AT THE MERCY OF THE CLIMATE

The Impact of Climate Change on IDPs in Yemen

February 2025

حلم أخضر
Holm Akhdar

AT THE MERCY OF THE CLIMATE

The Impact of Climate Change on IDPs in Yemen

February 2025

Authors:

Mohammed Al-Hakimi
Amani Mohammed
Maha Al-Salehi

PUBLISHER:

Holm Akhdar for Environmental Studies & Consultancy

Enma street, Al Buraiqeh District.
Interim Capital, Aden, Republic of Yemen.

✉ contact@holmakhdar.com
www.holmakhdar.com

Cover image:

An IDPs camp damaged by a rainstorm in Hajjah © Holm Akhdar Environmental Consultancy/Issa Ahmed.

Suggested citation:

Al-Hakimi, M., Mohammed, A., & Al-Salehi, M. (2025). *'At the Mercy of the Climate: The Impact of Climate Change on IDPs in Yemen'*. Holm Akhdar for Environmental Studies & Consultancy, Aden, Yemen.

About Holm Akhdar for Environmental Studies & Consultancy

Holm Akhdar for Environmental Studies & Consultancy is an environmental research and consulting firm, based in Aden, and registered in the Ministry of Industry and Trade in the Republic of Yemen with a commercial registry No (22971). It seeks to make a positive impact in the field of environmental and climate policies. And enhancing environmental awareness and knowledge by working with various business organizations and local communities, with the aim of establishing a common understanding of environmental and climate challenges in Yemen.

www.holmakhdar.com

This publication was carried out with the support of the Federal Department of Foreign Affairs (FDFA) through the Embassy of Switzerland to Oman and Yemen.

Schweizerische Eidgenossenschaft
Confédération suisse
Confederazione Svizzera
Confederaziun svizra

Federal Department of Foreign Affairs FDFA

DISCLAIMER

ACKNOWLEDGMENTS

This study was conducted by a research team, led by Mohammed Al-Hakimi, included Amani Mohammed and Maha Al-Salehi. Research assistance, translation, and English editing were provided by Radfan Abdo. Further review tasks were conducted by Hael Ahmed. Tasks including coordination, document preparation, and data entry were carried out by Roweida Mohammed.

The questionnaire, qualitative interviews and focus group discussions (FGDs) were conducted with the respondents and relevant stakeholders under the field researchers who made great efforts to obtain and collect the data required for this study from the respondents and relevant stakeholders. Thanks also to Dr. Khalid Al-Shajni, Ms. Aisha Al-Hamami, Ms. Hadeel A., Mr. E. Mohammed and the field team for their dedicated contributions. Technical assistance to the field team during data collection was provided by Ibrahim Mohammed. The study's direction, design, and graphics were expertly handled by Amjad Abdulla. We thank all the photographers for the photos taken: Abdullah Saleh, Abdulghani Al-Hadidi, I. Ahmed, Ammar Nomish, Walid Haddar, and M. Abdu.

At Holm Akhdar for Environmental Consultancy, we extend our sincere gratitude to all participants, key stakeholders, experts, academics, humanitarian personnel, community leaders involved in the IDP camps, and Executive Unit for IDP Camps Management (EXUIDPs).

Holm Akhdar team extends its sincere gratitude to the Federal Department of Foreign Affairs (FDFA) and the Embassy of Switzerland in Oman and Yemen for their generous support for the production of this study. Special thanks and recognition to **His Excellency Dr. Thomas Oertle**, Ambassador of Switzerland to the Sultanate of Oman and Yemen, for his invaluable cooperation and unwavering dedication. Kind gratitude also to all the embassy staff.

Lastly, we would like to express our heartfelt appreciation and gratitude to all individuals, both men and women, whom we encountered in the IDP communities throughout this case study. We are sincerely thankful for the trust they bestowed upon us and for generously sharing their experiences, challenges, and valuable expertise. We would also like to thank the representatives of local authorities and humanitarian organizations in the surveyed governorates for their indispensable cooperation and active participation in providing crucial insights.

ACRONYMS

CAMA	Civil Aviation and Meteorology Authority
CCCM Yemen	Camp Coordination and Camp Management Cluster
DRR	Disaster risk reduction
EPA	Environmental Protection Authority
EWS	Early warning systems
EXUIDPs	Executive Unit for IDP Camps Management in Yemen
FAO	Food and Agriculture Organization
ICRC	International Committee of the Red Cross
IDMC	Internal Displacement Monitoring Centre
IDP	Internally Displaced People
IFRC	International Federation of Red Cross and Red Crescent Societies
INGOs	International non-governmental organizations
IOM	International Organization for Migration
IRG	Internationally Recognized Government
MWE	Ministry of Water and Environment
NAPA	National Adaptation Programme of Action
NGO	Non-governmental Organization
NIC	National Information Center in Yemen
NWRA	National Water Resources Authority
OCHA	United Nations Office for the Coordination of Humanitarian Affairs
OSESGY	Office of the Special Envoy of the Secretary General for Yemen
UN	United Nations
UNDP	United Nations Development Programme
UNESCO	United Nations Educational, Scientific and Cultural Organization
UNFCCC	United Nations Framework Convention on Climate Change
UNFPA	United Nations Population Fund
WASH	Water, sanitation, and hygiene
YRCS	Yemen Red Crescent Society

CONTENTS

TABLES, FIGURES, AND TEXTS BOXES

TABLES

FIGURES

TEXTS BOXES

GLOSSARY

Climate Change:

As defined by the Intergovernmental Panel on Climate Change (IPCC), climate change is a long-lasting change in climatic conditions that usually lasts for decades or longer. It refers to any discernible change in climate patterns over time, whether attributed to natural climate variability or resulted from human activities. (IPCC, 2018)

Climate Shocks:

The occurrence of climate hazards that significantly impact various aspects of people's lives, livelihoods, health and well-being, ecosystems and species, economic assets, social and cultural values, services, and infrastructure. (Sinha, 1999)

Climate Action:

Urgent actions and measures undertaken to address and mitigate the impacts of climate change. It refers also to all efforts exerted to strengthen resilience and adaptive capacity to climate-related risks and natural disasters in all countries. Climate action is the key focus of the thirteenth goal of the United Nations Sustainable Development Goals. (ICRC, 2020)

Climate Crisis:

It refers to the serious problems that are being caused, or are likely to be caused, by climate changes, including weather extremes and hazards, ocean acidification and sea-level rise, loss of biodiversity, food and water insecurity, health risks, displacement, and even violent conflict. (UNDP, 2023)

Climate Finance:

It pertains to Local, national, or transnational financing-obtained from both public and private sectors, as well as alternative funding sources, dedicated to supporting mitigation and adaptation actions addressing climate change. (UNFCCC, 2016)

Climate Risks:

According to the International Federation of the Red Cross (IFRC), climate risks denote the negative impacts of climate fluctuations and climate change – or responses undertaken to adapt to or mitigate climate change impacts on people's lives, livelihoods, health and well-being, ecosystems and species, economic assets, social and cultural values, services and infrastructure. Risks emerge from the interaction of vulnerability, exposure, and the hazards themselves. (ICRC, 2022)

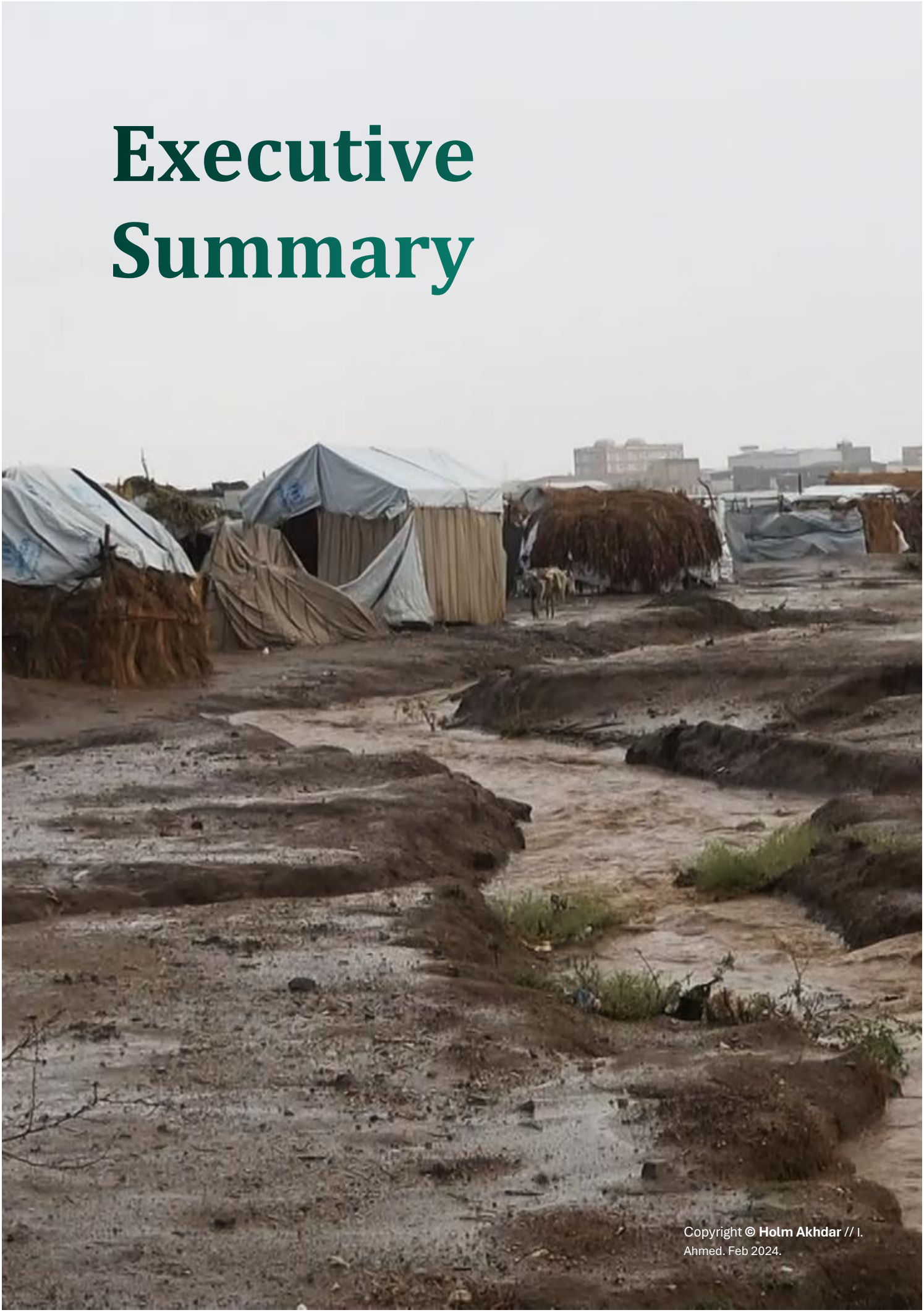
Internal Displacement:

It is the forced movement of people within the boundaries of their own country. Internally displaced persons (IDPs) are individuals or groups of who have been forced or compelled to flee or to leave their homes and places of habitual residence, primarily to evade or avoid the effects of armed conflict, generalized violence, human rights violations, natural or man-made disasters, and importantly, they have not crossed internationally recognized state borders. (ICRC, 2022)

Resilience:

It refers to the ability of individuals, communities, institutions and systems to anticipate, absorb, adapt, respond to and/or recover from shocks and stressors resulting from conflict, violence, and various forms of risks without compromising their long-term future aspirations. (ICRC, 2020)

Executive Summary



The extreme weather events in Yemen from 2015 to 2024 have clearly illustrated that climate change has exacerbated humanitarian crises within conflict-affected communities. Throughout this period, climatic events–including cyclones, heavy rains, flash floods, droughts, and landslides–have significantly contributed to environmental degradation and the deterioration of natural resources amid ongoing armed conflict. These interconnected factors have accelerated the rate of displacement, both in affected communities and among already displaced populations. The nexus between environmental degradation, climate change, and conflict intensifies the multiplier effects that perpetuate the crisis over the long run.

The vast majority of IDPs in Yemen live in unplanned camps lacking contingency planning, with "approximately 40% of these camps located in flood-prone areas." (CCCM, 2023) This exposes IDPs to ongoing climate hazards and perpetuates repeated displacement. Furthermore, most camps are often built on privately owned land without formal lease agreements, leading to land conflicts and potential evictions. Currently, "103 camps in Yemen face immediate evacuation threats." (EXUIDPs, 2024) IDP shelters, often constructed from flimsy materials such as tarpaulins, straw, or tin sheets, fail to provide adequate protection, particularly during summer heat. Many IDPs report receiving new tents only every two to three years. Additionally, most IDPs lack stable income sources or social safety nets to secure better and safer housing. Moreover, most camps in Yemen lack infrastructure, such as water, sanitation, and hygiene (WASH).

In focus group discussions (FGDs) conducted by Holm Akhdar for Environmental Consultancy, participants from the displaced community identified several factors that contribute to increased climate-related risks for their communities. These include the lack of climate emergency plans in camps, the absence of early warning systems for local communities, and inadequate disaster awareness and preparedness. The lack of early warning systems EWS remains one of Yemen's major challenges, leaving the country in a state of uncertainty for decades amidst climate threats. Updated data and modern climate monitoring stations are scarce, with EWS limited to the historic cities of Old Sana'a and Shibam in Hadhramout, and 20 governorates remaining uncovered. Other existing systems, installed within the past two years under FAO initiatives, focus only on flood and Locust warnings for farmers and exclude broader populations.

> “
>
> **13.9%**
>
> of the surveyed IDPs respondents **reported being displaced due to the impact of Climate Changes** in their areas of origin.

Study Overview

This study examines the impact of climate change on IDPs in Yemen across six chapters, focusing on IDPs in Marib, Hajjah, Al-Maharah, and Socotra. The study begins with an introduction briefly outlining the general framework of the study, including its significance, objectives, and scope. The Second Chapter details the study methodology, approaches and methods, data collection tools, and the study population and sample size.

The Third Chapter of the study provides a theoretical framework for climate change and internal displacement based on previous studies and reports, covering seven key themes, beginning with a general overview of climate change and internal displacement. The second theme explores the role of conflict and climate in driving environmental degradation and exacerbating social tensions in Yemen. The third theme provides an overview of climate-induced displacement in the country, while the fourth one summarizes critical climatic disasters contributing to displacement, including cyclones, storms, torrential rains, floods, desertification, sand dune encroachment, landslides, and rockslides. The fifth theme is a review on displacement and the outbreak of climate-related epidemics. The sixth analyzes national laws and policies addressing displacement and climatic and environmental issues, while the seventh one discusses the data gap in Yemen.

The Fourth Chapter of the study examines the impact of climate change on IDPs in Yemen, utilizing comprehensive field data, including questionnaire responses, qualitative interview findings, focus group observations, and data analysis. The chapter is organized into ten key topics. The first provides a general overview of the studied governorates-Marib, Hajjah, Al-Maharah, and Socotra. The second topic explores the key drivers of internal displacement, focusing on climate-related drivers. The third assesses the level of awareness among the IDPs regarding climate change. The fourth one identifies the most serious climate challenges faced by IDPs in camps, while the fifth investigates the direct impacts of climate change, particularly severe storms, and floods. The sixth topic highlights the cascading and compounding effects of climate change on IDP communities in the four studied governorates. The seventh discusses systemic factors that exacerbate climate risks for vulnerable communities. The eighth evaluates IDPs' adaptation strategies to cope with changing climatic condition. The ninth topic examines the role of key actors, including local authorities, EXUIDPs, and international relief organizations, as perceived by respondents, along with their expectations of donors. Finally, the tenth topic addresses the future climate threats as perceived by IDPs.

The Fifth Chapter presents the findings of the study and their interpretation. The Sixth Chapter offers a set of actionable recommendations for policymakers, stakeholders, UN agencies, and donors, aiming to enhance adaptation, improve disaster response, and effectively manage displacement challenges in Yemen.

Key Findings

Climate changes and their fluctuations have profoundly impacted the lives of 1.6 million IDPs in Yemen and threatened their stability. These changes resulted in damaging shelters, disrupting livelihoods, and reducing access to basic services for many of them. The study findings reveal that 99.2% of IDP respondents in Marib, Hajjah, Al-Maharah, and Socotra reported considerable changes in weather and climate at their displacement sites.

Field results indicated that a significant proportion of IDPs, approximately **86.1%** of respondents in Marib, Hajjah, Al-Maharah, and Socotra, were displaced primarily as a result of war and conflict. In contrast, **13.9%** of the total respondents reported being displaced due to the impact of climate changes. Among those displaced due to climate changes, around **10.2%** experienced displacement triggered by intense storms, floods and landslides**,** leading to the destruction of housing, erosion of agricultural lands, and disruption of various livelihoods. Additionally, **3.7%** of IDPs were displaced because of drought and inadequate rainfall in their areas of origin, resulting in water scarcity and adverse effects on productive sectors and income sources such as agriculture, livestock grazing, and other economic activities.

Additionally, field data shows that **94.3%** of IDPs in the camps of Marib, Hajjah, Al-Maharah and Socotra have been directly affected by a wide range of climate-related changes impacting their camps. At the governorate level, the study found that IDPs in Al-Maharah and Socotra were fully 100% affected, due to successive extreme weather events such as cyclones, tropical storms, torrential rains, floods, and landslides, which hit the eastern coastal regions including Al-Maharah, Socotra and Hadhramout and deeply affected the ecological habitats and natural resources upon which the population depends for sustenance. Meanwhile, about 95.5% of IDPs in Marib reported having been impacted by climate change, while 90% of IDPs in Hajjah have experienced similar challenges.

> "The most pressing threats posed by **Climate Change** to IDPs in **Yemen** include **intense storms** (affected **96.7%** of the surveyed IDPs), **heavy rains** (affected **93.1%**), and **flash floods** (affected **75.1%**).

> A cumulative and compounding effect of **climate change** is **increased social tension** in IDP camps, which affected **44.1%** of the **IDPs** surveyed.

The most pressing threats posed by climate change to IDPs in Yemen include intense storms (affected 96.7% of the surveyed IDPs), heavy rains (affected 93.1%), and flash floods (affected 75.1%). These impacts are associated with an escalating death toll and exacerbated losses and damages on an annual basis. It is imperative to recognize the heightened vulnerability of frontline communities,

which are particularly exposed to the adverse effects of climate change. Displaced people including women, Muhamasheen, people with disabilities, and others are the most affected and least able to cope with these impacts. This exacerbates the climate displacement crisis, thereby creating a vicious cycle of intergenerational trauma and ecological devastation.

Social tensions are a major cumulative effect exacerbated by extreme climatic events affecting IDP communities. Approximately **44.1% of displaced respondents reported an increase in social tensions and concerns** from the host community regarding land issues associated with the camps, which are often owned by local residents. After nearly a decade of displacement, landowners are increasingly motivated to invest in their properties, most of which lack formal rental agreements. Additionally, tensions arise from competition over scarce services and resources in host communities. Furthermore, **approximately 69.4% of IDPs** surveyed in the governorates expressed future concerns about the potential destabilization of host communities, leading to increased social tensions as a consequence of climate change**.** This is particularly evident in the camps located in Marib and Hajjah.

> “
>
> The **Findings** of this **Study demonstrate** that the **disasters** and **extreme climate events** in Yemen have pushed more than a half of IDPs to **Adopt Maladaptive Coping Strategies.**

The climate shocks experienced in the governorates of Marib, Hajjah, Al-Maharah and Socotra have forced displaced families to adopt maladaptive coping strategies, due to their inability to effectively cope with climate risks. Remarkably, **62% of the IDPs in these areas resorted to changing their shelter and endured second displacement** to escape the floods and storms that ravaged their camps. While this adaptation strategy may provide temporary relief from immediate climate threats, it could further deepen the climate displacement crisis in the country. Among these IDPs, **36%** opted to relocate their shelter within the same area of displacement, while **26%** were forced to undergo displacement once again to seek refuge in other safer areas. The decision to flee for a second time was driven by the fact that their initial settlements were situated in flood-prone zones.

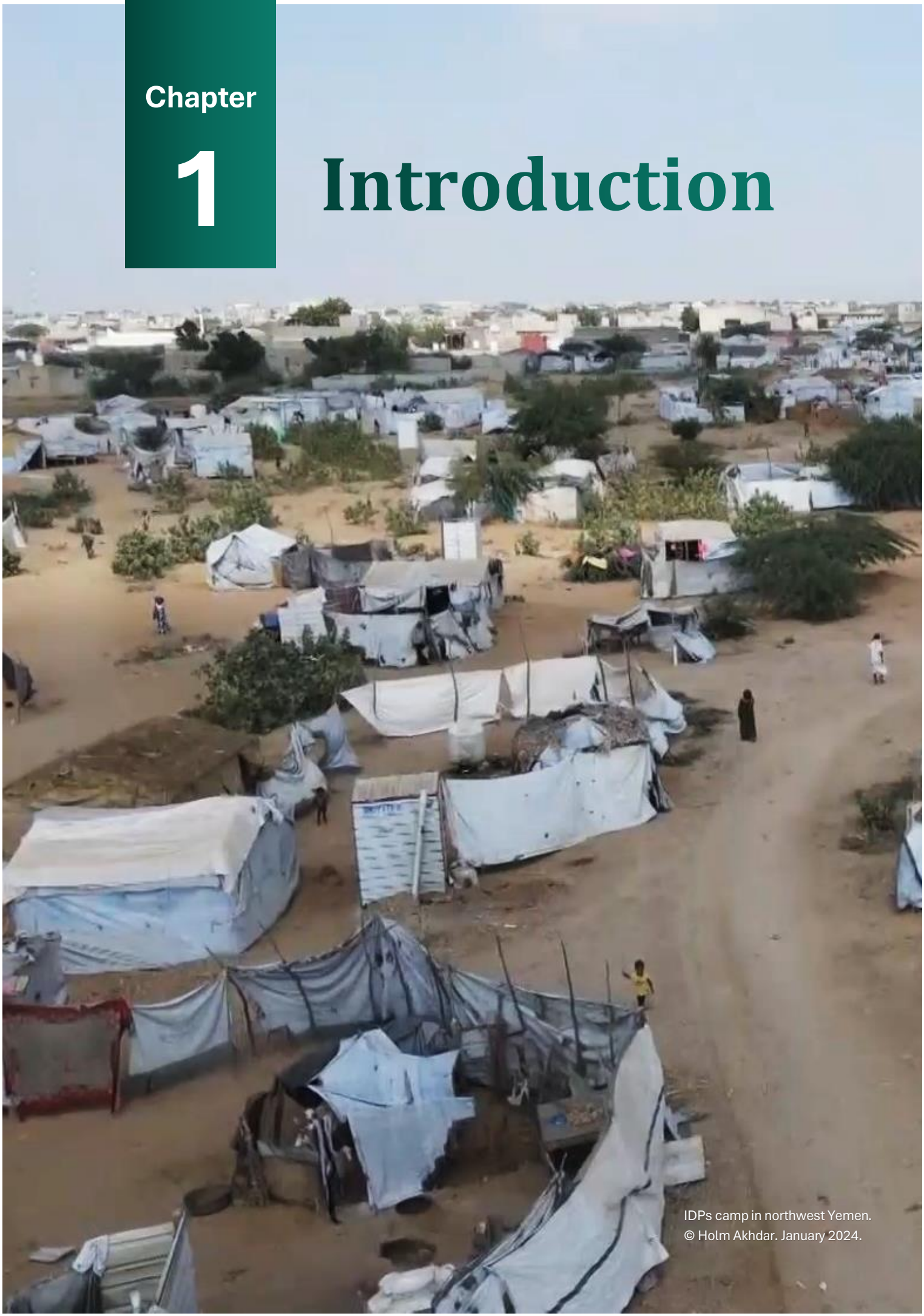
The findings of the study reveal a range of systemic and institutional factors that contribute to the intensification of climate risks faced by displaced communities, as well as the issue of increasing climate-induced displacement. Field data illustrates the most significant factors, accounting for 82% of the IDPs respondents, which is absence of early warning systems (EWS) to effectively alert local communities of climate-related disasters. In addition, all shelter camps in Yemen have no EWS for disaster risk reduction DRR, including the regions of Marib, Al Maharah, Hajjah, and Socotra. This is closely followed by 80% limited official awareness regarding the severity of climate change and the necessary preparations to mitigate its impacts. Lack of policies pertaining to the environment and climate ranks third among these contributing factors, representing 75.5% according to displaced respondents. Furthermore, the absence of environmental governance and inadequate institutional capacities are identified as additional factors contributing to climate risks, accounting for 75.1%. Insufficient international support provided to Yemen in confronting climate change is also a major factor, representing 74.7%. Notably, the lack of climate emergency funding incorporated into government budgets and aid organizations' allocations, combined with the split in authorities and regulatory conflicts, accounts for 72.2% of the contributing factors to the exacerbation of climate shocks on communities. Lastly, the insufficient focus on local capacity building programs in the realm of climate and environmental action accounts for 59.2% of the contributing factors.

