

RISKING THE FUTURE:

Climate Change, Environmental
Destruction, and Conflict in Yemen



**CENTER FOR
CIVILIANS IN CONFLICT**
RECOGNIZE. PREVENT. PROTECT. AMEND.

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Cover: Increased displacement caused by the conflict is creating greater strain on resources. Sahel Abyan Refugee Camp, Aden Yemen Credit: Ali Najip

ORGANIZATIONAL MISSION AND VISION

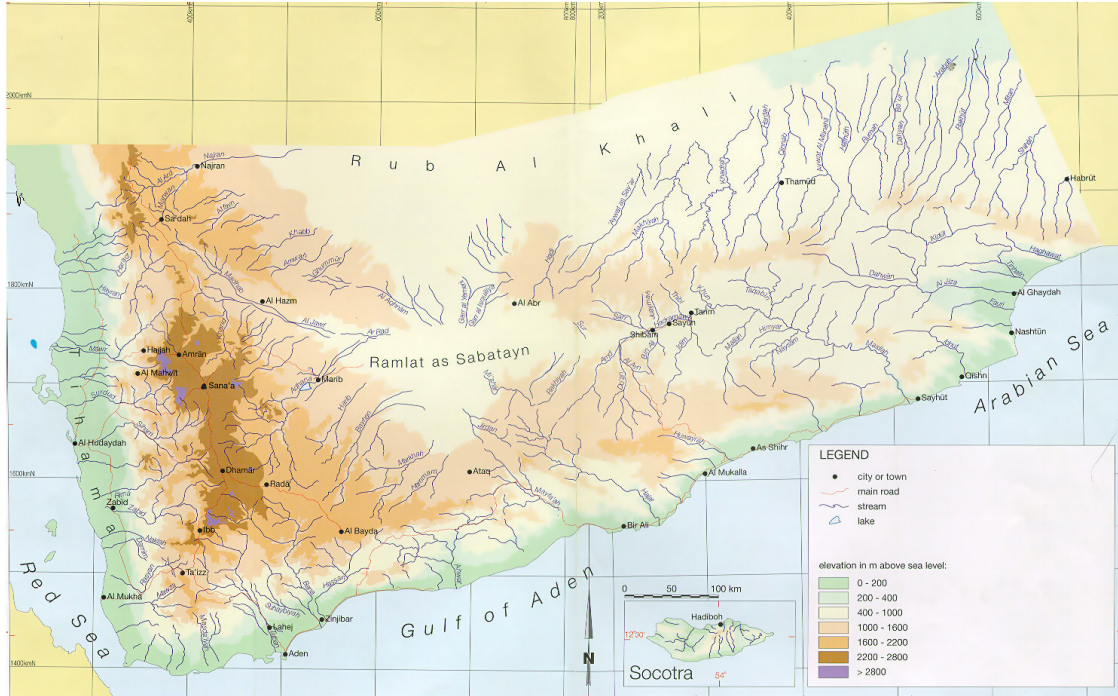
Center for Civilians in Conflict (CIVIC) is an international organization dedicated to promoting the protection of civilians in conflict. CIVIC envisions a world in which no civilian is harmed in conflict. Our mission is to support communities affected by conflict in their quest for protection and strengthen the resolve and capacity of armed actors to prevent and respond to civilian harm. CIVIC was established in 2003 by Marla Ruzicka, a young humanitarian who advocated on behalf of civilians affected by the war in Iraq and Afghanistan. Honoring Marla's legacy, CIVIC has kept an unflinching focus on the protection of civilians in conflict. Today, CIVIC has a presence in conflict zones and key capitals throughout the world where it collaborates with civilians to bring their protection concerns directly to those in power, engages with armed actors to reduce the harm they cause to civilian populations, and advises governments and multinational bodies on how to make life-saving and lasting policy changes. CIVIC's strength is its proven approach and record of improving protection outcomes for civilians by working directly with conflict-affected communities and armed actors. At CIVIC, we believe civilians are not "collateral damage" and civilian harm is not an unavoidable consequence of conflict—civilian harm can and must be prevented.

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I. EXECUTIVE SUMMARY

“Around the world, climate change is increasing the risk of violent conflict by discrediting central governments, prompting clashes over resources, and boosting the recruiting appeal of nonstate armed groups.”¹

Scientists have been discussing the threat posed by climate change in Yemen for decades. One of the most water-poor countries in the world, Yemen is at great risk of running completely dry, leaving its 30 million inhabitants without water. In 2010, the World Bank published a paper predicting that Yemen’s groundwater reserves would be depleted between 2030 and 2040²—a prediction that remains largely unchanged. Ten years later, in 2020, the Century Foundation published a report stating that, even as the war rages on, “Yemen’s environmental crisis is the biggest risk for its future”³ Although water scarcity in Yemen is a complex problem with multiple causes, climate change has—and continues to—exacerbate the problem while also contributing to the dire food scarcity and famine experienced throughout the country.⁴

In addition to the threat that climate changes pose to Yemenis’ ability to access water and food, they also threaten to exacerbate the conflict and spark future conflicts due to resource competition and migration—threats that the UN Secretary General warned of in 2020.⁵ This phenomenon is already evident in Yemen: the impacts of climate change, combined with the harm warring parties in the current armed conflict have inflicted upon the environment and on critical resources,⁶ have contributed to resource scarcity and forced migration across the country. These impacts have, in turn, led to increased protection threats, tensions between different communities over resources, and outbreaks of violence and local conflicts. With no sustainable, long-term solutions in place to mitigate the effects of both climate change and environmental destruction, the population of Yemen faces great risks moving forward—both in their ability to attain needed resources to survive and in the potential for conflict to continue well into the future over increasingly constrained resources.

Temperatures in Yemen have already increased by 1.8 degrees Celsius over the last 50 years and continue to rise. Water levels in the country’s water basins have rapidly declined in the last few decades, and a significant number of the country’s wells have already dried up. Prior to the start of the current conflict in 2014, it was predicted that Sana’a would be the first capital city in the world to run out of clean water—a result of poor planning and resource management over the last several decades. Extreme weather events have also increased in the last several years, including flooding and droughts, further devastating the country’s land and resources. In the summer of 2022, severe floods wrecked many areas of the country, killing and displacing thousands of people.

The last eight years of conflict have compounded the impacts of climate change on land, water, and food through the deterioration of basic government services, blockades by warring parties, direct attacks upon farmland and water sources, and the placement of landmines across wide swaths of agricultural land as well as near and inside of water sources. Resource mismanagement has been an issue for many decades in Yemen, starting long prior to the conflict. However, it has been exacerbated by the conflict. The breakdown of government institutions due to the lack of salary



Accumulation of waste in Taiz City, the photo shows the extent of the environmental disaster in the city. November 2021

payments since the start of the war—as well as the broader impacts of the war—have left many government entities either completely shut down or working with minimal resources. Additionally, there are possibly over two million landmines scattered across the country.⁷ Moreover, the Group of Eminent Experts and non-government organizations have widely documented attacks on water and food infrastructure and sources.⁸

The Center for Civilians in Conflict (CIVIC) spoke with communities and individuals in Aden, Marib, Taiz, and elsewhere to discuss the impacts that climate change and the current conflict have had on their access to resources, on their livelihoods, and on inter- and intra-community relations. CIVIC found that, combined with the environmental destruction that has been caused by warring parties, climate change is directly correlated to shortages in critical resources, loss of livelihoods, forced migration, and ultimately, conflict.

