES discussions by demonstrating how ethnic and identity politics and ecological scarcity increase the risk of communal violence. While Homer-Dixon and Kahl provide an essential insight into environmental scarcity leading to conflict, their analysis remains mainly state-centric, focusing on how state institutions with weak or exclusive control mediate environmental stress effects (Graeger, N., 1996). Primarily, the "neo-Malthusians [who] employ a state-centric approach to demographic and environmental conflict, which tends to contend that the erosion of state authority expands the structural opportunities (or 'political space') for anti-state challengers" (Kahl, C., 2006, 44).

Moreover, Jon Barnett (2001) posits that environmental stress has typically been viewed through the lens of threats to national security caused directly by environmental degradation or through the impact of human actions on protecting the environment (ecological security). The research of Robert Kaplan (1994) together with Homer-Dixon (1999) and Kahl, C. (2006, 39-45) and Busby, J. W. (2007; 2022) and the 1990s US National Security Strategy demonstrates that environmental scarcity weakens national security through its effects on state social structures and economic systems and bureaucratic capabilities. The authors explain that environmental scarcity diminishes state governance capabilities and moral standing, which results in state collapse. They also show how vulnerable states become more susceptible to environmental-induced

conflicts. Furthermore, the state-centric approach emphasizes strong state capacity, inclusive political institutions, and equitable distribution of foreign aid to different vulnerable groups as conditions for being prepared to avoid environmental emergencies.

Busby contends that states remain the most significant players, even if community-level responses are the first line of defense against extreme weather emergencies (2022). For him, non-state actors (NSAs) are crucial service providers. They may help fill gaps and build local coping mechanisms where state intervention is weak or absent, especially when combined with external assistance. Despite this, he believes that environmental stress may make the general public vulnerable to significant hazards. NSAs, similar to civil society organizations, may require official support to respond to these hazards. This support may include the capacity to lift capabilities to supply emergency supplies and carry out rescue operations (ibid.). When environmental issues are securitized—treated as threats to national security—they are often framed through the lens of state capacity and decision-making (Graeger, N. 1996). In this view, a state's ability to respond to environmental stress depends on its political stability and institutional and economic strength. As a result, much of the mainstream literature, especially state-centric approaches, tends to overlook NSAs, community-level dynamics, and underlying structural inequalities in shaping environmental governance and communal conflict outcomes. This dissertation seeks to contribute to the ES literature and move away from the state-centric legacy by examining the role of NSAs in ES governance and how people navigate their roles in an ethnically divided society.

Ellen Lust's (2022) "Everyday Choices" framework offers more profound insights into NSAs' involvement in governance. This framework provides a perspective for shifting away from a state-centric approach to focusing on the role of NSAs in ES. The definition of NSAs varies. However, this dissertation defines NSAs as social and customary leaders and institutions, such as sheikhs, tribal leaders, religious leaders, and other influential groups, including militias, political party offices, and their leaders. This dissertation considers the KRG and the GoI as state actors since they enjoy constitutional recognition and legitimacy.

1.4. Conceptual Groundwork for the Study

Determining the essential concepts that underpin this analysis is crucial for exploring the interplay of water scarcity, drought, competition for arable land, governance, community conflict, and NSAs in Iraqi disputed territories. This dissertation focuses on four main concepts: ES, NSAs, and communal conflict.

1.4.1. Environmental Security (ES)

ES is a complex concept that connects the environment, environmental issues, and resource scarcity with security. Detraz, N., and Betsill, M. M. (2009) identified two unique discourses about security-environment linkages. These discourses are environmental conflict and environmental security. During the Cold War, states and scholars that studied security primarily neglected environmental issues as potential challenges to state security. Instead, they focused on worries regarding the military and security of other countries. This perspective reflects the realist view of state security. This direction was a more state-centric approach, perceiving a threat from another state in the international system to the state's military and economy (Daoudy, M., 2020). This has been known as a traditional security threat to the state. In this tradition, the referent objective was only a state and its military and economic power. However, with the end of the Cold War, this view of security was broadened, and “rethinking security” in the 1980s included non-traditional threats to human rights, health, energy, and ES. One of the most prevalent calls was to define environmental degradation as a security threat that poses risks to both human well-being and the ecosystem and states national security and interests (Krause, K., & Williams, M. C., 1996). However, scholars like Marc Levy (1995) and Rober Dorffs (1994) believed that framing the environment as a security issue is more a matter of rhetoric than a sustainable status of security issues.

In the 1990s, Homer Dixon, Gleick, and Barchler provided a clear understanding of environmental resource scarcity, including arable land and water, to the concept of conflict (Dalby, S., 2021, 242). Homer-Dixon and others conducted further studies on the

Rwandan genocide and South African conflicts to determine the link between environmental scarcity and conflict. However, this relationship has been challenged, with a lack of consensus among scholars around a clear link between environmental scarcity and interstate conflict (Krause, K., & Williams, M. C., 1996, 233-236). During this period, ES was more defined from a neo-realist lens, describing it as “threats to the integrity of the state” (Daoudy, M. 2020, 27). Homer-Dixon theorized environmental scarcity as a potential challenge for the security and stability of weak and developing states (1999). This approach also prioritizes national security, as environmental issues were seen as a threat to state sovereignty. Allenby, B. R. argues that the concept may be defined as “the intersection of environmental and national security considerations at national level policy” (2000, 5). At the same time, research in this field continues along two main lines: one examines the environment-conflict nexus and threats to states, and the other approach focuses on environmental issues more broadly where the main referent object is not the state alone but human communities, groups, and ecosystems (Daoudy, M. 2020, 27).

In short, the environmental conflict tradition focuses on how resource scarcity, demographic pressure, and ecological degradation create conditions for violent conflict in the Global South. In this perspective, national security and state stability are the primary concerns, while the state maintains its position as the leading actor responsible for conflict prevention. The approach supports immediate environmental stress management through resource substitution, technological and ‘social ingenuity’ (Detraz, N., & Betsill, M. M., 2009, 305-306).

On the other hand, redefining security through critical and human security viewpoints is seen as “emancipation” or “freedom from war and occupation” instead of merely the capacity for warfare. This perspective shifts security studies to focus on networks of individuals and NSAs. This is what Detraz, N., & Betsill, M. M. call “the ES discourse” (2009). In this tradition, scholars like Jon Barnett (2007) and then Simon Dalby (2019) broaden the existing approach of ES and expand the concept of looking beyond the state to questions of human security and well-being (Daoudy, M., 2020, 28). For instance, Barnett critiques conventional security thinking because the Cold War era perspectives

conceal both fundamental causes and actual effects of environmental deterioration on human welfare. Adrian Martin argues that “the main aim of Barnett is to rescue the concept of ES from realist political discourse” (2002). Barnett defines ES as “the process of peacefully reducing human vulnerability to human-induced environmental degradation by addressing the root causes of environmental degradation and human insecurity” (Barnett, J., 2001, 129).

Thus, Barnett presents a new way to conceptualize ES compared to the earlier approach focused on how resource scarcity would lead to interstate conflicts. He identifies the need for new forms of multi-level, polycentric governance, which find new working relationships between citizens, the state, and global institutions based on environmental justice and the peaceful solution of social and political inequality (Franke, V., 2004). He criticizes the existing view on ES (that environmental stress threatens national security) and the ecological perspective (that humans impact the security of the environment itself). Barnett presents ES as a third approach, which defines it “in terms of how environmental degradation threatens the security of people (human security)” (Franke, V. 2004). Daoudy further broadens the scope of ES by developing a new framework called human-environmental-climate security (HECS), which re-centers the human subject in the ES (Daoudy, M., 2021).

Environmental changes, therefore, threaten human security, leading some to define it as the “sustainable utilization and protection of the human environment" (Graeger, N., 1996, 113). This dissertation draws on both ES views but focuses on structural aspects of ES (ethnopolitical and institutional issues) in post-conflict and ethnically divided societies. In the Iraqi disputed territories, ES is about managing ecological risk, governance and ownership claims of environmental resources, competition and confiscation of resources, and legitimacy struggles among various NSAs.

The ES discourse presents a broader human-centered framework based on human security principles. The discourse moves away from state survival to examine how environmental degradation affects individual and community vulnerability. This discourse

identifies natural environmental processes and human activities, including overconsumption and social inequality, as sources of insecurity. This includes multiple actors from state institutions, substate groups, and international organizations. The approach supports extensive long-term policies that target conflict prevention and the root causes of environmental vulnerability in social, economic, and ecological systems (Detraz, N., & Betsill, M., 2009, 306-306).

Table 1.1. Two Ways of Conceptualizing the Security-Environment Nexus

Concepts	***Environmental Conflict Discourse***	***ES Discourse***
Main Focus	The link between resource scarcity and violent conflict	Impact of environmental degradation on human well-being
Referent Object	The state and its stability	Individuals and communities (human security)
Core Threats Identified	Resource scarcity, population growth, and migration	Environmental degradation, inequality, and globalization effects
Primary Actor	The state as protector and conflict manager	Multiple actors: state, substate, suprastate, civil society
Conflict Role	Central concern: conflict is a likely outcome	One among many risks, not necessarily inevitable
Policy Orientation	Short-term adaptation to avoid conflict	Long-term structural change, equity, and vulnerability reduction
Example Scholars	Homer-Dixon 1994, 1999; Michael Ross, 2003.	Liverman 2001; Vogel & O'Brien 2004; Adger 2006; Eakin & Luers 2006; Jon Barnett 2007; Simon Dalby 2009.

Source: Detraz, N., & Betsill, M. M., 2009.

In the disputed territories of Iraq, resources are scarce and have been captured by state policies that prevent and deny access to minority groups like Kurds and Turkmen to their lands and water resources. At the same time, various state actors (GoI and KRG) and NSAs (tribal leaders, sheikhs, political parties, and militia leaders) have been involved in everyday community governance, including managing water resources and ecological services. People have been asked about their perception of structural and resource scarcity relations to communal conflict in the region, the choice among authorities to address their environmental needs, and potential resource weaponization between upstream and downstream authorities in the country. Therefore, this dissertation defines ES as the formal and informal governing of environmental resources, mainly water and arable lands, and the capacity to address ecological scarcity in an equitable and accessible manner that reinforces cooperation and coordination between rival ethnic communities.

1.4.2. Non-State Actors

NSAs are traditional individuals, organizations, and institutions that exercise power, can provide services, and have social and political influence on shaping individual choices and influence governance, often without being an official part of state institutions. Lust argues that NSAs have different roles, making it difficult for people to recognize the role of those actors when they turn to them for help (2022). Much is published in ES literature on the role of NSAs, especially cities, municipalities, companies, and even community leaders, in governing ES. For example, an article by Mads Yding explores the role of tribal chiefs in Turkana, Kenya, during colonialism in the 1970s (2024). The tribal leaders sought to balance their roles as a colonial agent and a respected community leader in the ‘contact zone.’ The leaders needed to balance their roles in fulfilling the colony's demands and their communities' expectations (ibid.). However, while a small body of literature addresses the role of NSAs, there is virtually no research on NSAs' involvement in environmental security in Iraq. By examining how people navigate various NSAs in the context of water governance, this dissertation seeks to advance ES scholarship toward a more polycentric governance framework.

Defining NSAs in the context of Iraqi ES presents a conceptual challenge. NSAs may have overlapping identities and roles. Explaining the concept in the context of Iraq's ES is difficult because NSAs such as sheikh, tribal chief, and military commanders can enjoy multiple positions in state and social institutions. For example, a tribal chief or sheikh can be a parliamentarian or governor despite having a prominent community position (Lust, E., 2022). In Iraq, a tribal leader functions as a traditional authority while holding positions as local mayor, a member of parliament, and a political party leadership member, and so maintains direct access to state decision-makers. When local residents seek these performers to meet their daily environmental demands, they fail to understand their different roles. Given the uncertainty of identity and the roles of NSAs, people find it challenging to choose which authority they approach for assistance. However, this dissertation describes NSAs as sheiks, tribal leaders, clerics, political party members, and militia leaders who possess social and political influences that shape people's daily lives.

1.4.3. Communal Conflict

Communal conflict is another key concept explored in this dissertation. Climate change vulnerabilities such as rainfall anomalies, land degradation, and competition over water resources have caused communal groups to conflict over environmental resources, especially in Africa (Fjelde, H., & Von Uexkull, N., 2012; Eck, K., 2014). Communal conflict is described as a violent attack by an independent group on the territory, rights, and interests of another group by a non-state actor (tribal men, peasants, militias) due to differences in economic interests, competition over natural resources and power, and cultural differences (Okpa, J. T., Ajah, B. O., Eze, O. J., & Enweonwu, O. A., 2023, 4-5). Wig and Kromrey also defined the concept as “violent confrontations between NSAs where the cleavages largely fall along ethnic or tribal lines” (2018). They also distinguish between two sorts of communal conflict: intercommunal conflict, which refers to conflict between competing ethnic groups, and intracommunal conflict, which refers to a conflict within ethnic and tribal groups, called “intracommunal groups” (Okpa, J. T., Ajah, B. O., Eze, O. J., & Enweonwu, O. A. 2023).

Northern Iraq enjoys rich communal and ethnic diversity, where tribes and ethnic groups both cooperate and compete over governance and natural resources. In this context, periodic ethnic, sectarian, and tribal conflicts refer to the recurring tensions between different groups fighting for control of resources and governance in various territories. The communal conflicts in the country are rooted in the Ba'ath Party's legacy of exclusivity and marginalization, as well as the sectarian political restructuring in the post-2003 period, which allows ethnic and sectarian groups to assert identity-based claims over disputed territories.

The communal conflict in Iraq emerges from historical grievances, identity conflict, federal fragmentation, and competition over environmental resources in regions with overlapping authority. In Iraq, communal conflict, especially in the southern regions and the disputed territories between the KRG and the GoI, has been a factor in governing environmental resources, especially water and arable lands. In southern Iraq, declining in the water level of the Tigris and Euphrates rivers significantly contributes to conflict between upstream and downstream tribes and communities over water distribution. In Kirkuk and the disputed territories, there are periodic conflicts between Kurdish and Arab farmers over agricultural land access and water resources, especially in eastern Kirkuk, part of the Little Zab River basin.

The communal conflict in Iraq stems not only from the historical exclusion and denial of minorities' access to environmental resources under the Ba'ath regime but also from the deterioration of these resources, mismanagement of water, and conflicts between governments regarding natural resource management, particularly land.

Consequently, this dissertation defines the concept of *communal conflict* as:

> Ethnic, sectarian, and tribal groups often engage in violent conflict over water resources and infrastructure, agricultural land, and irrigation systems. This conflict can be resolved peacefully. From a historical perspective, these conflicts originate in the state's policies of reform,

exclusion, and deprivation, the scarcity of resources, and the poor governance of environmental resources, particularly water and its infrastructure. In addition, there are issues regarding the ownership of agricultural land, particularly in Kirkuk, Diyala, and Mosul [Ninewa].

1.5. Methodology

This dissertation employs a mixed-methods approach that incorporates qualitative and quantitative techniques to systematically analyze and test the hypotheses and answer the research questions. Pluye, P. & Hong N. Q. contend that the mixed method approach aims to strengthen the advantages of both quantitative and qualitative methodologies while compensating for their shortcomings (2014). The mixed methods also allow the author to “combine the power of stories and the power of numbers” (ibid.). By incorporating numerical data, statistical analysis from the survey questionnaires, and rich descriptive data from interviews and focus group discussions, the author thus could better understand the nexus of Iraq's environment, ethnicity, and communal conflict and the underlying perceptions of ethnic groups of ES and their everyday environmental governance.

1.5.1. Qualitative Comparative Analysis (QCA)

To bridge the gap between quantitative and qualitative research, scholars have introduced methods that help to identify patterns where multiple combined factors cause an outcome. Qualitative Comparative Analysis (QCA) is a method for understanding how and why ethnic groups compete during environmental stress and the factors that shape ethnic conflictual perceptions. Ide (2014) applies QCA methods to study the factors that lead to conflicts over scarce renewable resources. Ide introduces two analytical elements: the first is ‘structural conditions,’ which refer to long-term issues like ethnic division and power imbalances, while the second is "triggering conditions," which relate to political change and resource appropriation [capture] (2015).

Each element of QCA has two conditions. The first is ‘negative othering,’ which is established when a group perceives the other groups as a threat, enabling a structural condition for conflict. The formation of such perceptions usually occurs within specific contexts. The second condition is ‘power imbalance,’ which represents the discrepancies in power and influence between ethnic groups, affecting the potential for conflict. Triggering Conditions is the next element that includes ‘external resource appropriation,’ where an actor (states, dominant ethnic groups) captures local resources via conservation and reform policies, leading to conflict by excluding local communities or enforcing claims through force. Finally, recent political changes describe governance or legal changes that create instability by institutional weakening and changing the control and governance of water resources and arable lands. Political transformations can sometimes decrease conflict levels but more often act as catalysts (Ide, T. 2015).

This dissertation examines ethnicity and environmental conflict in northern Iraq, where ethnic divisions exist, and institutions have limited power, which matches the QCA analysis criteria. The ethnic groups in Kirkuk, particularly Kurds, Arabs, and Turkmen, engage in ‘negative othering’ in their everyday politics, mainly on the elite level, as they perceive each other as threats to their environmental governance. The combination of historical grievances, such as Arabization and forced displacement, with current exclusionary policies, contributes to ethno-sectarian perceptions of these groups on water and land governance, and the authorities should handle the everyday environmental needs of people. Findings from surveys show that the perception of water or agricultural land governance is a zero-sum game, especially at the grassroots level, strengthening ethnic identity division and communal conflict. Furthermore, the power distribution remains unbalanced as Arabs and the federal government control most of the resources and infrastructures in the disputed territories, while KRG institutions remain weak and contested. The power disparities lead to conditions that increase tensions through frustrated resistance as farmers experience blockages when trying to access rival-controlled lands.

In the disputed territories, resource appropriation occurs when the GoI (mainly the previous Ba'ath regime) confiscates arable lands, implements irrigation infrastructures (Hawija Irrigation Canal) to serve the dominant ethnic group in the past, and the current regime is reluctant to solve agricultural land ownership issues. The KRG also exercises 'despotic power' in water governance as an upstream actor by restricting the flows of dams. Ethnic groups often feel excluded from environmental governance over land and water resources. The recent political developments, such as the war against ISIS and the Kurdish independence vote, have altered land and water resource governance and allowed additional NSAs to be involved in ES. The renewal of agricultural contracts for imported Arabs and subsidy payments strengthened the fragmented perceptions and communal conflict among ethnic groups.

The method is significant for this case because it effectively captures multiple causes of environmental conflict in Iraq, especially as this dissertation compares different areas in Iraq (Kurdish-inhabited vs. non-Kurdish) and different areas under the control of the KRG and the GoI. Conflicts over water and arable lands in Kirkuk arise from various structural and political conditions, including ethnic identities and exclusive and weak governance. Lastly, the 'fuzzy-set variant'[1] of QCA enables this project to systematically examine how different factors influence ES, conflict escalation, or even cooperative outcomes among competing groups.

1.5.2. Process Tracing

In addition to the QCA method, this dissertation uses process tracing methods to draw "descriptive and causal inferences" to unpack the sequence of relationships between ethnic conflict and ES in Iraq (Collier, D., 2011; Bennett, A., & Checkel, J. T. (Eds.), 2015).

[1] The Fuzzy Set theory is a social science theory used to examine the causal complexity when several factors together generate an outcome. According to Tobias Ide (2015) "the method of fuzzy-set qualitative comparative analysis is used to bridge the gap between quantitative and qualitative accounts in the field and to detect patterns of conjunctural causation. In theoretical terms, structural conditions (negative othering and high-power differences between the conflict parties) and triggering conditions (external resource appropriation and recent political change) of a violent escalation of renewable resource conflicts are distinguished."

Particularly to trace the agricultural and land reform policies from 1958-2003, demographic changes and resource capture (Arabization, land confiscation) practice, and the exclusion of minority groups from accessing environmental resources.

Process tracing is a qualitative method that reveals the underlying mechanisms linking causes to outcome variables in a particular case (Bennett, A., & Checkel, J. T. (Eds.)., 2015). It navigates the chain of events, policies, and decisions, linking the independent variables in this study (state environmental policy: agricultural reform and agricultural land confiscation) to a specific outcome variable (communal conflict and the division of ethnic groups' understanding of ES). This method is useful for studying the conflict between ethnic farmers over agricultural land and water resources in Kirkuk and understanding how and why this conflict occurs.

While QCA helps us identify the factors necessary to achieve the outcome variable (division of group perceptions of ES and communal conflict), process tracing allows us to delve deeper into cases and reveal how decisions and specific policies about environmental issues occur over time. Using this method, we can gain a deeper comprehension of the agrarian reform program, the confiscation of agricultural land that belonged to Kurdish and Turkmen farmers, the subsequent settlement of Arab farmers, and the water governance processes that have taken place between the federal government and the KRG over the past few decades.

Process tracing depends on details of evidence to “provide the basis for descriptive and causal inferences” and build a gradual construct of narratives on how the regime's agricultural, land, and water policies contributed to the environmental scarcity of minority groups in Iraq (Collier, D., 2011). Thus, the author extensively examined agricultural reform decisions, land policies under the Ba'ath regime, and interviews with farmers in Kirkuk, the KRG Minister for the Disputed Territories, mayors of Kirkuk’s districts, and directors of agricultural and water offices to demonstrate how government environmental policies may have contributed to communal conflict and competition over environmental resources. Additionally, the author interviewed KRG’s Minister of Agriculture and Water

Resources (MoAWR), the KRG's Minister of Environment, and the directors of KRG dams.

1.5.3. Qualitative Data Collection

The research data collection started in late 2023 following Virginia Tech IRB approval. The author conducted multiple field visits to Kirkuk districts for data collection purposes. Before beginning the data collection process, the author needed to obtain different administrative approvals. This approval is necessary to conduct interviews in the districts of Kirkuk, which is a mandated process for citizens and foreigners. The selection of venues and subjects was related to safety, accessibility, and interview availability. For interviews in 2023, the author visited relevant government offices and requested interviews. The author reached out to the participants of this dissertation through multiple methods. In Iraq and Kurdistan, journalists have consistently served as a vital resource for fostering connections with various administrative, bureaucratic, political, and social figures, including tribal chiefs, mukhtars, and farmers. Consequently, the author reached out to multiple journalists to connect with representatives of farmers as well as political and administrative officials. The author subsequently requested that the participants introduce additional individuals; for instance, the former KRG Minister of Environment facilitated the introduction of the former KRG Minister of Agriculture and Water Resources. The previous director of agriculture in Chamchamal also played a role in facilitating the introduction of the director of dams in the Kurdistan Region. The author also directly visited various offices in the Shwan, Qara Hanjir, and Chamchamal districts. However, some interviews conducted in 2024 and 2025 were conducted by telephone, and the author approached subjects through the snowballing technique.

The following table summarizes the interviews and group discussions conducted as part of data collection for this dissertation.

Table 1.2. Summary of Interviews in Kirkuk and the KRG 2023-2025

Name	*Date*	*Location*	*Position*	*Type of Interview*
Ismael, S.	24/13/2025	Derbandikhan Dam, Sulaymaniyah	Director of Derbandikhan Dam	Recorded - Remote
Jamal, K.	4/6/2025	Dukan Dam, Sulaymaniyah	Director of Dukan Dam	Recorded - Remote
Talabani, B.	2/4/2025	KRG	KRG Minister of MoAWR	Recorded - Remote
Majid, A. S.	4/5/2025	KRG	Former KRG Minister of MoAWR	Recorded - Remote
Burhan, F.	11/21/2024	KRG	Minister of Kurdish areas Outside Kurdistan Region	Recorded - Remote
Saed, D.	3/28/2025	KRG	Former KRG Minister of Environment	Recorded - Remote
Idrees, M.	1/7/2025	Daquq, Kirkuk	Representative of Kurdish farmers in Daquq	Recorded - Remote
Sheikh Ezadeen, T.	1/21/2025	Daquq, Kirkuk	Representative of Kurdish and Turkman farmers in Daquq	Recorded - Remote
Abdullah, O.	2/6/2025	Topzawa, Kirkuk	Representative of Kurdish farmers in Topzawa	Recorded - Remote
Ghafoor, S.	1/18/2024	Topzawa, Kirkuk	Representative of Kurdish and Turkman farmers in Topzawa	Recorded - Remote
Ameen, M.	2/22/2025 1/14/2024	Sargaran, Kirkuk	Representative of Kurdish farmers in Sargaran	Recorded - Remote

Shawqi, H.	7/31/2024	Qara Hanjir, Kirkuk	Kurdish farmer in Qara Hanjir	Recorded - Remote
Kamaran, N.	7/31/2024	Qara Hanjir, Kirkuk	Head of PUK Office in Qara Hanjir	In Person
Ashti, M.	7/31/2024	Qara Hanjir, Kirkuk	Director of Qara Hanjir Agricultural Department	In Person
Sirwan Jabbar	07/31/2024	Qara Hanjir, Kirkuk	Director of Agricultural Data and Information	In Person
Bahjat, W.	8/28/2024	Shwan, Kirkuk	Mayor of Shwan (Kirkuk)	In Person
Bahroz, T.	8/28/2024	Shwan, Kirkuk	Director of Shwan (Kirkuk) Agriculture Department	In Person
	1/14/2024	Chamchamal, Sulaymaniyah	Former Director of Chamchamal Agriculture Department	In Person
Zyad, J.	1/14/2024	Chamchamal, Sulaymaniyah	Head of Water Distribution in Chamchamal	In Person
Haval, M.	1/14/2024	Chamchamal, Sulaymaniyah	Director of Media Department at Chamchamal Mayor	In Person
Ameen, Gh.	8/15/2024	Chamchamal, Sulaymaniyah	Media Director of Chamchamal Mayor	In Person
Party Official	07/11/2024	Chamchamal, Sulaymaniyah	Chamchamal PUK Headquarters	In Person
Rebaz, N.	8/29/2024	Chamchamal, Sulaymaniyah	Director of Chamchamal Statistics Office	In Person
Hiwa, K.	8/14/2024	Shorish, Sulaymaniyah	Director of Shorish Water Department	In Person

The author applied a thematic analysis to the qualitative data gathered from interviews and focus groups. This process involved several steps, including selecting keywords and quotations, coding, identifying themes, interpreting the data, and developing a conceptual model.

The process of thematic analysis requires researchers to analyze transcripts to discover recurring ideas and concepts that reveal patterns and themes in interview data (Naeem et al., 2023). The author conducted data familiarization and transcription before identifying initial themes and extracting key data segments with corresponding quotes and themes. This process involves closely examining the data and employing techniques such as visualizing themes and keywords to depict participants' perceptions and meanings. Using coding techniques, the author also assigned concise phrases or words to data segments, such as inter-group conflict over land or urban conflict over water.

Subsequently, the author clustered the themes to detect patterns and develop cohesive themes. For instance, if specific themes related to the role of water scarcity in communal conflict, I labeled them as 'water-induced intercommunal conflict. Next, I defined emerging concepts from the data, like 'water-induced intercommunal conflict,' as violent conflicts arising between groups due to competition over water resources. This stage involved using diagrams or models to illustrate patterns among concepts. Finally, I constructed a conceptual model to represent the data and aid in addressing the research questions (Naeem et al., 2023).

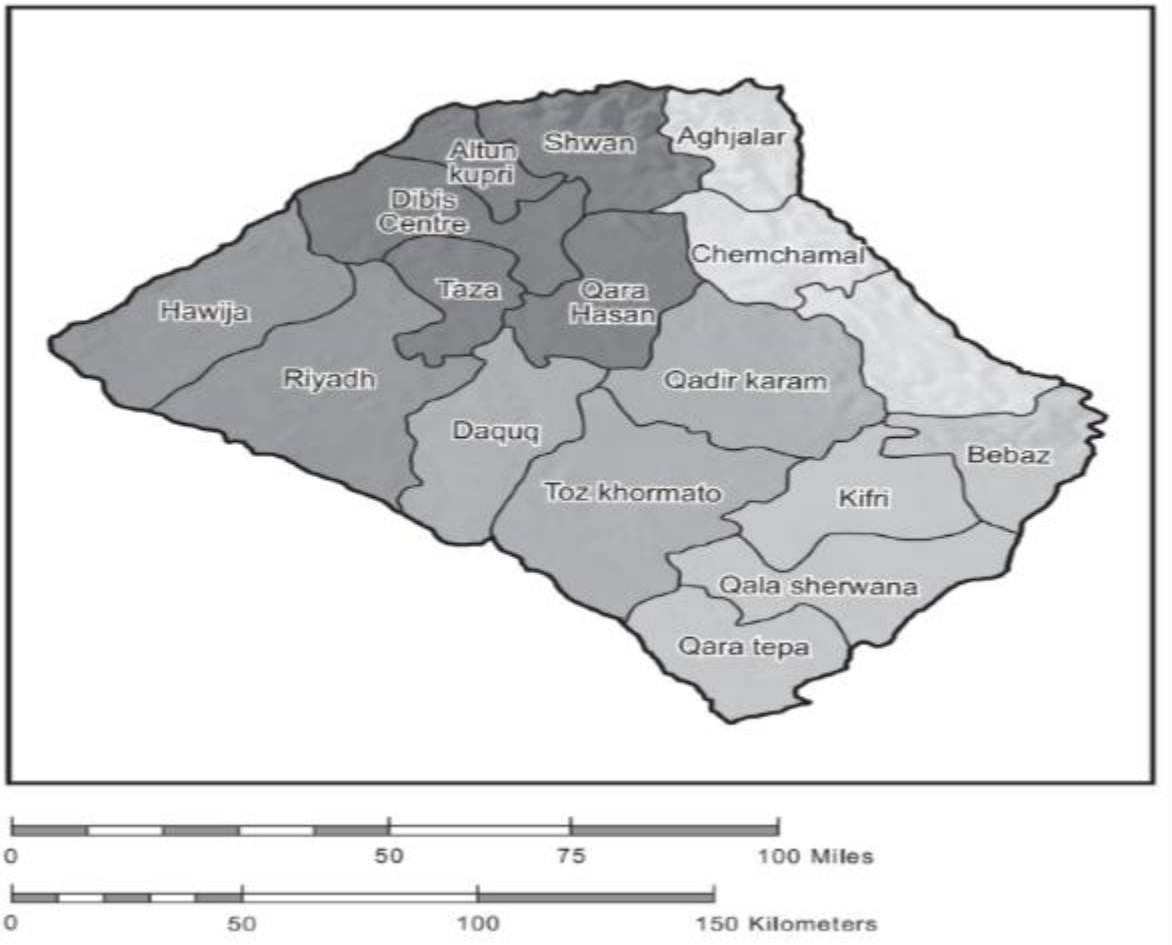
1.5.4. Quantitative Surveys Questionnaires

Three quantitative surveys were conducted between 2023 and 2025. Two took place in Kirkuk Governorate and one in the Garmian region, with a total of 1,950 participants.

The survey participants represented the Kurdish, Arab, and Turkmen communities, with both genders participating. The questionnaires began with demographic sample data followed by focused questions on ES and perceptions of ethnic communities on water

and land governance and the involvement of NSAs in environmental governance. These question areas included agricultural challenges, employment opportunities, water scarcity, drought impacts, interethnic community dynamics, rural-urban migration factors, and social tensions among villagers, farmers, and livestock breeders. Participants were provided multiple response options, allowing for nuanced answers reflecting varied perspectives. Regression analysis was applied as an analytical approach to analyze the survey data and to test the hypotheses.

Map 1. Kirkuk Areas Surveyed



Source: Anderson, L., & Stansfield, G., 2009.

1.5.5. Kirkuk Surveys

Two primary surveys were conducted in Kirkuk at different times. A local survey and media company registered with the Iraqi government called ‘San Company,’ which has previous experience conducting surveys and data collection for the UN organizations and the University of Kirkuk on democracy and electoral participation conducted the data collection in both instances.

The first survey was conducted in the Kirkuk city center and the Shwan, Laiylan, and Daquq districts from April 9 to May 4, 2023, with 600 participants.

The second survey was rerun after the IRB protocol was amended and approved in December 2024. It was conducted from February 2 to 15, 2025, with 400 participants, covering different districts, including Sargaran, Dibs, Topzawa, Yaichi, Daquq, and Hawija, all of which face numerous agricultural and environmental problems and an ongoing communal conflict between ethnic groups.

1.5.6. Garmian Surveys

A separate survey was conducted along the Sirwan River, which stretches from Halabja province to Lake Hamrin in Diyala Governorate. This third survey was conducted from April 23, 2023, to May 9, 2023, in the Garmian region (incorporating parts of Halabja, Derbandikhan, and Kalar in Sulaymaniyah Governorate; and Khanaqin, Saadiyah, and Jalawla in Diyala Governorate), with 950 participants.

This area, situated along the Sirwan River, has a small Arab population but is administratively controlled by the KRG. A local Garmian company conducted the survey DPCN, which is licensed by the KRG and has experience working with surveys for local and international organizations.

1.6. Dissertation Structure

This dissertation encompasses six chapters, all related to the overarching theme of ES, addressing it from different angles and thus answering various questions.

The dissertation examines how ethnicity influences ES in an ethnically divided society. The author analyzes this question from the perspectives of individuals and groups living in Kirkuk and the disputed territories who confront everyday environmental stress. Additionally, the author considers it from the viewpoint of people under the KRG's jurisdiction, particularly in areas like Garmian. Moreover, the author investigated the dynamics of government-to-government relations between the GoI and the KRG.

Therefore, following this introduction, the second chapter examines the relationship between ES and ethnicity in Kirkuk and Garmian, exploring how ethnicity influences people's perceptions of ES and how ethnic communities respond to environmental stress. The next chapter investigates the link between environmental degradation and migration in Iraq, particularly emphasizing how water scarcity and drought cause migration and possibly contribute to communal violence. Chapter Four looks at the role of NSAs in environmental governance in Kirkuk and provides a new perspective on analyzing ethnic conflict in northern Iraq. Furthermore, it explores how people perceive these actors and how much they rely on them to navigate environmental stress. Chapter Five examines the role of structural scarcity in ethnic competition over arable land in Iraq. The final chapter examines environmental federalism, mainly the water governance between the GoI and the KRG. It studies how the KRG employs water resources for its state-building agenda and to what extent this has affected the federal dynamics in the country.

The author concludes by stating that the ethnic conflict has influenced the environmental security response among the competing ethnic groups in the Iraqi disputed territories as they have different understandings of ecological challenges and the extent to which environmental insecurity has exacerbated the risk of communal conflict. Consequently,

the ethnic groups have turned to various authorities and social institutions to govern their ecological security.

Chapter Two

Environmental Security and Ethnicity

2.1. Introduction

Northern Iraq, particularly Kirkuk, and the disputed areas, is home to diverse ethnic, religious, and cultural groups (e.g., Kurds, Arabs, Turkmens) whose relations are characterized by frequent conflicts. Much of the existing conflict studies literature focuses on these conflicts, particularly ethnic strife and competition over natural resources, such as oil (Bet-Shlimon, A., 2019, 2012; Astarjian, H. D., 2007; Anderson, L., & Stansfield, G., 2009; Bet-Shlimon, A. 2012; Nurdiansah, N. 2023; O'Driscoll, D., 2021; Westcott, T., 2019). However, the link between ES and ethnic conflict in the region remains largely unconsidered. This study seeks to fill that gap by examining how specific environmental stress affects ethnic relations in Kirkuk and by exploring the perceptions of rival ethnic groups on ES in Kirkuk and the Garmian region in the disputed territories.

The historical and demographic link between Garmian and Kirkuk is the key to understanding their similarities and differences. Up until the early 1970s, Garmian was a part of Kirkuk, but now it's a contentious territory. It has a diversified population, similar to other parts of Kirkuk; however, the majority is Kurdish. Arab communities are scattered across areas from Garmian to Khanaqin; many were settled there through government-driven relocation policies between the 1970s and 1990s, known as Arabization. Garmian and Kirkuk share a hot, dry climate, but Garmian relies primarily on the Sirwan and Alwand rivers. Whereas Garmian's population is relatively homogeneous, Kirkuk's demographic makeup is more complex, which makes it valuable for comparative analysis.

By examining the relationship between ES and ethnicity among residents of disputed territories, this chapter explores how ethnicity influences people's perceptions of ES and how ethnic communities respond to environmental stress. It focuses specifically on the views of Kurds and non-Kurds (Arabs and Turkmen) about water scarcity, drought, and

disputes over agricultural lands. It argues that political and ethnic beliefs within these groups shape how they understand the environmental stress where they live. In Kirkuk and the disputed areas that are the focus of this dissertation, the policies of the Iraqi government in the past, particularly during the Ba'ath Party era, marginalized ethnic groups by prioritizing the distribution of agricultural land in Kurdish and Turkmens villages over imported Arab farmers from central and southern Iraq. Interviews with representatives of Kurdish and Turkmen farmers in Kirkuk reveal that over 2,100,000 acres of agricultural land have been taken from these two ethnic groups. Their title deeds and contracts have been annulled and reassigned to farmers, Arabs, and various Iraqi government ministries. In Sagaran, located west of Kirkuk, approximately 14 villages have faced issues related to agricultural landownership, and numerous villages in Daquq are experiencing similar challenges. Based on two surveys conducted in 2023 in Kirkuk and its districts and the Garmian region, the findings in this chapter indicate that non-Kurdish respondents perceive a stronger relationship between environmental stress and communal conflict than Kurds.

In other words, data from this study shows that non-Kurds are more likely than Kurds to perceive a strong connection between water scarcity, drought, and communal conflict in the region. They tend to agree that environmental stress significantly contributes to ethnic tensions, disputes between farmers and villagers, the abandonment of agriculture, and the rise of broader social problems. By contrast, Kurdish respondents are less likely to view environmental stress as a driver of such conflicts. The difference in perceptions between non-Kurds and Kurds is statistically significant at the 90 percent confidence level across survey questions. This suggests that the variations are not the result of random chance.

These divisions may stem from differing lived experiences. This seems to be particularly so for non-Kurds, who have felt increasingly marginalized in the allocation of water resources since 2003 due to the power struggle between the KRG and the GoI and changes in their residency status. For their part, Kurds seem to understand environmental stress as less central to conflict dynamics and instead perceive ethnic, governance, and

structural issues as more decisive factors. This chapter is organized into four sections: a review of literature on ES and conflict, an analysis of ethnic fragmentation and environmental stress in the areas of study, a discussion of ethnic conflict in Kirkuk, and a data analysis from the surveys to test the hypothesis.

Map 2. The Kurdistan Region and Kirkuk

Source: Anderson, L., & Stansfield, G., 2009.

2.2. Environmental Scarcity and Ethnic Conflict

Global environmental change, including heavy rainfalls, floods, cyclones, prolonged droughts, desertification, and water scarcity, have significantly undermined human security worldwide in recent decades (Barnett, J., & Adger, W. N. 2007; O'Brien, K., & Barnett, J. 2013; Daoudy, M. 2023). They have resulted in considerable loss of life, displaced millions, and created serious challenges to food security. Developing countries with limited institutional capacity are especially vulnerable, and the resulting tensions exacerbate profound ethnic and communal tensions within and between communities (Clack, Meral, and Selisny, 2023, 114; Barnett, J., & Adger, W. N. 2007, 691). Developing countries are more susceptible to violence driven by 'environmental scarcity,' primarily because their economies and well-being rely heavily on agriculture. Such countries typically lack the necessary financial, material, and human resources to address the impacts of such scarcity and often possess fragile state institutions whose stability is frequently marred by internal discord (Homer-Dixon, 2010; Van Baalen, S., & Mobjörk, M., 2018; Shi, R., Su, Y., Pan, J., & Kang, Y., 2024).

Homer-Dixon (2010) argues that environmental scarcity can contribute to various forms of violent conflict. For example, environmental degradation caused by logging and dam construction can trigger armed conflicts. Scarcity may also drive ethnic conflict as population migration intensifies social divisions. Additionally, civil strife can emerge when environmental scarcity undermines economic productivity, disrupts livelihoods, influences elite behavior, and weakens the state's ability to meet societal demands. Interstate conflicts may arise from competition over scarce essential resources. In contrast, disputes between Global North and South countries can escalate over responsibilities related to mitigating, adapting to, and compensating for global environmental stress. Among these five types of conflict, ethnic conflict and civil strife are particularly significant, as they often result in population displacement and reduce economic productivity in ways that deepen social fractures and threaten the livelihoods of affected communities (Homer-Dixon, 2010, 4–5).

This chapter examines the contribution of environmental stress in northern Iraq to communal conflict between Kurds and non-Kurds and how specific already ethnic disputes between Kurds and non-Kurds groups influence these groups' perceptions of environmental governance in the region. This chapter aims to illuminate how water scarcity, droughts, and land conflicts elevated the risk of tensions between these populations and influenced their perspectives on ES by exploring the relationship between ecological challenges and ethnic relations.

Two significant scholarly projects in the 1990s, one at the University of Toronto and the other at the Swiss Peace Foundation, examined the relationship between environmental scarcity and violent conflict. They thereby began a wave of research on the connection between these two variables (Hauge, W., & Ellingsen, T. 1998). Scholars such as Collier and Hoeffler later introduced a contrasting perspective by arguing for a link between environmental abundance and violent conflict, which shifted scholarly focus from scarcity as the sole driver of violence to how the availability of resources fuels tensions and conflict (Collier, P., & Hoeffler, A. 2005; Khagram & Ali, 2006, 399). This study refrains from asserting direct causality between environmental stress and ethnic tension in Iraq. However, it does posit that the ongoing conflict between Kurds and Arabs is influenced by environmental stress, particularly water scarcity. As such, it may further divide these communities through their perceptions of water scarcity and their approaches to governance.

Evidence currently suggests a weak causal link between environmental stress and conflict; consequently, it cannot be assumed that ethnic competition for resources adequately explains the emergence of violent conflict (Mach et al., 2019, 193). For example, an empirical analysis conducted by Wimmer, Cederman, and Min (2009) examined data from 115 countries between 1945 and 2005. It focused on non-environmental factors to explore the connection between ethnic politics and armed conflict. Their findings revealed that rebellion, infighting, and secession were often driven by ethnic exclusion and state segmentation (power sharing by competing elites) in weak states with little history of centralized governance (Wimmer, Cederman, & Min 2009, 316;

Sunga 2011, 77). Raleigh, Urdal, and Sunga also illustrate that the link between ethnic conflict and ES is either weak or indirect, particularly in cases such as the Darfur conflict (Sunga, 2011, 64; Raleigh & Urdal, 2007). These conclusions do not suggest that environmental stress cannot lead to ethnic strife; instead, they indicate that such conflicts should be analyzed in tandem with other contributing factors, including power dynamics within a society, the preservation of sociopolitical rights for all ethnic groups, the reinforcement of the rule of law, and economic deprivation (Sunga, 2011, 78).

Ethnic divisions, which significantly influence individuals' understanding and prioritization of ES in conflict and post-conflict societies, shape not only community engagement but also community responses to environmental stress on a national scale (Brulle, Carmichael, & Jenkins, 2012, 8; Benegal, 2018, 736). In multiethnic societies, ecological issues in combination with other "structural and contextual conditions such as ethnopolitical exclusion," economic and socio-political factors, and political marginalization may intensify group identity and motivate marginalized communities to mobilize against the dominant ethnic group (Buhaug, H., 2010, 16477; Buhaug, H., 2016; Wischnath, G., & Buhaug, H., 2014; Shi, R., Su, Y., Pan, J., & Kang, Y., 2024; Fjelde, H., & Von Uexkull, N., 2012).

Moreover, ethnic and 'social' identity is frequently intertwined with how communities perceive, attitudes, behaviors, and use the environment or take adaptation measures, particularly for those whose livelihoods depend entirely on environmental resources (Fielding, K. S., & Hornsey, M. J., 2016;1-2; Barnett, J., Graham, S., Quinn, T., Adger, W. N., & Butler, C., 2021, 2; Elias, T., Dahmen, N. S., Morrison, D. D., Morrison, D., & Morris, D. L., 2019). Environmental stress may not only jeopardize the economic well-being of indigenous groups but also endanger their survival (Lee, 1997, 374). In short, when the identity of ethnic groups is profoundly tied to a particular territory, environmental stress can seriously threaten their sense of identity. When such groups become mobilized to address their grievances and pursue their collective interests, conflicts with dominant ethnic groups and governments often arise.

In northeastern Manipur, India, climate change and ethnic conflicts severely impact Loktak Lake, vital for over 100,000 residents who depend on its fish for their livelihoods. Tensions between two ethnic groups, the Meitei and Kuki-Zo, have intensified competition for fishing resources; as a result, the number of individuals in villages such as Thinungei who rely on fishing has increased from 100 to 150 to around 300. This surge in demand is putting immense strain on the lake's ecosystem (Mbiyozo & Maunganidze, 2021; Anand, Oinam, & Wieprecht, 2024, 12).

Similarly, since gaining independence in 1948, Sri Lanka has faced persistent ethnic conflict between native Sinhalese and Tamils who have descended from Indian laborers brought in by the British in the twentieth century. The Sinhalese predominantly inhabit the wet zone in the southwest, whereas the Tamils reside in the drier eastern and northern regions. Due to decreased agricultural productivity resulting from environmental stress, particularly flooding, farmers from less fertile areas have migrated in search of better lands. At the same time, food scarcity and rising starvation levels have incited civil unrest. This situation is exacerbated by flooding, which has prompted significant internal migration to areas already suffering from long-standing ethnic conflicts between Sinhalese and Tamils. As a result, some Tamils resorted to joining insurgent groups (Lee, 1997, 374; Lawrence, 2013).

The African countries have experienced regional destabilization through violent armed conflicts, which were significantly influenced by environmental stress factors, including temperature and rainfall scarcity. The tensions between ethnic and religious groups have been escalating since numerous farmers and herders have been in conflict. As arable land becomes scarce, herders more frequently invade traditional farming areas, intensifying disputes and sparking violent clashes (Burke, M. B., Miguel, E., Satyanath, S., Dykema, J. A., & Lobell, D. B., 2009; Van Baalen, S., & Mobjörk, M., 2018; Cappelli, F., Conigliani, C., Consoli, D., Costantini, V., & Paglialunga, E., 2023; McGuirk, E. F., & Nunn, N. 2025; Cabot, C., & Cabot, C., 2017).

Research from the Wilson Center's Africa Program highlights the impact of climate change on extremism in the Lake Chad Basin, where catastrophic environmental degradation has disrupted or destroyed the livelihoods of local communities. The shrinkage of the lake from 26,000 square kilometers in the 1990s to just 1,350 square kilometers by 2014 has created a regional humanitarian crisis in Cameroon, Chad, Niger, and Nigeria that includes rising violent extremism as well as escalations in particular ethnic and communal conflicts. In Nigeria and the Republic of Chad, for example, environmental stress has driven the Fulani herdsmen (Bororos) in northern regions to migrate southward. This movement has strained Fulani relationships with the Yoruba people in the southwest, resulting in a tense atmosphere marked by armed conflict, social unrest, cattle theft, and nighttime robberies. In the Democratic Republic of Congo, ethnic conflict arises from competition for resources between the Hema, traditional herders, and the Lendu, who are primarily farmers, as both groups vie for land essential to their respective ways of life (Folami & Folami, 2013, 107–108; Madeira, 2019; Vanegas, 2021, 156–157; Clack, Meral, & Selisny, 2023, 5).

In ethnically divided societies, environmental stress often contributes to tribal and communal identities, strengthening individuals' sense of 'groupness' (Kahl, C., 2006). At the same time, however, ethnic tensions worsen—potentially leading to violent conflict—as environmental stress escalates and competition for scarce resources increases (Raleigh, C., 2010, 70). The awareness and assertiveness of marginalized groups about their identity grows stronger because they experience deprivation and frustration from unequal resource distribution. These groups' Political mobilization will intensify political and social tensions in already fragmented societies. The process intensifies existing communal conflicts that could have stayed hidden otherwise.

Environmental stress has caused major ethnic conflict between tribes in Mali. The conflict between Dogon farmers and Fulani pastoralists has been portrayed as an ethnic dispute over limited resources. However, studies show that examining the politics of land governance within a historical context is essential to understanding the situation. Benjaminsen, T. A., & Ba, B. (2021) contend that the issues between these two groups

are fundamentally linked to political and economic factors, particularly concerning access to and control over arable lands and natural resources.

It is well known that environmental scarcities indirectly affect conflict by spurring migration and other demographic shifts. Current scholarly discussions on the relationship between the environment, conflict (Le Billon, 2014, 5), and migration often rely on Malthusian theory (Goldstone, 2002; Selby & Hoffmann, 2012, 998) or climate change adverse outcomes (drought and water scarcity) (Kelley et al., 2015, 3241; Gleick, P. H., 2014), or recently structural factors (Selby et al., 2017b; Selby et al., 2017a; Selby, 2019; Daoudy, M., 2020).

Chapter three will expand on these arguments, but it is important to note that environmental migration leads to conflict between competing groups because the arrival of new settlers creates competition for resources and disrupts the existing social and political dynamics in receiving regions. As these rival groups struggle for control over land and resources, the likelihood of conflict rises, jeopardizing social cohesion and stability (Reuveny, R. 2007). In Bangladesh in the 1970s, for example, the government initiated Bengali relocation to the southern regions, resulting in the Bengalization of Chakma territories. Following a devastating cyclone in 1970 and 1991, the government encouraged impoverished and landless Bengali migrants to settle in the Chittagong Hill Tracts. Accordingly, until 1991, nearly half a million Bengali settlers from disaster-affected coastal areas and offshore islands were granted state-owned land that had previously been designated as communal lands for the indigenous populations. This process fostered a pan-tribal identity among the indigenous groups and ultimately led to violent rebellions against the Bengali settlers (Bashar, 2011, 4–8).

Other environmental stress has further intensified ethnic and sectarian segregation in the Hill Tracts. The Hill peoples of Bangladesh, who are primarily of Arakanese–Burmese

origin and practice the distinctive *jhums* [2] cultivation method, differ from the predominantly Muslim Bengali majority. In the mid-1970s, guerrilla warfare broke out between the armed tribal group Shanti Bahini and the government, mainly in response to the allocation of illegally seized common lands to Bengali settlers. The displacement of people disrupted the traditional shifting cultivation practices of indigenous communities, especially the Chakmas. The settlers' invasion of land that was available to all for cultivation led to a violent escalation of tensions (Lee, 1997, 384–85; Chowdhury, 2008, 62).

Government policies that demonstrate a preference for particular groups, "ethnic favoritism," in ethnically divided societies tend to intensify existing ethnic tensions, especially when environmental stress is present. Busby (2022) points out that ethnic favoritism manifests through exclusionary decision-making and unfair aid distribution during environmental stress, which has increased the likelihood of ethnic conflict. Biased allocation of resources, neglect of minority communities, and uneven environmental governance can deepen and amplify grievances, making ethnic groups more vulnerable to mobilization and conflict—particularly if such groups are already marginalized. In Pakistan, since partition, water infrastructure along the Indus River has been concentrated in Punjab, significantly reducing the water flow to downstream Sindh. This has led to severe economic hardship in Sindh, with the river often running dry before reaching the sea and millions of Sindhi farmers and fishermen losing their livelihoods and contributed to communal conflict among groups (De Luca, G., Hodler, R., Raschky, P. A., & Valsecchi, M., 2018, 7).

Also, the ethnic conflict in Darfur, Sudan, is one of the earliest examples of strife linked to environmental scarcity. In 2007, the United Nations Secretary-General Ban Ki-Moon asserted that climate change was a driving factor behind atrocities there (Mazo, J. 2010); however, southern residents had long viewed government actions as fueling ethno-

[2] Jhum chash, or shifting cultivation, involves farming on hill slopes and is predominantly practiced in the Chittagong Hill Tract (CHT) area of Bangladesh by tribal communities. This traditional method has fostered strong personal connections between the ethnic minorities and the cultivation framework, enhancing their ethnobotanical knowledge over generations. For further details, refer to the work of Pasha, Mozumder, and Chakma. (Pasha, Mozumder, and Chakma)

religious tensions between Arab Muslims in the north and African (non-Arab) Christians in the south. In general, the uneven distribution of the advantages and burdens associated with agricultural policies has intensified ethnic violence in Sudan (Mazo, J., 2010). The Khartoum government's introduction of mechanized farming initiatives aimed at achieving food security and establishing the region as a significant food exporter primarily benefited elite and affluent merchant farmers. The Arabization of arable lands in the south has also played a part. In the late 1980s, because of the alienation of land ownership from the Moro ethnic group, state-run farms were predominantly owned by Arab Muslim ethnic groups. The combination of government encroachments and actions by the Jellaba on traditional Moro lands pushed the Moro speakers to support the southern rebel forces in their assaults against the Muslim Arab speakers of the Hawazma and Jellaba communities (Mazo, J., 2010).

Lastly, the exploitation of environmental resources by dominant ethnic groups can heighten inter-group tensions, especially when a particular group perceives that these resources are being hoarded to serve a dominant one and that this disparity contributes to the marginalization of one or more subordinate groups (Icduygu, A., Romano, D., & Sirkeci, I., 1999). A notable example is the Kurds; as an ethnic group deeply connected to the mountainous regions of northern Iraq and Turkey, they depend heavily on the land for agro-pastoralism. The environmental destruction of vital resources through deforestation, dam construction, land confiscation, and oil extraction threatens both their survival and autonomy while creating political tensions. The Turkish military's deliberate destruction of forests and vital sources of livelihood as part of a calculated military strategy combined with Turkey's control of upstream rivers has caused severe damage to the Kurdish agrarian economy while creating multiple complex challenges. Kurds in southeastern Turkey also face insecure access to arable lands and forced relocation because of these policies. Furthermore, over 3,000 Kurdish villages and hamlets in the region were forcibly evacuated between 1990 and 2000; the practice peaked in 1994 when 1,531 villages were either evacuated or burned. This strategy of depopulating rural communities and forcibly relocating people, which has destroyed essential agricultural practices and resources, has caused a significant decline in farming and animal

husbandry, the two primary economic activities in the region (Icduygu, Romano, & Sirkeci 1999, 996; Van Etten et al., 2008; Gurses, 2012, 254, 261).

Iraq is currently dealing with the lasting consequences of past environmental and agricultural policies that forced many farmers and communities to abandon their lands. In Kirkuk and the surrounding disputed territories—which are at the heart of this study—government policies have historically marginalized certain ethnic groups by reallocating agricultural land from Kurds and Turkmen to Arabs. The growing environmental stress has made land and natural resource competition more apparent in Kirkuk, which already had ethnic tensions. The current scarcity of resources has intensified the conflict between ethnic groups, while past environmental policies that favored certain ethnic groups have increased the potential for conflict in the region. The question arises: What happens to ethnically divided communities when they face environmental insecurity?

To address this question, it is essential to propose a hypothesis that regards ES as a contributing factor in communal conflict. The current research literature avoids making direct connections between ES and conflict. The research identifies environmental stress and political and economic challenges as major elements that lead to conflict. This chapter of the dissertation bases its assumptions on this understanding.

H. 1. If competing ethnic groups are unevenly affected by environmental insecurity, including water scarcity and arable land appropriation, then the likelihood of increased communal conflict rises.

2.3. The Role of Ethnic Divides in Shaping Environmental Security Dynamics

For this dissertation, it is assumed that considerations of ethnicity and identity are critical to addressing broader social and political challenges in deeply divided societies, as different groups are likely to have unique political concerns, grievances, and interests. For example, minority groups frequently experience fewer state privileges compared to

the dominant ethnic group; in turn, such disparities result in under-resourced areas and reduced political participation, as well as adverse effects on minority economies. They also influence how each ethnic group perceives environmental risks—a question germane to this study. Accordingly, one of the central concerns of this study involves whether minority ethnic groups or those grappling with political and identity challenges prioritize improving their economic conditions and social status over ES issues, as well as whether they may also view environmental stress as secondary to their immediate needs for stability and recognition within society. It is assumed herein that the roles of ethnic identity and societal cohesion within groups are key to understanding how members of those groups perceive environmental stress and, by extension, how people and societies respond to these challenges.

Environmental security is widely recognized as a social issue, with ethnicity, race, religion, and group dynamics playing a significant role in shaping perceptions and policies on the matter (Lazri, A. M., & Konisky, D. M., 2019; Bryant, B., & Mohai, P., 1992; Arbuckle, M. B., & Konisky, D. M., 2015). There are several generally identified trajectories in understanding ethnic perception for ES. First, when the relationships among ethnic groups are marked by incompatibility and conflict, one or more marginalized groups experience political, identity, economic, social, and environmental issues. Consequently, their understanding of ecological security and approaches to environmental governance diverges from those of other ethnic groups, particularly the dominant ones (whose identity, needs, and interests are reflected by state institutions and official policies). The result is that disenfranchised ethnic groups tend to put their economic, political, and cultural concerns above ES (Lazri & Konisky, 2019; Bryant, B., & Mohai, P., 1992). They often perceive environmental stress not as an immediate threat but as a secondary issue. Their primary focus, the struggle for their survival, overshadows ecological considerations.

Traditionally, it has been argued that minority ethnic and racial groups exhibit less concern for environmental problems, usually because they are perceived as focusing primarily on issues of immediate urgency (e.g., social justice, political representation, and

economic security) despite often residing in areas more susceptible to environmental risks (Jbaily et al., 2022, 228; Bryant, B., & Mohai, P., 1992). Although this dissertation emphasizes the Iraqi disputed territories on Kirkuk, insight from the United States-based studies provides a significant point of comparison, especially when there is limited data and research on this aspect in the region. In the U.S., where different ethnic and racial groups live nearby or may be integrated, public attitudes toward environmental concerns are "deeply polarized" (Egan & Mullin, 2017, 210; Smith, Bognar & Mayer, 2024).