The study results also highlighted a weak response to the climate emergency, revealing significant shortcomings among local authorities and aid organizations. Specifically, **57%** of IDPs reported that local authorities and humanitarian organizations have implemented limited interventions to mitigate climate risks and facilitate adaptation efforts. Furthermore, **43%** of IDPs indicated that no meaningful actions were taken in their IDP sites to protect them from climate disasters. The lack of climate risk reduction interventions was particularly pronounced in the governorates of Socotra and Al-Maharah, as reported by **67%** of IDPs, followed by **57%** in Hajjah and **29%** in Marib. Overall, IDPs in these sites indicated that they have not seen any effective interventions to assist them cope with the challenges impacting their camps. Key actors in Yemen should focus on climate change mitigation and adaptation as the main strategies to respond to climate change.

Chapter

1

Introduction



IDPs camp in northwest Yemen.
© Holm Akhdar. January 2024.

> Climate change affects all, but not all are affected equally.”
>
> (Yuen et al., 2017)

Notwithstanding years of global negligence on the climate, the conflict in Yemen has made climate change no less of a threat to Yemen than the pandemic and the violence caused by conflict. (Alshamiry, 2023) Yemen experiences annual weather disasters and extreme climatic events, including rainstorms, flash floods, landslides, droughts, and higher temperatures. It ranks among the countries most vulnerable to climate change and least prepared to address its challenges. In recent years, the rising frequency of natural disasters–such as cyclones, storms, and floods–has caused significant loss of life and property, further damaging shelters and infrastructure already weakened by conflict. The intensity of extreme weather variability has exacerbated the ongoing crisis, with IDP camps suffering from storm and flood damage. Moreover, new populations have been displaced due to climate change impacts.

All these factors have aggravated Yemen's social, economic, and humanitarian costs, increasing vulnerabilities among affected populations and contributing to social instability and declining livelihoods. This has further complicated the humanitarian crisis, resulting in rising poverty and food shortages, persistent institutional and organizational conflicts, increased fragility, and inadequate disaster risk management in communities impacted by conflict and climate change.

More than a decade of conflict in Yemen has created one of the world's most severe humanitarian crises, and one of the world's largest displacement crises. (WFP, 2024) Since 2015, approximately 4.5 million individuals have been internally displaced, with approximately 1.6 million IDPs were living across 2,284 displacement hosting sites in the country. (CCCM Cluster, 2024) According to available data, climate-induced displacement is on the rise, with natural disasters, including storms, floods, droughts, and landslides displacing 933,000 individuals between 2008 and 2023. (IDMC, 2024) In 2024, UNFPA reports the displacement of around 500,000 people due to the rains and flooding. (IFRC, 2024) This cycle of successive displacement has fueled ongoing social unrest and conflicts over resources, land, and water, leading to new tensions within host communities and perpetuating a nonstop cycle of displacement.

Displacement profoundly disrupts lives overnight, placing internally displaced persons (IDPs) at the forefront of climate vulnerability, disproportionately affected by climate change. Despite their minimal contribution to climate change exacerbation, IDPs are the most affected by its ongoing impacts. Makeshift camps, characterized by poor infrastructure, lack stability and security, exposing IDPs to a range of immediate risks. Without climate action, the impact of climate change on IDPs in Yemen will not be limited to the current situation but will extend to successive generations within each local community, perpetuating cycles of vulnerability and displacement.

To understand the displacement and climate change related to natural resources, this study aimed to identify the impact of climate change on IDPs in Yemen and to investigate the relationship between climate change and internal displacement in the country. It sought to understand the causes and factors from stakeholders' perspectives, as well as to comprehend the direct climate impacts and the cumulative compounding effects of climate change on IDPs.

Employing a descriptive and analytical approach, the research utilized a questionnaire as the primary data collection tool, supplemented by qualitative interviews and focus groups. The questionnaire was administered to a random sample of 310 IDPs across 26 sites in four governorates: Marib, Hajjah, Al-Maharah, and Socotra. Data were analyzed using SPSS to interpret the findings and draw conclusions.

The study concluded that a correlation exists between climate change and internal displacement in Yemen, emphasizing the disproportionate impacts of climate change on IDPs. These climate effects, combined with conflict and environmental degradation, have exacerbated various multiplier effects on

local communities, leading to destabilization, intensified social tensions, and threats to the livelihoods of frontline communities, particularly the IDPs.

Furthermore, the study identified several systemic and structural factors that intensify climate risks for vulnerable groups within the surveyed communities. It also highlighted gaps in the responses of relevant actors to climate emergencies. To address these issues, the study provided recommendations for policymakers, stakeholders, and donors aimed at facilitating climate reforms in Yemen that promote early disaster preparedness. Such measures could enhance response efforts and improve displacement management, ultimately strengthening the adaptation and resilience of frontline communities to these challenges.

1.1 The Significance of the Study

The significance of this study lies in its being one of the first case studies that examine the impact of climate change on internal displacement in Yemen, specifically focusing on the governorates of Marib, Hajjah, Al Maharah and Socotra. Prior to this research, no comprehensive studies have been conducted on the impact of climate change-induced displacement in these particular areas. The importance of the study is also reflected in its subject, which may make this study a new qualitative addition to increased understanding of the impact of climate change on internal displacement in Yemen. This increased understanding can raise awareness among key stakeholders about the significance of effective disaster risk management and climate-induced displacement, particularly for the most vulnerable communities. Moreover, the study highlights the role played by climate change impacts in exacerbating social tensions, as well as local and institutional conflicts, thereby intensifying the trauma and suffering of IDPs, and hindering their ability to respond effectively to these challenges.

1.2 Objectives

This study aims to determine the impact of main threats of climate changes on IDPs in Yemen, with a specific focus on the governorates of Marib, Hajjah, Al Maharah, and Socotra, as well as to comprehend the direct climate impacts and the cumulative compounding effects of climate change on IDPs.

The study also seeks to identify the underlying systemic factors that contribute to the exacerbation of climate impacts on IDPs and understand dynamics of forced climate displacement. The study findings could contribute to the enhancement response of actors in effectively managing the recurring climate-induced displacement within frontline affected communities. Furthermore, the study recommendations will contribute to supporting and strengthening the resilience of displaced communities, thereby addressing the adverse effects of climate displacement on people's security and livelihoods, and mitigating social tensions, as well as local and institutional conflicts caused by environmental and climate pressures in Yemen.

1.3 Research Question

The intensity of extreme climate change has created a crisis within the major Yemeni crisis. This crisis manifests in two ways: first, war and conflict- related IDP camps endured serious damage of rain and floods on displacement. Second, the displacement of additional communities caused by tropical cyclones and floods that hit the country. Based on the above, the study seeks to address this gap by providing an answer to the following question:

What is the impact of climate change on IDPs in Yemen?

From this primary question, four sub-questions have branched out:

- *What specific climate changes have affected IDPs in the targeted governorates of Marib, Hajjah, Al Maharah and Socotra?*
- *Have these climate changes caused displacements among IDPs in the targeted governorates?*
- *What systematic factors that have contributed to the increase in climate-related incidents among IDPs in Marib, Hajjah, Al Maharah and Socotra?*
- *What interventions and measures have been taken by the community and relevant actors to adapt to the risks of climate change?*

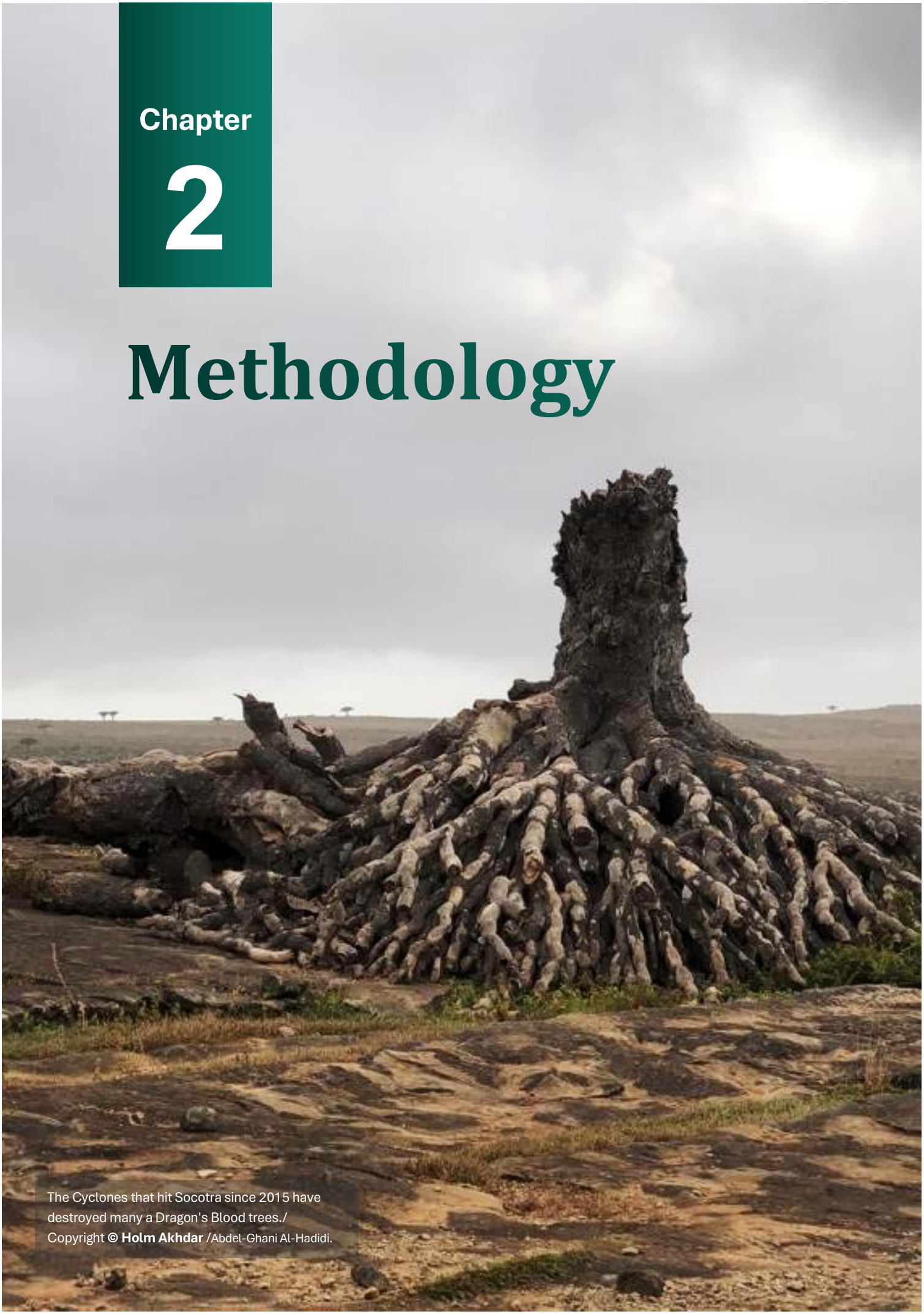
1.4 Limitations

The study encountered several limitations. **First,** A little reliable and comparable data are available related to climate displacement in Yemen, and climatic risks on displacement sites. There were challenges in collecting data, either from government agencies or INGOs. Furthermore, there is no comprehensive, disaggregated, and up to-date data on the patterns and drivers of climate-induced internal displacement. Actors reports often present generalized data on displacement without detailing those linked to climate change, leaving a big gap in understanding this phenomenon. **Second**, the study's geographical scope was restricted to specific governorates, the study covered only four governorates: Marib, Hajjah, Al-Maharah, and Socotra.

Chapter

2

Methodology



The Cyclones that hit Socotra since 2015 have destroyed many a Dragon's Blood trees./ Copyright © **Holm Akhdar** /Abdel-Ghani Al-Hadidi.

2.1 Approach

This study employed a mixed-methods approach, combining qualitative and quantitative methods for data collection and analysis. The descriptive and analytical approach was utilized to identify the study's objectives and to provide a comprehensive description, interpretation, and analysis of the impact of climate change on IDPs. Effective tools were used to elicit responses from relevant stakeholders.

In February 2024, the research team conducted field visits to the targeted governorates, conducting a survey at 26 IDP camps, and discussions within the displacement community, as well as interviews with stakeholders from actors; local authority officials, Executive Unit for IDPs, and representatives of some humanitarian and relief organizations in Marib, Hajjah, Al Maharah and Socotra, a questionnaire was distributed to IDPs and using the Kobo Toolbox App to collect responses from individuals in those areas.

2.1.1 Data Collection Tools

The study team developed a set of research tools to facilitate data collection for the field study. These primary tools included surveys, focused group discussions (FGDs), and qualitative interviews. **The total number of participants across all study tools amounted to 302**, male and female individuals. These participants were distributed among questionnaire respondents, FGDs participants, and interviews in the governorates of Marib, Hajjah, and the Eastern Regions, namely Al Maharah and Socotra.

Questionnaire: A questionnaire served as the primary data collection tool for this study, and it was distributed to a sample of 310 participants of these, 245 valid and fully completed questionnaires were returned, resulting in a response rate of 79%. The collected data were subsequently analyzed using SPSS software and Microsoft Excel.

Focused group discussion sessions (FGDs): Five FGD sessions comprising IDPs and stakeholders (both males and females) were conducted in Marib and Hajjah governorates, totaling 37 participants. Unfortunately, FGD sessions could not be conducted in Al Maharah and Socotra due to limitations and challenges faced by the team, including restricted access to relevant actors.

Qualitative Interviews: In-depth interviews were conducted by Holm Akhdar for Environmental Consultancy with key stakeholders from government agencies, local authorities, local and international humanitarian organizations, and experts in the environmental field in the targeted governorates. A total of 20 qualitative interviews were conducted in Marib, Hajjah, Al-Maharah and Socotra, and with academic professionals and national experts.

Desk Review: The team conducted a comprehensive desk review of previous studies, documents, and literature related to the study topic. This included examining annual reports from the Executive Unit for IDPs Camps, CCCM Cluster, MWE, EPA, UN agencies, and reports from international organizations.

245

Random samples of displaced communities in four governorates: Marib, Hajjah, Al-Maharah, and Socotra.

5 FGDs
37 Participants

Five discussion sessions with **37** participants from IDPs community leaders. (60% males, 40% females)

20 interviews

Qualitative interviews with 20 officials from government institutions, local authorities, organizations, etc.

Desk Review

Review all available previous studies, documents and reports.

2.2 Study Population and Sampling

The study population comprised all stakeholders, both male and female, residing in displacement camps across the governorates of Marib, Hajjah, Al Maharah, and Socotra. The questionnaire was administered to a sample size of 245 participants, selected randomly, and distributed among the four targeted governorates. The distribution of samples by governorate as shown in **Figure 1** is as follows: Marib had the highest response rate, with 53.9% of IDP participants, followed by Hajjah with 32.7%. While the percentage of IDPs responding was 13.5% in the eastern regions (Al Maharah and Socotra). This distribution indicates that Marib accommodates the largest number of IDPs compared to the other regions.

2.2.1 Gender and Age

Regarding gender and age, the field data indicate that among the total respondents (see **Figure 2**), approximately 58.8% were male and 41.2% were female. In terms of age groups **(Figure 3)**, the majority of displaced respondents fell within the 26-40 years category, comprising 47.8% of the total, followed by the age group 41-60 years, accounting for approximately 26.1% of IDPs. The age group 18-25 years constituted 21.6% of the respondents, while respondents aged 60 and above represented 4.5% of the sample.

2.2.2 Education level

Regarding the educational level of respondents **(Figure 4)**, approximately 37.6% of the total IDPs responding to the questionnaire possessed a high school qualification, while 31.4% held a bachelor's degree. Participants with a primary school degree or below accounted for 28.2%, and IDPs with higher qualifications such as a Masters/PhD constituted 2.8% of the sample.

2.2.3 Place of Residence and Accommodation

With regard to the type of housing among the IDP participants in the governorates of Marib, Hajjah, Al Maharah and Socotra **(Figure 5)**, the majority of IDPs confirmed that they are currently residing in IDP camps, comprising 78.8% of the participants. IDPs living in monthly rented houses accounted for 7.8%, then comes the IDPs living in damaged houses by 6.5%. While the IDPs who live in their own property constitute 5.7%. The results of the survey also showed that IDPs living in the open spaces outside IDP camps reached 0.8%. While the percentage of IDPs living in their relatives' houses reached 0.4% of the total respondents in the four governorates.

2.2.4 Duration of Displacement

The survey results, conducted by Holm Akhdar for Environmental Studies, revealed significant findings regarding the duration of displacement among IDP respondents **(Figure. 6)**. The vast majority 88.6% of IDPs reported having spent more than two years in displacement camps and are still residing there. A smaller proportion 6.9% indicated that they have been displaced for less than a year, representing individuals who have recently relocated to displacement sites due to communal movements within the country. Additionally, 4.5% of respondents reported being in displacement sites for a duration of one to two years.

These findings indicate the prolonged displacement experienced by the majority of IDPs in the governorates of Marib, Hajjah, and the eastern regions, haven't ended by the end of its underlying causes. Rather, it has extended, and turned to be enduring state of forced internal displacement. The majority of IDPs in these locations have suffered the loss of their homes in their areas of origin, the deprivation of their sources of income, and the inability to rebuild their homes or businesses due to various factors, notably the scarcity of financial resources.

FIGURE 1 Distribution of samples by governorates %

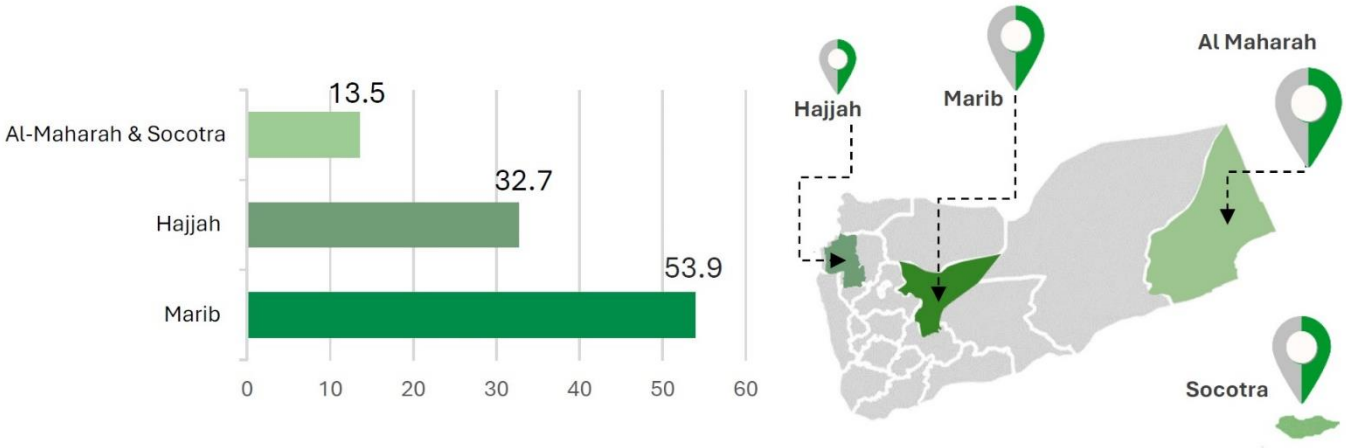


FIGURE 2 Distribution of samples by gender %

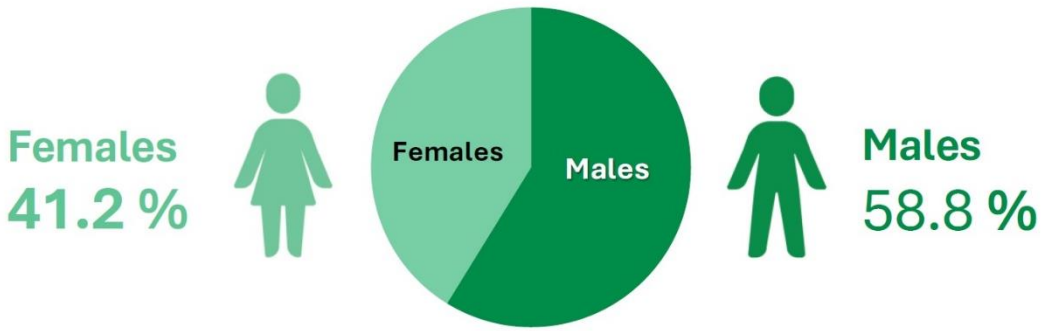


FIGURE 3

Classification according to age group of IDPs interviewed %

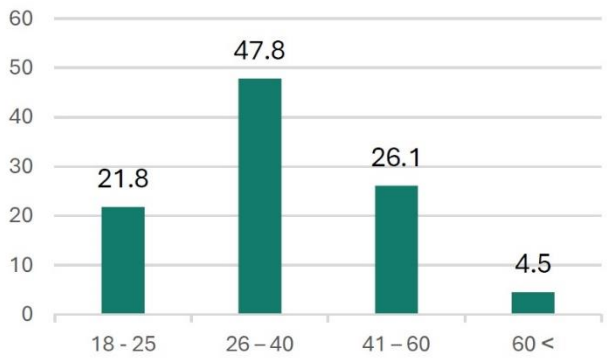
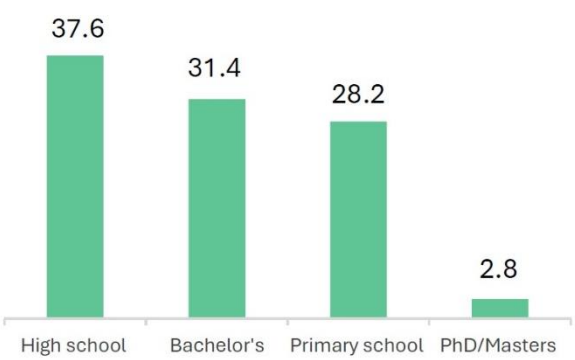


FIGURE 4

Educational level of IDPs respondents %



2.3 Focus Group Discussions (FGDs)

As for the focused group discussions, a total of 5 FGD sessions were conducted, with three sessions held in Marib and two sessions in Hajjah, and about 37 participants took part in these sessions, including 24 males and 13 females (**Figure 7**), most of them possessed higher educational levels, with around 21 participants holding a bachelor's degree or higher, while 16 participants had high school education or below. In terms of age groups, 23 participants fell within the age group 26-40, 12 participants were in the 41-60 age group, and 2 participants were between 18-25 years old.