Disputes over land and water in Yemen are not a new phenomenon. In conversation with CIVIC, Dr. Walid Saleh, the Chief Technical Advisor at the UN Food and Agricultural Organization (UNFAO) in Aden, cited statistics provided by the Ministry of Interior in 2010, stating, “Land and water conflict is the second biggest cause of conflict in Yemen... 4,000 people are killed each year in conflicts over land and water.”⁹ Today, water and land scarcity remain one of the greatest challenges that Yemen faces, and continues to cause local conflicts across the country. “[There] are so many disputes over water in wells,” CIVIC was informed by Muna Luqman. Luqman is the founder of Food4Humanity, a Yemeni civil society organization, as well as one of the authors of the study “Gender, Climate,

and Conflict in Yemen.”¹⁰ She continued, “Families are running away from the conflict ... then they end up fighting with the host communities there over the limited water sources.” Ultimately, climate change and environmental degradation are having a multiplier effect on conflict drivers and are exacerbating protection threats facing civilians, creating a greater risk for ongoing and future conflicts to occur in Yemen.

The combined effects of climate change and environmental degradation are threatening people in Yemen’s right to life, to food, and to water, and they are creating civilian protection concerns as conflicts erupt and individuals are displaced due to the increasing lack of resources. Under international human rights law (IHRL), everyone has the right to a healthy life, which includes adequate access to water and food—a right that the Yemeni government must uphold. In addition, the destruction of critical infrastructure, including food and water infrastructure, as well as the placement of landmines on farmland and in or near water sources, constitute violations of international humanitarian law (IHL).

While the impacts of climate change and environmental degradation are felt by everyone in Yemen, certain communities face additional vulnerabilities and harms, including women, children, and IDPs and refugees.

Women and girls are usually responsible for fetching water, and as water has become scarcer and water sources have become inaccessible or unfunctional, women and girls have had to spend entire days traveling to fetch water.¹² During these journeys, they are further at risk of stepping on landmines.¹³ Meanwhile, IDPs and refugees face a multiplier effect in the challenges and harms posed by climate change and environmental degradation. Their homes are often more vulnerable to flooding and other extreme climate events,¹⁴ and many of those living in camps have less access to safe and affordable water and food compared to their non-displaced counterparts. The poverty and displacement that has been exacerbated by climate change and environmental degradation has also contributed to child recruitment into armed groups¹⁵ and early marriage,¹⁶ and many children have been forced to drop out of school to support their families.¹⁷

CIVIC’s research demonstrates that climate change and environmental degradation must be addressed immediately to promote stability and prevent the outbreak of further conflicts over access to resources and contribute to inter- and intra-communal tensions. Further, extremist groups and warring parties may utilize resource scarcity to recruit individuals to their groups, leading to the strengthening of these groups. The Yemeni government, security forces, and international community must cooperate in order to effectively confront the civilian harm threats posed by climate change. Warring parties must immediately cease tactics that are further degrading the environment and causing long-lasting harm to civilians—either directly or through their impact on land, water, and food. Communities must also be provided opportunities to self-advocate and contribute to solutions that take their specific needs into account.

While efforts to end the current conflict and secure sustainable peace are the priority and a necessary first step to both ensuring civilian protection and ending the extensive harm caused by the war, it is also a necessary one in order to allocate more resources to rebuilding the country. The impending climate crisis in Yemen is an opportunity for international and local actors to work together toward building a sustainable system of resource management and governance in Yemen.

“It’s a conflict trigger. Even if there’s not a conflict because of climate change yet, it’s a serious risk for causing future conflict.”

— IDP from Sirwah district currently living in Al-Sumayya IDP Camp in Marib¹¹

II. RECOMMENDATIONS

Climate change and the environmental degradation being caused by the war pose significant risks to Yemen's future, including the risk of continued conflict due to resource constraints and migration. It is imperative that the government, in coordination with community leaders, local civil society, and religious leaders, develop a long-term plan and relevant policies to mitigate these future risks and ensure a more stable future for Yemeni civilians.

The following recommendations are addressed to different actors who have a role in mitigating the risks stemming from climate change and environmental degradation:

To the Yemeni government and all security actors:

- Analyze current trends in climate change and environmental degradation and identify security risks based on these trends. Develop an action plan based on this analysis for climate adaptation in coordination with relevant ministries, civil society organizations, community leaders, and non-governmental organizations.
- Establish needed mechanisms and/or bodies comprised of private and public entities to effectively manage resources, including water and food, per the climate adaptation action plan. Define communication and coordination between these bodies and civil society organizations, NGOs, and other relevant entities working on climate change adaptation.
- Provide regular review and updates per the National Adaptation Programmes of Action.¹⁸
- Address civilian harm and land and water scarcity posed by landmines by reviewing and adapting the mine action plan to address the increasing gap between mine laying and clearing.
- Develop a mechanism to address community-level conflicts over resource-sharing, particularly regarding water-based conflicts.
- Develop a strategy for supporting NGOs and civil society organizations that engages in climate work and water and food management, including the necessary approvals, partnerships, and support, in a timely fashion.
- Facilitate passage of NGOs, CSOs, and government agencies through checkpoints, particularly where they are working to improve water infrastructure and mitigate harm from climate change and environmental degradation.
- Develop early warning mechanisms for extreme climate events, particularly in IDP and refugee camps, and provide resources and infrastructure to help prevent destruction of homes and shelters.

To the Office of the Special Envoy of the Secretary-General for Yemen:

- Ensure that any peace process includes and prioritizes a plan to address the impacts of climate change, environmental degradation, and conflicts related to resource scarcity.

To the international community:

- Engage with the Yemeni government and authorities on the need to prioritize addressing climate change and environmental protection.
- Provide resources, including funding, legitimacy, and support, to NGOs and civil society organizations working on issues related to climate change, resource management, climate resiliency, and sustainability.
- Enhance protection-related interventions with security forces to ensure better protection for civilians.
- Finance and support rehabilitation of essential services, such as water infrastructure, to reduce water losses, increase water availability, and mitigate flooding.
- Partner with the Yemeni government on efforts and programming related to climate change preparedness, including pre-positioning communities with supplies, food, water, and other humanitarian necessities.
- Support programs that educate community leaders and government offices on climate preparedness and environmental protection.

III. METHODOLOGY

Center for Civilians in Conflict (CIVIC) engaged with individuals across the country, as well as with communities in Marib, Taiz, and Aden governorates, in order to understand the impacts of climate change on resources, the impacts of the conflict on the environment, and the way in which resource scarcity and environmental degradation threaten security—and, thus, civilian protection—in Yemen. Interviews were semi-structured and took place in person in Marib and Aden, and over the phone and via video calls with individuals located in other governorates and abroad. Most interviewees were initially chosen through CIVIC’s Yemen team, and included members of the CIVIC-supported Community Protection Groups (CPGs) as well as security forces that CIVIC engages with in Yemen.¹⁹ Interviewees also included government officials and subject-area experts, with further interviewees identified using snowball sampling techniques.

Many of the interviews that took place in Marib and Aden were in the form of focus group discussions, including with IDPs, local government officials, and community leaders. In addition, CIVIC spoke with academics, government leaders, representatives of local and international non-governmental organizations, and members of security forces. In total, CIVIC conducted interviews with 37 individuals, including 5 focus group discussions. CIVIC focused its research particularly on the ways that specific vulnerable groups, including women and girls, youth, and minorities, experience conflicts differently than the general population.