Minority ethnic groups historically have purportedly viewed issues such as water quality, sewage management, and air pollution as predominantly "White issues/things" (Hershey & Hill, 1977, 439). For example, research examining the perspectives of African American college students on environmental topics found that their level of concern was lower compared to that of their White peers (Kreger, 1973, 33; Mohai & Bryant, 1998, 475). More recent studies have called this perspective into question by emphasizing the diversity of such viewpoints among U.S. ethnic and racial groups. Ethnic minority groups commonly experience 'environmental racism' (Bullard, R. D., 1993),[3] meaning that they face disproportionate impacts from environmental stress and degradation. Consequently, such heightened environmental vulnerability has led numerous minority communities to prioritize ES and efforts to address related threats, such as reducing greenhouse gas emissions (Bullard 1993; Leiserowitz and Akerlof 2010, 18; Schuldt and Pearson 2016, 495).

Research indicates that individuals' political beliefs determine their readiness to engage in climate-related discussions and their willingness to support or actively work on

[3] Environmental racism was first termed by Benjamin F. Chavis Jr. during a North Carolina protest in 1982. The residents of Warren County (home to the highest population of Black residents in the entire state) were protesting the imminent landfill pollution near their homes. Chavis was among nearly 500 people who were arrested. He coined the term “environmental racism” from a jail cell, referring to the intentional placement of waste facilities and pollution in areas populated by minority ethnic communities. Furthermore, a sociologist Robert Bullard, known as the “father of environmental justice,” defined environmental racism as “any policy, practice, or directive that differentially affects or disadvantages (where intended or unintended) individuals, groups, or communities based on race.” For more information, please see the: https://leadthechange.bard.edu/blog/the-effects-of-environmental-racism or https://www.nrdc.org/stories/what-environmental-racism

environmental sustainability initiatives. People who identify as liberal tend to back ES initiatives more strongly than those who identify as conservative and show less interest in these matters (McCright & Dunlap, 2011, 1167). For example, environmental awareness and activism tend to fall along political lines in the U.S.; liberals typically emphasize environmental protection and sustainability, whereas conservatives prioritize economic growth and deregulation. White men, on average, tend to perceive ecological risks (such as climate change) as less severe, which aligns with conservative political parties' climate change skepticism across political settings (McCright, A. M., & Dunlap, R. E., 2011; Egan, P. J., & Mullin, M., 2017), which reflects a broader trend of division in the perception and treatment of environmental matters within the political sphere. Consequently, an individual's perspective on environmental issues is likely influenced by their political affiliation.

Research also documents that people of color support pro-climate attitudes more than their White counterparts (Leiserowitz, A., & Akerlof, K., 2010). Communities of color tend to express greater concern about environmental stress, perceive them as significant threats, and advocate more passionately for climate action (Perry, A. M., Donoghoe, M., & Lall, J., 2023). In September 2023, Citizen Data estimated that 88 percent of Black voters are somewhat concerned about climate change—9.6 percentage points higher than the national average of 78.4 percent and 12 percentage points higher than white voters alone. By contrast, White males often demonstrate higher levels of skepticism and "endorse denialist views" about climate change by frequently questioning its seriousness and the urgency of necessary responses (McCright, A. M., & Dunlap, R. E., 2011, 1). Additionally, Asian Americans and Hispanics are found to exhibit greater concern for climate-related issues compared to their Black and White counterparts (Macias, 2016, 113; Benegal, 2018; Leiserowitz & Akerlof, 2010; Elias & Hmielowski, 2021; Smeltz, D., Kafura, C., Rondeaux, C., Rasool-Ayub, H., & Avant, D., 2023).

Various explanations have been proposed to clarify the disparities in environmental perceptions and awareness among different ethnic and racial groups, such as the U.S. examples highlighted above. The environmental justice literature contends that the

vulnerability of minority groups, which is shaped by systemic inequalities, deprivation, and their heightened exposure to environmental stress, not only influences their understanding of what constitutes an environmental issue but also intensifies the environmental risks they face (Mohai, Pellow, and Roberts, 2009, 411; Bullard et al., 2008, 11; Hardy et al., 2018, 3).

Ethnic groups hold distinct views about environmental issues because of economic inequalities (Bryant, B., & Mohai, P., 1992, 6-8). People of color face financial difficulties, which prevent them from addressing environmental issues and other societal problems. The economic stability of White people allows them to engage more effectively with ecological problems. Media exposure also plays a substantial role in shaping these perceptions. For instance, Hispanic Americans who consume conservative media tend to show decreased concern about climate change. In contrast, those exposed to nonpartisan or liberal media tend to express greater concern about environmental issues and align their views more closely with those of Asian and Hispanic Americans (Kreger, 1973, 33; Elias & Hmielowski, 2021).

Research shows that different ethnic and racial groups may prioritize particular environmental concerns rather than addressing broader environmental stress (Ballew, M., Maibach, E., Kotcher, J., Bergquist, P., Rosenthal, S., Marlon, J., & Leiserowitz, A., 2020). The 2019 Climate Change in the American Mind surveys found that Hispanics/Latinos (69%) and African Americans (57%) expressed higher levels of alarm or concern about global warming than Whites (49%). The survey results show that Whites demonstrate higher levels of doubt or dismissal about global warming (27%) than Hispanics/Latinos (11%) and African Americans (12%) (Ballew, M., Maibach, E., Kotcher, J., Bergquist, P., Rosenthal, S., Marlon, J., & Leiserowitz, A., 2020).

The beliefs of individuals and groups about environmental issues, which are often diverse and dynamic, can be influenced by socioeconomic and political factors (Millner & Ollivier, 2016, 226). For example, Mohai and Bryant (1998) found that African Americans were generally more concerned about pollution than about nature conservation and offered

three explanations for racial and ethnic disparities in environmental concerns: hierarchy of needs, cultural differences, and environmental deprivation (Mohai, P., & Bryant, B.,1998). The first two suggest that communities of color may focus less on environmental issues, but the third implies that African Americans may have greater ecological concerns than other groups (Liere & Dunlap, 1980, 183–184; Mohai & Bryant, 1998, 475). The understanding of nuanced differences between group reactions to environmental issues is significant to the analysis of the disparity between Kurds and Arabs in Kirkuk, as the Kurds may be more concerned about problems related to arable lands compared to air pollution and water scarcity.

Building on the evolving understanding of how different ethnic and racial groups in the U.S. feel and express concern about ES, a second approach emerges that considers the potential to use environmental stress as a peacebuilding tool in post-conflict societies (Ide, T., 2017; Dresse, A., Fischhendler, I., Nielsen, J. Ø., & Zikos, D., 2019). This perspective suggests that although the dynamics among competing ethnic groups about environmental stress may differ significantly, these groups may unite and collaborate in the face of environmental stress in a process known as EP. In other words, environmental stress (e.g., water scarcity and drought) that impacts communities across ethnic and sectarian lines can diminish polarization among rival groups.

For example, cooperation and peace were noted among Achaean communities in Indonesia instead of their usual conflicts after the 2004 tsunami (Popovski, 2017). Environmental stress also strengthens the ties between small ethnic farming and African pastoralist groups (Moritz, 2010). Scholars have noted that, in practice, there tends to be more cooperation than conflict between farmers and herders in the Sahel, with many disputes being resolved peacefully (Bukari, Sow, & Scheffran, 2018). This cooperation manifests through numerous mechanisms, including cattle entrustment, resource sharing, trade, friendship, intermarriage, visitations, exchanges, communal labor, and social solidarity, all of which foster positive relationships between communities despite the pressures of environmental stress.

The strength of environmental stress determines the effectiveness of EP. The approach receives support from Geoffrey D. Dabelko, Ken Conca, Ide Tobias, Ashok Swain, Carl Bruch, Anaïs Dresse, et al., Erika Weinthal, and other scholars who claim that quick environmental stress development creates social cohesion through community and group unity. Environmental threats that require immediate action develop a sense of shared purpose, which unites communities even when other conflicts exist. When confronted with a shared crisis, ethnic factions may put aside their differences to collaborate. When disaster compels individuals to work together, bonds between previously divided groups may be strengthened, and cooperation may be fostered across ethnic and social boundaries (Geoffrey D. Dabelko, 2005; Florian Krampe, Ashok Swain, Carl Bruch, 2018; 2023; Slettebak, 2013; Ide, T. 2017; Dresse, A., Fischhendler, I., Nielsen, J. Ø., & Zikos, D., 2019).

The literature on EP examines the potential for collaborative environmental efforts among ethnically diverse and conflicting groups during and after periods of conflict and even between the upstream and downstream countries in the Middle East; in this sense, it is relevant to this dissertation's examinations of ongoing inter-group conflicts in northern Iraq (Ide, T., Sümer, V., & Aldehoff, L. M., 2018; Moosa, H., 2018). Its conclusions are based on the premise that environmental stress can foster "peace and cooperation rather than violence and competition" (Dresse et al., 2019, 99). Within this framework, peace is viewed as a "continuum" that ranges from the mere absence of violence (possibly temporarily) to a state in which violence becomes inconceivable (Conca & Dabelko, 2002, 9). EP is thought to operate in three key dimensions: security, livelihood and economy, and political and social relations; again, these dimensions are directly relevant to the conditions in northern Iraq examined in the present study (Ide et al., 2021, 3). The latter dimension, in particular, suggests that shared environmental stress can serve as entry points for cooperation, even between groups with hostile or distrustful relationships. Moreover, positive-sum collaboration on environmental issues can foster trust and understanding between social and ethnic groups.

The EP literature views the good governance of natural resources as a tool for fostering peace among communities in post-conflict settings (Beevers, 2015, 230; 2018, 9). When resources such as water and minerals are assessed, allocated, and distributed fairly, with empowered state authorities effectively addressing competition and preventing monopolies, mismanagement, and overexploitation are likely to decrease. For example, good governance of natural resources in Liberia and Sierra Leone, particularly diamonds and forests, has facilitated peacebuilding efforts (Beevers, M. D., 2018). The economic opportunities and job creation generated within these countries by this approach serve peace and stability. In Ethiopia, participatory and inclusive resource management involving communities in decision-making processes enables framing and managing conflicts over resource use in ways that promote constructive solutions rather than leading to destructive or unproductive outcomes (Martin, 2005, 329). As a geopolitical strategy, EP aims to transform mistrust, uncertainty, suspicion, and conflicting interests among states by treating the sharing of natural resources as a tool for resolving conflicts (Dresse et al., 2019, 103). At the level of societal relations, environmental cooperation, and shared resources among ethnic groups promote societal interdependence and encourage a sense of ecological responsibility, leading to peaceful resolutions to environmental disputes (Conca & Dabelko, 2002, 10).

The research study does not include the development of EP strategies for northern Iraq, which serves as the research area. Instead, it focuses on environmental studies by examining northern Iraqi conditions, especially Kirkuk and its surroundings, which produce ethnic conflict because of environmental stress and governance interactions. The different groups in Kirkuk have political goals that align with how important they think the area is to their ethnic history. The substantial political differences between groups make it nearly impossible to understand constitutional and political issues. For instance, since the fall of the Ba'ath regime in 2003, provincial council elections have been held almost every four years across Iraq; in Kirkuk, they have been held only twice due to ongoing disagreements among the parties.

Similarly, establishing a national government in Iraq that addresses all community needs proves challenging. The implementation of Article 140 from the Iraqi Constitution serves as a clear example because it failed to prevent ongoing ethnic conflicts despite its goal to resolve territorial disputes and governance issues, including those in Kirkuk, by 2007. This article and its implementation are thoroughly discussed in Chapter Four.

The UN Assistance Mission for Iraq (UNAMI) has persistently but unsuccessfully attempted to mediate conflict between Kirkuk's communities. In 2009, it issued a special report recommending that the parties agree to hold a referendum to decide the city's future, including the possibility of Kirkuk becoming an independent region—an outcome intended, seemingly counterintuitively, to further entrench federalism in Iraq. However, the impasse did not change until the KRG assumed direct military control of Kirkuk in 2014, at the onset of the war against ISIS. As a result, the city's administration was entirely under Kurdish control until 2017. During this period, KRG President Massoud Barzani declared that Article 140 had been fulfilled, and Kirkuk now belonged to the KRG.

Despite swift and adverse reactions from both the UN (UNAMI 2017) and Baghdad to this verbal annexation, the Kurdish-majority Kirkuk Provincial Council raised the Kurdish flag over the city. At the same time, the Kurdistan Democratic Party (KDP) and the Patriotic Union of Kurdistan (PUK), the two dominant Kurdish parties, seized control of Kirkuk's oil fields, which connected the city's oil pipeline to the Kurdistan Region of Iraq's (KRI) infrastructure and assured continued export of Kirkuk's oil to Turkey. Tensions rose between the two parties as the KDP monopolized oil revenues. In response, the PUK deployed forces to seize control of several oil wells, impacting their agreement on oil exports. Ultimately, the ruling parties agreed on the issues, and the KRG sold oil from Kirkuk while withholding the revenues from the Iraqi federal budget.

In the wake of these events, in 2017, the KRG decided to hold an independence referendum within its official borders and in Kirkuk and other disputed areas. On September 25, 2017, unilateral action by the KRG without Baghdad's approval received widespread criticism as a strategic mistake because both the U.S. and neighboring

countries had requested a delay. Massoud Barzani ignored these warnings, which triggered the Iraqi army and Shiite militias to launch a military operation to seize Kirkuk and other disputed areas. The neighboring states implemented severe political and economic sanctions against the KRG, intensifying political and ethnic conflicts among Kirkuk's various communities (O'Driscoll & Baser, 2019; Park et al., 2024). Consequently, Kirkuk's communities remain politically and ethnically divided and unable to agree on governance.

In light of this example and its relevance to the proposed relationships between environmental stress and ethnically based perceptions, this study explores how Kurds and Arabs perceive ES in Kirkuk. Specifically, how does ethnicity affect each group's perception of ES? To answer this question, the study hypothesizes the following:

H. 2. If divided ethnic groups face water scarcity, drought, and arable land issues, then they are more likely to cooperate and reach mutual understanding and concern to address environmental stress.

2.4. Ethnic Conflict in Iraq

Significant ethnic distinctions can be found throughout Iraq. Its history as a colonial project played an essential role in the formation of its heterogeneous identity, particularly the compulsory inclusion of the whole Kurdish community following the establishment of the nation-state in 1920. Over the past century, Iraq's political landscape has contained growing ethnic and religious divisions, accompanied by ongoing conflicts. The state's dominant ideology of Pan-Arabism, which emerged under Sunni Arab leadership from the 1920s to 2003, effectively suppressed and marginalized other ethnic and religious groups (e.g., Kurds, Turkmen, Shiite Muslims, Jews, and Christians) from political power and participation. The Arabization policy created further separation between these communities because it stripped them of their rights and identities. The state's actions against civilians, including Kurds, Shiites, Christians, and Turkmen, made these groups more distant from the Iraqi government, which resulted in their ability to support their

religious and ethnic groups and political parties becoming weaker. Consequently, significant divides emerged among citizens of various ethnic backgrounds and the Iraqi state.

Thus, Iraq's ethnic diversity in and of itself creates conditions that are conducive to the politicization of ethnicity and potential conflict. Although population data is often unreliable due to undemocratic government policies, Makiya's *Republic of Fear* (1989) provides a snapshot from 1932 that shows a population of approximately 21 percent Sunni Arabs, 53 percent Shiite Arabs, 14 percent Kurds, 5 percent Jews, and 6 percent from other groups such as Turkmen and Assyrians. The newly formed state and its politicians relied on appeals to the solidarity of specific ethno-religious groups to establish legitimacy (Wimmer, 2003, 113–114).

By all accounts, ethnic and religious divisions have fueled conflict and violence among Iraqi communities almost from the inception of the modern state (Anderson, L., & Stansfield, G., 2009). Ethnic representation in Iraq's national government has historically been marked by exclusion. Between 1932 and 1958, most prime ministers were Sunni Arabs, while Kurds occupied only moderate positions in state administration, comprising 15 percent of higher ranks and 25 percent of lower ranks during the monarchy. Following the establishment of the republic in 1958, this representation saw a significant decrease, with Kurds holding merely 2 percent of the highest positions. During the 1950s, Jews were not only ousted from official positions but they were also expelled from the country in large numbers, with the majority of them coming from Kurdistan. Shiite representation in the Ba'ath Party's Central Command dropped from 54 percent to just 6 percent by 1970, which exacerbated sectarian divides within the country's Muslim majority (Wimmer, 2003, 115; Ahram, A. I. 2024, 269; Ismail 1991).

There are several key interpretations of the ethnic conflict between Iraq's communities, particularly the long-standing tension between the Kurds and the Arab ruling majority. One of the most common ones frames the conflict as a combination of ethnic and geopolitical issues. It emphasizes the struggle for Kurdish political and cultural rights and

the desire for Kurdish autonomy or even independence. Following the Treaty of Lausanne in 1923, Britain and the League of Nations annexed Mosul's (former) province (present-day Ninewa) to Iraq. The province, which was predominantly Kurdish, held significant strategic value due to its vast oil reserves, which prompted Britain's determination to secure it. After Mosul's incorporation into British Mandatory Iraq, efforts to Arabize the region began swiftly and particularly targeted Kirkuk and the surrounding areas of Mosul (Romano, 2006b, 31, 183).

Immediately after the establishment of an exclusively Sunni Arab Iraqi state in the 1920s, the Kurds rejected Sunni Arab dominance and sought to establish their independent authority in the north. In 1919 and 1922, Sheikh Mahmoud Barzenji twice led a revolt against the Iraqi monarchy and the British, declaring an independent Kurdish government in northern Iraq. Then, in 1945, it culminated in the formation of the KDP, Iraq's first Kurdish political party and armed movement. After the monarchy was overthrown in 1958 and the Republic of Iraq was established under Abdul Karim Qasim and then Ba'athists in the 1960s-70s, efforts were made to address Kurdish political autonomy and to recognize Kurdish cultural and political rights (Gunter, 2003, 201–202; Logan, 2009, 165; Edmonds, 1971, 99–100; Romano, 2006a, 196). However, the Ba'athists refused to include Kirkuk in the Kurdish autonomous region, while the Kurds were unwilling to settle without Kirkuk. As Bengio notes, Saddam Hussein's later clarification that "autonomy was given to the people, not to the land" (2012, 55) indicated that Kirkuk would remain outside Kurdish control.

Subsequently, the Ba'athist regime escalated its efforts to assimilate Kurds and alter the demographic balance of Kurdish regions, particularly Kirkuk, through its Arabization policy. The regime first attempted to quell these conflicts by re-zoning the province to include more Arab tribes, renaming Kirkuk to Ta'meem, and initiating ethnic cleansing by deporting Kurds, Turkmen, and Christians and replacing them with Arabs relocated from the south. These newcomers were incentivized with subsidized housing and cash rewards, while Kurdish tribes were pressured to change their nationality to Arab. This Arabization campaign, which is extensively discussed throughout this dissertation,

culminated in the Anfal genocide (1980–1989), during which 150,000 to 200,000 Kurdish civilians were killed, 5,000 villages were destroyed, and around 500,000 elderly, women, and children were forcibly resettled in newly created collective villages called Mujama'ats (O'Leary, McGarry, & Salih, 2006, 142; Anderson & Stansfield, 2009, 40; Romano, 2013, 266, 201; O'Driscoll, 2018, 2–4; Bet-Shlimon, 2019, 5).

A second explanation for the Kurdish-Arab conflict in Iraq is grounded in resource curse theory (Ross, 2012), particularly the central role of oil—especially in Kirkuk. According to this explanation, the discovery of oil at the Baba Gurgur field in 1927 marked a key turning point in the dispute; proponents note that Turkey only agreed to cede Mosul to Iraq on the condition that it would receive 10 percent of the revenues from the Kirkuk oil fields. Scholars such as Anderson and Stansfield (2009), Bet-Shimon (2019), and Natali (2008) further argue that Kirkuk's emergence as Iraq's first central oil hub drove the government's Arabization policies, including demographic engineering and the establishment of a security belt of Arab settlers on Kurdish lands. For their part, Massoud Barzani and the KDP rejected the Ba'athist autonomy plan in the 1970s mainly because it excluded Kirkuk; Barzani declared his readiness to exchange Kirkuk's oil reserves for foreign backing. The repeated breakdown of political agreements between the Kurds and successive Iraqi governments was interpreted as being based on the strategic importance of Kirkuk's oil, which the Kurds considered essential for their ambitions for independence.

The research mentioned earlier does not fully explain why Kurds and Arabs fight in Kirkuk because oil extraction and revenue control are not the leading causes of their conflict. The literature shows that oil pollution creates significant environmental stress, which affects the environment. The people of Kirkuk now face two significant environmental challenges: water security and agricultural land availability. For instance, the drying up of the Khasa River, a seasonal river fed by rainfall and water from valleys in northern Kirkuk, has become a significant concern. The Khasa River, which used to flow into the Zaytun Valley and eventually the Al-Azaim River, no longer carries water due to a lack of precipitation and the effects of climate change. Instead, its riverbed is a dump site for

thousands of tons of garbage, particularly near Kirkuk's central market, where plastic waste is rampant (Mohammed, 2020; Karim, 2024).

The water crisis in Kirkuk has become more severe because the Little Zab River water reservoir has experienced a significant decrease in its water levels, which serves as the province's primary water source. The Dukan dam serves as Kirkuk's primary water source, but its water storage has decreased substantially. The Little Zab River, which splits into two branches—one serving the Kirkuk Irrigation Project and the other continuing as part of the river's flow—has also proven insufficient to meet the region's needs for both irrigation and drinking water (Rudaw, 2022).

This water crisis has had a severe impact on agriculture in the region. In 2022, Kirkuk lost 60 percent of its agricultural land. The province thus produced only 200,000 tons of wheat, a sharp decline from the 700,000 tons it produced annually in previous years (Al-Yaum, 2023). Considering these urgent environmental and humanitarian challenges, this study explores the role of ES in the ethnic conflict between Kirkuk's communities in northern Iraq. Specifically, as mentioned, it aims to examine how different ethnic groups perceive ES at the national levels in Iraq and assess whether environmental stress—such as water scarcity, drought, and issues with agricultural land—has contributed to conflicts among these communities.

Additionally, the study investigates ethnic groups' views on ES at the micro level by asking whether environmental stress has intensified conflicts and tensions among villagers, farmers, and landowners. After comparing the various ethnic groups' perspectives on ES, the following sections will explore their proposed solutions for governing these issues and the type of authority they believe should handle ES in the region.

2.4.1. Ethnic Perception and Environmental Security in Iraq

Based on the literature in EP, this study posits that when competing ethnic groups (i.e., Kurds and Arabs in Iraq) are confronted with environmental stress such as water scarcity,

drought, and agricultural land issues, they tend to unite and collaborate to address them as shared challenges. The premise is simple: negative environmental situations impact all population groups equally, regardless of their ethnic, religious, cultural, linguistic, or even political and economic differences. It is, therefore, expected that the salience of ethnic divisions between Kurds and Arabs will diminish when they are faced with environmental stress.

Historical precedents, such as the Iraqi economic embargoes of 1990 and 2003 and international interventions targeting the Iraqi regime during the same period, did not bring ethnic communities in Iraq closer together. However, at the elite level, Iraqi political figures (i.e., Kurds and Shiite Arabs) collaborated with opposition movements aimed at toppling the Ba'ath regime in the late 1980s and 1990s. The elite cooperation did not lead to better relations between the Kurdish and Arab communities in general. Instead, the mistrust and rivalries over land, sovereignty, and governance issues were reinforced after the regime's collapse. Therefore, it is essential to explore the extent to which both ethnic communities share an understanding of environmental issues and how this may shape potential cooperation between them. The study also hypothesizes that when these groups develop a common understanding of ES, they are more likely to seek the same governing authority to resolve environmental stress.

Conversely, drawing from literature on ES and conflict that suggests environmental stress can intensify communal conflicts, the study also assumes that ecological stress in northern Iraq could exacerbate community disputes. The existing tensions between Kurds and Arabs from before and after the 2003 regime change will likely intensify because of water scarcity and agricultural land disputes. The research predicts that environmental stress will cause ethnic groups in northern Iraq to seek different authorities for their specific issues, thus intensifying their divisions. The study presents two possible outcomes regarding environmental stress: it either leads to cooperation or conflict based on divergent and shared governance approaches and challenges and the preferred authorities of each group to navigate their environmental governance.

2.4.2. Empirical Results and Key Findings

To test the above hypotheses, the research investigates the first survey data from Kirkuk province, of which the number of participants was 600, to evaluate the three survey questions (Q. 19, Q. 20, and Q. 21) in the appendix. The research begins by studying how different ethnic groups answer Q. 19 about the relationship between water scarcity and drought with agricultural issues and ethnic tensions. The research investigates how ethnic groups understand environmental stress effects on national and ethnic politics, divisions, and environmental governance. The research then conducts a micro-level analysis to determine how different ethnic groups view environmental stress effects on communal tensions between farmers, villagers, and landowners. This local-level analysis, represented in Q. 20 of the survey, focuses on the impact of environmental stress on vulnerable communities in Kirkuk. Finally, the study investigates how each ethnic group responds to the impact of environmental stress on the abandonment of agriculture and livestock and what they perceive as the subsequent implications for economic and social issues such as unemployment, poverty, and social unrest. This analysis is reflected in Q. 21 of the survey.

Column 1 of Table 1.3 below summarizes the total sample's perceptions of the impact of environmental stress on ethnic conflict, tensions among farmers, villagers, and landowners, and the abandonment of agriculture/social unrest. The survey used a 5-point Likert scale, where the minimum value is total disagreement, and the maximum is total agreement. Ethnicity, specifically Arabs and Kurds, categorizes the responses in Kirkuk. The column represents the entire survey population to differentiate between ethnic groups while showing the statistical significance confidence level between them. The second column shows how these ethnic groups view Q. 19, which investigates environmental stress as a factor in ethnic tensions in Iraq. The third column presents the understanding of the ethnic groups concerning Q. 20, which probes how environmental stress affects tensions among farmers, villagers, and landowners. The last column pertains to Q. 21, which seeks to illustrate the perceptions of Kurds and Arabs about the impacts of environmental stress on the abandonment of agriculture and social unrest.

Table 2.1. Ethnic Perception and Environmental Security in Kirkuk

Ethnic Groups	***Impact of environmental stress on ethnic conflict***	***Impact of environmental stress on farmers, villagers, and landowners' tensions***	***Impact of environmental stress on the abandonment of agriculture and social unrest***
	Q. 19	Q. 20	Q. 21
Full Population	4.43	4.38	4.40
Arab	4.64	4.51	4.47
Kurd	4.19	4.23	4.33
Ethnic Difference Significant at 90%	Y	Y	Y

The ethnic responses show substantial variations between Arabs and Kurds regarding their interpretation of the survey questions. The average agreement scores for Arabs regarding the impact of ES on ethnic conflict (Q. 19) reached 4.64, while Kurds scored 4.19. The difference in responses shows that Arabs believe environmental stress intensifies ethnic conflicts more than Kurds do. The survey results for Q. 20 about ES effects on Kirkuk farmers, villagers, and landowners show Arabs scored 4.51 while Kurds scored 4.23. The difference in scores shows that Arabs believe environmental stress affects communal conflicts between ethnic farmers and landowners to a greater extent. The scores for Q. 21 about ecological stress effects on social unrest showed Arabs at 4.47 and Kurds at 4.33. These findings further illustrate that Arabs perceive environmental stress as having a more significant impact on communal conflict compared to their Kurdish counterparts in Kirkuk. In other words, the data suggests that Kurds view the effects of environmental stress as less severe than Arabs. Nonetheless, the relatively high scores indicate that both groups still express significant concern.

The differences between the two ethnic groups are statistically significant at the 90 percent confidence level for all three questions. This statistical significance indicates a

meaningful divergence in perceptions between Arabs and Kurds. Various explanations for this outcome will be discussed in subsequent chapters. The critical observation at this point is that the survey results contradict the second hypothesis of the study above, which proposes that ethnic groups are likely to cooperate in the face of environmental threats, according to the premise that ecological stress may function as a peacebuilding tool among rival groups.

The data from Kirkuk shows ethnic background-related divisions. However, most people agree that environmental stress elevates communal violence risks in Iraq to a degree of 4.4 across all proposed questions about these variables. The observation shows that many people in northern Iraq believe water shortages and droughts lead to communal conflicts, although it does not prove direct causation.

The survey results suggest that respondents believe environmental stressors are linked to broader social and ethnic problems. However, it is crucial to differentiate between perception and reality. People's perceptions that environmental factors cause or escalate conflict do not necessitate that this belief reflects a proven causal connection. Thus, further investigation is needed to determine whether these environmental stressors drive conflict or whether other political, economic, and/or historical factors play more decisive roles. These findings support the first hypothesis, which posits that environmental stress will likely increase communal conflicts. However, further exploration is necessary to explain how these factors contribute to conflict. The following chart highlights the perception of each group.

Figure 2.1. Perceptions of Water Scarcity and Drought as a Contributor to Ethnic Tensions in Iraq

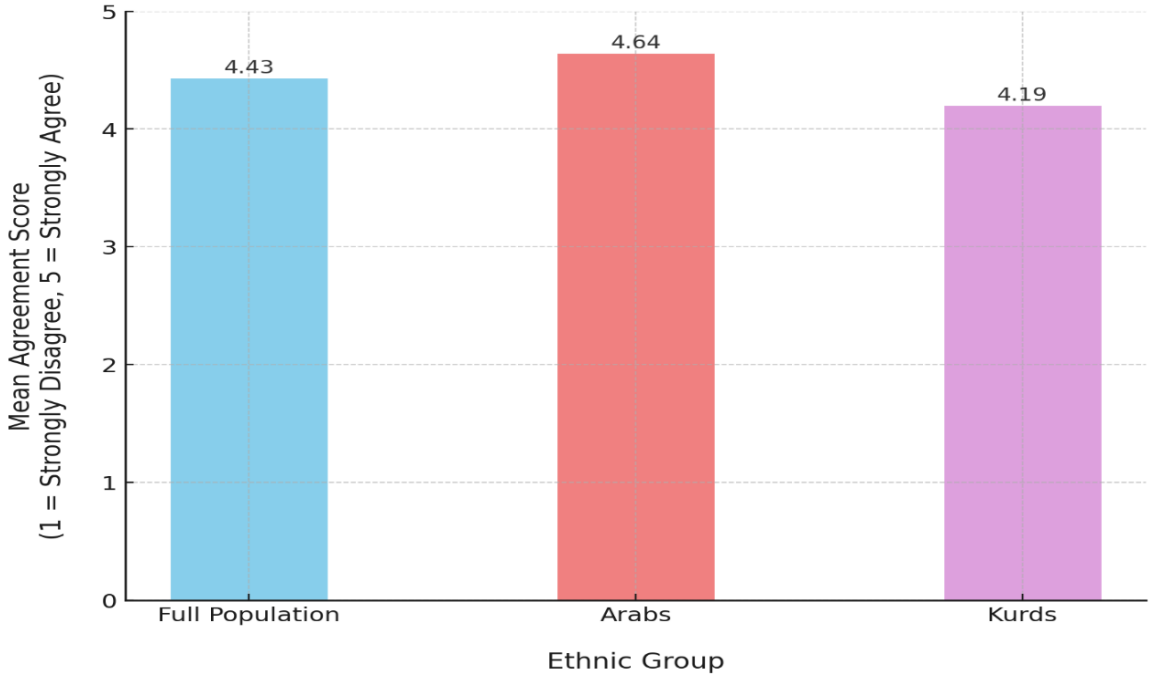
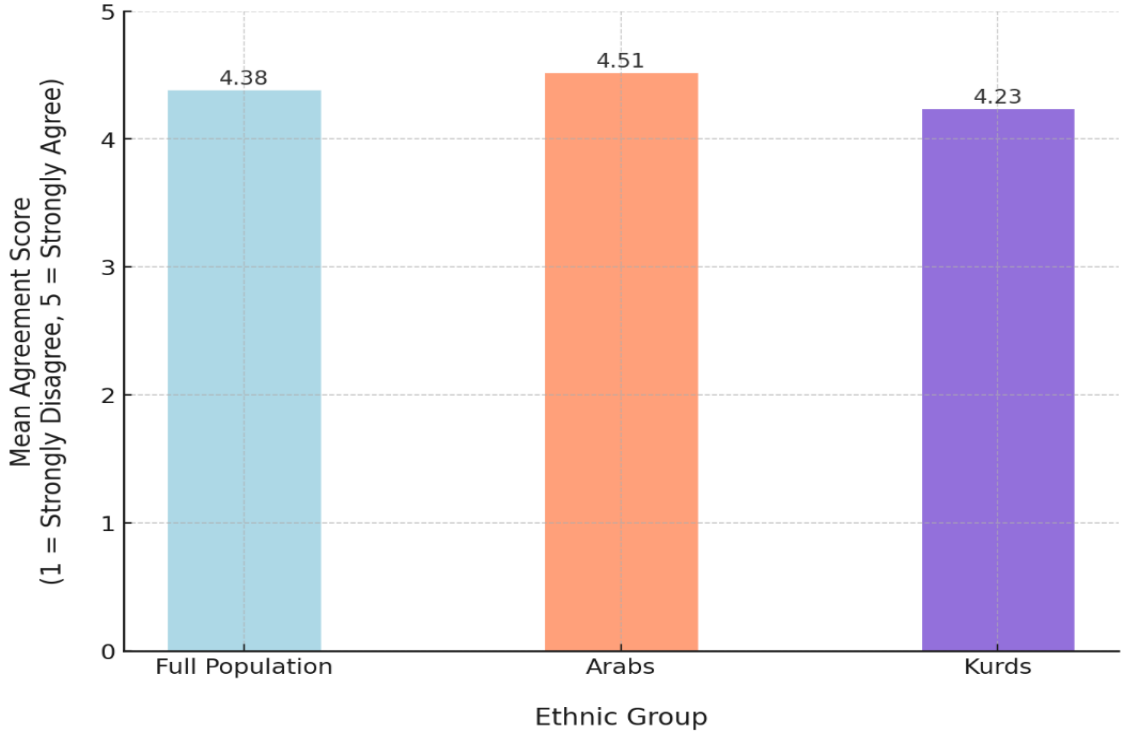


Figure 2.2. Perceptions of Environmental Stress Causing Tensions Between Agrarian Communities



To better understand ethnic divisions related to ES and their implications for communal violence, this study aims to compare the perceptions of ethnic groups in Kirkuk on

environmental stress with those of ethnic groups in the KRG, specifically in areas like Garmian. In the spring of 2023, the author conducted a survey with similar questions to assess the public perceptions of the people in Garmian,[4] located in the KRI. The demographic composition of the Garmian region differs significantly from that of Kirkuk. Garmian is predominantly Kurdish, with only a few Arab villages or families in villages located between the Kalar Administration and Diyala province. The region has been governed by the KRG for decades, except for some parts in the Diyala governorate that remain under GoI's control.

The Garmian region has historically benefited from abundant water resources as the Sirwan River flows through it. Further south, in Khanaqin, the Alwand River also provides water to the area. However, water availability has come under immense pressure in recent years due to climate change and Iran's water policies. Every year, as the water level of the Sirwan River declines, dozens of acres of rice fields dry up (SNN, 2020; K24, 2017). Even though it is confronted with these challenges, the Garmian region exhibits better climate and water resources than Kirkuk, which relies on the Little Zab River for its drinking water and irrigation requirements. The public's perception of ES and how it contributes to ethnic and communal conflict in Garmian should be investigated as part of this study. When compared to Kirkuk, the comparison will disclose whether ethnic distinctions affect sentiments about ES or whether or not Garmian's homogenous population suffers identical challenges associated with ES.

The Garmian survey data from Q. 12, Q. 13, and Q. 14 (see appendix) provides a clear understanding of the population’s perception of ES and its relationship with the regional communal conflict. This data also facilitates comparisons with areas such as Kirkuk. Table 2.2 below presents responses to three questions about the effects of ES and shows

[4] Garmian refers to a geographical area within the KRI, primarily covering parts of the Sulaymaniyah governorate and some Kurdish areas in Diyala governorate under the GoI. This region is characterized by a less mountainous landscape and climate with long, dry summers and short winters. In contrast, KRI also includes the Kwestan region, another geographical term used to describe areas with a more mountainous climate, such as Penjwen, Qandil, and Raparin in Sulaymaniyah, as well as Haji Omeran and Choman in Erbil and much of the Duhok region.

average scores for the overall population and breakdowns by ethnic groups. The table also indicates whether ethnic differences are statistically significant at the 90 percent confidence level.

The first column from the table represents the ethnic groups surveyed, namely Kurds and Arabs. The second column reflects people's perceptions of Garmian about ES's impact on ethnic conflict in Iraq, corresponding to Q. 12, which aims to capture views on this issue at a micro level. Columns 3 and 4 present the public's understanding of how environmental stress affects tensions among farmers, villagers, and landowners and the abandonment of agriculture and social unrest, corresponding to Q. 13 and Q. 14 of the survey, respectively.

Table 2.2. Ethnic Perception and Environmental Security in Kirkuk

Ethnic Groups	***Impact of environmental stress on ethnic conflict***	***Impact of environmental stress on farmers, villagers, and landowners' tensions***	***Impact of environmental stress on the abandonment of agriculture and social unrest***
	Q. 12	Q. 13	Q. 14
Full Population	2.765935	3.684431	4.246604
Arab	2.736264	3.813187	4.417582
Kurd	2.769053	3.670901	4.228637
Ethnic Difference Significant at 90%	N	N	Y

The findings indicate no significant difference in perceptions of ES between Kurds and Arabs in Garmian. In this survey, the number of participants was 950. Specifically, respondents' answers to Q. 12 and Q. 13 reveal moderate agreement and a similar understanding for both groups, with no significant ethnic differences noted. For Q 12, concerning the role of ES in ethnic tension in Iraq, Arabs scored 2.74, and Kurds scored

2.77, reflecting close agreement. A similar trend is observed for Q. 13, which addresses the impact of environmental stress on tensions among farmers: Arabs averaged 3.81, and Kurds averaged 3.67. It is important to note that although both ethnic groups recognize the impact of environmental stress on tensions between agrarian communities, the perception is somewhat greater among Arabs. The findings from these two questions illustrate that in a homogeneous society where Kurds dominate, the perception of environmental stress as a cross-ethnic issue indicates a shared sense of vulnerability. Despite ethnic distinctions, these communities are experiencing everyday environmental stress, which reduces the likelihood of divergent views based on ethnic affiliation.

However, a difference between the two groups can be observed in Q. 14, which concerns the role of environmental stress in the abandonment of agriculture and livestock and the implications of this abandonment of social unrest. The Arabs agreed with a value of 4.41, while the value for their Kurdish counterparts was 4.22. This similarity suggests that both groups acknowledge certain less-shared perceptions of communal conflict and the seriousness of these issues in the region. Still, the gap between their responses is as much as in Kirkuk.

Thus, if there is a difference between the perceptions of both ethnic groups, it is slight. In other words, while the perceptual gap between Kurds and Arabs in Kirkuk on ES is significant, in Garmian, the Kurds and the Arabs do not think the issues are substantial. Chart 2 below illustrates the closeness and dichotomy between ethnic groups on Q. 12, Q. 13, and Q. 14.

Figure 2.3. Perception of Environmental Stress Driving Ethnic Tensions in (Garmian Region)

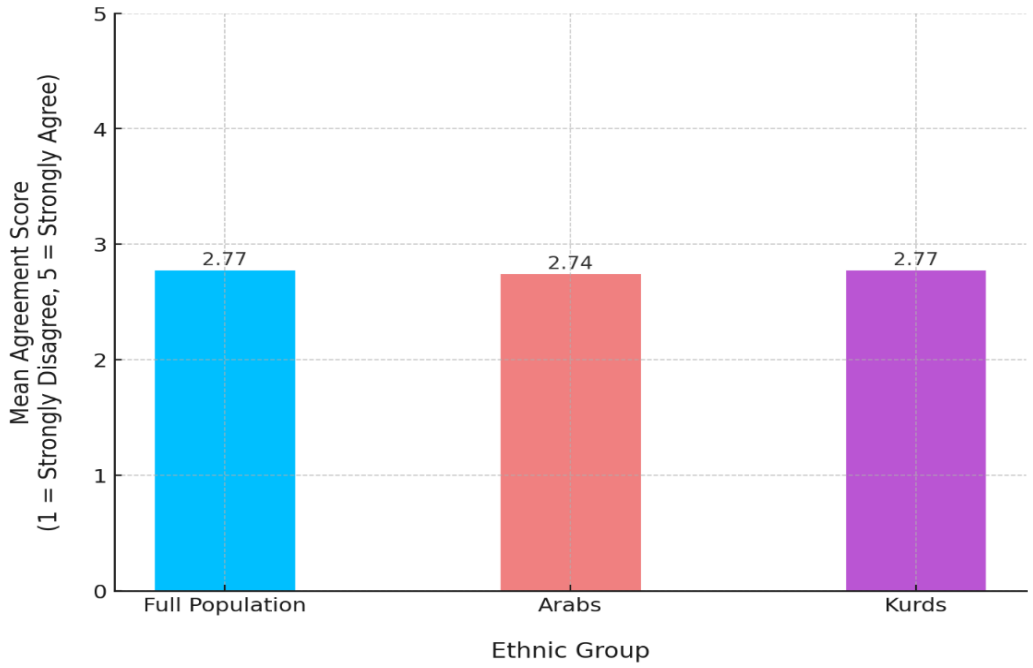
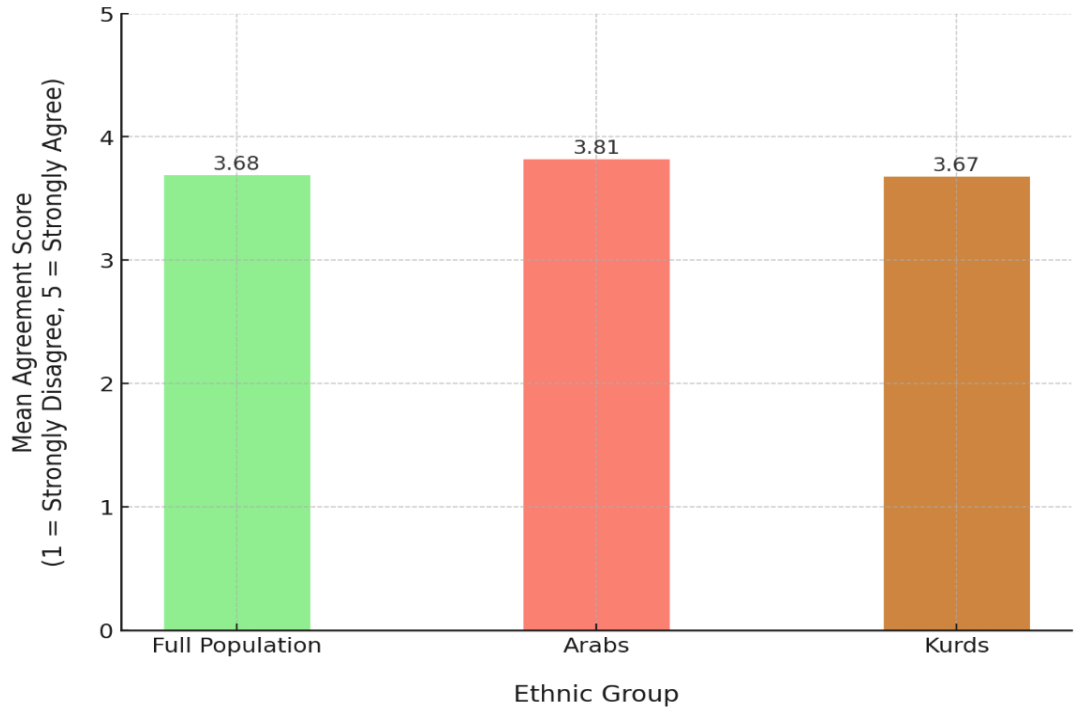


Figure 2.4. Perceptions of Environmental Stress Causing Tensions between Agrarian Communities in Garmian.



The findings from Garmian show different results from those in Kirkuk. The Garmian survey indicates no significant division between ethnic perceptions of ES, but the Kirkuk survey reveals a clear polarization in how ethnic groups perceive environmental stress. In both cases, however, Kurds are generally less concerned about environmental issues compared to their Arab counterparts. In Garmian, a relatively homogeneous society with a small Arab minority, Kurds and Arabs largely agree on environmental issues, though the Arab group shows slightly more concern.

This finding supports the argument for EP by implying that environmental stress could be used as a tool for peace, which could unite multiethnic communities around shared concerns. By contrast, in ethnically divided societies such as Kirkuk, environmental stress fails to bring ethnic groups to a common understanding of the issues; their perspectives are shaped by preexisting ethnic and political beliefs. Possible explanations for why ethnic divisions over ES exist in Kirkuk but not in areas such as Garmian are discussed below.

For this chapter, Garmian, which falls under the authority of KRI, has a more reliable system for managing environmental stress. Governance in Garmian is more stable and effective, reducing concerns about environmental issues such as water shortages. The interviews with the people of Kirkuk and disputed territories, including Chamchamal, reported that people had faced several governance challenges, including weak state institutional capacity and observation from Baghdad. Some other participants also mentioned that water resources are often stolen, misallocated, or diverted improperly, which causes greater anxiety and uncertainty about water access and availability in the regions. In Garmian, the provincial authorities make decisions about allocating and using resources, and their directives are generally enforced without exception.

Water distribution schedules for the entire region are issued by provincial authorities and followed by districts to manage water shortages during the summer. Although some

changes occur locally by certain MirAw,[5] who control water network locks in neighborhoods, the overall guidelines are typically adhered to across the region. Zyad Jabar (2023), the head of the water distribution in Chamchamal Water Department, whose area is geographically part of Garmian, mentioned that he and other local water department heads meet regularly with officials from the Sulaymaniyah Water Department to receive instructions on managing environmental resources and addressing crises. Also, when the KRG's MoAWR and the Garmian Administration together imposed a ban on rice farming in 2019 due to water shortages and drought, the directive was uniformly enforced across Garmian, which particularly affected around 45 villages in the Maydan district. These villages, covering about 32,175 acres and primarily used for rice cultivation, adhered to the ban for up to two years. At times, the KRG, acting upon requests from the Iraqi government, imposes restrictions on rice cultivation along the Sirwan River in Garmian to ensure sufficient water supply reaches Diyala province. This policy applies equally to Kurdish and Arab farmers without distinction (Rudaw, 2018, 2019).

Unlike the Garmian region, Kirkuk generally experiences frequent violations in managing natural resources, particularly water. Public water resources are often misused for unauthorized agricultural projects and fish farming (KirkukNow, 2023). For instance, despite a 2019 Iraqi Council of Ministers decision to remove illegal fishponds due to water scarcity, many ponds remain operational in Kirkuk. As of 2024, the Kirkuk Irrigation and Drainage Projects Maintenance Department closed 1,129 illegal fishponds, but 160 of these were reopened by their owners. According to the local Water Resources Department, the Daquq district of Kirkuk has approximately 3,000 fish farming ponds, yet only seven are formally licensed (KirkukNow, 2023; Shafaq, 2023, 2024).

A second explanation relevant to this chapter is that the KRG has an inclusive policy compared to the policy of marginalization and exclusion in Kirkuk. In Garmian, when

[5] MirAw is an employee of the water departments in KRG, typically hailing from the neighborhoods they serve. These water chiefs, who may be permanent government employees or contractors, are responsible for managing the access to drinking water networks in their areas by unlocking and locking these systems during designated hours.

MoAWR decides on the issues of water, grain, and other agricultural products, all communities benefit without discrimination. For example, the decision to distribute fertilizer and wheat and provide fuel to farmers, which is a small amount of assistance to farmers and villagers, always benefits villagers without regard to their ethnicity (Garmian, 2013). Like Kurdish farmers, Arab farmers and villagers in Garmian can cultivate their lands and benefit from water resources such as the Sirwan River. Hence, Kurds and Arabs are not too divided and understand environmental issues closely. However, in Kirkuk, a policy of marginalization has prevented Kurdish farmers and villagers from cultivating their lands. At the same time, Arabs have seized these lands with the assistance of Iraqi government military forces and courts.

M. Ashti (2023), Director of Agriculture in the Qara Hanjir district, and Bahjat Wahid (2023), former Mayor of Shwan District, informed the author that their districts frequently request services from Kurdish villages, such as pulling water pipes and assisting with agricultural harvests. However, these requests have been consistently denied by the governor of Kirkuk, who justifies his decision by referencing Ba'ath-era policies that stripped Kurds of land ownership rights. The Kirkuk Provincial Council appointed both officials before 2017, when the council was dominated by Kurdish representation, and the city was under the influence of the KRG. Given their appointments during this Kurdish-dominated period, their perspectives on environmental stress are shaped by the broader ethnic and political tensions that have historically characterized Kirkuk.

Consequently, they tend to view the denial of services through the lens of ethnic and political marginalization, particularly in the aftermath of the Iraqi federal government's reassertion of authority over Kirkuk in 2017. This attitude may reflect a bias that frames environmental stress, such as water scarcity and service neglect, not purely as technical or governance issues but as part of a larger narrative of ethnic exclusion rooted in both past and present conflicts.

Similarly, Arab farmers in southern Kirkuk are concerned about the KRG water policy because the Little Zab River, which supplies water to the city, flows from the KRI. Many

Arabs in the area believe that the Kurds are using water as a weapon to pressure them into leaving Kirkuk. The withdrawal and reduction of water levels from the Dukan dam during the spring and summer of 2014 also raised serious concerns among Arab farmers in southern and southwestern Kirkuk, as these actions directly impacted their agricultural output. Abdul Rahman Manshid al-Aasi, leader of the Arab Political Council in Kirkuk, claimed that "the KRG manipulates the flow of water from the Dukan River, releasing more water during the summer months—when it has limited benefit for agriculture—and reducing it during February, March, and April when crops are in critical stages of growth" and according to al-Aasi "this practice cuts water availability by half during the key growing season, [which] is a[n allegedly] deliberate strategy by the KRG to exert pressure on the central government in Baghdad… as a direct result of the ongoing conflict between the KRG and the federal government" (Al-Daudi, 2014). This perception has heightened Arabs' anxiety over water insecurity and caused them to view the issue differently from the Kurds.

Furthermore, another explanation that warrants mention is the awareness of both Arabs and Kurds in Kirkuk that their territory remains disputed. As a result, Kurds may view any recognition or agreement with Arabs about environmental issues as a potential avenue for increased intervention by the GoI in their city. This awareness contributes to differing opinions based on separate understandings of the local situation. For instance, the Kurds have proposed a bill to the Iraqi parliament to restore ownership rights of agricultural lands in Kirkuk to Kurdish farmers. However, Shiite and Sunni factions within the GoI have stalled the vote on this bill, and the cabinet is reluctant to support it (Rudaw, 2024). Situations like this inform people how the GoI perceives their environmental demands, directly impacting the region's future and contributing to city community divisions. In contrast, Garmian is not disputed; although a small Arab minority exists, they understand the status they retain under KRG governance. As a result, their approach to ES is much more coordinated than that of the people in Kirkuk.

In Kirkuk, ethnic groups are not only aware of their status but also recognize their nearly equal size and strength, which creates uncertainty about the potential outcome of any

conflict. By contrast, ethnic divisions in Garmian are minimal, as Arabs have historically been a minority and understand that this reality is unlikely to change. Furthermore, many Arabs in Garmian are either displaced or immigrants, so they acknowledge that they are not indigenous to the area. As a result, they seek to coordinate with the majority because they cannot effectively oppose them.

Ultimately, the question remains about why the people of Garmian are less concerned about environmental stress than Kirkuk's residents. Addressing this question requires political and ecological interpretations of Garmian as a water-rich area. Garmian enjoys a favorable position along the Sirwan River, which offers plentiful water resources for drinking and agricultural endeavors, aiding farmers and livestock breeders. However, in recent years, Iran's water policies and the impacts of climate change have led to intermittent cuts in the river's water flow during the summer, significantly affecting the KRI, particularly Garmian (Keynoush, 2018). In contrast to Kirkuk, where agriculture heavily depends on seasonal rains and farmers primarily cultivate wheat, Garmian's farmers grow various crops, including rice, cotton, vegetables, and grain, thanks to the reliable water supply from the Sirwan River. Kirkuk, which lacks its water source, relies on the Little Zab River, which is fed through the Dukan dam. The dam's water levels have been consistently low in recent years due to reduced rainfall and drought, resulting in less water availability for the city. Therefore, farmers in southern Kirkuk, who depend on water supplied by the city's irrigation project sourced from the Little Zab River—especially in Hawija—are concerned that the KRG might use water to pressure them into leaving the city.

Chapter Three

Ethnic Perception on Environmental-Migration-Communal Conflict

3.1. Introduction

Increasing environmental stress has led to a substantial acceleration in the mobility of the people, which has been a well-known characteristic of human society for a long time. There is a growing worry on a worldwide scale regarding migration that is linked to environmental change. Rapid- and slow-onset ecological changes such as water scarcity, extended droughts, declining rainfall, rising sea levels, recurrent flooding, and coastal erosion are forcing communities to alter their migration patterns and reassess their livelihoods (Reuveny, R., 2007; Warner, K., 2010; Koubi, V., Freihardt, J., & Rudolph, L., 2022). The impact of environmental change on living sources in communities is profound, as essential freshwater sources, rivers, wells, boreholes, and other reserves—are depleted. Global estimates place the 'environmentally induced migration' at 200 million people by 2050 (Mistri and Das, 2020,6).

Iraq is one of the most vulnerable nations to environmental change based on its sensitivity to serious issues, including water scarcity. National and regional water policies aggravate these issues, particularly those related to dam building and environmental and industrial rules influencing water availability. Simultaneous demographic changes, including population increase and urbanization, drive rising water usage (Von Lossow, T., 2018; Toka Mahmoud et al., 2023). According to the International Organization for Migration (IOM), the environment has caused environmental migration in Iraq, as of March 2024, "23,364 families (140,184 individuals) displaced by environmental factors across 12 governorates" (Iraq, IOM, 2024, 3). The environmental degradations have severely undermined food security, triggered migration, and intensified communal conflict (Ingram, Ericksen, and Liverman 2012, 10–11). Thousands of displaced individuals and families have relocated to urban centers or remained in rural areas where the collapse of livelihoods—due to crop failures and livestock depletion—makes survival increasingly

difficult. This chapter investigates the link between environmental degradation and migration in Iraq, particularly emphasizing how water scarcity and drought cause migration and possibly contribute to communal conflict.

This study examines how various ethnic groups in northern Iraq perceive water scarcity, drought, and migration, focusing on the connection between environmental changes and increased communal conflict. This chapter addresses three key questions: How do ethnic communities perceive environmental migration in Iraq? To what extent do competing ethnic groups agree on the link between environmental change and communal conflict? Do water scarcity and drought drive environmental migration in northern Iraq?

The findings from the Kirkuk survey show that both Arabs and Kurds in Kirkuk perceive a strong connection between environmental change, migration, and communal conflict (both within and between communities). The average response of Arab people (4.47) exceeds that of Kurds (4.33), suggesting they are more aware of or susceptible to these challenges. The survey demonstrates that all ethnic groups agree that water shortages and drought lead to rural migration, agricultural decline, and social conflicts. The groups differ slightly in their emphasis on this relationship.

The data also reveal that although Kurdish and Arab communities associate water scarcity and drought with rural migration, the strength of this perception varies notably between the two groups. With a lower average score (1.48), Kurdish respondents demonstrate a heightened awareness of how environmental changes, particularly in agricultural areas such as Kirkuk, have driven environmental migration from rural to urban areas. The average score of Arab respondents reaches 1.75, which indicates they see a weaker link between water scarcity and environmental migration, possibly because of their unique livelihood approaches, resource availability, and historical settlement locations.

3.2. Environmental Migration: Unpacking the Conceptual Terrain

The concept of environmental migration has been a focus of scholarly debate in the ES literature, in which views differ on whether it should be understood as a proactive form of adaptation to environmental change or as a reactive response to the harmful effects of environmental degradation. The adaptation perspective highlights the beneficial aspects of migration, showcasing how it can enhance livelihood diversity and strengthen resilience against ecological changes. It highlights the proactive nature of migrants by portraying them as innovative individuals actively finding solutions to environmental changes and enhancing their economic situation instead of merely reacting to external challenges. Conversely, the view that environmental migration is a response to ecological threats interprets it as a constrained, often involuntary movement undertaken only as a last resort by communities facing acute environmental disruptions (Vinke et al., 2020, 624–628).

Both the United Nations High Commissioner for Refugees and the European Commission have acknowledged the growing role of climate change in driving forced displacement. Yet, international legal frameworks still lack provisions to protect those displaced by environmental factors. The 1951 Refugee Convention does not recognize climate-related hazards as grounds for refugee status. It has not been sufficiently revised, meaning "climate refugees" are left in a legally grey area. Meanwhile, climate change continues to severely impact vulnerable populations, particularly in coastal and low-lying areas. The extreme weather events that displaced millions globally affect developing and developed regions (Apap, J. and Harju, S., 2023).