2.4 Qualitative Interviews

A total of 20 qualitative interviews were conducted with relevant stakeholders in the government agencies, active humanitarian agencies, as well as specialists and experts in the field of climate change. These interviews were distributed as follows: six interviews in Marib, seven interviews in Hajjah, and four interviews in the eastern regions (Al Maharah and Socotra), and three interviews at the national level. The interviews targeted 10 government offices (agriculture, water and environment, education, local authorities, and displacement management units), in addition to five local and international organizations working on environmental issues, and four other academic and professional agencies.

FIGURE 5

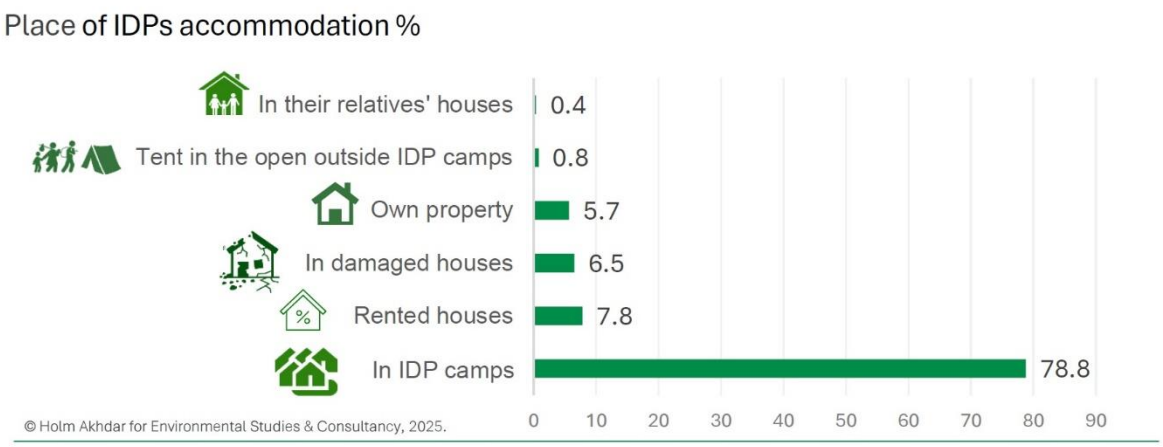


FIGURE 6 Years of presence of IDPs respondents in displacement areas %

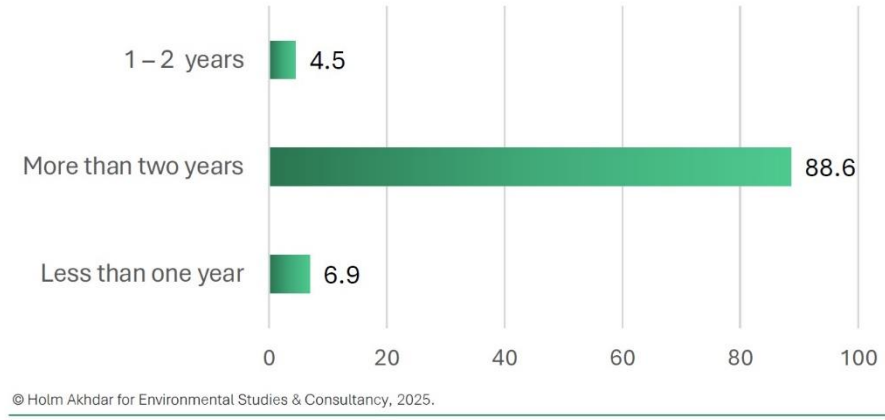
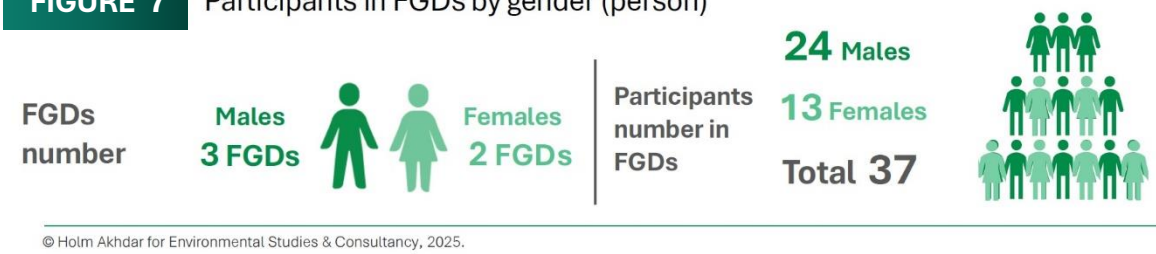


FIGURE 7 Participants in FGDs by gender (person)



Chapter

3

Climate Change and Internal Displacement

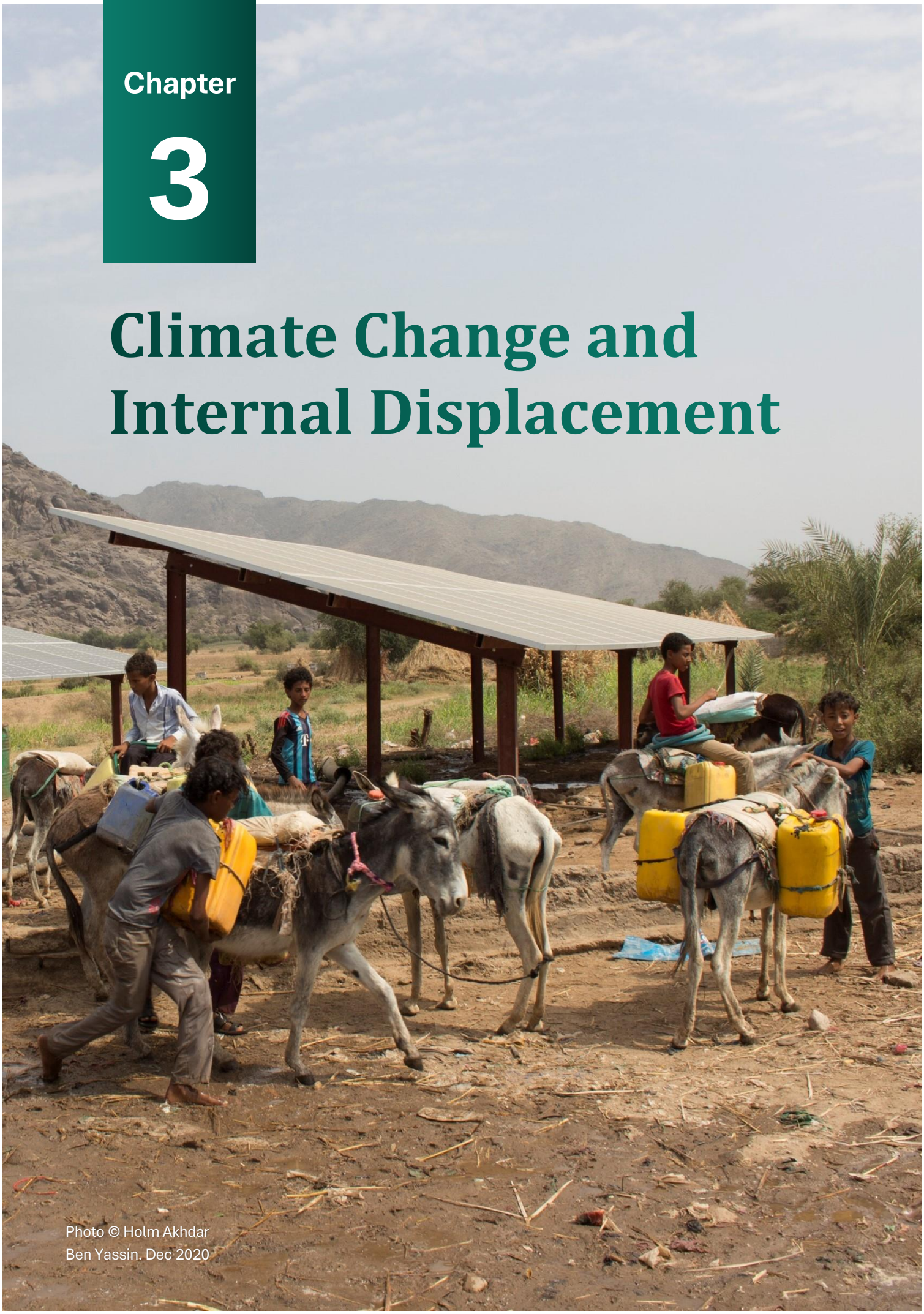


Photo © Holm Akhdar
Ben Yassin. Dec 2020

Topographic map of Yemen / December 2012. © CC BY-SA 3.0.

3.1 Climate Overview

The Republic of Yemen, located in the southwestern part of the Arabian Peninsula, enjoys having a coastline spanning 2,200 kilometers along the Red Sea, Gulf of Aden, and Arabian Sea. Geographically, Yemen is situated within the northern extensions of the equatorial climate zone and shares borders with subtropical regions. Yemen covers an area of approximately 555,000 square kilometers (Ministry of Oil and Minerals, 2020) and is estimated to have a population of around 39.3 million people. (World Bank, 2023) They are unevenly distributed across its diverse terrain.

Yemen has a dry and semi-arid tropical climate along its coastal and inland deserts. The highland regions of Yemen exhibit a subtropical and temperate climate, with generally wide temperature ranges. (World Bank, 2023) The country is characterized by five major land systems: First a hot and humid coastal Tihama plain, 30- 60 km wide, along the Red Sea and the Gulf of Aden; Secondly: the Yemen Highlands, a volcanic region with elevations between 1,000 and 3,600 m parallel to the Red Sea coast, and with temperate climate and monsoon rains; Third: the dissected region of the Yemen High Plateaus and the Hadhramout –Al Maharah Uplands, with altitudes up to 1,000 meters; Fourthly the Al-Rub Al-Khali desert interior, with a hot and dry climate; and Fifth the islands, (EPA, 2018) including Socotra in the Indian Ocean and more than **186 islands** [(1)] in the Red Sea, Bab al-Mandab, Gulf of Aden, and Arabian Sea. Yemen's coastal and marine ecosystems which include extensive mangroves, coral reefs, and sea grass areas are of major economic importance for fisheries and tourism. (EPA, 2018)

3.1.1 Temperature

In Yemen, the temperatures range widely depending on elevation or, in the coastal areas, distance from the sea. Mean temperatures in the highlands range from below 15 °C in winter to 25°C in summer, and in the coastal lowlands from 22.5°C in winter to 35°C in the summer. (Henderson, 2023) Over the past five decades, from 1971 to 2020, the average annual temperature in the country increased by 0.42 °C

[(1)] Until 2006, the Yemeni Islands Promotion and Development Authority (YIPDA) reported that the number of Yemeni islands was 184 islands, but during the period (2007-2013), the southern Red Sea region witnessed tremendous volcanic activity, which caused the movement of tectonic plates in the depths of the Red Sea. These volcanic eruptions resulted in the creation of new islands off the coast of Yemen, where the eruption created two new islands and two islets within the Zubair and Jebel at Tair volcanic islands group. As a result, the number of Yemeni islands has increased to 186, distributed in 3 main sectors: the Red Sea (154 islands), the Gulf of Aden (21 islands), and the Arabian Sea (11 islands). (Source: authors' elaboration)

per decade, with large regional and seasonal differences accompanying a significantly increasing number of hot and humid days and nights. (World Bank, 2023)

3.1.2 Precipitations

Rain in Yemen falls in two seasons, during the spring (March - April) and the summer (July - August) during which rains fall greater than the spring season. Mean annual precipitation in Yemen is 190 mm, and two-thirds of the country is classified as hyper-arid with less than 50 mm per year. (Acacia Water, 2021) The coastal plain rainfall ranges from 10 to 100 mm per year, about 80 per cent of which is received during the winter months. Precipitation increases significantly with elevation, averaging 100–600 mm per year on the western-southern highlands. (NWRA, 2021) Some areas of the western highlands, most notably Ibb and Taiz, receive about 1,000–1,500 mm of rain per year, and Sana'a receives around 300 mm per year. (Acacia Water, 2021)

3.1.3 Sea Level Rise

The Gulf of Aden sea level rose at the global rate of 1.8 mm per year over the period 1992–2012. (EPA, 2018) A case study assessment of the Al-Mukalla Coastal Zone showed that, among other climate impacts, sea level rise will exacerbate shoreline erosion rates and lead to corresponding land loss of about 440 hectares under an assumed rise of 0.5 meters of the waters of the Arabian Sea by the year 2035. (EPA, 2018)

3.1.4 Projected Climate Scenarios

Although Yemen's contribution to exacerbating the climate crisis is minimal, the country is experiencing noticeable impacts of climate change, including droughts, heatwaves, and high temperatures in certain regions. Changes in precipitation patterns, such as rain, hail, snow, torrential rains, and flash floods, have also been observed. The intensity of monsoon speed caused by weather depressions, tropical cyclones, and storms has also increased. Furthermore, fluctuation of air and ground humidity have contributed to the spread of epidemics and pests, impacting public health and the environment. In addition to the increased water evaporation from the soil and Earth's surface. Though gradual, there is also a rise in sea levels.

International and local predictive studies and reports outline three climate change scenarios that provide insights into Yemen's future until 2080. The first: a "hot and dry" scenario of higher warming of 2 to 4.5 °C, with aridity dramatically increased due to the combined effects of low rainfall and high ET. (EPA, 2018) This scenario entails an increased occurrence of droughts, leading to significant challenges facing agricultural sector in Yemen such as reduced rainfall and heightened evaporation, resulting in various societal impacts. The second scenario is a "mid" scenario, with considerable warming of between 1.6 and 3.1 °C but no significant change in average annual rainfall. The third scenario is a "warm and wet" scenario with lower warming of between 1 and 1.6 °C and an increase in average annual rainfall. (EPA, 2018)

In terms of the future impacts of climate change on Yemen's long-term development, one report based on an analysis of historical climate data predicts that without climate action to enhance resilience and adapt to climate change, the country will experience significant increase in malnutrition and poverty rates. By 2060, Yemen is expected to lose a cumulative $93 billion in GDP. An additional 3.8 million people are expected to suffer from malnutrition. (UNDP, 2023) Moreover, the number of climate-related deaths could surpass 121,000 by 2060. These adverse effects could potentially push approximately 8.1 million Yemenis into poverty. (UNDP, 2023)

Climate change is among the priority water resource management threats in Yemen. According to these climate scenarios, the impacts of weather and climate fluctuations on Yemen's groundwater are likely to intensify, as the country's water reserves are projected to face further depletion from most critical aquifers during the period (2025-2030). A case study assessment of the Wadi Zabid drainage basin under a range of climate change scenarios showed that the region's aquifer will steadily deplete in the coming decades in the absence of effective adaptation initiatives. (EPA, 2018) Urgent action and the

implementation of effective solutions are necessary to prevent the complete depletion of Yemen's water reserves. Additionally, the country's urban centers are already facing severe water pressure, while the livelihoods of rural populations, heavily reliant on agriculture, grazing, and natural resources, are at considerable risk.

Yemen's projected climate modeling data shows significant changes in rainfall patterns across the country. Observations indicate a notable increase in summer rainfall in the highlands and along the Red Sea coast. These trends are expected to persist in the future. (UNDP, 2023) Not only will there be an overall increase in average rainfall, but there will also be a substantial rise in rainfall variations, leading to harsher natural phenomena at high and low rainfall levels over different periods of time. (UNDP, 2023)

During the past few years, climate change has led to increased population movements, as people were forced to displace from affected regions. The diminishing livelihood opportunities and limited access to essential resources and services, coupled with a lack of focus on climate disaster adaptation programs, pose a significant challenge for Yemen. Over the past decade, climate risks have been on the rise, becoming one of the most significant threats to the lives, health, livelihoods, and future of millions of Yemenis. Addressing these challenges necessitates the implementation of community-oriented climate reforms.

3.2 The Role of Conflict and Climate Change in Environmental Degradation and Social Tensions

Over the past decade, climate change and displacement in Yemen have become increasingly intertwined. The intensification of extreme weather events and deteriorating environmental conditions, compounded by ongoing conflict, have exacerbated multiple, overlapping crises in the country. These crises have further endangered lives, deepened poverty, and eroded livelihoods, contributing to heightened tensions within local communities. Consequently, these interconnected factors are driving a growing number of cases of forced displacement across the country.

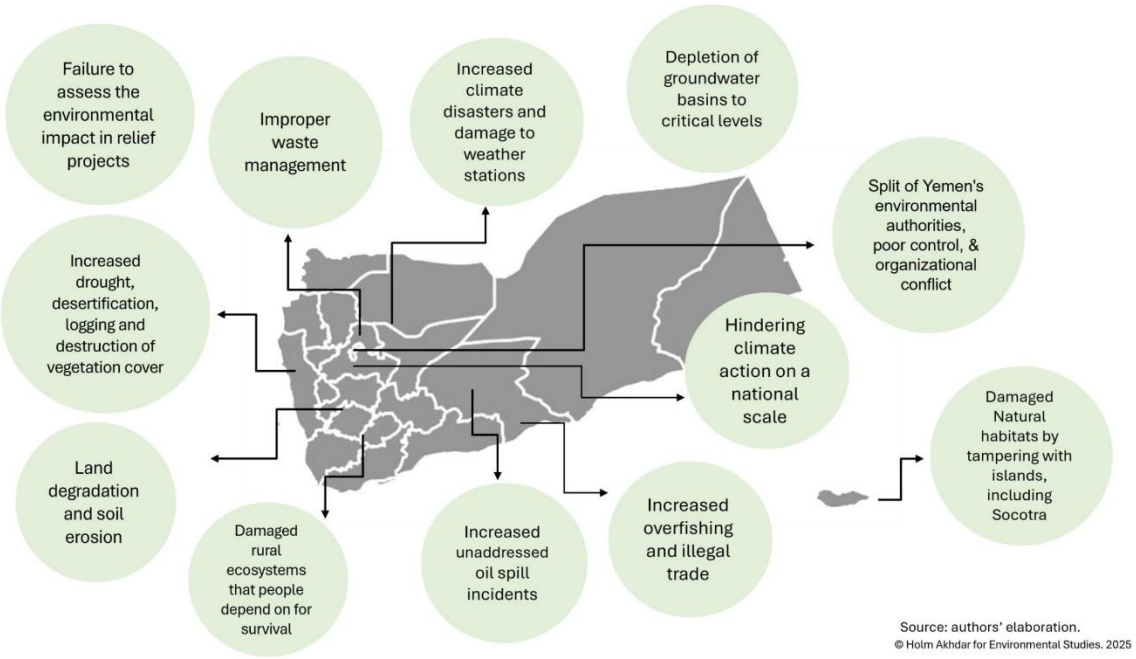
Two villages in **rural Taiz, fought** over **water** from **2000** to **2015.** More than **six people** were **killed** and injuries to numerous individuals.

The escalating war and conflict in Yemen since March 26, 2015, has created an environmental crisis within the country's major humanitarian crisis, exacerbating climate change impacts. The conflict has placed immense pressure on natural resources, particularly the already scarce water sources in Yemen. Additionally, the country's infrastructure has been extensively damaged. The repercussions of the conflict have also hindered the enforcement of environmental policies, legislation, and the implementation of national plans, thereby impeding effective climate action efforts in Yemen. "This neglect of climate change considerations in decision-making processes and peace negotiations among the Yemeni parties heightens the risk of future conflicts induced by climate change." (IOM, 2023)

It is crucial to recognize that the effects of climate change on conflict and security cannot be viewed in isolation from the broader context of environmental degradation. In many cases, including in Yemen, the impacts of climate change exacerbate existing environmental degradation caused by overexploitation and pressure on natural resources. (DCAF, 2022) Even in periods of relative stability, climate change in Yemen has already contributed to conflicts and social tensions. A stark example is the violent bloody events that the country witnessed about 24 years ago. When a number of water wells in the southwestern countryside of Taiz governorate dried up, armed tribal clashes outbroke in 2000 between the residents of Qarada and Al-Marzouh in the Sabr Al-Mawadim district, over the remaining water wells. Both villages engaged in violent disputes over the scarce and rapidly depleting water supplies from their shared mountain springs. More than six people were killed and many were injured in clashes that intensified in 2013. (Friedman, 2013) As each village persistently sought to own the remaining water wells, the clashes between the two villages did not subside until wider war and conflict broke out in 2015, when their battles spread to other villages of Sabr district. (Al-Hakimi, 2018)

Climate change has serious and perilous implications for ecosystems. Over the past ten years, Yemen has been witnessing a profound correlation between the environmental crisis and the humanitarian crisis. The country has never been hit by severe climate disasters amidst such conflict and humanitarian catastrophe. (Al-Hakimi, 2018) Since 2015, successive cyclones and tropical storms have struck Yemen's southeastern coasts, causing severe damage and losses in terms of lives and properties. These climate-related impacts have been further aggravated by escalating conflict and a diminishing government attention paid to climate risks. Consequently, the geography of the humanitarian crisis in Yemen has expanded, with two main dimensions: displacement driven by conflict and displacement triggered by climate disasters. However, it is essential to acknowledge that the effects of climate change in Yemen are pale if compared to the effects of years of bitter and devastating conflict. (Hanna, Bohl, & Moyer, 2021) Apart from the extensive destruction of infrastructure, economic decline, and the deterioration of livelihoods within local communities, efforts to strengthen governance and develop public and environmental policies have stagnated in Yemen, and national plans and strategies have not been completed. Regrettably, the Yemeni government has not prioritized climate change considerations over the past ten years. Climate change issues have not received sufficient attention in the policy-making process and the Yemeni peace consultations, despite the increasing frequency of direct climate change impacts on the environment, development, and the immense economic, social, and humanitarian costs endured by local communities. The climate disasters in Yemen are humanitarian disasters, not just natural disasters, as perceived by the authorities.

FIGURE 8 The most prominent effects of conflict on the environment in Yemen



In an interview with an EPA branch manager, the government official summarized: "The division of environmental authorities within the country has significantly contributed to power conflicts and regulatory disputes between institutions, which has weakened the environmental oversight process and decline the compliance with laws and environmental protection legislation in both northern and southern Yemen." Consequently, there has been a concerning neglect of biodiversity, with various nature reserves suffering from habitat degradation and interference. For example, the island of Socotra, located east of the Gulf of Aden, has experienced extensive disruptions that pose a grave threat to the unique archipelago's biodiversity.

The rapid and uncontrolled construction activities in recent years have disregarded the vulnerability of the delicate environment to potential hazards. (Holm Akhdar, 2021) Socotra Island has also encountered challenges in managing solid and plastic waste, particularly in and around the main cities of the archipelago. Waste, including plastic bags and cans, accumulates along roads, coastlines, including estuaries, and valleys. (UNESCO, 2022) The tourism industry on Socotra Island has also appeared as a significant threat, as it has been accompanied by high-impact developments. (UNESCO, 2022) Furthermore, the "Bura'a" nature reserve, located in Al-Hodeidah Governorate, was subjected to destructive human activities, including logging, and the large-scale planting of Qat trees on lands within the protected areas. Kamaran Island Reserve has also been subjected to heavy logging.