Interview questions focused on: the impacts seen from climate change in relation to land and water sources in Yemen; the impacts of the war—particularly landmines, missiles, attacks on farmland and water sources, airstrikes, forced migration, and IDPs; resource limitations and resource sharing among communities; and conflicts over resources. Special focus was also placed on the particular impacts of climate change and environmental degradation on vulnerable communities, including women, children, and IDPs. Significant additional research was conducted based on a review of secondary literature and analysis.

IV. BACKGROUND

From 2014 to 2020, it is estimated that there have been over 20,000 civilian casualties— a number that is likely much higher now.²⁰ Over 4 million individuals have been displaced.²¹ The majority of the population is in need of humanitarian assistance, with an estimated 64 percent of the population facing food insecurity and 61 percent facing water insecurity.²² All warring parties have committed egregious violations of IHRL and IHL, including indiscriminate attacks, the use of antipersonnel landmines, arbitrary detentions, torture, enforced disappearances, blocking humanitarian aid, and more.

Food and water insecurity in the country has worsened drastically during the conflict, but the root of the problem has a much longer history. The population rose from 5.3 million in 1960 to 25.8 million in 2014.²³ The percentage of the population living in urban areas rose from 9 percent to 34 percent in the same time frame.²⁴ These increases led to the need for greater water infrastructure, particularly for use in agriculture. Deep well drilling began in the 1970s in response, and water basins, wells, dams, and broader water infrastructure were built in the following decades.²⁵ While these initiatives proved successful in allowing for greater water access and irrigation, they were done with little government regulation. Over the last several decades, the impacts of poor policies have become clear: private wells have been built at an astronomical rate and irrigation systems have been developed with almost no oversight. The result is that water basins are quickly running out of water supplies.²⁶

Climate change has, of course, exacerbated these problems, as the amount of rainfall has continuously decreased and frequently comes in the form of downpours that lead to flooding.²⁷ Flooding and inconsistent rainfall, combined with increased temperatures and extended periods of drought, has left the country's water basins unable to replenish water supplies.²⁸ At the same time, irrigation has only continued to increase each year—due, in particular, to the expansion of the cultivation of Yemen's main cash crop, qat, which requires significant water in order to grow.²⁹ Moreover, wells have continued to be dug with minimal oversight, draining already-diminishing water supplies and sometimes leading to well systems faltering when they no longer have enough water pressure because water sources have been spread too thin.

Now in its eighth year, the conflict has caused extensive civilian harm and damage to the country's infrastructure, including to the same water infrastructure that is already failing to provide adequate water to the population. Food and water sources have been damaged and destroyed across the country—by direct attacks, as collateral damage, and as a result of the use of landmines (described further below in Section VII).³⁰ Further degradation is also being caused by declining access to the resources needed to maintain existing infrastructure, including by the blockades of warring parties,³¹ inflation in prices and

Now in its eighth year, the conflict has caused extensive civilian harm and damage to the country's infrastructure, including to the same water infrastructure that is already failing to provide adequate water to the population.

general lack of needed fuel and parts,³² and the degradation of government institutions in charge of maintenance.³³ The war has accelerated and had a multiplier effect on all of the resource shortages being caused by and predicted to occur with climate change.

Today, Yemen continues to be one of the countries most at risk of completely running out of potable water, and the majority of the population is in need of food assistance. According to World Bank data from 2018, Yemen's freshwater resources per capita is 74 cubic meters a year,³⁴ compared to the water poverty line of 1,000 cubic meters.³⁵ In July 2022, UNOCHA and UNICEF stated that "over 61% of Yemenis have no access to safe water,"³⁶ and 19 million people are projected to facing acute food insecurity by the end of the year.³⁷ As climate change continues to worsen year by year, Yemeni civilians remain at significant risk of being unable to access water and food, of experiencing displacement, of losing their livelihoods, and of experiencing future conflicts.

V. LEGAL FRAMEWORK

The war in Yemen is a non-international armed conflict (NIAC) between the government of Yemen and the Houthis. The Houthis began vying for power against the government in 2004, and eventually took control of the capital, Sana'a, in 2014, sparking the current conflict.³⁸ Since then, they have taken control of significant swaths of territory in Yemen, mostly in the north of the country. Though the Saudi-led Coalition (SLC)³⁹ entered the conflict in March of 2015 and has since played a significant role, their involvement has been at the request of the Yemeni government, meaning that the conflict continues to be classified as a NIAC. Further, though Iran supports the Houthis, there is not enough evidence to show that it has effective control over the group—a requirement for the conflict to be considered an international armed conflict (IAC).

In the context of a NIAC, Common Article 3 to the Geneva Conventions (CA 3) applies to warring party actions, as does customary IHL, IHRL, and international criminal law (ICL). Additional Protocol II to the Geneva Conventions (AP II) also applies to certain NIACs where the non-state armed group that is party to the war “exercise[s] such control over a part of [the] territory as to enable them to carry out sustained and concerted military operations and to implement [the] Protocol.”⁴⁰ The Houthis meet this definition, and thus AP II also applies to the conflict in Yemen.

While these bodies of laws place a wide range of obligations upon warring parties aimed at protecting civilians, there are particular prohibitions relevant to the actions outlined in this report, namely: attacks on critical civilian infrastructure; destruction of the environment; and impeding civilian access to water and food. Under AP II, warring parties are prohibited from attacking, or rendering useless, objects indispensable to the survival of the civilian population (OIS),⁴¹ including water infrastructure, agricultural land, and installations such as wells. This prohibition extends to the use of landmines to render useless or destroy OIS.⁴² Thus, warring parties’ numerous attacks on water and food infrastructure and sources in Yemen, as well as their widespread placement of landmines on agricultural land and in and around sources of water, constitute a violation of IHL.

Customary IHL and ICL speak to prohibitions related to the destruction of the environment. According to the ICRC’s Customary IHL guidelines, “The use of methods or means of warfare that are intended, or may be expected, to cause widespread, long-term and severe damage to the natural environment is prohibited.”⁴³ Under the Rome Statute of the International Criminal Court, it is a war crime to launch an attack with knowledge that the attack will cause “widespread, long-term and severe damage to the natural environment” when the attack is not proportional to the anticipated military advantage.

Furthermore, IHRL continues to be applicable during situations of armed conflict. The Universal Declaration of Human Rights (UDHR), which Yemen is obligated to uphold as a member of the UN, states that “[e]veryone has the right to a standard of living adequate for the health and well-being of himself and of his family, including food.” It further states that “children and mothers are entitled to special care and assistance.”⁴⁴ The UDHR also includes the non-derogable right to life, for which access to food and water is a prerequisite. Moreover, Yemen is a signatory to the International Covenant on Economic, Social and Cultural Rights (ICESCR), which includes the “right of everyone to an adequate standard of living for himself and his family, including adequate food.”⁴⁵ The right to food under the ICESCR includes, implicitly, the right to water.⁴⁶ In addition, members of the Saudi-led Coalition “remain bound by their human rights obligations under ICESCR to refrain from undertaking activities which can have a direct and foreseeable impact amounting to the deprivation of food [and water] amongst the civilian population in Yemen.”⁴⁷

IV. CLIMATE CHANGE IN YEMEN

Experts have been discussing issues related to climate change in Yemen for many years, if not decades. In the last fifty years, the average temperature in Yemen has increased by 1.8 degrees Celsius,⁴⁸ with predictions that the temperature will only continue to increase by as much as 3.3 degrees Celsius by 2060.⁴⁹ Extreme weather events have become more frequent, including catastrophic cyclones and “destructive downpours and floods.”⁵⁰ This increase in temperature, as well as the associated extreme weather events and lack of rainfall, has meant that Yemen—one of the most water-scarce countries in the world—is at an even greater risk of running out of this precious resource in the future.