The literature on ES employs a range of terminology to capture the intricate connection between environmental change and human mobility, including 'ecological refugees' to 'forced migrants for environmental reasons,' environmental migration, climate change-induced migration, environmental refugees, climate change migrants, and environmentally induced forced migrants. (Dun, O., & Gemenne, F., 2008; Rosenow-Williams, K., & Gemenne, F. (Eds.)., 2015; Apap, J. and Harju, S., 2023). While climate refugees and migration refer to population movements driven by environmental factors,

they carry distinct meanings. The term "climate refugee" generally refers to individuals forcibly displaced due to severe environmental degradation or sudden-onset climate disasters, implying both a lack of choice and a humanitarian emergency (Wodon, Liverani, & Joseph, 2014, 174). It also suggests a failure of climate change mitigation and adaptation efforts, though it lacks formal recognition under international refugee law. By contrast, climate migration is a broader concept that includes voluntary and involuntary movements responding to slow-onset environmental changes (e.g., drought, declining agricultural productivity, etc.). It frames migration as a potential adaptive strategy that allows individuals or communities to reduce vulnerability and manage climate-related risks before they escalate into crises. Thus, both refer to environmentally driven displacement but differ in how they portray agency, urgency, and the severity of environmental impacts.

Dun and Gemenne (2008) contend that the absence of a definition for migration induced by environmental degradation or change, first and foremost, stems from the challenge of distinguishing environmental factors from other factors of migration. Ecological factors are intricately intertwined with the socio-economic, political, and cultural contexts they rely on. Second, there is an ongoing debate over whether environmental migration is inherently a form of forced displacement or can also represent voluntary relocation. Dun and Gemenne further argue that another difficulty resides in the confusion of forced and voluntary migration (ibid.). Is environmental migration fundamentally a type of forced displacement? Can it manifest as voluntary resettlement? What is the status of resettlement programs that specific governments implementing in response to or anticipate environmental degradation?

Many studies have discussed environmental factors as a direct single driver of migration for communities vulnerable to environmental degradation. Still, other socioeconomic, security, and political factors may influence the decision of groups and individuals to migrate. A lack of clear, direct causality between environmental change and migration further complicates the identification of cases in which environmental degradation serves as a contributing factor, which would qualify them as EM (Lilleør, H. B., & Van den Broeck,

K., 2011; Warner, K., 2010; Hunter, L. M., Luna, J. K., & Norton, R. M., 2015; Rigaud, K. K., 2018).

Environmental migration must distinguish between rapid environmental disasters, such as earthquakes and floods, and swift-onset environmental stress, such as desertification and water shortage(s). Environmental migration occurs mainly through the latter: economic choices made by people whose survival depends on environmental resources rather than sudden disasters, gradually pushing people to relocate. Rapid- and slow-onset environmental change contributes to various forms of migration, including "cyclical migration, permanent migration, temporary, permanent displacement, both internally and internationally" (Warner, K., 2010, 3; Black, R., Adger, W. N., Arnell, N. W., Dercon, S., Geddes, A., & Thomas, D., 2011, 7). Furthermore, the distinction between voluntary and forced migration becomes ambiguous when environmental issues create additional pressures because it makes it difficult to classify the movement as purely environmental migration (Dun, O. & Gemenne, F., 2008).

Academic discussions about environmental migration originated in different fields in the 1970s and 1980s. The academic community is divided into two groups regarding environmental migration causes: "Alarmists" focus on environmental factors such as climate change, while "skeptics" argue that migration involves multiple complex factors beyond environmental causes. The alarmist perspective emerges from environmental or security studies, whereas skeptics originate from forced migration and refugee studies (Dun, O. and Gemenne, F., 2008). Formulating a universally accepted definition proves difficult, but scholars and international organizations have introduced several definitions that provide practical frameworks for understanding environmental migration in this dissertation.

The World Bank (2018) identifies climate migrants as individuals who relocate within their own country due to climate impacts such as extreme weather events, rising sea levels, droughts, or other environmental stress that make their current location uninhabitable or unsustainable. This description focuses on long-term, internal relocations rather than

temporary, seasonal, or cyclical migrations (Felli, 2013, 337–38). Other sources designate climate migration as a specific category within environmental change and refer exclusively to environmental changes caused by climate change. In this view, climate migration involves the movement of individuals or groups who, primarily due to sudden or gradual environmental changes driven by climate change, are compelled or choose to leave their usual place of residence. This migration can be temporary or permanent and may occur within a country or across international borders (Vitorino, 2019). The Cancun Agreements on climate change adaptation,[6] adopted by the States Parties to the UN Framework Convention on Climate Change (UNFCCC) at its 2010 conference, recognize three forms of climate change-induced movement: displacement, migration, and planned relocation (UNFCCC, 2010).

The distinction between migration and displacement regarding environmental issues needs a thorough understanding. The legal and policy frameworks define migration as a voluntary movement because people choose to relocate for economic benefits or personal reasons. The legal system defines displacement as an involuntary process requiring people to leave their homes because of conflicts, natural disasters, or persecution (Geddes et al., 2012, 952). The legal distinction proves helpful in court cases, yet it needs additional evaluation for policy development. The environmental crisis in Iraq has created an urgent situation because people and families must migrate with restricted alternatives. Although most of Iraq's environmental changes do not stem from sudden natural disasters such as hurricanes or earthquakes, the impacts of slow-onset degradations have been severe enough to force people to relocate internally. Therefore, this dissertation uses the terms "environmental migration" and "environmental displacement" interchangeably, as environmental degradation—even when slow and

[6] “The Cancun Agreements were a set of significant decisions by the international community to address the long-term challenge of climate change collectively and comprehensively over time, and to take concrete action immediately to speed up the global response to it. The agreements, reached on December 11 in Cancun, Mexico, at the 2010 United Nations Climate Change Conference, represented key steps forward in capturing plans to reduce greenhouse gas emissions, and to help developing nations protect themselves from climate impacts and build their own sustainable futures.” See “Intro to Cancun Agreements” on the United Nations Climate Change, available at: https://unfccc.int/process/conferences/the-big-picture/milestones/the-cancun-agreements

gradual—has compelled groups and populations to relocate, particularly in the country's rural and agricultural areas.

The dissertation requires a clear definition of environmental migration together with its implications. The following explanation of how this chapter interprets and applies the term offers a clear definition and contextual framework. IOM defines an environmental migration as "a person or group of persons who, primarily due to sudden or gradual changes in the environment that negatively impact their lives or living conditions, are compelled to leave their homes or choose to relocate, either temporarily or permanently, within their country or across borders" (IOM 2007). This definition broadly encompasses both voluntary and forced migration, regardless of whether the movement is short-term or permanent, and includes movement within a country or across borders. Although environmental migration is often linked to rapid-onset natural events (e.g., floods, hurricanes, earthquakes, etc.), this definition also covers slower, more gradual ecological changes such as the ones discussed in this study: land degradation and water scarcity and Drought (Millock, 2015, 37).

Given the generality of the IOM definition, this dissertation examines environmental migration explicitly within Iraq, and it primarily uses data from the IOM to explore the impact of environmental degradation on agricultural, pastoral, and rural communities in Iraq's rural and farming regions that generate migration. This dissertation defines environmental migration as individuals, families, or groups whose livelihood depends on environmental resources. Due to slow-onset environmental changes (such as water scarcity, drought, and desertification), these people are forced to leave their occupations and relocate as entire families or with only some family members. Notably, these migrations occur in Iraq, whether temporary or permanent.

Furthermore, this project aims to extend the idea of environmental migration by considering those who migrate from agricultural and livestock communities to cities and towns owing to water shortage crises or drought without all their family members migrating. As stated differently, some family members—especially female members—

stay home while others are compelled to migrate to different locations to meet their demands in view of environmental problems. Consequently, in this regard, families' livelihoods no longer mostly rely on environmental resources for their income, which alters the categorization of ecological migration. For example, NRC in 2021 reported that in South Iraq, “1 in 15 households had a family member forced to migrate in search of work due to drought”, or in other cases, initially, “the head of household and other male members move first, leaving the women behind to sell any family assets before joining them” (Iraq, I. O. M. 2022). This comprehensive approach captures both complete rural-to-urban migration and partial migration strategies that families employ in response to environmental stress.

Although this definition is narrowly focused on Iraq, it offers a clear framework for understanding environmental migrants in the country: people in rural and agricultural settings whose incomes are closely tied to natural resources and are, therefore, vulnerable to slow-onset environmental changes. Unlike rapid environmental disasters, which are rare in Iraq, the country faces significant challenges from progressive issues such as water shortages, drought, rising temperatures, desertification, and frequent dust storms. These persistent stresses are the primary environmental drivers of migration for Iraq's rural populations rather than rapid-onset events. Therefore, because this dissertation concentrates specifically on three types of environmental change in Iraq—water scarcity, drought, and issues with agricultural land—the survey questions directed to participants focused on these factors. For this dissertation, the above definition of environmental migration is assumed to apply to groups facing these environmental threats within Iraq directly.

3.3. Environmental Triggers of Migration and Conflict

In 1990, the First Assessment report by the Intergovernmental Panel on Climate Change warned that one of the most serious consequences of climate change could be large-scale human displacement caused by shoreline erosion, coastal flooding, and severe drought (Brzoska, M., & Fröhlich, C., 2016, 192). This called attention to the risk of

climate-induced migration and its potential to create significant social and political tensions, including a greater likelihood of violent conflict. However, it is widely argued that as natural resources are increasingly depleted due to overexploitation and climate change, growing populations will be forced to migrate, both within and across borders, and it is widely noted that such migration is often linked to heightened competition for diminishing resources, which raises the risk of conflict (Gleditsch, N. P. 2007; Hendrix, C. S., & Glaser, S. M., 2007).

This ES-migration-conflict nexus aligns with neo-Malthusian thinking, which posits that population growth, combined with rising affluence and consumption, will sharply increase demand for natural resources and thereby result in shortages, environmental degradation, and disputes over access to land and water (Ehrlich, 1990, 680–82; Ehrlich, & Ehrlich, 2009; Goldstone, 2016; Homer-Dixon, 2010; Verhoeven, 2011). This bleak forecast predicts that environmental change could displace enough people by 2050 to overwhelm host communities, strain state capacities, and trigger violent conflicts. It frames environmental stress as a key driver of future instability and mass displacement. More dire projections warn that environmental change could trigger mass migration on a scale involving hundreds of millions to billions of people. Due to environmental change by 2050, displacement estimates range from 50 million to 700 million individuals. (Warner, 2010, 1; Selby & Hoffmann, 2014b, 748; Tacoli, 2009, 513).

Homer-Dixon proposes three hypotheses about the link between environmental scarcity and conflict: (a) Environmental scarcity can lead to interstate conflict over environmental resources; (b) Environmental scarcity can drive large-scale population movements (environmental migration), which may fuel group identity conflicts; and (c) Environmental scarcity can cause economic hardship and disrupt social institutions, leading to "deprivation conflicts" (1994, 19–22). Although Homer-Dixon ultimately dismisses his first hypothesis, he supports the idea that environmental scarcity often triggers large-scale migration that can lead to group identity conflicts. For example, in Bangladesh and Northeast India (particularly Assam), environmental migration has fueled regional tensions, with millions of displaced people reportedly intensifying conflicts. Similarly,

Robert D. Kaplan (1994) argues that environmental scarcity, particularly water scarcity in transboundary rivers, is crucial when examining future global challenges. Kaplan accurately anticipated that this specific scarcity would become a source of conflict in regions such as the Middle East, Africa, and Europe.

Water scarcity in shared rivers has not always led to conflict, as Aaron Wolf (2007) highlights; it has also often fostered cooperation among states. However, Kaplan's central argument relies on a simplistic, causal model that assumes environmental change will lead to resource scarcities that, in turn, will drive migration and intensify societal pressures. Other researchers agree that such migration surges increase demands on local and state institutions, weakening institutional capacity and potentially escalating conflicts (Mathews, 1989, 166; Homer-Dixon, 2010; Kaplan, 1994, 8; Wolf, 2007). However, it has become evident that the relationships among environmental scarcity, migration, and conflict are far more complex than may be portrayed and cannot be reduced to simplistic or sensationalist conclusions (Brzoska and Fröhlich 2016, 190).

Although environmental degradation is not the sole nor primary cause of migration, it remains a key contributing factor alongside issues such as ethnic and religious conflict, political repression, and broader sociopolitical dynamics (Barnett, J., & Adger, W. N. 2007, 643). Reuveny (2007) identifies four pathways through which environmental migration can lead to conflict and notes that the risk intensifies when these multiple pathways overlap. The first involves heightened competition between migrants and host communities over scarce resources. The second arises when migrants and locals belong to different or rival ethnic groups. The third reflects growing distrust between origin and host communities, often linked to fears of demographic shifts or perceived dominance by migrants. Fourth is the premise that conflict may emerge along preexisting socioeconomic divisions, such as competition for land between migrant pastoralists and resident farmers (Reuveny, R., 2007, 659).

The argument that recent conflicts are primarily driven by climate change-induced migration has been contested on two main points. First, many conflicts did not originate

in the areas from which displaced populations migrated. Second, in some cases, competition stemmed from resource abundance rather than scarcity. Selby and Hoffmann (2014a) challenge the neo-Malthusian interpretation of Sudan's conflict by suggesting it is better explained by resource abundance—particularly water—and factors such as militarized state power, global political-economic dynamics, and patterns of state-building. They argue that analyses should focus on how abundance and political structures shape conflict (Selby, J., & Hoffmann, C., 2014a, 360).

A similar critique applies to Syria's 2007–2010 drought. Scholars such as Kelley et al. (2015) and Gleick (2014) claim that drought and water scarcity contributed to mass rural-urban migration because before the civil war, 1.5 million people became displaced, which heightened tensions (Kelley et al., 2015, 2341; Gleick, 2014, 331). Others, including Daoudy (2020) and Selby (2017), argue that these environmental changes alone do not fully explain the conflict in Syria. They point out, for example, that despite significant drought impacts in Hasakah, no large-scale protests emerged against the Syrian regime. Instead, they both emphasize structural drivers, including government-mandated agricultural reforms, sectarian favoritism, and long-standing sociopolitical grievances, as key contributors to Syria's unrest (Selby et al., 2017, 232; Daoudy, 2020, 111). The authors recognize that environmental conditions can make existing conflicts worse. Still, they believe political, economic, ethnic, and social factors play a more significant role in shaping conflicts. The authors agree that environmental resource scarcity and migration can increase tensions, but they do not believe these factors cause conflicts alone. With these arguments and conclusions in mind, this study hypothesizes that:

H. 3. If water scarcity and drought cause environmental migration, then this is likely to intensify communal conflicts between ethnic groups.

3.4. Water, Drought, and Leaving: Environmental Migration Dynamics in Iraq

Iraq faces significant climate change effects, and water scarcity represents its most severe environmental challenge. The crisis emerges from Turkey and Iran's upstream water restrictions, which affect the Tigris and Euphrates rivers and their tributaries. It is further exacerbated by poor water management, deteriorating infrastructure, and inefficient water distribution systems that result in significant water loss. Outdated agricultural and irrigation methods used by farmers also contribute to the problem, and internal disputes over water governance further complicate efforts to address the growing scarcity (Loveluck, L. & Salim, M., 2022; The World Bank, 2022, 2022, 24; WPS, 2022). Disagreement between the KRG and the GoI and upstream and downstream provinces in southern Iraq has further aggravated the situation, especially when the KRG exercises hydro-hegemony during dry seasons. In addition, rising temperatures, frequent droughts, and declining groundwater and surface water levels have accelerated desertification and reduced arable land, while shrinking green spaces have contributed to the growing frequency and severity of dust and sandstorms.

Studies and government officials increasingly name water scarcity and drought as Iraq's most urgent environmental stress. On November 12, 2024, at COP29 in Baku, Iraqi President Abdul Latif Jamal Rashid—who served as the Minister of Water Resources from 2003 to 2010—emphasized that Iraq's water resources are under severe strain, with vast farmland now devastated. He also stated that "extreme weather phenomena are severely damaging the agricultural sector, worsening food insecurity, and endangering the livelihoods of rural communities dependent on agriculture" (Presidency, 2024).

While the GoI has identified rapid onset environmental events, such as floods, as an immediate existential threat, their current impact on communities may be exaggerated. Compared to other environmental stress, such as chronic water scarcity, advancing desertification, declining agricultural production, and environmentally driven migration,

the threat posed by floods remains relatively lower regarding long-term social and economic consequences. Even so, impacts from flooding may be severe. In recent years, however, hundreds, if not thousands, of people have been affected by flooding, primarily due to damage from water and sanitation services. This issue has been particularly severe in some neighborhoods and IDP camps in Erbil, where inadequate sewage system designs have exacerbated flooding problems (UNICEF, 2018; ECHO, 2024; Hawlergov, 2023).

In 2024, heavy rainfall in March and May triggered severe flash floods in areas such as Dohuk, Erbil, Diyala, and Maysan. Dohuk in the KRI experienced 80 mm of rain, leading to widespread flooding, mudslides, transport disruptions, isolating 16 villages, and damaging infrastructure. Authorities conducted evacuations in high-risk areas. In Diyala and Maysan, mainly comprising rural communities near the Iranian border, hundreds of families were displaced. The Iraqi Red Crescent Society reported approximately 921 affected households in Dohuk and Erbil, with at least 600 more impacted in Diyala and Maysan (OCHA, 2024).

Iraq's water security relies on three primary sources: surface water, rainfall and snowmelt, and groundwater (Abd-El-Mooty, Kansoh, & Abdulhadi, 2016). Surface water from shared rivers, particularly the Tigris and Euphrates, provides around 98 percent of Iraq's water supply. However, dams constructed upstream by Turkey and Iran have reduced river flow by 30 percent since 1980, with projections suggesting a decline of up to 50 percent by 2030. This reduction has precipitated a growing imbalance between water supply and demand, currently around 5 billion cubic meters, which could widen to 11 billion cubic meters by 2035 (Berghof Foundation, 2023a, 9–10; Adelphi, 2022, 4). In 2023, Iraq's Ministry of Water Resources (MoWR) reported record-low water reserves, down to half of the previous year's levels. By 2050, rainfall is expected to drop by 25 percent, a loss that will rapidly accelerate desertification and reduce farmland by approximately 25,000 hectares annually. Iraq's growing population will further exacerbate this impending crisis, poor governmental management of water resources, and escalating climate change–

induced migrations (Todd, 2023, 9; Islam & Wilson, 2023; House, 2023, 6; CIVIC, 2022, 7; UNSDG, 2022).

Rainfall and snowmelt from the KRI mountains, which form Iraq's second primary water source, replenish rivers and reservoirs in summer. Yet, increasing droughts and air pollution have significantly reduced precipitation. For example, 2021 was one of the driest years in four decades and severely impacted agriculture (UNSDG, 2022; NRC, 2022b). Groundwater contributes 2 to 9 percent of Iraq's drinking, farming, and livestock water supply. However, falling groundwater levels, high drilling costs (up to $40,000 for deep wells in areas such as Erbil), unreliable electricity, and stricter permit regulations have made groundwater extraction increasingly difficult (NRC, 2021; Berghof Foundation, 2023a, 17). Despite these challenges, groundwater use has surged due to worsening water scarcity, further depleting water availability; Iraq now has 88,725 wells, including 600 drilled by the government between 2022 and 2023 (Al-Talibi, 2022; M. Ali, 2023).

Water governance failure is also an indirect driver of Iraq's water scarcity. External factors such as upstream restrictions contribute to the crisis, but Iraq's political system is a significant barrier to effective water sector investment and environmental management. Michael Mason (2022) argues that the water insecurity in Iraq is mainly rooted in the political structure that has been created since 2003, especially the political *Muhasasa* system, which refers to the creation of networks of clients in which political parties offer political support to each other in exchange for administrative and bureaucratic positions such as ministries and general directorates in the federal and local governments. In some parts of the country, such as Basra, this political exchange has led to public procurement and retention of contracts, especially in water infrastructure and environmental resources, for political patronage and diversion of project funds. This will cause severe damage to investment in water infrastructure and water resources. Mason highlights that such clientelist practices, particularly in southern Iraq, are central to the country's water challenges. Combined with neoliberal state-building policies emphasizing privatization, these dynamics have greatly diminished the state's ability to provide essential services,

including dependable access to clean water (Mason, 2022, 51, 59; Al-Rubaie, Mason, & Mehdi, 2021).

The political influence on Iraq's water sector reaches beyond infrastructure privatization because government projects are distributed according to political party quotas. Basic water access in certain areas depends on political party membership. People who want to drill wells for water supply need to get permits, which become more accessible when they have connections to political parties. Political clientelism becomes more pronounced in areas with extreme water scarcity, including the Kurdistan Region, which restricts fair access to water resources.

The lack of water in urban areas has forced people to create unauthorized wells and illegally break into public water supply systems. Households have started to break into the central water system by making holes and connecting multiple water lines to their homes to get enough water. Since most of these coping strategies prove ineffective, and with limited water access, many residents have few options and increasingly view migration as a necessary solution. According to Zyad (2023), in Chamchamal, a town heavily affected by water scarcity, only 10 27 municipal artesian wells remain functional. However, these provide water for only a few hours daily. Interviews with residents in Chamchamal and Kirkuk in 2023 reveal coping mechanisms such as purchasing water from private tankers or attempting to drill private wells—although drilling requires political connections due to current restrictions. Nonetheless, severe shortages persist, especially during the summer when temperatures reach 45°C (113°F) or higher, forcing some residents to migrate. In July 2023, the author visited a neighborhood in Shorish, a large Nahiyah (subdistrict) in Chamchamal, mainly inhabited by survivors of the Anfal genocide, where residents reported receiving drinking water only twice a month. While the author visited Hiwa Karim’s office (2023), the director of the water office in Shorish observed groups of residents coming daily to demand water access. One elderly man named Faieq Ahmed (2023), who gave the author permission to use his name, said: "I have two sons, and every summer, they migrate to Sulaymaniyah until winter because of the water

shortage. Since they rent their home, it's easier to relocate to a city where water is more reliable, and they don't have to pay extra for tanker deliveries."

Environmental migration is becoming a critical issue in Iraq. It is primarily driven by the environmental stress of water scarcity and drought, leading to the loss of agricultural land and frequent crop failures. Farmers and rural communities rely heavily on natural resources and are most vulnerable to environmental displacement. Many people migrate to survive as these resources decline, placing additional pressure on rural and urban areas (REACH, 2022). The resulting conditions have damaged crops, rendered areas uninhabitable, forced people to sell their livestock and migrate, and even raised security concerns. In 2022, the World Bank emphasized the impact of environmental degradation, stating that "farmers abandoned their land because the water level in the river declined. They had decided to leave their lands" (The World Bank, 2022, 24). In southern Iraq, families face increasingly dire conditions, with many perceiving migrations as essential for survival. The Euphrates-Tigris basin has seen high migration levels, with Iraq alone accounting for an estimated 1.2 million displaced individuals, according to IOM; by the end of 2021, there had been an explicit displacement of around 20,000 people because of water scarcity, high salinity, and poor water quality. (IOM, 2021).

The widespread impact of climate-related water concerns over the entirety of Iraq is highlighted by the fact that this displacement is concentrated in ten of the country's nineteen governorates (André Mueller et al., 2021, 19; IOM, 2022a, 5). As water resources diminish, sustaining life in the region becomes increasingly challenging. People (mainly youth) face an uncertain future, with many losing jobs or migrating for better economic opportunities. According to the Norwegian Refugee Council (NRC), 45 percent of respondents indicated that youth across Iraq have been forced to leave their homes, driven by the scarcity of resources and limited job prospects (NRC, 2022a, 11).

Kirkuk districts like Shwan, Qara Hanjir, Daquq, and Laiylan have recently experienced a sharp decline in agricultural output, particularly wheat. Water scarcity and the resulting steep decrease in crop production have forced farmers in Kirkuk's rural areas to abandon

their land and sell their livestock as they migrate to cities to search for work. The Director of Shwan District, Bahjat Wahid, told the author on August 27, 2023, that only a single farmer remains in some villages and that nearly 17 of the 40 villages in the district have been entirely abandoned. Farmers no longer live permanently in these areas; they return only during the rainy season, even if the weather is favorable. Sometimes, they visit their abandoned homes on weekends but do not maintain agricultural activities. The mayor also mentioned that several village schools have closed due to depopulation because the GoI stopped sending teachers to areas where they would outnumber the students.

Similarly, M. Ashti (2023), in an interview, mentioned that farmers in her district faced pressure to leave villages, and many did so due to the legacy of Arabization policies implemented during the Ba'ath regime. For example, much of the arable land in Qara Hanjir was allocated to Arab settlers and the Iraqi Ministry of Defense during the Ba'ath regime; after 1991, a large portion of the district was converted to a military base. Following the fall of the Ba'ath regime in 2003, these lands were returned to their original owners. However, Avesta Sheikh Mohammed, Mayor of Qara Hanjir District, stated that "since the failure of the Kurdish independence referendum and the Kurdish withdrawal from Kirkuk in 2017, Arabs have been attempting to reclaim these lands, presenting the renewed Ba'ath-era contracts to assert ownership over Kurdish farmers' lands" (A. Ali, 2022). While the land competition between ethnic groups will be discussed in chapter five, it is crucial to understand at this point that farmers' ability to resist and adapt to ongoing environmental degradation, especially water scarcity, has been significantly weakened by the lack of formal land ownership. The lack of legal ownership prevents farmers from receiving federal government subsidies and support programs, which limit their capacity to address climate change impacts. The environmental changes in the region have forced farmers to choose migration as their primary adaptation strategy.

3.4.1. Triple Threat: Environmental Degradation, Political Instability, and Migration in Iraq

International organizations have worked extensively on the environmental migration in Iraq and have published dozens of reports for policy purposes; thus, they are an essential

source of knowledge for studying environmental-induced migration. Therefore, the following discussions summarize the data, findings, and arguments highlighting how water scarcity and drought have increased migration and affected social and political stability. For example, the NRC has conducted extensive research on the impacts of environmental change in Iraq to assess (among other issues) how water scarcity and drought affect local community livelihoods (NRC, 2021, 2022a, 2023). Each of its three reports highlights the problem of environmental migration, particularly the challenges in Iraq's southern regions. Table 3.1 below summarizes the NRC's main study areas, significant ecological stress, and primary findings from these reports.

Table 3.1. NRC Studies of Environmental Stress and their Implications Across Iraq.

Year	***Survey Location***	***Environmental Stress***	***Key Findings***
2021	Anbar, Basra, Duhok, Kirkuk, Ninewa, Salah Al-Din, Thi-Qar	Water scarcity, crop failure, livestock disease	- 40 percent of farmers reported near-total losses of wheat crops due to water scarcity. - Many farmers lost livestock due to insufficient water, lack of feed, and disease spread. - 1 in 15 households mentioned migration due to drought's economic effects.
2022	Anbar, Basra, Dohuk, Kirkuk, Ninewa	Drought, water scarcity, illegal drilling, inter-communal tensions	- Due to drought, 4 percent of households surveyed relocated during harvest. - 38 percent of households reported increased inter-communal tensions over water scarcity, which led to illegal drilling and unauthorized water pumping.
2023	Anbar, Kirkuk, Ninewa,	Impact of environmental degradation	- 60 percent of farmers reduced cultivated land and water use.

Salah Al-Din	impact on crop yield. Reduced water availability, food insecurity Climate change impacts, economic pressures, abandonment of farming	- In Ninewa and Kirkuk, 80 percent of farming community respondents cut back on food spending. - In Ninewa Plains, 1 in 5 respondents linked climate change to communal tensions; 1 in 4 considered relocating due to drought impacts. - A quarter of small-scale farmers abandoned farming due to environmental stress. - Nearly 40 percent of respondents reduced food expenditure due to financial pressure from environmental stress.

The NRC reports identify water scarcity and drought as Iraq's most urgent environmental stresses. They state they are particularly severe in the southern regions, where they have driven significant environmental migration. The reports also emphasize that such migration has intensified intercommunal tensions due to competition for dwindling water resources; communities often resort to unauthorized borehole drilling and illegal water pumping. Environmental degradation affects all regions, but southern Iraq faces the worst challenges, negatively impacting social and resource-based conflicts. The NRC's findings indicate that districts with the highest levels of intercommunal tensions—such as Hawija in Kirkuk (57 percent), Ramadi (63 percent), and Mosul (55 percent)—were heavily impacted by past conflicts and are still hosting IDPs and returnees (NRC, 2022a, 16).

Climate change has also intensified pressures in urban areas, with farmers and temporary wage workers displaced by drought and water scarcity migrating to cities for stability. The decline of rural farming has forced numerous families to leave their homes, resulting in more people moving to urban areas. The population shift has worsened urban poverty while overburdening urban resources and services and (despite migrants' hopes) has created both economic instability and communal tensions within cities. IOM has examined

this environmental migration, focusing on southern and central provinces where water scarcity and drought are primary drivers and with less emphasis on the northern regions. Its reports indicate that most environmental migration in Iraq is permanent rather than seasonal, with many individuals and families taking drastic measures—such as selling land, livestock, and homes—to support their relocations, corroborating NRC's reports (IOM, 2021, 2022a, 2023, 2024). Table 3.2 below summarizes the primary focus areas and key findings from recent IOM research on environmental migration in Iraq.

Table 3.2. Recent IOM Studies on Environmental Migration in Iraq

Year	*Survey Location*	*Environmental stress*	*Key Findings*
2021	Central provinces (Karbala, Qadissiya, Muthanna, Najaf, Wassit)	Severe water scarcity	- Nearly 6,000 environmental migrants were recorded in November 2021 alone due to water scarcity. - Migration pressures continued to rise as thousands sought better conditions amid ongoing drought and limited water resources.
2022	Southern provinces (Basra, Maysan, Thi-Qar), central provinces (Karbala, Qadissiya, Muthanna, Najaf, Wassit), KRI	Drought, water scarcity, heatwaves, sand and dust storms, unpredictable rains, flooding, salinity in the soil and water, pollution, and other environmental issues	- Water scarcity and drought are primary drivers of migration. - 8 percent of households in the southern provinces rely on environmental resources; 7 percent of farming households abandoned their livelihoods due to water scarcity. - In Thi-Qar, nearly half of households left their land due to environmental stress. - 20 percent of displaced farmers reported family migration for livelihood support, and 30 percent expressed a

		throughout the world	desire to migrate. - KRI: Over 100,000 displaced due to the drying of karez[6] aqueducts.
2023	Southern and central provinces, Diyala (northern)	Drought, water scarcity	- 12,212 families (73,272 individuals) displaced by drought across ten governorates as of March 2023. - 38 percent (4,659 families) of displaced households remain within their districts. - 76 percent of the displaced population has relocated to 347 urban locations, placing strain on urban infrastructure and resources.
2024	Southern and central provinces like Thi-Qar, Maysan, Najaf, Muthanna, Basrah, Qadissiya, Wassit, Kerbala, Salah Al-Din, Babylon, Baghdad, and Diyala in the north.	Water scarcity, drought, and land degradation.	As of June 30, 2024, around 24,500 families (147,000 individuals) remain displaced due to climate-related factors across 12 governorates across 440 locations. It is estimated that approximately 48 percent of these households have relocated within their district of origin, while slightly more than half of them have moved to urban areas.

The International Organization for Migration studies show that environmental problems, particularly drought and water scarcity, significantly impact migration and displacement. These reports heavily emphasize southern Iraq. Their findings indicate that rural communities, including farmers and herders, are particularly vulnerable to these pressures. Although some individuals and families have moved within their districts, most

have migrated to urban centers, worsening poverty and increasing demands on state-provided resources and services. The IOM further emphasizes the connection between environmental migration and intercommunal conflicts, especially in regions already burdened by conflict and housing IDPs.

Lastly, the Berghof Foundation studied how climate change affects conflict in Iraq by focusing on the Garmian and Chamchamal areas within the KRI. The research uses semi-structured interviews and focus group discussions to reveal how environmental changes increase social tensions. A primary factor is livelihood insecurity, highlighting how slow-developing ecological challenges endanger livelihoods, leading to displacement and migration. These issues are further aggravated by high unemployment, fragile state institutions, and limited urban infrastructure to support new arrivals; as a result, displaced individuals often resort to informal or illicit economic activities. Such an influx of migrants can intensify competition and strain between local communities and newcomers, destabilizing social cohesion and elevating the risk of conflict (Berghof Foundation, 2023a, 4; 2023b).

Environmental migration has deepened Iraq's ongoing political and social instability as well. In the southern regions, many young people from farming families have suffered environmental stress financially. The process of becoming migrants would lead them to overcrowded urban slums where they face poor living conditions and limited economic opportunities, which make them susceptible to militant organizations and criminal networks, thus enabling these groups to expand. The combination of informal urban settlements and transient living arrangements demonstrates how Iraq's migration patterns create socioeconomic challenges that generate security risks.

For their part, armed groups such as ISIS and Popular Mobilization Forces (PMF) exploit migrant and youth vulnerability by offering financial incentives to recruits. Families facing economic hardship sometimes pay bribes to secure jobs for relatives in the police or Iraqi security forces. Such dynamics fuel the proliferation of weapons and increase the risk of

violence and intergroup conflict as militarized actors expand their influence within rural as well as urban communities (CIVIC, 2022, 16; SIPRI, 2022, 3).

Environmentally vulnerable communities and farmers in Iraq have been deliberately targeted by jihadist groups, and this sustained attention fuels cycles of violence. A National Geographic report (2017) reveals that in drought-affected regions such as Salah Al-Din, Tikrit, and Kirkuk, groups such as ISIS provide cash, food, and other support to struggling farmers in exchange for the recruitment of family members. Around Tikrit, ISIS gained more traction in water-scarce communities compared to better-resourced areas. In Tharthar, farmers closest to desert-encroached lands were reported as more likely to join Jihadist ranks than those in river valley regions (Schwartzstein, 2017). The Climate Diplomacy report (2024) indicates that in Ninewa—where in 2010, roughly 30 percent of rural communities lacked access to clean water—many individuals joined ISIS due to a mix of ideological beliefs, fears, and largely overlooked material and environmental factors. The decline of agriculture and water scarcity has also played a significant role in escalating violence, as ISIS capitalized on the economic desperation of impoverished farming populations (Barry, 2024; IRI, 2010).

The PMF draws its members from rural areas to work on agricultural projects that involve land restoration and artesian well drilling. The PMF operates through formal and informal networks, which makes it difficult to obtain reliable information about its economic structures and operations, but it plays a complex role in Iraq's rural areas. Beyond mobilizing farmers and displaced populations, the PMF has actively supported rural livelihoods and revitalized agricultural activities. In several regions, local militias have established secure agrarian areas. For example, in Diyala province, some farmers credit the PMF with helping restore parts of the local agricultural economy. Mohammed al-Obaidi from the local agricultural union noted that their protection allowed the replanting of key crops on over 10,000 dunams of farmland (B. Ali, 2021; Karbala News, 2023).

The PMF's influence has also extended into state institutions in ways that affect agricultural policy decisions. In 2018, Iraq and Saudi Arabia reached a preliminary

agreement for a large-scale Saudi agricultural investment covering lands from the Iraq-Saudi border to the deserts of Karbala, Muthanna, and Najaf. The project promised to benefit farmers and rural communities through economic stimulation and infrastructure development but faced substantial political and security opposition, particularly from the PMF's Shiite leadership. Citing concerns over the depletion of Iraq's strategic groundwater reserves, the PMF rejected the initiative and pursued domestic investment alternatives via Iraqi companies. Under this growing pressure, the MoWR suspended the project, resulting in Saudi Arabia's withdrawal despite its potential benefits to Iraq's agricultural sector (B. Ali, 2021; Karbala News, 2023).

The militias are also wealthy enough to subsidize and fund farmers and herders to secure their recruitment or allegiance, as these groups have deeply embedded themselves within government institutions and receive substantial government funding. They are spearheading a large-scale agricultural project in Iraq's Muthanna Governorate, referred to as the Badia Reclamation Project (Muthanna Investment Commission, 2024). The PMF claims the project aims to enhance Iraq's food security and contribute to economic development by converting over two million dunams of desert land into arable farmland. It is also projected to create approximately 30,000 jobs, offering employment opportunities to local populations and addressing regional unemployment challenges. Additionally, the project promotes the adoption of modern agricultural practices by capitalizing on the region's abundant groundwater resources and vast desert spaces to foster diversification in both crop and livestock production (Al-Alam, 2023).

The militias in the south and middle of Iraq operate their own companies that provide distinct services. For instance, in 2023, a PMF affiliate called the Al-Muhandis Company launched a project to plant a million palm trees in the Samawah desert. Many view this initiative as a significant step toward combating desertification (Menmy, 2023; Almasdar Online, 2023).

Environmental Migration has exacerbated political tensions in northern Iraq between competing authorities and other groups. In Kirkuk, where ethnic groups already compete

for territorial and political control, the influx of new migrants can be seen as shifting the ethnic balance. This is particularly so in areas with a history of demographic engineering, such as the Arabization policies of the Ba'ath regime. As new migrants settle, they may unintentionally reignite or intensify unresolved conflicts over land ownership, political representation, and resource allocation among communities and forces already competing. The World Bank, noting an increasing migration trend from southern Iraq, stated that "water-stressed communities in the south of Iraq will increasingly migrate north" (World_Bank_Group, 2022, 46; Berghof Foundation 2023a, 4; 2023b).

All this movement heightens the potential for communal conflict, especially in northern governorates such as Diyala, Kirkuk, Ninewa, and the KRI—areas with historical tensions between Kurds and Arabs around sovereignty, governance, and natural resources. The increasing population movement in northern Iraq creates significant issues for the KRG because thousands of families, including environmental migrants, are moving to disputed territories and the KRI territories. The KRG has continuously expressed its worries about demographic changes in these areas, while Iraqi officials tend to avoid discussing these changes. Unlike Iraqi officials, who generally refrain from commenting on the demographic changes in these areas, the KRG attributes most of the demographic shift to Arabization policies that operate in disputed territories. In November 2024, Fahmi Burhan, the head of the KRG's Disputed Territories Committee (and holding a cabinet minister position), highlighted several threats that Kurds face in these regions. He claimed more than 600,000 Arabs have migrated to Kirkuk and its districts since 2017, increasing tensions between those populations (Rudaw, 2024).

Amid Iraq’s preparations for a national census in 2024, the KRG formally requested the GoI to delay the census in the disputed territories until the situation of displaced Arab families could be addressed. The KRG wanted to ensure that Arab migrants, whether displaced by conflict or environmental factors, were not registered as permanent residents of the KRI or other disputed regions (Kirkuk). Therefore, they requested that these families be recorded in their original areas of residence, which would prevent

altering the region's demographic balance (K24, 2024).[7] The continuous demographic shifts explained above add complexity to the already delicate issues of governance, sovereignty, and resource management in the contested regions of northern Iraq, which in turn heightens concerns about prolonged political and social instability. Therefore, this study hypothesizes that:

H. 4. When competing ethnic groups in ethnically divided societies experience environmental degradation (water scarcity and drought), then they are likely to have split perceptions of environmental migrations.

3.4.2. Unpacking the Data: Migration, Environment, and Governance

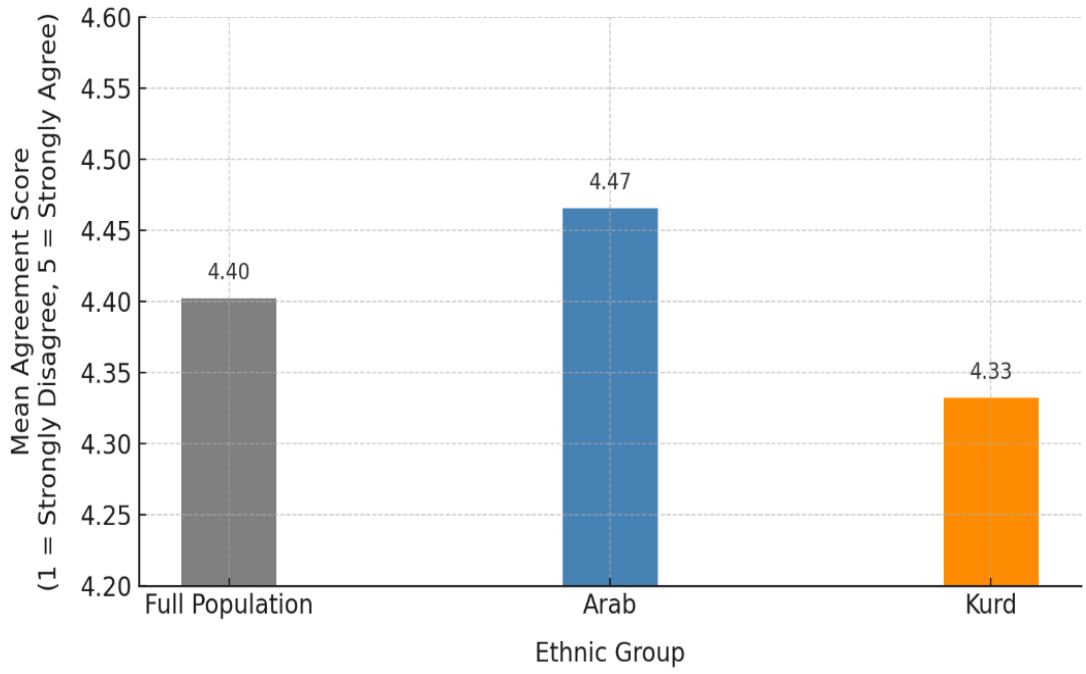
To test the hypotheses (H. 3 & H. 4) above, this dissertation examines data collected from the Kirkuk surveys, explicitly focusing on Q. 21 and Q. 22 (please see appendix). These questions explore ethnic perspectives in Kirkuk on the links between water scarcity, drought, and migration and whether these environmental changes contribute to rising issues such as communal conflict. Q. 21 seeks respondents' perceptions of the broader impacts of water scarcity and drought in Iraq and the potential for subsequent communal disputes. Q. 22 takes a more personal approach by asking whether water shortages and drought have directly impacted the respondents or someone they know, for example, resulting in migration from villages, abandonment of agriculture and livestock, and heightened communal conflict. For the data on this question, see Chapter Two, table 2.1, page 64.

The dissertation begins by analyzing responses to Q. 21 to determine the presence of support for (H. 3) that water scarcity and drought have contributed to migration within Iraq

[7] The Iraqi budget is, effectively, allocated along demographic lines. During the transitional period after the fall of the Ba'ath regime in 2003, the federal government in Baghdad and the KRG agreed upon a 17% of bidger sgare allocation for the region, due to the lack of a general census. The federal government have always raised concern about that, yet the KRG believes that its should the same amount or slightly higher. Thus, the recent general census will definetly affect a potential financial agreement between the federal government and KRG.

and have thus led to subsequent social instability. Figure 3.1 below illustrates the perspectives of Kurdish and Arab citizens in Kirkuk on the relationship between environmental change and migration and their relationship to the occurrence of communal conflict.

Figure 3.1. Ethnic Perception of ES – Migration-Communal Conflict Nexus in Kirkuk.



The chart presents the average Arab response rate as 4.47, slightly above the overall mean. This result indicates increased awareness among Arabs of the triple nexus of environmental changes, migration, and communal conflict. In comparison, the average response rate for Kurds is 4.33. Although the Kurds also perceive a strong relationship between environmental changes, migration, and communal conflict, their average response is slightly lower than that of the Arabs. This difference suggests that while Kurds acknowledge the impact of environmental changes, migration, and communal conflict, they may also perceive themselves as somewhat less vulnerable to these issues than the Arabs do.

The average response among survey respondents reveals a high general perception of the relationship between environmental stress, migration, and social conflict. Respondents broadly, regardless of the respondents' ethnic affiliations, believe that water shortages and drought have driven migration to urban areas, especially from villages, and abandonment of agriculture and pastoralism, which in turn have led to communal conflict. Nonetheless, it is essential to understand the degree to which each group prioritizes or strongly believes in this acknowledged connection between environmental factors and communal strife.

This finding also partially confirms (H. 3: migration, potentially triggered by water shortages and drought, might lead to communal conflicts) because environmental migration is caused by water scarcity, and drought tends to increase communal disputes between ethnic groups. The mean agreement scores of 4.40 from respondents on a 5-point Likert scale demonstrate that environmental degradation has led to agricultural abandonment and rural-to-urban migration and has caused unemployment, poverty, and rising intercommunal tensions. The survey results showed that Arabs strongly agreed with the statement, but the 90 percent confidence level statistical difference indicated their perception levels differed. The data supports the causal relations of the hypothesis, yet the causal pathways need further investigation. The data shows how ethnic groups perceive water scarcity and drought as causes of communal conflict but does not demonstrate actual migration patterns. Nevertheless, it still provides helpful context.

The data shows that environmental stress leads to instability, which makes rural communities consider leaving their farms or moving away. The slight differences in response patterns between Arabs and Kurds suggest that these groups perceive or understand the effects of water scarcity and drought differently. The adaptive responses of these groups to environmental change may differ because of their distinct approaches to migration and other coping strategies. The statistically significant difference in ecological perceptions between Kurds and Arabs at a 90 percent confidence level indicates that ethnicity shapes these views. This variation is also likely to reflect

differences in each group's dependence on environmentally driven economic activities, levels of social isolation, and ethnic status.

Several factors contribute to Arab respondents' heightened perceptions of water scarcity and drought as catalysts for migration and social tensions in Kirkuk compared to the Kurdish respondents.

First is the economic dependency on environmental resources, specifically, the long-standing tensions between Kirkuk's Kurdish and Arab populations, which are linked to the broader political relationship between the KRG and the GoI, significantly shaping these perceptions. Although recent research suggests that everyday interactions within Kirkuk City and bazaars are more peaceful than conflict-ridden (O'Driscoll, 2021), this atmosphere does not extend to rural areas and villages, where disputes over land and ownership may occur daily. Despite being historically colonized by past Iraqi regimes as part of large-scale agricultural programs (especially in places such as Daquq, Hawija, and Sargaran), the Arab residents of these areas continue to rely primarily on farming and herding for their means of subsistence. This economic dependency on environmental resources such as land, water, and livestock renders the Arab community more vulnerable to environmental changes than the Kurdish population.

This historical context further illuminates these differences. With the ascent of the Ba'athist regime in the late 1960s, the Kurdish faced forced evictions and restrictions on agricultural land and environmental resource use, often enforced through legal and judicial means. This exclusion intensified during the Anfal campaign of the 1980s, during which approximately 5,000 villages were destroyed, and the residents relocated to camps (Black, 1993). Consequently, the Ba'ath regime maintained its control until 2003, which prevented Kurdish farmers and herders from accessing their agricultural lands, thus forcing them to find alternative non-agricultural sources. The collapse of the regime allowed some Kurds to return to their villages and rebuild their homes because they felt a strong national connection to the land. However, agriculture remained absent, and many visited their villages recreationally on weekends. This lifestyle, which has

diminished their direct exposure to climate-related changes, differentiates them from the Arabs, who remain the region's primary agricultural and pastoral demographic.

A second factor influencing divergent environmental perceptions between Kurds and Arabs in Kirkuk is geopolitical and social isolation. There is limited sociopolitical connection between the Kurdish population in Kirkuk and the KRI and Iraqis in the country's central and southern regions, the latter of which are more severely impacted by water scarcity and drought. This separation stems partly from oppressive and discriminatory policies enforced by past Iraqi regimes, which are further compounded by ongoing security and political instability in southern Iraq. By contrast, Arab farmers and herders in Kirkuk are better acquainted with the environmental change affecting other parts of Iraq due to familial and other connections, and this familiarity shapes their perspectives on environmental issues in Kirkuk.

The southern and central parts of Iraq face severe climate effects because the Tigris and Euphrates rivers deliver less water to their downstream regions. The water shortage has caused Arabs from Kirkuk to interact with Arabs from southern Iraq through mass population movements of thousands of Arab families who have settled in northern regions for agricultural and pastoral activities. Meanwhile, Kurdish villagers and farmers in Kirkuk, largely isolated from the rest of Iraq, look to the KRI, which enjoys comparatively favorable environmental conditions. These different experiences of social and spatial distance contribute to the differing perceptions of environmental stress between the two groups.

The third factor is status uncertainty in Kirkuk. This refers to the Arab community's evident outlook on environmental change, migration, and social tensions as influenced by changing variables around their residency in Kirkuk. According to Article 140 of the Iraqi Constitution, large numbers of Arabs resettled in Kirkuk as part of the Arabization campaign between the 1970s and 1990s were expected to leave, starting in 2007, as part of the region's demographic normalization. While most Arab families received compensation and left Kirkuk until 2017, the failed Kurdish independence referendum and subsequent reestablishment of Iraqi control of Kirkuk in the same year prompted the

return of many Arabs and the arrival of others. Aware that future displacement may be possible as well as the need to relinquish agricultural lands traditionally belonging to Kurds and Turkmen residents still experience heightened anxieties about environmental migration. Conversely, because they view themselves as the indigenous custodians of the region, Kurds prioritize issues of land ownership and identity over environmental stress. For the Kurds, therefore, the ethno-political struggle over Kirkuk takes precedence over concerns about water scarcity and drought.

The second hypothesis in this chapter (H. 4) presented in this chapter suggests that Kurds and Arabs interpret the environmental stress-migration nexus in significantly different ways. Analyzing Q. 22 from the Kirkuk survey is key to exploring this hypothesis. The author uses a 5-point Likert scale: the minimum value is total disagreement, and the maximum is total agreement. This question assesses personal perspectives on whether water scarcity and drought drive individuals to leave their villages and abandon agricultural and livestock activities. Table 3.3 below, which presents the responses to this question, offers insight into how these ethnic communities, on an individual level, experienced the impact of water scarcity and drought on changes in migration and livelihood.

Table 3.3. Ethnic Perceptions of Environmental Migration in Kirkuk

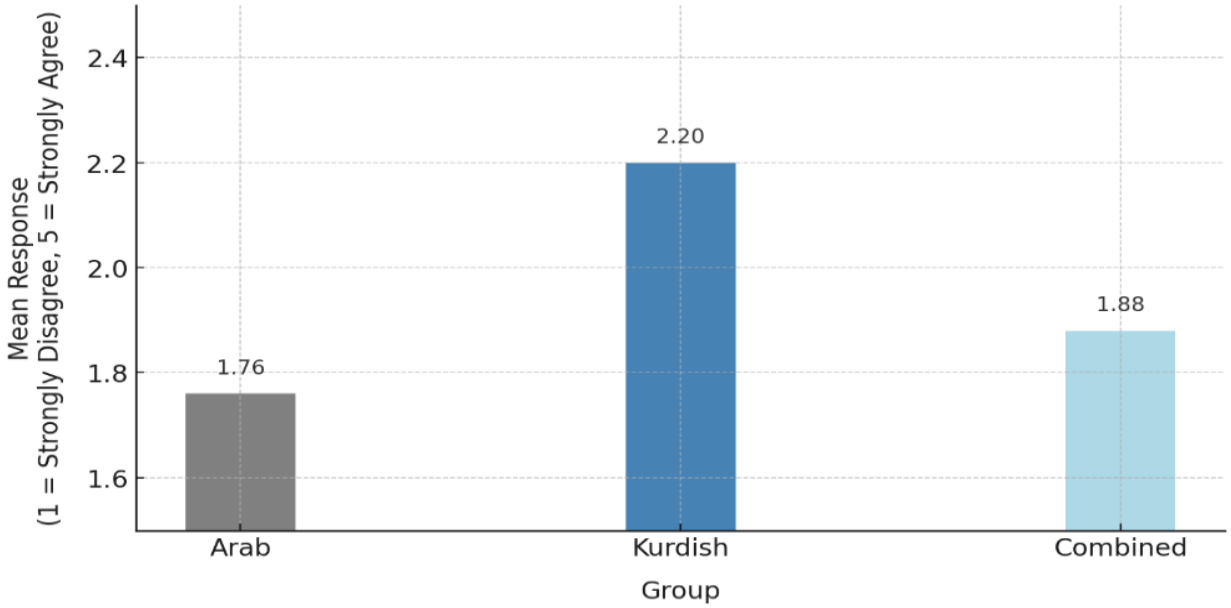
Ethnic Groups	*Average Response*	*No. of Respondents*
Arab	1.76	314
Kurdish	2.20	116
Combined	1.88	439
Significance at 90%	Y	-

The findings regarding ethnic perceptions of their experiences with environmental migration and communal conflict are presented. The participants were asked if they/or their family members experienced migrations due to water scarcity and drought and abandoned agriculture and their livestock. The combined average response was 1.88,

indicating a general tendency toward disagreement or weak agreement with the statement. The results show that Kurdish respondents agreed more strongly with the statement (2.20) than Arab respondents (1.76 at the 90 percent confidence level). Although the findings show that most people did not directly attribute their or their relatives' migration to environmental stress, the result indicates that the Kurds are more likely to associate migration and abandonment of agriculture with environmental stress.

The results indicate that Kurdish communities link environmental stress, particularly water scarcity and drought, to migration and rural livelihood abandonment more strongly than other communities. The results show that environmental migration through direct causes does not affect the entire sample but affects Kurdish communities more strongly because of their unique ecological vulnerability and migration patterns between ethnic groups. This is especially true in areas like Kirkuk and its rural surrounds, where Kurdish farmers rely heavily on rain-fed agriculture and encounter challenges with limited water infrastructure. The following figure clearly illustrates the divisions between Kurds and Arabs regarding environmental migration in Kirkuk.

Figure 3.2. Individual Experience of Environmental Migrations among Ethnic Groups in Kirkuk.



A weaker relationship between water shortages and forced migration is indicated by the higher average score of 1.75 among Arab respondents. This disparity may indicate differences in the two groups' exposure levels or methods of coping. For example, there may be less of a need for Arab respondents to leave their current locations due to the availability of other means of subsistence, water supplies, or economic opportunities outside of agriculture. Another possibility is that Arab communities have not been completely affected by the migratory pressures caused by the drought because of sociopolitical variables such as land ownership patterns, how the government distributes resources, or their settlement history.

In other words, the Kurdish group is more worried about drought and water scarcity and believes that these environmental conditions have led people to give up farming and raising animals, which has caused migration and other social problems. Even Arabs, albeit to a lesser extent than Kurds, feel the truth of these statements. Still, there is a discrepancy between the two groups' views on environmental migration due to drought and water scarcity. The results of Q. 22 show a significant difference between the two groups at a 90 percent confidence level, which means that the Kurds and Arabs in Kirkuk have different views on environmental migration, which supports the hypothesis (H. 4) that in ethnically divided societies, groups tend to have different views on environmental migration when facing environmental problems such as water scarcity and drought.

The findings confirm that environmental stress is interconnected with social, ethnic, and political factors. The likelihood of migration becomes higher when rural livelihoods face environmental disturbances, as seen in specific Kurdish regions of northern Iraq. In contrast, Arab respondents may exhibit varying levels of exposure or adaptive strategies. Therefore, results also indicate that environmental stress affects different ethnic groups unevenly and thereby drives unique migration trends.

This disparity in average responses highlights that Kurds and Arabs place differing levels of importance on environmental migration, with Kurds perceiving it to be more significant and consequential. In terms of ES and migration, different ethnic communities in Kirkuk

have different assessments of how important they are. The differences between Kurds' and Arabs' perceptions in Kirkuk about environmental stress and migration to cities arise from several factors.

First, Kurdish farmers have been more severely impacted by village evacuations and past migrations. From the beginning of the Ba'ath regime's land confiscations in the late 1960s until its end in 2003, with the fall of the regime, Kurdish farmers and villages were deprived of their lands and water resources. Even after the regime's collapse, Kurdish farmers have rarely and intermittently benefited from agricultural projects and assistance from both the Iraqi government and the local administration in Kirkuk. Such support has generally only been accessible when Kurds have governed the city. This exclusion intensified from 2018 until August 12, 2024, under the governance of a Sunni Arab governor who furthered the re-Arabization of Kurdish and Turkmen villages.

Without legal land ownership, Kurdish farmers in many villages could not seek assistance from agencies focused on agriculture, environment, and water resources. For instance, W. Bahjat (2023), the Mayor of Shwan district, told the author that “by the summer of 2023, 17 out of 75 villages had been evacuated, which left around 700 farmers facing severe water shortages”.

Despite these obstacles, Kurdish farmers typically do not abandon their villages permanently; instead, they temporarily evacuate (K24, 2020). According to Bahroz Tahir Ahmad, head of the agriculture unit in the Shwan district, Kurdish farmers often retain homes in areas where villages have been evacuated and return weekly or monthly. Some farmers return to cultivating wheat and barley if there is sufficient rainfall during the agricultural season. However, due to environmental changes, they no longer see staying in evacuated villages as a viable source of livelihood (interview on August 27, 2023). By contrast, Arab farmers are less inclined to leave the agricultural lands—much of it contracted to them by the Ba'ath government—even when facing water shortages and drought. Since 2017, with the return of the Iraqi army to Kirkuk, Arab farmers have consistently received support from the city administration, which has provided water

projects for low-lying areas and assistance in digging wells. The local administration also supplies fuel and other material aid that reinforces their capacity to stay. Arab farmers consider migration only if legally compelled, financially compensated, or if security threats arise from Kurdish farmers. So far, such threats have been mitigated by the direct protection of the Iraqi army and PMF, both of whom guard Arab farmers as well as their agricultural lands.

Second, Kurds have a history of forced village migration that influences their perceptions of further displacement due to water shortages and drought, allowing for increased Iraqi government intervention and further occupation of their lands by Arab farmers and herders. Mohammed Ameen (2024), a representative of farmers in Sargaran, told the author that “in the 1970s, many villages in western Kirkuk were taken from Kurds under the pretext of developing oil fields; ownership was transferred to the Iraqi government's Ministries of Finance and Oil. Later, Kurdish residents were vacated from additional villages near the oil fields to establish a security belt around the city; control of those lands was transferred to the Ministry of Defense”.