Furthermore, the ongoing conflict has undermined oversight and led to the mismanagement of water resources, resulting in indiscriminate depletion. Groundwater basins, upon which Yemen heavily relies for its water resources alongside rainfall, have been depleted to critical levels. The country's water crisis is apparent and stands as one of the most pressing environmental challenges faced today. Yemen comprises 14 aquifers, 5 of which are classified as critically depleted basins, and only two are self-sufficient. All basins continue to experience a steady decline in water levels without effective intervention from the authorities. (Al-Salehi, 2022)

According to **Figure 8**, the ongoing conflict in Yemen has compounded a multitude of environmental and climatic hazards, presenting numerous challenges to the nation, including the escalation of weather-related disasters and extreme climatic events, exacerbated by the lack of climate data due to the damage the weather stations endured. Since the onset of the conflict, most of these stations have been damaged, although the United Nations has recently re-established some of them in a number of governorates.

Yemen has also experienced a surge in droughts and an expansion of desertification. The ongoing conflict and the subsequent decline in government services since 2015 have contributed to the current crisis of cooking gas, which has in turn exacerbated the situation with regard to logging, due to the scarcity of available gas and the significant increase in its price compared to previous levels. This has resulted in the proliferation of the trade in firewood and coal as an alternative fuel to gas, particularly for citizens and the service sector, including restaurants and bakeries. Consequently, extensive areas of vegetation have been depleted, particularly in the northwestern, southwestern, and western coastal regions. (Al-Yabari, 2022) This has had a significant impact on livestock and the Yemeni honeybee sector, which depend on pasture areas and forest trees. These areas have been subject to extensive cutting and uprooting by firewood traders, with no effort made to restore the vegetation cover that has been lost over the past ten years. Furthermore, social tensions have arisen in logging areas between beekeepers and livestock owners, with firewood traders, who have threatened the livelihoods of these groups. Moreover, the issue of land degradation and erosion of fertile soil has emerged, significantly impacting the ecosystems that rural people depend on for their survival.

The conflict and weak oversight have also contributed to unaddressed oil spills, particularly from deteriorating oil pipelines in the central governorate of Shabwah, and leaks from fuel ships in the waters of the Gulf of Aden. (Holm Akhdar, 2021) In addition, wildlife crime and illegal trafficking in Yemen continue to be active and unchecked, and further exacerbating the environmental challenges faced by the country. (Holm Akhdar, 2020)

BOX 1

Social tensions associated with displacement and climate change

Focus group discussions (FGDs) conducted by Holm Akhdar Environmental Consultancy with IDP community leaders revealed that the majority of Yemeni IDPs reside in informal, non-state-owned shelter sites. This situation has created ongoing challenges related to the land on which their camps are established, threatening their security and stability. Most camps were self-constructed and randomly located, often on fertile land owned by members of the host community. While some landowners have shown sympathy and permitted IDPs to stay on their land as an act of social cooperation, the duration of displacement has exceeded their expectations. Furthermore, there are no formal agreements or leases governing the use of these lands, leaving IDPs vulnerable.

For example, Al-Jufainah camp in Marib, the largest displacement camp in Yemen, accommodates over 74,000 IDPs, based on a verbal rental agreement. (REACH, 2024) The absence of formal leases has prompted landowners to reclaim their lands for cultivation or investment due to economic pressures, posing significant threats to IDPs and creating challenges for management units and actors responsible for their welfare.

Currently, approximately 103 IDP camps in Yemen are at risk of immediate eviction (EXUIDPs, 2024) due to land disputes. Additionally, some camps are situated in areas vulnerable to security risks, such as valleys and flood-prone zones, where remnants of unexploded ordnance and landmines can be washed away by floods, directly endangering the lives of displaced families.

Climate change poses serious challenges to the lives of IDP communities in Yemen. Its multifaceted impacts can destabilize large populations of, compounded by numerous vulnerabilities and a lack of viable solutions. According to the Executive Unit for IDPs, approximately 490 displaced families are living outdoors, directly exposed to climate risks. Additionally, about 15,060 families reside in unfinished buildings, while 34,362 families occupy emergency shelters. Furthermore, 280,144 families live in rented accommodations, with 46,743 facing eviction due to their inability to pay accumulated rents. (EXUIDPs, 2024)

The interconnected effects of armed conflict, climate change, and environmental degradation cannot be effectively addressed through humanitarian action alone. A coordinated effort involving humanitarian, development, environmental, and peacebuilding actors is essential to establish a foundation for long-term sustainability and to enhance the resilience of communities before, during, and after disasters. (ICRC, 2022)

Al-Jafina camp, the largest camp in Marib. Jan 2024 © Holm Akhdar Environmental Consultancy / Aisha Al Hamami

3.3 Climate Displacement in Yemen

> “ The haphazardly established camps have proven being a source of suffering. Numerous camps were established and built without adherence to systematic planning, in inappropriate locations and without climate-resilient infrastructure. The majority of IDPs in these camps inhabit tents made primarily of straw and torn tarpaulins, which have not been replaced by organizations for more than three years.”

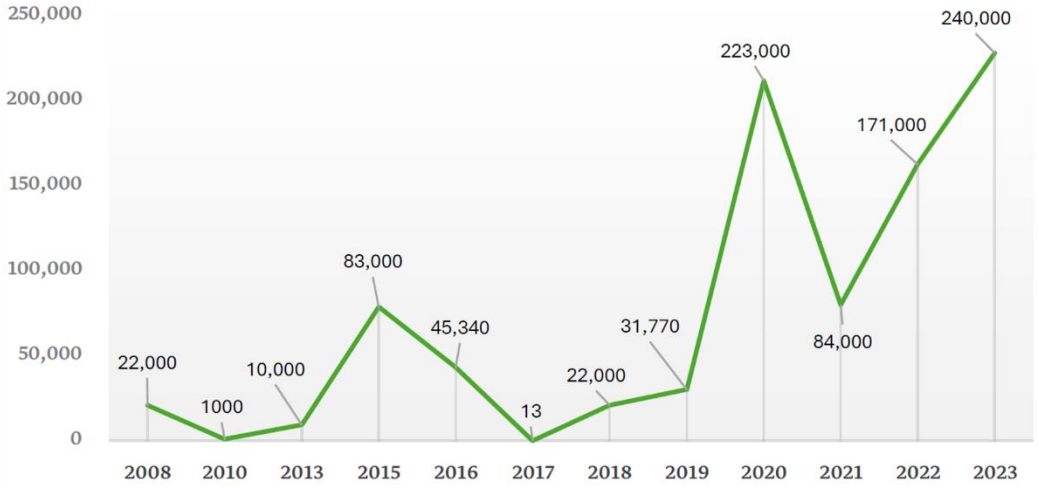
A Professor at Hajjah University

Climate-induced displacement can be characterized as a sudden and random mass phenomenon rather than an individual movement. It typically manifests as an unplanned and unregulated mass movement by affected communities. In such situations, most household heads make the decision to flee with their families, dominated by a combination of confusion and an excessive sense of isolation. This decision is often driven by the imminent threat to their survival, after their homes and properties were destroyed by natural disasters such as cyclones, storms, flash floods, landslides, rockslides, etc.

Climate-induced displacement is described as the mass movement of entire communities, including villages, displacement camps, or larger populations. Entire communities of all ages are forcibly displaced because of a severe climate or environmental disaster. The displacement triggered by climate disasters in the governorates of Marib, Hajjah, Al Maharah and Socotra shares common features, namely, it is an unplanned and forced displacement that lacks essential survival information.

The focus group discussions (FGDs) conducted by Holm Akhdar Environmental Consultancy, showed that the majority of IDP respondents who fled their villages, disaster-stricken areas and camps following extreme weather events, did not end their displacement once the conditions causing them ended, or once the disaster that displaced them ended. Rather, the duration of their displacement has ranged from medium-term displacement (more than two or three years) to long-term and continuous migration. The majority of IDPs have lost their homes and have not been able to rebuild them. They have lost their source of income and the natural resources that sustain their livelihoods.

FIGURE 9 Internal displacement movement due to natural disasters in Yemen during the period (2008-2023) (person)



When people are displaced, their lives change overnight. They are forced to live on the frontlines in vulnerable communities, disproportionately affected by climate change. Although displacement communities are often the least contributing to the exacerbation of climate change. However, they are the most affected by its ongoing effects. "This is because of unjust social, political and economic structures which have led these frontline communities to be disproportionately exposed to climate risks."(CIG, 2022) Makeshift camps do not provide IDPs with stability and security, leaving them vulnerable to a wide range of direct risks.

In Yemen, one of the dire consequences of climate change is the recurrent displacement of its population. (IOM, 2023) Over the span of fifteen years, from 2008 to 2023, climate-related disasters have displaced approximately 933,000 individuals in Yemen (IDMC, 2024) with torrential rains and floods being the primary drivers of displacement, accounting for about 85 percent of cases. Despite a decline in conflict-related displacement in Yemen following the declaration of a Truce Agreement by OSESGY in April 2022, there has been a substantial increase in climate-related displacement in 2023 and 2022. (***see* Figure 9**)

In an interview conducted by Holm Akhdar, with a professor at Hajjah University, he said, "The haphazardly established camps have proven being a source of suffering. Numerous camps were established and built without adherence to systematic planning, in inappropriate locations and without climate-resilient infrastructure. The majority of IDPs in these camps inhabit tents made primarily of straw and torn tarpaulins, which have not been replaced by organizations for more than three years."

Climate change could further complicate the way to recovery, although a great deal of uncertainty remains on exactly how to do so. (UNDP, 2023) Given the prolonged nature of climate-induced displacement in Yemen, humanitarian actors need to understand the evolving needs of affected communities and prioritize climate-centric reforms to address the gaps in displacement sites. – particularly as climate-induced displacement surpasses conflict-related displacement. (REACH, 2024)

In 2023, the displacement of people in Yemen reached a significant scale, with more than 314,000 individuals being displaced. Among these IDPs, approximately 235,000 people 76% were displaced by extreme climate change. (OCHA, 2024) The primary causes of displacement were cyclones, heavy rain, and floods. The remaining 24% (over 79,000 people) were displaced by the ongoing conflict, and a substantial number of them were residing in remote unreachable areas or areas hosting IDPs.

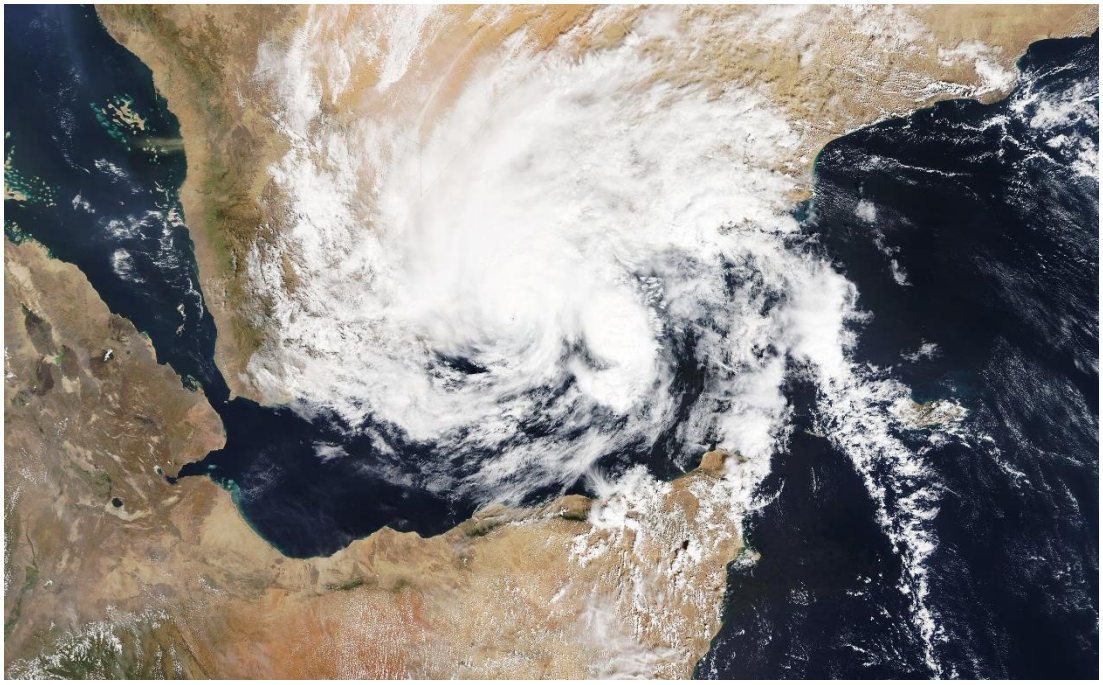
Figure 9 shows a significant increase in climate-induced displacement since 2015. In that year, Yemen was hit by two storms leading to the displacement of 83,000 people. Subsequently, in 2016, cyclones and tropical storms caused torrents and flash floods, causing the displacement of 45,340 individuals. The year 2017 saw the least number of displacements, with only 13 people were displaced by landslides. (IDMC, 2024)

In 2019, weather and climate-related incidents affected 12 Yemeni governorates, which witnessed heavy rains causing flash floods that damaged displacement camps, and approximately 31,770 people were displaced as a result. Floods washed away IDP tents in various governorates, displacing 3,000 individuals for the second time. By the end of July 2019, intensified rains caused the displacement of an additional 13,000 people. In September, flash floods caused significant damage and resulted in the second displacement of 15,000 individuals from their original sites in the governorates of Aden, Lahj, and Abyan. (IDMC, 2020) From May to August 2020, a tropical weather depression was concentrated over the eastern and southern regions of Yemen, bringing heavy rains accompanied by thunderstorms, and flash floods affected 19 Yemeni governorates and about 189 rural districts. More than 223,000 people were displaced during those months in 2020, as their homes and food supplies were destroyed by the floods.

The damage experienced in the displacement sites within Hajjah and Marib governorates surpassed that in other areas across the country. In Hajjah governorate, the districts of Abs (including Midi, Hiran, and Bani Hassan) and Haradh suffered considerable impact. The total population affected in these areas amounted to about 109,170 individuals. (al-Akwa & Zumbrägel, 2021) Similarly, most districts in Marib governorate experienced significant repercussions, affecting a total of 101,526 people. (al-Akwa & Zumbrägel, 2021)

In 2023, Yemen also experienced significant displacement caused by heavy rains and floods, resulting in the displacement of tens of thousands of Yemeni individuals. This displacement was a consequence of the extensive damage to IDP homes and camps. Furthermore, the infrastructure in several governorates was adversely affected, hindering the provision of adequate life-saving services. In May 2023 alone, floods impacted nearly 44,800 households, leading to their displacement to other places. About 253 shelter sites for IDPs were damaged. Moreover, the intensification of thunderstorms resulted in 50 fatalities from lightning strikes. (OCHA, 2024) During 2023, climate-related displacement in Yemen reached its highest level in almost four years. Among those affected, women and girls have been the most affected groups, as around 80% of the total 4.5 million IDPs in Yemen are women and children. Female-headed households currently account for 26% of all displaced families. (UNFPA, 2023)

In 2024, heavy rainfall and associated flooding and landslides during Yemen's two annual rainy seasons—spanning April to May and July to September, had affected nearly 938,000 people since March as of August 31, 2024, exacerbating food and health concerns among vulnerable populations, according to the UN. (USAID, 2024)



Satellite image of Chapala after its landfall over Yemen. 3 November 2015 © NASA

3.4 Climate Disasters Triggering Displacement in Yemen

"Cyclones and strong winds have uprooted and destroyed a significant number of rare Dragon's Blood trees on Socotra Island. Additionally, floods have severely damaged the main roads connecting the southern regions to the central part of the island."

IDP from Socotra Archipelago

3.4.1 Cyclones and Tropical Storms

Cyclones are powerful, rotating storms that form over warm tropical and subtropical oceans and generally move from East to West before turning towards higher latitudes. These cyclones are known as Hurricanes in the Atlantic and Northeast Pacific basins, and as Typhoons in the Northwest Pacific basin. (World Bank, 2024) Cyclones pose a significant threat upon landfall, causing heavy rain, strong winds, flooding, and widespread damage, which can degrade water quality and destroy infrastructure.

Over the past two decades, Yemen has faced serious risks due to the increase in extreme weather phenomena. The country has been subjected to a persistent series of tropical cyclones and storms, which have served to exacerbate the already considerable humanitarian and economic costs. From October 23-25, 2008, Tropical Storm (03B) hit the eastern regions of Yemen, causing widespread flooding in several locations in the southeastern governorates of Hadhramout and Al Maharah. The two governorates were subsequently declared disaster areas. The storm resulted in 73 fatalities and 13 individuals remain unaccounted for. It displaced more than 25,000 people, the destruction of 2,826 homes, and damage to infrastructure, housing, and livelihoods. Additionally, approximately 550,000 palm trees were uprooted, and 58,500 livestock perished. The estimated losses amounted to approximately US$1,638 million. Losses in the agricultural sector alone accounted for nearly 64 % of the total losses, and the food security gap increased by 15 %. (World Bank & GFDRR, 2009)

Between 2015 and 2023, Yemen was hit by eight cyclones and severe storms, compared to only one tropical storm in the previous years (2007-2014). **Tropical Cyclone Chapala** was the first hurricane-force tropical cyclone to make landfall in Yemen in more than 30 years, (Mullen, 2015) which struck the island of Socotra on November 2, 2015, with maximum sustained winds of around 140 km/h, causing severe devastation in Socotra, Hadhramout, Al-Maharah, and Shabwah. (FAO, 2015) The Cyclone

Chapala claimed the lives of 11 individuals and displaced more than 50,000 people, and destroyed 800 homes according to the Government Committee Charged with Overseeing the Aftermath of the Cyclone Chapala. Only a week later, on November 8, 2015, Socotra was hit by a second cyclone named **Megh**, characterized by strong winds and heavy rainfall, causing the death of 13 people on the island. (Reuters, 2015) As Cyclones Chapala and Megh reached Yemen's southern governorates, adverse weather conditions led to the displacement of 5,974 households across 13 districts. (IOM, 2015) On May 18, 2018, Yemen's coastal areas were hit by **Cyclone Sagar**, which killed a woman in Al-Maharah, and followed by **Cyclone Mekunu** that hit the coasts of Yemen on May 25, 2018. Cyclone Mekunu caused extensive destruction on Socotra Island, killing at least 10 people on the island, and displacing over 1,000 families there. (WHO, 2018)

On October 14, 2018, Socotra and Al Maharah in Yemen experienced the impact of **Cyclone Luban**. This cyclone had significant consequences, affecting over 3,000 families. Tragically, the floods killed 11 people and injured 124 others. The hospital in Qishn district has been out of operation since October 16, 2018, as it was severely affected by flooding, and all healthcare workers have been evacuated from the facility. In Messila district, the cyclone completely destroyed 30 houses, while an additional 32 houses were partially damaged by the flooding. (OCHA, 2018) From 2-8 November 2019, Yemen's coastal areas were hit by **Cyclone Kyarr**, followed by **Cyclonic Storm 'Maha'**, bringing about severe storms and strong winds in Hodeidah and Hajjah. (OCHA, 2019)

The year 2023 proved to be the most dynamic in terms of climate-induced displacement in Yemen. On October 22-23, 2023, **Cyclone Tej** ravaged the country, causing extensive damage and losses to housing, properties and camps due to flooding and torrential rains. The impact was particularly concentrated in the governorates of Al-Maharah, Socotra, Hadhramout and Abyan. Reports by United Nations agencies indicate that more than 18,000 families were affected, 12 camps in Al-Maharah and Hadhramout sustained substantial damage. Additionally, 32 IDPs in Abyan lost their rented houses, and 91 shelters for IDPs were also damaged. (OCHA, 2023) Cyclone Tej affected the population and infrastructure in Al-Maharah more than other governorates. According to the Executive Unit for IDPs, over 1,700 displaced families are displaced in Al Ghaydah, Al Masilah, Sayhut, Qishn, Hasswin, Hawf and Shehin districts. In Socotra, 192 households (HHs) were displaced due to Cyclone Tej including 30 HHs in Nawjed area of Hadibu district, and 162 HHs in Qalansiyah, and Abd Al Kuri district.

> “
>
> **Between 2015 and 2023, Yemen was hit by Eight Cyclones and Severe Storms compared to only One Tropical Storm in the previous year's 2007 - 2014.**
>
> Study authors.

According to the Emergency Operations room of the Governorate Health Office (GHO) and Yemen Red Crescent Society (YRCS), 6 fatalities and 473 injuries were reported in Al Maharah. The consequences included market closures, disruption of the fishing sector, and significant impact on fishermen and herders. (OCHA, 2023) Cyclone Tej also caused damage to more than 600 homes in Socotra, 300 houses completely destroyed, and 314 partially damaged across the archipelago.

Figure 10 indicates that the number of IDPs in Yemen due to cyclones and storms reached 69,975 people during the period (2015-2023). However, the number may be even higher, as the study identified numerous IDP sites affected by climate-related disasters that have not been assessed due to limited access for humanitarian actors. In fact, if we count those displaced by cyclones and storms in 2023, the figure could potentially double. As the lack of reliable local data in Yemen poses a significant challenge in the field of climate displacement studies, hindering comprehensive assessments and accurate estimations of the true extent of the issue.

FIGURE 10

Cyclones and tropical storms that hit Yemen and the number of displaced during 2015 - 2023

2015

Cyclone Chapala
November 2, 2015
Socotra
11 death
50,000 IDPs.

Cyclone Megh
November 8, 2015
In Socotra & Al-Maharah
13 dead.
5,974 displaced families.

2018

Cyclone Sagar
May 18, 2018.
One death in Al-Maharah

Cyclone Mekunu
May 25, 2018
10 Fatalities
1,000 families displaced.

Cyclone Luban
October 14, 2018
Socotra and Al-Maharah
11 Fatalities
3,000 Families displaced

2019

Cyclone Kyarr
November 02, 2019

Storm Maha
November 08, 2019
Socotra.

2023

October 22, 2023

Cyclone Tej
Socotra and Al-Maharah
6 Fatalities
10,000 displaced in Al-Maharah
12 Camps in Al-Maharah and Hadhramaut sustained. substantial damage.
91 Shelters were damaged.
300 Houses completely destroyed.
314 Partially damaged .

Data Source:
The Government Committee Charged with Overseeing the Aftermath of the Cyclone Chapala & Megh 2015. IOM (2015). FAO (2015), Reuters (2015), OCHA (2018, 2019, 2023), and IDMC (2023).

Flooding in the streets of Sana'a, July 2024 © Holm Akhdar/ Mahmoud Abdu.

3.4.2 Flash Floods

Flood is a circumstance when an overflow of water submerges an area or land. (Zaid, et al., 2021) This inundation of a normally dry area caused by rising water in an existing waterway, such as a river, stream, or drainage ditch. Ponding of water at or near the point where the rain fell. Flooding is a longer term event than flash flooding: it may last days or weeks. (WMO, 2006) A flash flood is a flood of short duration with a relatively high peak discharge in which the time interval between the observable causative event and the flood is less than four to six hours. (WMO, 2006) The reason of flash flood is torrential rains brought by tropical storms, which is uncommon in arid regions. These precipitations are in a short period, but very intense. (Zaid, et al., 2021) Flash floods are usually characterized by raging torrents after heavy rains that rip through riverbeds, urban streets, or mountain canyons sweeping everything before them. (WMO, 2006) Climate change and rapid urbanization have resulted in the escalation of floods. Furthermore, they may occur during a dry season when excessive rain falls on an exceptionally dry ground surface that cannot be penetrated by the water. (World Bank & GFDRR, 2010) Other factors like tornadoes, thunderstorms, monsoons, and extra-tropical cyclones, might trigger flash floods. (Zaid, et al., 2021)

Torrents and flash floods are the most frequent annual disasters in Yemen. During the rainy season, which starts from March to September each year, the country experiences severe accidents due to torrents and flash floods. Yemen is particularly vulnerable to flooding due to its topography and changing rainfall patterns. (IOM, 2023) Recent field data indicate that 40% of IDP sites are at risk of torrents and flash floods. While 73 percent of IDP sites in Yemen are random sites. (CCCM, 2023) This increases climate risks to communities, thus recurring climate displacement of these communities in a dead-end cycle.