The flooding, heat waves, and lack of consistent rainfall have resulted in significant challenges for farmers across the country. Yemen is highly dependent on surface water and groundwater, which means that changes in rainfall can cause significant disruptions to the water supply.⁵¹ “The rainfall has completely changed. There has been very little rainfall in the last few years, and when it comes it is very intense for a short period of time, causing floods, which in turn causes significant damage to farmland and buildings as well as the loss of life,” said Dr. Saleh.⁵² Heavy rains and flooding tore through Yemen throughout the summer of 2022, causing extensive damage and civilian harm. In June alone, floods affected over 41,000 in Ad Dali’, Al-Hodeidah, Hadramawt, Hajjah, and Ta’iz governorates.⁵³

Perhaps most critical to the future of the country’s access to water is the fact that the water levels in Yemen’s various water basins have dropped dramatically over the last five decades.⁵⁴ Although this trend is in large part attributable to water mismanagement over several decades (as well as to the increased farming of qat, Yemen’s biggest cash crop, which requires significant amounts of water),⁵⁵ it is also due to the lack of consistent rainfall. Without consistent rainfall, there is not enough water to replenish in the face of heavy use and mismanagement.⁵⁶

In Sana’a, a study by four engineering students revealed that during the period from 2007 to 2018, the demand for water significantly outweighed the supply. In other words, they found that more and more water has been taken from the groundwater supply each year—a supply that, ideally, should never be tapped into.⁵⁷ Each year between 1970 and 2020, the gap between the amount of groundwater withdrawn and the groundwater recharge (the amount to which the groundwater is replenished by natural water sources) grew significantly, leaving Sana’a’s access to water in the future increasingly precarious.⁵⁸ According to Dr. Saleh, the water level in Sana’a’s water basin is dropping at a rate of seven meters per year. “Overall, Sana’a is running out of water,” he told CIVIC.⁵⁹

This situation has also meant that many of the city’s wells, which are connected to the basin, have dried up. Previously, water could be found in Sana’a at a depth of just 180 meters, and springs flowed through underground channels (“falaj”) to fill the city’s cisterns.⁶⁰ Today, some wells in the city reach a depth of 1000 meters.⁶¹ In some cases, potable water is no longer available even where wells have been drilled this deep.⁶²

Other parts of the country are experiencing similar challenges. A government official working on water in Aden told CIVIC that there had been “almost no rainfall for the last few years” in Aden, leading to drops in the levels of water contained in the governorate’s water basins.⁶³ In Marib, another government official working on environmental protection stated, “there’s a drop in water and we’re not getting enough water. There has been a change to the rain seasons, resulting in the inability to grow some crops.”⁶⁴



Flooding of the Marib Dam, in August 2020. The water flooded out from behind the dam toward other areas of Marib District.

While the threat of water depletion is in itself significant, climate change has far more expansive implications. It will mean the decline of a critical resource that people need to survive, as it is necessary in terms of drinking water for humans and animals, for farming, and for growing food crops. Meanwhile, extreme weather events in Yemen, including floods and droughts, have contributed to the decrease in agricultural productivity seen in recent years,⁶⁵ both because of their impact on the land and because of the displacement they have caused.⁶⁶ According to USAID, “Water scarcity continues to be the largest hindrance to agricultural productivity in Yemen, and further depletion of water resources is expected to reduce agricultural productivity by up to 40 percent.”⁶⁷ This decline in critical resources will ultimately lead to more conflicts between communities over what limited resources remain—a phenomenon that has already affected Yemen for decades.⁶⁸

The decrease in agricultural productivity due to the lack of water and harsher climate in many areas has also pushed, and will further push, people into displacement. As the populations in urban areas increase, already limited resources will be further strained, leading to more conflicts between communities in urban areas as well. Furthermore, disease rates will increase, including from water-borne illnesses. The spike in disease caused by displacement is evident in Marib, where Doctors Without Borders have stated that they have been “receiving an increasing number of patients, especially children, suffering from diseases related to poor sanitation and harsh living conditions.”⁶⁹ Of course, it is impossible to disaggregate these effects from other causes—most significantly, the war and lack of government oversight. However, it is clear that climate change will have a multiplier effect on these issues and, ultimately, exacerbate protection threats facing civilians. And it is clear that it will create greater risk in relation to ongoing and future conflicts in Yemen.

V. ENVIRONMENTAL DEGRADATION CAUSED BY THE WAR

While the resource scarcity posed by climate change in Yemen is undeniable, the war has caused significant and vast environmental degradation that has compounded the threat of resource scarcity many times over. The causes are various. First, the deterioration of government institutions has left the country without effective land, water, and waste management. Second, displacement caused by the war has greatly strained resources and systems in hosting areas. Third, airstrikes and landmines on and around farmland and water sources have left large portions of Yemen's arable land and water sources unusable.

A. Deterioration of government institutions

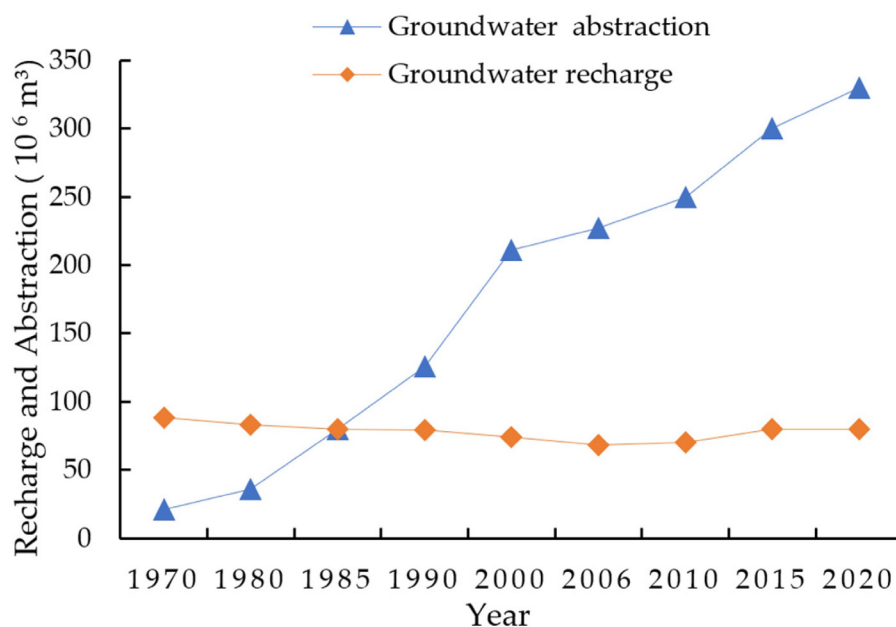
Although resource management has been a problem since long before the start of the war, the current breakdown of government institutions has crippled much-needed efforts to manage critical resources. Non-payment of government officials' salaries, as well as political fragmentation, has left many local government offices in a state of either complete collapse or operating at a minimal level.⁷⁰ This situation has resulted in the ineffective management of land, water, food, and waste, as well as the deterioration of critical infrastructure due to a lack of maintenance and money to purchase fuel and needed supplies.

Meanwhile, water sources have not been appropriately maintained or evenly divided among people, which has contributed to water scarcity across the country. According to the government official working on water in Aden, only 60 of 100 wells are currently working in Aden due to the breakdown of pumps or other infrastructure needed to maintain the wells.⁷¹ Many wells have been drilled with minimal oversight, meaning that groundwater is being drained at an unsustainable pace. As a result, wells have dried up in some areas where the water pressure has fallen too low to pull in groundwater from the water basins.