As a result of these displacements, Kurdish farmers remain deeply concerned about leaving their villages, particularly as they continue to face restrictions on agricultural and livestock activities on their lands. For instance, the Iraqi army annually prevents certain Kurdish villages from plowing fields or harvesting crops due to ongoing conflicts between Kurdish and Arab farmers (K24, 2023). These challenging historical experiences have intensified Kurdish farmers' concerns about all forms of migration, including those prompted by environmental stress.

In sum, the ethnic groups in Kirkuk do not all appear to have experienced significant environmental issues; however, they agree that environmental stress has led to migration and increased the risk of communal conflict. Nonetheless, they hold significantly divided perceptions regarding the relationship between environmentally induced migration and regional communal strife.

Chapter Four

Environmental Governance Across Competing Authorities in Iraq

4.1. Introduction

Societies are complex social organizations, as simple center-periphery dichotomies do not describe them. Instead, they comprise ethnic groups, tribes, villages, religious institutions, families, economic entities, the state, etc. The state is just one of many that compete for social control, and, as such, it is not immune to resistance. “Societies with a melange of social organizations (including many different kinds of groups), many having their rule-making ability, have witnessed stiff resistance to leaders' efforts to use the state as a means of sustained political mobilization” (Migdal 1988, 28, 208). Nor are the state and its institutions only or even the most essential governors and providers of communities’ everyday environmental needs (Lust, 2022).

ES in Iraq is threatened by water shortages, drought, desertification, and competition over arable lands, all contributing to communal conflict between communities. Environmental issues also affect political, security, sectarian, and ethnic conflicts. The political instability that results has enabled a variety of NSAs to take over the responsibility of governing ES, such as the PMF’s role discussed in Chapter Three. The weak Iraqi state has also enabled the emergence of ‘competing authorities’ to which people have turned to get their problems solved and their daily needs met.

This chapter examines how NSAs assume everyday environmental governance. Environmental governance is here defined as “the set of regulatory processes, mechanisms and organizations through which political actors influence environmental actions and outcomes… governance is not the same as government. It includes the state's actions and… [non-state] actors such as communities, businesses, and NGOs.”

(Lemos, M. C., & Agrawal, A., 2006; 298). It seeks to demonstrate how people navigate their environmental governance. Which authority do they turn to address their everyday environmental needs? And why?

Research has explored the role of NSAs, also called sub-state actors, in environmental governance and their increasing significance compared to traditional state actors. These NSAs include cities, corporations, advocacy groups, civil society organizations, and NGOs, all of which play crucial roles in climate action. They are involved in critical areas of mitigation and adaptation (e.g., urban transportation infrastructure) that determine many climate policy outcomes. (Bäckstrand, K., Kuyper, J. W., Linnér, B. O., & Lövbrand, E., 2017; Hale, T., 2018; Michael, E., 2023). Additionally, the role of traditional authorities in environmental governance in Africa has been examined (Schwaiger, J., Tas Kronenburg, Z. M., Auch, A., Bosker, T., & Ehrhardt, D., 2024).

The UNFCCC identifies the NSAs as relevant to a project based on their role in developing policies, increasing resilience, facilitating knowledge transfer, and building capacity. NSAs also partner with governments to execute climate projects such as renewable energy and carbon reduction. In addition, they provide technical support and innovative ideas for climate policy debates and participate in international climate negotiations (Hoffman, A. J., & Henn, R., 2008).

Rather than focusing on the types of NSAs mentioned above, this chapter furthers the study's goals by analyzing the social customary and unofficial political institutions central to the everyday governance in Iraq. Such ‘social institutions’ are structures that include tribal leaders, sheikhs, religious leaders, militias, and political parties’ offices and leaders outside the state apparatus. These actors shape Iraq’s societal norms, behaviors of individuals and groups, and decision-making in given contexts or spheres of engagement, which Lust defines as an “arena of authority” that refers to “spheres of engagement that are characterized by expected allegiances, established authorities, and distributions of power” (Lust, 2022, 2), in which state and NSAs, formal and informal authorities contest

power. These interactions establish spaces of power, competition, and overlapping authority.

In northern Iraq, two formal and constitutional authorities govern the everyday lives of communities: the GoI in Baghdad and the KRG in Erbil. In addition, other NSAs govern many customary and informal arenas of authority. Lust defines the “arena of authority” as "a sphere of activity with clear membership, goals, and institutions...it has boundaries, which distinguish members of the community (inside the arena) from outsiders. Membership in the community may be based on such foundations as ethnicity, tribe, or religion, but regardless of the foundation, the community seeks to propagate itself beyond the current generation" (Lust, 2022, 17). For this study, the term NSAs in Iraq refers to any or all the established social and political structures, such as tribal and societal leaders, religious institutions and leaders, political party offices and members, members of parliaments, and militia leaders, which play roles in governing everyday environmental needs of the community (Owen, 2013).

Although the ‘arena of authority’ in which the NSAs operate neither necessarily requires nor receives “de jure (legal) recognition” (Lust, 2022, 19), the NSAs often cooperate with or sometimes compete with state institutions. In such relationships, they enjoy some recognition by state institutions. For instance, in Iraq, tribal leaders and religious leaders are recognized as holding state roles because the state often needs their political support. In exchange, political parties may advance shared objectives by incorporating these actors into their leadership structures or providing them with financial backing and armed forces (mainly for tribal leaders). Sometimes, political parties seat these actors at national and local legislative councils, thereby adding institutional authority to their impact and affirming the relationship between NSAs and state structures.

The concept of ‘arena of authority’ concept can help explain how different NSAs are beyond the state shape of environmental governance. Various ethnic, tribal, and sectarian communities operate within their arenas of authority in which local actors such as tribal leaders, clerics, and militia commanders control access to and use of water resources,

arable lands, and pastures. These areas are distinct because they have ethnic or sectarian-based boundaries and often coexist or compete with state institutions. Environmental governance operates through informal rules of these arenas, which interact with formal state authorities in such circumstances. The fragmented governance structure demonstrates how power structures based on identity and environmental choices in Iraq are connected.

Given the varying perceptions of ES between Kurds and Arabs in Iraq (see Chapters Two and Three), this study claims that political beliefs and ethnic identities are key to shaping the perceptions of these ethnic groups in navigating and addressing their environmental needs. As shown in the following figures and tables, the groups' choices become more fragmented due to the differences in these perceptions. Each group wants the solutions it prefers from authorities who are in step with their particular ethnic classification. While well entrenched, this dynamic critically impacts our understanding of environmental governance in fragile and divided societies. It raises the central question of this chapter: How do people navigate environmental governance in the context of multiple "arenas of authority"? When competing ethnic groups face ecological change, which authorities do they rely on to address their environmental needs?

In this chapter, the author will determine which NSAs are perceived by people in Kirkuk as the most accountable and attentive to issues regarding ES, despite the increasing interest in the role of NSAs in climate actions and environmental conservation by being a part of mitigation and adaptation plans (Whyte, K. P. 2013; Etchart, L., 2017; Jones, N., 2020). The issues governing ES, mainly by traditional and social NSAs, have received relatively little attention. In the case of Iraq, the role of NSAs in ES has been largely ignored. This chapter also argues that prior political beliefs and ethnic identity shape individuals' and communities' decisions in navigating the NSA's role in environmental governance. Despite the growing literature on ES and environmental activism, this area is also underdeveloped in Iraqi environmental governance.

Most studies on NSAs in Iraq are constrained to violent ones, which include terrorist organizations, sectarian groups, and tribal Sahawat fighters upon whom the government has had to rely at one time or another (Rashid, 2005; Durac, 2015; DiPaolo, 2004; Benraad, 2011). This chapter, which examines the roles of NSAs in environmental governance in Kirkuk, provides a new perspective on analyzing ethnic conflict in northern Iraq. In this way, this dissertation aims to contribute to the literature by describing how societies respond to environmental change when strong state institutions are absent.

4.2. The Primacy of States in Environmental Security

On a global scale, environmental governance has become one of the state's most essential and immediate challenges. ES literature has mainly remained state-centered and identifies the state as the organization most threatened by environmental degradation and the principal agent in charge of ecological risks (Homer-Dixon, 2010; Kahl, 2006; Salehyan and Hendrix, 2014). The literature on ES also maintains this state-centered approach by framing such challenges as issues of high politics. Thus, the state's ability to manage environmental changes becomes the key question. Although there is a growing body of literature about cities, NGOs, international firms, and even customary institutions in Africa's climate action and mitigation efforts, a state-centric focus in broader environmental governance scholarship exists alongside. The non-state perspectives make up a limited portion of the total literature. Thus, this chapter moves beyond the conventional state-focused perspective to analyze how NSAs influence environmental governance systems in areas with disputed state authority.

State actors have inevitably linked ES practices and narratives to territorial and national security doctrines, thereby subsuming environmental risks within traditional state threats (Mason & Zeitoun, 2013, 294). According to this approach, the state only performs functions that NSAs cannot always perform. Several key factors explain this emphasis. For example, the state has historically controlled natural resources, defined resource management and utilization rules, and dealt with the most critical environmental problems (e.g., water issues, waste disposal, and air pollution). Furthermore, the state can enforce

such efforts by forming environmental policies and running essential systems (e.g., water sharing between upstream and downstream regions or countries).

Both Homer-Dixon and Colin Kahl made state-centric arguments in the 1990s and 2006 concerning the link between environmental change and conflict in developing countries. They argue that state weakness, elite dynamics, and societal fragility are key. Homer-Dixon asserts that renewable resource scarcity reduces agricultural and economic production, triggers migration, and erodes state capacity, resulting in social fragmentation and deprivation-induced conflicts such as rural insurgencies and ethnic conflicts. He also shows how scarcity increases the demand on state institutions, encourages elite predation, and creates what he calls “social friction” through the unequal distribution of resources, such friction, in turn, worsens inequality, undermines legitimacy, and fosters conditions that lead to instability (Homer-Dixon, T., 2010, 1778; Kahl, C. 2006; Homer-Dixon, T. and Blitt, 1998, 8; Barnett, 2003, 4).

Kahl identifies two pathways for environmental shocks and demographic stress to erode state capacity, cohesion, and legitimacy, opening the door to violence. The first is state failure, as in the Philippines and Somalia, and state exploitation, as in Rwanda and Kenya. Second are what Kahl calls “groupness” (i.e., societal fragmentation into subnational segments across ethnic lines) and institutional inclusiveness, essential moderating variables that help predict whether environmental change results in conflict. He also stresses the importance of strong state institutions and sound policies in mitigating environmental stress and preventing violence (Kahl, 2006, 209, 237).

Mathews, Myers, and Levy also adopt the state-centric approach to ES in their examinations of the importance of ES to U.S. national interests. Mathews claims that environmental degradation erodes state sovereignty, diminishes security, and undermines economic stability through competition over shared resources in state conflicts (Myers 1989, 23-24). Myers, who notes the economic and political consequences of environmental degradation in developing countries and the implications of these consequences for the U.S., also mentions trends in rapid environmental change

and growing ecological interdependence and suggests the need to incorporate environmental concerns into security planning (Mathews, 1989, 166). Likewise, Levy notes that many environmental stresses present serious and imminent risks to U.S. national security when they manifest as death, harm to public welfare, or threats to core national values. He points out that environmental degradation affects not only a state's citizens but also the state's capacity to deal effectively with crises (Levy, 1995, 39).

Busby (2022) further strengthens the state-centric approach by examining how state capacity, political inclusiveness, and even distribution of international assistance affect climate security management. He argues that strong state capacity enables effective policy implementation and disaster response. At the same time, an inclusive political institution ensures the equitable access of all ethnic groups and communities to state and international mitigation and adaptation actions. He claims that international support enhances the capacity of a state to deal with crises. Busby uses case studies of droughts, famines, and cyclones in sub-Saharan Africa, the Middle East, and South Asia to show that the countries with better state institutions (e.g., India and Ethiopia) fare better than those with weak states (e.g., Somalia).

Busby further discusses that the probability of an environmental emergency causing conflict depends on how well a country is prepared and responds to such emergencies. When communities are the first responders, ideally, the state supports them in maintaining social stability and delivering essential services. Nonetheless, he concludes that although NSAs may be necessary for "partially filling gaps and building up local coping capacities where a state presence is limited or absent, especially when combined with international assistance… climate hazards may be so severe that civil society organizations may be unable to address them effectively" (Busby, 2022, 40). Unfortunately, this body of literature consistently fails to consider how everyday choices to engage competing NSAs in environmental governance can either facilitate or hinder competition and cooperation between state and social and customary institutions (Lust, 2022). Its utility within the present chapter is, therefore, limited.

4.3. Social Institutions and Environmental Governance

NSAs are a part of the environmental governance structure in post-conflict and developing societies. This is especially so for countries such as Iraq, where many arenas of authority contend for power and legitimacy. In Iraq, for example, some NSAs have weaponized environmental resources, including water and its facilities (Daoudy, 2020). As James Scot (2017) observes, when state institutions are ineffective but a strong society has been developed, people have no choice but to seek governance from religious leaders, clans, ethnic groups, tribal leaders, warlords, criminal groups, terrorist groups, and others. Below is a review of some critical works that illustrate the possibility of environmental governance by NSAs without state presence (Zoellick, 2008).

Elinor Ostrom (1990) explores how people agree and cooperate in managing a 'community pool of resources' without the state. Her study establishes that, over time, farmers, fishing communities, and other groups can create fair and sustainable systems to govern CPR. Specifically, people can cooperate without the government if they share close trust with their neighbors and know they will have reliably the same interactions with them; thus, they gradually develop a local governance structure that can independently sustain cooperative resource management. Ostrom claims that people can come up with their own environmental policies at the local level, including resource protection and sustainable use, without state participation.

However, a key problem with governing CPR is that "a rational individual determines that he will still have access to the resources even if he does not fully contribute to its maintenance—a free rider problem" (Ostrom, E., 1990, 413). Ostrom recommends including centralized governmental regulation or CPR privatization to address this issue but believes the ideal solution is "the design of durable cooperative institutions that are organized and governed by the resource users (local communities) [because] resource scarcity means that the users will have strong incentives to manage their resources sustainably" (ibid., 415).

Ostrom states that the state's most significant role of government in environmental governance is its ability to regulate environmental security access and impose rules and regulations on how to use them (Ostrom, E., 1990, 117). In the case of groundwater depletion in the Los Angeles metropolitan area, she points out that negotiations are often held "in the shadow of the law" and that the state imposes a "public-interest default penalty" based on contract law (Mansbridge, J. 2014, 10). This top-down pressure provides a strong incentive for local parties to reach a negotiation compromise.

The polycentric model developed by Ostrom relies on the fact that some levels exist above the local level. The higher levels have the power to impose alternative solutions, provide neutral information, support local negotiations, and discipline non-compliance (Mansbridge, 2014, 9); environmental governance can, therefore, emerge locally rather than being imposed by the government. This conclusion must be reached because it lends credence to the notion that environmental governance is not only a process that is carried out from the top down but that it can also be carried out from the bottom up in smaller communities, such as villages or tribes, without the interference of the state.

J. Scott, an anthropologist, sees states as a "largely unmitigated disaster" (Fukuyama, F., 2020, 281) because the government introduces policies and decisions that worsen the environment and ecology. Village residents are thereby compelled to leave to escape governmental intervention in their environmental affairs and because they believe they can manage their environment better than the government can. In such situations, only the "state's coercive capacity [keeps] inhabitants in line" (Scott, 2017; Kull, 2019).

According to Scott, the processes of the agrarian revolution and the rise of early states were neither smooth nor linear. Instead, contrary to common assumptions about state-driven agricultural societies, some versions of irrigation systems and harvesting tools were used by communities well before the formation of states (Richter, 2019, 459). Like Ostrom, Scott acknowledges that people think they know how to use the water and land they own better than the state. In other words, environmental governance is not only the domain of the state but is also possible and practiced at local and community levels.

Joel S. Migdal (1988) focuses on the state–society relationship and the capacity of the state to penetrate society, regulate social relations, and mobilize resources. He counters the notion that the state exercises uniform authority in governance by explaining a contradictory process: on the one hand, states confront entrenched social structures, but on the other, societies resist state attempts in ways that make policy implementation difficult. Consequently, states must turn to local authorities (e.g., tribal leaders, mukhtars [neighborhood leaders], and sheikhs) who, unlike bureaucrats in the capital, exercise real decision-making power at the local level. Migdal further notes that the state usually competes with or is even replaced by powerful social structures such as tribes, religious bodies, militias, and local elites.

According to Migdal, state leaders are always in a contest with local "strongmen"—chiefs, landlords, and wealthy peasants—who exercise substantial social control (1988, 101). Because their authority is societally rooted, it limits the state's ability to centralize power, even if such power would be relatively weak or moderate. He attributes the origin of strongmen to the historical expansion process of the world's first European economies. Also, he refers to the colonial encouragement of power development among local elites, which diverted authority to institutions other than the state. For example, in Sierra Leone, the British decision to rule through local notables created a strong society that could control its state thereafter (Migdal, 1988, 5-9; Owen, 2013). In Chapter Five, I will discuss the implications of this framework for land confiscation policies in Iraq.

Although Migdal does not explicitly address environmental governance, his theory proves helpful in analyzing this domain. First, his framework can be used to evaluate the process of environmental governance as strong social institutions such as tribes, religious organizations, militias, and local elites compete with the state to control critical sectors (e.g. water, land, forests, and other natural resources). This competition results in control and regulation by NSAs, singly or in combination, of the use of resources without state participation. Second, his concept of fragmentation of social control also identifies how different actors may enforce different rules within the same area (Migdal, 1988, 40). Customary and informal environmental regulations, such as tribal water sharing or

religious rulings on land use, often challenge or override weak state laws. Third, his observation that weak states cannot control the extent of their territory and, therefore, cannot enforce environmental policies, particularly in peripheral or contested areas where local actors are more influential or affiliated with other governments, also acknowledges that strong social institutions step in to fill the governance vacuum in such cases. They do so by arbitrating land and water disputes, enforcing traditional environmental norms, and engaging communities in combating the impacts of environmental stress. In these ways, local people emerge as the principal environmental governors without a strong state (Migdal, 1988, 28, 40, 208).

The arguments of Ostrom, Scott, and Migdal closely serve the argument of this study that environmental governance can exist without the state. As described, Ostrom successfully argues that local communities can develop their own fair and enduring mechanisms for governing common-pool environmental resources. She establishes that when local communities have sufficient trust and repeated interactions and develop unique rules, the state is not necessarily required to govern resources. Instead, village councils, tribes, and/or farming cooperatives can do so independently. Scott expands on this view by pointing out that people may dislike being governed by the state because such situations often result in environmental degradation and/or the subversion of local power.

Scott's work informs us that although NSAs may govern environmental resources, they do so cautiously because they perceive the state as an inherently destabilizing force. For example, in Iraq, tribes or local leaders might either visibly contest or cooperate with environmental regulations announced by the government to sustain traditional resource management practices. Migdal extends this analysis by situating environmental governance in weak states' contest for authority between government and social institutions. He argues that when state capacity is low—something that applies to many parts of Iraq—other social actors (in Iraq, these might be tribal sheikhs, religious leaders, and/or armed groups) will assume environmental governance. His concept of fragmented social control effectively explains how NSAs ensure that their ecological norms and governance mechanisms are followed (Migdal, 1988, 40).

Together, these three scholars' different perspectives supply a coherent framework for analyzing how environmental governance in Iraq is influenced by weak state institutions and powerful societal and social institutions (e.g., localized NSAs) that exercise governance over environmental resources, negotiate authority, and resolve environmental conflicts within the community. Yet, specific questions remain: does Kirkuk illustrate local environmental governance by NSAs, or does it indicate a distinct pattern of governance in which state engagement in ES is predominant? Do reactions to environmental changes in Kirkuk suggest ethnic groups favor community-based environmental governance through NSAs, or do they prefer the state (GoI and KRG) to assume responsibility for environmental governance?

Lust (2022) illuminates how different spheres of authority interact in people's everyday choices and decisions in ways that enrich our knowledge of how environmental issues are dealt with in deeply divided societies where ethnic groups must face climate change. According to Lust, the state is not always the main or even the only source of authority that determines how people, service providers, and state officials handle politics and development. Instead, people do not always resort to state authorities for solutions to education, jobs, and disputes. State-centric approaches focus on government policies, formal institutions, and official structures but do not account for how individuals and communities deal with issues such as water scarcity, drought, or land expropriation through social institutions. Yet these everyday decisions directly shape environmental governance and the dynamics of NSAs' cooperation or conflict. Thus, it is important to consider how these everyday decisions directly shape environmental governance and the dynamics of NSAs' cooperation or conflict beyond state-centric approaches.

The rest of this chapter focuses on the role of NSAs, which has either been underemphasized or poorly explored in environmental governance literature. These informal authorities are pivotal in determining responses to environmental changes, especially in regions where state capacity is weak or contested by strong societies. In its consideration of the role and influence of NSAs in environmental governance in Iraq, this dissertation also considers the significance of community-level dynamics of

environmental governance in areas with multiple arenas of authority, such as northern Iraq, and attempts to offer an understanding of how communities navigate environmental stress beyond the state-centric paradigm. It also tries to illustrate how divided ethnic groups perceive NSA actors in environmental stress and whether local people turn to NSAs or state authorities to address their everyday environmental needs.

4.4. Non-State Actors in Environmental Governance

The 22nd Conference of the UNFCCC was held in Marrakesh in November 2016. The conference theme, “Together Now,” addressed the need for unity between states and NSAs to move toward a carbon transition society (Murigi, 2017, 36). Environmental NGOs, activists, international government organizations (IGOs), city and municipal networks, regional governments, oil companies, consulting and legal firms, carbon brokers, indigenous communities, trade unions, women's groups, youth organizations, and religious communities are all considered to be member states of the UNFCCC. As these actors step forward to engage with environmental concerns, they are resorting to collective mobilization more often (Bäckstrand et al., 2017, 564; Buthe, 2004, 281; Sadouni, 2022, 8; Hale, 2018, 3; Cia Alves et al., 2022, 122).

Because governance is not limited to the state and its institutions, it does not make all or even most of the everyday choices that determine politics and development (Lust, 2022, 9). Instead, governance is located on a spectrum that includes state-focused models, non-state approaches, and hybrid forms that combine both (Cole, 2011, 396). This model of coexistence between state and non-state governance is also known as co-governance or polycentric governance. The study of environmental governance usually subsumes NSAs under more general concepts such as experimental governance, networked governance, or transnational governance, depending on the roles of various actors, although individual studies usually focus on external or transboundary aspects rather than internal, local dimensions (Hoffmann, 2011; Stevenson and Dryzek, 2014; Bulkeley, 2014; Dietzel, 2022, 9).

Polycentric governance recognizes the roles of all stakeholders and balances top-down and bottom-up approaches. It also acknowledges the supportive roles of social institutions, private sectors, and community-based organizations in national and global governance structures, producing innovative and efficient solutions to challenges facing a particular society. In the context of environmental governance, this model is multiscalar, meaning that it involves a variety of actors and processes at the local, regional, national, and global levels (e.g., cities, provinces, states, firms, local government networks, national governments, and international regimes). Thus, this interconnected framework can effectively address a wide range of environmental issues through the coordination of actions across numerous scales (Cole, 2015, 114; Aligica and Tarko, 2012, 244-247; McGinnis, 2016, 6; Mansbridge, 2014, 10; Abbott, 2012, 586; V. Ostrom, Tiebout, and Warren, 1961; Jordan et al., 2018, 5).

NSAs demonstrate their importance in environmental governance by developing innovative strategies and corporate models that help reduce emissions and enhance climate change resilience. Knowledge exchange and capacity building are critical in scaling these innovations and ensuring they are adopted worldwide. Within the functions of global environmental governance, NSAs have been identified as shapers of information and ideas, brokers of knowledge, norms, and initiatives, implementers of policies, and influencers of behavior. Most non-state climate actions focus on mitigating greenhouse gases to assist countries in meeting and implementing their nationally determined contributions (NDCs). However, others are focused on adaptation and resilience. NSAs are involved in enabling both types of tasks by providing finances, facilitating information exchanges, and enhancing technical capacities (Bäckstrand et al., 2017, 564; Buthe, 2004, 281; Sadouni, 2022, 8; Hale, 2018, 3; Cia Alves et al., 2022, 122). Krasner and Risse affirm that NSAs can play active roles in environmental governance, especially in “areas of limited statehood,” areas in which the state’s material or institutional capacity is weak, meaning that the state cannot control or direct most of the activities within its borders (2014, 197). In such cases, NSAs are either involved in state-building processes or take over the provision of public services (Krasner & Risse, 2014, 546; Hale, 2018) to

address governance deficits and perform the essential tasks traditionally attributed to the state.

The NSAs in Iraq have been a part of the state-building process by providing security and basic services to communities for decades (Owen, R. 2013). Consequently, sheikhs, tribal leaders, militia groups, clerics, religious institutions, and so on are likely to play multiple roles in different arenas of authority because of their multiple identities (Lust, 2022). Many of these actors simultaneously hold different responsibilities. For instance, a sheikh could be a local council member, a party leadership member, and a militia leader. Such multiple functions and system interactions are especially evident in northern Iraq, and their complexity highlights the difficulty of identifying institutions and their roles as they cross each other in the governance structure.

In the second chapter, we found that communities of different ethnicities facing environmental stress in northern Iraq tend to be less cohesive, mainly because the two sampled ethnic groups perceive ES differently. Kurds seem to be less concerned about environmental issues such as water scarcity and drought. At the same time, Arabs are more concerned with these issues and agree that environmental change increases ethnic conflict. One interpretation of this division is that political beliefs shape how these ethnic groups understand ES. In other words, because people view ES through a nationalist lens, they do not see it as a purely environmental issue. Based on this result, this chapter suggests that their differing perceptions of ES lead competing ethnic groups to make conflicting choices among the various arenas of authority available to them to address environmental stress. Therefore, the following hypotheses are proposed in this chapter:

H. 5. When ethnic groups perceive ES differently, then they will likely turn to different authorities for environmental governance.

H. 6. If Kurds and Arabs have contrasting preferences for governing the status of Kirkuk, then they favor opposing authorities to deal with their environmental security.

To test these hypotheses, the author analyzes the Kirkuk survey data to explore how two distinct ethnic groups see the national status of Kirkuk (i.e. whether they identify it as part of the GoI or the KRG) and what governance structure they prefer. If the sampled ethnic groups share the same preference for governing Kirkuk, whether by the GoI in Baghdad, the KRG, or a joint administration, H. 5 is supported. In that case, the author would expect Kurds and Arabs to turn to different authorities to address issues such as water scarcity, competition over arable land, and agricultural and irrigation challenges.

Next, to test H. 6, the author will identify the authorities that each ethnic group in Kirkuk turns to for ES. By comparing the choices made by Kurds and Arabs, the author can determine whether one group relies on a particular type of authority while the other turns to an opposing authority. If the findings show a significant relationship between ethnicity, perceptions of Kirkuk's status based on nationalist perspectives, and the choice of authority, both hypotheses will be supported. However, if the data show that both ethnic groups have identical preferences for Kirkuk's status and depend on the same authorities to address environmental problems despite different understandings of environmental stress, they will be disproved.

4.5. Insights from the Field: A Data-Driven Discussion

This section discusses data collected from a survey conducted in Kirkuk and its districts in 2023. The survey asked participants which authorities they turn to govern their environmental stress (i.e., drought, water scarcity, and agricultural and irrigation issues). The respondents were also polled on their preferences for governing the status of Kirkuk and whether they want the city to be governed by the GoI, the KRG, or a joint administration. For the questions on environmental change, participants were offered several alternatives, including the GoI and the KRG as two state actors, politicians (political parties and their leaders), parliamentarians, traditional leaders (tribesmen, sheikhs, and clerics), militias, and even their own families as a form of NSAs. The survey provides a unique opportunity to understand the choices and expectations of individuals as they interact with multiple authorities through the lenses of their ethnic affiliations.

Table 4.1 below shows the variation in the choices that ethnic groups make to tackle environmental stress in their day-to-day lives by seeking support from various states and NSAs.

Table 4.1. Ethnic Choice among Multiple 'Arenas of Authority' in Kirkuk to Address Disputes over Agricultural Lands and Irrigations Issues.

	Combined		***Arabic-speakers***		***Kurdish-Speakers***		***T-test Positive at 95% Level***
Arenas of Authority	Sum	Mean	Sum	Mean	Sum	Mean	
GoI	287	47%	245	77%	42	15%	Y
KRG	107	18%	13	4%	94	33%	Y
Politicians	320	53%	112	35%	208	72%	Y
Traditional Leaders	47	8%	31	10%	16	6%	N
Militias	8	1%	2	1%	6	2%	N
Family	37	6%	20	6%	17	6%	N
TOTAL	806	132%	423	132%	383	133%	
Avg. Number of Selections	1.32						
Max. Number of Selections	3						

(Multi-code answers, see Q. 16 in appendix)

Table 4.1 shows the preferences of Kurdish and Arab groups in Kirkuk in resolving disputes over agricultural land and irrigation issues and the choices made among the

different authorities. Three key actors are the most favored; the only one is an NSA, namely, politicians. These competing authorities are considered the most responsible and likely to address agricultural land disputes between ethnic communities.

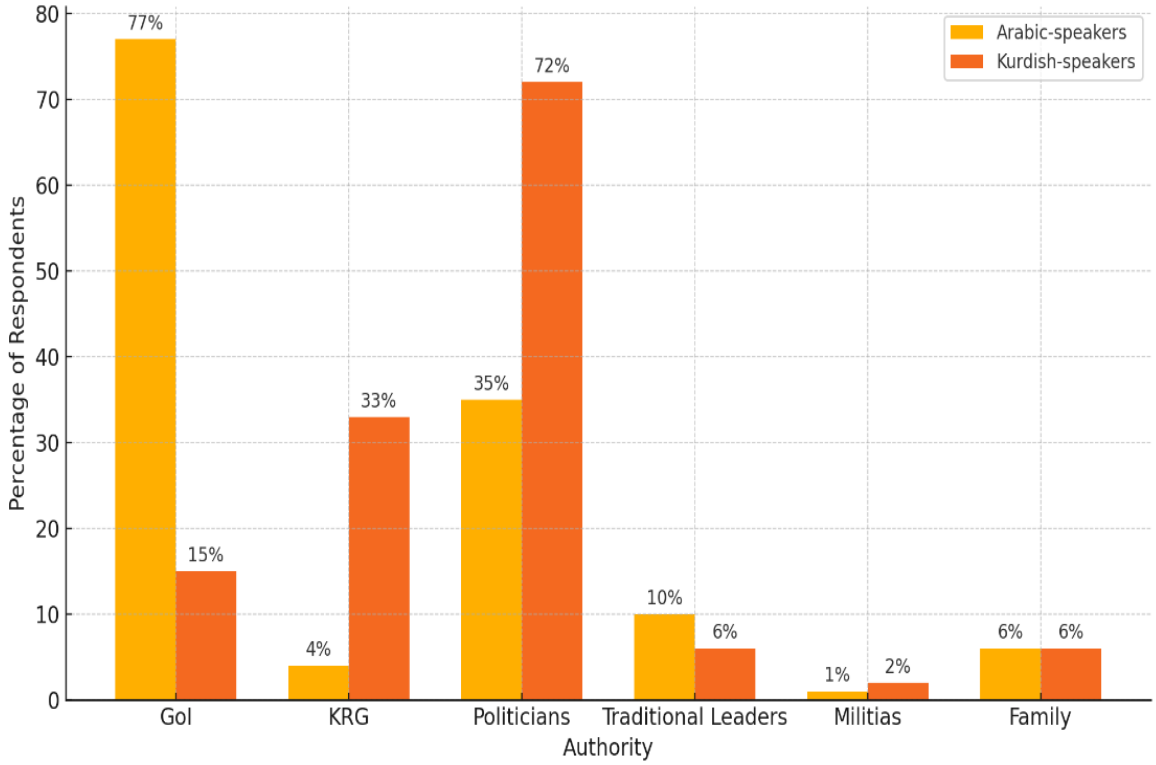
More specifically, 47 percent of participants rely on the GoI, 18 percent on the KRG, and 53 percent on politicians. Notably, only 8 percent of respondents believe traditional authorities, such as tribal leaders and sheikhs, should handle their environmental issues, while NSAs, like militias, are generally not regarded as viable options for addressing environmental changes, including disputes over arable lands. This indicates that vulnerable communities prefer the state and its institutions to govern environmental stress rather than NSAs.

The two ethnic groups have different preferences regarding the official authorities of the state institution. The federal government is the preferred form of administration for Arabic speakers, whereas regional institutions and political individuals are more popular among Kurdish speakers. The data shows a clear relationship between preferences for authority, ethnic identity, and political beliefs. Arabs, at 77 percent, predominantly prefer the GoI for addressing agricultural disputes, compared to 15 percent of Kurds. By contrast, 33 percent of Kurds prefer the KRG, 72 percent perceive politicians as the most responsible authority for these issues, whereas only 4 percent of Arabs opt for the KRG. While this finding is not surprising, as Kurds have lost influence in Kirkuk since 2017, it remains important to understand how communities govern environmental security and which ‘arenas of authority’ they might turn to for help.

As for traditional authorities, more Arabs (10 percent) than Kurds (6 percent) are likely to seek tribal leaders and sheikhs. The differences observed reach statistical significance at the 95 percent confidence level, indicating fundamental ethnic and political differences in state institutions' perceptions. The two groups maintain comparable minimal trust in traditional leaders, militias, and family members to resolve disputes, but they prefer to use formal institutions that differ between them. The research demonstrates that ethnic identity powerfully influences how people view authority and legitimacy in environmental

governance, especially regarding agricultural and irrigation issues. The following figure clearly illustrates the divisions between the ethnic groups.

Figure 4.1. Ethnic Perception on Role of 'Arenas of Authority' in Agriculture and Irrigation Issues in Kirkuk.



The finding also shows different perceptions of legitimacy and access to authority structures based on ethno-political affiliations. It illustrates that ethnopolitical dynamics are key in determining people's perceptions of authority and governance in vulnerable ethnic communities in Kirkuk about agricultural disputes.

These findings have important implications for the state-centric literature in the ES literature, as the findings perceive state authority as the most trusted arena of authority in governing agricultural and irrigation issues (the GoI versus the KRG). However, the findings still complicate state-centric arguments because the desire for plural state preferences suggests that the state is not a monolithic actor. Instead, its environmental

authority is divided along political and ethnic lines. Furthermore, the weak endorsement of NSAs is due to the lack of reliance on customary leaders and militias. Thus, despite the hybrid nature of environmental governance, the role of NSAs is limited in addressing the everyday environmental needs of communities in Iraq. This strengthens the state-centric lens; however, it still raises questions about the influence and accessibility of state structure, as a reasonable percentage of people rely on politicians, especially the Kurdish participants.

The findings partially support the first hypothesis (H. 5), which states that different ethnic groups' perceptions of ES lead to selecting various NSAs for environmental governance. Chapter Two showed how ethnic groups in Iraq develop distinct ES perspectives. The finding in this chapter indicates that different authorities receive support from Arabic speakers who focus on the GoI. In contrast, Kurdish speakers direct their needs to the KRG and political leaders. However, this divergence does not extend to NSAs. The two groups show equivalent minimal dependence on traditional leaders, militias, and family members to address agricultural land and irrigation problems. The first condition of the hypothesis holds true, but the hypothesis's assumption about different ES perceptions resulting in different NSA engagements does not receive support. The environmental governance role of NSAs appears restricted in Iraq because state-affiliated institutions maintain control of authority despite their fragmented nature.

Table 4.2 below presents data on ethnic groups in Kirkuk's perceptions of their preferred arenas of authority to address climate change issues (e.g., water shortages and drought). This analysis reveals how communities navigate the importance of authorities to govern environmental stress affecting their livelihoods and the region's stability.

Table 4.2. Ethnic Choice Among Multiple 'Arenas of Authority' in Kirkuk to Address Water Scarcity and Irrigation Challenges.

	Combined		***Arabic-speakers***		***Kurdish-Speakers***		***T-test Positive at 95% Level***
Arenas of Authority	Sum	Mean	Sum	Mean	Sum	Mean	
GoI	287	47%	245	77%	42	15%	Y
KRG	90	15%	11	3%	79	27%	Y
Politicians	321	53%	106	33%	215	74%	Y
Traditional Leaders	49	8%	40	13%	9	3%	Y
Militias	5	1%	1	0%	4	1%	N
Family	12	2%	10	3%	2	1%	Y
TOTAL	764	126%	413	129%	351	122%	
Avg. Number of Selections	1.25						
Max. Number of Selections	3						

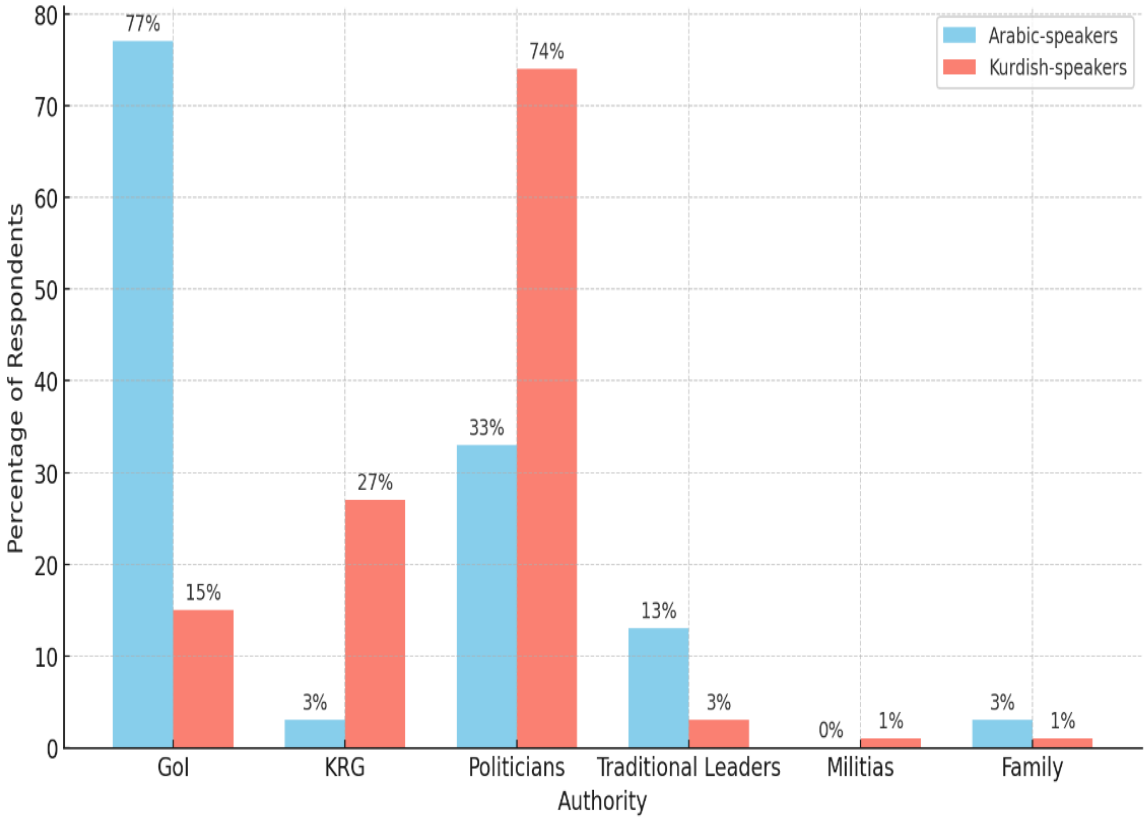
(See Q. 18 in the appendix)

The data clearly show that ethnic groups in Kirkuk have different opinions on who should best handle water scarcity and drought (see below for comparison by ethnicity). Forty-seven percent of respondents preferred the GoI, and 15 percent opted for the KRG. Politicians were seen by 53 percent as the most active authority. However, 8 percent thought traditional authorities, such as tribal leaders and sheikhs could help solve these problems. Militias were not considered a viable option for addressing environmental stress.

Regarding their choices for navigating the environmental stress in their area, demographic analysis reveals a clear difference between Kurds and Arabs: 77 percent of

Arabs thought the GoI is responsible for tackling water shortages compared to only 15 percent of Kurds, but 27 percent of Kurds thought the KRG is the proper authority to deal with such problems. Both groups largely dismissed militias; however, notable differences emerged in their perceptions of traditional authorities. More Arabs (13 percent) than Kurds (3 percent) viewed tribal leaders and sheikhs as effective in addressing environmental stress. These findings suggest cultural and social factors, including customary institutions and actors, will likely shape ethnic groups' NSA governance preferences. The findings indicate that the differences observed are statistically significant at the 95 percent confidence level. Other actors, including militias and family members, exhibit minimal influence, with only slight or statistically insignificant variations between the two groups. The following figure illustrates the distinct perceptions of ethnic groups on the role of NSAs in climate change governance.

Figure 4.2. Ethnic Perception on the Role of 'Arenas of Authority' in Environmental Governance in Kirkuk.



The findings indicate that ethnic identity influences the perception of ES and the selection of authorities deemed legitimate or effective in governing water scarcity and drought. This underscores the influence of political identity and ethno-regional loyalty on environmental governance preferences in contested areas such as Kirkuk, presumably driven by limited Kurdish representation at a GoI level in Kirkuk, primarily until 2024. H. 6 is, again, partially supported by the findings. According to the data, people's perceptions of EG and the authorities they choose to approach are influenced by their ethnic identity. The more significant difference is which hybrid authorities, such as politicians or state institutions, ethnic groups depend on, and overall interaction with clearly defined NSAs is still restricted.

When the results of the above findings are compared with the perceptions of Kurds and Arabs about the governance status of Kirkuk, a clear preference emerges for the GoI in Baghdad to manage these issues. Fifty-three percent of the respondents favored the GoI, while almost 33 percent opted for the KRG. When the data is broken down demographically, it reveals clear ethnic divisions. Only 5 percent of Arabs disagreed that the GoI should govern Kirkuk and its security, while 64 percent of Kurds agreed that the KRG should.

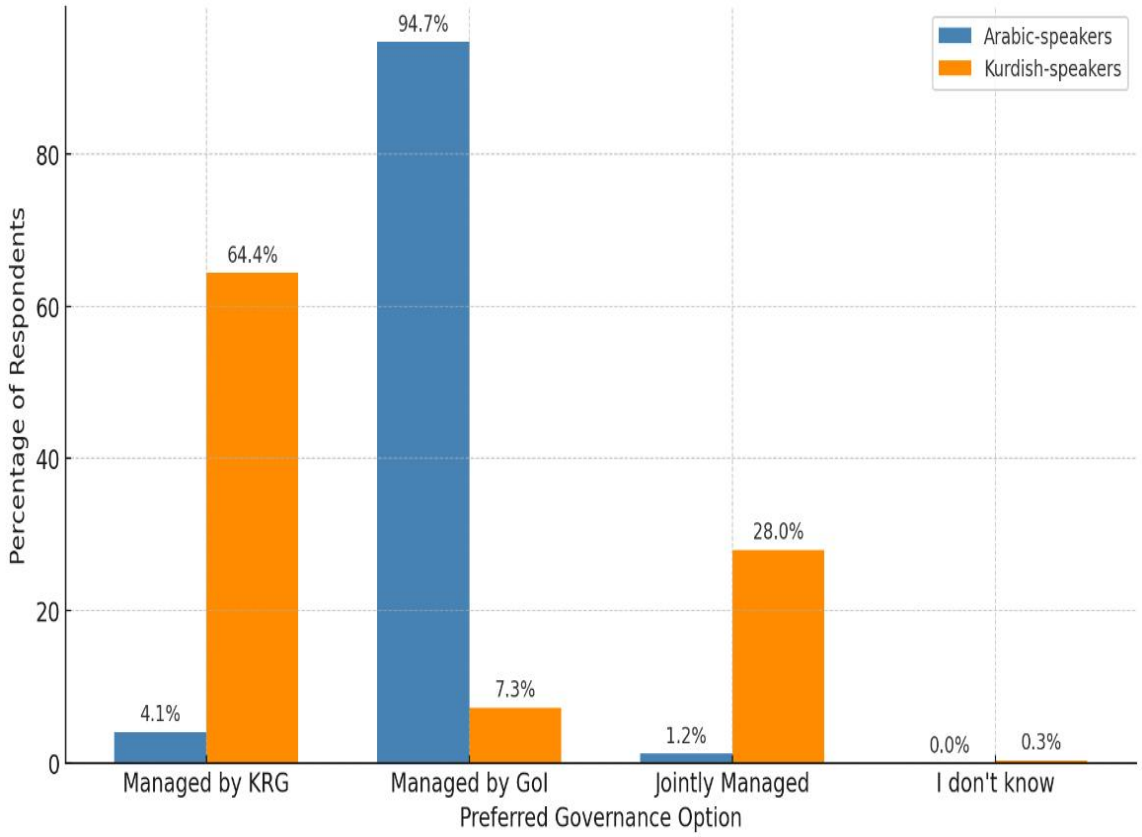
These results not only reveal the ethnic difference in the perception of who should govern Kirkuk but also capture a nationalist sentiment because ethnic and national identity among respondents determines their preference for political authority and territorial control in Kirkuk. Most Arab participants selected the GoI, which reflects a strong sense of Iraqi Arab nationalism (i.e., the Arab respondents perceive Kirkuk as an integral part of the Iraqi state); therefore, they support governance by the central authority in Baghdad. By contrast, Kurdish participants' selection of the KRG aligns with their Kurdish nationalist aspirations and perceptions of Kirkuk as part of Kurdistan on historical and cultural grounds. Results for Q. 11 (see the appendix), which asked who respondents think should govern Kirkuk's status, are presented in Table 4.3 below.

Table 4.3. Ethnic Perception on the Status of Kirkuk.

Options	*Combined %*	*Arabic-Speakers %*	*Kurdish-Speakers %*	*T-Test Positive (95% Level)*
Managed by KRG	32.68	4.06	64.36	Y
Managed by GoI	53.20	94.	7.27	Y
Jointly Managed	13.96	1.25	28.03	Y
I don't know	0.16	-	0.35	N

Analysis of ethnic perceptions of how to meet everyday environmental needs in Kirkuk reveals a link between environmental preferences and nationalist perspectives on governance. Most respondents prefer the GoI to deal with issues about agricultural and irrigation problems, water shortage, and drought (see Table 4.2): 47 percent of participants chose this option, whereas approximately 20 percent chose the KRG. Nearly 80 percent of Arabs chose the GoI in Q. 16 and Q. 18, and 95 percent of Arabs chose the GoI in Q. 11; all three questions asked about which entity should be responsible for addressing Kirkuk's environmental stress and national status. The following figure illustrates the ethnic perception of Kirkuk's governance status.

Figure 4.3. Ethnic Perception on the Status of Kirkuk



These results indicate that Arab participants who prefer Baghdad to govern Kirkuk also tend to consider the GoI as the authority that should address the city's ES. Similarly, Kurdish participants who endorse the KRG's governance of Kirkuk also advocate for the KRG to handle environmental stress in the region. These beliefs are less pronounced compared to the Arab participant's responses; however, as Kurds are more inclined to turn to other NSAs (e.g., politicians) than the KRG to address water scarcity, irrigation, and agricultural challenges, this is likely due to lack of ethnic representation at a governorate/state level.

The variances in responses between the two ethnic groups show that nationalist narratives shape their views on governance. Furthermore, by linking this finding (which shows significant relationships among ethnic identity, preferences on the status and governance of Kirkuk, and preferred arenas of authority for environmental governance), it can be argued that the choice of ethnic groups for a particular arena of authority is

based on that group's perception that such authority is more likely to respond effectively to its environmental demands and more capable of governing its ES. In other words, ES in the area is a definite part of the larger ethnic politics of governance in Kirkuk. The perceptual dichotomy revealed by the survey responses is not only about who has the power to govern the region and who is perceived to have this power but also about which communities can effectively manage and gain access to limited environmental resources and how they prefer to do so. In this way, we see a straightforward integration of identity politics and environmental governance.

Another significant finding from the data is that ethnic groups in Kirkuk prefer state involvement in their everyday environmental governance over-reliance on NSAs. This preference circles back to a question raised in chapter two on state-centric discussion: Does Kirkuk's environmental stress manifest a preference for community-based environmental governance, or do communities favor state involvement in addressing everyday environmental needs? The findings indicate that, despite widespread distrust of state institutions, the prevailing perception in Kirkuk is that only the state (whether that means GoI or KRG) possesses the legitimacy and/or capability to tackle environmental stress. The communities in Kirkuk show less interest in self-governing environmental resources; their preference for state-led solutions indicates a continuing dependence on formal institutional interventions for environmental governance. This result also challenges the assumption that non-state environmental governance emerges in a strong society and an absent or weak state presence. The following sections interrogate why ethnic groups engage with competing state and non-state authorities to address ES issues.

4.6. Survey Findings Mean in the Context of Environmental Governance

As discussed above, data derived from the study questionnaire indicate that ethnic groups in Kirkuk make everyday choices among various arenas of authority, that their dominant preference is for state involvement to achieve ES, and that this preference is linked to

nationalist perspectives. Kurds in Kirkuk adopt a nationalist perspective, which leads them to see environmental stress as a problem that needs help from both state authorities and NSAs, including the KRG and politicians. The Arabs of Kirkuk mainly work with the GoI on environmental governance because they see these matters as the GoI's responsibility and seek help from politicians and customary leaders. Notably, neither ethnic group considers militias suitable for addressing water scarcity, drought, and agricultural and irrigation issues. In the following sections, the author investigates several explanations for these ethnic groups' decisions as they navigate several different arenas of authority to meet their environmental needs.

4.6.1. Historical Arab Rule in Kirkuk

As shown above, the Arab community in Kirkuk prefers the federal government in Baghdad to take the lead in matters of ES. This preference is based on their nationalistic and historical/political values and beliefs because Arabs, both as a government and as a community, have controlled and ruled the city except from 2014 to 2017. Kirkuk has been considered an Arab region so emphatically by successive Iraqi governments and Arab political parties that some moderate Arabs call it a "mini-Iraq." This perspective has profoundly shaped the identity of Kirkuk's Arabs, who see themselves as the city's rightful guardians. They hold a nationalistic and Iraqi-centric view of ES, which emphasizes the need for a central authority to address water issues, drought, and agricultural challenges (Hamdani, 2023; Al-Bayati, 2023; Al-Taghier, 2024; Alforatnews, 2024). Therefore, it should not be surprising that Kirkuk's Arab community prefers the Iraqi government to handle ES.

The Iraqi central government's ongoing control of Kirkuk has enabled the Arab community to benefit from a historical concentration of wealth and power. State institutions have continued to serve the interests of this structure, which has maintained its commitment since its establishment. Successive Iraqi governments have conducted demographic changes in Kirkuk to remove non-Arab ethnic groups, mainly from the urban areas, while building up the Arab population's position and strengthening claims over natural resource

control and fertile lands (Saeed, 2018, 8). As noted in previous chapters, the Ba'ath regime took agricultural lands from non-Arab farmers from the 1970s to the 1990s. It carried out genocide against rural civilians through its Anfal campaign, which lasted from 1980 to 1988 and caused severe ecological destruction in the northern areas. The destruction of 5,000 villages resulted in severe deterioration of the natural environment throughout Kurdish areas. The security-restricted zones established by the government forced Kurdish farmers to abandon their agricultural and rural occupations and livelihoods because large portions of these areas were designated as security-restricted zones. The resulting ecological destruction and community harm continue to affect the region (Ahram, 2023, 28).

Following the failure of the Kurdish independence referendum in 2017, Kurdish short rule (brought about by the governorate's liberation from Daesh occupation) ended in Kirkuk. Through its Ministry of Justice and Ministry of Agriculture, the federal government made the courts and agricultural office in the city restore hundreds of agricultural contracts from the Ba'ath era for Arab farmer settlers. These contracts allowed imported Arab farmers to work on farming lands and utilize water resources that the Kurdish and Turkmen farmers owned (a discussion of land confiscation and agricultural policy during the Ba'ath era appears in Chapter Five). However, following significant pressure from Kurdish parties in the Iraqi Parliament, the decision to renew these contracts was suspended in 2023 by order of Hadi al-Amiri, leader of the PMF Badr Organization and head of the implementation of Article 140 of the Iraqi Constitution in Kirkuk (K24, 2023; Rudaw, 2021).

Along with revoking the land ownership rights of non-Arab farmers, the Ba'ath regime barred them from receiving government agricultural programs and support. The effects of the former regime's policies are felt by non-Arab farmers to this day, as the lack of formal land ownership still limits them. Sirwan Jabar (2023), the Director of IT in the Qara Hanjir Agriculture Department, told the author that the district contains 45 villages spanning 33,000 acres of farmland but has only one small dam to support agriculture and livestock. Moreover, even if farmers from Kirkuk can grow wheat and grain, they cannot sell crops

to government silos during harvest season because their land titles have been revoked. H. Shawqi (2023), a Kurdish farmer in Qara Hanjir, told the author that the right of Arab farmers to sell wheat to government silos remains intact, however, even though they possess only agricultural contracts to use the lands. This situation enables some Arab farmers to access state institutions and privileges by purchasing wheat and other crops from non-Arab farmers at reduced prices. The Kurds and Turkmen farmers, due to past land appropriation policies, have lacked direct access to government-subsidized programs and faced bureaucratic and political exclusion, which forced them to sell their agricultural products informally and mostly at a lower price. The Arab farmers then use their political and bureaucratic advantages to resell these crops to government silos for higher profits, which creates substantial economic inequalities by enabling dominant ethnic groups to exploit bureaucratic barriers that disadvantage Kurdish and Turkmen farmers.

4.6.2. Water Disputes between KRG and Baghdad

Another explanation for the Arab community's preference for the GoI to handle environmental issues in Kirkuk is due to the disputes between the federal government and KRG. These revolve around federal budget sharing and sometimes on water resource management and dam construction projects. In the lead-up to the Kurdish referendum, and exacerbated by Iranian water pressure on Kurdistan, tensions between the KRG and GoI intensified. The KRG's Minister of Agriculture blocked the passage of food-supply trucks to southern Iraq and to reduce water levels (water governance is discussed in Chapter Six in detail) (Al-Salem, 2016). Similarly, in 2023, amid budget disputes between Erbil and Baghdad, an advisor to the KRG MoAWR, about the central government's refusal to transfer Kurdistan's share of the federal budget, tweeted: "If Baghdad does not comply, we will prevent water releases to the central and southern regions of Iraq" (InfoPlus, 2023).

These disputes have been escalated following 245 proposals for new dams in the KRG since 2014 (Save Tigris, 2020, 15; Francis, 2023; Al-Asadi, 2023)—projects that have

impacted water flow to areas under the control of the central government. In addition, Iran's water flow reductions from the Sirwan River and the Little Zab River have negatively affected the KRG's dams and electricity production. Threats have been made in response from the KRG to reduce water flow to central and southern Iraq if the Iraqi government fails to address the issue (Abdulrahman, 2020, 453).

This federal relations dynamic over environmental resource distribution influences the Arab community's perspective significantly more than the Kurdish communities. For the Kurds in Kirkuk, it is difficult to imagine that the KRG would intentionally reduce the water quota to Kirkuk as a pressure tactic. However, the Arab public perceives any corresponding rhetoric from the KRG as a threat and a challenge directed not only at the Iraqi government but also at Arab communities living outside the KRG. Consequently, the KRG's willingness to use water resources as a bargaining tool strengthens the Arab community's belief that Baghdad should handle environmental matters and protect its interests.

4.6.3. A Perceived Failure of KRG Governance in the Disputed Territories

The Arabs in Kirkuk and disputed areas faced unilateral Kurdish governance from 2014 to 2017, which they saw as discriminatory, party-centered, and influenced by partisan factions, and these approaches failed to gain support from these communities. The KRG's presence in Kirkuk was largely informal, and the two dominant Kurdish parties, the PUK and the KDP, monopolized the actual governance process. This division resulted in parallel institutions that included two security forces, two police systems, and two separate educational structures, which led to significant internal fragmentation. Arabs and Turkmen accused the security forces of engaging in questionable security practices, particularly leading up to the 2017 independence referendum. Therefore, Kirkuk's Arabs often view the city not as being governed by the KRG but rather as under the control of two armed parties, the PUK and KDP. This perception reinforces their belief that the Iraqi state institutions are the only institutions capable of effectively addressing environmental issues in Kirkuk.

Study results show that people in Kirkuk moderately address their concerns to politicians instead of KRG or GoI or political figures such as MPs, party leaders, and local officeholders instead of state institutions. Data show that turning to the KRG for environmental governance is not the first option for the Kurds of Kirkuk. Instead, most participants reported that they prefer to seek out politicians. The unresolved status of Kirkuk under the Iraqi constitution continues to be an essential barrier for the KRG to exercise formal authority in these areas. Thus, we may safely conclude that the main reason for this choice is the lack of the KRG's administrative and military presence in the disputed territories since 2017.

People in Kirkuk recognize that the KRG might fail to address their environmental needs. Additionally, Kurds in the city may sense a disconnect from the KRG due to the persistent intra-Kurdish conflicts between the PUK and the KDP. Their choice of politicians over the KRG or GoI is aligned with the broader pattern of personalized governance that emerges when people distrust bureaucratic procedures (usually due to institutions' exclusive nature and incompetence) and instead consider political actors more effective intermediaries. In Kirkuk, where state authority remains fragmented and ethnic divisions run deep, politicians act as brokers who leverage their connections to obtain resources, including land, water, and public services. This trend agrees with Lust's (2022) observation that the everyday choices of groups and individuals also reflect attachment and commitment to sub-identities and political alliances, as individuals turn to actors who share their communal affiliations and are perceived as more accountable to their needs. However, ethnic groups in Kirkuk also depend on informal networks and political mediation for governance because state institutions have been historically exclusive regardless of Arab, Kurdish, or Turkmen control.