Most of Yemen's areas are situated in an arid climate with convective storms resulting in flash floods and significant damage to infrastructure and human settlements. (World Bank & GFDRR, 2009) A notable example of this phenomenon is the series of tropical storms that struck the eastern portion of Yemen, from October 23 to 25 of 2008, causing extreme devastation and left thousands of people homeless. (Zaid, et al., 2021) They caused torrential and prolonged rainfalls continuously over a period of days, resulted in a huge volume of water about 91 mm on Wadi Hadhramout catchment region of two million hectares. The catchment zone gathered about two billion cubic meters of water and inflicted critical floods to the various areas, that rose up to 10 m in height. (World Bank & GFDRR, 2010) The floods completely destroyed 1,700 homes in Hadhramout and caused widespread damage to infrastructure, especially roads, bridges, water supply, electricity and telecommunications networks. In

Al-Maharah governorate, the floods destroyed 487 houses and about 280 farms. As a result, hundreds of families were displaced in 6 coastal centers. (IRIN News, 2008)

IDMC Data show that during the period from 2008 to 2022, floods were the most significant climate-related disasters in Yemen, causing the displacement of 587,000 people nationwide. (IDMC, 2024) Floods in Yemen exacerbate the vulnerability of communities and individuals already affected by the conflict, with serious social and economic consequences, including deteriorating living conditions and increased risk of water supply contamination and disease outbreaks of fever epidemics: such as dengue fever: malaria, and chikungunya. All regions of Yemen are projected to experience an increase in extreme weather events, including heavy floods interspersed with prolonged droughts, with an annual rise in rainfall by (2040-2059). (Barry, McMurray, & Schmelzer, 2024) This will further stress water resources, disrupt growing seasons, impact ecosystems and fisheries, (ICRC, 2022) and thus pose threats to food security, intensify competition for dwindling natural resource, and fuel conflicts. (Ministry of Foreign Affairs, Netherlands, 2019)

IDPs in Yemen are particularly vulnerable to the impacts of flooding and torrential rains, as their homes are more susceptible to damage, and they have limited access to safe drinking water and food. Women and girls constitute most the IDPs who face escalating vulnerabilities. (OCHA, 2024) According to initial estimates, 1.2 million people in 168 districts in Yemen live in areas prone to flash floods and torrential rains. Of these, 383,500 people live in 330 IDP settlements at high risk of flooding. (IFRC, 2024)

> “
>
> **In 2024, floods caused by heavy rains in Yemen, killed 240 people and injured 635.**
>
> The initial assessments by YRCS, Nov 2024.

In focus group discussions conducted by Holm Akhdar, participants described their displacement experiences, including the encounter of numerous challenges. For example, in 2020 about 14,000 families were compelled to relocate from their dwellings within multiple camps located in Marib city due to floods and heavy rainfall. As the tents they were living in were terribly inundated. A significant part of these families sought refuge in alternative camps situated both within and outside the city while others sought temporary shelter by renting houses in safer areas.

In 2022, triggered by the heavy seasonal rains, extensive floods have ravaged several governorates in Yemen since mid-July, with more than 35,000 households impacted across 85 districts in 16 local governorates. (UN, 2022) At least 77 people, including children, were killed in Al-Bayda, Amran, Dhamar, Hajjah, Marib, and Sana’a governorates. In addition, displacement sites and infrastructure– including water supply, public services, and private properties – were severely damaged. (UN, 2022)

Yemen’s rainy season in 2024 witnessed unprecedented rainfall causing severe flooding leading to destruction and displacement in the country. Yemen experienced two main rainy seasons, one in April and May and the other from July until end of September which was particularly devastating this year due to unusual weather patterns and prolonged heavy rain across the country. (IFRC, 2024) According to initial assessments by the Yemen Red Crescent Society (YRCS), 655, 011 people from 93, 573 family are affected by the heavy rains and flooding that recently hit the country resulting in the death of 240 people and injuring 635. Twenty out of 22 Governorates were affected by the floods. (IFRC, 2024) UNFPA reports the displacement of around 500,000 people due to the rains. According to Yemen national shelter/NFIs cluster recent updates, 34,709 shelters were damaged, out of this 12,837 were partially damage and 21,872 completely damage. Flooding is one of the major threats to Internally Displaced Persons (IDPs) residing in IDP hosting sites across Yemen. For instance, the prevalence of flooding across Yemen is evident in the national flood hazard analysis of IDP sites, which listed 893 flooding events occurring between June 2021 and January 2024. (CCCM Yemen & REACH, 2024) Currently, 62% of IDP sites at risk of critical or high flood hazard are managed by CCCM Cluster partners. However, these managed sites account for only 30% of the total IDP sites in Yemen, reflecting a significant data and information gaps in unmanaged sites. (CCCM Yemen & REACH, 2024)

Dune encroachment near IDP camps, Feb 2024 © Holm Akhdar for Environmental Consultancy.

3.4.3 Desertification and Dune Encroachment

Desertification is a non-reversible reduction in the productivity of drylands. Climate change and human activities degrade the soil until plants can no longer grow. Overgrazing and deforestation can contribute to desertification, as can changing rainfall patterns, higher temperatures and drought. (Cazabat, 2021) The slow onset effects of climate change, such as desertification, increasing temperatures, land and forest degradation, and loss of biodiversity are increasing. Under certain circumstances, these effects can lead to displacement, but the scale of this phenomenon is unknown. (Cazabat, 2021) The issue of desertification persists in Yemen's northwestern and southwestern regions and is projected to worsen in the coming decade. In 2022, Yemen experienced its driest year in four decades, after facing similar conditions in 2014 and 2000. (YFCA, 2023)

Over the past decade, the monsoon winds, the reduced vegetation cover due to logging, and the absence of afforestation efforts contributed to the encroachment and invasion of sand dunes to bury citizens' residences in several areas and villages across the northern and southern parts of the country. The latest example includes the village of Deir Qutimel in Tihama, as well as the villages of Al-Maghras area in Hodeidah governorate and the village of Bir Nasser Al-Shaqaa in Wadi Tuban in the southwestern governorate of Lahj. Consequently, a significant number of villagers have been displaced as the sand engulfed dozens of houses and roads, forcing individuals in these villages to flee and seek refuge elsewhere after they got tired of appealing to the authorities and organizations. The suffering of these residents remains unresolved, with their homes transformed into abandoned villages over the past years without any intervention from authorities or aid organizations.

On June 24, 2024, a powerful sandstorm hit Al-Anad camp for IDPs in Tuban district, Lahj Governorate, completely destroying all tents in the camp. This catastrophic event left 112 households without shelter, putting them in an extremely vulnerable situation. (EXUIDPs, 2024)

In the FGD sessions conducted by Holm Akhdar with leaders of the displaced community, participants from Al-Somaya'a camp, located in Al-Wadi district in Marib governorate, described that sand dunes have encroached upon the IDPs' shelters, affecting 80 families. The IDPs in the camp have also suffered from water scarcity as water tanker trucks were unable to enter the site due to the dense sand hindering their entry. Moreover, the makeshift school tents for IDPs have sustained damage by sand and dust-laden winds, thus classes were disrupted.

Rockslides during the process of breaking up rock masses that are about to fall in Al-Ahjor area by Civil Defense Authority in August 27, 2023
© photo: CDA Yemen / handout.

3.4.4 Landslides and Rockslides

Landslides and rockslides are major natural hazards in Yemen, causing substantial damage to infrastructure and resulting in loss of life and property. The country's varied topography and climatic conditions heighten its vulnerability to these events.

In recent years, landslides have been increasingly linked to climate change, due to erratic weather patterns resulting in prolonged periods of intense rainfall and increased soil erosion. The impacts of landslides extend beyond immediate destruction; they further contribute to aggravating long-term social and economic challenges. (Khalil, Y. et al, 2023)

Yemen exhibits significant variations in topography, geology, climate, and living conditions. Most settlements are situated at the edges of mountain slopes or beneath inclines, rendering them susceptible to rockfalls and landslides. Slope failures often occur due to both natural and human-induced factors. Natural factors include the region's geological fragility, tectonic activity, climate change, and extreme fluctuations in temperature and rainfall. (World Bank, 2010) Human-induced factors involve cutting mountain edges for housing, road construction, blasting at mining sites, deforestation, and haphazard construction at the foot of slopes. (World Bank, 2010) The interplay of heavy rainfall, earthquakes, and human activities, such as deforestation and unregulated construction, exacerbates this vulnerability. (World Bank & GFDRR, 2010)

Yemen's mountainous regions are periodically subjected to landslides, resulting in substantial losses including the destruction of homes and agricultural land, as well as human and material casualties. This is particularly concerning given that over 75 percent of Yemen's population resides in the mountainous highlands, characterized by a dispersed settlement pattern. The country comprises approximately 128,475 population centers in Yemen–cities, villages, and districts–most of which are situated in these mountainous heights. (Jamil, 2008)

On December 28, 2005, a rockslide occurred in the village of Al-Dhafeer in the Bani Matar district of Sana'a governorate, resulting in over 90 fatalities and the destruction of approximately 20 homes, displacing hundreds of residents. (World Bank, 2010) **As of 2024, Yemen continues to grapple with the aftermath of landslides that have claimed dozens of lives in the Al-Mahwit, Ibb, and Hajjah governorates.**

On August 27, heavy rainfall triggered dangerous flash floods in the Milhan district of Al-Mahwit governorate, northwest Yemen, affecting nine localities. The persistent rains caused rockslides that impacted approximately 65 homes; 15 were fully destroyed, over 50 others sustained grave damage. Authorities reported approximately 40 fatalities and missing persons, along with the displacement of around 215 families. (OCHA, 2024) Due to inadequate disaster preparedness, access to the affected area was impeded for three days because of landslides blocking all main roads.

Another massive rockslide struck Al-Ahjor area of Al-Mahwit governorate, near Al-Mahjar village in Shibam Kawkaban district on September 3, 2024. This area has a history of rockslides, including incidents on February 5, 2023, when a critically unstable rock mass collapsed near Al-Ahjor waterfall, and two significant rockslides in the same area on August 4 and August 14, 2022, resulting in two fatalities and multiple injuries.

In August 2024, heavy rainfall caused landslides and mudslides in Sumara area of Ibb governorate, central Yemen, resulting in the closure of the main road between Sana'a and Ibb multiple times over two weeks. The Raymah governorate has experienced numerous landslides and rockfalls in recent years, as indicated by geological studies. Similarly, Hajjah governorate has recently experienced erratic landslide incidents of varying risk severity.

In FGDs with participants, it was noted that "some districts in Hajjah have been affected by landslides, resulting in prolonged road blockages, this has created significant challenges for students residing in mountainous areas, making it difficult for them to attend school".

Given the inadequate early disaster preparedness and the essential recovery and mitigation efforts required, there is an urgent need for initiatives to improve early warning systems EWS, enhance infrastructure resilience, and promote sustainable land-use practices. Furthermore, international cooperation and investment are crucial to strengthening community resilience and Yemen's ability to respond effectively to these escalating threats.

During the period **2022 - 2024**, **Al-Ahjor** and **Milhan** districts in **Al-Mahwit Governorate** experienced multiple **Landslides** and **Rockslides,** resulting in **42 fatalities,** and the **displacement** of around **215 families.**

3.5 Climate-Related Displacement and Epidemics

The intricate interconnectedness between climate change, pandemics, and internal displacement in Yemen is evident. Although heatwaves pose substantial public health risks in numerous countries, Yemen has experienced a distinct pattern. In 2020, the country sustained extreme climate fluctuations, heavy rainfall, and flash floods, which resulted in a surge of fever-related diseases in both the northern and southern regions. More than 50,747 cases of fever epidemics were reported in the northern governorates, with approximately 162 fatalities. Similarly, the Ministry of Health and Population in the southern part of the country documented over 35,000 cases of fever, leading to more than 100 deaths. IDPs in Hajjah, Hodeidah, Aden, and Lahj governorates were among the most vulnerable to these epidemics, including dengue, chikungunya, and malaria. (Holm Akhdar, 2020)

In a country like Yemen, with half of its healthcare system collapsing, displacement resulting from natural disasters, directly or indirectly, has profound health consequences. Health data from 2020 indicated a notable increase in suspected cases of dengue fever among displaced communities due to heavy rainfall. The number of fever cases at the end of 2020 was seven times higher compared to 2019 and six times higher than 2018, as reported by the Yemen Health Cluster. (IFRC, 2021)

During the period (2020-2024), displacement camps in Hajjah governorate, northwest of the capital Sana'a, suffered damage from rains and floods. Within these camps, some 120,619 cases of fever, diarrhea, and skin diseases were recorded according to a document from the local authority. In the focus groups, participants reported that "the health situation in Hajjah was severely affected, especially after the withdrawal of organizations providing health services in the camps from some districts, which exacerbated the epidemics". Representatives from IDP camps in Marib governorate also reported 2,000 cases of fever in their communities in 2023. In 2020, the largest camp for IDPs in Marib governorate's capital city, Al-Jufainah camp, suffered severe damage due to intense rainfall, subsequent flooding, and water flows that inundated the camp and submerged the IDPs' tents. Due to the absence of proper sewers, drainage systems or mechanisms to channel out the torrents, floodwaters penetrated the camp's center, dividing it in half and cascading toward the camp's other edge. Torrents washed away dust, mud and waste, and the traditional septic tanks and sewers within the camp were filled with rainwater, causing pollution and the outbreak of epidemics. This situation disproportionately affected vulnerable individuals in the camp, particularly the elderly and children living in dilapidated and lightweight tents and tarpaulins. Consequently, many camp residents infected with fevers, diarrhea, and cholera. The stagnant floodwaters across the camp area, mixed with sewage, created breeding hotbeds for mosquitoes, and further exacerbated the spread of diseases.

In an interview conducted by Holm Akhdar, the Director of the National Malaria Control Program in Yemen pointed out that there are several factors contributing to the increased incidence of fever-related diseases among people in recent years. These factors include weather fluctuations, heavy rainfalls, the movement of IDPs from areas affected by these epidemics to areas or camps which were unaffected by such diseases. “In recent decades, there has been a dramatic surge in the incidence of fever-related diseases due to environmental changes, unregulated urbanization, population mobility, and inadequate implementation of sustainable vector control measures.” (WHO, 2019)

In 2024, floodwaters have damaged health care and water, sanitation, and hygiene (WASH) infrastructure, increasing the risk of further cholera outbreaks across affected areas, according to the International Rescue Committee (IRC). As of September 7, 2024, the Ministry of Public Health and Population had identified more than 186,000 suspected cases of cholera countrywide. (USAID, 2024)

Although locals, especially IDPs, suffer the brunt of these epidemics annually in the rainy seasons, **Yemen lacks medical centers and facilities capable of effectively managing fever-related diseases.** Until mid-2022, there was no medical center specialized in treating fever epidemics in the country. In August 2022, Yemen's first-ever center for the treatment of fevers and infectious diseases was established in Hodeidah governorate. This crucial step was achieved with the support of UN agencies and the Social Fund for Development. (UNDP, 2022) Nevertheless, the existing facility falls short in meeting the healthcare needs of the entire country, leaving numerous regions underserved.

3.6 National Laws and Policies

3.6.1 Environmental Legislation and Strategies

Over the past three decades, Yemen has adopted a set of national laws, legislations, regulations, decisions and strategies related to the environment, biodiversity, water and land resources, natural habitats and others. Law No. 26/1995 for the Protection of the Environment is the legislative and environmental framework of the Republic of Yemen. The provisions of this law aim to "include environmental considerations in economic development plans at all levels and stages of planning." It provides for "the implementation of the international commitments ratified by the Republic of Yemen relating to the protection of the environment, the preservation of natural resources, and the observance of environmental issues such as the depletion of the ozone layer, climate change and the fight against pollution." (NIC, 1995)

In 1995, Yemen prepared the National Environmental Action Plan, which identified priority actions related to key environmental issues. The Environmental Protection Authority (EPA) is responsible for preparing and implementing environmental policies, strategies and plans. A national biodiversity strategy has been finalized. In 2009, the government approved the National Adaptation Program of Action (NAPA). In addition, the government enacted the Water Law No. 33/2002, which is a unique legislative achievement for the country, and its implementing regulations announced in 2011. It also launched the National Water Strategy and Investment Program, which is managed by the National Water Resource Authority (NWRA). The government also approved the National Strategy for Renewable Energy and Energy Efficiency.

All these efforts are good, but they are not enough and not much has been completed. To date, there is no regulatory framework or stated environmental policy to support the implementation of Yemen's environmental law. The environmental law also does not clearly address climate change and responses. Given the country's current situation and conditions of insecurity, it seems unexpected that the Environmental Protection Authority will begin to complete the regulatory framework and develop environmental and climate policies at the national level. Implementation of water legislation by the authorities remains weak. Compliance with the requirements of the water strategy (NWSSIP) is not strictly enforced.

There is an urgent need to fill the gaps and develop the provisions of the legislation, which does not cover many climate-related aspects. Formulate specific policies, including climate adaptation plans. In response to climate change, the government should develop the current policy frameworks of some actors and align them with environmental and climate considerations to protect the most vulnerable from climate threats and mitigate their effects on local livelihoods.

In terms of the level of challenges, “Yemen is ranked second globally in terms of the extent of challenges to inequalities in governance.” (ESCWA, 2023) Due to its classification as a fragile and conflict-affected country, “Yemen encounters challenges in meeting the eligibility criteria for climate finance mechanisms, which require robust governance structures.” (ICRC, 2022) Furthermore, the government encounters obstacles in “accessing climate finance for adaptation to climate change, particularly from multilateral climate funds. This is due to risk aversion by climate actors and donors, a lack of flexibility, incoherent responses, and institutional isolation.” (ICRC, 2022)

The strengthening of climate governance mechanisms in a country like Yemen necessitates a comprehensive grasp of the intricate and interwoven requirements inherent to this challenge. To address the unequal climate impacts on societies and structural issues, multi-level governance should be introduced as an effective tool for finding solutions and addressing climate threats. This requires the involvement of all relevant actors and groups of affected communities in discussions and decision-making processes, as essential to a possible response. Furthermore, coherence between local, national and international policies and plans must be enhanced, and protection for the most vulnerable from climate impacts must be ensured.

Rainwater has been pooling for days in front of the tents of IDPs in north Sana'a. © Holm Akhdar / Shohdi Al Sofi.

3.6.2 National Policy for Addressing Internal Displacement

In 2009, Yemen established the Executive Unit for the Management of IDP Camps (EXUIDPs), which was established by Cabinet Resolution No.454/2009. This unit operates under the authority of the Presidency of the Council of Ministers. In June 2013, the Yemeni government officially approved the country's National Policy to Address Internal Displacement, making Yemen the second country in the Middle East to adopt such a national policy. (EXUIDPs, 2013) However, challenges such as instability, the outbreak of war and conflicts, and the division of political and humanitarian management have hindered the effective implementation of this policy at the national level, despite its potential to provide a comprehensive national framework for addressing the multifaceted issue of internal displacement in the country.

The policy encompasses IDPs affected by both conflict and natural disasters. Its primary objectives are to prevent future forced displacement, provide assistance and protection to IDPs and host communities, and seek durable, secure, and voluntary solutions for IDPs, including facilitating their safe return to their homes and the reconstruction of conflict-affected areas. (EXUIDPs, 2013) The policy document acknowledges the rights of IDPs, outlines respective institutional roles and responsibilities, and establishes procedures for implementation. However, this policy omitted the participation of displaced stakeholders, as well as those concerned with environmental and climate disaster management: such as the Civil Defense Authority, EPA, Red Crescent Society, the Meteorological Authority, the Geological Survey Authority and others. These actors were not included in the members of the Higher Committee for Addressing Displacement, which manages and implements this policy.

3.7 Poor Data Quality

Field data is one of the key components for informed decision-making in disaster response efforts targeting affected communities in Yemen. However, inaccurate data lead to substantial gaps in response initiatives, stemming from deficiencies in flawed monitoring and reporting systems. Consequently, the effectiveness of humanitarian interventions in affected communities is severely compromised.

In Yemen, there is no systematic or coordinated mechanism for sharing detailed data on various patterns of displacement among stakeholders. Furthermore, there is no comprehensive, disaggregated, and up-to-date data on the patterns and drivers of climate-induced internal displacement. Reports often present generalized data on displacement without detailing those linked to climate change, leaving a big gap in understanding this specific phenomenon.

“

In Yemen, there is **no comprehensive, disaggregated,** and **up-to-date data** on the **patterns** and **drivers of climate-induced internal displacement, leaving a big gap** in **understanding** this specific **phenomenon.**

A desk review conducted by the team identified major discrepancies in previous studies and reports by some international organizations and UN agencies, which are critical to making informed response strategies. Inconsistencies were found in data concerning climate and natural disasters in Yemen, as well as in the reported numbers IDPs due to such events and the classification of climate risks in displacement sites. For example, the Internal Displacement Monitoring Centre (IDMC), based on data from relief partners, reported that between 2008 and 2023, 150 individuals were displaced by earthquakes, and 1,200 by wildfire in Yemen. (IDMC, 2024) However, these figures are implausible. Yemen experienced no recorded earthquakes during this period, and no forest fires were reported by EPA or local authorities.

“There are no real forests areas in Yemen. However, the country does have vast areas of biodiversity and forests in the country, covering the forested landscapes and limited tropical forests in the western and southern mountainous highlands, as well as Al-Maharah and Socotra.” (Al-Khalidi & Bazraa, 2012) Additionally, the National Forestry Report emphasizes that “there is currently no precise estimation of the extent of forested areas in Yemen, as high-resolution satellite imagery, GIS technology, and remote sensing have not been utilized to assess these forest areas. Furthermore, comprehensive on-the-ground exploration of the country's forests and wooded areas remains incomplete. Previous reports on the subject have provided estimations that are contradictory, and inaccurate”. (Al-Khalidi & Bazraa, 2012)

Similarly, many organizations publish contradictory information in their reports on natural disasters in Yemen, relying on data from the Global Facility for Disaster Reduction and Recovery’s (GFDRR) **ThinkHazard** platform, which inaccurately classifies wildfire in Yemen as high- hazard events affecting 16 governorates. (GFDRR, 2020) Verification reveals this analysis to be far from reality. Most of these governorates are agricultural or mountainous regions, such as Sana’a, Dhamar, and Amran, characterized by cold to moderate climates and no history of natural fires. This highlights the inaccuracy of the data used in such analyses.

Lack of reliable data on the urgent needs of IDP communities during climate emergencies undermines the ability of humanitarian actors to assess and respond effectively to the environmental and climatic risks faced by IDP camps. This data gap limits their capacity to understand the specific conditions at displacement sites and address the needs of affected IDP sites.

Several factors contribute to these data challenges, including the lack of a joint coordination mechanism between international NGOs, UN agencies, EXUIDPs,

and local authorities; "poor organization of humanitarian response efforts", (Vuylsteke, 2021) restrictions imposed by authorities on surveys and research in areas outside the control of the Internationally Recognized Government (IRG); and operational difficulties in conflict-sensitive environments. Additionally, "much of the reports on humanitarian responses in Yemen is generated externally, without sufficient engagement of local response environment". (Vuylsteke, 2021)

In this regard, **leveraging local expertise is essential for conducting in-depth analyses of climate displacement dynamics and developing effective solutions**. Active involvement of key stakeholders, including IDPs, in data collection, needs assessments, and the formulation of adaptation and response strategies is crucial.