In Marib, the main dam in the governorate has, for the most part, been closed off since June 2021, meaning that the 18 wells connected to the dam have dried up. The large community of farmers living in the surrounding area has been left without a source of water for their land and for their families. One farmer living in the area by the dam, who relies on farming as his source of livelihood, told CIVIC that "Due to the drying out of wells, [he] can no longer farm." "I finally had to start selling off my animals for income. There's only one well still working that's one kilometer away from everyone and we all rely on that well for water, but this won't last for long."⁷²

Waste management is also a significant challenge across the country. According to Ishraq Al-Maqtari, a member of the National Commission for the Investigation into Alleged Human Rights Violations in Yemen and an activist from Taiz, waste is not picked up or managed at all in the governorate because waste management sites are located at the edge of the governorate on the frontlines of the war.⁷³ Since these sites became inaccessible, the government has done little to divert the waste, instead leaving it to pile up throughout the governorate. This situation has led to drastic spikes in disease.⁷⁴ "There used to be a trench down the middle of the main road [in Taiz city] to navigate water, and now it is being used as a dump," Al-Maqtari told CIVIC.⁷⁵ Lack of fuel and other basic resources contributes to the issue, as does the total breakdown of state institutions. As Al-Maqtari put it, "there is nobody to manage the influx of waste."⁷⁶ In Marib as well, several individuals discussed the lack of waste management across the city and the resulting increase in disease that they have witnessed.⁷⁷ In many areas across the country, moreover, sewage holes have been dug at random and without any government regulation. Some have been dug too deep and have infiltrated the groundwater, thus contaminating vital water sources.

Groundwater Abstraction in Sana'a



Source: <https://www.mdpi.com/2073-4441/14/7/1039/htm>

Even where government entities have focused efforts on improving infrastructure and resource management, they have not had the money or resources necessary. In Marib, where the population exploded from under 500,000 to over 3 million people during the war due to the influx of IDPs,⁷⁸ the Hygiene Improvement Office has worked overtime to collect the city's waste and educate community members on the need for proper waste and sewage management. However, they have not had the resources or infrastructure to solve the city's overflowing waste problems. In Aden, too, the Ministry of Water and Environment has struggled to manage what sewage systems they have without the money to buy fuel or much-needed new pumps and piping.⁷⁹ "...There are no government offices working on these issues," Dr. Saleh of UNFAO shared with CIVIC, "particularly in the north where they haven't gotten their salaries for years. The war has kept all of them busy... They must start integrating planning at all levels to solve the water crisis."⁸⁰

B. Strains on resources compounded by displacement

Since 2015, the conflict in Yemen has displaced over four million people.⁸¹ This displacement has created significant strains on already deeply constrained resources, as millions of people have fled to areas that lack the proper infrastructure to host such large populations.

The strain of displacement is particularly evident in Marib.⁸² Prior to the war, Marib had very limited water and waste management infrastructure, with only one portion covered by a water system.⁸³ Most people across the governorate relied upon wells or purchased water tanks to meet their water needs,⁸⁴ and each home had its own sewage holes—holes that were built with government permission from the municipality and that could last for decades without needing to be emptied.⁸⁵

Since the start of the war, however, the governorate has been trying to cope with the influx of 2.5 million IDPs who have been displaced to the area. The wells in the city have been insufficient to

meet the needs of the population. Moreover, many of the IDPs living in camps cannot access the wells because they are too far away from where camps have been set up.⁸⁶ In many camps, IDPs are reliant upon water coming from NGOs and UN organizations; however, these organizations are unable to provide full water coverage for everyone.⁸⁷ Those who are not able to access water from wells or through NGOs must use their limited resources to buy expensive water from elsewhere.⁸⁸ Al Rayan camp, in particular, does not have a source of water. Located between Al-Jawf and Marib governorates, the area's lack of water forces people to travel 70 kilometers by car to obtain it.⁸⁹ This situation has meant that many people have begun digging their own wells without obtaining any government permission to do so and without any higher-level planning. As a result, the limited groundwater has been spread into too many wells and is causing them to dry out.⁹⁰ People have also dug deeper into previously existing wells and, in some cases, have dug new wells too deep. This practice has caused salt water and gas contained in the ground to enter the groundwater.⁹¹

The influx of IDPs in Marib has resulted in an exponential increase in waste and sewage that the government cannot keep up with. This buildup across the governorate has led to more pollution and disease, including cholera and typhoid,⁹² and its effects will be more difficult to reverse the longer the buildup continues. IDPs who have moved into the area have likely built hundreds of thousands of new holes for sewage across the camps and within neighborhoods, and these wells have sometimes hit the groundwater supply.⁹³ In addition to taking place without any government oversight or general planning scheme, these sewage holes have oftentimes not been covered properly.⁹⁴ In a number of cases, children have died from falling into poorly covered sewage holes, including in Al-Jufina Camp in Marib.⁹⁵

The influx of IDPs in Marib has resulted in an exponential increase in waste and sewage that the government cannot keep up with.

Now we don't have those resources to meet the needs of all of the people here. To do the sewage, to get the waste/garbage from every neighborhood. We are working day and night to provide this service and to provide it with quality. People started digging their own [sewage] holes, up to 25 meters, meaning they've hit the groundwater and affected drinking water. Also, if we don't take the waste and garbage, it will cause more diseases as the waste sits outside and isn't treated.⁹⁶

The situation in Marib is not unique. In conversation with CIVIC, the government official in Aden working in water described that many new communities have sprung up in Aden in the last few years, and that many cities have grown, because of the influx of IDPs.⁹⁷ He stated that people have been “digging sewage holes with no plan” around one of the governorate's water basins, “including in the land above the water basin... [which will] eventually infiltrate the groundwater.”⁹⁸

Notably, the influx of IDPs has also created land management problems in different governorates. In many cases, IDPs have built homes and camps on lands where either the owner is not in the area or where the owner has granted permission for IDPs to stay temporarily. However, as the war has continued for eight years, the issue of land has become more fraught. IDPs continue flooding into different areas, and landowners have begun seeking the return of their land.⁹⁹ In Taiz, for example, the government under former President Abdullah Saleh used to own all of the land, selling parcels to individuals. Now, people use their connections with security officials to take over areas of land, a practice that is leading to conflict in some cases.¹⁰⁰ Across Yemen, according to the NRC,

“Spontaneous settlements on private land have often led to conflicts with landowners—who often attempt to evict these occupants—occasionally with violence.”¹⁰¹

C. Landmines on farmland and near water sources

One of the war’s greatest impacts on critical resources has been the laying of landmines across the country. The effect of landmines on farmland, on water sources, on livelihoods, and on civilian lives—both at present and in the future—cannot be understated. Though it is unclear exactly how many landmines have been laid throughout the duration of the conflict, the Deputy Executive Director of YEMAC, Abdulqawi Mohammed Abdullah, stated that, in the last four years alone, around 800,000 landmines have been collected.¹⁰² He added, “[YEMAC] can’t even understand the size of the problem because it’s happening at such a great degree and too fast to track and do a proper assessment.”¹⁰³

Landmines are capable of causing extensive civilian harm, including death, injury, and displacement, for decades after they have been placed. They also prevent aid from entering areas that have been mined.¹⁰⁴ The Houthis are responsible for laying landmines before and since the start of the war,¹⁰⁵ and the group has repeatedly mined areas where they have lost control.¹⁰⁶ The Secretary General’s 2019 report on “Children and armed conflict in Yemen” found that “mines and unexploded ordnance represented the third leading cause of child casualties (728), resulting in 149 children being killed... and 579 being injured...”¹⁰⁷