According to Busby (2022), this exclusivity weakens state institutions' ability to prepare for and respond to climate change. It intensifies people's feelings of deprivation and marginalization, thereby allowing NSAs to function as service providers and governance entities.

The Kurdish agrarian community, villagers, and herders thus rely on political parties such as the PUK and KDP to meet their environmental needs. For example, in 2022, administrative officials from the Shwan and Altun Kupri (in Kurdish: Prde) districts went to the PUK Political Bureau. They asked to execute electricity projects in their villages, enabling constant irrigation pumping. In response, the head of the political bureau in Kirkuk met with the district mayors and extended the electricity supply to their villages. PUK officials similarly supervised the construction of roads and the provision of water and sewerage services in the underprivileged areas of Kirkuk (KRT, 2022; Kirkuk Satellite Channel, 2024).

Kamran Salih (2023), director of the PUK headquarters in Qara Hanjir, told the author that his office has helped farmers and villagers, as well as residents of urban areas, by providing electric generators, water well motors, and drilling equipment, and by installing large shut-off valves for water networks in neighborhoods and villages alike. The political party asphalted several kilometers of roads as well. Furthermore, the author learned at the PUK headquarters in Chamchamal that the PUK had helped many neighborhoods by laying down water networks and graveling streets. This form of NSA governance is both familiar and expected in areas and villages in which the families of martyrs and high-ranking partisan cadres affiliated with the ruling parties reside. Party officials and leadership members grant *tazkya* (endorsement) to these families who visit party headquarters on a regular basis to obtain the fulfillment of their demands and request acceptance.

Specific communities and farmers can autonomously address their environmental issues because the state's capacity continues to be inadequate, political party *tazkya* is absent, or bureaucratic procedures result in delays and neglect (NRT, 2018). Farmers and villagers independently dig wells, build small ponds, install electricity lines, and acquire electricity generators. They often pool their resources to cover costs or seek assistance from local charities. However, turning to political parties and politicians remains a viable option due to their limited capacity to fully meet their environmental needs independently.

People understand that political parties are wealthy and usually willing to satisfy their needs to guarantee their allegiance.

The KRG has provided minimal assistance to Kurdish farmers in Kirkuk and the disputed territories since 2017 due to its lack of administrative and military presence. The government has failed to settle disputes between farmers regarding land ownership and to accept their wheat deliveries to government silos. The party leadership and local political offices have provided essential services, including electricity and water, to villages that support the party. Kurdish farmers continue to expect enhanced financial and technical assistance from the KRG. But even so, the KRG maintains its position by stating that these duties belong to the GoI.

Regarding the study's explicit finding that people are reluctant to choose militias to address environmental issues in Kirkuk, it can be argued that the primary motive for this reluctance is the militia's lack of broader societal acceptance. Neither Kurds nor Arabs consider militias a viable option for managing ES—an opinion primarily attributed to the widespread perception that militias function as disruptive forces rather than constructive or reliable public affairs managers. People are more likely to turn to these options when alternative actors are available, such as the state, political parties, or traditional institutions with established legal, political, and social legitimacy. Shiite militias in Kirkuk are strong and heavily armed but are not relied upon to manage ES, as they still have other alternatives and prefer them.

This mistrust is more than reasonable. Reports have documented war crimes and acts of retribution committed by some militias against Sunnis, particularly during the war against ISIS in northern Iraq (Amnesty, 2017). Hence, the religious difference between the militias and the Arab people of Kirkuk is significant. The Iraqi army and the Shiite militias, Sunni and Turkmen, and Kurdish militia PMF groups control the city of Kirkuk and its surrounding disputed areas. Most of Kirkuk's Arabs are Sunni, notwithstanding the thousands of Shiite families relocated from southern Iraq after 2017 with the backing of the Iraqi army and militias. This religious divide, combined with the militias' criminal

tendencies, is likely an explanation for why Arabs reject militias as a viable option for environmental assistance.

Similarly, as study data affirm, Kurds do not regard militias as a desirable option for managing ES. Moreover, many Kurds believe that the imported Arab farmers and families in Kirkuk are receiving protection from the Iraqi army and PMF militias. Although the PMF militias deny accusations of inciting conflict between Kurdish and Arab farmers, the arrival of Arabs from southern Iraq has resulted in the seizure of 12 villages that cover 63,000 acres of agricultural land (K24, 2024; Baghdadtoday, 2019).

More importantly, the reluctance to rely on militias to address ES issues is tied to the nature of environmental stress, both generally and in Kirkuk specifically. Governing agricultural contracts or negotiating water-sharing agreements between upstream and downstream areas exemplify government functions that militias and armed leaders might find challenging to manage. The Iraqi Parliament and Council of Ministers must enact legislation to resolve the land ownership dispute involving imported Arab and Kurdish farmers in Kirkuk. Reliance on militias for such issues would provide a temporary solution, at best, one that would dissolve with the militia's withdrawal from the region. Furthermore, water shortages in the area, while partly caused by upstream diversions by neighboring countries from shared rivers, are also linked to relations between the KRG and the central government in Baghdad. Addressing these challenges requires the involvement of state institutions, particularly as efforts to strengthen such institutions continue.

The final point that the data findings highlight concerns limited reliance on social and traditional institutions (e.g., sheikhs and tribal leaders) to address environmental issues. The survey results reveal that people rarely approach such customary authorities to resolve environmental problems. Sheiks' historical power and influence, as with similar social institutions, are directly related to their ownership of environmental resources, including water and agricultural lands (Owen, R., 2013). Throughout Ottoman rule (approximately 400 years), until the Ba'ath regime consolidated the state's power in 1968, political authorities needed sheikhs and tribal leaders to concentrate on state governance

and authority. Governments provided extensive agricultural landholdings to these social actors through cadaster systems and farming contracts.

For their part, sheikhs and tribal leaders possessed too much land for personal cultivation. The tribal leaders created social agreements with farmers and villagers to maintain economic control and receive stable revenue by permitting land use for grazing and cultivation while taking most of the agricultural output via the crop-sharing system. This arrangement served a dual purpose. Traditional leaders maintain control over small farmers' economic resources in their domains, which forces farmers to obey their control on the one hand and meet the state that assigns political and security responsibilities to these leaders.

Traditional NSAs have played a vital historical role in environmental management in northern Iraq. Still, their influence has waned due to multiple factors, even though some have attempted to restore their power to secure tribal support. One crucial factor is the expansion of economic resources and opportunities for farmers, villagers, and tribal members, which has freed many from the constraints of tribal laws and rules. This trend varies across regions. The Kurdish population in Iraq enjoys more independence from tribal restrictions than Arabs who live in other parts of the country. This trend is reflected in study data from Kirkuk, where Kurds rarely turn to tribal authorities to resolve environmental problems. By contrast, 13 percent of the Arab community believes that social institutions such as tribes should play a role in addressing these issues.

Other factors are cultural development, education, and increased openness to the outside world. Local communities are no longer exclusively exposed to tribal thinking and traditional ways of living or strictly bound to follow tribal orders. Instead, exposure to external cultures and ideas has broadened perspectives and influenced decision-making processes. As a result, tribal leaders and other social institutions in northern Iraq, including Kirkuk, have lost much of their power and influence. They still have a role to play, especially during elections when they give political support to certain parties or

candidates. Still, they can no longer help regulate social problems with broader implications, such as environmental and security issues (Lust, E., 2022).

These findings suggest that the most effective way to address ES, ensure water security, and resolve agricultural and irrigation issues involving ethnic communities and farmers in northern Iraq is by empowering state institutions to govern ES, whether this means GoI or KRG. Ensuring ES in Kirkuk necessitates strengthening governance institutions and establishing inclusive frameworks that reflect the interests and demands of all communities.

Chapter Five

Structural Scarcity and Land Conflict

5.1. Introduction

Historical tensions have long been a source of contention over agricultural land in Iraq. The expropriation in the 1950s coincided with agricultural reforms implemented throughout the Middle East, including Syria, Egypt, Jordan, Lebanon, Turkey, and Iran. These programs were launched not solely for economic development but also to consolidate political power and secure domestic support (Yeşilbursa, 2019). Before the land reforms in Iraq, ownership was concentrated in the hands of elites (e.g., tribal leaders, sheikhs, and Aghas), and most of the agricultural production was under exploitative sharecropping arrangements. In addition to taking most of the grain yields and leaving the tenant farmers with very little for subsistence, landowners possessed significant political influence and did not want to relinquish their holdings.

The 1917 British occupation, and later its Mandate, of Iraq used these influential landowners to keep the rural areas in order. "The power of the tribal chieftains was enhanced, and the enactment of a primitive tribal law sanctioned their status and privileges…The semi-feudal tenure system headed by the tribal sheiks was revived for political reasons" (Edwards, A. L.,1961, 72). They held elections under manhood suffrage and gave those who cooperated privileges such as official land registrations, irrigation expansions, tax exemptions, and legal power over tenants. These arrangements entrenched landowners' dominance and institutionalized unequal land ownership (Owen, 2013, 193; Yeşilbursa, 2019, 25; Olson, 2013; Natali, 2010, 3–11).

The 1958 revolution brought change when Abd al-Karim Qasim introduced agrarian reform laws that gave land to landless peasants. The Agrarian Reform Act of 1958 and later legislation in 1970s were enacted to diminish the power of tribal landowners and

distribute plots to small farmers. The Ba'ath regime followed the same policy as the 1970 Agricultural Reform Law No. 117, which nationalized agricultural lands and provided farmers with long-term leases (alzama).

As it reshaped Iraq's political and demographic landscapes, the Ba'ath regime also consolidated its power through land reform policies; these, however, did not lead to a fair distribution of land among farmers everywhere in the country. The government took control of extensive arable lands in northern regions during the 1970s and 1980s, then changed the demographics of disputed areas (e.g., Kirkuk). These activities, which continued through the 1990s in the southern marshlands, centered on expelling farmers and destroying their villages. As explained in previous chapters, redistribution programs essentially meant forcibly removing minority groups and replacing them with Arab farmers, which led to heightened competition over arable lands among Kurds and Arab farmers since the fall of the regime in 2003 (Ahram, A. I. 2015; Al-Ossmi, 2024; Tripp, 2007, 193; Yeşilbursa, 2019).

Over time, government policies have contributed to resource scarcity and heightened ethnic competition over limited agricultural land. This phenomenon, which Homer-Dixon (1991) theorizes as structural scarcity (see Chapters One and Two), arises when elites and states capture resources and distribute them unequally or deprive certain groups of access. Such appropriations may be justified under the pretext of environmental and agricultural reforms but exacerbate communal conflicts among ethnic groups, particularly in regions in which ethnic-political conflicts are already present. This chapter examines the role of structural scarcity in ethnic competition over arable land in northern Iraq. Since establishing the present state in 2005, various government policies have aggravated resource scarcity and contributed to communal conflict, particularly in Kirkuk. These dynamics illustrate the state monopoly of access to scarce environmental resources and the denial of access to minority ethnic groups, all resulting in an uneven distribution that favors the dominant ethnic group, seen as the regime's popular base (Homer-Dixon, 2006).

Homer-Dixon's (2006) concept of resource capture provides an intriguing lens through which to examine state land policy in Iraq, which has disproportionately favored Arab farmers (e.g., Sunnis in Kirkuk) in the name of agricultural development and reform initiatives. For example, ethnic grievances were increased by regime-implemented irrigation projects that were completed in privileged Arab-majority areas south of Kirkuk, such as the Hawija waterway, while other projects, such as the Bekhma dam and Kirkuk irrigation project, were left unfinished (see Chapter Six). Moreover, the Ba'ath Revolutionary Leadership Council in the 1970s and the Northern Affairs Committee in the 1980s and 1990s had already institutionalized uneven access to arable lands by revoking non-Arab ownership.

This chapter examines how Iraq's state agricultural and land policies have caused land scarcity and competition among rival ethnic groups in Kirkuk. It describes the mixed-methods approach employed in the present study, which utilizes interviews with farmers in Kirkuk from late 2024 and early 2025, TV interviews and social media content analysis to capture Arab farmers and peasants' perceptions, and survey questionnaires (the second Kirkuk survey conducted in 2025, see Chapter One) to examine people perceptions on the agricultural land disputes. In addition, interviews were conducted with local non-Arab farmers engaged in ongoing conflicts, identified through snowball sampling. Other key informants included a Kurdish farmers' representative in Sargaran, representatives from Daquq and Topzawa districts (the locations of most of the conflict among farmers), and Fahmi Burhan, who is from Kirkuk. Due to access and communication limitations, direct interviews with Arab farmers were impossible; their perspectives were gathered from public statements and media interviews.

The second survey was conducted in February 2025 across several districts in Kirkuk, with 400 participants. It explores agricultural land disputes and the government policies that influence them. The findings confirm the hypothesis discussed in this chapter in the following discussions, namely that competition over agricultural lands has fueled communal conflict, particularly between Kurdish and Arab farmers. While environmental stress is a factor, this chapter contends that state-led land expropriation practices and

other structural factors are still the leading causes of communal violence in disputed regions.

5.2. Land Scarcity and Conflicts

Homer-Dixon (1991) argues that environmental scarcity and demographic pressures contribute to intense disputes among agricultural communities, particularly in developing countries, because of resource deprivation. The broader debate on the scarcity conflict nexus includes four primary perspectives (see section 3.3):

> (1) environmental stress as a major driver of violent conflict in developing nations; (2) environmental stress as a minor contributing factor to civil conflict; (3) resource abundance, rather than scarcity, as the actual driver of conflict; and (4) violent conflict as fundamentally rooted in structural economic exploitation and expropriation, which renders environmental stress largely irrelevant. (Homer-Dixon 2006, 585; Kahl 2006, 9–10)

Ethnic competition in Iraq over arable lands is mainly rooted in intentionally discriminatory government policies about land reform and agricultural development; thus, the fourth perspective is most applicable to this chapter. While the communal conflict in Kirkuk is deeply rooted in structural economic exploitation and expropriation, this study also acknowledges the validity of the first perspective, particularly the relations between water scarcity, environmental migration, and communal conflict.

The systematic revocation of land ownership in the northern areas of Iraq by the Ba'athist regime captured millions of dunams of agricultural lands from Kurdish and Turkmen farmers (hereafter, non-Arab farmers) who were forcibly displaced to mandatory settlements (*mujamats*) or relocated to urban areas. These state policies systematically rendered the Kurd/Turkmen majority in Kirkuk into marginalized minorities and deprived marginalized minority groups of critical resources, not only to maintain political control but

also to reinforce structural deprivation and economic dependence. Meanwhile, the state transferred land ownership rights to government institutions under the pretext of serving public interests while also contractually allocating huge portions of land to dominant ethnic groups. This process of creating institutionalized inequality aligns with structural scarcity, which is characterized by the "unequal social distribution of resources, where access is concentrated in the hands of a privileged few while the rest of the population experiences severe shortages" (Percival & Homer-Dixon, 1998, 281; Homer-Dixon, 1994).

Although Homer-Dixon classifies structural scarcity as a form of environmental scarcity, it is neither the outcome of physical resource degradation (which shrinks the pool of total resources) nor the result of population growth and changes in consumption (which boost demands for various resources). Instead, structural scarcity is caused by severe imbalances in the distribution of and access to resources and power (Homer-Dixon, 2010, 15; Percival & Homer-Dixon, 1998, 283–284); in this case, favored ethnic groups get disproportionately large slices of the resource pie and intentionally marginalized groups are left with minimal or no access to essential resources. Because structural scarcity is always a product of deep-rooted state political and social exclusion and inequalities, this research uses the concept to refer specifically to state-introduced land reforms and politically driven approaches to arable land governance and not to natural limitations on land resources and access to them.

It is true, however, that structural scarcity intersects with climate-induced issues like water scarcity and desertification in many regions and that the results include more intense land competition between rival ethnic groups as well as exacerbation of communal conflicts. It is therefore relevant to reiterate the three main types of resource scarcity (Homer-Dixon, 2010): supply-induced, or the physical degradation of renewable resources; demand-induced, or the increasing demands on renewable resources due to demographic growth and resulting changes in consumer behaviors; and structural-induced, or the factors such as deliberate, unequal, and exclusive governmental policies (Ide, 2015, 62). Regarding the scarcity-conflict nexus, these three forms of scarcity illustrate the conditions under which competition over scarce renewable resources leads to conflict.

In this chapter, structural factors are interpreted as what Tobias Ide calls the "structural conditions" that define the preconditions of a violent conflict; Ide believes these are "largely static and invariant over time (relatively stable and long-term)" as they are linked to background situations such as ‘groupness’, historical injustices, or structural inequality (2015, 62). When renewable resources are inaccessible to some populations, even when there are enough resources for everyone to benefit, this is called structural scarcity. The control exerted by dominant groups, including states and elites, prevents minority groups from obtaining the necessary resources. As a result, these resources become "excludable," meaning that property rights or institutional practices can be used to prevent specific groups from accessing them (Mahlakeng & Solomon, H., 2023, 95). This inequality creates conditions that increase the risk of violent conflict.

Homer-Dixon's three categories interact in numerous ways, particularly around land disputes in Sudan, South Africa, and Iraq. As discussed above, one such interaction is the resource capture that occurs when the state and dominant groups manipulate resource allocation; they may do so by asserting that resources are too scarce for equal allocation or by simply granting access to a dominant group. This form of environmental scarcity is thus not due to absolute resource depletion but rather unequal access and distribution that often reinforce social inequalities and contribute to conflict (Homer-Dixon & Blitt, 1998, 6–7; Homer-Dixon, T., 2010, 15).

Structural scarcity alone does not necessarily lead to communal conflict among groups. Instead, additional intervening factors are critical in shaping conflict dynamics. These include the fragmentation of ethnic groups, what Kahl called "groupness," which can influence patterns of competition and alliances, and the nature of political institutions and political systems, which determine whether grievances are managed through inclusive governance or exacerbated by exclusion and discrimination, potentially escalating tensions into violence (Gleditsch, P., 2001; Busby, J., 2022). Kahl (1998) captures this logic with the argument that elites "capitalize on scarcities of natural resources and related social grievances to advance their parochial interests" (Busby, J., 2022, 47). He contends that demographic-environmental stress can significantly contribute to civil conflict through

state disintegration, increasing competition among groups for political power. Demographic-environmental stress can also increase the risk of state exploitation when a government implements policies that mobilize its supporters in violent actions against other groups.

Whether a society follows one of these pathways is not determined solely by demographic-environmental stress but instead depends on two key intervening variables. The first, groupness/ethnic fragmentation, indicates how a society is divided into mutually exclusive identity groups based on ethnicity, religion, or other social markers. High groupness fosters fragmentation, intergroup competition, and conflict while enabling state elites to manipulate these divisions for political gain. The second, institutional inclusivity, describes the degree to which state institutions allow a broad range of social groups to participate in political processes and influence government decisions (Kahl, 2006, 29, 221, 227; Gleditsch, 2001; Busby, 2022, 47).

The structural deprivation faced by Black South Africans under apartheid became evident because the apartheid system restricted their land ownership, which blocked their access to vital resources. The apartheid regime created institutionalized structural scarcity through its enforcement of unequal environmental resource distribution, according to Percival and Homer-Dixon (1998). The apartheid regime imposed systematic restrictions that blocked Black South Africans from economic opportunities and prevented them from investing in their owned lands in both rural and urban areas. Their limited access to essential agricultural inputs, including capital, fertilizers, and modern farming technologies, worsened their economic situation. This structural scarcity, compounded by ecological vulnerabilities, not only deepened poverty and environmental degradation but also intensified overall resource scarcity, ultimately contributing to social and political conflict (Percival & Homer-Dixon, 1998; Homer-Dixon, 1994, 16–17).

In conflict-prone regions of Kenya, political elites exploited ethnic and clan identities to mobilize groups against one another; leveraging existing societal divisions enabled them

to further their political agendas and maintain power. However, land scarcity had already become a significant and worsening issue in Kenya before these ethnic clashes of 1991 to 1995. A substantial portion of the country's fertile, arable land was (and continues to be) controlled by a small number of large-scale farmers and foreign companies. Environmental degradation, including desertification and deforestation, is also reducing the cultivable land while rapid population growth causes continuous divisions and subdivisions; as a result, ever-smaller plots are available for subsistence and smallholder farming (Kahl, 2006, 131).

A key incident in this conflict occurred on October 29, 1991, at Meteitei Farm in Nandi District, Rift Valley Province. The farm, established initially through the reallocation of land from white settlers, was jointly managed by Kalenjin and non-Kalenjin farmers, including some from the Kikuyu, Kisii, Luhya, and Luo communities. The conflict escalated into violence when Kalenjin community members, backed by local politicians and administrators, asserted exclusive ownership and forcibly expelled non-Kalenjin farmers—those who resisted faced killings, arson, and property destruction. The government fueled the conflict by failing to intervene effectively and expressing support for one group over the others (Kahl, 2006, 3–4).

In Mauritania, which has a long history of racial discrimination against Black Africans, tensions escalated in the spring of 1989 when government forces killed several Senegalese farmers in the riverine areas. The Mauritanian government then exploited the crisis by passing a law that classified black Mauritanians living near the Senegal River Valley as Senegalese citizens, thereby justifying their forced displacement and the occupation of their land. Eventually, the degradation of agricultural lands and increasing population pressures led to large-scale environmental projects that increased land values and intensified competition for land. The ruling elite was primarily composed of White Moors (Beydane); accordingly, the government changed land ownership laws to consolidate control over arable land, grazing areas, and fishing rights near the Senegal River Valley. These legal changes effectively disenfranchised Black African communities

that traditionally depended on the land for livelihood and eventually led to mass evictions and outbreaks of ethnic and sectarian violence (Homer-Dixon, 1994, 14, 15, 76, 77).

Land conflict due to inequality in Colombia was a significant factor in that country's prolonged internal conflict, which resulted in the deaths of more than 200,000 people between January 1958 and December 2012. Government policies encouraged landless populations to colonize jungles by clear-cutting them for agriculture and farming. But various other groups also demanded access to agricultural land, and indigenous, as well as Afro-descendant communities, farmers, and peasants, sought the right to return to ancestral lands from which they had been forcibly displaced. These groups also contested government policies that they claimed had created structural scarcity and criticized the deprivation of their rights and criminalization of their agricultural practices, cultures, and identities (Goyes, D. R., 2016, 75, 87–88).

Land competition has also been a significant driver of conflict across rural regions of Sudan. In 2007, the UNEP reported that 29 of the 40 violent local conflicts in Darfur since independence in 1956 have involved grazing and water rights. Mazo (2010) discusses how the violence in Darfur in the 1980s originated from tribal conflicts over access to grazing lands and water desired by agriculturalists and pastoralists (Mazo, J., 2010, 71–76; Wise, 2021). This competition was intensified by increasing demands for land and natural resources to support livelihoods and foster economic development among numerous stakeholders, including the state (Gari, 2018, 2, 3, 9).

The Sudanese government took away land allocation and resource governance authority from traditional local institutions when it abolished their power in 1970. The state's weak ability to control land and resource use resulted in unregulated mechanized farming, intensifying the strain on resources for nomadic groups and small-scale farmers. Rather than serving as a neutral mediator in these interethnic resource conflicts, the state frequently intervened in a biased manner, which intensified ethnic tensions and contributed to resource-related violence (De Juan, 2015, 22, 31; Olsson & Rapp, 1991, 192).

Despite significant environmental stress (e.g., water scarcity and desertification), structural scarcity (understood as restricted access to agricultural land due to exclusionary state policies) remains an essential driver of ethnic conflict in Iraq's disputed territories. Ongoing competition for land control by ethnic groups in these regions persistently intensifies tensions. In Kirkuk, over one million dunams of agricultural land remain contested among Kurds, Turkmen, and Arabs—a legacy of the Ba'ath regime's agrarian reforms, ethnic cleansing policies, and demographic engineering from the late 1960s to the 1990s. This intersection of structural scarcity and environmental stress has further deepened ethnic divisions, particularly between Kurds and Arabs, which regularly leads to violent conflicts. Therefore, this chapter's hypothesis again focuses on structural issues related to the communal conflict in Iraq and is as follows:

H. 7. When state-led policies generate structural resource scarcity, then the combination of structural conditions (land confiscation), climate-induced water scarcity, and desertification exacerbate communal conflict among ethnic groups.

5.3. Historical Background

5.3.1. Formation of Iraq and Agricultural Challenges in Kirkuk, 1920–1968

From the 1920s to 2003, Iraq was a British colonial entity structured around the dominance of Sunni Arabs, who, despite comprising less than 20 percent of the population, held exclusive control within the regime. By the 1920s, opposition emerged, particularly among the Shiite population in Baghdad, that escalated beyond the capital as tribal sheikhs in the mid-Euphrates region began mobilizing against British rule. Their motivations were diverse: some were influenced by opposition movements in Najaf and Karbala, driven by religious and political concerns over British governance, while others were motivated by pragmatic issues such as land tenure, taxation, and economic instability affecting their tribes. The Kurds also launched an armed rebellion under the leadership of Sheikh Mahmoud Hafid in pursuit of independence (Tripp, 2007, 31, 42, 43).

Land competition among ethnic groups in Iraq is less rooted in actual scarcity of physical resources than the structural inequality and excludability of state policies enacted under the pretexts of land reform and agricultural developments, which generate historical grievances and tensions among population groups. During the monarchy (1921 to 1958), tribal leaders consolidated power by acquiring agrarian lands, often at the expense of small farmers (known as miskin). Even though land reforms were implemented in the 1930s and 1940s, they further concentrated on lands in the hands of a few tribal land oligarchs; due to the influence of these powerful tribal landowners, small farmers communities were not beneficiaries (Batatu, 1978; Stahl, 2018; Edwards, A. L., 1961). Irrigation projects to feed arable lands, which were also part of the government's rural agricultural policy following the end of the British Mandate in 1932, enacted the belief that transitioning from subsistence farming to settled agriculture was essential for economic development. Shida and Hamid (2020, 93) and Bet-Shlimon (2019, 94) found that the government's preference for tribal sheikhs resulted in the consolidation of agricultural rights over arable land among a small elite of tribal leaders. Through the implementation of this plan, the economic and political influence of these social and customary leaders was magnified, and structural inequality was further entrenched.

Consequently, the state's land policies triggered significant social and demographic changes that served its political agenda. New neighborhoods in Kirkuk were built within oil industry tracts to house migrant workers, who, by the 1930s, were earning higher wages than local *Kirkukis*. This process marked the first phase of Arabization, but scholars trace the policy to 1929 when the term ta'rib[8] was first explicitly used. The Iraqi government also launched the Hawija Irrigation Project, which converted the desert into arable land. But instead of allowing Kurds and Turkmen to benefit from these changes, the regime brought in Arab farmers, mainly from southern and central Iraq, and granted them confiscated lands through state contracts. These actions were part of the broader

[8] Ta’rib literally means Arabization, which refers to the process of demographic change of the northern regions of Iraq that have been predominantly Kurdish inhabitants. This process was a significant guarantee for the Ba’ath regime to implement its policies mainly the land confiscation to diminish the influence of the tribal aristocrats in the internal politics and then weaken the Kurdish separation movements.

Arabization strategy to alter the region's demographic makeup (Bengio, 2012, 27; Anderson & Stansfield, 2009, 28, 30; Bet-Shlimon, 2019).

As discussed in previous chapters and above, the government land reform policy started in the 1930s via the redistribution of land and the development of irrigation channels. These immediately introduced structural conditions that promoted inequality and the deprivation of ethnic groups. However, agricultural reforms in Kirkuk, Ninewa, and Diyala caused deep structural scarcity and prevented access to arable land for decades. These outcomes resulted from the entanglement of ethnic politics with the practice of targeting large landowners. Under the guise of agricultural and land reform, non-Arab farmers were dispossessed, and the redistributed lands were not given back to small farmers from those ethnic groups.

According to Nouri Talabany (2001), structural land scarcity began in 1930 with the GoI's decision to develop the Hawija irrigation project. Then, in 1935, one year before construction began, the GoI relocated around 1,000 Arab families, mainly from the Ubaid and Jibbur tribes, to Hawija. Subsequent incorporation of the area into Kirkuk under Decree 328 restricted the mobility of the original farmers even further. The new Arab settlers occupied "14 villages in an area of approximately 100 square kilometers between the Little Zab River and the road linking Hawija to Kirkuk" (Talabany, N., 2001, 26).

The agricultural and land policies of the monarchy period established two fundamental types of structural scarcities. In one type, the system granted special advantages to large landowners (Agha), widening the social and economic distance between tribal land elites and tenant farmers. For example, as discussed, the government relocated Arab farmers to Hawija in Kirkuk under agricultural and irrigation development schemes while taking state-owned land from non-Arab farmers and forcing them to either sell their lands or migrate elsewhere. In the other type, the government established water infrastructure to serve the agricultural requirements of the newly established Arab settlements, which deepened inequality and grievances among the peasant communities in Kirkuk. These

peasants' grievances and demands for removing structural land scarcity were key to the agenda of the *Tamuz* Revolution in 1958.

Iraq's socioeconomic transformation in the second half of the 20th century was enabled by this class transformation, which also caused the sociopolitical revolution that sought to reform the distribution of agricultural lands under the leadership of military officers such as Qasim and later the Ba'ath regime. By then, six of Iraq's seven largest landowners held over 100,000 acres. Therefore, Iraq's big landowners (the aristocracy) and small landholders (farmers) stood on opposite sides of the 1958 revolution in terms of both interests and political loyalties (Batatu, 1978; Stahl, 2018). Under Qasim, the government introduced initiatives, notably the 1958 Agrarian Reform Law, which sought to dismantle large landholdings and redistribute land to small-scale farmers (Gurses et al., 2020, 189; Yeşilbursa, 2019; Fernea, 1969; Al-Ossmi, 2024).

The land reform and redistribution movement, which was essentially populist, aimed to remove structural inequality and empower small and landless farmers. Land reform and expropriation in central and southern Iraq were framed primarily as class-based struggles. These efforts targeted large landowners—particularly the tribal sheikhs—to dismantle what was seen as a feudal infrastructure (Batatu, 1978). The regime aimed to support small farmers by providing them with land, a strategy designed to gain the backing of farming communities throughout Iraq. This initiative included abolishing the eviction of farmers by tribal sheikhs, ending the privilege of tribal leaders to hold the most fertile lands, and limiting land ownership to between 40 and 200 dunams based on factors such as irrigation, crop type, and land quality (Batatu, 1978; Stahl, 2018). Daoudy describes this land reform as a "mobilizational technique" employed by (despotic) regimes (Daoudy, M., 2020, p. 115).

In northern Iraq, land reform and agricultural development were tasked with a different agenda, mainly the weakening of rebel groups and their tribal bases. Bengio argues that Baghdad enforced these reforms strategically to weaken Kurdish leadership by "transferring ownership of land from Kurdish to Arab hands," particularly in Kirkuk (2012).

The government also expropriated the lands of large Kurdish landowners, effectively stripping them of their primary source of power and further weakening Kurdish political and economic influence (ibid., 48, 159). Then, the regime used a land reform policy to change the demographic composition of the border areas that central Arab inhabitant provinces. Talabany (2001) observes some of the tactics used by the GoI in the Daquq district of Kirkuk. Through its agents, the GoI offered to buy land from some landowners for significant sums while threatening others to destroy their villages if they refused to sell. It then distributed the land to Arab tribes, and government land was requested for distribution according to the Agrarian Reform Law.

The Iraqi government's land policies also provoked political conflicts, particularly in Kurdish regions where tribal land oligarchs held significant influence and were deeply involved in political and revolutionary movements. Kurdish Agha had frequently engaged in land and tribal disputes during the colonial period. Ultimately, the deterioration of relations between Kurdish tribes and Qasim's government over land reforms led Mulla Mustafa Barzani to support the Kurdish farmer's uprising against the regime in 1961 (Tripp, 2007, 72; Anderson & Stansfield 2009, 26). However, Kurdish landowners' determination to resist the first agrarian reform in Iraq also contributed to this revolution, the longest-lasting Kurdish armed rebellion against successive central governments in Iraq.

The main objective of Barzani and other Kurdish tribe leaders, as described by McDowall (2004), was to enhance their regional power. These leaders pursued whatever actions were needed to advance Kurdish national interests, leading them to become dominant. The tribal leaders merged tribal land interests with nationalism while employing nationalist rhetoric to support their territorial and political expansion plans. Thus, Barzani secured the support of Kurdish landowners who opposed Qasim's reforms, intertwining tribal land interests with Kurdish nationalism (Gurses et al., 2020, 186; Pipes, 1993, 21; McDowall, 2004).

The Iraqi government introduced the Agricultural Reform Law of 1963, extending land expropriation across multiple regions. The state gained authority to take control of all unregistered agricultural lands, including properties that exceeded legal ownership restrictions. The northern provinces, especially Kirkuk, experienced another round of land confiscation that primarily harmed Kurdish farmers through forced land redistribution with small payment offers. This policy furthered the state's efforts to weaken Kurdish economic and political influence by restructuring land ownership in favor of non-Kurdish populations and depopulating their areas (Fernea, 1969; Yeşilbursa, 2019).

O'Leary (2002) and Anderson and Stansfield (2009) note that the first Ba'athist regime (February to November 1963) marked a period of intensified oppression for Kurds in Kirkuk that initiated a systematic campaign of Arabization and ethnic cleansing. The Iraqi government implemented policies of forced displacement, demographic engineering, and cultural erasure to weaken Kurdish influence: Kurdish neighborhoods were demolished, approximately forty Kurdish villages were depopulated, and Arabs from southern and central Iraq were resettled in the area. In Dibis, Sargaran, and Kandinawa, Kurdish residents were expelled and replaced by Arab tribes. Kurds were also removed from the oil sector; police forces were Arabized; and Kurdish place names were changed to Arabic—all of which reinforced state control over the region (Anderson and Stansfield 2009, 35–36).

5.3.2. Land Policy in Kirkuk Under the Ba'ath Regime

When it regained power in 1968, the Ba'ath Party initially sought to recognize Kurdish rights, and Saddam Hussein led negotiations with Mulla Mustafa Barzani. The Kurds demanded autonomy, including Kirkuk, which they considered essential to their national identity. Iraq agreed to determine Kirkuk's status within four years but refused to include the oil-rich city in the autonomous Kurdish region. On March 11, 1970, the Ba’ath manifesto officially recognized Kurds as Iraq's second nation. Nonetheless, despite the Ba'ath regime's formal recognition of Kurdish autonomy and political rights, it was reluctant to acknowledge Kirkuk as within Kurdish borders (Sluglett-Farouk & Sluglett,

2001). Instead, after consolidating power, the Ba'athists started Arabization again after gaining control by limiting Kurdish land ownership and promoting Arab settlement in Kirkuk. The policies created tension with the Iraqi government, which forced Barzani to oppose Iraq's independent choices, thus starting another armed conflict. (Anderson & Stansfield, 2009, 36–42).

Beginning in 1970, the Iraqi regime intensified Arabization efforts by reducing the Kurdish proportion of Kirkuk's population. Specifically, the government "grant[ed] Iraqi citizenship, alongside various concessions and incentives, to Arabs from other Arab countries to reduce the percentage of Kurds in the population" (Bengio, 2012, 159). The regime also redrew administrative boundaries that transferred Kurdish-majority areas to Iraq. For example, "the two exclusively Kurdish districts of Chamchamal and Kalar were attached to the neighboring Sulaymaniyah governorate, while the Kifri district, where the Kurds constitute a great majority, was attached to the Diyala governorate, and the Tuz-Khurmatu district with a Kurdish majority was attached to the distant Salahaddin (Tikrit) governorate" (Talabany, 2001, 46). Large-scale development projects, including infrastructure improvements and agrarian reforms, were introduced under the guise of modernization but primarily aimed to weaken Kurdish leadership. Around 250,000 Kurds were forcibly relocated to state-controlled settlements under military surveillance, which disrupted their traditional social structures (Voller, 2014, 57; Bengio, 2012). In these settlements, the people had no economic opportunities or access to environmental resources for their livelihoods, which caused more socioeconomic issues.

Between 1970 and 1987, parallel land confiscation and irrigation and agricultural projects continued to facilitate demographic changes in the region. At the same time, the Ba'ath regime systematically captured lands and depopulated inhabitants through three methods. First, *istila* (appropriation) seized 400,000 dunams of land that had been under Kurdish contractual ownership since the Ottoman period and redistributed it to Arab immigrants. Second 1987, *liitfaa* (extinguishing land titles) transferred 500,000 dunams in southeastern Kirkuk to the government, including Altun Kupri, Shwan, and Taq, under the Northern Affairs Committee. Third, *istimlak* (expropriation) targeted 300,000 dunams

across Sargaran, Dibs, Topzawa, and Daquq, where the lands leased to Arabs, mostly internal Kirkuki Arabs such as those from Hawija, to further alter the demographics of non-Arab areas (Burhan, F., 2024; Ameen, M., 2025; Ezadeen, T., 2025). Because most of the confiscated villages in Kirkuk have a combination of these three types of land disputes, the related issues are highly complex.

To summarize, in 1970, the Ba'ath government's land policies started to redistribute tribal-controlled land, expropriate Kurdish and Turkmen agricultural areas, and facilitate Arab farmer's resettlement in Kirkuk and northern Iraq. Furthermore, Agricultural Reform Law No. 117 limits land ownership from area to area to target influential tribal leaders. Larger land holdings were confiscated in Kirkuk; in Daquq, Dibs, and Sargaran, 50,000 dunams were seized. Turkmen-majority lands were also transferred to state ministries under claims of oil reserves and national security (FOA, 2020; Ezadeen, T., 2025; Al-Ossmi, 2024).

In the 1980s, the Iran-Iraq War provided a pretext for escalating Arabization. In Topzawa, 9,400 dunams were confiscated under Decree 917, initially for redistribution but later transferred to state ministries. By 1987, villages were forcibly evacuated, and lands were allocated to Arab immigrants through 33 agricultural contracts (Daoudy, Abdullah Mohammed, 2025; Ameen, M., 2025; Knights & Ali, 2010; Ghafoor, Sami, 2024). The prevention of non-Arab farmers from returning to villages and accessing their arable lands caused widespread land scarcity, poverty, and social unrest among the groups. The Ba'athist government extended its expropriation policies beyond agricultural land until the late 1990s. Thousands of Kurdish families with political affiliations to the Kurdish revolutionary movements had their homes and properties confiscated. These properties were then sold at significantly reduced prices to resettled Arabs as an incentive to encourage their permanent residence in Kirkuk and its surrounding areas (Burhan, F., 2024; Ezadeen, T., 2025).

Farmers in Daquq, Sargaran, and Burhan claimed that "the official justification for resettling Arab farmers in parts of Kirkuk was to provide grazing land due to insufficient

rainfall and inadequate pastures in their original regions." However, the reallocation of arable lands for the Arab farmers primarily served as a demographic engineering strategy for the Ba'athist government, which constructed residential communities for these immigrants (Burhan, F., 2024; Ezadeen, T., 2025; Ameen, M., 2025; Talabani, Idris, 2025; Ghafoor, Sami, 2024). This ongoing reinforcement of Arabization and alteration of the ethnic composition of Kirkuk seemed necessary because the regime perceived the areas as "anti-state spaces" (Ahram, A., 2023, 7). Moreover, the construction of the Kirkuk Irrigation Project called initially the Saddam Irrigation Project, made it possible to build dozens more settlements in the Daquq area for the thousands of Arab farmers that had moved into the region in the 1970s and 1980s when land deprivation had intensified (Talabany, N., 2001, 54–55). By redistributing land and weakening traditional power structures, the regime intended to suppress Kurdish revolutionary groups. Structural scarcity was employed to capture land and depopulate the areas, preventing Kurdish communities from forming strongholds for armed resistance or asserting territorial claims over Kirkuk (Ahram, A., 2021, 56; Pipes, 1993, 10, 20; Romano, 2006, 188).

The forced population movements, together with village destruction, worsened the existing structural scarcity and restricted economic possibilities for non-Arab groups in Kirkuk. The Anfal genocide in 1988 led to the destruction of thousands of villages, which made structural scarcity worse because displaced people could not recover or work their lands until after 2003. Moreover, the mass executions and deportations during Anfal wiped out large numbers of Kurdish men and young laborers—the primary providers for their families—leaving many, especially women, without economic prospects in a society already struggling with sanctions and a lack of opportunity.

5.3.3. Land Disputes in Kirkuk, 2003 to Present

Following the fall of the Ba'ath regime in 2003, Kurdish farmers returned to Kirkuk, but many Arab farmers who had been relocated to confiscated lands in Kirkuk abandoned these lands. At the same time, Article 140 of the Iraqi constitution was introduced to resolve the status of territories claimed by the KRG and the GoI but not to resolve land

disputes between ethnic peasants. However, the article did mandate compensation for the imported Arabs, including the peasants, for the cost of returning to their previous areas of residence. This initiative was seen (at least by the non-Arab farmers) as a great chance to resolve land disputes between the ethnic groups via a legal framework to normalize the situation in Kirkuk: assistance would be offered both to Arab immigrants in the region to return to their original places, and to displaced people (mainly Kurdish peasants) to return to Kirkuk. After this reversal of the state-arranged demographic changes in the city, the next step was supposed to include conducting a public census and holding a referendum to determine the status of the city as either remaining under Baghdad rule, becoming a part of the KRG, or the third option of becoming an independent region (Saeed, 2016).

The new government did not extend agricultural contracts given to Arab farmers, forcing them to leave the previously given farmlands. These displaced peasants chose to move either to different regions of Iraq or Arab-majority areas of Kirkuk. The normalization of Kirkuk's demographic situation required financial compensation to Arab immigrants while providing financial assistance to Kurdish and Turkmen farmers who had been displaced to return to their original lands. The management of these payments fell under the remit of the Article 140 Committee, a constitutional executive ministerial and legal body created by the GoI on September 8, 2006.

Kaka Rash Sadiq, head of the Kirkuk office for the Article 140 Committee, stated in 2024 that the rate of compensation to Arab farmers who moved to Kirkuk during Ba'ath rule was rate twice as high as non-Arab farmers received when they returned (K24, 2024). These resettlement efforts have continued since 2017. Although the government established the Property Disputes Commission under Law No. 2 of 2006 to address land disputes, the commission failed to resolve the issues and was eventually dissolved in 2012. One key obstacle was that much of the land confiscation in Kirkuk had been carried out under decrees issued by the Ba'ath Revolutionary Command Council. Since these decisions were legally binding then, reversing them required parliamentary approval, which was never secured (Ezadeen, T., 2025; Protect Goizha Mountain, 2024).

In 2012, the Iraqi government issued Decrees No. 29 and No. 30 to suspend legislative measures related to Revolutionary Command Council decisions. Also, under Ali Hassan Majid, the Northern Affairs Committee issued non-legally binding directives enforced at the discretion of officials in northern Iraq. The directives prohibited Arab immigrants from renewing their agricultural contracts while state institutions, including the Ministry of Defense, gained temporary control of non-Arab farmers' lands. The decrees received official approval, but their implementation failed to materialize and continued without enforcement (Burhan, F., 2024; Ameen, M., 2025).

Due to ongoing political disputes, the constitutional provisions and the government's decisions remain unimplemented. From 2014 until 2017, when the Kurds governed Kirkuk, the KRG was able to prevent structural scarcity for area minorities by halting the renewal of agricultural contracts originally granted to Arab farmers by the Ba'ath regime. In 2017, the KRG unilaterally held an independence referendum that prompted a military response from the Iraqi government and Shiite militias, who re-took control of Kirkuk and expelled Kurdish forces (Hama, H. H., 2020; Palani et al., 2021). With the return of Baghdad's authority over Kirkuk, Arab immigrants began reclaiming their holdings, citing government-issued agricultural contracts. The non-Arab farmers resisted these claims. To dispel the resumption of conflict between these ethnic groups, the local military authorities in Kirkuk, at the order of Baghdad, suspended agricultural practices by non-Arab farmers, including cultivation and harvesting (K24, 2021).

Through these restrictions on Kurdish and Turkmen farmers' agricultural activities, the state established an exclusionary system that creates unfair disadvantages for entire non-Arab communities. The extensive structural inequalities in Kirkuk's environmental resources management become evident through this dynamic because resource access directly relates to ethnic and political identities and long-standing grievances. The military intervention in land governance enforcement between ethnic groups continues the Ba'ath legacy of Arabization. It affirms the perception that minority groups are yet again subject to state-induced structural scarcity.

The mechanisms of land structural scarcity in Kirkuk were also intensified in October 2019 following the Iraqi Parliament's dissolution of provincial and local councils in response to the Kurdish political protests (Karwan Faidhi Dri, 2019). The resulting legislative vacuum (which included the already inactive Kirkuk Provincial Council, paralyzed by political disputes since October 2017) created an institutional gap that enabled Arab elites, particularly the acting governor Rakan al-Jabouri, to consolidate control over land accessibility. Thus, a subsequent wave of Arabization began. Arab farmers who had previously held land contracts and had been compensated for leaving the area were now allowed to return and reclaim lands with relative ease. The governor backed these returning peasants, who were not only permitted to renew their agricultural agreements but were also facilitated by the city's agricultural department and courts—institutions that had ceased equitable oversight after 2003.

According to Ameen (2025), "Kurds and Turkmen farmers have been systematically prevented from accessing their lands. In many cases, Arab returnees physically occupied arable land by erecting tents, creating de facto control over disputed plots such as three villages in Dibis in West Kirkuk and reinforcing the perception of ethnic favoritism". Thus, the lack of local legislative oversight and the manipulations of state administrative structures have reinforced structural scarcity, entrenched ethnic inequality, and escalated tensions in the Kirkuk region.

Structural denial of non-Arab farmers to arable lands in Kirkuk has been strengthened via active involvement by state institutions and armed actors. Under Governor al-Jabouri, the local government has provided substantial institutional support to Arab farmers who returned to the disputed areas. Fahmi Burhan reports that between 2017 and 2024, "nearly 600,000 Arabs were relocated to Kirkuk, with al-Jabouri establishing nine new neighborhoods to accommodate them" (Burhan, F., 2024; Rudaw, 2024). The local government also provided substantial institutional support to Arab farmers by reaching beyond administrative assistance to include protection by military forces. These deployments have transformed local land conflicts into security matters in which violent treatment of non-Arab farmers is justified. Security forces regularly detain dozens of non-

Arab farmers during each agricultural season while seizing their farming equipment to prevent them from working their lands (Kurdsat, 2023; Kirkuk-Now, 2024; Rudaw, 2025). Dashti Agha, one of the affected farmers in Dibis, west Kirkuk, claims that "often when a new officer is transferred here [the area], the Bedouin [his term for the Arab farmers] encourage them to target Kurdish farmers. They come to harass and detain us" (K24, 2024).

Thus, through bureaucratic obstruction and coercive measures, the state has developed a land governance system that prioritizes Arab land claims at the expense of other ethnic groups and thereby entrenches divisions in an already fragile and contested region. Table 5.1 below explains the renewal and reactivation of agricultural contracts for imported Arabs in Kirkuk from 2017 to 2024.

Table 5.1. Renewal Land Contacts of the Arab farmers in Kirkuk from 2017-2024.

No.	*Districts*	*Number of agricultural contracts*	*The land area in Dunams*
1	Kirkuk Center	197	9800
2	Sargaran	11	550
3	Dibs	13	650
4	Altun Kupri-Prde	6	300
5	Laiylan	39	1950
6	Daquq	127	6250
	Total	393	19500

Source: K24, 2020.

Following the failure of the Kurdish independence referendum in 2017 and the return of the Iraqi army to Kirkuk, the GoI issued arrest warrants for Kirkuk Governor Najmaddin Karim and Provincial Council Speaker Rebwar Talabani due to their involvement in facilitating the referendum. Although Kurdish parties secured eight out of sixteen seats in the 2023 provincial elections, intra-Kurdish disputes delayed the appointment of a new

Kurdish governor. The PUK established a local government with an Arab party through its six seats to appoint Rebwar Taha as governor and an Arab as Provincial Council speaker. The suspension of agricultural contracts by Taha and his enforcement of court orders to return land to Kurdish farmers created rising tensions, which led the Iraqi military to intervene. In response, the Kurdish governor proposed establishing a local police regiment to manage regional agricultural land disputes.

The new Iraqi regime has been willing to maintain the status quo by avoiding implementing the constitution and related executive decisions on the disputed lands. The policy has made it possible for consecutive rounds of renewed Arabization and agricultural land acquisition, especially between 2017 and 2024. These changes have made it possible for farmers to compete with one another for resources and have decreased agrarian production in the region, which has intensified communal conflicts. During the harvest season, non-Arab farmers in Kirkuk frequently face large-scale arson attacks on their crops, allegedly perpetrated by Arab immigrants claiming ownership rights. In 2019, approximately 600 dunams of cultivated wheat fields in Sargaran were burned before harvest (Kurdsat, 2022). Barzan Sheikh Ghazi, chairman of the Agriculture Committee in Daquq District, reported that in 2019 alone, around 4,000 dunams of wheat and barley fields belonging to Kurdish farmers were deliberately set on fire by unidentified perpetrators. In Shanshin village (Dibis district), where only one Kurdish farmer remains following forced displacements by Arab immigrants and Iraqi army pressure, land disputes have escalated into violence. In 2021, a confrontation between resettled Arab farmers and the last remaining Kurdish farmer resulted in arson, destroying 23 acres of wheat fields (Kirkuk Now, 2019a, 2019b, 2020; Harem, 2021).

Iraqi Member of Parliament Dylan Ghafoor (2023) confirms that Kurdish farmers in Kirkuk face systematic barriers to agricultural production and economic stability. Due to the lack of legal land status, they are unable to sell crops to government silos or access state agricultural subsidies, all of which discourage farming. In Topzawa, the government blocks electricity permits for irrigation, while in Daquq, restrictions on fish farming have led to widespread closures. Since 2023, the Iraqi Ministry of Agriculture has destroyed

thousands of fishponds; however, this campaign ceased after a Kurdish governor's appointment in 2024 (Shafaq, 2024; Talabani, Idris, 2025).

In December 2024, the Iraqi Parliament passed a bill mandating the return of agricultural lands expropriated from non-Arab farmers under Ba'athist land policies since the 1970s. The law, which aimed to restore 300,000 acres in Sargaran, Topzawa, and Dibis, required Arab immigrants to vacate. However, tensions escalated before its implementation. On February 17, 2025, clashes erupted among Kurdish farmers, the Iraqi army, and Arab immigrants when Kurds attempted to reclaim the village of Shanagha. A Kurdish army officer who refused to act against the farmers was subsequently punished and relocated (Al-Hadath Iraq, 2025; K24, 2025). Arab immigrants strongly opposed the bill, which Sheikh Hatem Assi al-Ubaidi warns "will affect approximately 360,000 dunams of arable lands from Dibs district to Tuz Khurmat, [including] 36 neighborhoods, and will displace 11,000-12,000 Arabs, potentially leading to civil conflict in Kirkuk" (Al-Hadath Iraq, 2025; K24, 2025). Instead of cooperating with the outright expulsion of Arabs from the area, Arab farmers have called for land redistribution. Sheikh Nasir al-Jubouri, a leader of a resettled Arab tribe, is quoted as arguing that "three generations of families now live in Kirkuk, making relocation impractical. He also questions where 150 families from his tribe could be resettled under current circumstances" (KRT, 2025).

Some Arab farmers consider land redistribution the best approach to solving the current structural problem of unequal access to land. They acknowledge that the Ba'ath regime denied the Kurds and Turkmen access to land. Still, they also contend that their presence in the region was founded on a mandate from the state and that the land contracts they received were for lands under state ownership. They also assert that the state can reorganize land ownership, distribution, and access. Therefore, they do not consider these lands to be the rightful property of Kurdish or Turkmen farmers.

Nazim al-Shamri, General Secretary of the Arab Opinion Commission in Kirkuk (2025), argues that there is a widespread misunderstanding about the background of the land scarcity presently affecting farmers in Kirkuk. He contends that the land does not belong

to ethnic farmers from any group but is, in fact, state-owned. According to him, no farmer or group has historically held private ownership of these lands, as they have always been under the control of the Iraqi state and remain so. To prove this assertion, he cites that the Iraqi state originally expropriated the lands from feudal landowners and redistributed them among farmers as part of its 1970 agricultural land reform. He believes the only solution to the current conflict is for the farmers to accept the state's reallocation of the lands (Rudaw, 2024a).

For their part, the Arab farmers contend these contested lands are rightfully theirs because, during the 1970s and 1980s, the Iraqi regime provided compensation to non-Arab farmers in exchange for relinquishing their agricultural lands. For instance, in the Topzawa, Dibs, Sargaran district during the 1980s, non-Arab farmers who were forcibly displaced from their villages reportedly received "compensation at a rate of 2.5 Iraqi dinars per dunam" (Ameen, M., 2025), which was confirmed by farmers in Daquq and Sargaran. Based on this history, Arab farmers argue that the government authorized their relocation to Kirkuk and that they acquired their lands through a legitimate state allocation process. Contrarily, non-Arab farmers state they had to accept Ba'ath regime compensation because refusing the government's offer after the deadline would have led to detention and other forms of punishment.

The KRG has issued statements in support of Kurdish farmers because of the ineffective governance in Kirkuk, condemning actions that prevent them from cultivating their lands and burning their crops during harvest season. Meanwhile, Kurdish MPs in the Iraqi Parliament actively visit farmers and express their support (Rudaw, 2025). In February 2025, tensions escalated when the Iraqi army prevented Kurdish farmers from plowing their lands and reportedly attacked several of them. That same week, despite the arrest of several soldiers by the Iraqi administration in Kirkuk, 40 Kurdish MPs convened a parliamentary faction meeting in the village of Shanakha Sargaran to demonstrate their solidarity with Kurdish farmers (Rudaw, 2025).

5.4. Findings from Data Collection

5.4.1. Qualitative Interview Data Findings

The following chapter sections describe the mixed-methods approach employed in the research project. It incorporated semi-structured interviews with five farmer representatives from different regions of Kirkuk and the KRG minister for the disputed territories. Participants included M. Ameen, from west Kirkuk-Sargaran (January 2024 and February 2025), Sheki Ezadeen Talabani and Idris Talabani from Daquq (January 2025), Sami Ghafoor (January 2025) and Abdullah Daoudi (February 2025) from Topzawa, a district in southern Kirkuk with a significant Turkmen population. Each interview lasted approximately 30 minutes and was conducted via telephone.

The initial interview was with the farmer representative in Sargaran, who then facilitated connections with other farmer representatives in different areas (snowballing). The participants consented to have their conversations recorded and used for this study, as well as to the disclosure of their names and locations, given that they are publicly known representatives of local farmers. These individuals were specifically chosen because they are directly engaged in the daily struggles of farmers about agricultural land conflict, possess in-depth knowledge of the legal and administrative aspects of land disputes, and have firsthand experience of eviction and land confiscation by the Ba'ath regime since the 1970s. Their long-standing involvement allows them to recall these events vividly and provide valuable historical perspectives.

One week after the most recent conflict in February 2025 between Kurdish and Arab farmers, in which the Iraqi military sided with the Arab farmers (Al-Nashmi, 2025), the author interviewed Kurdish and Turkmen farmers in Kirkuk to understand both conflict perspectives. The author attempted to contact Arab farmers through Kurdish journalists, but security issues made direct communication unfeasible. A non-Arab farmer representative shared information about Arab immigrants who returned to the area to

reclaim lands they considered rightfully theirs. The author supported these narratives through brief interviews with Arab farmers and their leaders, which were obtained from TV interviews and social media platforms. The Arab farmers' statements closely match non-Arab farmer accounts, reinforcing the reliability of the data the author gathered firsthand. These findings highlight key non-Arab farmer perspectives on Kirkuk's structural scarcity and illustrate contrasting narratives and deep-seated tensions over land ownership.

The primary trigger of conflict among farmers in Kirkuk is land ownership. Non-Arab farmers believe their lands were unjustly confiscated by the Ba'ath regime due to their ethnic identities and consider their ownership indisputable. However, Arab farmers argue with equal conviction that the lands belong to the state and that government decisions legally sanctioned their relocation to the area. Consequently, both groups propose fundamentally different solutions: non-Arab farmers demand land restitution, whereas Arab farmers advocate for a just redistribution because they view the land as state-owned, not private property.

Burhan (2024) told the author, "The Kurds and Turkmen farmers possess Ottoman-era cadastral records dating back several centuries. In contrast, the earliest land ownership documents held by Arab farmer settlers date only to the period following the Ba'ath Party's rise to power in Iraq." Ameen (2025), the representative of farmers in Sargaran, mentioned that "the Arab farmers know they do not possess legal land ownership, as they were only granted usage contracts, which do not confer permanent ownership rights. Therefore, the land must be returned to the original owners". To support the Kurds' contention that they had legal titles before revocations by the Ba'ath regime, Ameen pointed out the lack of cemeteries in Arab farmers communities; he believes this is clear evidence of their historical absence from the area: "The Arab farmers in Sargaran and Dibs have not established cemeteries in the areas and do not bury their dead there.

Instead, they transport their deceased to other Iraqi provinces, particularly Mosul, Tikrit, and various locations in southern Iraq" (Ameen, M., 2025).

In short, the findings indicate, in summary, that unresolved land disputes in Kirkuk have resulted in chronic economic disadvantages for both ethnic groups present there. Since 2018, access to agricultural land has been restricted or suspended, exacerbating tensions. When Kurdish farmers attempt to cultivate the land, Arab farmers often intervene or resort to crop arson before harvest. In response, the Iraqi military frequently suspends land use, further limiting agricultural activity. Simultaneously, Kurdish farmers resist the return of Arab farmers even though many of the latter have renewed their agricultural contracts since 2017. As a result, both groups experience a mutual sense of economic deprivation and perceive themselves as being denied the right to cultivate land and sustain their livelihoods.