Focus group discussions with IDP community leaders revealed further critical issues. Participants noted that humanitarian organizations often rely on secondary data provided by their field delegates, which is frequently reproduced in reports without proper field verification. Many organizations fail to ensure direct access to all affected IDPs across displacement sites. "Organizations attribute these shortcomings to security risks, access restrictions imposed by authorities, and the geographical remoteness of response centers", (Vuylsteke, 2021) particularly in eastern regions and Hajjah. However, given the substantial funding received by the UN and its partners for humanitarian response in Yemen, "such justifications are unconvincing." (Vuylsteke, 2021) To enhance the effectiveness of climate and disaster response efforts, it is imperative to address these data gaps. Accurate and disaggregated data on disaster-affected IDPs and associated risks is essential for understanding year-to-year variations in displacement figures and developing tailored interventions. Bridging these gaps will provide a deeper understanding of Yemen's climate displacement crisis, enabling more targeted and sustainable solutions and strengthening the country's overall response capabilities.

Chapter

4

Impact of Climate Change on IDPs

Case study of Marib, Hajjah, Al Maharah, and Socotra

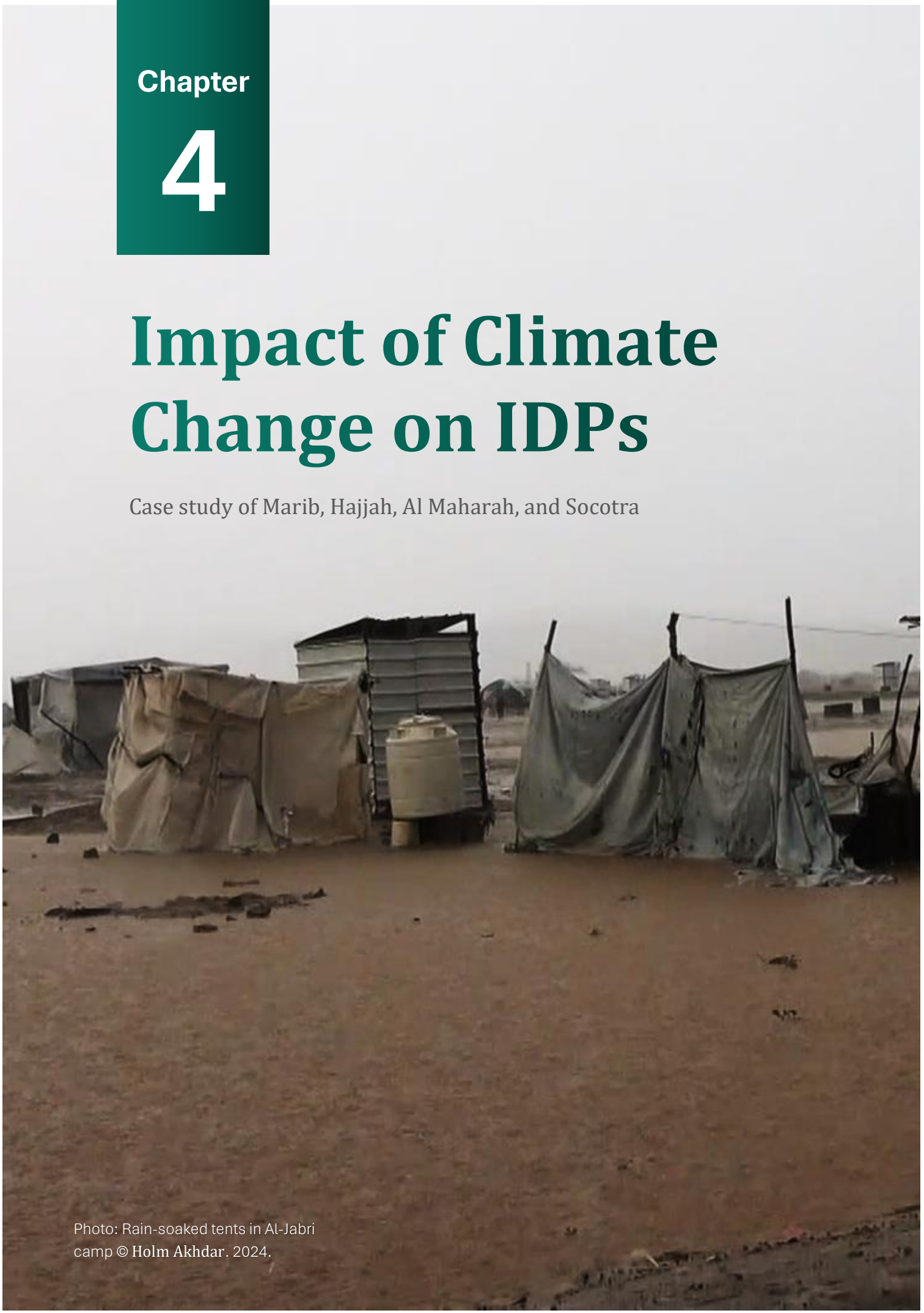


Photo: Rain-soaked tents in Al-Jabri camp © Holm Akhdar. 2024.

> “ We, as displaced women, encounter numerous challenges during rainfall events. Beside caring for our young children, we must go to remote and distant valleys and wells to fetch water and firewood. This exposes us to imminent risk of devastating floods that sweep away everything in their path.”
>
> Displaced Mother

4.1 Background

Yemen is one of the world’s most vulnerable countries to the impacts of the climate crisis, yet among the least prepared. (WFP, 2024) It is also categorized as one of the most significant displacement crises globally. Since 2015, the ongoing war and conflict have forcibly displaced approximately 4.5 million individuals internally. (UNHCR , 2024) Presently, over 1.6 million people reside in 2,284 displacement and hosting sites across the country. The major camps are situated in Hodeidah, Hajjah, Marib, and Taiz governorates. (REACH, 2024) In Marib, the number of IDPs totals around 328,422, while Hodeidah accommodates approximately 420,751 IDPs. In the governorate of Hajjah, there are about 352,185 IDPs residing in camps. (CCCM Yemen, 2023) In 2023, Yemen witnessed the highest level of climate-induced displacement in nearly four years, with nearly 240,000 individuals displaced due to natural disasters. (IDMC, 2024) Although Yemen faces limitations in independently addressing climate change, there are still ample opportunities to enhance resilience and mitigate the potential adverse impacts. (UNDP, 2023)

IDPs in Marib, Hajjah, Al Maharah, and Socotra camps covered by the study (see **Figure 11**) are exposed to a wide range of major direct risks of climate change. Approximately 40% of them reside in areas that are susceptible to the risks of inundation and flooding, where access to essential services is severely inadequate. Mostly, these services are either non-existent or available only to a limited extent. They live in poor tents made of lightweight materials such as tarpaulin. The vast majority of IDPs in camps lack a stable source of income and social safety nets that would facilitate their access to improved and secure housing options. It is noteworthy that most IDPs in these locations have endured prolonged and recurrent displacement, exacerbated their vulnerabilities and intensified the challenges they face.

Annually, during the rainy seasons (March - August) in the country, incidents of displacement and relocations occur due to shelter collapses and other consequences resulting from high winds camp flooding. In FGD with IDP community leaders define a set of factors that contribute to triggering these extreme climate incidents and their impact on IDPs. Such factors include the absence of an emergency plan specifically designed to address climate-induced displacement and mitigate the impact of climate change on these vulnerable communities, a lack of early awareness regarding climate-related disasters and appropriate response protocols, which are crucial for the IDPs, and the absence of dedicated budgets allocated for climate-induced displacement and resettlement further compounds these challenges, limiting the capacity of relevant actors and local authorities to effectively reduce the impact of climate change on temporary settlements.

Additionally, the IDP community members have confirmed the absence of early warning systems in all IDP camps and host communities exacerbates the vulnerability. **The lack of early warning systems remains one of Yemen's major challenges, leaving the country in a state of uncertainty for decades amidst climate threats**. Updated data and modern climate monitoring stations are scarce, with early warning systems limited to the historic cities of Old Sana’a and Old Shibam in Hadhramout , and 20 governorates remaining uncovered. Other existing systems, installed within the past two years under FAO initiatives, focus only on flood and locust warnings for farmers and exclude broader populations. Currently, “62% of IDP sites at risk of critical or high flood hazard are managed by CCCM Cluster partners. However, these managed sites account for only 30% of the total IDP sites in Yemen, reflecting a significant data and information gaps in unmanaged sites.” (CCCM Yemen & REACH, 2024)

Marib Governorate

Marib governorate is situated to the northeastern part of Sana'a governorate. On the southern side, Marib is bordered by Shabwah and Hadramawt governorates. To the west, it is also located in proximity to Sana'a governorate. Encompassing an area of approximately 20,023 square kilometers, Marib governorate is situated at about 1,093 meters above sea level. The city of Marib serves as the capital of the governorate and boasts a rich historical heritage, featuring ancient landmarks and monuments such as the renowned Marib Dam and the Temple of the Sun. During the ongoing war and the prevailing conflict, Marib has experienced substantial population growth. Hundreds of thousands of citizens have been displaced to Marib, causing the population of Marib to double to over three million individuals. The number of IDPs in Marib has reached approximately 1.5 million, with around 328,422 IDPs being accommodated in various camps within the governorate. **(Figure 12)**

Hajjah Governorate

Hajjah governorate is situated northwest of the capital city, Sana'a, at a distance of approximately 123 kilometers. The governorate is comprised of 31 districts, with the city of Hajjah serving as its administrative center. Located along the Red Sea coast, Hajjah governorate is characterized by a hot tropical climate, with humid summers. As of December 2023, the governorate accommodates 484 sites for IDPs, hosting around 352,185 IDPs within various camps **(Figure 12)**. Hajjah governorate ranks as the third highest in terms of the concentration of IDPs among Yemen's governorates, following Marib and Hodeidah governorates. (CCCM Yemen, 2023)

Al Maharah Governorate

Al Maharah governorate is in the eastern part of the Republic of Yemen, positioned between latitudes 15° and 20° and longitudes 51° and 45° east of Greenwich. It is located at a distance of 1318 kilometers from the capital city, Sana'a. Al Maharah shares borders with the Empty Quarter desert to the north, Hadramawt governorate to the west, the Arabian Sea to the south, and Oman to the east. The area of the governorate is about 67,297 square kilometers, distributed over 9 districts. (Berghof, 2021) In recent years, Al Maharah has experienced severe weather events, resulting in significant damage to both residents and infrastructure. In late 2023, cyclones and storms led to the displacement of thousands of individuals. Over the past four years, Al Maharah has received tens of thousands of IDPs, with a total of about 25,000 IDPs, including 5,000 individuals residing in camps. **(Figure 12)**

Socotra Archipelago Governorate

The Socotra archipelago is situated in the southern region of the Republic of Yemen, between the Arabian Sea and the Indian Ocean. The archipelago covering a land area of about 4,000 km2 (UNESCO, 2022), consists of four islands and two islets: Socotra Island itself, the largest among them, covering about 95% of the total land surface in the archipelago, followed by Abdul Kori Island, the second largest island accommodating 370 inhabitants. Samha Island, also known as Al-Akhawayn, is home for about 200 inhabitants, while Darsa Island remains uninhabited. Socotra Island possesses exceptionally rare qualities, boasting remarkable biodiversity in its plant species, including a significant proportion of endemic species. Recognizing its significance, UNESCO designated Socotra as a World Heritage Site in 2008. Socotra holds the distinction of being the largest among the Arabian and Yemeni islands. Previously, Socotra was administratively affiliated to Hadramawt governorate until 2013 when it was established as an independent governorate, consisting of two districts. Hadibo district is the administrative center of Socotra governorate. “The climate of Socotra is predominantly arid, yet the Indian Ocean Monsoon brings periodic rainfall during certain periods of the year.” (UNESCO, 2022) Between 2015 and 2024, Socotra faced various climate-related challenges and regional interventions. The island experienced the impact of eight severe cyclones, resulting in substantial damage and a loss much of its biodiversity. Over the past nine years, the island has witnessed the displacement thousands of families due to cyclones and tropical storms. Currently, there are approximately 194 displaced persons in Qalansiyah camp according to CCCM Yemen. (*see* **Figure 12**)

FIGURE 11 Locations of IDP camps covered by the study in the governorates of Marib, Hajjah, Al Maharah, and Socotra

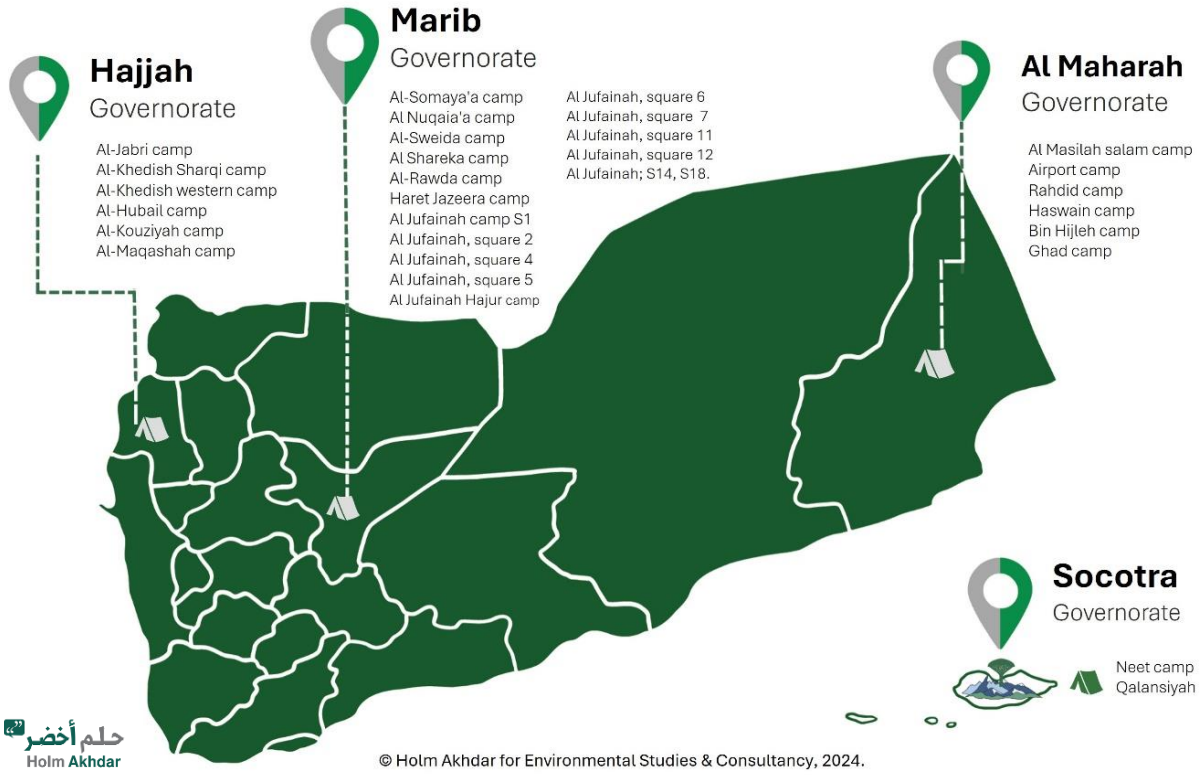
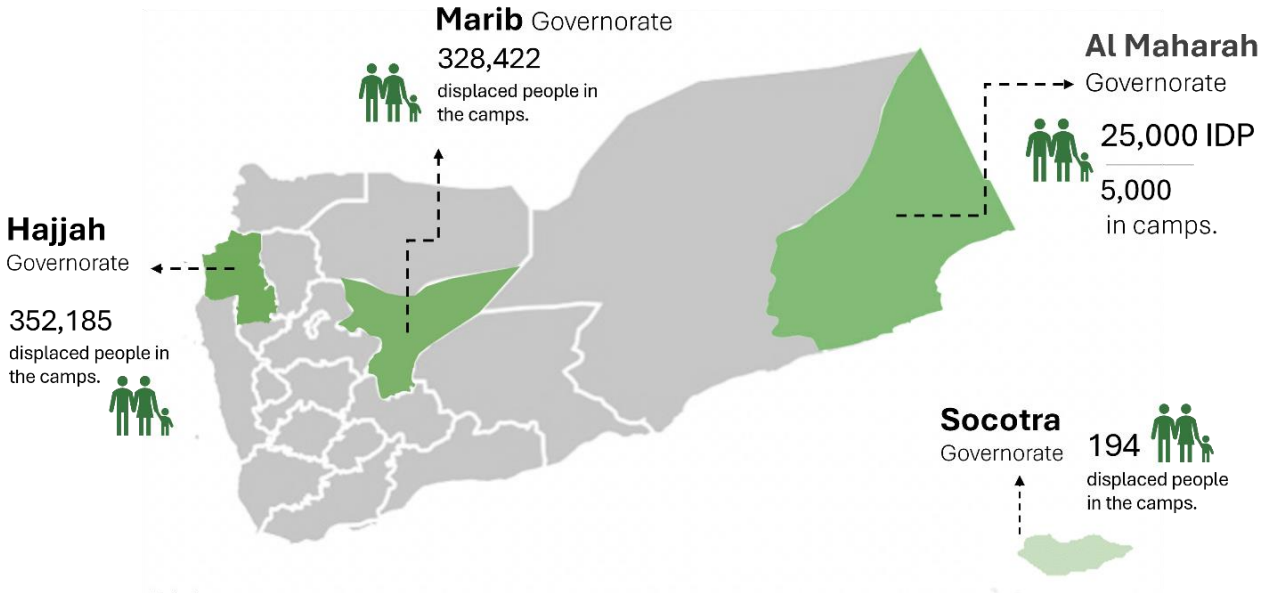


FIGURE 12 Numbers of IDPs in hosting sites in the governorates of Marib, Hajjah, Al Maharah, and Socotra until the end of Dec 2023



Data Sources:
- CCCM Yemen. (2023). Cluster situation report. Jan 2024.
- The Executive Unit for IDPs Camps Management, Al-Mahrah Governorate.

© Holm Akhdar for Environmental Studies, 2024.

4.2 Drivers of Displacement

The findings of the field study highlight the primary drivers of displacement among IDPs in the governorates of Marib, Hajjah, Socotra and Al-Maharah. The study revealed that a significant proportion of IDPs, approximately **86.1% of respondents, were displaced primarily as a result of war and conflict.** In contrast, **13.9% of the total respondents reported being displaced due to the impact of climate changes** (*see* **Figure 13**). Among those displaced due to climate changes, around 10.2% experienced displacement triggered by flash floods, and landslides leading to the destruction of housing in their areas of origin. Additionally, 3.7% of IDPs were displaced because of drought and inadequate rainfall in their areas of origin, resulting in water scarcity and adverse effects on productive sectors, disruption of various livelihoods and income sources such as agriculture, livestock grazing, and other economic activities. It is worth noting that the drivers of displacement exhibit regional variations. In Marib governorate, the vast majority of displacement, accounting for 98.5% of the total IDPs, can be attributed to war and conflict, with only 1.5% being displaced due to climate change.

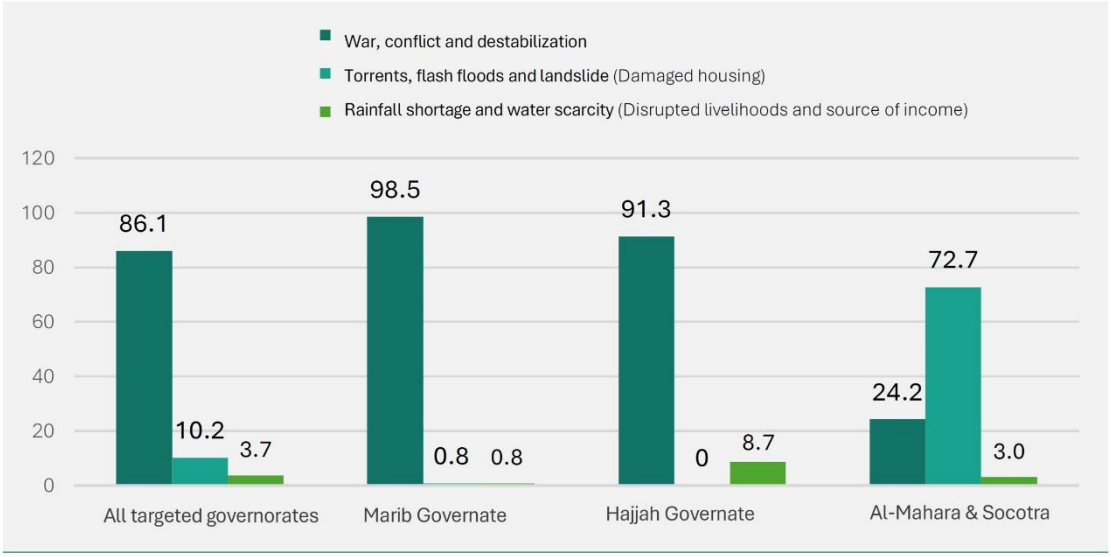
13.9% of the surveyed IDPs were **displaced** by **Climate Change.** **10.2%** of these IDPs displaced due to **floods,** and **landslides. 3.7%** by **drought** and inadequate rainfall.

On the other hand, in Hajjah governorate, the percentage of displacement caused by war and conflict, decreases to about 91.3%, while 8.7% of displacement is attributable to climate disasters. However, in Socotra and Al Maharah, climate change, particularly floods and heavy rainfall, stood as the primary cause of displacement, accounting for 76% of the total causes (**Figure 13**), while conflict and instability accounted for 24% of the IDPs. However, it is important to acknowledge that while war and conflict have been the predominant driver of displacement, the occurrence of extreme weather events throughout the country in recent years has significantly compounded the crisis faced by IDPs living in camps.

The findings of focused group discussions (FGDs) and qualitative interviews conducted by Holm Akhdar team, as part of this study, reveal that climate disasters have intensified the hardship experienced by IDPs, compelling them to endure multiple displacements, either within sites or towards other districts and governorates. A significant portion of climate-induced displacement from these camps can be attributed to torrential rains and flash floods, as witnessed in Socotra and Al Maharah governorates. Additionally, in the camps of Hajjah Governorate, displacement was driven by water scarcity, prompting IDPs to seek relocation to areas in close proximity to wells and water sources.

FIGURE 13

Drivers of displacement among surveyed IDPs in governorates %



Beit Mismar Castle in Sayhut District, Al Maharah, after it was destroyed by Cyclone Tej © Holm Akhdar / Abdullah Saleh. Feb 2024.

BOX 2

Displacement in search of relief assistance

Driven by various underlying factors, many families were compelled to relocate from one camp to another or to different regions. Last year, a significant number of families were displaced from Al-Khadesh camp in Abs after organizations stopped supplying water to the camp. Similarly, in Aslam district, numerous displaced families were forced to move from their camps to other locations due to the lack of access to essential provisions, including food and water. In Marib, the situation was similar in four camps. While in Al-Maharah governorate, some families were displaced from two sites due to the salinity of the water.

This lack of access was a result of organizations discontinuation to provide aid to the camp which they were situated in for several reasons, including arbitrary factors such as individual problem between an IDP and an aid organization employee during their work, which lead to depriving the camp or the entire zone. Moreover, certain camps face issues related to nepotism among employees of local organizations, leading to an unequal distribution of relief aid and the absence of a fair and systematic plan. Additionally, inadequate coordination between organizations and leaders of displaced communities further exacerbates the challenges faced by these camps.

Source: FGDs with leaders of IDP communities, February 2024.