Notably, the majority of landmines placed during the current conflict are antipersonnel, rather than antivehicle,¹⁰⁸ and are thus prohibited under the 1997 Convention on the Prohibition of the Use, Stockpiling, Production and Transfer of Anti-Personnel Mines and on Their Destruction—which Yemen is a party to.¹⁰⁹ The majority of the landmines in Yemen are also improvised in nature, meaning that they can be easily assembled at a low cost. Many are disguised, as well, including as toys.¹¹⁰ Human Rights Watch, relying on data from the Civilian Impact Monitoring Project, stated in their 2022 report that “landmines and unexploded ordnance (UXO) have caused approximately 9,000 civilian casualties since the beginning of the [current] conflict.”¹¹¹

Landmines have been placed virtually everywhere in Yemen—18 of 23 governorates have been mined during the current war, and mines have been placed on farmland, along roads, around wells, and inside streams, as well as in schools, airports, hospitals, and even homes.¹¹² Colonel Aref, the head of YEMAC in Taiz (a governorate heavily impacted by landmines), told CIVIC, “They specifically have placed landmines in civilian areas—in schools, near water sources, areas of community gatherings, etc.”¹¹³ Abdullah described the long-term impacts these landmines could have, beyond the immediate displacement and civilian harm they cause: “With landmines, their ability to explode continues for decades. The longer they stay, the more dangerous they become, because the materials break down over time and they become more sensitive.”¹¹⁴

Communities have been forced to abandon entire areas and districts after they were mined.¹¹⁵ Many of these abandoned areas were used as agricultural land that provided people with sources of livelihood and provided the country with food. Al-Jawf, a governorate highly dependent on agriculture, is littered with landmines. “Every two weeks there’s an incident of people getting blown up by these landmines,” said one government official working with IDPs in Al-Jawf.¹¹⁶ He added, “Even our movement as an office to provide humanitarian assistance is limited because of these landmines.”¹¹⁷

In many cases, the Houthis laid additional landmines in areas after people had been displaced from their homes due to fighting.¹¹⁸ Thus, when people attempted to return after cessations in fighting,



Water is being trucked into a displacement camp where about 200 muhamasheen families, displaced from Sa'ada, live.

they were unable to do so. Al-Maqtari described an incident to CIVIC in which a child and his family returned to their home in Al-Khokhah in Hodeidah Governorate. “While entering the house, a mine exploded,” she shared. It caused the child to “lose his upper and lower limbs.”¹¹⁹

Describing the displacement of people from agricultural land around Al-Jawf after fighting escalated in February 2020, a government official who works in the Executive Unit for IDPs in Al-Jawf said: “All of these people used to be farmers, they left their farms, they left their water resources, and their livelihoods, and their land is no longer usable. [Since then], these farms have been destroyed, their land is planted with landmines, and water sources have been destroyed. In Bir Al-Marazeek village, every single person left and was displaced. It used to be one of the greenest places in the country. Now there’s also military sites all around it.”¹²⁰

Landmines have also been specifically placed around and within water sources. In Taiz, the many areas that contain wells and are critical water sources for the area have been “contaminated the most with landmines.”¹²¹ Landmines were also placed in a stream in the area,¹²² a practice seen in other parts of the country as well.¹²³ “Communities are cut off from water as landmines are placed near wells,” noted Charlotte Slente, the Secretary General of Danish Refugee Council, in a statement this past March.¹²⁴ In addition, water pipelines—such as those in Hodeidah—have been destroyed due to landmines planted by the Houthis during a period of fighting in mid-2018. The governorate’s water supply has been severely impacted as a result.¹²⁵

Where landmines have not been placed directly on people's land, flooding has washed them onto it. In Al-Juba District, Marib, the Houthis laid landmines all around the city in October 2021 to prevent people from leaving.¹²⁶ Over the following two months, several floods washed many of them up, forcing farmers to abandon their land in the area.¹²⁷ "Even sheep couldn't graze there," said a woman who was herself displaced from Al-Juba district to Marib due to the landmines.¹²⁸ An individual living in the area near Marib dam stated that the Houthis had strategically placed landmines into dried-out streams. He feared that heavy rains would float the landmines into civilian areas.¹²⁹

Finally, mining impacts waste management. In Taiz, for example, waste disposal is located near the frontlines of the conflict within an area that has been littered with landmines. As a result, the waste management facility has become inaccessible and unable to be used.¹³⁰ According to Al-Maqtari, "Even the machinery that they were using, including the trucks used to pick up trash, are now all stuck in these areas on the frontlines that are too dangerous to access because of the landmines there."¹³¹ This inaccessibility has left Taiz with severe waste buildup and, as a result, spikes in diseases and health problems.¹³²

D. Airstrikes and other attacks on water sources and farmland

Airstrikes conducted by the SLC, as well as general clashes between the warring parties, have also had a significant impact upon water sources and farmland in Yemen. Both the Yemen Data Project (YDP), a data collection project, and Mwatana for Human Rights, a Yemeni civil society organization, have documented hundreds of airstrikes by the Saudi Coalition that have impacted food and water infrastructure and sources.¹³³ The Houthis have similarly caused extensive destruction through ground attacks.

When the Houthis initially tried to capture areas in Marib and Al-Jawf at the start of the war in 2015, the SLC responded with airstrikes. These airstrikes destroyed fertile farmland across the two governorates, as well as many of the wells that were providing water for the large populations within them.¹³⁴ In particular, warfare between the Houthis and the SLC destroyed all of the water towers and wells in Al-Faw area, which is the only area in Marib with fully clean water that is not impacted by the nearby Marib-Jawf gas field. "Until now, these water towers have not been rebuilt," one individual living in Marib told CIVIC. Overall, YDP found 1112 Saudi Coalition air strikes that impacted food and food-related sites between March 2015 and May 2021 (including airstrikes on farms, fishers' boats, food storage facilities, food transportation, and markets).¹³⁵ YDP also reported 121 airstrikes by the Saudi Coalition on water sources and water infrastructure in the same time frame.¹³⁶

The sewage treatment center in Aden was also shut down after the Houthis attacked it in 2015. As Abdel Hakim described: "There are two stations there, including Kabouta, which has become totally full of sewage. Now the sewage can't even enter the tank so it goes into the land around the station, which are wetlands, and it goes from there into the sea."¹³⁷ The SLC-imposed blockade and subsequent inflation have exacerbated the problem, as the government has been unable to procure new pumps to replace those that were destroyed in the attack.

VI. EFFECTS ON CONFLICT DRIVERS

The combination of climate change and environmental degradation caused by the conflict has had widespread, devastating impacts on the Yemeni population, and the long-term effects will be significant. The research conducted for this report revealed two main, intertwined conflict drivers that have been exacerbated by climate change and environmental degradation in Yemen: resource constraints and migration. Notably, these conflict drivers are only two among a vast array of other factors impacted by climate change and environmental degradation. Yet, all in all, it is clear that these two phenomena are exacerbating the consequences of conflict and having a multiplier effect on the many causes of conflict.