Kurdish farmers in Kirkuk perceive the Iraqi government as an exclusive and irresponsible authority that fails to resolve longstanding land disputes. Local farmers in Daquq, a mainly agricultural district of Kirkuk, also stress that clarifying ownership rights is essential for their land access. Sheikh Ezadeen (2025), who represents Kurdish farmers in the area, explained that unresolved land claims persist because the government implements structural deprivation policies against non-Arab communities: "The federal government in Baghdad shows no intention to remove Ba'athist land confiscation policies while maintaining the current situation… The GoI does militarize the land issues. The military forces' suspension of acts as a conflict prevention method that creates additional land scarcity for non-Arab farmers."

The Iraqi Parliament decided in December 2024 to return some of the confiscated lands to their original owners, adding to the Arab farmers' feelings of neglect by the GoI. Arab farmers perceive this approach as denying land access because it requires the return of agricultural land to Kurdish and Turkman farmers. The cancellation of agricultural land

leases led to protests by Arab farmers in Kirkuk outside the provincial parliament office in January 2025. They warned that this decision could exacerbate ethnic tensions among Kirkuk's communities. Farmers in Kirkuk proudly exhibited banners stating that the agricultural lands granted to Arab farmers fifty years ago were in accordance with the agricultural land reform regulations that were in effect in Iraq during that period (964 Arabic. 2025). Many feel that the government's track record of unfairly settling land disputes contributes to the pervasive mistrust and instability in the region.

The research reveals a dual-layered concern at the intersection of environmental elements and ethnic contestation in Kirkuk's land conflict. Non-Arab farmers, mainly Kurds, perceive Arab farmers as political beneficiaries of state-backed demographic engineering and as competitors motivated by greed who seek control of fertile land and water resources. Ameen explained, "We know that the Ba'ath regime moved Arab farmers to Kirkuk for demographic alteration, yet we also know that the peasants stay because they want access to the land and water resources, especially in Dibs and Sargaran areas which have abundant water from the Little Zab River" (Mohammed Ameen, 2025). He went on to say that "the area provides such advantages that no one would choose to leave it voluntarily, especially when they receive government backing and contract to access the land." Sami Ghafoor (2025) in Topzawa and Idress Talabani (2025) in Daquq also stated that the irrigation infrastructure, particularly the Kirkuk irrigation project that began in 1975, has yet to be fully completed.

Such irrigation systems have played a vital role in ensuring water security, particularly for Arab-populated areas in Kirkuk's southern and eastern parts, where Arab farmers still use a considerable proportion of the land. Ghafoor and Talabani pointed out that the irrigation infrastructure is essential in persuading Arab farmers to stay in Kirkuk. The project is planned to divert water from the Little Zab River at Dibis to sub-districts like Taza Khurmatu and then to Daquq, a region inhabited by many Arab farmers as well as Kurds and Turkmens (Al-Obaidi, Riyam Salah, and Mariwan Ridha Faris., 2024).

However, Arab farmers reject the Kurdish accusations of greed by asserting that their presence has evolved over almost seven decades. Al-Shamri (2025) stated, "Arab farmers are not subject to Article 140 [they are not required to leave the area as part of the normalization process]. They are not immigrants; they hold family registration documents from the 1957 Kirkuk census." He also added that Arab farmers had reclaimed their agricultural lands, which had been seized by Peshmerga forces after 2003, following the 2017 Operation to Impose Law in Kirkuk (a move the Kurds perceived as an occupation of the city after the failure of their independence referendum). Sheikh Nasir Al-Jubouri (2025) agreed in a TV interview that Arab farmers had come adequately to Kirkuk and is sure that their relocation is unrealistic because "unlike in the past when displaced communities could relocate to areas like a valley a mountain with available land and water resources, increasing scarcity makes such an option no longer viable." This opinion highlights the relationship between population changes, environmental limitations, and territorial disputes, making conflict resolution more challenging.

Overall, the findings highlight the significant communal conflict among ethnic farmers regarding land ownership and access to agricultural lands in Kirkuk. The situation has been further complicated by the intervention of armed groups and even the Iraqi army, which has primarily supported Arab farmers. As a result of media sources publishing conflicting assertions, the Kurdistan Regional Government and Kurdish and Arab political factions in Kirkuk have upped their hostile rhetorical claims. The escalating discourse has exacerbated the existing tensions and increased mistrust between the parties. There is a considerable probability of an upsurge in communal conflict if farmers' grievances are not addressed. This is especially true given that the law regarding land restitution has not yet been applied to non-Arab farmers. If the law is enforced, Arab farmers are expected to resist vacating the land, which could potentially result in violent confrontations.

Repeated changes in and reversals of state policies over decades have led Kurds and Arabs in Kirkuk to develop opposing views about land rights and access. Each group maintains that it receives unjust treatment around land access while also showing evidence of government-imposed structural scarcity. The Ba'ath regime used Arabization policies to remove Kurds from their homes before transferring their lands to Arab immigrants. Then, the return of Kurdish peasants to the confiscated lands after 2003 led Arabs to assert that the lands were unjustly seized or made inaccessible. Both groups maintain critical stances toward each other in Kirkuk because they see themselves as victims of deliberate resource denial and land exclusion, which continue to fuel the interethnic conflict and unresolved governance issues.

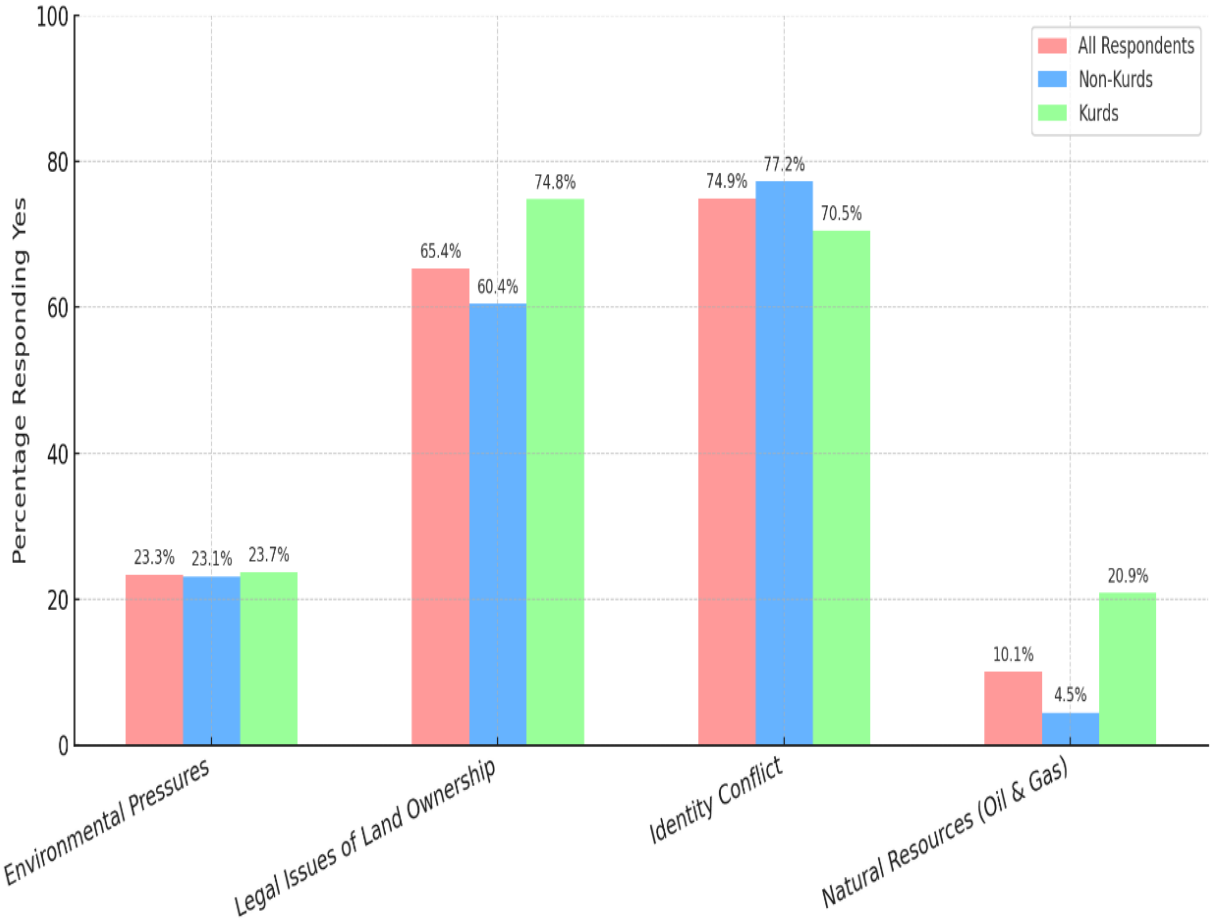
5.4.2. Survey Data Collection and Findings

The second dataset is derived from 400 survey responses gathered in Kirkuk in February 2025 by a professional survey firm. The survey examined the Hawija, Laiylan, Sargaran, Daquq, Topzawa, and Yaichi districts to evaluate the study's hypotheses through responses from a representative sample about farmer land-related conflicts. It investigated agricultural land disputes and their primary causes while examining how political experiences, historical grievances, and government policies increased tensions. The findings highlight the complex interplay of structural scarcity and environmental stress within the conflict dynamics in Kirkuk. The results below are from the multicoded responses to Q. 17 (see the appendix), which asked respondents to identify factors that drive conflicts among Kurdish, Turkmen, and Arab farmers in Kirkuk.

Respondents identified multiple factors behind land disputes, with land ownership and ethnic identity conflicts emerging as the most significant drivers, cited by 75 percent and 65 percent, respectively. However, environmental factors (e.g., water scarcity and desertification) were identified as secondary contributors to competition over agricultural land; 23 percent of respondents attributed communal conflicts to water scarcity, irrigation issues, and desertification. By contrast, only 10 percent of respondents believed that the

abandonment of natural resources, particularly oil and gas, plays a significant role in land disputes. The figure below illustrates these findings.

Figure 5.1. Contributing Factors in Ethnic Conflicts among Ethnic Farmers in Kirkuk.



These findings support the chapter hypothesis (see section 5.2 above) that structural scarcity caused by state policies combined with water scarcity, desertification, and agricultural issues leads to communal conflict in ethnically divided societies such as Kirkuk in Iraq. The survey results show that 75 percent of respondents named land ownership the leading cause of disputes, while 65 percent identified ethnic identity as a key factor; these results indicate that land access has become politicized due to decades of state favoritism and exclusion. They also demonstrate that land is not only an environmental resource but can also be a political arena of contestation between groups

and authorities if state agendas and ethnic favoritism mediate its access and ownership. In addition, these findings confirm that Kirkuk's land scarcity exists due to structural conditions that have developed through decades of exclusionary state policies.

Furthermore, the results show that 23 percent of participants identified climate-induced water scarcity, desertification, and irrigation challenges as secondary factors in land-related conflicts among farmers. The data confirms the study hypothesis that environmental stress enhances preexisting structural issues instead of acting independently as conflict triggers. Environmental degradation in this scenario intensifies existing historical deprivation of land access because it worsens perceptions of unfair state-led resource governance and ethnic favoritism rather than creating competition itself.

The data also confirms the fundamental premise of ES (physical/natural or structural) theory, which is that such scarcity in developing societies creates ethnic tensions through its interaction with political issues such as weak state institutions, exclusionary systems, and ethnic and social cleavage (Busby, 2022; Homer-Dixon, 1998). The structural risk of communal conflict in Kirkuk becomes probable because environmental vulnerability combines with institutionalized exclusion. The findings suggest that conflict between Kurdish and Arab farmers cannot be restricted to ethnic and environmental explanations. As explored in the previous chapters, it also stems from state-imposed structural deprivation and denial that interact with climate vulnerability that may be mapped along geographically, historically, or socially based ethnic divisions.

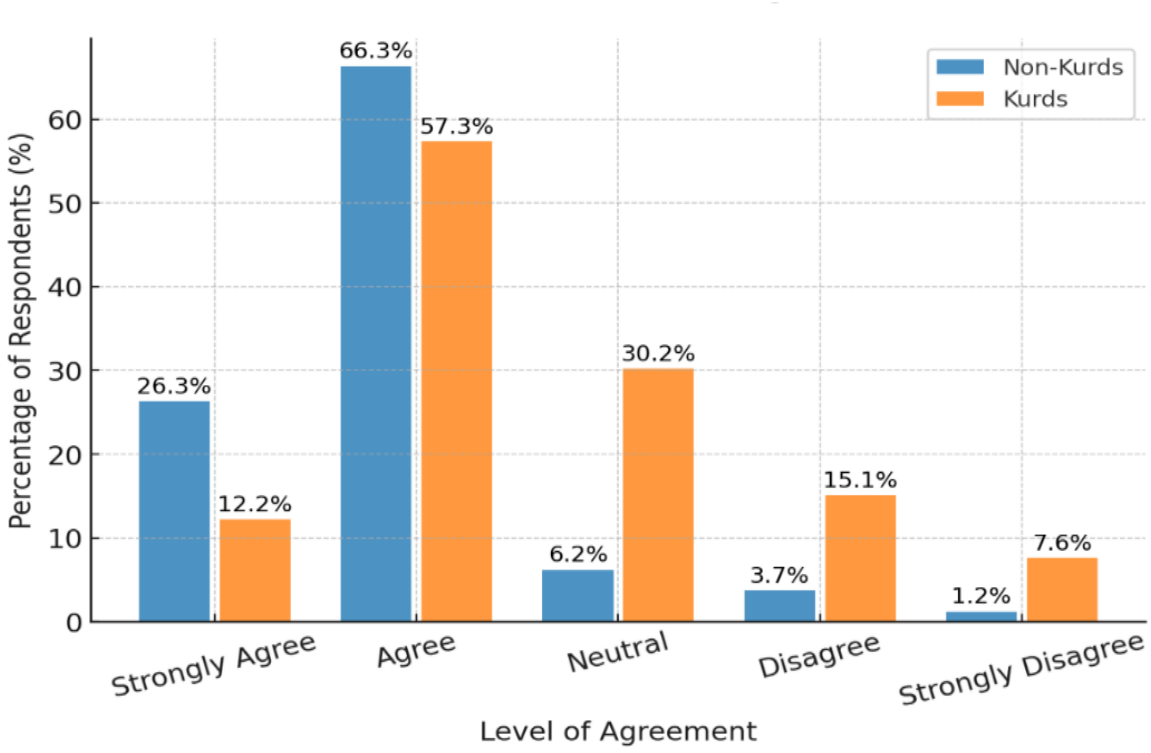
Figure 5.2 below shows the impact of government land, water, and irrigation policies on communal conflict in northern Iraq. The findings indicate that non-Kurdish farmers are more likely than Kurdish farmers to believe that the GoI land policy exacerbates tensions. Q. 23 (see the appendix) asked participants in Kirkuk to what extent they agreed or disagreed with the statement that 'State policies in Iraq to address problems related to

agricultural land, water, and irrigation have contributed to the outbreak of communal conflicts between ethnic groups.'

The findings show that 93 percent of Arab and Turkmen farmers consider the government land policies to be a key cause of farmer conflicts, and 70 percent of Kurdish farmers share this view. This discrepancy suggests that while most Kurdish respondents acknowledge this issue, their level of agreement is lower compared to Arab and Turkmen farmers, whereas 30 percent of Kurdish farmers remain neutral on the issue. The latter discrepancy indicates a more divided stance within the Kurdish farming community than its Arab counterpart.

These results support the hypothesis (see section 5.2 above) that state-led environmental policies have created structural scarcity, ultimately increasing communal tensions in Kirkuk. The significant difference in government land policy perception between Arab and Turkmen farmers (93 percent) and Kurdish farmers (70 percent) shows that they believe land access depends as much on political and institutional arrangements as it does on physical availability. Non-Kurdish farmers show strong agreement about their structural exclusion from land resources, especially since the post-2003 power shift. This 30 percent of Kurdish respondents who did not express a clear opinion demonstrate internal variation among this ethnic group, possibly because they have received different benefits from land access since 2003. The pattern shows that structural scarcity is based on long-standing grievances, and uneven land governance creates ethnic-based land claims that intensify communal conflict risk.

Figure 5.2. Perceptions of Kurd and Non-Kurd Farmers on the Government Confiscation Land Policies and Communal Conflict Nexus in Kirkuk



These findings suggest that farmers in Kirkuk largely agree that the Iraqi regime's land policies have contributed to communal conflicts. Everyday disputes over agricultural land access, especially between Kurdish and Arab farmers, underscore the impact of these policies. However, a key question arises as to why Kurdish farmers are less likely than their Arab and Turkmen counterparts to perceive this issue as a significant source of conflict, although most of the land confiscated under the Ba'ath regime belonged to Kurds. One possible explanation is that although Kurdish farmers suffered under the Ba'ath regime's structural scarcity between 1970 and 2003, the political landscape changed favorably after Saddam Hussein's fall. After 2003, the KRG gained considerable influence in Baghdad and Kirkuk, with Kurdish authorities directly governing Kirkuk between 2014 and 2017. In August 2024, the PUK regained political and administrative control in Kirkuk, which led to the removal of the Sunni Arab governor and the reversal of seven years (2017 to 2024) of land policies that favored Arab immigrant peasants.

In addition, Kurdish farmers have received direct support from the KRG and Kurdish political factions. For example, since 2014, a dedicated ministry established by the KRG, focused on disputed territories, has been tasked with protecting Kurdish identity. The PUK, which commands significant Kurdish electoral support in Kirkuk and other disputed territories, has established an attorney team to advocate for Kurdish farmers and help secure favorable rulings in land disputes. Furthermore, despite the lack of valid ownership documents, most Kurdish farmers successfully reclaimed their land after the fall of the Ba'ath regime in 2003. However, the failure of the Kurdish independence referendum in 2017 resulted in the loss of some villages, particularly along the borders of Arab-populated areas in which Iraqi security forces often backed Arab farmers.

The findings from the study's qualitative data, collected through interviews with farmer representatives and the KRG's Minister for the Disputed Territories, align with these quantitative data findings in specific ways. For example, qualitative data affirm the survey findings in that the interviewees generally agreed that structural scarcity in governmental land policies is ethnically and politically motivated. All parties also agreed that the present Iraqi regime's land policy remains the primary source of conflicts over agricultural land. Both qualitative and quantitative data indicate that identity-based tensions are another significant factor driving competition for agricultural land. However, notable discrepancies exist between the qualitative and quantitative findings about the role of environmental factors in land-related conflicts among farmers in Kirkuk.

In contrast to the results from the interviewees, the survey data illustrate that a notable segment of respondents (23 percent) attribute land disputes to environmental stress. This discrepancy can be explained by two key methodological factors in data collection. The first is survey structure: the survey employed guided questions with predefined answer choices, which allowed respondents to select from multiple options regarding the causes of conflict, whereas the open-ended interview questions asked participants to identify the leading cause of Kurdish-Arab land disputes without explicitly prompting them to mention environmental concerns. The second is the sampling approach: the snowball sampling method used to select farmer representatives significantly influenced the perspectives

captured in their interviews. These representatives actively participate in discussions and negotiations, strategizing how to address land disputes and developing a unified position to advocate for their farmers' rights. Whenever a conflict arises in any part of Kirkuk over agricultural land, non-Arab farmers' representatives collectively mobilize to show solidarity with their farmers across different regions. Such consistent coordination and shared advocacy have shaped their viewpoints, which became evident in conversations with them. Furthermore, their primary role involves representing farmers in governmental institutions, courts, and law enforcement agencies. As a result, their focus is predominantly on legal and administrative disputes rather than on the daily environmental stress farmers face.

The findings of this chapter and the study contribute to the ES literature, particularly by illustrating how state policies and resource scarcity exacerbate ethnic tensions and environmental stress. Barnett (2007; Barnett & Dovers, 2001) defines ecological insecurity as the vulnerability of ethnic groups to adverse effects caused by environmental stress, particularly resource scarcity. In Kirkuk, the Iraqi regime's denial of land and water access to ethnic minorities aligns with Barnett's concept, as it demonstrates how human-induced environmental degradation disproportionately affects marginalized communities in ways that increase their economic and social vulnerability. The conflict over arable land in Kirkuk closely aligns with the Darfur conflict, where state-induced structural scarcity, coupled with climate change, fueled communal violence between pastoralist and agrarian groups. In both cases, government policies manipulated land and water access, deepened environmental stress, and intensified ethnic competition over resources (Mazo, J., 2010).

The land conflict in Kirkuk, which exemplifies structural scarcity, also aligns with Ahram's (2021, 2015) analysis of state-induced environmental stress, particularly in the Ba'ath regime's destruction of Iraq's southern marshlands under the guise of economic development following the Iran–Iraq War. In both cases, the Ba'athist government employed land reform and environmental manipulation as tools of political control and demographic engineering; in short, it systematically restricted Kurds and Turkmens in the

north and the marsh Arabs in the south from accessing vital environmental resources. By viewing Kirkuk and the southern marshlands as anti-state spaces, the government perceived their populations as threats to regime security. As a result, it implemented environmental denial strategies such as diverting water through irrigation projects, draining marshes, destroying villages, and displacing rural populations into state-controlled urban areas. Although these policies were officially justified as economic development and agricultural reform, they primarily functioned as mechanisms for state consolidation, demographic restructuring, and the systematic denial of ES to targeted ethnic groups (Ahram, 2021, 2023).

In sum, this chapter explored the ongoing competition between ethnic groups over agricultural land in Kirkuk by tracing its origins to government-led land reform policies. The land reform policies of the 1970s played a decisive role in shaping current disputes by expropriating over a million dunams from non-Arab farmers and terminating their agricultural titles. The lands were then redistributed to Arab immigrants and state institutions such as the Ministry of Defense and the Ministries of Finance and Agriculture. State policies have historically manipulated land tenure by using land reform as a tool for demographic engineering and political control; these tactics remain the key drivers of current conflicts in northern Iraq. The findings of this study confirm that state-induced environmental policies (i.e., agricultural and land policies) have generated structural scarcity by imposing confiscation, denial, and uneven distribution of arable lands and that this structural scarcity has caused competition between Kurdish and Arab farmers over resources. Meanwhile, climate-induced water scarcity, desertification, and irrigation issues have exacerbated competition over agricultural land. Similar patterns can be observed in other contexts where centralized land policies have displaced marginalized communities, reinforced economic inequalities, and perpetuated long-term disputes over land access.

Beyond Kirkuk, land disputes in Iraq impact various communities, including Sunni landowners, Iraqi Christians, and other minority groups; sectarian, political, and legal manipulations often shape these disputes. The findings from Kirkuk, which align with

these cases, highlight similar patterns of structural scarcity, including capturing land and properties and revoking ownership. In Sunni-majority areas surrounding Baghdad, such as Tarmiyah, Taji, Madain, and the Baghdad Belt, Shiite militias have expropriated agricultural land by exploiting legal loopholes, particularly Law No. 80, which revokes agricultural contracts for uncultivated land (Al-Rafidain, 2024). These militia groups typically leverage informal connections with state institutions and local councils to exploit vulnerabilities. Establish laws and regulations to eliminate Sunni ownership rights to agricultural land, particularly in regions affected by displacement and armed conflict. The utilization of agricultural land has been prohibited. When agricultural landownership is eliminated, it is seized and allocated to individuals affiliated with the militias. This is frequently utilized as a residential project and subsequently sold.

Similarly, Christian communities have faced systematic land confiscation, particularly since 2003, and displaced Christian property owners have been unable to reclaim their assets. Reports indicate that Shiite militias have unlawfully appropriated approximately 60,000 Christian-owned properties, often using ideological justifications. Moreover, Christians have raised concerns over land confiscation by Kurdish authorities, particularly in Dohuk and Erbil, which prompted the Kurdistan Parliament to enact Law No. 5 of 2015 on the Protection of Minority Rights (Al-Kubaisi, 2025; The Kurdistan Parliament, 2015; Nabeel & Salloum, 2023). These cases suggest that the land conflict in Kirkuk—marked by state-induced scarcity, demographic manipulation, and legal restrictions—is part of a broader pattern of land disputes across Iraq that reinforces both environmental and governance challenges.

On a larger scale, the findings of this study align with historical and contemporary cases in which state-led land policies and environmental stressors have intensified communal conflicts. In South Africa during the 1970s, land centralization under the guise of economic development systematically stripped local communities of their customary land rights. The Unregistered Land Act transferred ownership to private entities for large-scale

commercial farming, while restrictive legal frameworks denied displaced communities legal recourse (McCarthy, 2003, 27; Mabin 2003, 14). Similarly, declining rainfall and desertification in Darfur reduced available pastureland, which heightened competition between pastoralists and farmers. Government-backed land policies further exacerbated these tensions by privileging Arab farmers while restricting pastoralist access to resources, which fueled territorial disputes and large-scale violence (Johnson, 2003).

The findings of this study support Homer-Dixon's theory of environmental scarcity, in which structural scarcity, as the outcome of state resource captures, shapes relations between groups and mostly leads to violent conflict. The case of agrarian reforms in Iraq exemplifies how land policies have served state interests and favored the dominant ethnic group while displacing and disenfranchising minority communities. This study also aligns with Gleditsch's argument that conflict and environmental stress interact with variables such as political structures, economic conditions, and historical grievances (Gleditsch, 2001; Homer-Dixon & Blitt, 1998). In Kirkuk, land reform policies framed as economic opportunity and agricultural development initiatives have been, in reality, instrumentalized by the Iraqi regime to dispossess non-Arabs of agricultural land.

While the findings largely support the environmental scarcity theory, they also introduce essential nuances. Homer-Dixon and Kahl emphasize that environmental resource depletion results from population growth (1991 and 2006), which is "natural/demographic-induced scarcity." However, this study demonstrates that structural scarcity (state and elite resource capture), the main driver of land competition among farmers in Kirkuk, is not based only on natural and physical shortages. Indeed, there is such scarcity for tenant farmers, but they have not benefited from land redistribution in northern regions. Instead, the main objective of land distribution has been to diminish the power and influence of tribal land oligarchs via land reform.

The state has controlled agricultural lands in northern Iraq, deliberately restricted them from the original farmers, and awarded them to the dominant ethnic group. All these efforts have created structural scarcity. Thus, the findings indicate that elites do not always frame resource capture as a response to scarcity. Instead, they justify redistribution, dispossession, and even destruction of resources under broader economic development and agricultural modernization agendas implemented to serve broader political and security agendas.

Chapter Six

Water Governance in Iraqi Environmental Federalism

6.1. Introduction

The scarcity of water resources in Iraq endangers the stability of the nation's social structure, economic development, and agricultural production. The country's competition for water resources between farming communities and provincial governments has become more pronounced. This competition is not only driven by physical scarcity but also by the historical failed water governance and the nature of the political system based on *Muhasasa*, which affects the implementation of water projects (Skelton, 2022; Mason, 2022). Water governance in Iraq is deeply complex, as multiple institutional and non-institutional arrangements are in place at local and regional levels.

Environmental federalism refers to environmental policy and governance between "federal, state, and local governments," which is at the core of these complexities (Gerlak, 2006; Percival, 1995, 1141). Water governance is both an opportunity and a challenge for state building, which is an expression of strengthening a state's legitimacy and capacity to rule and penetrate society.

Water governance can become a mechanism for conflict between the federal and regional governments if the water resources are ‘weaponized’ and actors exercise ‘hydro-coercion’ by restricting water flow downstream (King, 2021). It could also be an essential opportunity for political coordination and state institution-building in a fragmented federal system like Iraq. The increased autonomy of KRG would affect Iraq's water management strategy. The region gets the most rainfall in Iraq, and the Tigris River and several smaller tributaries from Iran pass through it. Thus, Baghdad must negotiate cooperative water-sharing governance with the KRG. The Kurdish water governance potentially exerts political pressure on the federal government by controlling environmental and natural resources (Forsythe, 2017, 179). In return, the federal government can exert pressure on the KRG by exercising its monopoly on constitutional and sovereignty powers.

Over the past years, the relationship between KRG and the federal government deteriorated, especially during the fight against ISIS and after the independence referendum in 2017. On top of that, pressure from neighboring countries like Iran and Turkey over transboundary rivers has only exacerbated this. Iran is the "source of about 10 percent of the water flow in the Tigris basin, on average" (Forsythe, 2017, 178). Water pressures from neighboring countries have affected federal relations in Iraq, particularly regarding water flow regulations from dams. Iran has limited water flow from the Little Zab River and Sirwan River, which enter Iraq via Kurdistan. This has affected the Dukan and Derbandikhan dams' capacity to supply sufficient water to downstream areas under the federal government, including Kirkuk (Hasan, Q.M. et al., 2023). The KRG and federal government have jointly and independently negotiated with Iran over water resources. The Iraqi Tigris water share is also directly affected by the Turkey irrigation and damming projects (the South-Eastern Anatolia Project, known as 'GAP,' which started in 1977) (Hasan, Q. M., Salar, S. G., Raman, D., Campbell, S., & Qasim Palani, I., 2023, 782). During the remainder of the Saddam years, Iraq continuously complained that Turkey was violating the 1987 water agreement and not providing enough water to Iraq. In a post-regime change in Iraq, the relationships further deteriorated, especially with the establishing of an oil pipeline between the KRG and Turkey, which affected the federal relations within Iraq (Dohrmann, M., & Hatem, R., 2014, 568).

The political system of Iraq maintained a strict centralized structure, which granted the federal government complete authority to decide on essential resource management, including water distribution. The 2003 collapse of the Ba'ath regime established a pivotal moment in Iraq's political transformation. In a federal system, water governance requires "collective action... because water connects social sectors, geographic regions, and stakeholders" (Grigg, 2023). The new 2005 Iraqi Constitution introduced "environmental federalism" (Bernat & Megdal, 2022) by granting the federal and regional governments the constitutional authority to handle internal affairs collectively, including water governance such as building dams, ponds, and irrigation systems, issuing regulations and policies. The Constitution requires water distribution equity and environmental policy cooperation to stop pollution between the federal government and the KRG. The

Constitution provision in Article 114 establishes joint authority between the federal government and regional authorities (Constitution, 2005). Yet, it reserves some critical water provisions for the federal government, including water negations and diplomacy. Even though the genuine cooperation between the federal government and KRG has remained limited, the parties could address water-related issues peacefully.

Water governance in Iraq has become a constant issue, whether between governments or provinces, groups, and tribes. Dramatic increases in Iraq's water scarcity make water governance a strategic issue, especially in a semi-arid region. Notably, the KRG enjoys an upstream position. The Tigris River's main tributaries, such as the Sirwan River, Little Zab River from Iran, and the Upper Zab River from Turkey, enter Kurdistan's territories and then flow to other parts of Iraq, especially Diyala, Kirkuk, and Ninewa. This flow of rivers through Kurdistan grants the Kurds de facto control over the primary water resources. Thus, geographical dominance over the rivers has given the KRG the upper hand to exercise hydro-hegemony (King, 2021, 80-84).

Another source of conflict is the development of water infrastructures like dams, ponds, and irrigation canals by the KRG, which are often built without the coordination and consent of the federal government. The KRG treats water governance as an opportunity to build a state and legitimacy, not just an exercise of its constitutional rights. The chapter examines the environmental federalism in Iraq by looking at the water governance between the KRG and the federal government in Baghdad and how water governance has affected the federal political dynamic in the country. The research investigates how KRG utilizes water governance to advance its state-building agenda and influence federal relations within Iraq. It also examines how contested ethnic communities in the disputed territories perceive the dynamics of water governance between the KRG and the federal government in Baghdad.

This chapter employs Daoudy's "negotiation-bargaining power" theory in the interaction of transboundary water resources between upstream and downstream countries (Daoudy, M., 2009). Daoudy's theory helps us understand how the KRG governs water

resources as the upstream actor for the state-building agenda and how the federal government uses bargaining power via “issue-linkage” to counterbalance the KRG's geopolitical advantage in environmental federalism. To address the research questions, this chapter utilizes a mixed-method approach, conducting interviews with three ministers from the KRG—specifically, those responsible for the environment, water resources, and agriculture. Additionally, interviews are conducted with the directors of the Dukan and Derbandikhan dams and the Director of the Agriculture Department in Chamchamal.

Furthermore, this chapter draws on the findings of the second Kirkuk survey conducted in February 2025 in Kirkuk and its districts. Findings from the qualitative and quantitative data indicate that the KRG is heavily involved in water governance for state building by exercising its upstream position, which enables the region to coordinate and interact with the federal government in water governance and encourages the federal government to employ "issue-linkage" strategy to counterbalance of KRG. The findings also show that despite seasonal technical disputes over water flow, there is no evidence of real conflicts between the parties over water resources. Finally, the data illustrate that even though communities slightly agree that water governance might contribute to disputes between the KRG and federal government, there is no strong belief that the regional government weaponizes water resources in Iraq.

6.2. State Power and Environmental Federalism

Upstream countries have imposed unilateral water policies upon downstream countries in the Middle East, like Turkey and Iran, versus Iraq and Syria, the Nile River basin countries, especially Ethiopia, Sudan, and Egypt (Williams, 2012, 21; Forsythe, 2017). Upstream countries reduce water flow from transboundary rivers by imposing unilateral decisions on water access by building water infrastructures and reducing or cutting water from downstream areas without consultation and agreement. This form of governance is often temporary, and although it may subjugate downstream parties, it undermines trust and coordination among parties in the long run and leads to reactions and conflict, especially within an (environmental federalism where ethnic politics might shape the

water governance) (Kehl, 2017). Weaker downstream countries can counteract the advantages of upstream geographic and material power, known as "asymmetric power," by linking water governance with broader political and security issues during water negotiations (Daoudy, M. 2009).

The dynamics of water governance between the KRG and the federal government in Iraq reflect the concept of internal "asymmetries power" within the framework of water "negotiation" between upstream and downstream countries (Daoudy, M., 2009). Daoudy (2009) develops a 'negotiation-power' theory in water governance among the Tigris–Euphrates basin states, mainly between Syria and Turkey, which provides an essential understanding of water governance in Iraqi environmental federalism. She applies the negotiation theory to the interaction between upstream and downstream actors by emphasizing how power dynamics can shape water negotiations between the parties. According to Daoudy, traditional forms of power, such as military and economic power and geopolitical (upstream) positions, are no longer the only source of influence; bargaining strategies and timing also matter. Thus, she claims that "power asymmetries do not necessarily determine the results of (water) negotiations" (Daoudy, M. 2009, 363).

Although upstream countries, like Turkey, might take advantage of its strong geopolitical upstream positions to affect the water negotiations, the weaker downstream countries, including Syria and Iraq as the co-basins of the Tigris-Euphrates Rivers, can strengthen their negotiating power by connecting water problems to larger political and security issues (Daoudy, M. 2009). The weak downstream countries can exercise bargaining power on strong upstream countries through what Daoudy calls "issue-linkage." Syria used this strategy as an "issue linkage" in its interactions with Turkey over water disputes in the 1980s-1990s. Furthermore, Daoudy (2008) argues that legal principles as a source of bargaining power, including international law and (constitutional powers and provisions in environmental federalism), can "influence the process of water negotiations and increase the legitimacy of downstream riparian's and enhance their bargaining position in negotiation processes." Although this strategy might strengthen the downstream

positions, it remains a "short-term" cooperation mechanism, as the real power comes from geographical and economic positions (Daoudy, M., 2008, 89, 90).

In the late 1980s to 1990s, the relations between Turkey and downstream countries, Syria and Iraq, deteriorated when the Turkish refused to share the Euphrates and Tigris water and introduced them as a Turkish river. Turkey's water infrastructural developments (GAP) have been perceived by downstream countries as "threats" because they cause a reduction in surface flows inside of Syria and Iraq (Daoudy, M., 2009; Gorvett, J., 1998, 33; Gleick, P. H., 2014, 334). In return, the downstream countries, mainly Syria, used some 'issue-linkages' in water negotiations, including exploiting "the Kurdish insurgency by supporting the PKK from 1984-1998, which impacted Turkey's security alternatives and brought the upstream riparian to sign the first bilateral water agreement in 1987, block international investment in the GAP via EU and the World Bank, link made with peace process in the Jordan Basin, (revive) historical claims on the Sandjak of Alexandretee-Hatay Province by Turkey" (Daoudy, M., 2009, 378; 2008, 91; Gorvett, J., 1998, 34). However, as Syria faced the civil war since 2011, the relations between the Assad regime and Ankara deteriorated, and the Kurds built a semi-autonomous region in the northeastern parts of the country; Turkey started to exercise hydro-hegemony again and emerged as the "latest weaponizer of water" in the Syrian conflict (Daoudy, M., 2020, 1362).

Another example is the water governance among the Blue Nile River basins, especially between Ethiopia, Sudan, and Egypt. The latest two countries, particularly the noncontributing country Egypt, historically consumed most of the water and, according to the 1929 Treaty between the United Kingdom and Egypt, had a "consent" of privileged power to prevent water infrastructural development on the Nile without its permission (El-Fadel, M., El-Sayegh, Y., El-Fadl, K., & Khorbotly, D., 2003; Milas, S., 2013, 1,109-110). However, Ethiopia rejected the unjust water distribution, as the country provides 80 percent of the Nile’s water, which has represented the source of the Egyptian-Ethiopian dispute, as the latter demands its natural rights to exploit its rivers, over which Egypt has assumed total control (El-Fadel, M., El-Sayegh, Y., El-Fadl, K., & Khorbotly, D., 2003,

111). For a long time, the Egyptians promoted a "war narrative" if the upstream countries began damming the Nile without their consent. Therefore, Egypt has used its material power (economic and military) and its relations with the British in negotiations to counterbalance Ethiopian geopolitical advantages (Milas, S., 2013, 79, 80, 168).

However, the Ethiopian government began the construction of the Grand Ethiopian Renaissance Dam (GERD) in early 2011, which is the largest water infrastructure project on the Nile River, as a part of the state-building process by the Ethiopian People's Revolutionary Democratic Front (EPRDF). The EPRDF adopted the federal system, believing that breaking away from the imperial past would strengthen its legitimacy and broaden its political agenda. Still, this system did not seem to work as violence erupted in 2005 (Verhoeven, 2021, 161-164; Wheeler, K. G., Jeuland, M., Hall, J. W., Zagona, E., & Whittington, D., 2020, 2). The Ethiopian perceives the GERD as an opportunity to create a new relationship between the state and its people – the process of state building – by "substantially reducing poverty and creating an atmosphere for social change" (Mulat & Moges, 2014) and to bring justice and equity in the management of the water resources (Verhoeven, 2021). The above examples manifest water governance between independent sovereign countries; however, this study applies the bargaining power theory to Iraq's environmental federalism and examines how KRG and GoI have governed water governance.

Environmental factors have consistently played a role in developing human institutions, including the structure of governance systems. In federalism, power-sharing and co-governance of resources are the primary mechanisms for conflict resolution (Reilly, 2007). Environmental federalism refers to the collective government of environmental resources by multiple institutions, such as water and air, not owned by just one group or region (Shobe 2020; Fox 2020, 134; Fox 2020, 134). It is about the question of "voice, accountability, autonomy, efficiency, and interdependence" (Ryan, 2017, 32) at different levels of government. However, studies illustrate the disadvantages of environmental

federalism. Implementing environmental federalism and deciding whether to centralize or decentralize environmental resource management have been influenced by environmental issues and raised questions on its applicability. Shobe, W. (2020) illustrated that environmental stress has created problems for regional governments. He argues that "environmental spillovers" have increased and crossed regional boundaries along with a growing population and consumption. Environmental spillover is defined as a "causal effect that one environmental behavior has on another environmental behavior" (Behn, O., Wichmann, J., Leyer, M., & Schilling, A., 2025, 3) or "as the desirable or undesirable impacts on costs and outcomes other than those targeted by the intervention" (Desterbecq, C., & Tubeuf, S., 2023, 1270), such as the impact of specific environmental policies by a regional government on other regions.

In federal systems, spillovers reduce the benefits of decentralized environmental resource management because "laboratory federalism as a common rationale for decentralization" (Shobe, 2020, 259) has been unsuccessful in practice. National policy also faces many challenges when regional governments have different environmental priorities. Shobe (2020) believes that regional governments' resource management has not been very successful, especially in some countries in the U.S. Thus, he argues that governing environmental resources via the federal government is better (Shobe, 2020).

Drawing on the previous analysis, the decentralized governance of environmental resources in a weak state (weak federalism) is also expected to be unsuccessful. Water governance in weak federal systems reflects a power relation between upstream and downstream governments. Rotberg argues that weak states like Iraq "typically harbor ethnic, religious, linguistic, or other intercommunal tensions" (Rotberg, R., 2003). Iraqi federalism is fundamentally asymmetric, shaped by ethno-sectarian arrangements recognizing only one regional government (KRG) and leaving the creation of future federal regions ambiguous (Popelier, 2021, 218-219; Bammarny, 2019, 270-272). The Iraqi government and KRG have had conflicts regarding resource management, especially oil and gas exports. Each side has bargaining power through different means.

The country's water governance system shows internal 'asymmetries' between the federal and regional governments. The KRG, as the upstream region, has de facto autonomy over most of the Tigris River tributaries in Iraq, including the Little Zab River, the Upper Zab River, the Sirwan River, and the Faysh Khabur River, and can influence water flows from rivers through damming, withholding water, and influencing regulating water policy in the central and southern provinces (King, 2015). On the other hand, the federal government maintains authority over national water policy and international water negotiations and possesses both institutional and financial power that enables Baghdad to regulate water infrastructural development and negotiations. The federal government can block funding and infrastructure development while using its alliance with neighboring countries to counterbalance the KRG's upstream advantages. This power imbalance shapes both the process and results of their water negotiations.

The KRG and the federal government can employ bargaining power according to their political interests. The KRG can delay its cooperation over water resources to receive concessions regarding long-term budget and oil export issues. In contrast, the federal government can exercise legal and financial powers to force the KRG to cooperate on water-sharing policy. In opposition to negotiations between sovereign upstream and downstream countries like Turkey and Syria, employing a bargaining power in Iraqi environmental federalism generates long-term water cooperation between regional and federal governments. The federal government has irresistible constitutional and legal authority over external water negotiations and policies; it's the sovereign and recognized actors that can receive or block international funds for the development of water infrastructures and can build alliances with neighboring countries, mainly Iran, to exert influence over the KRG for cooperation. Thus, this study argues that despite the poor coordination between the federal government and KRG over water resources and the various issues they tend to conflict with, they do not engage in deep conflict in governing water because the federal government possesses the bargaining power that is required to counterbalance the KRG's upstream advantages. Therefore, this chapter proposes a hypothesis as follows:

H. 8. If the KRG exercises upstream geographical power in governing water resources within Iraqi environmental federalism, then it mobilizes the downstream federal government's bargaining power and public opinions, undermining its internal legitimacy as a cooperative actor.

6.3. Historical Background of Water Governance until 1991

Until 1991, water governance in Iraq was a centralized matter and strongly linked to maintaining political control (Ahram, 2024)—regimes combined “despotic and infrastructure powers” to deliver service and construct water infrastructures across the country. The government perceived managing water resources and infrastructure as an approach to advancing agricultural reform and promoting social integration within the country; consequently, it exercised direct supervision over these projects. The regime showed zero tolerance towards any form of resistance or shared governance concerning water infrastructure. When faced with opposition primarily from Kurdish armed movements, the Ba’ath leaders resorted to military force. The regime extended hydropower through damming projects that justified a greater military presence in Kurdistan, which resulted in a destructing ecological system and genocide mainly against local agrarian communities (Ahram, 2023).

Water governance was a critical instrument for the British mandate in Iraq, particularly building “irrigation mega projects” as an economic and social development mechanism (Abdullah & Al-Ansari, 2021, 36). In southern Iraq, the development of new hydrological infrastructure enhanced trade and transportation and boosted agricultural production. In 1923, the GoI introduced the first law to protect and monitor irrigation and small dams. The law was in effect for four decades. It supported the state-building strategy by facilitating the expansion of state institutional authority, asserting sovereignty, building legitimacy, and weakening non-state governance of water resources. The situation in Kurdistan was different, as the region is ecologically diverse and upstream, so the Iraqi government relied on water supply from the area (Ahmmad, 2013, 194).

The British colonial administration maintained complete authority to manage water resources and irrigation development because they saw these resources as vital instruments for strengthening state authority and boosting agricultural output. The water governance system in Kirkuk operated as both an infrastructure network and a tool for political and demographic engineering. The Hawija Irrigation Project, constructed on the Little Zab River, supplied water to the Arab regions of Kirkuk. Karim Yildiz (2004) argues that the GoI built the project to serve imported Arab farmers in the region, where previously the area had suffered from a lack of water and agricultural problems (Yildiz, 2004, 205-206). This suggests that water management was largely centralized and politically shaped.

Most strategic water and irrigation infrastructure processes in Iraq and Kurdistan were carried out until the 1960s. In the mid-1950s, due to increased oil revenues, the GoI began to develop social programs to build economic and energy infrastructures. This, including the construction of dams and irrigation projects, became a priority for the regime. Although most projects were in the Middle Euphrates region, the government still began building dams on the Tigris River, including the Hawija Barrage, Al-Azaim Barrage, Khan Beni Saad Regulator, Nahrawan Canal, Dukan and Derbandikhan dams in Kurdistan and the Hamrin and Diyala dams in the disputed territories (Lebon, 1955, 56-57). When the Ba'athists took power, the Kurdish revolution against the government broke out again, and then conflicts with neighboring countries caused the suspension of water projects and constructions to remain uncompleted.

The development of water infrastructure and control of resources in the 1950s coincided with the policies of agrarian reform that were the demands of the middle class and small farmers in Iraq (see chapter five). When the Tamuz Revolution in 1958 broke out, efforts to control water resources increased because the leaders believed that controlling water would help them overcome the agricultural land oligarchs, whose land reforms and agrarian development they had always resisted. The government began to nationalize farmland and water governance, provide funds for projects, and eventually weaken the

hegemony of large landowners. In the north, the construction of the Dukan (1954-59) and Derbandikhan (1956-61) dams, which can store 3 and 7 billion cubic meters of water, respectively, began in the mid-1950s and are an essential source of electricity production. After the Ba'athists returned to power for the second time in 1968, a new ministry called the Ministry of Irrigation was established, road projects were extended to the northern regions, and electricity was generated from the Dukan dam to supply Kirkuk and Sulaymaniyah (Ahram, 2024).

As mentioned in the previous chapter, the issue of agricultural land reform and control of water resources was a point of contention between the GoI and armed Kurdish nationalists. Most of Mulla Mustafa Barzani's supporters opposed the reform policies as they had much to lose. In 1961, Barzani supported a tribal uprising against the Qasim regime. The regime's armed groups and tribes in Badinan opposed Barzani (Issaev & Zakharov, 2021, 35-36). From this point, the focus of the conflict shifted to targeting water infrastructures, such as dams. In September 1961, fighting intensified around Derbandikhan, with Iraqi forces attacking villages and tribal leaders close to Barzani. According to reports from American companies working on the project to the U.S. government, the attacks delayed the final stages of the dam's construction. But then, the GoI defeated Barzani's armed groups, and the project's construction continued (Ahram, 2024).

With the Ba'athists coming to power in 1963, the Iraqi government was fairly open to the Kurdish issue, and dialogue was established, but the threat to the dams continued (Bengio, 2012, 47). British officials feared attacks on dams by Barzani's fighters, given the unfavorable military situation for Kurdish groups. That year, British and American engineers warned officials about the threat to dams, notably the Dukan dam, which could halt oil activities and industry in Kirkuk. They also warned that the Derbandikhan dam "could be breached with small explosive charges … We believe that the Kurds who have worked on both these sites in skilled jobs are aware of the sabotage potentialities at Dukan and Derbandikhan. The Iraqis [too] seem to be equally aware of the danger" (Ahram, 2024, 5). Fighting between Kurdish groups and the government

persisted in 1965 in Penjwen, Derbandikhan, Qara Dagh, and the mountains west of Dukan dam. The Iraqi government established the National Defense Battalion (called Jash by the Kurds) to secure the Derbandikhan and Dukan dams, which are vital for political stability in northern Iraq (Ahram, 2024).

In the second phase of Ba'athist rule in Iraq from 1968, Barzani and the GoI held autonomy talks, leading to an agreement in March 1970 recognizing Kurdish rights. However, disputes over control of natural resources, particularly oil fields in Kirkuk, led to failed negotiations (Bengio, 2012, 49). The government agreed to keep Kurdish-majority areas autonomous, but demographic changes in Kirkuk led Barzani to reject the deal. In 1972, the government media accused Barzani of treason and sabotage by attempting to blow up dams, bridges, and power lines (Ahram, 2024). Saddam Hussein then announced the Autonomy Law No. 33 of 1974, which Barzani rejected. Although the law would allow the Kurds to govern their social and economic affairs with local budgets, it failed to satisfy Barzani, prompting him to seek other alliances with the Iranians (Yildiz, 2004, 18-21). The law granted Kurds significant governance powers over education, housing, agricultural reform, transportation, and communications. Still, it did not recognize their rights to govern environmental resources like water and energy. If the Kurdish agreement with the Iraqi government for autonomy had succeeded, it would have presented a valuable opportunity to develop economic infrastructure and resources, as the region was set to receive additional investment from Baghdad through an economic development plan considering Kurdish needs underdevelopment (Yildiz, 2004; Ahram, 2024).

The GoI continued to support economic development by focusing on infrastructure projects like new irrigation systems, which fostered residential area construction. In the 1970s, several major irrigation projects were completed, and a few were started in Kurdistan, including the biggest dam, Bekhma on the Upper Zab River in Erbil Governorate, which remains unfinished due to insufficient resource funds (Al-Dabbas. 2024, 64). The following table shows significant water infrastructures built and governed

by the GoI in Kurdistan while the regime was in military conflict with the Kurdish armed groups.

Table 6.1. Water Infrastructures in Kurdistan during the Ba'ath Rule

Irrigation Project	***Approx. Year(s)***	***Location***
Dibis	1965	Located in the north of the town of Dibis, in Kirkuk Governorate, on the Little Zab River
Shemamok Irrigation Zone	The 1970s (ongoing during the Ba'ath period)	Lowland area between Erbil and the UZR, north of Dukan dam
Zakho Irrigation Zone	1970s	Foothills near the Tigris River (Zakho area)
Sarisian Irrigation Project	The late 1950s (relocation started) intensified post-1975	Northeast bank of Dukan Reservoir; villages: Bardashan, Bemusha, Bengart.
Balanda Irrigation Project	1970s	Left bank of the UZR; areas including Amadia and Chalki
Penjwen Resettlement/Irrigation Area	1978 (mass relocation)	High mountains near the Iranian border, upstream from Derbandikhan dam
Kirkuk Irrigation Project	1975 (not completed, but now the new government is working on it)	In Kirkuk, it will be fed by the Little Zab River to provide water for the south and east of Kirkuk.
Bekhma dam	The site has been planned since 1940, and	It will be in Erbil and fed by the UZR, which will join

	construction began in 1988. However, it has not been completed due to a lack of funds after the outbreak of the Gulf War in 1990. Since 2003, there has been no agreement between KRG and Baghdad to complete it.	the Tigris near Mosul. The project aims to generate hydropower and supply water for irrigation to northern Iraq.

Source: Ahram 2024; Q.M. Hasan et al. 2023; Stansfield & Shareef 2017; Shaland, G., 2017.

The Iraqi government's hydrological reconstruction efforts in northern Iraq created conditions that led to the genocide of Kurds and the destruction of their villages. In the 1970s-80s, the Iranian regimes began arming the Kurdish armed groups against Iraq; in response, the GoI bombed many villages, evicted the people, and turned them into military no-go zones. Subsequently, in 1987-88, Kurdish villages were destroyed by order of Saddam's cousin Ali Hassan Majid, and the Anfal process began, which caused the genocide of between 50,000 and 180,000 people and the destruction of approximately 5,000 Kurdish towns (Yildiz, 2004, 25; Ahram, 2023).

During the 1980-88 war, Iraq and Iran “weaponizing water” infrastructure (Daoudy, M. 2020) constructed temporary dams, bridges, and barriers in southern Iraq. In the north, Iraqi dams became primary targets (The New York Times, 1980). Early in the conflict, Saddam aimed to bomb Iranian dams to disrupt electricity and inflict damage on cities. By 1986, Iraq planned extensive airstrikes on the Karoon and Dez river dams while also fearing attacks from Iran and Kurdish groups on northern dams, leading Saddam and his commanders to be vigilant against possible guerrilla strikes. In September 1986, Iran attacked the Dukan dam, cutting electricity to Kirkuk for days. To prevent further threats, the Iraqi government temporarily emptied the Derbandikhan dam. In mid-1988, Iran and

Kurdish groups attacked the Dukan dam and captured surrounding heights, facilitating their assault on the dam facilities (Ahram, 2024).

Furthermore, in early April 1988, the Iraqi forces could stop the joint Iranian and PUK armed attack on areas in the Sulaymaniyah region close to the Derbandikhan dam (Bengio, 2012, 182; Marr, 2018). The military operation to defend and retake the dam area demonstrated that Baghdad treated water infrastructure as vital national security assets and territorial sovereignty components. The dams and rivers required Iraqi control to maintain water flows to downstream areas while blocking enemy forces from using water resources (Ahram, 2024). The regime protected water sites against domestic and foreign attacks, reflected as part of its state-building approach to maintain control over vital environmental resources and block separatist movements while keeping environmental governance centralized in fragmented Iraq.

Despite the Anfal genocide in the late 1980s, the GoI remained committed to advancing water infrastructure, agriculture, irrigation, and energy in the 1990s. Several other dams, Bekhma, Badoush, and Baghdadi dams, were also intended for construction but were never built because of the Second Gulf War and the subsequent UN sanctions. These infrastructure projects have often been linked to efforts to control territories. The GoI later went back to work on the Bekhma dam in Erbil and invited foreign firms to help repair the damaged Derbandikhan dam, which shows the strategic importance of water infrastructure in the northern Iraq region (Q. Hasan, 2023, 115; Ahram, 2024).

6.4. Water Governance from 1991-2003

Following the 1991 Kurdish Spring Uprising and the creation of a no-fly zone in Kurdistan by Europe and the U.S., the Kurds created their first elected government and parliament. On November 14, 1992, the parliament adopted Resolution No. 34 to establish the

Ministry of Agriculture and Irrigation to assess and govern water resources and support farmers with seeds and assistance, marking a shift from revolutionary groups to governance after years of conflict (Kurdistan Parliament, 1992). The UN water and sanitation projects also impacted around 90 percent of villages in the region, and US-funded wheat gradually stimulated agricultural production for farmers (Natali, 2010, 30-32). The legal frameworks for water and aid indicated the KRG's infrastructural power in state-building by controlling environmental resources, reflecting a desire to strengthen autonomy and function as a de facto state in Iraq.

Political differences between the KDP and PUK hindered government decisions and lawmaking, leading to civil war in 1994. The conflict split the region into two zones: the Yellow Zone in Erbil and Duhok, controlled by the Massoud Barzani family (KDP), and the Green Zone in Sulaymaniyah and Halabja, led by Jalal Talabani (PUK). During the war, controlling water resources and infrastructure was crucial (Stansfield, 2013; Yildiz, 2004). The KDP seized the Dukan dam after Massoud Barzani invited the Ba'ath army on August 31 to expel Talabani. On October 21, 1996, the KDP, backed by Ba'athists, attacked Dukan and captured the dam, but the Iranian-backed PUK retaliated and forced the KDP to withdraw. Capturing the dam was vital for the PUK's plans to liberate Kurdistan, aiming to secure Ranya, Koysinjaq, and Qala Dize, thus forming a new frontline along Haibat Sultan mountain (Reuter, 1996; Deseret News, 1996; HRW, 1988).

The Kurds practiced independence while maintaining relations with Baghdad to foster economic and energy development. Despite internal divisions in Kurdistan, the KDP had closer ties with the Ba'ath, especially after the Iraqi army intervened in 1996 to support Barzani against Talabani. In the 1990s, Most negotiations between the Iraqi government and Kurdistan were unofficial and partisan talks between the Ba'ath regime and KDP and PUK separately. The negotiations also remain focused on establishing a federal region for Kurdistan, but efforts to establish a federal system were unsuccessful. Still, the two sides maintained strong interdependence. With Baghdad losing control, it relied on Kurdistan for oil exports to Turkey and water from Dukan and Derbandikhan for central

parts of the country. Conversely, Kurdistan depended on Baghdad for trade and electricity. This led to further impetus in the idea of federalism for Iraq, which the Kurds emphasized but Iraq feared (Bengio, 2012, 251). The administrative division and military conflict not only prevented the management of water resources from being on the government's agenda but also caused delayed state-building in the region (Natali, 1999, 2010). Thus, no real negotiation and institutional mechanisms are available to be mentioned on water governance in the region, apart from the fact that water infrastructures remained as military targets during the civil war, and PUK administrations understood water exchange to trade with Baghdad.

6.5. Water Governance in the Kurdistan Region from 2003-present

The collapse of the Ba'ath regime in 2003 brought a vital chance to establish environmental federalism in Iraq while providing the KRG with constitutional authority to govern water resources in its territory. The Constitution recognizes the KRI as a federal, regional government through Article 117 and Article 114; paragraph 7 requires federal and regional governments to work together to establish water policies that aim to distribute water resources fairly throughout the country. Article 110, paragraph 8 of the Constitution, enables the federal government to maintain control over water governance and policy externally and negotiate with neighboring countries (Constitution, 2005; Bammarny, 2019). The Constitution establishes specific barriers for the KRG to directly manage water negotiations and management with neighboring countries while maintaining its authority to develop water policy within its territories.