4.3 IDPs' Awareness and Concern of Climate Risk

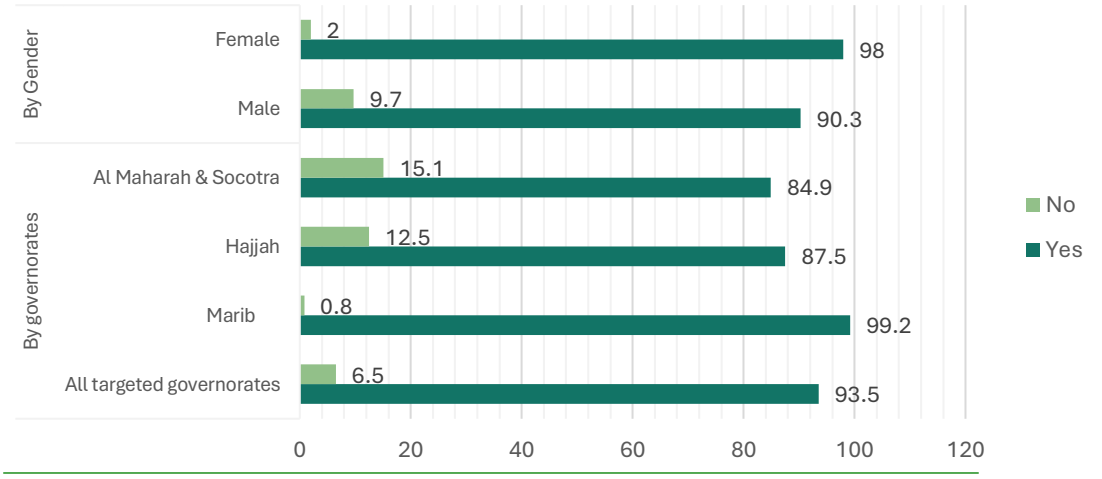
4.3.1 IDPs Hearing About Climate Change

Despite the overall low level of awareness, authorities and active humanitarian organizations do provide life-saving information to displaced communities. However, IDP communities exhibit a notable level of awareness regarding climate risks. This can be attributed to their active engagement with media outlets and social media platforms. As shown in **Figure 14**, approximately 93.5% of IDPs surveyed in the targeted governorates have, in some way, acquired knowledge about the hazards associated with climate change in their surroundings. Although there are slight variations between governorates, the awareness of disaster risks among IDPs is particularly high in Marib governorate, reaching 99.2%, compared to approximately 87.5% in Hajjah and around 84.9% in Al Maharah and Socotra.

The study findings **(Figure 14)** reveal that displaced women exhibit a higher level of awareness and understanding of the severity of climate change compared to men. Specifically, women who heard about climate change composed the vast majority, accounting for 98%, compared to 90.3% among men. This may be attributed to the increased tasks women perform, as well as their exposure to climate risks compared to men, such as fetching water or firewood and caring for children. In addition, the greater concern shown by women, as well as their tendency to actively follow local media outlets such as radio.

Furthermore, the study observed a decline in the level of awareness regarding climate changes among different age groups of the IDPs. The percentage of those who had heard about climate changes was highest in the younger age group (18-25 years), reaching approximately 98.1%. In contrast, the percentage of awareness decreased among older age groups, with only about 63.6% of IDPs aged 60 years and above reporting awareness of climate changes. This discrepancy can be attributed to the younger age groups' interest in communicating through internet platforms and social networks, which serve as sources of climate-related information. These platforms are more commonly used by younger age groups. Additionally, the study found a positive correlation between the level of education among the IDPs and their knowledge of climate change. The percentage of awareness regarding climate changes increased with higher levels of education. Specifically, the awareness rate rose from 85.5% among IDPs with basic education or below to 100% among those with postgraduate qualifications such as master's and PhD degrees.

FIGURE 14 IDPs' awareness about climate change %



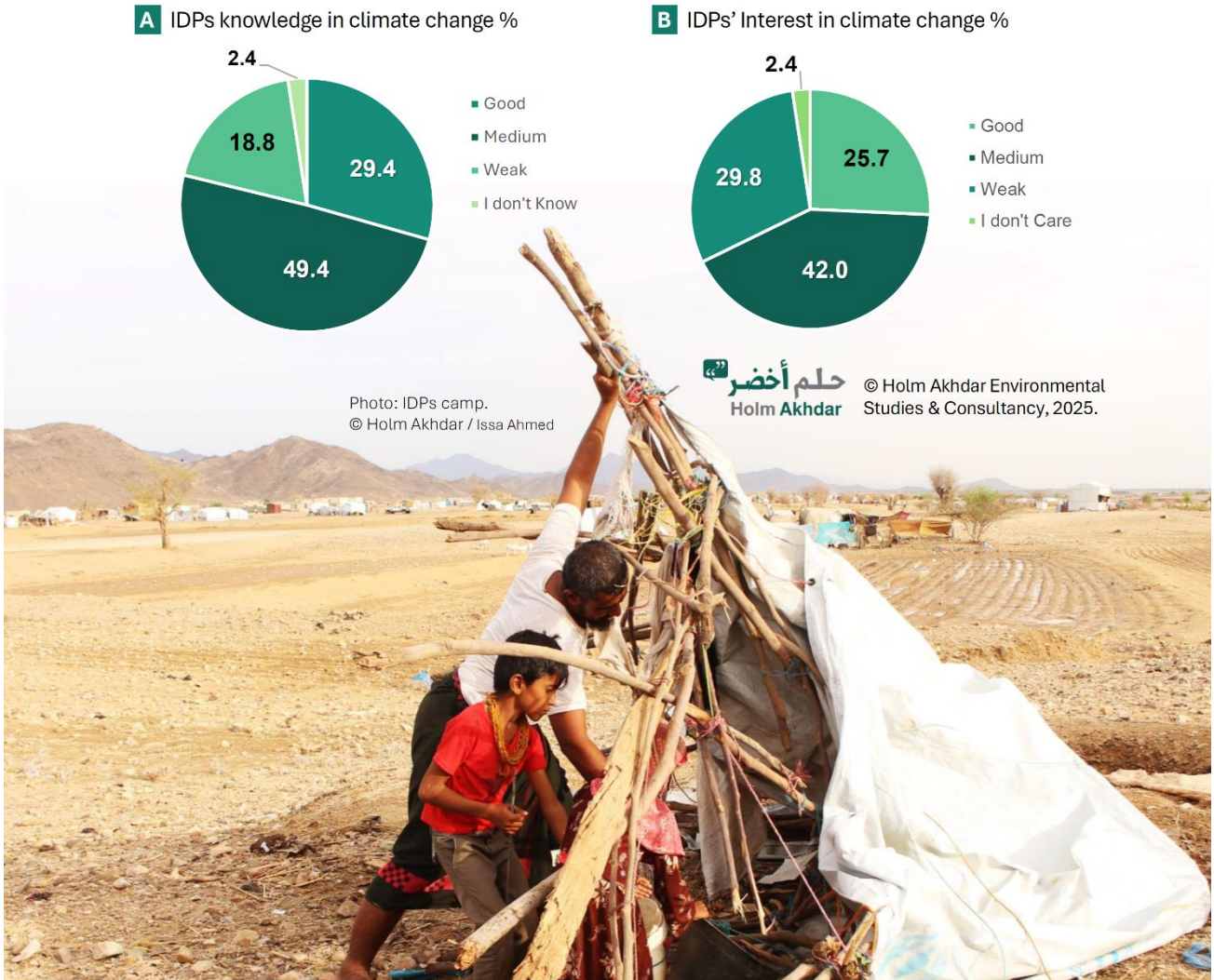
4.3.2 Knowledge of Climate Change Among IDPs

Despite a considerable percentage of IDPs having heard about climate change, there exists variation in their level of understanding regarding the nature of these changes, their diverse impacts on both themselves and their communities, and the appropriate strategies to address them. **Figure 15-A** provides insights into this variation, revealing that only around 29.4% of IDPs in Marib, Hajjah, Al Maharah, and Socotra governorates possess a good understanding of climate change, compared to about 49.4% with average level of knowledge, and 18.8% exhibit poor knowledge. This disparity can be attributed to the limited availability and effectiveness of environmental awareness initiatives, which IDPs urgently require from relevant stakeholders. Furthermore, inadequate access to humanitarian assistance from aid organizations and authorities contributes to the knowledge gap. IDPs primarily rely on sources of information that are often unreliable, such as unofficial platforms or social media sites, rather than obtaining information from reliable sources like meteorological centers, official authorities or relief organizations. The field results also reveals that the knowledge of climate change among IDPs varies based on gender, age, and educational level. Females demonstrate a higher level of knowledge compared to males. Moreover, within age groups, the age group (26–60) years exhibits a greater understanding of climate change compared to other age groups.

4.3.3 IDPs' Interest in Climate Change Issues

Turning to the level of interest displayed by IDPs in climate change issues and their impact on their communities, data in **Figure 15-B** shows that approximately 42% of IDPs reported having a moderate interest in climate change. Furthermore, 25.7% indicated a strong interest, while 29.8% exhibited little interest. A small percentage of respondents 2.4% expressed no interest at all. This may indicate a general lack of public interest in Yemen, not limited to the IDPs, as individuals prioritize other urgent challenges related to livelihoods, access to shelter, and security, away from the effects of conflict and violence.

FIGURE 15 IDPs' Knowledge and interest of climate change %



A displaced persons tent damaged by a rainstorm, Sept 2023 © HolmAkhdar Environmental Consultancy

4.4 Climate Changes Faced by IDPs in Yemen

Climate changes and their fluctuations have profoundly impacted the lives of IDPs in Yemen and threatened their stability. These changes resulted in damaging shelters, disrupting livelihoods, and reducing access to basic services for many of them. Field data **(Figure 16-A)** reveals that 99.2% of IDP respondents in Marib, Hajjah, Al-Maharah, and Socotra reported noticeable changes in weather and climate at their sites. Only 0.8% of respondents in these regions reported not noticing any climatic changes. They are among those who have been displaced for less than a year.

Further analysis (**Figure 16-B**) shows that 94.3% of IDPs in these governorates have been directly affected by a wide range of climate-related changes impacting their camps. At the governorate level **(Figure 16-C)**, the study found that IDPs in the eastern governorates of Al-Maharah and Socotra were fully 100% affected, due to successive extreme weather events such as cyclones, storms, strong winds, torrential rains, floods, and landslides, which hit the eastern regions including Al-Maharah, Socotra and Hadhramout.

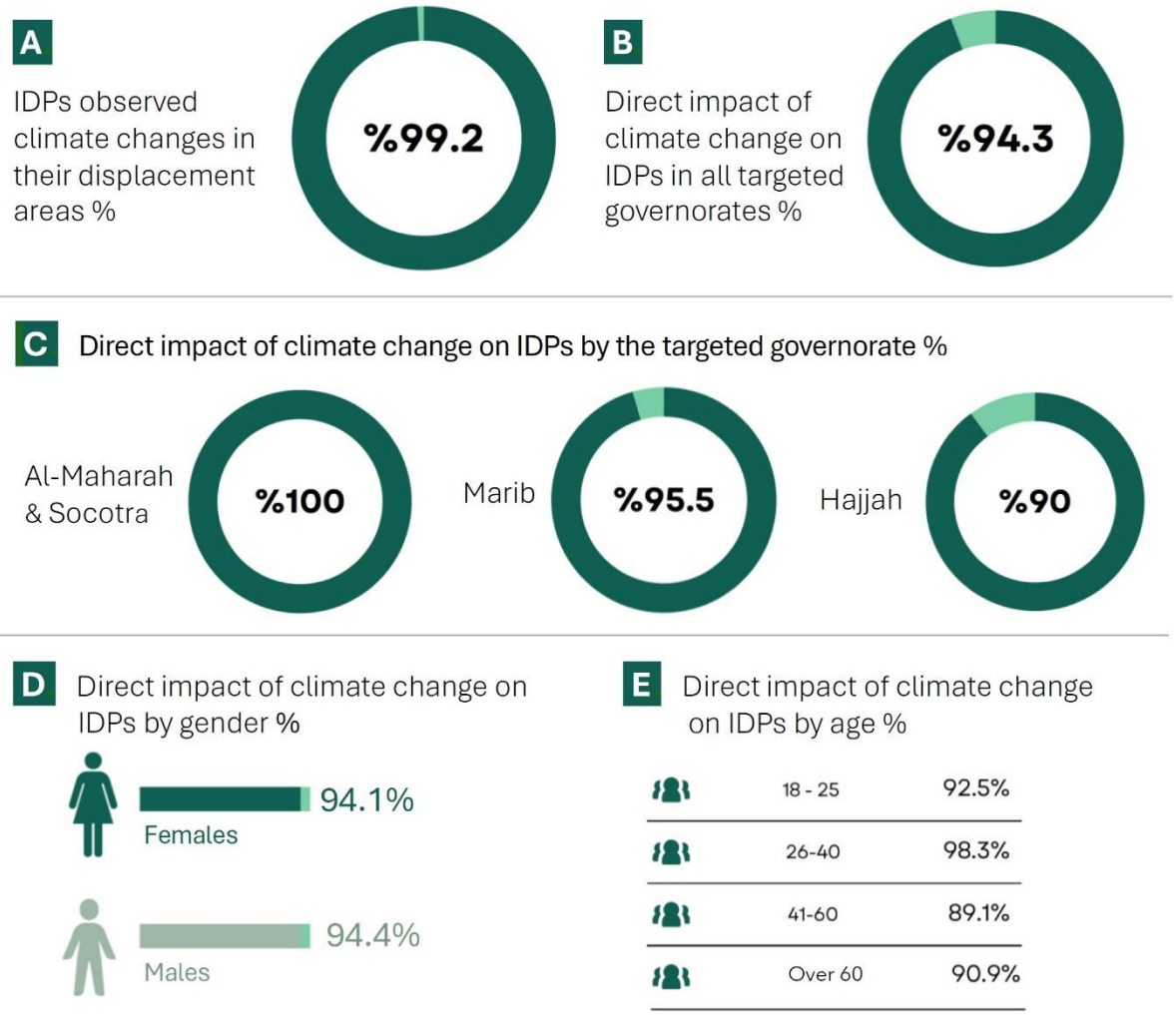
Key factors exacerbating the suffering of IDPs in these governorates include the absence of disaster early warning systems, limited humanitarian access to remote IDP sites, and weak disaster preparedness by civil defense teams. Meanwhile, about 95.5% of IDPs in Marib governorate reported having been impacted by climate change, while 90% of IDPs in Hajjah governorate have experienced similar challenges.

4.4.1 Vulnerability to Climate Change by Gender and Age

Regarding vulnerability to climate change by gender and age, data in **Figure 16-D** indicates that climate changes have nearly equal impacts on both genders, with 94.1% of males and 94.4% of females reported being affected. By age group **(Figure 16-E)**, IDPs aged 26–40 years were found to be the most affected, at 98.3% of total respondents, while those aged 41–60 years were the least affected by climatic events, at about 89.1% the total respondents.

FIGURE 16

Vulnerability to climate change by governorate, gender and age %



4.4.2 Key Climate Changes Observed by IDPs

As climate change continues to intensify the frequency and severity of extreme weather events, more people are forced to flee their homes. Over recent years, IDP camps across the country have been severely impacted by extreme weather, causing widespread suffering and severe damage to shelters. This study identifies key climate changes observed by IDPs in 26 sites in the north-west, north-east (Marib - Hajjah) and southeastern (Al-Maharah – Socotra) regions.

High Temperature

IDP communities in Yemen's coastal and desert regions are characterized by a dry, semi-arid tropical climate with substantial temperature fluctuations. Elevation of areas above sea level contributes to temperature variability, with temperatures decreasing by approximately 0.65°C for every 100 meters of altitude. The higher the elevation, the cooler the temperature, and this is considered as an average for the topography of Yemen. (Al-Khorasani, 2005) Field data in **Figure 17** show that the majority of IDP respondents reported experiencing changes in temperature, as about 91.4% of IDPs in Marib, Hajjah, Al-Maharah, and Socotra reported elevated temperatures affecting their camps. Rising temperatures were among the most prominent changes in Marib and Hajjah, whereas fluctuations in temperature have had a particularly severe impact on IDPs in eastern regions of Al-Maharah and Socotra.

Changes in Precipitation

Rainfall refers to the amount of water that falls over a specific area, measured in millimeters, and reflects the thickness of the water layer reaching the ground. In Yemen, rainfall typically occurs as rain or hail. Hail sometimes falls, particularly in areas above 1,800 meters above sea level. (Al-Khorasani, 2005) Variations in rainfall depend on time and location, often occurring as intense rainstorms over limited areas. Significant variations in rainfall amounts may occur over short distances. Additionally, there is a clear correlation between average annual rainfall and regional terrain. (Al-Khorasani, 2005) Field data shown in **Figure 17**, reveals that heavy rainfall and changes in precipitation patterns and timing were among the most prominent climatic phenomena affecting IDPs. According to the field data, heavy rainfall impacted 84.5% of the responding IDPs in Marib, Hajjah, Al-Maharah, and Socotra.

Cyclones and Storms

Since the outbreak of conflict in Yemen in 2015, the country has experienced a significant increase in the frequency and severity of extreme weather events. In the nine-year period between 2015 and 2023, Yemen was struck by eight tropical cyclones and storms, a significant increase compared to the previous years (2007-2014), during which only one tropical storm occurred. The aforementioned events had a profoundly detrimental impact on the eastern, southern, and western coastal regions, resulting in the displacement of hundreds of thousands of residents. Field data in **Figure 17** indicates that 73.9% of IDPs in Socotra, Al-Maharah, Hajjah, and Marib were affected by these severe storms, which are now among the most prominent extreme weather challenges in Yemen. Meanwhile, cyclones and storms were the primary challenges in Al-Maharah and Socotra.

Groundwater Salinity

Although salinization is recognized as a slow-onset impact of climate change by the United Nations Framework Convention on Climate Change (UNFCCC), it poses severe consequences that can compel individuals to abandon their homes, resulting in cascading and compounding effects. (Cazabat, 2021) In Yemen, groundwater salinity has emerged as a major issue over the past two decades. Survey results presented in **Figure 17** shows that approximately 71.4% of IDP respondents experienced saline drinking water in their host communities. In an interview with a technical manager at the Public Water and Sanitation Corporation in Marib, stated, "Climate change affects water quality. Floods and torrents damage water supply pipelines within the governorate, potentially increasing salinity levels in water supplies. This impacts IDPs."

Several factors contributing to salinity, including rising sea levels, which intrudes into groundwater in coastal regions like Hajjah, Al-Maharah, and Socotra. *Zainab*, a displaced woman in Al-Maharah, said, "The camp lacks clean water, and the salty water we drink causes illnesses like diarrhea for us and our children" Furthermore, human activities—such as excessive use of fertilizers and pesticides, along with inadequate solid waste management—exacerbate groundwater salinization, a problem that has intensified over the past decade.

Landslides and Soil Erosion

According to the United Nations, heavy rains, floods, and accompanying landslides during Yemen's two annual rainy seasons—spanning April - May and July - September -have affected approximately 938,000 people between March and August, 2024. Survey data in **Figure 17** illustrates that 58.4% of responding IDPs in Marib, Hajjah, Al-Maharah, and Socotra faced risks from landslides and soil erosion in their sites. In recent years, incidents of landslides have increased, threatening both local and IDP communities.

Floods and Torrents

Topographic differences across Yemen's governorates create variations in the climate impacts experienced by IDPs. Floods and torrents remain among the most common climate hazards in Yemen. Survey data **(Figure 17)** shows that 49.8% of IDPs reported experiencing floods and torrents, often perceiving heavy rainfall (which affected 84.5% of respondents) as flooding due to its intensity and impact on their camps. The FGDs conducted by the Study team with key stakeholders, including local authorities, experts, and leaders of IDP communities in Marib governorate, reveal other risks generated by the flooding of the dams, which was more dangerous than the rain flood, resulting in severe threats to the IDP camps. This posed challenges for the authorities and complicated humanitarian work in the vast desert environment of Marib. For example, two areas of Rawdat Jahm and Dhanah in Serwah district experienced a catastrophic event beyond response capabilities. Floods from the Marib Dam swept away nearly 500 tents, mostly belonging to IDPs in both areas. This led to the destruction of significant parts of service and infrastructure projects in the region, including roads and water sources. In 2020, the Wadu Dam in the Harib district also burst, causing the destruction of 20 houses and the death of over 100 sheep and cattle. The lack of action resulted in social tensions among tribes. In Sirwah district, the flood from Marib Dam affected around 750 families, washing away their tents, homes, and belongings they maintain

Water Scarcity

Among the climate changes affecting displacement communities, approximately 49.4% of IDP respondents reported experiencing drought and desertification in displacement camps. This phenomenon can be precipitated by protracted periods of drought in arid, semi-arid, or dry sub-humid zones, colloquially designated as "drylands," as posited by the expert respondent. These conditions can result in the degradation of land productivity, as evidenced by observations in the Marib and Hajjah regions. While 35.1% of IDPs in Marib, Hajjah, Al-Maharah, and Socotra noted groundwater depletion and water scarcity **(*see* Figure 17)**. In FGDs with IDPs, participants recounted their displacement experiences, highlighting numerous challenges. *Yahya*, (49 years old) IDP, mentioned difficulties associated with displacement, stating, "Repeated displacement occurs in areas with water shortages, such as the Aslam camp, where people left due to water scarcity and moved to Abs district." This underscores the challenges of limited humanitarian access and poor coordination, which hinder effective responses.

In an interview with a government official at the Ministry of Agriculture and Irrigation, he stated, "Water and food security is affected by drought due to high temperatures and groundwater scarcity, as water networks have been washed away by floods. Most small projects, especially in the agricultural sector, have been at risk of drought, diseases, burial and erosion of agricultural land. Consequently, these factors increase agricultural product prices, and most IDPs cannot afford them".

FIGURE 17

Climate changes observed by IDPs surveyed in Marib, Hajjah, Al-Maharah, and Socotra %

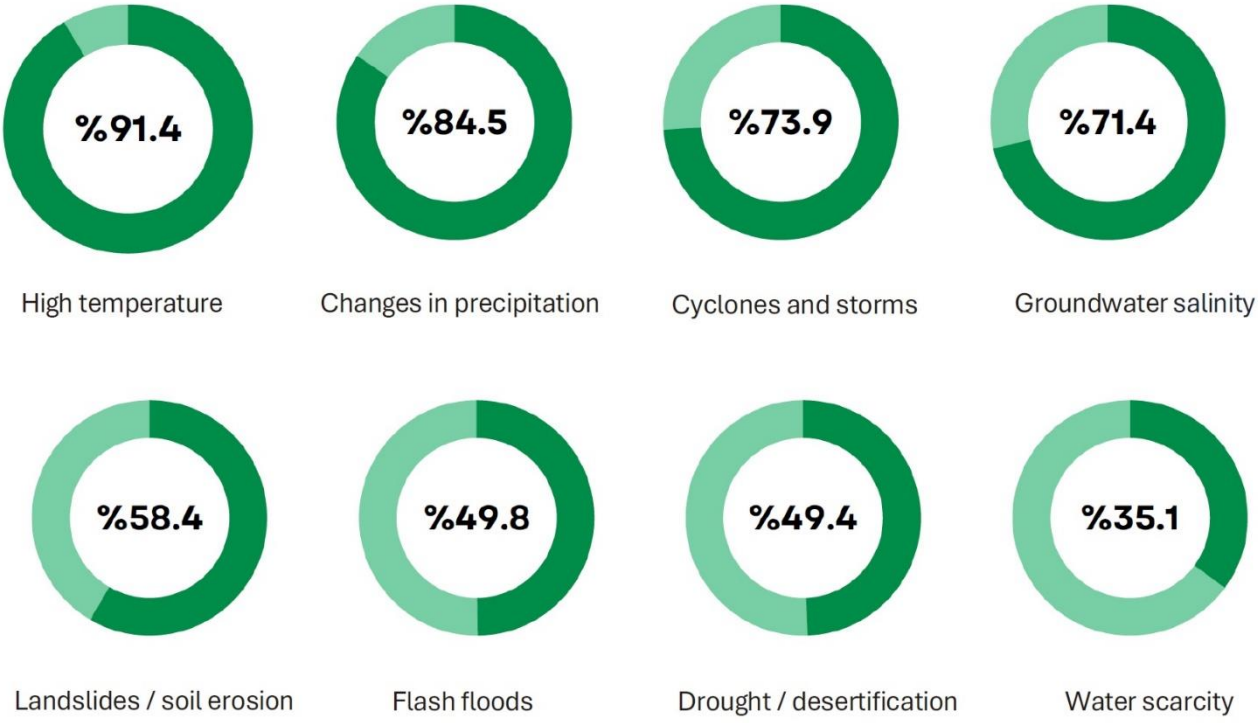


Photo: a village in Tihama plain covered by sand. Feb 2022.
© Abdulsalam Ahmed/Holm Akhdar.