A. Resource constraints

Historically, one of the greatest conflict drivers is the exploitation of natural resources. According to a 2009 study published by the United Nations Environment Programme addressing conflicts over a span of 60 years, “at least 40 per cent of all intrastate conflicts have a link to natural resources, and ... this link doubles the risk of a conflict relapse in the first five years.”¹³⁸ In 2020, the UN Security Council warned that climate change would exacerbate resource competition and existing conflicts, and that it has the potential to create new conflicts.¹³⁹

In Yemen, conflicts over resources are not a new phenomenon. Historically, local disputes over land and water distribution have been a major source of conflict. Prior to the conflict, a number of sources cited statistics from the Yemeni Ministry of Interior to report that around 4000 people die each year due to violent disputes over land and water.¹⁴⁰ In 2010, the Small Arms Survey “conducted a non-exhaustive review of domestic and international media reports of violence in Yemen over a 12-month period.” As part of its “Yemen Armed Violence Assessment,” it reported that conflict over water and land in the country is “so pervasive and self-perpetuating that it claims thousands of lives each year and severely inhibits social and economic development.”¹⁴¹

Today, conflicts over resources have continued alongside the much larger conflict unfolding across the country. Across interviews with CIVIC, respondents described conflicts that had broken out between villages, communities, tribes, groups within IDP camps, and neighbors, as well as between communities and NGOs, over water, food, and land resources. For example, an activist from Marib stated that fights have often broken out within IDP camps between different families or groups over food and water.¹⁴²

Water scarcity in particular has led to significant outbreaks of violence. The NRC stated that disputes over water are among the most frequently mentioned types of disputes in discussions with local communities and authorities across the country.¹⁴³ UNICEF has found that water scarcity is “increasingly becoming a driver for conflicts and displacement” across the MENA region.¹⁴⁴ In conversations with CIVIC, Dr. Saleh described conflicts over water sources around the country, including one that has lasted for over 200 years between three villages in Sana’a. “Water scarcity is the biggest problem Yemen faces,” he said. “It will tear at community resources and lead to further conflicts.”¹⁴⁵ Al-Maqtari, meanwhile, described an example of two tribes living in the Muwadim district of Taiz Governorate. They have been in conflict over fresh water for over two decades, resulting in people from both tribes being killed and wounded. She noted that in spite of mediation efforts, the conflict has not only persisted, but has also been exacerbated by the war and the Houthi’s siege on the city.¹⁴⁶



Waste dump in the west of Taiz city (gardens and parks previously called Hadayek Al-Saleh). The authorities in the city were forced to turn it into a garbage dump due to the siege. November 2021.

In a community in the Tarim district of Hadramawt governorate, the increasing floods of the last decade destroyed an entire irrigation system, leading to conflict and displacement. Saad Alhousali, a Sana'a-based water management specialist at UNFAO, described for CIVIC how families in the district had been fighting for many years over water from Wadi Altahab.¹⁴⁷ After floods destroyed one of the canals emanating from the Wadi, the farmers connected to it put a block on the entire canal system in order to keep their land from being flooded by heavy rainfall. However, this left all of the farmers who previously relied on the channels for irrigation without any water for their land. The situation led to fighting between the farmers and, ultimately, displacement, as families eventually moved after years of not being able to irrigate their land.¹⁴⁸

Khalid Al-Othmani, the program manager at National Foundation for Development and Humanitarian Response, told CIVIC that there has been fighting over resources—especially water sources—in Al-Bayda and Al-Jawf.¹⁴⁹ In Aden as well, individuals at the Ministry for Water and Environment described neighbors who engaged in conflicts over water sharing in their neighborhoods and buildings.¹⁵⁰ Many other interviewees told CIVIC that “of course” there were conflicts over water sources around the country—and particularly over well access in places like Al-Bayda, where water has grown particularly scarce.¹⁵¹ Even those who have not personally witnessed clashes over water sources—including, for example, community leaders in Marib—felt that there were signs of such conflicts beginning.¹⁵² “If they don’t solve [the water problems],” one interviewee told CIVIC, “it will cause problems soon.”¹⁵³

Food access and allocation has also been a source of conflict, particularly in IDP camps. Both IDPs and humanitarian aid organizations described to CIVIC instances in which IDP communities either had conflicts with one another or had conflicts with the organization distributing aid.¹⁵⁴ In Marib, an IDP and community leader living in Al-Summaia camp in Marib stated that many of the community members who had been displaced from Sirwah and Al-Juba districts had not been receiving monthly food baskets since their displacement in October 2021. This had sparked conflicts with other IDPs who had been receiving the food baskets, as well as conflicts with the NGOs and camp management that were handling the basket distribution.¹⁵⁵ In some cases, IDPs have staged protests and not allowed NGOs to distribute food until the baskets were delivered to everyone in the camp.¹⁵⁶

Disputes over land, which were “widely held to be the most common cause of armed violence in Yemen” prior to the war,¹⁵⁷ have also become common, particularly in areas to which IDPs have fled. In many cases, IDPs have moved onto lands owned by individuals who either have allowed them to stay temporarily or who are not in the area and thus may not be aware that IDPs are living on their land—or may not have the ability to remove them. One IDP explained to CIVIC, “When people left Al-Juba district, they moved to a land in Al-Wadi district, but these days the landlords are coming back to Al-Wadi and saying they want their land back, and threatening [the IDPs].”¹⁵⁸ The director of a local NGO added: “When the war is over, the real conflict will occur, because these properties are not government owned. The land they’re on belongs to specific tribes, and people keep going to these lands with no rights. So after the war finishes and people will come back to these houses and demand their land back and at that moment the real conflict will start.”¹⁵⁹

One government official stated that, on the very morning that CIVIC interviewed him, there had been a conflict between a landlord and more than 50 IDP families living on his farmland. The conflict was related to the fact that the IDP families had dug sewage holes and impacted the land in other ways. “Every day there is some form of conflict over land,” he said. “Some of them have made it to the courts and to police stations.”¹⁶⁰

B. Migration

Migration, and in the case of Yemen, displacement, is one of the main links between climate change and conflict.¹⁶¹ Climate change has the potential to displace millions of people in Yemen in the next few decades. Already, extreme weather events in the last few years have impacted hundreds of thousands of Yemenis and displaced tens of thousands. This displacement, in turn, has the potential to exacerbate a wide swath of conflict drivers: loss of livelihoods, particularly when people are displaced from rural areas; strains on critical resources in areas of relocation; and opportunities for armed groups to recruit more individuals.

There are an estimated 4.3 million IDPs within Yemen.¹⁶² In 2020, the UNHCR reported that in a period of three months from May to August, about 300,000 individuals lost their homes, crops, livestock, and personal belongings due to torrential rains and severe flash floods.¹⁶³ In the span of just four days in June 2022, 518 individuals were displaced due to floods in Ash Shir and Mukalla, two cities in Hadramawt governorate. Many tents were damaged and destroyed within the area’s camps, according to the International Federation of the Red Cross.¹⁶⁴

Marib, the governorate most impacted by the influx of IDPs from around the country, also experienced heavy flooding in July 2022 that severely impacted the many IDP camps in the area.¹⁶⁵ The governorate has “little infrastructure” and “not enough water,” and it “can’t meet the needs of all of the people,” said a government official working on environmental protection in Marib. The



Credit: Frank van Steenberg

Agricultural Well also serving Village Water Supply, Farmers Initiative, Wadi Qarada, Yemen.

development of IDP camps in the governorate has also taken place on agricultural land that he reports “can no longer be used.”¹⁶⁶ The exponential increase in population in the area has also led to the waste and sewage buildup described in Section VII.B, further threats to the limited water supplies, and other health problems.