Water governance in KRI is solely the KRG's responsibility. Abdul-Satar Majid and Begard Talabani (2025), former ministers of the MoAWR from 2010-2018 and 2018-present, respectively, along with Dara Saeed, former KRG Minister of Environment from 2006-2010, told the author that the region has the constitutional right to create its water policy and develop infrastructures, including building dams and ponds. For instance, the

MoAWR and Ministry of Environment planned 18 major and medium dams in 2010 without consulting federal approval. The KRG eighth cabinet from (2018-2024) proposed 14 strategic dam projects again without coordination with the federal government (Rudaw, 2019). The lack of coordination with Baghdad stems from KRG's constitutional right to develop its water policy internally. More recently, the KRG's MoAWR 2022 announced the signing of a memorandum of understanding with the Chinese company 'Power China' to build four new dams in the region without coordination with the federal government in Baghdad.

However, the federal government has used its bargaining powers in negotiations with the KRG over water governance. According to Begard Talabani (2025), the federal government (federal government) has cut funding for water development projects, including the construction of dams and ponds in the region. This has hindered the KRG's access to any internationally allocated funds for Iraq. The director of the Dukan and Derbandikhan dams reported to the author that the federal government had also cut salaries for employees, which the GoI previously provided until 2018 since these employees are classified as federal workers. Furthermore, Majid (2025) informed the author that in 2017, the federal government utilized its relationships with neighboring countries—notably Iran and the UN—to exert pressure on the KRG following a decision to restrict water flows to downstream areas.

On the federal government has rejected the KRG's dam project, in April 2022, the GoI's MoWR reported that "the construction of the four dams will have significant negative impacts on water resources in Iraq, particularly the Tigris River… (and stressed that) the KRG is required to either withdraw from the construction of these dams or construct them according to a plan coordinated with the Federal Ministry of Water Resources, as it is responsible for managing the water issue in Iraq" (Salem, Z., 2022).

On the parliamentary level, Rafiq Al-Salihi (2023), a member of the Iraq Parliamentary Agriculture and Water Committee, described the KRG dam projects as having

"catastrophic consequences." He mentioned that “if the region continues to build dams on the Tigris River, this poses a threat to Iraqis' water and food security…(and) asked the federal government to intervene urgently to prevent the construction of small and medium-sized dams by the region, which does not have the authority to build them without Baghdad's approval" (Francis, B., 2023).

Table 6.2. Status of Dams and Ponds in the Kurdistan Region

Category	*Completed*	*Under Construction*	*Proposed*	*Total (Planned + Existing)*
Dams	25	12	42	79
Pounds (Ponds)	103	56	46	205

Source: Draw, 2025.

Furthermore, there have been disputes between the GoI and the KRG over the completion of some strategic water infrastructures initiated by the Ba'ath regime. The largest dam in Iraq, the Bekhma dam, has been in the working stages since the 1970s and is situated on the Upper Zab River in Erbil province. Planning for the dam began in the early 1930s during the monarchy, and about 35 percent of the project is reportedly complete. After the fall of the Ba'ath regime, the GoI resumed work on the project, but it has not yet been implemented due to disagreements between Erbil and Baghdad. There are several explanations for the suspension of the project and the disappearance of the equipment: Fouad Siddiq, in his book Crisis of Reason – ازمة العقل, points out that after the 1991 uprising, the PUK and KDP sold the dam equipment to a Kurdish investor, and he smuggled them to Iran for sale (Draw, 2022). There is limited public information available regarding the disputes over the dam. During an interview with the KRG Ministry of Agriculture and Water Resources (MoAWR), Begard Talabani declined to comment on the matter. During his tenure as a minister, Majid stated that no funds were allocated to

address this project, which is classified as a federal initiative. He noted that Baghdad has expressed a commitment to see it completed. Additionally, he mentioned that some of the challenges are related to the need to evacuate the area, as there is now a substantial population living there (2025).

Although the dam will also benefit the northern provinces, as it will irrigate the Erbil plains and meet part of their electricity needs,

> Kurdistan has objected to it and raised doubts about it, claiming that it will submerge villages and swathes of land, dividing the region into two separate parts, according to press sources. However, these sources cited other reasons for the Kurdish objections related to compensation for the land on which the dam reservoir will be built, which belongs to owners from the Barzani clan. The influence of this clan has prevented the resumption of work on the project. (Yaqin News, 2021)

Lastly, the federal government has limited involvement in water infrastructure operations in Kurdistan because dams fall under the KRG's constitutional authority.

Sometimes, intergovernmental disputes arise over water flows from dams, which caused the federal government to exercise bargaining powers to counterbalance the KRG upstream advantage. Majid and Saeed (2025) informed the author that the GoI annually requests more water from February to May. Iraq's central and southern regions experience low rainfall, and the rainy season ends early. Agricultural irrigation depends on water from the upstream dams. However, the KRG must reduce river water flow to increase dam storage levels for irrigation and electricity generation during the summer. Kochar Jamal (2025), director of the Dukan dam, told the author that the problems between the two governments are technical. The seasonal mismatch between water needs and supply availability poses a significant governance challenge for water management between the KRG and the GoI.

The KRG stores water during the wet months (December to March) because it requires this supply to irrigate farms and generate electricity in the summer. The KRG often constructs dams unilaterally to safeguard seasonal waters. The differences reflect ecological variations and conflicting governance strategies within Iraqi environmental federalism. According to Saman Ismael (2025), the director of Derbandikhan dam, annual meetings occur at the federal government MoWR and the Directorate of Dams in KRI at the beginning of the summer (May) to negotiate water distribution. This illustrates how both governments employ institutional mechanisms to manage water resources rather than exercising 'issue-linkage.'

Political situations in Iraq have allowed the KRG to exercise water governance beyond its constitutional boundaries. It has actively and diplomatically participated in water negotiations. According to Saeed (2025),

> Until 2017, due to significant turmoil in Iraq, the KRG was directly involved in environmental negotiations with NGOs and foreign state donors without consulting the GoI. Baghdad's security and political environment sometimes dissuaded foreign states and organizations from implementing environmental and irrigation projects there. Consequently, they engaged directly with the KRG to execute their projects, which created a crucial opportunity to solidify sovereignty over environmental resources.

The KRG has used this opportunity to present the water and environmental issues in the region and requested assistance. Subsequently, the KRG received support primarily from INGOs and EU countries, mainly Germany, for building irrigation systems. This engagement represents a form of de facto recognition of its capacity as a legitimate partner in environmental resource management, even in the absence of the GoI. External support enables the KRG to govern through institutions rather than coercion, reinforcing Mann's idea that infrastructural power is essential to modern statehood.

The KRG has negotiated water issues with upstream countries like Iran after deteriorating GoI-KRG relations over water flows to downstream regions. This includes the KRG directly negotiating with Iran to address water issues stemming from transboundary rivers such as the Little Zab River and the Sirwan River. In July 2017, just before the independence referendum, the KRG-MoAWR decided to reduce water flow to downstream areas in response to Iranian water pressure. This negotiation occurred after the federal government complained about KRG's water restriction due to the Iranian water policy over transboundary rivers.

The KRG's move prompted the UN and Iran to negotiate directly with Kurdistan. According to Majid (2025), who made the decision, the Iranians came to negotiations with KRG based on the GoI request because the federal government perceived the KRG's decisions as a reaction to Iranian water pressure on the country. Majid recounted to the author a story of Iranian involvement:

> A few days after the water cut, the Iranian consul in Erbil visited the KRG-MoAWR and informed me that he had a message from Qasem Soleimani, the former commander of the IRGC, who was then [purportedly] recognized as the de facto ruler of Iraq. The message expressed Iran's concern about the KRG's decision to cut water from dams to downstream areas, indicating that the KRG aims to create a negative perception of Iran in the country by blaming Tehran for the problem. This issue needs to be solved immediately. The consul also mentioned that Soleimani has invited you to Tehran to discuss the matter… However, I declined the invitation until the water flow from the rivers into Kurdistan was normalized. The same day after the meeting, Iran started the water flow into the rivers, and a few weeks later, a delegation from the KRG visited Tehran, and an agreement on the river's water flow was reached. (2025)

The KRG's action contested environmental federalism principles because this system depends on coordinated governance between different levels of government, which must maintain equality in their decision-making processes.

Furthermore, every federal delegation that discusses water issues with neighboring countries includes a KRG representative. The GoI has also invited KRG representatives to participate in international and regional conferences and meetings on environmental changes and Iraq-related issues. Begard Talabani (2025) pointed out that, despite this, the KRG receives little support from the federal government in environmental and water governance. She stated that the KRG has not received environmental protection or water development funds from the federal government. Nor has the GoI assisted the KRG with dam maintenance, and there is no formal cooperation mechanism.

Begard Talabani (2025) pointed out that since 2018, an inter-ministerial committee was established to address water and agricultural issues. The two ministers are members of this council, which meets on an as-needed basis, particularly in the event of disputes over water allocation or issues related to agricultural coordination. This is a critical reflection of intergovernmental coordination development and an essential recognition of the KRG's role as an upstream actor in governing water resources. It also provides an opportunity for KRG to increase its diplomatic capability and indirectly govern environmental resources that cross the administrative boundaries of the region.

The KRG's water governance also expands to disputed territories without official sovereignty control. Since 2003, the KRG has built villages, schools, roads, and water infrastructure. The latter includes several strategic water projects built after 2010, especially in Kirkuk, such as the Khasa Dam, also known as the Kochak Dam. Majid (2025) told the author that KRG allocated 11 billion Iraqi dinars to complete several projects, one of which was the Khasa dam in 2013, which is used for water storage and irrigation. The KRG also built the Qadir Karami Dam from 2013 to 2017, which the KRG directly manages. In addition to the dams, the KRG has built several small and medium

ponds between the villages for the everyday use of village farmers, including one pond in the Takya district and two in the Shwan district.

Furthermore, Mohammed Hassan (2025), the former director of agriculture in Chamchamal, told the author that despite the construction of water projects in the disputed areas for farmers, the KRG has also established agricultural offices in every district of Kirkuk province, such as Shwan, Qara Hanjir, Laiylan, Qadir Karam, Prde (Altun Kupri), and Sargaran. The federal agrarian buildings in Kirkuk also house an office representing the KRG's agriculture department, which operates under the Chamchamal and Erbil Agricultural Directorates. The KRG offices support farmers alongside the federal offices by delivering agricultural aid, providing equipment for irrigation system repairs, and supplying diesel generators for villages to pump water from wells for farm irrigation and livestock.

The water infrastructure is a claim-making instrument in disputed territories because it allows the KRG to demonstrate governance capabilities before it (potentially) gains legal control. Thus, while it lacks official control of disputed territories, the KRG exploits water infrastructure as a significant tool for state-building through both pragmatic purposes and symbolic meaning. By building dams and ponds in Kirkuk, the KRG exercises sovereignty and displays its ability to implement policies across territories. The KRG enhances its internal national aspirations even before establishing territorial control and sovereignty in the disputed territories through state-like functions.

6.6. Analysis and Interpretation of Findings

6.6.1. Findings From Qualitative Data

The findings in this chapter stem from two main data collection approaches. The research includes semi-structured interviews with three KRG ministers: Begard Talabani, the current KRG MoAWR (2018 to present); Abdulsatar Majid, the former KRG MoAWR (2014 to 2018); and Dara Saeed, the former KRG Minister of Environment (2006 to 2010).

The author also interviewed the directors of Dukan and Derbandikhan dams, Kochar Jamal and Saman Ismael, respectively. In February 2025, a quantitative survey was run in Kirkuk to gather opinions from 400 participants about water governance and resource management. The following discussion examines the hypothesis presented in this chapter. The findings show:

1. There is no evidence of significant conflict between the KRG and the federal government over water governance. The three ministers mentioned that "the KRG is committed to exercising its constitutional rights to govern water resources, and the GoI respects these constitutional rights. The KRG also participates in negotiations on water issues with neighboring countries and international agreements alongside Iraqi delegations" (Saed, 2025).

2. The KRG and the federal government have periodic disagreements over the annual volume of water released from the Dukan and Derbandikhan dams. According to Jamal and Ismaiel (2025), "These disagreements are mainly due to differences in seasonal timing. The rainy season in the middle and southern Iraq ends before Kurdistan, typically around February, but this is an active water storage and rainfall period for Kurdistan, which causes differing opinions about the appropriate amount to release during this time." The coordination mechanisms handle such disputes, especially the joint committees with ministers and technical representatives from the KRG and federal government. The committee functions as a negotiation platform that enables the parties to create agreements that prevent conflicts from escalating.

3. The KRG has the full right to govern water resources within the region, such as constructing dams, ponds, and irrigation systems, formulating water policies, regulating water distribution, and allocating the budget. Nevertheless, Begard Talabani (2025) claims that "it has not built irrigation projects on the shared rivers to avoid influencing water flow to downstream areas." In turn, the federal government exercises its constitutional right to negotiate and enter into

agreements with neighboring countries on water security in the transboundary rivers. The KRG has also sometimes held direct talks with neighboring countries, such as Iran, on water issues and agricultural exchanges, but the federal government has not resisted these moves.

4. The KRG has not limited water governance to its official borders but has built dams, ponds, irrigation projects, and rebuilt villages in contested areas like Kirkuk. It has also established the KRG's Agriculture Offices in the regions to assist Kurdish farmers and coordinate with the GoI offices.

5. Since the fall of the Ba'ath regime, the KRG has only once decided to cut the water flow to downstream regions under the GoI Iraq, including Kirkuk, due to Iranian water pressures on the Little Zab River and Sirwan River in 2017. According to Majid, who made the decision, "The aim was to send a message to the federal government to take its responsibility to protect Iraqi water security rather than weaponizing water resources. (nevertheless, some might interpret these measures as a type of water weaponization, which brought to light the contentious nature of environmental governance and legitimacy within Iraq's environmental federalism)." The KRG dam projects remain a topic of debate, but the federal government has not considered them a security threat because they have not disrupted water flow in downstream regions. Recently, the GoI decided not to pay employees working at the KRG dams. While this decision seems to stem from a lack of direct control over the dams, the directors informed the author that it relates to broader financial and salary disputes between the two governments.

These findings support the chapter's hypothesis that, by avoiding hydro-hegemony, the KRG prevents the federal government from leveraging its bargaining powers. Compared to energy and financial affairs, the KRG-GoI relationship has not involved conflict over water resources. Yet, halting the federal funding for maintaining existing dams and supporting the potential damming project is a clear example of the federal government's

bargaining power in its negotiations with KRG over water resources. The GoI also leveraged its alliances with Iran and the UN to discourage the KRG from pursuing hydro-hegemony in 2017. At the federal government's request, Iran negotiated with the KRG; however, the KRG refused to allow the normalization of water flow to downstream regions until Tehran amended its water restriction policies concerning the KRG. This case aligns with the example of Syria when it “linked the agreement on the Jordan water with a pressure put on Turkey over the Euphrates water” (Daoudy, M., 2009, 379).

Furthermore, Majid, who met with the UN delegation, told the author that the GoI asked the UN to intervene and inform the KRG about the federal government's international legal rights over water resources as a sovereign nation. Thus, the KRG is unlikely to take a risk of exercising hydro-hegemony given its longstanding “seeking for regional and international recognition” (Voller, Y., 2014). By asking the UN to mediate the issues, the federal government illustrates its “legal principle,” which is another element of bargaining power that increased the legitimacy of the GoI as a downstream riparian (Daoudy, M., 2008, 89). In summary, the GoI could strengthen its bargaining power by mobilizing external alliances (like Iran) and leveraging its legal principle through UN involvement and constitutional authorities. The GoI’s reluctance to finance dam projects (and dam employees) in the KRG further increased its bargaining position despite being a downstream actor and, thus, incentivized the KRG to refrain from pursuing hydro-hegemony.

Nevertheless, the findings indicate several limitations in Iraq's environmental federalism: the GoI "does not provide financial and technical support for water projects and infrastructure in the KRI except in emergencies, e.g., earthquakes” (Jamal, 2025). For instance, in November 2017, a powerful earthquake struck the KRG, damaging some parts of the Derbandikhan dam. The federal government allocated $3.33 million, while the KRG contributed $1.26 million for the dam's reconstruction efforts. (K24, 2017; Mohammed, 2017). In addition, the KRG's unilateral decision to cut water from dams in 2017 in downstream areas due to Iranian hydro-coercion indicates that there is always a

potential for implementing despotic measures when political disputes weaken government coordination. This will harm environmental federalism in Iraq, especially in times of political crisis and conflict. However, the federal government's bargaining power has demonstrated that, like the independent state, the enhancement of the upstream position of the regional government is restricted. Nevertheless, it can operate effectively within the framework of environmental federalism.

6.6.2. Findings From Quantitative Data

The quantitative survey asked participants two related questions about water governance between the KRG and the federal government. Q. 18 (see the appendix) inquired about the role of water governance in creating intergovernmental tensions in Iraq. Additionally, the survey requested participants to assess the likelihood of the KRG weaponizing water resources and infrastructure against downstream regions governed by the federal government. The survey employed a 1-5 Likert scale where one represented Strongly Agree and five indicated Strongly Disagree to measure participant responses.

Question 18's non-Kurdish respondents agreed with the assertion that water regulation causes interstate tensions in Iraqi environmental federalism, as indicated by their average score of 2.73. This stance aligns with their downstream stance and how they see matters from the federal government's standpoint. Given its unilateral moves, the KRG's water policy and laws may be seen as a forceful approach to establishing a state and consolidating autonomy. On the contrary, the Kurdish opinion indicates a slightly higher mean score of 3.03, indicating their views are close to neutral. This suggests a level of unilateral legitimization of water governance by the KRG. The combined mean across all participants is 2.83, indicating mild agreement overall. More importantly, the difference between the two groups is statistically significant because the value of $P = 0.007$ suggests that ethnic identity plays a vital role in shaping perceptions of how water resources are governed in the context of environmental federalism. The table below explains the views

of the ethnic groups on KRG water governance and the potential for conflicts with the federal government.

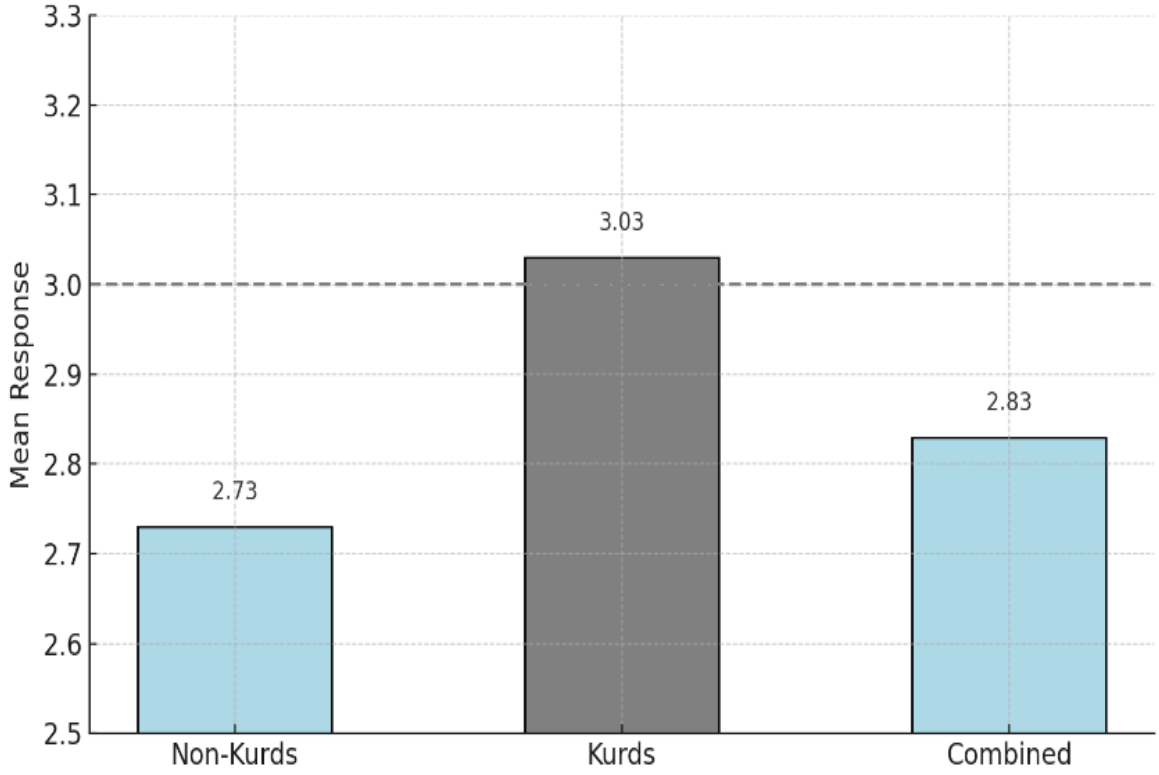
Table 6.3. Perceptions of Ethnic Groups on Water Governance and Intergovernmental Tension in Iraq

Group	*Obs.*	*Mean*
Non-Kurd	268	2.73
Kurds	139	3.03
Combined	407	2.83
Diff		-0.30
p=value	0.007 This is statistically significant	

This finding supports the hypothesis that the opinions of non-Kurdish participants indicate that the KRG's water governance, due to its upstream position, could increase the risk of conflict with the GoI. However, the Kurds' opinions are more neutral; they are uncertain whether the KRG's water governance leads to intergovernmental tensions, which contradicts the hypothesis. This opinion is possibly driven by two factors: the first stems from the ethno-nationalist sentiment that the Kurds perceive the KRG water governance as a legitimate state-building right. The second is driven by the KRG's ability to expand its infrastructural powers to the disputed territories by building water projects and establishing agricultural offices to address the needs of Kurdish farmers.

The following figure shows the understanding of ethnic communities in Kirkuk on water governance by the KRG and potential intergovernmental tensions with the federal government in Baghdad.

Figure 6.1. Perceptions of Ethnic Groups on KRG Water Governance and Intergovernmental Conflict.



Q. 19 (see the appendix) asks whether the KRG weaponizes water resources and infrastructures against downstream areas, including Kirkuk, during a political crisis with the federal government. The findings here reflect uncertainty and a consciousness of public understanding. There is no meaningful difference between Kurds and non-Kurds on this question; both groups express uncertainty or mild skepticism about the idea that the KRG would use water as a political weapon. Non-Kurdish participants scored 2.96, but Kurdish respondents scored slightly higher at 3.11, which put the opinion of both groups at the level of neutrality and uncertainty. The combined mean score is 3.01, and the difference between the two ethnic groups is not statistically significant, as the value of P=0.193. This suggests that neither ethnic group believes that the KRG will weaponize water against GoI-controlled downstream areas. In other words, participants across all ethnic groups are uncertain about using despotic measures for water governance. Although some participants may think that using water as a weapon may be a potential strategy at some time, it is generally an unexpected move. The table below shows the

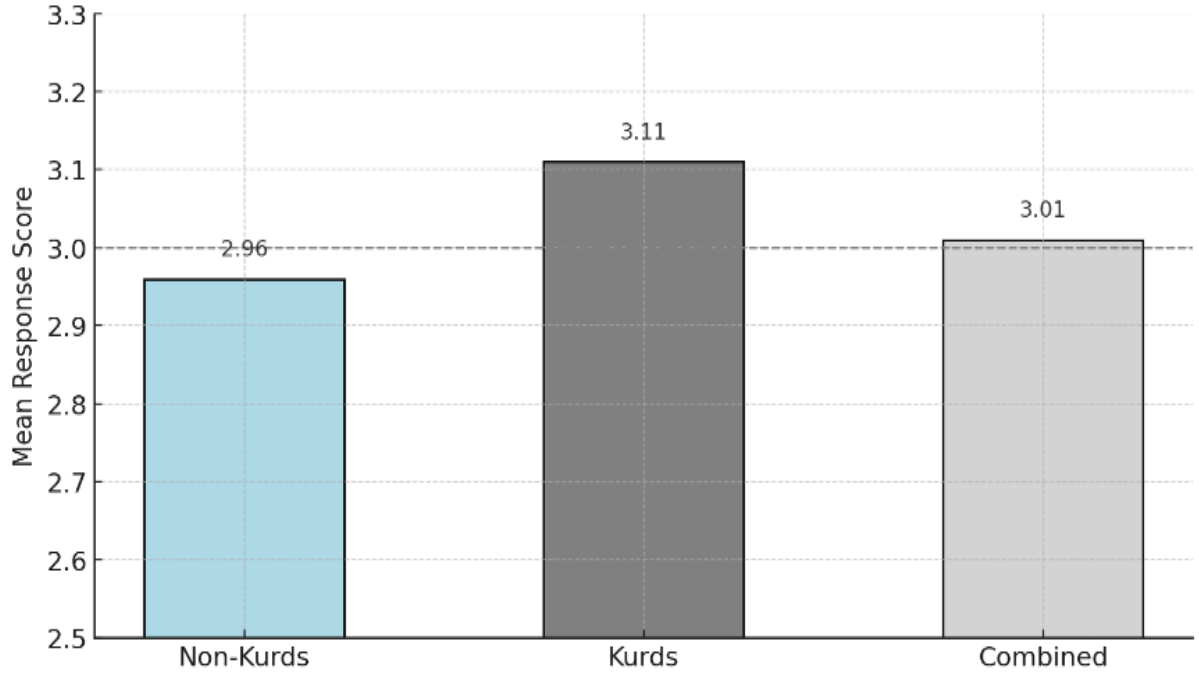
views of ethnic groups in Kirkuk on water weaponization in Iraqi environmental federalism.

Table 6.4. Perceptions of Ethnic Groups on KRG's "Water Weaponization" in Iraq

Group	*N*	*Mean*	*Std. Dev*
Non-Kurds	268	2.96	1.07
Kurds	139	3.11	1.22
Combined	407	3.01	1.12
P-value		0.193	

Regarding the KRG's use of water as a weapon, the following figure displays the perspectives of several ethnic populations in Kirkuk.

Figure 6.2. Ethnic Perceptions of KRG's "Water Weaponization"



The study reveals that water governance within the framework of Iraqi environmental federalism results in intergovernmental tensions, particularly impacting non-Kurdish participants. The consensus among the public is that the theory of water being used as a weapon lacks strong support. The noted difference reinforces the idea that the KRG's water governance system has not resulted in significant conflicts with the federal government.

In conclusion, the findings are linked to Daoudy's 'bargaining power' theory, which states that weak downstream countries can counterbalance the asymmetric power of the upstream actors by employing several strategies, including mobilizing external allies, exercising legal principles, and applying financial pressures. This is especially true of water governance in environmental federalism, where the federal government is expected to fund development projects.

Notably, the findings of Q. 18 non-Kurdish participants believed that the KRG's governance of water resources may contribute to tensions between it and the federal government in Baghdad. In contrast, the views of Kurdish participants on water governance by the KRG are neutral, which suggests that they are less likely to perceive it as a source of tension. Regarding Q. 19, both Kurdish and non-Kurdish perceptions of water weaponization by the KRG are impartial as they are uncertain that the region exercises such a strategy in its relations with the federal government. Although cutting the water from rivers and dams represents the potential exercise of non-institutional mechanisms in water governance, the results show that no ethnic groups believe that the KRG weaponizes water resources. This is an intriguing connection between what people experience in downstream areas and what the government and officials practice in the KRI.

These findings contradict all literature on water weaponization, which claims that upstream actors, whether state or non-state, tend to weaponize water resources to advance political and military agendas. However, KRG's water governance as an

upstream actor in the Tigris basin reveals that while local communities may profoundly disagree on environmental governance, it is also possible for more coordination to occur at the policy and elite levels of governance. This has a negative meaning as it shows a disconnect between what the population thinks of and that the political elites do not reflect what the grassroots feel.

While significant problems exist between the KRG and the federal government on issues such as oil, gas, and borders, contrary to the author's thought, water governance has not been a serious problem. Therefore, the significance of these results is that they contradict the more geographically focused literature and claim that upstream actors have always exercised hydro-coercion against downstream areas (Zawahri, 2017, 162; Forsythe, 2017). Another significant finding is that although some politicians and media figures claim that the KRG should take advantage of its upstream position and use water as a weapon in political issues to compromise Baghdad on suspended issues like oil exports, in practice, the KRG pursues a different approach to its relations with the federal government through coordination and interaction in governing water resources.

Conclusion

Iraq is one of the countries in the Middle East facing major environmental crises, particularly water scarcity, drought, and desertification, among other issues such as misgovernance, corruption, political and security instability, war, and conflict. That has greatly exacerbated the effects of environmental degradation. However, the historical state environmental policies have contributed to structural violence and increased conflict among ethnic groups over ecological resources. This dissertation examined the complex relationship between environmental security and communal strife in Iraq, particularly in the disputed areas such as Kirkuk, an ethnically divided community. There has been societal and governmental conflict over governance, natural resources such as oil, territorial sovereignty, and identity-based claim over city ownership. These areas have experienced significant environmental scarcity, mainly water shortage, desertification, and drought. Ethnic farmers, villagers, and herders have been competing over access to arable lands and water resources, increasing the risk of communal conflict.

This dissertation utilized a mixed method that included three major surveys in Kirkuk in 2023 and 2025 and Garmian in 2023. The survey involved roughly 2,000 respondents, and the regression analysis technique was used to measure the perceptions of environmental security among groups.

It also relied on semi-structured interviews with ordinary people, farmers, politicians, and bureaucrats to investigate the impact of ethnicity on understanding of ethnic communities over environmental factors such as water scarcity and problems of arable lands. In other words, to examine the interaction of ethnic, racial, and political dynamics in Iraqi disputed territories. Using surveys and interviews in conflict zones and divided societies like Iraq helped show how important and influential mixed methods are when both statistical patterns and narrative interpretation can capture the truth of events.

The dissertation's broader puzzle was what happens in ethnically divided societies when they face environmental insecurity, especially water scarcity and land appropriation. The extent to which ethnicity affects the response of ethnic groups to ecological security. Can ethnic groups cooperate to cope with degradation? In light of EP, this study hypothesized that when ethnic groups in a divided society face environmental stress, they will cooperate in facing this common threat. However, the findings showed that the structural environmental scarcity, which is the product of the Iraqi state's discriminatory and oppression policies against minority groups such as Kurds and Turkmen in the past, has prevented any cooperation among ethnic groups over environmental issues. The groups are not likely to coordinate over ecological insecurity.

The study measured the views and understandings of ordinary people—the grassroots—to understand the impact of ethnic conflict on environmental security and the issue of environmental governance via authorities to which people turn to address their environmental problems. These included formal authorities like the GoI and the KRG and social and customary authorities such as tribes, sheikhs, political parties, and even militias. The findings elucidated people's views on environmental security, which are divided at the grassroots level, with Arabs and Kurds looking at environmental issues from different directions. These ethnic groups have different opinions on choosing the authority to govern environmental resources. Furthermore, the study explored the views and understandings of politicians and bureaucrats in KRG by conducting interviews with several KRG ministers, directors of water and agricultural offices, and directors of dams in the region. These interviews illustrated different understandings of environmental security at the elite and political levels compared to the grassroots level, especially regarding environmental federalism in the country. The view of politicians and bureaucrats on environmental governance and coordination between the KRG and the GoI was that, despite the deteriorating intergovernmental relations due to political, constitutional, and financial issues, the two governments do not have a significant conflict over water resources. Although the GoI's coordination and assistance to KRG in governing and building dams and environmental infrastructures remains limited, the KRG does not exercise hydro-hegemony by withdrawing water resources.

The environmental security literature argues that scarcity of environmental resources such as water and agricultural land and climate change-related issues such as drought, low precipitation, and desertification generate conflicts. Thomas Homer-Dixon, Colin Kahl, Jon Barnett, Peter H. Gleick, Joshua Busby, and many others believe that environmental resource scarcity generates competition among groups, leading to conflict.

According to Homer-Dixon, a well-known environmental security specialist, the scarcity of natural resources such as water and agricultural land leads to various conflicts, including ethnic conflicts, interstate conflicts, and even civil wars. This dissertation is based on Homer-Dixon's theory, which is where this dissertation is founded. He introduced three types of environmental resource scarcity that lead to violent conflict: supply scarcity, which expresses the physical depletion of environmental resources; demand scarcity, which represents the lack of environmental resources to meet people's demands due to population growth. However, the other type of ecological scarcity is "structural scarcity," which causes conflict between groups due to a resource capture by the state and dominant ethnic groups. Sometimes, the state takes over water and land resources under the pretext of scarcity, which is indeed aimed at depriving minority groups. Sometimes, under the pretext of economic, agricultural, and environmental reforms, the government issues decisions to confiscate farmland and water resources, which contributes to communal conflict, as happened in Iraq in the 1950s.

The findings of this study show that environmental and structural scarcity, such as water scarcity, embedded in the recent environmental degradation in Iraq has led to many communal conflicts, especially in disputed areas such as Kirkuk and even in southern Iraq. Therefore, the question is whether the findings of this study can be generalized, specifically the impact of environmental and structural scarcity on political stability and the emergence of internal conflict between ethnic groups. And under what conditions can the findings of this dissertation be generalized?

A summary of the findings of this dissertation, which is divided into six main chapters, is briefly presented here. The first chapter introduced the main arguments and questions of

the project with a theoretical basis that frames the relationship between environmental issues and ethnicity. It also presented the main argument of the environmental security literature, arguing that the perception of ethnic groups on environmental security remains divided, contrary to what environmental peacebuilding scholars advocate. It also contended that environmental and structural scarcity had exacerbated communal conflict among competing ethnic groups in Kirkuk. Lastly, the dissertation claimed that when ethnic groups have remained divided over ecological security, they are more likely to turn to various authorities to govern their everyday environmental needs.

The findings illustrated that, on the one hand, Kurds and Arabs had expressed different understandings of environmental security and communal conflict nexus and, on the other hand, the impact of environmental stress on conflict among ethnic groups. The Arab respondents strongly understood the relationship between environmental degradation and communal strife. At the same time, Kurd respondents remained less concerned about environmental factors in the conflict, as they considered structural factors like ethno-identity disputes. The second chapter, which is the essence of this dissertation, examines Kirkuk's ethnic groups' perception of the impact of water scarcity, drought, and agricultural land issues on social conflict. Here, the findings showed that Arabs are more concerned about the relationship between environmental security and social violence, believing that there is a strong link between water scarcity, drought, and land issues in Agriculture and communal conflict. In contrast, Kurds are less concerned about environmental issues and their impact on social stability. Instead, they view issues from an ethnic perspective, believing that identity and ethnic issues have caused more conflict among groups than environmental issues.

However, Kurds are still more concerned about the link between lack of environmental security, urban migration, and communal conflict. This reflects the situation of the Kurds, who still suffer from historical state deprivation policies that are mainly driven by the lack of legal ownership of agricultural land and environmental resources. Therefore, Kurd villagers and farmers alone cannot face the environmental challenges and are forced to

give up farming activities and evacuate their lands due to water shortages, drought, and lack of services, the findings of which are mentioned in Chapter Three.

The dissertation hypothesized that when ethnic groups have a distinct understanding of environmental security, they are more likely to turn to different authorities to navigate their ecological needs. The study's findings in Chapter Four, which deals with the perceptions of ethnic groups on the authority they hold responsible for solving environmental challenges, showed that although there is a polycentric governance of ecological resources, it reflects coordination between formal and informal authorities such as state and social institutions. Yet, communities in disputed Iraqi territories generally preferred state institutions, especially the GoI, to handle environmental problems. The communities felt more protected by the state's involvement in their everyday EG. Although Kurds rely heavily on politicians to address water scarcity and land issues, they still turn to the KRG when choosing between the federal and regional governments.

It should also be noted that ethnic groups expressed little confidence in traditional authorities such as sheikhs, tribal leaders, and militias to address their needs. This is mainly because NSAs cannot resolve some environmental issues within legal dimensions, such as land ownership and water security. Thus, people will feel more secure if they return to the government to address the environmental challenges.

The findings also indicate a strong relationship between nationalism and perceptions of ES and decisions of ethnic groups to navigate authorities to govern environmental resources in Kirkuk and disputed territories. One of the main findings was the relationship between nationalist attitudes on the status of Kirkuk (who should govern Kirkuk) and concerns about environmental problems. Arabs showed greater awareness of the relationship between environmental security and social conflict and preferred the Iraqi government to govern Kirkuk. In contrast, Kurds were less concerned about ecological security problems in the city and believed that the KRG should govern Kirkuk. This finding suggests that political attitudes and environmental perceptions among ethnic groups are closely intertwined with the nationalist views that shaped the groups' EG choices. In other

words, the more groups, such as Arabs, are nationalist about the status of Kirkuk, the more concerned they are about ES.

Land appropriation has been one of the key contributors to environmental and structural violence among competing ethnic groups in Kirkuk. The findings of this dissertation on competition over agricultural lands between Kurds and Arabs show that state-led agrarian and environmental reform policies have exacerbated communal conflict in Kirkuk as the ethnic groups compete over accessing scarce environmental resources. The findings suggested that ethnic groups believe that the state's past policies to capture environmental resources, which caused deprivation and denial of minority groups such as the Kurds and Turkmen to access lands and water resources, are still contributing to everyday conflict among ethnic farmers in the disputed territories.

The ethnic groups believe that environmental scarcity has played a secondary role in the conflict among Arab and non-Arab farmers in Kirkuk. They believe the conflict is rooted in structural scarcity, which is driven by land appropriation, capture of environmental resources, and exclusionary policy. Furthermore, the ethnic groups perceived that water scarcity and desertification have combined with structural triggers and exacerbated the communal conflict.

Iraq has asymmetric federalism as the KRG is the only recognized regional government and possesses greater autonomy than other provinces. The KRG enjoys the upstream position over the shared water resources in the country and intends to exercise hydro-hegemony, especially during the political crisis with the federal government. However, this dissertation showed peaceful water resource governance between the GoI and the KRG exists. While there is a slight disagreement between the two sides over water share each season, the question of shared governance of the water resources has been peacefully managed.

Although the geographical advantages of its upstream position have enabled the KRG to exercise hydro-hegemony by withdrawing water from the Little Zab River and Sirwan

River and damming the primary water resources in the region, yet to avoid conflict, the KRG does not do so. Also, the Iraqi government has enjoyed a "bargaining power" that forces the KRG to cooperate over water governance rather than weaponize the resources. The GoI has used its irresistible legal and constitutional authority over water negotiation abroad to ensure Iraqi water security. It has utilized its political alliances with neighboring countries to pressure the KRG to avoid water weaponization, especially in 2017. The government of Iraq is also reluctant to fund the KRG damming project and water infrastructure in the region as the KRG does not cooperate with Baghdad over its economic and other policies. It also does not share the benefits of any international environmental fund with the KRG to mitigate climate change issues like water scarcity and development, agriculture sustainability, and energy transitions. The federal government has been able to counterbalance the geopolitical advantage of the KRG's upstream position over the rivers by controlling the budget, revenues, legal principles, and foreign relations with neighboring countries.

Therefore, despite the lack of significant cooperation, intergovernmental relations over water resources have remained peaceful, and there is no considerable conflict over water resources between both sides. Furthermore, the findings showed that citizens' perceptions of KRG water governance are aligned with what the KRG officials and bureaucrats claim. The public opinion in Kirkuk does not believe that the KRG weaponized water resources regarding disagreement with Baghdad over political issues. People are generally uncertain whether the KRG is using water as a weapon. However, some Arabs believe that the KRG's water governance might lead to conflict with the federal government, but in general, people remain neutral on KRG water weaponization. Therefore, this finding aligns with the qualitative data findings and emphasizes the healthy water governance relationship between the KRG and the GoI in Iraqi environmental federalism.

In sum, from a comparative reflection on the findings of this dissertation, it can be noted that the key finding of this dissertation, which is the impact of structural scarcity on

communal conflict, seems to be generalizable in some cases, but it is not certain yet. Kirkuk and the disputed territories in Iraq are unique, a striking illustration of complexity within the country. No other region grapples with the same depth of ethno-territorial conflict and overlapping sovereignty claims. Consequently, the insights gleaned from this dissertation may not extend seamlessly to different parts of Iraq. Downstream areas like Basra, which is plagued by severe water scarcity and NSAs (mainly tribal leaders and social institutions), have actively engaged in water governance. Even though Iraq is diverse, this study's findings—particularly the complex relationship between ethnicity, environmental scarcity, and fragmented governance—might be relevant worldwide. For example, the ethnic conflict in Sudan was caused by environmental degradation, particularly drought, and the seizure of agricultural land by the government and dominant ethnic groups further contributed to communal strife and civil war.

Similarly, it could be extended to the case of the Kurdish regions of Turkey, where state (militarized) environmental projects such as the construction of dams (the GAP Project) have caused the flooding of Kurdish villages and deprived Kurds of access to water resources; as such, this may have escalated the already heated ethnonationalist dispute between Turkey and the PKK. In Iraq, the Ba'ath regime used a similar tactic from the 1970s until 2003 in their ecological war against Kurdish regions to alter population demography and quell anti-government protests. Lastly, the case of Northern Ireland may also be one of the cases to which the findings of this study can be generalized, mainly when structural inequality in access to land and public services has led to ethnic conflict.

Overall, the findings of this dissertation can be generalized to several contexts, including when deep ethnic and identity issues are deeply intertwined with historical deprivation and marginalization. Furthermore, claims of territorial ownership and marginalization in governance emerge most clearly, as Migdal puts it when a weak state cannot deliver environmental services such as fair access to land and water resources. In contrast, strong societal actors fill the governance vacuum. Lastly, in rare structural patterns in

which a dominant group has disproportionate access to environmental resources and ecological infrastructure, whether, via the support of the state or informal authorities, such access is often instrumentalized to strengthen the political and territorial position of the dominant ethnic group by exacerbating existing inequalities and exclusion that sowing the seeds of communal conflict.

Bibliography

Barnett, Jon, and W. Neil Adger. "Climate change, human security and violent conflict." *Political geography* 26, no. 6 (2007): 639-655.

Gleick, Peter H. "Water, drought, climate change, and conflict in Syria." *Weather, climate, and society* 6, no. 3 (2014): 331-340.

Kelley, Colin P., Shahrzad Mohtadi, Mark A. Cane, Richard Seager, and Yochanan Kushnir. "Climate change in the Fertile Crescent and implications of the recent Syrian drought." *Proceedings of the national Academy of Sciences* 112, no. 11 (2015): 3241-3246.

Hoerling, Martin, Jon Eischeid, Judith Perlwitz, Xiaowei Quan, Tao Zhang, and Philip Pegion. "On the increased frequency of Mediterranean drought." *Journal of climate* 25, no. 6 (2012): 2146-2161.

Selby, Jan, Omar S. Dahi, Christiane Fröhlich, and Mike Hulme. "Climate change and the Syrian civil war revisited." *Political geography* 60 (2017): 232-244.

Daoudy, Marwa. *The origins of the Syrian conflict: Climate change and human security*. Cambridge University Press, 2020.

Dalby, Simon. "Climate change and environmental conflicts." In *Routledge handbook of environmental conflict and peacebuilding*, pp. 42-53. Routledge, 2018.

Ide, Tobias. "The impact of environmental cooperation on peacemaking: definitions, mechanisms, and empirical evidence." *International Studies Review* 21, no. 3 (2019): 327-346.

Conca, Ken, and Geoffrey D. Dabelko, eds. *Environmental peacemaking*. Woodrow Wilson Center Press, 2002.

Ide, Tobias. "The dark side of environmental peacebuilding." *World Development* 127 (2020): 104777.

Bruch, Carl, David Jensen, and Monica Emma. "Defining environmental peacebuilding." In Routledge Handbook of Environmental Security, pp. 9-25. Routledge, 2021.

King, Marcus DuBois. "The weaponization of water in Syria and Iraq." *The Washington Quarterly* 38, no. 4 (2015): 153-169.

King, Marcus D., and Julia Burnell. "The weaponization of water in a changing climate." *Epicenters of Climate and Security: The New Geostrategic Landscape of the Anthropocene* (2017): 67-73.

Daoudy, Marwa. "Water weaponization in the Syrian conflict: strategies of domination and cooperation." *International Affairs* 96, no. 5 (2020): 1347-1366.

Nixon, H. (2006) Review: Environmental Peacemaking. International Environmental Agreements. 6:109–111 Springer 2006 DOI 10.1007/s10784-005-4661-2

Graeger, Nina. "Environmental security?." *Journal of Peace Research* 33, no. 1 (1996): 109-116.

Krause, K., & Williams, M. C. (1996). Broadening the agenda of security studies: Politics and methods. *Mershon international studies review*, *40*(Supplement_2), 229-254.

Martin, A. (2002). International Affairs (Royal Institute of International Affairs 1944-) 78(1): 178-180.

Barnett, Jon. *The meaning of environmental security: Ecological politics and policy in the new security era*. Zed Books, 2001.

Franke, V. (2004). [Review of *The Meaning of Environmental Security: Ecological Politics and Policy in the New Security Era*, by J. Barnett]. *Armed Forces & Society*, *31*(1), 155–158.

Daoudy, Marwa. "Rethinking the climate–conflict nexus: a human–environmental–climate security approach." *Global Environmental Politics* 21, no. 3 (2021): 4-25.

Eck, Kristine. "The law of the land: Communal conflict and legal authority." *Journal of Peace research* 51, no. 4 (2014): 441-454.

Fjelde, Hanne, and Nina Von Uexkull. "Climate triggers: Rainfall anomalies, vulnerability and communal conflict in Sub-Saharan Africa." *Political Geography* 31, no. 7 (2012): 444-453.

Okpa, John Thompson, Benjamin Okorie Ajah, Obinna J. Eze, and Olisa Anthony Enweonwu. "Communal conflict and violence: Causes and impact." In *Handbook of Anger, Aggression, and Violence*, pp. 1-17. Cham: Springer International Publishing, 2023. Wig, Tore, and Daniela Kromrey. "Which groups fight? Customary institutions and communal conflicts in Africa." *Journal of Peace Research* 55, no. 4 (2018): 415-429.

Le Billon, Philippe. "The political ecology of war: natural resources and armed conflicts." *Political geography* 20, no. 5 (2001): 561-584.

Pluye, Pierre, and Quan Nha Hong. 2014. "Combining the power of stories and the power of numbers: mixed methods research and mixed studies reviews." *Annual review of public health* 35: 29-45.

Al-Yaum. 2023. "Severe water crisis in Kirkuk as a result of the neighbors blocking river water." Accessed 10-8. https://www.youtube.com/watch?v=0BMLe-ITsow.

Anand, Vicky, Bakimchandra Oinam, and Silke Wieprecht. 2024. "Synergistic impact of climate and land use land cover change dynamics on the hydrological regime of Loktak Lake catchment under CMIP6 scenarios." *Journal of Hydrology: Regional Studies* 53: 101851.

Anderson, Liam, and Gareth Stansfield. 2009. *Crisis in Kirkuk: The ethnopolitics of conflict and compromise*. University of Pennsylvania Press.

Bashar, Iftekharul. 2011. "Bangladesh's forgotten crisis: Land, ethnicity, and violence in Chittagong Hill Tracts." *Counter Terrorist Trends and Analyses* 3 (4): 1-5.

Beevers, Michael D. 2015. "Governing natural resources for peace: Lessons from Liberia and Sierra Leone." *Global Governance* 21: 227.

---. 2018. *Peacebuilding and natural resource governance after armed conflict: Sierra Leone and Liberia*. Springer.

Benegal, Salil D. 2018. "The spillover of race and racial attitudes into public opinion about climate change." *Environmental Politics* 27 (4): 733-756.

Bengio, Ofra. 2012. *The Kurds of Iraq: Building a state within a state*. Lynne Rienner Publishers.

Benjaminsen, Tor A, and Boubacar Ba. 2021. "Fulani-dogon killings in mali: Farmer-herder conflicts as insurgency and counterinsurgency." *African Security* 14 (1): 4-26.

Bet-Shlimon, Arbella. 2019. *City of black gold: Oil, ethnicity, and the making of modern Kirkuk*. Stanford University Press.

Brulle, Robert J, Jason Carmichael, and J Craig Jenkins. 2012. "Shifting public opinion on climate change: an empirical assessment of factors influencing concern over climate change in the US, 2002–2010." *Climatic change* 114: 169-188.

Bukari, Kaderi Noagah, Papa Sow, and Jürgen Scheffran. 2018. "Cooperation and co-existence between farmers and herders in the midst of violent farmer-herder conflicts in Ghana." *African Studies Review* 61 (2): 78-102.

Bullard, Robert D. 1993. "The threat of environmental racism." *Natural Resources & Environment* 7 (3): 23-56.

Bullard, Robert D, Paul Mohai, Robin Saha, and Beverly Wright. 2008. "Toxic wastes and race at twenty: Why race still matters after all of these years." *Envtl. L.* 38: 371.

Chowdhury, Khairul. 2008. "Politics of identities and resources in Chittagong Hill Tracts, Bangladesh: ethnonationalism and/or indigenous identity." *Asian Journal of Social Science* 36 (1): 57-78.

Clack, Timothy, Ziya Meral, and Louise Selisny. 2023. *Climate Change, Conflict and (In) Security: Hot War*. Taylor & Francis.

Dresse, Anaïs, Itay Fischhendler, Jonas Østergaard Nielsen, and Dimitrios Zikos. 2019. "Environmental peacebuilding: Towards a theoretical framework." *Cooperation and Conflict* 54 (1): 99-119.

Edmonds, Cecil J. 1971. "Kurdish nationalism." *Journal of contemporary history* 6 (1): 87-107.

Egan, Patrick J, and Megan Mullin. 2017. "Climate change: US public opinion." *Annual Review of Political Science* 20 (1): 209-227.

Elias, Troy, and Jay Hmielowski. 2021. "Media use, race and the environment: The converging of environmental attitudes based on self-reported news use." *Environmental Values* 30 (4): 477-500.

Faris, Stephan. 2007. "The real roots of Darfur." *Atlantic Monthly* 299 (3): 67.

Folami, Olakunle Michael, and Adejoke Olubimpe Folami. 2013. "Climate change and inter-ethnic conflict in Nigeria." *Peace Review* 25 (1): 104-110.

Garmian. 2013. "Activities of Garmian General Directorate of Agriculture in the past year." Accessed 10-8. https://www.garmiyan.com/Babetekan_dreje.aspx?jimare=198.

Goldstone, Jack A. 2002. "Population and security: How demographic change can lead to violent conflict." *Journal of international affairs*: 3-21.

Gunter, Michael M. 2003. "The Kurdish question in perspective." *World Affs.* 166: 197.

Gurses, Mehmet. 2012. "Environmental consequences of civil war: Evidence from the Kurdish conflict in Turkey." *Civil Wars* 14 (2): 254-271.

Hardy, Dean, Heather Lazrus, Michael Mendez, Ben Orlove, Isabel Rivera-Collazo, J Timmons Roberts, Marcy Rockman, Kimberley Thomas, Benjamin P Warner, and Robert Winthrop. 2018. "Social vulnerability: social science

perspectives on climate change, Part 1." *Washington, DC: USGCRP Social Science Coordinating Committee*.

Hershey, Marjorie Randon, and David B Hill. 1977. "Is pollution 'a White thing'? Racial differences in preadults' attitudes." *Public Opinion Quarterly* 41 (4): 439-458.

Icduygu, Ahmet, David Romano, and Ibrahim Sirkeci. 1999. "The ethnic question in an environment of insecurity: the Kurds in Turkey." *Ethnic and Racial Studies* 22 (6): 991-1010.

Ide, Tobias, Carl Bruch, Alexander Carius, Ken Conca, Geoffrey D Dabelko, Richard Matthew, and Erika Weinthal. 2021. "The past and future (s) of environmental peacebuilding." *International Affairs* 97 (1): 1-16.

Ismail, Sadaf. 1991. "The Kurdish Problem in Iraq." *Pakistan Horizon* 44 (4): 57-68.

K24. 2017. "The production of Kurdish rice in Bani Khelan is more than 100 tons." Accessed 10/7/2024. https://www.kurdistan24.net/ckb/story/39417.

Karim, Zaki. 2024. Al-Khas River in Kirkuk... Stations of Memory and History. In *Good Morning Iraq*, edited by Iraqi TV Channel.

Keynoush, Banafsheh. 2018. "Water scarcity could lead to the next major conflict between Iran and Iraq." https://www.mei.edu/publications/water-scarcity-could-lead-next-major-conflict-between-iran-and-iraq.

Khagram, Sanjeev, and Saleem Ali. 2006. "Environment and security." *Annu. Rev. Environ. Resour.* 31 (1): 395-411.

Kreger, Janet. 1973. "Ecology and black student opinion." *The Journal of Environmental Education* 4 (3): 30-34.

Lawrence, Connor. 2013. "Climate Change and Conflict in East and North Sri Lanka." https://mandalaprojects.com/ice/ice-cases/lanka-civil.htm#:~:text=Increasing%20temperatures%20melt%20ice%20caps,in%20low%20altitude%20coastal%20regions.

Lazri, Adam McBride, and David M Konisky. 2019. "Environmental attitudes across race and ethnicity." *Social Science Quarterly* 100 (4): 1039-1055.

Le Billon, Philippe. 2014. *Wars of plunder: Conflicts, profits and the politics of resources*. Oxford University Press.

Lee, Shin-wha. 1997. "Not a one-time event: Environmental change, ethnic rivalry, and violent conflict in the third world." *The Journal of Environment & Development* 6 (4): 365-396.

Leiserowitz, Anthony, and Karen Akerlof. 2010. "Race, ethnicity and public responses to climate change." *Yale Project on climate change communication, New Haven*.

Liere, Kent D Van, and Riley E Dunlap. 1980. "The social bases of environmental concern: A review of hypotheses, explanations and empirical evidence." *Public opinion quarterly* 44 (2): 181-197.

Logan, Darren. 2009. "Thoughts on Iraqi Kurdistan: present realities, future hope." *Iran and the Caucasus* 13 (1): 161-186.

Macias, Thomas. 2016. "Environmental risk perception among race and ethnic groups in the United States." *Ethnicities* 16 (1): 111-129.

Madeira, John. 2019. *Climate change, sub-saharan Africa, and US national security*. JSTOR.

Martin, Adrian. 2005. "Environmental conflict between refugee and host communities." *Journal of peace research* 42 (3): 329-346.

Mbiyozo, Aimée-Noël, and Ottilia A Maunganidze. 2021. "Climate change and violence in Africa: no time to lose." *OCHA Reliefweb*.

McCright, Aaron M, and Riley E Dunlap. 2011. "Cool dudes: The denial of climate change among conservative white males in the United States." *Global environmental change* 21 (4): 1163-1172.

Millner, Antony, and Hélène Ollivier. 2016. "Beliefs, politics, and environmental policy." *Review of Environmental Economics and Policy*.

Mohai, Paul, and Bunyan Bryant. 1998. "Is There a "Race" Effect on Concern for Environmental Quality?" *The Public Opinion Quarterly* 62 (4): 475-505. http://www.jstor.org/stable/2749675.

Mohai, Paul, David Pellow, and J Timmons Roberts. 2009. "Environmental justice." *Annual review of environment and resources* 34 (1): 405-430.

Mohammed, Soran. 2020. "Khasa River; From a tourism project to a landfill." Accessed 10-7. https://kirkuknow.com/ar/news/60724.

Moritz, Mark. 2010. "Understanding herder-farmer conflicts in West Africa: Outline of a processual approach." *Human organization* 69 (2): 138-148.

Natali, Denise. 2008. "The Kirkuk Conundrum." *Ethnopolitics* 7 (4): 433-443.

O'Leary, Brendan, John McGarry, and Khaled Salih. 2006. *The future of Kurdistan in Iraq*. University of Pennsylvania Press.

O'Driscoll, Dylan. 2018. "Conflict in Kirkuk: A comparative perspective of cross-regional self-determination disputes." *Ethnopolitics* 17 (1): 37-54.

O'Driscoll, Dylan, and Bahar Baser. 2019. "Independence referendums and nationalist rhetoric: the Kurdistan Region of Iraq." *Third world quarterly* 40 (11): 2016-2034.

Park, Bill, Joost Jongerden, Francis Owtram, and Akiko Yoshioka. 2024. "On the independence referendum in the Kurdistan Region of Iraq and disputed territories in 2017." In *Kurdish Studies Archive*, 239-257. Brill.

Pasha, ABM Kamal, Sagar Mozumder, and Kornia Chakma. "The impact of Jhum cultivation on hilly area (Rangamati, Khagrachari)." *Management* 1 (1): 97-107.

Popovski, Vesselin. 2017. "Foresight Africa viewpoint: Does climate change cause conflict?" *Brookings Institution. Available online at: https://www. brookings. edu/blog/africa-infocus/2017/01/20/does-climate-change-cause-conflict/(Accessed on 3 May 2022)*.

Reuveny, Rafael. 2007. "Climate change-induced migration and violent conflict." *Political geography* 26 (6): 656-673.

Romano, David. 2006. *The Kurdish nationalist movement: opportunity, mobilization and identity*. Vol. 22: Cambridge University Press.

---. 2013. "The future of Kirkuk." In *Governance in ethnically mixed cities*, 93-111. Routledge.

Ross, Michael L. 2012. *The oil curse: How petroleum wealth shapes the development of nations*. Princeton University Press.

Rudaw. 2018. "In Garmian, drought and water shortages have reduced rice production." Accessed 10-8. https://www.rudaw.net/sorani/kurdistan/030720183.

---. 2019. "Rice planting season has started in Garmian." Accessed 10-08. https://www.rudaw.net/sorani/kurdistan/2106201910.

---. 2022. "Water Resources in Kirkuk: We Provide the City with Eight Cubic Meters Per Second." Accessed 10-7-. https://www.rudawarabia.net/arabic/business/14072022.