In Taiz as well, there has been a great strain on resources. “Water resources have always been an issue,” Colonel Aref told CIVIC. “Now it’s become a huge issue.”¹⁶⁷ As more civilians from the outskirts of Taiz have been displaced to the city center because of the war, he noted, crowding around wells has increased and water has become scarcer. “Conflicts between communities have definitely grown, including physical fights and some that have gone through courts... It’s congestion of people at the water source that’s causing this fighting.”¹⁶⁸ Al-Maqtari similarly described water scarcity in Taiz, noting also that a lack of land has “definitely been causing problems between communities” in the area. She pointed to these issues as stemming in large part from the lack of adequate government regulation since the start of the war.¹⁶⁹

The loss of livelihood caused by displacement, particularly for the many farmers who have been displaced from their land, is likely to worsen factors already contributing to conflict. A government official who works in the executive unit for IDPs in Al-Jawf, for example, described how the IDPs displaced to Al-Rayan camp all used to be farmers. “They left their farms, they left their water resources, and their livelihoods, and their land is no longer usable After they were displaced, they tried to find other jobs, such as in the army Some families started to get income from drug dealing.”¹⁷⁰ The areas to which these IDPs have been displaced then face greater resource constraints and, therefore, an increased possibility of conflict. Further, individuals, and children in particular, are more vulnerable to recruitment from armed groups when they have been displaced and lack economic opportunity.¹⁷¹

Additionally, disputes between IDPs and host communities are frequent where IDPs have received resources from humanitarian aid organizations that host communities have not. Disputes are also frequent where the influx of IDPs has driven up rental costs and other living costs. A community leader in Marib stated to CIVIC: “The host community is very angered that they’re not getting resources that the IDPs are getting. The problems between these groups are also about rental prices and real estate. IDPs have driven up rental prices and sometimes landlords double the price if they’ll kick out the former tenant.”¹⁷² According to another official who works in the executive unit for IDPs in Marib, “Every day there are conflicts between host communities and IDPs over these resources as well as over the distribution of humanitarian assistance.”¹⁷³ The same is true in many other areas of the country.

VII. IMPACTS ON VULNERABLE COMMUNITIES

As with other aspects of conflict, climate change has specific impacts on vulnerable communities, including women, IDPs and refugees, and children. CIVIC conducted interviews with one focus group of IDPs in Marib, as well as with several other individual IDPs and individuals working with IDPs across many governorates in Yemen. While CIVIC did not conduct specific focus-group interviews with women, children, or refugees, the impact of climate change on these groups often came up in interviews and in desk research.

A. Women

Many studies have investigated the impacts of climate change on gender, particularly with respect to access to water.¹⁷⁴ “Women are particularly impacted by water scarcity—it is usually their job to fetch water, even where it is kilometers away,” explained Dr. Saleh.¹⁷⁵ That women are usually responsible for collecting water for their families is well known in the context of Yemen,¹⁷⁶ and as water sources decrease, women are having to go further and further away in order to reach it. Young girls are sometimes prevented from attending school because of the need to fetch water and the significant time that this may take due to its inaccessibility.¹⁷⁷ This can be particularly devastating in areas that have been mined, as women then face far greater risks of stepping on landmines along their journeys.¹⁷⁸ In one devastating incident, a woman in Sabir Al-Mawadim District of Taiz Governorate died two days before her wedding because she stepped on a landmine while walking to fetch water.¹⁷⁹

In their “Gender, Climate and Security” study, Muna Luqman and Dr. Nadia Al-Sakkaf described the many protection risks women and girls face in Yemen, as well as how these protection risks are predicted to be exacerbated by the current conflict and by climate change. In addition to the challenges women face stemming from their responsibility to fetch water, the study states that “early marriage has increased [since the conflict began], since families resort to marrying off their daughters as a means to make income from dowries.”¹⁸⁰ Oxfam has also reported an increase in early marriage—including for girls as young as three years old—as a means of being able to “buy food and shelter to save the rest of the family.”¹⁸¹ As climate change continues to slowly degrade rural communities’ abilities to produce, early marriage and gender-based violence will likely increase.¹⁸²

B. IDPs and refugees

It is clear from many of the challenges to resource access described throughout this report that IDPs and refugees are particularly vulnerable to some of the impacts of climate change. First, climate change produces more IDPs and refugees, as the degradation of land and water sources displaces people in search of vital resources. After displacement, IDPs and refugees continue to face more challenges than their local counterparts when it comes to accessing the same resources, and they are at greater risk of being displaced again—particularly by extreme climate events.

Many IDP and refugee camps do not have adequate sources of water, such as wells, and the communities living within them are forced to either rely on expensive water trucks to deliver water or obtain it through other means. Many IDPs and refugees have lost their livelihoods and thus do not have any—or adequate—income sources, which makes this situation even more challenging. Circumstances are particularly acute for the many families who have been displaced from rural areas. They often relied on farming and agriculture for their livelihood and thus may not have other

skills or opportunities to find new jobs in the areas where they have been displaced.¹⁸³ Furthermore, IDPs and refugees not living in camps are also often in vulnerable positions with respect to the host community, which may blame them for straining local resources and driving up rent prices.¹⁸⁴

Displaced people are also more vulnerable to climate change and resulting extreme weather events, including “flood events that can quickly destroy the limited infrastructure in the camps, as well as heat waves that leave people with few options for cooling and shelter.”¹⁸⁵ In many of the recent extreme weather events that have wracked the country, IDPs were the most impacted. Camp housing often cannot withstand flooding and other weather effects, and IDPs are often already living in “abject poverty.”¹⁸⁶ Based on a recent assessment, UNHCR predicted that 70 percent of IDP sites in Taiz alone will be “affected” by rain in 2022.¹⁸⁷ This predication has already been born out in Marib, where 2500 IDP families were displaced due to flooding on July 13 and 14, 2022.¹⁸⁸ The flooding has since continued to displace many more.¹⁸⁹

C. Children

Children are a particularly vulnerable group with respect to climate change and environmental degradation. Currently, children in Yemen have incredibly high rates of malnutrition caused by these phenomena, which have exacerbated the decline in access to potable water and food.¹⁹⁰ Where families have been displaced, many children have had to drop out of school and find work to support their families.¹⁹¹ According to Luqman and Al-Sakkaf’s study on gender, conflict, and climate, poverty and hunger—both exacerbated by climate change—have also been a “powerful contributor” to the increase in child recruitment.¹⁹² And, as described above, early marriage has also increased, putting female children at risk.¹⁹³

Notably, children are also the group most exposed to, injured by, and killed by landmines. According to data from Save the Children, over 75 percent of child casualties caused by the war were caused by landmines and unexploded munition.¹⁹⁴ Abdullah told CIVIC that landmines may look like toys to children and that some have actively been disguised to look like them.¹⁹⁵ Save the Children’s Yemen Country Director, Rama Hansaj, characterized the danger in a press release from June 2022: “Children are curious by nature—they want to explore their world and learn about it. And when they see something shiny or interesting, they can’t help themselves from touching it.”¹⁹⁶

VIII. CONCLUSION

The threats posed by climate change and environmental degradation in Yemen are not ones for future speculation. These are threats that civilians across the country are already confronting. There are few places where the effects of water scarcity can be so clearly seen—they have displaced entire communities across the country and led to the deaths of thousands of individuals from resource-related conflicts. Yemen serves as an example for the rest of the world of what the future might hold if climate change is not effectively and rapidly addressed. More importantly, it has the potential to serve as an example of how government entities, civil society, community leaders, and the international community can come together to tackle climate change and environmental degradation before Yemen runs completely dry.

ENDNOTES

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A young Yemeni fetches water at a makeshift camp for people fleeing fighting in Hodedah Governorate.

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