---. 2024. "An important bill for Kurds and Turkmens is facing the no of Sunnis and Shiites." Accessed 10-8. https://www.rudaw.net/sorani/kurdistan/081020246.

Schuldt, Jonathon P, and Adam R Pearson. 2016. "The role of race and ethnicity in climate change polarization: evidence from a US national survey experiment." *Climatic change* 136: 495-505.

Selby, Jan. 2019. "Climate change and the Syrian civil war, Part II: The Jazira's agrarian crisis." *Geoforum* 101: 260-274. https://doi.org/https://doi.org/10.1016/j.geoforum.2018.06.010. https://www.sciencedirect.com/science/article/pii/S0016718518301829.

Selby, Jan, and Clemens Hoffmann. 2012. "Water scarcity, conflict, and migration: a comparative analysis and reappraisal." *Environment and planning C: government and policy* 30 (6): 997-1014.

Shafaq. 2023. "South of Kirkuk. Removal of dozens of fishponds." Accessed 10-8. https://www.shafaq.com/ar/%D9%85%D8%AC%D8%AA%D9.

---. 2024. "Water Resources stops filling fishponds in Kirkuk and explains the reasons." Accessed 10-8. https://shafaq.com/ar/%D9%85%D8%AC%D8%A.

Smith, E Keith, M Julia Bognar, and Adam P Mayer. 2024. "Polarisation of Climate and Environmental Attitudes in the United States, 1973-2022." *NPJ Climate Action* 3 (1): 2.

SNN. 2020. "Water shortage is drying up dozens of acres of farmers' fields in Garmian province." Accessed 10/7/2024. https://snnc.co/24315.

UNAMI. 2017. *UNAMI Concerned by Raising Kurdistan Flag in Kirkuk, Cautions Against Unilateral Steps [EN/AR].* (ReliefWeb). https://reliefweb.int/report/iraq/unami-concerned-raising-kurdistan-flag-kirkuk-cautions-against-unilateral-steps-enar.

Van Etten, Jacob, Joost Jongerden, Hugo J de Vos, Annemarie Klaasse, and Esther CE van Hoeve. 2008. "Environmental destruction as a counterinsurgency strategy in the Kurdistan region of Turkey." *Geoforum* 39 (5): 1786-1797.

Vanegas, Emely. 2021. "Climate of Conflict: Can Climate Change Cause Violent Ethnic Conflict? Emely Vanegas."

Wenner, Lettie M. 1963. "Arab-Kurdish Rivalries in Iraq." *Middle East Journal* 17 (1/2): 68-82.

Wimmer, Andreas. 2003. "Democracy and ethno-religious conflict in Iraq." *Survival* 45 (4): 111-134.

Arbuckle, Matthew B., and David M. Konisky. "The role of religion in environmental attitudes." *Social Science Quarterly* 96, no. 5 (2015): 1244-1263.

Bryant, Bunyan, and Paul Mohai. "Race and the incidence of environmental hazards." *Boulder, CO: Westview* (1992).

Perry, Andre M., Manann Donoghoe, and Justin Lall. "Black voters are more concerned about climate change than the national average, with implications for policy and messaging." (2023).

Smeltz, Dina, Craig Kafura, Candace Rondeaux, Heela Rasool-Ayub, and Deborah Avant. "Race, Ethnicity, and American Views of Climate Change." *" The Chicago Council on Global Affairs* (2023).

Ballew, Matthew, Edward Maibach, John Kotcher, Parrish Bergquist, Seth Rosenthal, Jennifer Marlon, and Anthony Leiserowitz. "Which racial/ethnic groups care most about climate change." *Yale Program on Climate Change Communication* 16 (2020).

Ide, Tobias. "Space, discourse and environmental peacebuilding." *Third World Quarterly* 38, no. 3 (2017): 544-562.

Moosa, Hannah. "Environmental peacebuilding in Iraq: Restoring the Iraqi Marshes and the ancient kahrez systems in the northern governorates." In *Routledge Handbook of Environmental Conflict and Peacebuilding*, pp. 188-209. Routledge, 2018.

Ide, Tobias, Vakur Sümer, and Larissa M. Aldehoff. "Environmental peacebuilding in the Middle East." In *Routledge handbook of environmental conflict and peacebuilding*, pp. 175-187. Routledge, 2018.

Ahram, Ariel I. "Israel and the Kurds." In *Routledge Handbook on Israel's Foreign Relations*, pp. 268-277. Routledge, 2024.

Abd-El-Mooty, Mohamed, Rawya Kansoh, and Ahmed Abdulhadi. 2016. "Challenges of water resources in Iraq." *Hydrology Current Research* 7 (4): 1-8.

Adelphi. 2022. *Climate Risk Profile Iraq.* file:///C:/Users/Owner/Downloads/2023_Climate-change-effects-on-conflict-dynamics-in-Iraq_EN%20(2).pdf.

Adger, W Neil, Nigel W Arnell, Richard Black, Stefan Dercon, Andrew Geddes, and David SG Thomas. 2015. "Focus on environmental risks and migration: causes and consequences." *Environmental Research Letters* 10 (6): 060201.

Al-Alam. 2023. "Iraq: Popular Mobilization Forces begin reclamation of agricultural land to develop economy." https://www.alalam.ir/news/6621368.

Al-Rubaie, Azhar, Michael Mason, and Zainab Mehdi. 2021. "Failing flows: water management in Southern Iraq."

Al-Talibi, Mohammed. 2022. "In numbers. Official statistics on the number of wells in Iraq." https://www.ina.iq/156093--.html.

Ali, Arkan. 2022. "Imported Arabs are demanding Qara Hanjir lands." Accessed 3/21. https://www.rudaw.net/sorani/kurdistan/200220194

Ali, Bashir. 2021. "Conspiracy phobia disrupts the largest Iraqi-Saudi investment project." https://almasra.iq/10278/.

Ali, Mohammed. 2023. "Iraq faces drought by drilling hundreds of wells: Drinking water is a priority." https://www.alaraby.co.uk

Almasdaronline. 2023. "Iraqi Shiite Mobilization Forces begin project to plant one million palm trees in Badia on the border with Saudi Arabia and Kuwait (edit)." https://almasdaronline.com/articles/271264.

André Mueller, Adrien Detges, Benjamin Pohl, Michelle Helene Reuter, Luca Rochowski, Jan Volkholz, and and Eckart Woertz. 2021. *Climate change, water and future cooperation and development in the Euphrates-Tigris basin.* (Adelphi). https://adelphi.de/system/files/mediathek/bilder/Euphrates-Tigris-Report_Final.pdf.

Apap, Joanna, and Sami James Harju. 2023. *The concept of 'climate refugee' Towards a possible definition.* (European Parliamentary Research Service – EPRS). https://www.europarl.europa.eu/thinktank/en/document/EPRS_BRI(2021)698753.

Barnett, Jon, and Michael Webber. 2010. "Migration as adaptation: Opportunities and limits." *Climate change and displacement: Multidisciplinary perspectives*: 37-55.

Barry, Sinéad. 2024. "Iraq's insurgency pipeline: water supply and ISIS's recruitment in northwest Iraq." https://climate-diplomacy.org/magazine/conflict/iraqs-insurgency-pipeline-water-supply-and-isiss-recruitment-northwest-iraq.

Berghof_Foundation. 2023a. *Climate change effects on conflict dynamics in Iraq Study of Makhmur, Tal Afar, and Al-Rifai districts.* (Peace Paradigms Organisation). file:///C:/Users/Owner/Downloads/2023_Climate-change-effects-on-conflict-dynamics-in-Iraq_EN%20(2).pdf.

---. 2023b. *Climate security challenges in Iraq Entry points for local-level dialogue.* file:///C:/Users/Owner/Downloads/BF-Climate-change-effects-on-conflict-dynamics-in-Iraq-Entry-points-EN-final%20(6).pdf.

Black, George. 1993. *Genocide in Iraq: the Anfal campaign against the Kurds*. Human Rights Watch.

Black, Richard, W Neil Adger, Nigel W Arnell, Stefan Dercon, Andrew Geddes, and David Thomas. 2011. "The effect of environmental change on human migration." *Global environmental change* 21: S3-S11.

Black, Richard, Stephen RG Bennett, Sandy M Thomas, and John R Beddington. 2011. "Migration as adaptation." *Nature* 478 (7370): 447-449.

Brzoska, Michael, and Christiane Fröhlich. 2016. "Climate change, migration and violent conflict: vulnerabilities, pathways and adaptation strategies." *Migration and Development* 5 (2): 190-210.

CIVIC. 2022. *Climate Change and Civilian Protection in Iraq.* (Center for Civilians in Conflict). https://civiliansinconflict.org/wp-content/uploads/2022/07/CIVIC_Iraq_ClimateChange_ProtectionofCivilians.pdf.

Dun, Olivia V, and François Gemenne. 2008. "Defining'environmental migration'."

ECHO. 2024. " Iraq - Floods ". https://reliefweb.int/report/iraq/iraq-floods-ifrc-noaa-cpc-echo-daily-flash-06-may-2024.

Ehrlich, Paul R. 1990. The Population Explosion. Simon & Schuster.

Ehrlich, Paul R, and Anne H Ehrlich. 2009. "The population bomb revisited." *The electronic journal of sustainable development* 1 (3): 63-71.

Felli, Romain. 2013. "Managing climate insecurity by ensuring continuous capital accumulation:'climate refugees' and 'climate migrants'." *New Political Economy* 18 (3): 337-363.

Geddes, Andrew, W Neil Adger, Nigel W Arnell, Richard Black, and David SG Thomas. 2012. "Migration, environmental change, and the 'challenges of governance'." *Environment and Planning C: Government and Policy* 30 (6): 951-967.

Gemenne, François, and Julia Blocher. 2017. "How can migration serve adaptation to climate change? Challenges to fleshing out a policy ideal." *The Geographical Journal* 183 (4): 336-347.

Gleditsch, Nils Petter. 2003. "Environmental conflict: Neomalthusians vs. cornucopians." In *Security and environment in the Mediterranean: Conceptualising security and environmental conflicts*, 477-485. Springer.

---. 2007. "Climate change and conflict: the migration link."

Goldstone, Jack A. 2016. *Revolution and rebellion in the early modern world: population change and state breakdown in England, France, Turkey, and China, 1600-1850*. Routledge.

Hawlergov. 2023. "Erbil... A meeting was held to determine a suitable design for the construction of a box sewer in Cornish Street." https://www.hawlergov.org/app/on/node/6711.

Hendrix, Cullen S, and Sarah M Glaser. 2007. "Trends and triggers: Climate, climate change and civil conflict in Sub-Saharan Africa." *Political geography* 26 (6): 695-715.

House, Skills. 2023. Policy Guidelines on Climate Change-induced Displacement in Ninewa Governorate. (Norwegian Refugee Council). file:///C:/Users/Owner/Downloads/in-ninewa-governorate.pdf.

Hunter, Lori M, Jessie K Luna, and Rachel M Norton. 2015. "Environmental dimensions of migration." *Annual Review of Sociology* 41 (1): 377-397.

Ingram, John, Polly Ericksen, and Diana Liverman. 2012. *Food security and global environmental change*. Routledge.

IOM. 2007. *Migration And the Environment.* https://www.iom.int/sites/g/files/tmzbdl486/files/jahia/webdav/shared/shared/mainsite/about_iom/en/council/94/MC_INF_288.pdf.

---. 2021. *Migration Into a Fragile Setting: Responding to Climate-Induced Informal Urbanization and Inequality in Basra, Iraq.* https://iraqdtm.iom.int/files/Climate/2022412275953_IOM_Iraq_Migration_into_a_Fragile_Setting_Responding_to%20Climate_Induced_Informalization_and_Inequality_in_Basra.pdf.

---. 2022a. *Migration, Environment,* and *Climate Change in Iraq.* (International Organization for Migration). https://iraq.un.org/sites/default/files/remote-resources/079bd27fc79b4084e48157653d335c8f.pdf.

---. 2022b. *Migration, Environment, and Climate Change in Iraq.* https://iraq.un.org/en/194355-migration-environment-and-climate-change-iraq.

---. 2023. *Climate-Induced Displacement – Southern Iraq* (International Organization for Migration (IOM)). file:///C:/Users/Owner/Desktop/CHAPTER2/IOM%203RD%20REPORT.pdf

---. 2024. *Climate-Induced Displacement – Central and Southern Iraq* file:///C:/Users/Owner/Desktop/CHAPTER2/20248194033531_IOM_DTM_Climate_ET_June_2024.pdf.

IPCC. 2014. *Climate Change 2014: Impacts, Adaptation,* and *Vulnerability. Part A: Global and Sectoral Aspects.* (Intergovernmental Panel on Climate Change). https://www.ipcc.ch/report/ar5/.

---. 2023. *The IPCC Working Group I examines physical science underpinning past, present, and future climate change.* https://www.ipcc.ch/2019/09/25/srocc-press release/ https://www.ipcc.ch/report/ar6/wg1/

IRI. 2010. *Survey of Iraqi Public Opinion.* International Republican Institute. https://www.iri.org/wp-content/uploads/2011/02/201120February20220Survey20of20Iraqi20Public20Opinion20October2023-3020201028129.pdf.

Islam, Imrul, and Thomas Wilson. 2023. "Extreme heat, drought and displacement in Iraq." *Humanitarian Practice Network* 4 (84). https://odihpn.org/publication/extreme-heat-drought-and-displacement-in-iraq/#:~:text=As%20of%20October%202023%2C%20the,80%2C000%20as%20of%20August%202023.

K24. 2020. "Kurdish farmers in Sargaran refuse to leave their farmland." https://www.kurdistan24.net/ckb/story/.

---. 2023. "Representative of wandering farmers: The Iraqi army has warned a number of villages not to carry out agricultural work." https://www.kurdistan24.net/ckb/story/2.

---. 2024. "The Iraqi Council of Ministers is discussing the issue of the census in the disputed territories." https://www.kurdistan24.net

Kanta Kumari Rigaud, et al,. 2018. *Grounds Well Preparing for Internal Climate Migration.* World Bank. file:///C:/Users/Owner/Downloads/WBG_ClimateChange_Final.pdf.

Kaplan, Robert D. 1994. "The coming anarchy." *Atlantic monthly* 273 (2): 44-76.

Karbala_News. 2023. "Al-Muthanna: The Popular Mobilization Authority announces the launch of a project to plant one million palm trees in the southern desert.". Accessed 3/21. https://www.youtube.com/watch?app=desktop&v=uc1ENrh8BVQ.

Lightfoot, Dale. 2009. "Survey of infiltration Karez in Northern Iraq: history and current status of underground aqueducts."

Loveluck, Louisa, and Mustafa Salim. 2022. "Climate migrants flee Iraq's parched rural south, but cities offer no refuge." https://www.washingtonpost.com/world/2022/09/06/iraq-climate-crisis-drought-basra/.

Mason, Michael. 2022. "Infrastructure under pressure: Water management and state-making in southern Iraq." *Geoforum* 132: 52-61.

Mathews, Jessica Tuchman. 1989. "Redefining security." *Foreign affairs* 68 (2): 162-177.

McLeman, Robert. 2009. *Climate change and adaptive human migration: lessons from rural North America*. Cambridge University Press, Cambridge, UK and New York, NY, USA.

Menmy, Dana Taib. 2023. "Iraq grants investment rights to PMF-linked company for one million palm trees in Samawah Desert." https://www.newarab.com/news/muhandis-company-plant-one-million-trees-samawa-desert.

Millock, Katrin. 2015. "Migration and environment." *Annu. Rev. Resour. Econ.* 7 (1): 35-60.

Mistri, Avijit, and Bhaswati Das. 2020. *Environmental change, livelihood issues and migration*. Springer.

NRC. 2021. *Iraq's drought crisis and the damaging effects on communities.* (Norwegian Refugee Council). https://www.nrc.no/resources/reports/iraqs-drought-crisis-and-the-damaging-effects-on-communities/.

---. 2022a. *A dry horizon: Iraq's interlinked*

drought and climate crises. (The Norwegian Refugee Council). https://www.nrc.no/globalassets/pdf/reports/a-dry-horizon/a-dry-horizon-2022.pdf.

---. 2022b. "Iraq: Drought crisis destroys income and crops countrywide." https://www.nrc.no/news/2022/october/iraq-drought-crisis-destroys-income-and-crops-country-wide/.

---. 2023. *Inadequate and inequitable: water scarcity and displacement in Iraq.* (The Norwegian Refugee Council). https://www.nrc.no/globalassets/pdf/reports/water-scarcity-and-displacement-in-iraq/water-scarcity-and-displacement-in-iraq---english.pdf.

O'Driscoll, Dylan. 2021. "Everyday peace and conflict:(un) privileged interactions in Kirkuk, Iraq." *Third World Quarterly* 42 (10): 2227-2246.

OCHA. 2024. *Iraq: Floods - Mar 2024.* https://reliefweb.int/disaster/fl-2024-000035-irq.

REACH. 2022. *Climate Motivated Displacement: Baseline.* https://knowledgeagainsthunger.org/wp-content/uploads/2022/09/ACF-ClimateMotivatedDisplacement_Iraq-Final-Report_April-2022.pdf.

Rudaw. 2024. "Fahmi Burhan: More than 600,000 Arabs have been taken to Kirkuk in seven years." https://www.rudaw.net/english/kurdistan/101120244.

Schwartzstein, Peter. 2017. "Climate Change and Water Woes Drove ISIS Recruiting in Iraq." https://www.nationalgeographic.com/science/article/climate-change-drought-drove-isis-terrorist-recruiting-iraq.

Selby, Jan, and Clemens Hoffmann. 2014a. "Beyond scarcity: rethinking water, climate change and conflict in the Sudans." *Global Environmental Change* 29: 360-370.

---. 2014b. Rethinking climate change, conflict and security. Taylor & Francis.

SIPRI, NUPI and. 2022. *Climate, Peace and Security Fact Sheet*

Iraq.file:///C:/Users/Owner/Downloads/NUPI_Fact_Sheet_Iraq_April2022_FINAL%232%20(4).pdf.

Tacoli, Cecilia. 2009. "Crisis or adaptation? Migration and climate change in a context of high mobility." *Environment and urbanization* 21 (2): 513-525.

The_World_Bank. 2022. *Country Climate And Development Report: Iraq.* https://iraq.un.org/sites/default/files/remote-resources/2b95ca075eb07cc5b753ef1a9d504037.pdf.

Todd, Ewen CD. 2023. "Waterborne Diseases and Wastewater Treatment in Iraq." *Journal of Food Protection*: 100204.

UNFCCC. 2010. *"Cancun Agreements:*

Cancun Adaptation Framework, Paragraphs 11-35, Decision 1.CP/16.". United Nations Framework Convention on Climate Change. https://environmentalmigration.iom.int/sites/g/files/tmzbdl1411/files/07a01.pdf.

UNICEF. 2018. "Flooding leaves thousands, including children, at risk of water-borne disease in Northern Iraq camps." https://www.unicef.org/iraq/stories/flooding-leaves-thousands-including-children-risk-water-borne-disease-northern-iraq-camps.

UNSDG. 2022. "Climate change is the biggest threat Iraq has ever faced, but there is hope to turn things around." https://unsdg.un.org/latest/blog/climate-change-biggest-threat-iraq-has-ever-faced-there-hope-turn-things-around.

Verhoeven, Harry. 2011. "Climate change, conflict and development in Sudan: global neo-Malthusian narratives and local power struggles." *Development and change* 42 (3): 679-707.

Vinke, Kira, Jonas Bergmann, Julia Blocher, Himani Upadhyay, and Roman Hoffmann. 2020. "Migration as adaptation?" *Migration Studies* 8 (4): 626-634.

Vitorino, António. 2019. *International Migration Law Glossary On Migration.* International Organization for Migration (IOM). https://environmentalmigration.iom.int/sites/g/files/tmzbdl1411/files/iml_34_glossary.pdf.

Warner, Koko. 2010. "Global environmental change and migration: Governance challenges." *Global environmental change* 20 (3): 402-413.

Wodon, Quentin, Andrea Liverani, and George Joseph. 2014. *Climate change and migration: evidence from the Middle East and North Africa*. World Bank Publications.

Wolf, Aaron T. 2007. "Shared waters: Conflict and cooperation." *Annu. Rev. Environ. Resour.* 32 (1): 241-269.

WPS. 2022. *Water challenges and conflict dynamics in Southern Iraq.* (The Water, Peace and Security). https://waterpeacesecurity.org/files/314.

Koubi, Vally, Jan Freihardt, and Lukas Rudolph. "Environmental change and migration aspirations: evidence from Bangladesh." *SocArXiv* (2022).

Toka Mahmoud et al., (2023). Water, Peace. "Understanding the Pathway from Water Insecurity to Urban Migration in Southern Iraq." Water, Peace and Security.

Von Lossow, Tobias. "More than infrastructures: Policy Brief water challenges in Iraq." *The Hague. https://www. clingen dael. org/sites/default/files/2018-07/PB_PSI_water_chal lenges_Iraq. pdf* (2018).

Iraq, I. O. M. " International Migration from Climate-Affected Areas In Iraq." *International Organization for Migration (IOM)* (2024).

Ginnetti, Justin. (2015). "Disaster-related displacement risk: measuring the risk and addressing its drivers." Norwegian Refugee Council.

Rosenow-Williams, Kerstin, and François Gemenne, eds. *Organizational perspectives on environmental migration*. London: Routledge, 2015.

Dun, Olivia, and François Gemenne. "Defining environmental migration: Why it matters so much, why it is controversial and some practical processes which may help move forward." *REVUE Asylon (s)* 6 (2008).

Lilleør, Helene Bie, and Katleen Van den Broeck. "Economic drivers of migration and climate change in LDCs." *Global environmental change* 21 (2011): S70-S81.

Presidency. (2024). President Rashid Highlights Climate Change as an Existential Threat to Iraq at COP29 Panel. Available at: https://presidency.iq/en/Details.aspx?id=5231

Amnesty. 2017. "Iraq: Turning a blind eye to arming the Popular Mobilization Forces." https://www.amnesty.org/ar/documents/mde14/5386/2017/ar/.

Baghdadtoday. 2019. "The Popular Mobilization Forces respond to accusations of being behind the “Arab-Kurdish” conflict in the Sarkaran district of Kirkuk." https://baghdadtoday.news/84244-.html.

Fernea, Robert A. 1963. "Conflict in Irrigation." Comparative Studies in Society and History 6 (1): 76-83. https://doi.org/10.1017/S0010417500001985. https://www.cambridge.org/core/product/BA49004892E733F742F86B3691612853.

Fukuyama, Francis. 2020. "Against the Grain: A Deep History of the Earliest States. By James C. Scott. New Haven: Yale University Press, 2017. 336p. 18.00 paper." Perspectives on Politics 18 (1): 281-282.

Hama, Hawre Hasan. 2019. "Framing the fall of Sinjar: Kurdish media’s coverage of the Yazidi genocide." Middle Eastern Studies 55 (5): 798-812.

K24. 2024. "The Kurdistan Democratic Bloc demands the return of palkana lands to their original owners." https://www.kurdistan24.net/ar/story/329203.

Kull, Christian. 2019. "Review of James C. Scott. 2017. Against the grain: a deep history of the earliest states. New Haven: Yale University Press." Journal of Political Ecology 26 (1).

Lust, Ellen M. 2022. Everyday choices: The role of competing authorities and social institutions in politics and development. Cambridge University Press.

Mansbridge, Jane. 2014. "The role of the state in governing the commons." environmental science & policy 36: 8-10.

Mansour, Renad. 2016. The Sunni Predicament in Iraq. Vol. 3. JSTOR.

Migdal, Joel S. 1988. Strong Societies and Weak States: State-Society Relations and State Capabilities in the Third World. Princeton University Press.

Ostrom, Elinor. 1990. Governing the commons: The evolution of institutions for collective action. Cambridge university press.

PMF-Media, Directorate of Information of the People's Army _. 2025. "The Popular Mobilization Forces began the harvest season in the largest agricultural project in Iraq." 05/10/2024. https://www.facebook.com/teammediawar/videos/1594653271387610/.

Richter, Steven. 2019. "Against the Grain: A Deep History of the Earliest States by James C. Scott (2017)."

Scott, James C. 2017. Against the grain: A deep history of the earliest states. Yale University Press.

Abbott, Kenneth W. 2012. "The transnational regime complex for climate change." Environment and Planning C: Government and Policy 30 (4): 571-590.

Abdulrahman, Salam Abdulqadir. 2020. "Water Shortage in Iraq's Kurdistan Region." Middle East Journal 74 (3): 451-460.

Ahram, Ariel I. 2023. ""There Should Be No Life": Environmental Perspectives on Genocide in Northern Iraq." Journal of Genocide Research: 1-21.

Al-aalem. 2016. "Kurdistan region's threat to cut off water is a "crime" against humanity that even Turkey has not done." https://al-aalem.com/d9-85-d8-ad-d9-84-d9-84-d9-88-d9-86-d8/.

Al-Asadi, Karar. 2023. "Kurdistan Dams: A Strategic Need or Other Disputed Files?". https://non14.net/157923.

Al-Bayati, Abbas. 2023. "Kirkuk is a "miniature Iraq" and we look forward to electing a balanced provincial council that represents all components." https://www.youtube.com/watch?v=kXBoYtLEVNg.

Al-sumaria. 2017. "Kirkuk tribal sheikhs call for the dissolution of the provincial council and the formation of another until elections are held." https://www.alsumaria.tv/news/politics.

Al-taghier. 2024. "Kirkuk...The story of an icon of brotherhood, a miniature image of Iraq, and a beautiful national and religious diversity | The story of a neighborhood." https://www.youtube.com/watch?v=7fsoMGm2tao.

Alforatnews. 2024. "Al-Hakim: Kirkuk is our miniature Iraq and success in it is success for Iraq." https://alforatnews.iq/news/

Aligica, Paul D, and Vlad Tarko. 2012. "Polycentricity: from Polanyi to Ostrom, and beyond." Governance 25 (2): 237-262.

Amery, Hussein A. 2002. "Water wars in the Middle East: a looming threat." Geographical Journal 168 (4): 313-323.

Amnesty. 2017. "Iraq: Turning a blind eye to arming the Popular Mobilization Forces." https://www.amnesty.org/ar/documents/mde14/5386/2017/ar/.

Bäckstrand, Karin, Jonathan W Kuyper, Björn-Ola Linnér, and Eva Lövbrand. 2017. Non-state actors in global climate governance: from Copenhagen to Paris and beyond. Taylor & Francis.

Baghdadtoday. 2019. "The Popular Mobilization Forces respond to accusations of being behind the "Arab-Kurdish" conflict in the Sarkaran district of Kirkuk." https://baghdadtoday.news/84244-.html.

Barnett, Jon. 2003. "Security and climate change." Global environmental change 13 (1): 7-17.

Benraad, Myriam. 2011. "Iraq's Tribal 'Sahwa': Its rise and fall." Middle East Policy 18 (1): 121-131.

Bulkeley, Harriet. 2014. Transnational climate change governance. Cambridge University Press.

Busby, Joshua. 2022. States and nature: The effects of climate change on security. Cambridge University Press.

Buthe, Tim. 2004. "Governance through private authority: non-state actors in world politics." Journal of International Affairs 58 (1): 281-291.

Chamberlain, David M. 2006. "The Green State: Rethinking Democracy and Sovereignty." Environmental Practice 8 (2): 135-136.

Cia Alves, Elia Elisa, Rodrigo Barros de Albuquerque, Marcos Alan Ferreira, and Cláudio Alves Monteiro. 2022. "Do Non-State Actors Influence Climate Change Policy? Evidence from the Brazilian Nationally Determined Contributions for COP21." Journal of Politics in Latin America 14 (1): 120-140.

Cole, Daniel H. 2011. "From global to polycentric climate governance." Climate law 2 (3): 395-413.

---. 2015. "Advantages of a polycentric approach to climate change policy." Nature Climate Change 5 (2): 114-118.

Cooley, John K. 1984. "The war over water." Foreign policy (54): 3-26.

Dietzel, Alix. 2022. "Non-state climate change action: Hope for just response to climate change?" Environmental Science & Policy 131: 128-134.

Dinar, Shlomi. 2002. "Water, security, conflict, and cooperation." Sais Review 22 (2): 229-253.

DiPaolo, Amanda. 2004. "Battle for State Control: Lessons from Violent Nonstate Actors Imitating the State: Colombia, Nicaragua, and Lessons for Iraq." World Affs. 167: 163.

Durac, Vincent. 2015. "The role of non-state actors in Arab countries after the Arab uprisings." IEMed Mediterranean Yearbook 2015 1: 37-41.

Eckersley, Robyn. 2004. The Green State: Rethinking Democracy and Sovereignty. The MIT Press.

Francis, Bassem. 2023 "Do Kurdistan Dams Threaten Water Security in Central and Southern Iraq?". https://www.independentarabia.com/node

Gremaud, Antoine, and Lada Kochtcheeva. 2024. "The role of non-state actors in promoting environmental justice: A comparative study of Kenya and South Africa." GeoJournal 89 (3): 110.

Hale, Thomas. 2018. "The role of sub-state and non-state actors in international climate processes." Londres: Chatham House.

Hamdani, Azam. 2023. "Is Kirkuk Arabi or Kurdi?". https://www.youtube.com/watch?v=pud8QvLWUOI.

Hoffmann, Matthew J. 2011. Climate governance at the crossroads: Experimenting with a global response after Kyoto. Oxford University Press.

Homer-Dixon, Thomas F. 2010. Environment, scarcity, and violence. Princeton University Press.

Homer-Dixon, Thomas F, and Jessica Blitt. 1998. Ecoviolence: Links among environment, population and security. Rowman & Littlefield.

InfoPlus. 2023. "Kurdistan threatens to cut off water if it does not get its share of the budget, Sulaymaniyah at a crossroads." https://www.infoplusnetwork.com/news/politics

Jordan, Andrew, Dave Huitema, Jonas Schoenefeld, Harro Van Asselt, and Johanna Forster. 2018. "Governing climate change polycentrically." Governing climate change: Polycentricity in action: 3-26.

K24. 2023. "The Presidency of the Article 140 Committee issues a decision on Kurdish and Turkmen farmers in Kirkuk." https://www.kurdistan24.net/ar/story/319688.

---. 2024. "The Kurdistan Democratic Bloc demands the return of palkana lands to their original owners." https://www.kurdistan24.net/ar/story/329203.

Kahl, Colin H. 2006. States, scarcity, and civil strife in the developing world. Princeton University Press.

Kirkuk_Satellite_Channel. 2023. "Sheikh Mamd Agha received a number of youth and personalities of Chamchamal."

---. 2024. "Kirkuk .. Aso Mamend follows up on the projects implemented by the PUK ".

Klare, Michael T. 2001. Resource wars: The new landscape of global conflict. Macmillan+ ORM.

Kliot, Nurit. 2005. Water resources and conflict in the Middle East. Routledge.

Krasner, Stephen D, and Thomas Risse. 2014. "External actors, state-building, and service provision in areas of limited statehood." Domestic Politics and Norm Diffusion in International Relations 197.

KRT. 2022. "The problem of the Urban Renewal Scheme has been solved by the Urban Renewal Project.". https://kirkuktv.net/KU/Details/11624.

Levy, Marc A. 1995. "Is the environment a national security issue?" International security 20 (2): 35-62.

Mansbridge, Jane. 2014. "The role of the state in governing the commons." environmental science & policy 36: 8-10.

Mason, Michael, and Mark Zeitoun. 2013. "Questioning environmental security." The Geographical Journal 179 (4): 294-297.

Mathews, Jessica Tuchman. 1989. "Redefining security." Foreign affairs 68 (2): 162-177.

McGinnis, Michael D. 2016. "Polycentric governance in theory and practice: Dimensions of aspiration and practical limitations." Available at SSRN 3812455.

Meier, Daniel. 2020. "'Disputed territories' in northern Iraq: The frontiering of in-between spaces." In In-Between Border Spaces in the Levant, 79-99. Routledge.

Michael, George. 2003. Resource Wars: the new landscape of global conflict. JSTOR.

Murigi, Teresa. 2017. "The Role of Non-state Actors in Climate Change Mitigation and Adaptation in Africa." University of Nairobi.

Myers, Norman. 1989. "Environment and security." Foreign policy (74): 23-41.

NRT. 2018. "Chamchamal: Low water levels prompt villagers to try local solutions with their own capabilities." https://www.facebook.com/nrt.arabicc/videos/2029388300657000/.

Ostrom, Vincent, Charles M Tiebout, and Robert Warren. 1961. "The organization of government in metropolitan areas: a theoretical inquiry." American political science review 55 (4): 831-842.

Parliament. 2023. "Rapporteur of the House of Representatives hosts Kurdish and Turkmen tribes in Kirkuk." https://iq.parliament.iq/blog.

---. 2024. "Deputy Speaker of the House of Representatives Dr. Shakhiwan Abdullah, confirms the continuation of work with Kirkuk deputies, tribal sheikhs, personalities and the governorate administration to address the problems in Balkana and Sarbashakh." https://iq.parliament.iq/blog.

Ramiz, Sevdimaliyev. 2023. "The Rise and Fall of the Iraqi Sunni Awakening Movement." Вестник МГИМО Университета 16 (1): 177-200.

Rashid, Faaiza. 2005. "Iraq: The challenge of non-state actors."

Rudaw. 2021. "Kirkuk Agriculture: There is a delay in renewing contracts and judicial decisions are enforceable and binding on us." https://www.rudawarabia.net/arabic/middleeast/iraq/221120218.

---. 2024. "Rudaw's Determination Alliance: Political parties agreed with the National Union to release Arab detainees in Sulaymaniyah prisons." https://www.rudawarabia.net/arabic/middleeast/iraq/301120244?fbclid=IwY2xjawHN5eJleHRuA2FlbQIxMAABHUch1QQRkbjjlHtWLktI0wxd6bFzWlwc3s5OrX0p0iwwQc0ICgkGAYyVCA_aem_N-x2m8qCmDPhM2deLXEjMA.

Sadouni, Samadia. 2022. Religious Transnationalism and Climate Change: The Role of Non-State Actors. Springer Nature.

Saeed, Nahwi. 2018. "Approaches to Resolving the Problem of Governance in Kirkuk." Journal

Salehyan, Idean, and Cullen S Hendrix. 2014. "Climate shocks and political violence." Global Environmental Change 28: 239-250.

Save_Tigris. 2020. Damming the Kurdistan Region of Iraq: Structural gaps in the KRG dam construction policies. https://www.savethetigris.org/wp-content/uploads/2020/07/Damming-the-Kurdistan-Region-of-Iraq-1.pdf.

Starr, Joyce R. 1991. "Water wars." Foreign policy (82): 17-36.

Stevenson, Hayley, and John S Dryzek. 2014. Democratizing global climate governance. Cambridge University Press.

Wolf, Aaron T. 1998. "Conflict and cooperation along international waterways." Water policy 1 (2): 251-265.

Yoffe, Shim, Aaron T Wolf, and Mark Giordano. 2003. "Conflict and cooperation over international freshwater resources: Indicators of basins at risr 1." JAWRA Journal of the American Water Resources Association 39 (5): 1109-1126.

Ahram, Ariel I. 2015. "Development, counterinsurgency, and the destruction of the Iraqi marshes." *International Journal of Middle East Studies* 47 (3): 447-466.

---. 2021. "Human ecology of the marshes." In *Southern Iraq's Marshes: Their Environment and Conservation*, 55-76. Springer.

---. 2023. ""“There Should Be No Life”: Environmental Perspectives on Genocide in Northern Iraq." *Journal of Genocide Research*: 1-21.

Al-Hadath_Iraq. 2025. "Kirkuk farmers demonstrate against dissolving Revolutionary Command Council decisions." Accessed 3/1. https://www.facebook.com/watch/?ref=search&v=1772414120203956&external.

Al-Kubaisi, Safaa. 2025. "Seizure of Christian Property in Iraq: A Recurring Crisis Awaiting Solutions." Accessed 3/10. https://www.alaraby.co.uk/economy/.

Al-Nashmi, Fadhel. 2025. "Returning Real Estate" Sparks Conflict Between Kurds and Arabs in Kirkuk." https://aawsat.com.

Al-ossmi, Laith HM. 2024. "Land tenure administration in Iraq: Quantitative analysis and a comprehensive evaluation." *Land Use Policy* 141: 107092.

Al-Rafidain. 2024. "Powerful militias confiscate citizens’ lands in Al-Madain area with the complicity of government agencies." Accessed 3/10. https://translate.google.com/?sl=en&tl=ar&op=translate.

Barnett, Jon. 2007. "Environmental security and peace." *Journal of Human Security* 3 (1): 4-16.

Barnett, Jon, and Stephen Dovers. 2001. "Environmental security, sustainability and policy." *Pacifica Review: Peace, security & global change* 13 (2): 157-169.

De Juan, Alexander. 2015. "Long-term environmental change and geographical patterns of violence in Darfur, 2003–2005." *Political Geography* 45: 22-33.

Farmers, Kurdish MPs go to Kirkuk to support Kurdish. 2025. "Rudaw." Accessed 3/7. https://www.rudaw.net/sorani/kurdistan/180220256.

Fernea, Robert A. 1969. "Land reform and ecology in postrevolutionary Iraq." *Economic Development and Cultural Change* 17 (3): 356-381.

FOA. 2020. *Agrarian Reform Law No. 117 of 1970.* (UN). https://www.fao.org/faolex/results/details/en/c/LEX-FAOC038269/.

Gari, Hussein Mohammed. 2018. "Land Tenure and Conflict in Sudan ". https://csf-sudan.org/wp-content/uploads/2023/10/land_tenure_and_conflict_in_sudan.pdf.

Ghanim, Marrwa S, and Ammar A Farhan. 2023. "Projected patterns of climate change impact on photovoltaic energy potential: A case study of Iraq." *Renewable Energy* 204: 338-346.

Gleditsch, Nils Petter. 2001. "Resource and Environmental Conflict: The-State-of-the-Art." In *Responding to Environmental Conflicts: Implications for Theory and Practice*, 53-66. Springer.

Goyes, David Rodríguez. 2016. "Land uses and conflict in Colombia." In *Environmental crime and social conflict*, 75-94. Routledge.

Gurses, Mehmet, Janroj Keles, David Romano, Michael M. Gunter, Massoud Dryaz, Vera Eccarius-Kelly, Barzoo Eliassi, Cengiz Gunes, Ahmad Hamza, and Ekrem Karakoc. 2020. *The Kurds in the Middle East : Enduring Problems and New Dynamics*. Lanham, United States: Lexington Books/Fortress Academic.

Homer-Dixon, Thomas. 2006. States, scarcity, and civil strife in the developing world. JSTOR.

Homer-Dixon, Thomas F. 1994. "Environmental scarcities and violent conflict: evidence from cases." *International security* 19 (1): 5-40.

Johnson, Douglas Hamilton. 2003. *The root causes of Sudan's civil wars*. Indiana University Press.

K24. 2024. "Despite Compensation, Arab Farmers Refuse to Evacuate Lands in Kirkuk." Accessed 3/1. https://www.kurdistan24.net/ar/story/815902.

---. 2025. "Arrest of a Kurdish officer in the Iraqi army due to the events of the village of Shanagha." https://www.kurdistan24.net/ar/story/826803.

Kahl, Colin H. 2006. *States, scarcity, and civil strife in the developing world*. Princeton University Press.

Knights, Michael, and Ahmed Ali. 2010. *Kirkuk in transition: Confidence building in northern Iraq*. Washington Institute for Near East Policy.

KRT. 2025. Land Disputes in Kirkuk. edited by Kirkuk TV.

Kurdsat. 2022. "55 dunams of wheat of a Kurdish farmer were burned in the village of Kharabay Sargaran." Accessed 3/1. https://www.youtube.com/watch?v=F3kcnaCI9Zg

Mabin, Alan. 2003. "Dispossession, exploitation and struggle: an historical overview of South African urbanization." In *The apartheid city and beyond*, 12-24. Routledge.

Mazo, Jeffrey. 2010. *Climate conflict: How global warming threatens security and what to do about it*. Routledge.

McCarthy, Jeff. 2003. "Local and regional government: from rigidity to crisis to flux." In *The apartheid city and beyond*, 25-37. Routledge.

McDowall, David. 2004. *A Modern History of the Kurds*. London, United Kingdom: I. B. Tauris & Company, Limited.

Nabeel, Gilgamesh, and Saad Salloum. 2023. "Christians in Post-2003 Iraq: Fragmentation Dynamics, Ethnic and Sectarian Fault Lines ". https://eismena.com/en/article/christians-in-post-2003-iraq-fragmentation-dynamics-ethnic-and-sectarian-fault-lines-2023-08-11.

Natali, Denise. 2010. *The Kurdish Quasi-State: Development and Dependency in Post-Gulf War Iraq*. Syracuse University Press.

NRC. 2023. *Inadequate and inequitable: water scarcity and displacement in Iraq.* (The Norwegian Refugee Council). https://www.nrc.no/globalassets/pdf/reports/water-scarcity-and-displacement-in-iraq/water-scarcity-and-displacement-in-iraq---english.pdf.

O'Leary, Carole A. 2002. "The Kurds of Iraq: Recent history, future prospects." *Middle East Review of International Affairs* 6 (4): 17-29.

Olson, Robert. 2013. *The emergence of Kurdish nationalism and the Sheikh said rebellion, 1880–1925*. University of Texas Press.

Olsson, Katarina, and Anders Rapp. 1991. "Dryland degradation in central Sudan and conservation for survival." *Ambio*: 192-195.

Owen, Roger. 2013. *State, power and politics in the making of the modern Middle East*. Routledge.

Palani, Kamaran, Jaafar Khidir, Mark Dechesne, and Edwin Bakker. 2021. "Strategies to gain international recognition: Iraqi Kurdistan's September 2017 referendum for independence." *Ethnopolitics* 20 (4): 406-427.

Percival, Val, and Thomas Homer-Dixon. 1998. "Environmental scarcity and violent conflict: the case of South Africa." *Journal of Peace research* 35 (3): 279-298.

Pipes, Daniel. 1993. The kurds: A contemporary overview: Edited by Philip G. Kreyenbroek and Stefan Sperl. New York: Routledge, 1992. 250 pp. $47.50. JAI.

Protect_Goizha_Mountain. 2024. https://www.facebook.com/people/Protect-Goizha-Mountain/61560511229696/?paipv=0&eav=Afa027bkmpuNv0jNQWM02SBmZ5ou9EghVILU3oc4vRTMg1LHOVE1h6P9_ZP13gdaRj0&_rdr.

Rudaw. 2024. "Fahmi Burhan: More than 600,000 Arabs have been taken to Kirkuk in seven years." https://www.rudaw.net/english/kurdistan/101120244.

---. 2025. "Kurdistan Regional Government (KRG) Presidency: Iraqi army's behavior towards Kurdish farmers is unacceptable
". Accessed 17/2. https://www.rudaw.net/sorani/kurdistan/1702202532.

Skelton, Mac, and Zmkan Ali Saleem. 2019. "Iraq's disputed internal boundaries after ISIS: Heterogeneous actors vying for influence."

The_Kurdistan_Parliament. 2015. "Law No. 5 of 2015 on the Protection of the Rights of Components (Minorities) in the Kurdistan Region." Accessed 3/10. https://www.parliament.krd/media/.

Tripp, Charles. 2007. *A History of Iraq*. 3 ed. Cambridge: Cambridge University Press.

Voller, Yaniv. 2014. *The Kurdish liberation movement in Iraq: From insurgency to statehood*. Routledge.

Wise, Louise. 2021. "The genocide-ecocide nexus in Sudan: Violent "development" and the racial-spatial dynamics of (neo) colonial-capitalist extraction." *Journal of Genocide Research* 23 (2): 189-211.

Yeşilbursa, Behçet Kemal. 2019. "Agrarian Reform in the Middle East (1945-1965)." *Gazi Akademik Bakış* 13 (25): 331-373.

Abdullah, Mukhalad, and Nadhir Al-Ansari. 2021. "Irrigation projects in Iraq." *Journal of Earth Sciences and Geotechnical Engineering* 11 (2): 35-160.

Acharya, Deepti. 2021. *Water and Public Policy in India: Politics, Rights, and Governance*. Routledge India.

Ahmmad, Yadgar Kamal. 2013. "9. Water Law in Iraq: The Present Model for Water Resources Protection." In *Water Law and Cooperation in the Euphrates-Tigris Region*, 191-216. Brill Nijhoff.

Ahram, Ariel I. 2024. ""There Should Be No Life": Environmental Perspectives on Genocide in Northern Iraq." *Journal of Genocide Research* 26 (4): 378-398.

Al-Dabbas, Moutaz. 2024. "Water Resources of Iraq: An Overview." *The Geography of Iraq*: 49-81.

Bammarny, Bawar. 2019. "Federalism and decentralisation in Iraq. A country study of constitutional asymmetry in Iraq." *Constitutional asymmetry in multinational federalism: Managing multinationalism in multi-tiered systems*: 255-286.

Bernat, Rebecca FA, and Sharon B Megdal. 2022. "Water federalism in the United States of America." In *Oxford Research Encyclopedia of Environmental Science*.

Constitution. 2005. Iraqi Constitution

Deseret_News. 1996. "IRANIAN-BACKED KURDS CAPTURE KEY DAM." https://www.deseret.com/1996/10/21/19272872/iranian-backed-kurds-capture-key-dam/.

Draw. 2022. "How was the Bakhma Dam sold?". https://drawmedia.net/ar/page_detail?smart-id=10454

---. 2025. "Water Infrastrctures in KRI." https://www.facebook.com/photo/?fbid=684028634199743&set=a.254221303847147.

EPIC. 2023. *Epic Report: Water Diplomacy in the Land of Two Rivers: Safeguarding Iraq's Water Security amid the Climate Crisis.* https://enablingpeace.org/water-diplomacy/?eType=EmailBlastContent&eId=a8f99c35-c0fe-4e87-af11-10fa3feb79ff.

Fernandes, Leela. 2022. *Governing Water in India: Inequality, Reform, and the State*. University of Washington Press.

Forsythe, David P. 2017. "Water and politics in the Tigris–Euphrates basin: hope for negative learning?" *Water Security in the Middle East*: 167-184.

Fox, Sarah. 2020. "Localizing environmental federalism." *UC Davis L. Rev.* 54: 133.

Gerlak, Andrea K. 2006. "Federalism and US water policy: Lessons for the twenty-first century." *Publius: The Journal of Federalism* 36 (2): 231-257.

Grigg, Neil S. 2023. "State government roles in water governance: Time for an upgrade." *Public Works Management & Policy* 28 (2): 117-134.

Hasan, Qaraman. 2023. "A trans-national analysis of equitable utilisation and minimisation of environmental harm under environmental laws at international, federal and national levels." The University of Waikato.

Hasan, Qaraman M, Sarkawt Ghazi Salar, Durgeshree Raman, Sam Campbell, and Ibrahim Qasim Palani. 2023. "When the law is unclear: challenges and opportunities for data and information exchange in the Tigris-Euphrates and Indus river basins." *Water Policy* 25 (8): 780-796.

Holyoke, Thomas T. 2023. *Water Politics: The Fragmentation of Western Water Policy*. Routledge.

HRW. 1988. "First Anfal--The Siege of Sergalou and Bergalou." https://www.hrw.org/reports/1993/iraqanfal/ANFAL3.htm.

Issaev, Leonid, and Andrey Zakharov. 2021. *Federalism in the Middle East*. Springer.

K24. 2017. "The government will allocate budgets for the rehabilitation of the Derbandikhan dam and damaged schools." Accessed 4/4. https://www.kurdistan24.net/ckb/story/43683

Kehl, Jenny R. 2017. "Water security in transboundary systems: Cooperation in intractable conflicts and the Nile system." *Water security in the Middle East: essays in scientific and social cooperation* 1: 39-66.

---. 2021. *Water and conflict in the Middle East*. Oxford University Press.

Kurdistan_Parliament. 1992. Law No. (10) Law of the Ministry of Agriculture and Irrigation.

Lebon, JHG. 1955. "The new irrigation era in Iraq." *Economic Geography* 31 (1): 47-59.

Lucas, John. 1998. "The tension between despotic and infrastructural power: The military and the political class in Nigeria, 1985–1993." *Studies in comparative international development* 33: 90-113.

Mann, Michael. 2008. "Infrastructural power revisited." *Studies in comparative international development* 43: 355-365.

Marr, Phebe. 2018. *The modern history of Iraq*. Routledge.

Mason, Michael. 2022. "Infrastructure under pressure: Water management and state-making in southern Iraq." *Geoforum* 132: 52-61.

Mohammed, Halo. 2017. "Two years after the earthquake, the rehabilitation of the Derbandikhan Dam began." Accessed 4/5. https://www.rudaw.net/sorani/business/08072019

Mulat, Asegdew G, and Semu A Moges. 2014. "Assessment of the impact of the Grand Ethiopian Renaissance Dam on the performance of the High Aswan Dam." *Journal of Water Resource and Protection* 6 (6): 583-598.

Natali, Denise. 1999. *International Aid, Regional Politics, and the Kurdish Issue in Iraq after the Gulf War*. Vol. 31. Emirates Center for Strategic Studies and Research.

---. 2010. *The Kurdish Quasi-State: Development and Dependency in Post-Gulf War Iraq*. Syracuse University Press.

Nicol, Alan, and Everisto Mapedza. 2017. *Water Governance and Collective Action: Multi-scale Challenges*. Routledge.

Percival, Robert V. 1995. "Environmental federalism: historical roots and contemporary models." *Md. L. Rev.* 54: 1141.

Phillips, David, Marwa Daoudy, Stephen McCaffrey, Joakim Öjendal, and Anthony Turton. 2006. *Trans-boundary water cooperation as a tool for conflict prevention and for broader benefit-sharing*. Vol. 4. Ministry for Foreign Affairs Stockholm, Sweden.

Popelier, Patricia. 2021. *Dynamic federalism: A new theory for cohesion and regional autonomy*. Routledge.

Reilly, Ben. 2007. "Political engineering in the Asia-Pacific." *Journal of Democracy* 18 (1): 58-72.

Reuter. 1996. "Kurds Fighting Mars Peace in Northern Iraq." https://reliefweb.int/report/iraq/kurds-fighting-mars-peace-northern-iraq.

Rotberg, Robert I. 2003. "Failed states, collapsed states, weak states: Causes and indicators." *State failure and state weakness in a time of terror* 1: 25.

Rudaw. 2019. "Construction of 11 dams resumes in the Kurdistan Region.". https://www.rudawarabia.net/arabic/kurdistan/24122019

Ryan, Erin. 2017. "Negotiating environmental federalism: dynamic federalism as a strategy for good governance." *Wis. L. Rev. Forward*: 17.

Shobe, William. 2020. "Emerging issues in decentralized resource governance: environmental federalism, spillovers, and linked socio-ecological systems." *Annual Review of Resource Economics* 12 (1): 259-279.

Skelton, Mac. 2022. "Competing over the Tigris: The politics of water governance in Iraq." *Institute of Regional and International Studies*.

Smith, Graham. 2014. *Federalism: the multiethnic challenge*. Routledge.

Stansfield, Gareth. 2013. "The unravelling of the post-First World War state system? The Kurdistan Region of Iraq and the transformation of the Middle East." *International Affairs* 89 (2): 259-282.

Stansfield, Gareth, and Mohammed Shareef. 2017. *The Kurdish question revisited*. Oxford University Press.

Verhoeven, Harry. 2021. "The Grand Ethiopian Renaissance Dam: Africa's Water Tower, Environmental Justice & Infrastructural Power." *Daedalus* 150 (4): 159-180.

Weiss, Linda. 2006. "Infrastructural power, economic transformation, and globalization." *Anatomy of power: The social theory of Michael Mann*: 167-186.

Williams, Paul A. 2012. "Euphrates and Tigris waters-Turkish-Syrian and Iraqi relations."

Yildiz, Kerim. 2004. "The Kurds in Iraq." *The Past, Present, and Future*.

Yousuf, Mahmood A, Nada Rapantova, and Jalal H Younis. 2018. "Sustainable water management in Iraq (Kurdistan) as a challenge for governmental responsibility." *Water* 10 (11): 1651.

Zawahri, Neda A. 2017. "Adapting to climatic variability along international river basins in the Middle East." *Water security in the Middle East* 145: 20.

Dohrmann, Mark, and Robert Hatem. "The impact of hydro-politics on the relations of Turkey, Iraq, and Syria." *The Middle East Journal* 68, no. 4 (2014): 567-583.

Gorvett, Jon. "Mixing water and politics: Turkey, Syria and Iraq." *Insight Turkey* 20 (1998): 33-38.

Milas, S. (2013). *Sharing the Nile: Egypt, Ethiopia and the Geo-Politics of Water* (1st ed.). Pluto Press.

Wheeler, Kevin G., Marc Jeuland, Jim W. Hall, Edith Zagona, and Dale Whittington. "Understanding and managing new risks on the Nile with the Grand Ethiopian Renaissance Dam." *Nature communications* 11, no. 1 (2020): 5222.

Behn, Oliver, Johannes Wichmann, Michael Leyer, and Angelina Schilling. "Spillover effects in environmental behaviors: a scoping review about its antecedents, behaviors, and consequences." *Current Psychology* (2025): 1-25.

Desterbecq, Charlotte, and Sandy Tubeuf. "Inclusion of environmental spillovers in applied economic evaluations of healthcare products." *Value in Health* 26, no. 8 (2023): 1270-1281.

The New York Times. (1980). Iranians Bomb Dam in Iraq's Kurd Area; Extent of Damage Not Reported-- Teheran Says Kharg Island Is Again Shipping Some Oil Iraq Is Also Reported Pumping Oil. November 22, 1980. https://www.nytimes.com/1980/11/22/archives/iranians-bomb-dam-in-iraqs-kurd-area-extent-of-damage-not-reported.html

Salem, Z. (2022). Kurdistan Region of Iraq: 4 New Dams Without Baghdad's Knowledge. Al-Arabi Jadid. Available at: https://www.alaraby.co.uk/economy

Francis, B., (2023). Do the Kurdistan Region's dams threaten water security in central and southern Iraq? Independent Arabia. https://www.independentarabia.com/node/467141

Yaqin News. (2021). Central-regional disputes deprive Iraq of its largest water dam. Available on: https://yaqinnews.net/?p=2866

UNICEF. (2023). Climate Landscape Analysis for Children and Young People in Iraq Unicef in Iraq Executive Summary. https://www.unicef.org/iraq/media/2896/file/CLAC%20-%20Executive%20summary%20-%20EN.pdf

Lee, J., (2024). Iraqi Census: Key Findings. *Iraqi Business News*. https://www.iraq-businessnews.com/2024/11/26/iraqi-census-key-findings/

Hauge, Wenche, and Tanja Ellingsen. "Beyond environmental scarcity: Causal pathways to conflict." *Journal of Peace Research* 35, no. 3 (1998): 299-317.

KirkukNow. (2023). Fish farmers forced to sell fish at low prices. https://kirkuknow.com/en/news/69221

Iraq, I. O. M. "Migration, environment, and climate change in Iraq." *International Organization for Migration (IOM)* (2022).

Shafaq. 2024. "Water Resources stops filling fishponds in Kirkuk and explains the reasons." Accessed 10-8. https://shafaq.com/ar/%D9%85%D8%AC%D8%A.

Appendix

Appendix A: Kirkuk Survey

These are a 5-point Likert agreement scale. The minimum is Strongly Disagree = 1, and the maximum is Strongly Agree = 5. It measures levels of agreement, from strong disagreement to strong agreement.

Q.11b. What is the most appropriate way to govern Kirkuk and the disputed areas?

- The KRG
- The federal government in Baghdad
- Joint government.
- I don't know

Q.16. If you or a member of your family or relatives faced problems related to agricultural lands and irrigation issues, who is the authority you seek refuge in to solve such problems?

Q.17b. The competition between Kurdish, Turkmen, and Arab farmers in Kirkuk is associated with which of the following issues?

- Environmental Pressures (climate change, lack of sufficient arable lands and water)
- Legal issues of land ownership
- Identity conflict
- Abundant of natural resources like oil and gas
- Weak Central Governance and strong NSAs

How much do you agree with this statement:

Q.18b. The governance of water resources and their infrastructures, rivers, and dams have contributed to tensions between GoI and KRI.

Q.18A. If you or a member of your family or relatives encountered problems related to water scarcity and drought, who is the authority you seek refuge in to solve such problems?

Q.19b. If it faces political or military problems with the central government, the KRG could resort to cutting off water from downstream areas as a weapon.

Q.19a. Water scarcity and drought contribute to tensions between Kurds, Arabs, Turkmen, and other ethnicities and sects in Iraq in general.

Q. 20. To what extent do you agree with the following statement: Water scarcity and drought contribute to tensions between villagers, farmers, and landowners?

Q. 21. Water scarcity and drought have led to the abandonment of agriculture and livestock and caused villagers to migrate to cities, resulting in rising unemployment, poverty, and communal conflict.

Q. 22. Have water scarcity and drought caused you or a relative to leave your village, abandon agriculture or livestock, and move to the city?

Q. 23. The regime's environmental and agricultural policies (land, water, and irrigation) have contributed to disputes among groups.

Appendix B: Garmian Survey

To what extent do you agree with the following statement:

Q.12. Water scarcity and drought contribute to tensions between Kurds, Arabs, Turkmen, and other ethnic and sectarian groups in Iraq.

Q.13. Water scarcity and drought contribute to tensions between villagers, farmers, and landowners.

Q.14. Water scarcity and drought have caused people to abandon agriculture and livestock, leading to migration to cities, increased unemployment, and the spread of poverty and social unrest.