Additionally, the changes in precipitation ranked third in terms of significance in Marib. IDPs in Hajjah have reported an increase in drought waves and the progressive desertification of agricultural land. Similarly, the eastern regions have experienced notable temperature changes. Furthermore, the findings of the interviews conducted by the team with various government officials, consultants, academics, and civil society organizations specialized in the environment and climate change issues emphasized the most prominent climate changes observed in the targeted governorates. A summary of these findings can be found in **Table 1**.

TABLE 1

Tangible climate change in the targeted governorates

Marib Governorate

- Increased drought due to rising temperatures, increased evaporation.
- Widespread desertification, the encroachment of sand dunes on the camps.
- Increased rainfall intensity and changes in precipitation periods.
- Increased flash floods.
- Land erosion of agricultural areas due to floods.
- Groundwater salinity.
- Depletion of groundwater resources and contamination of surface water from floods.

Hajjah Governorate

- Elevated temperatures in coastal and plain regions.
- Frequency of precipitation.
- Increased flash floods.
- Increased wind speeds during certain seasons of the year, due to conditions related to temperature and barometric pressure.
- Increased thunderstorms in mountainous areas and lightning intensity.
- Rockslides and landslides.
- Drought, sandstorms, dust, and soil erosion.

Eastern Governorate: Al-Maharah and Socotra

- Cyclones and tropical storms for nine continuous years.
- Increased intensity of heavy rainfall and flash floods.
- High temperatures.
- Groundwater salinity.
- Decrease in fresh and potable water, and the drying up of some fresh springs.
- Waves of drought, and widespread desertification in the interior and desert areas.

Source : Outputs of interviews with stakeholders, by Holm Akhdar Environmental Consultancy, Jan - Feb 2024.

Floods in Al-Khadish camp in Hajjah.© Holm Akhdar for Environmental Consultancy.

4.5 Direct Climate Impacts on IDPs

The escalating frequency and intensity of storms, heavy rains, and flash floods in Yemen significantly exacerbate the displacement crisis. Over the past four years, Yemen has experienced the highest number of flood-related fatalities in the region, posing a critical threat to the vulnerable populations residing in displacement camps.

4.5.1 Intense Storms

The field findings indicate that an overwhelming majority, representing 96.7% of the IDPs surveyed in Marib, Hajjah, Al-Maharah, and Socotra, reported being affected by severe thunderstorms accompanied by strong winds (**Figure 18**). Damage was particularly severe in Al Maharah and Socotra, where intense storms destroyed homes and left thousands of people homeless. From 2015 to 2023, cyclones and thunderstorms that resulted in substantial precipitation and squalls led to at least 52 fatalities in Al-Maharah and Socotra (***see* Figure 10**). In the past few years, Yemen has experienced an increase in severe thunderstorms, which have posed a significant threat to public safety and property. Lightning is a common occurrence during the country's annual rainy season; in 2023 alone, severe thunderstorms (including lightning) resulted in fatalities and injuries, with more than 150 casualties reported by YRCS. In 2024, thunderstorms killed at least 160 deaths in Yemen, including many displaced people in camps.

The cyclones that hit Socotra have also led to increased displacement, particularly in the valleys, where individuals are relocating to areas less susceptible to flooding. This ongoing displacement is indicative of the repercussions of climate change on the island's traditional way of life, where the valleys constituted the primary residential areas for numerous families. However, the escalating frequency and intensity of natural disasters has rendered it increasingly challenging for individuals to persist in inhabiting these regions. The destruction of homes and schools has led to a mass exodus of residents seeking refuge in urban areas, such as Hadibo, which has further exacerbated the pressure on the area's existing infrastructure.

4.5.2 Heavy Rains

Survey data in **Figure 18** reveal that approximately 93.1% of IDP respondents identified heavy rains caused by intense rainstorms as significant threats to their communities. These rains have damaged shelter sites and destroyed thousands of tents, many of which remain unreplaced by aid organizations for years. *Naji*, (53 years old) a displaced individual, stated: “I relocated of my tent away from the torrent

course in the camp. However, due to the intense rain and wind, our tents are always damaged, and we can do nothing but to wait for the organizations to provide us with tents and tarpaulin every two or three years.". Furthermore, most shelter sites in these governorates lack effective flood contingency planning. Between March and September of each year, the region experiences heavy rainfall, with increased intensity in the recent four years leading to severe floods across all governorates. IDP communities are disproportionately vulnerable, facing floods without prior preparedness measures or adequate post-disaster response.

4.5.3 Flash Floods

According to the findings, 75.1% of IDPs reported that flooding in their camps washed away tents and destroyed IDP shelters, which lacked adequate contingency planning. Floodwaters swept away tents and essential supplies, including food and blankets, and caused complete and partial damage to IDP huts in numerous villages across Hajjah and Marib governorates. In the focused group discussions (FGDs) with IDP community, a portion of the climate damage to IDP camps was revealed to have occurred during the period 2020-2024. According to IDP community leaders in Marib, 6,500 tents have been completely destroyed by floods in the last four years, and thousands of tents have been partially damaged. In addition, 175 camps and sites were completely damaged by flash floods in 2024. In Hajjah governorate, 91 IDP camps were severely damaged by floods, with 3,160 tents completely destroyed, and 2,869 tents partially damaged over the past four years. In Al Maharah, nearly 2,500 IDPs are still directly exposed to the risk of flooding in the camps.

Additionally, torrential rains and flooding have severely impacted sources of clean water essential for the IDPs. Flooding has inundated several traditional wells in Marib, Hajjah, Al-Maharah, and Socotra, leading to reduced water levels in wells located near IDP camps. In Hajjah, a total of 37 wells have been submerged and rendered inaccessible by torrential rains and floods laden with mud and stones, exacerbating the shortage of drinking water in IDP camps. Discussions with IDPs indicated that damage to these water sources has adversely impacted their livelihoods, particularly for those engaged in livestock and honey production, as well as for farmers and workers engaged in irrigating agricultural lands affected by flooding. For instance, in Wadi Daarho, located in the center of Socotra Island, flash floods and torrents caused significant destruction, including the complete obliteration of several houses. The only school in this valley had to be closed due to the extensive damage it sustained, leading to the displacement of many families to Hadibo. In Masaba village, six houses were completely destroyed, and its residents were compelled to leave their lands, joining the displaced in higher areas.

The study findings revealed that approximately 69.8% of IDPs were affected by flood damage to water sources, impacting their livelihoods **(see Figure 18)**. Additionally, 66.9% of respondents in these governorates reported that torrents and floods hindered their access to water, sanitation, and hygiene (WASH). Many displaced people described this year's floods as "unprecedented."

The National Flood Risk Analysis in IDP Sites, conducted by REACH and the Camp Coordination and Management Cluster (CCCM), indicates that 98 out of 197 displacement sites in Marib governorate are vulnerable to flash floods. Among these, 55 sites are categorized as high risk, 20 as medium risk, and approximately 15 as low risk. Eight sites were classified as having unknown risks, despite the presence of operational actors in Marib, reflecting poor access and inadequate field assessment. In Hajjah governorate, the analysis indicated that 255 out of 487 IDP sites are at varying levels of flood risk. Two sites face critical flood risks, concentrated in the Abs and Aslam districts. Approximately 87 sites are categorized as high risk across nine districts, while 33 sites are at medium risk in six districts. About 122 sites are classified as insignificant risk, and 11 sites have an unknown risk status. (CCCM Yemen & REACH, 2024) In the eastern regions of Al-Maharah and Socotra, flood susceptibility and impacts were estimated using historical data by Shelter Group for 2022-2023 due to data gaps and limited humanitarian access. The risk classification in Al-Maharah identified nine sites at risk of flooding, with an overall severity rating of one degree for each site (HNO-2024). The populated area with the highest flood susceptibility received a rating of five degrees. In the Socotra archipelago, only two areas were affected, with severity ratings consistent with those in Al-Mahara, as reported by the REACH analysis. (CCCM Yemen & REACH, 2024)

FIGURE 18

Direct impact of intense storms, heavy rains, and floods on IDPs in Marib, Hajjah, Al-Maharah, and Socotra %

Rain-soaked tents in Al-Sweida camp, Jan 2024 © Holm Akhdar Environmental Consultancy / Khalid Al Shajni.

4.6 Compounding Impacts of Climate Change on IDPs

The extreme weather events in Yemen from 2015 to 2024 have clearly illustrated that climate change has exacerbated humanitarian crises within conflict-affected communities. Throughout this period, climatic events–including cyclones, storms, floods, droughts, and landslides–have significantly contributed to environmental degradation and the deterioration of natural resources amid ongoing armed conflict. These interconnected factors have accelerated the rate of displacement, both in affected communities and among already displaced populations. The nexus between environmental degradation, climate change, and conflict intensifies the multiplier effects that perpetuate the crisis over the long run.

4.6.1 Food Shortages and Limited Access to Aid

Survey results presented in **Figure 19** indicate that food shortages and difficulty accessing relief assistance are among the most prominent compounding impacts of climate change, affecting 81.2% of IDPs in Marib, Hajjah, Al-Maharah, and Socotra. These challenges are further exacerbated when camps are struck by rainstorms or flash floods, which destroy supplies. The overall weak humanitarian responses and inadequate emergency preparedness by organizations and authorities, before or after climate disasters, contribute to unmet needs across displacement sites. Currently, only 720 of 2,284 IDP camps in Yemen are covered by international organizations, and humanitarian partners, (CCCM Yemen, 2023) reflecting a decade-long inadequacy in addressing the needs of all IDP communities.

4.6.2 Destruction of Housing and Loss of Shelter

Based on data in **Figure 19**, extreme weather events-such as storms, torrential rains, and floods-have caused 74.3% of IDP respondents to lose their shelters. The severity of climate impacts, ranging from cyclones and rainstorms to resulting floods, is particularly evident in eastern regions like Al-Maharah and Socotra, as well as northwestern areas like Marib and Hajjah. Additionally, the informal nature of IDP sites and their proximity to flood-prone areas, combined with the use of flimsy materials like tarpaulins, cloth, and plastic, which offer minimal resistance to rain, wind, and flooding makes IDPs highly vulnerable to climatic disasters. For instance, in May 2024, a report by CCCM Cluster on flood hazard in Al-Jufainah camp in Marib identified 1,375 affected shelters and 18 public buildings affected by flooding. (REACH, 2024)

4.6.3 Disease Outbreaks, Epidemics and Fevers

Diseases and epidemics associated with climate change, such as fevers (malaria chikungunya), and cholera, are serious threats in IDP camps, affecting 73.1% of IDPs **(Figure 19)**. Stagnant floodwaters create breeding grounds for disease vectors like mosquitoes, flies, and others, leading to the spread of infectious diseases. Additionally, contamination of water supplies with sewage has led to increased cases of diarrheal diseases and cholera among IDPs in Marib, Hajjah and Al-Maharah. These challenges are compounded by a lack of functional healthcare facilities in these governorates, as many of them sustained serious damages by conflict and extreme weather events. Water, sanitation and hygiene (WASH) services in most IDP camps have also declined due to flooding, worsening the public health crisis for IDPs.

4.6.4 Electricity Disruptions, Road Blockages, and Limited Access to Resources

Approximately **68.2%** of IDPs reported that the collapse and outages of the electricity supply, along with damage to their primary power source (solar energy systems), represent the fourth most significant impact of climate-related incidents in IDP camps. Road blockages and land erosion ranked fifth, impacting about 64.1% of respondents. Additionally, disruptions to communication networks are critical compounding effects of climate change. Difficulties in accessing essential resources, supplies, and markets were also reported as compounding impacts, affecting 64.1% of respondents **(Figure 19)**.

4.6.5 Camps Fires

Natural fires are generally caused by extreme summer temperatures; however, in Yemen, such fires do not occur in forested areas as they do in many other countries. The Environmental Protection Authority has not recorded any incidents of wildfires in the country over the past two decades. Although "Yemen lacks extensive large, forested regions, it is home to notable biodiversity, including limited forested areas and tropical forests in the western and southern mountainous highlands, as well as in the eastern regions of Al-Maharah and Socotra." (Al-Khalidi & Bazraa, 2012)

Data in Figure 19 indicates that 61.2% of IDPs across the four surveyed governorates identified fires in camps and shelters as significant recurring risks, intricately linked to climate-related factors. The study team noted an increase in fire incidents within IDP camps, forcing residents to seek alternative shelters. Fires often occur due to elevated temperatures in summer, floods, storms, high winds, electrical malfunctions, or cooking practices within tents, and mostly exacerbated by the absence of fire safety and prevention tools (e.g. fire extinguishers, fire blankets) in IDP camps.

> "**Fires** sometimes occur due to the **wind** in **our camp because** we **use firewood** and charcoal for **cooking**, and our **tents** are made of **wood** and straw. With **strong winds**, the **fire** spreads and **we cannot control it.**"
>
> Displaced women in Marib Governorate.

For example, between January 2020 and June 2024, there were 636 fires in Marib's camps, resulting in 36 deaths and 89 injuries, including children and women, according to the Executive Unit for IDPs. In Al-Maharah, IDP camps have experienced several fire incidents, the most recent occurring on November 4, 2024, in a marginalized community *Muhamasheen* camp in Al-Ghaydah. This camp has faced many fire incidents over the past two years. Notably, Cyclone Sagar in May 2018 ignited a dwelling in Al-Maharah, resulting in one fatality. In December 2022, a big fire at the Airport road camp in Al-Ghaydah destroyed 65 tents, displacing over 60 families, and causing injuries to five individuals.

In Hajjah governorate, NGO representatives reported sporadic fires incidents, including two fires in April 2019 that ravaged four emergency shelters and a temporary shelter at two sites accommodating IDPs in Abs district. Another incident occurred in 2018 at Al-Manjura camp in Bani Hassan district, where a fire broke out in the tents of IDPs, affecting more than ten families. In March 2024, a fire broke out in a camp in the Abs district, resulting in the death of a child and severe burns to his parents.

FIGURE 19

Compounding impacts of climate change on IDPs in Marib, Hajjah, Al-Maharah, and Socotra %

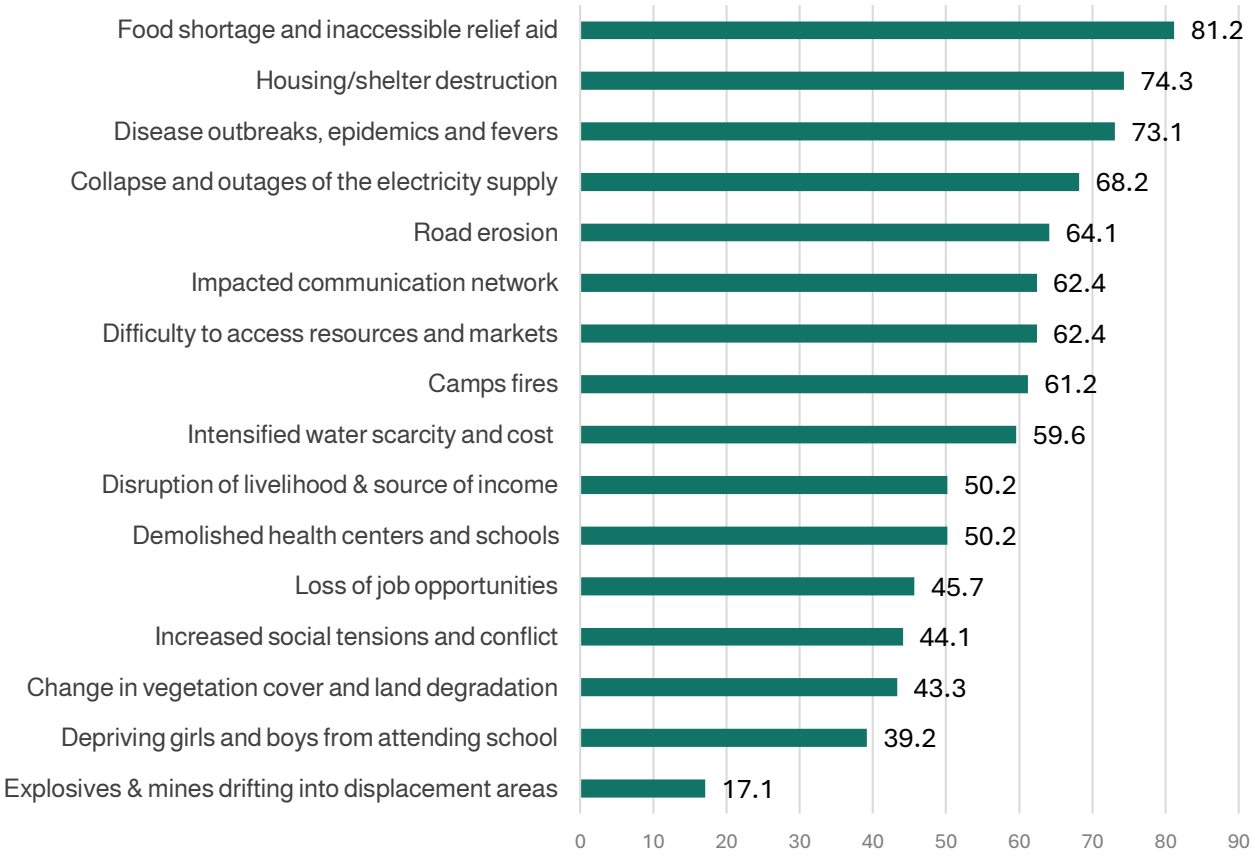


Photo: Dragon Blood tree destroyed due to the cyclones that hit Socotra island.
Copyright © Holm Akhdar /Abdel-Ghani Hadidi.

4.6.6 Livelihood Disruptions and Employment Loss

Water scarcity and rising costs, affected 59.6% of IDPs respondents in Marib, Hajjah, Al-Maharah, and Socotra, are cumulative impacts of climate change. A proportion, 50.2%, IDP reported disruptions to their livelihoods. For example, *Ameen*, (49 years old) a displaced individual, stated, "As a livestock farmer, I face significant challenges during cold days and heavy rains. It is a constant struggle to protect my animals from the rain, as they are kept in an open area. Exposure to rain leads to sickness and wastage. In my hometown of Haradh, I used to keep them in a shelter, but in the IDP camp, I lack the resources and land ownership to build a proper shelter for them."

Moreover, the compounded effects of climate change are reflected in the destruction of health centers and schools, as reported by 50.2% of respondents **(*see* Figure 19)**. As climate impacts persist, access to employment and sources of income diminish, as confirmed by 45.7% of IDPs in Marib, Hajjah, Al-Maharah, and Socotra.

4.6.7 Increased Social Tensions

Social tensions are a major cumulative effect exacerbated by extreme climatic events affecting IDP communities. Approximately 44.1% of displaced respondents **(Figure 19)** reported an increase in social tensions and threats from the host community regarding land issues associated with the camps, which are often owned by local residents. After nearly a decade of displacement, landowners are increasingly motivated to invest in their properties, most of which lack formal rental agreements. Additionally, tensions arise from competition over scarce services and resources in host communities.

In an interview with an aid worker in Hajjah, said, "The areas where clashes have occurred as a result of the conflict have exacerbated risks such as drought and high temperatures, and have also been hit by flooding. Such as the coastal districts in northern Abs, Hiran, Bakil Al-Mir, Kushar and Haradh district, where it has become difficult to shelter the displaced and provide services to them. Such areas are no longer receptive to sheltering or setting up camps for IDP, as they compete with indigenous people for services such as electricity, water and resources that are already limited in conflict conditions. Consequently, the displaced suffer from the lack of these services in their camps, forcing some of them to leave and return to their areas despite their danger." On the other hand, climate risks compelled IDPs to move and persistently seek alternative locations, often in areas that have been damaged by rain and floods. This has rendered them susceptible to social tensions arising from the lands on which the camps were established. For instance, the Al-Sweida camp, home to 9,185 IDPs, comprising 1,735 families, making it the third largest displacement site in Marib and the fourth largest in Yemen. (REACH, 2024) This self-occupied site is located on private land and lacks written and verbal lease agreements. These unresolved land issues have destabilized the IDPs and increased social tensions on them.

4.6.8 Damage to Vegetation and Land

The compounded impacts of climate change are prominently reflected in the degradation of vegetation and land in displaced communities. Approximately 43.3% of IDPs reported damage to large areas of vegetation in Al-Maharah, Socotra, Hajjah, and Marib. Cyclones Chapala and Megh caused a considerable harm to endangered trees in Socotra, uprooting entire groups of Dragon's Blood trees. A local report from the Environmental Protection Authority in Socotra stated that "the Boswellia trees, known as frankincense trees, in the Homhil Nature Reserve lost about 30% of its trees due to the intense winds of the cyclones. Shortly after being weakened by those damages, the remaining frankincense trees were attacked by bark beetles, resulting in an additional 30% loss of these unique and endangered species."

A national expert in eastern regions highlighted that monitoring climate change issues relies on visual observation, as there are no weather stations or climate monitoring devices in Socotra and Al-Maharah, and data is primarily sourced from international organizations such as the UN agencies and local media. The cyclones that impacted Socotra—particularly Chapala, Megh, and Luban— damaging fertile soil and depleting some natural springs, leading to a decline in vegetation cover and adversely impacting the island's rare biodiversity.

4.6.9 Mines and Explosives Drifting into IDP Camps

Climate disasters have inflicted severe damage on infrastructure, including temporary schools in IDP communities. In the regions of Marib, Hajjah, Socotra, and Al-Maharah, floods and torrential rains have deprived both boys and girls of their education, as reported by 39.2% of displaced respondents. Furthermore, the floods posed additional dangers by washing away landmines and explosives left from military conflicts. Landmines represent grave risks to frontline communities, impacting 17.1% of IDPs in Marib and Hajjah (*see* **Figure 19**). These risks were notably heightened in August 2024 following severe flooding in Marib and Hajjah, which drifted them into the camps.

Moreover, the cumulative effects of climate change are evident in the substantial damages and losses reported through interviews and discussions conducted by Holm Akhdar Environmental Consultancy with various stakeholders, including experts, consultants, and local authority officials in the surveyed governorates. **Table (2)** summarizes some impacts and losses resulting from climate-related incidents in Yemen's IDP communities.

TABLE 2

The primary damages by extreme weather events in the targeted governorates

Marib

- More than **150,000** households have been directly and indirectly affected.
- **6,500** tents have been completely destroyed, while thousands of other houses and tents suffered partial damage.
- Land degradation, loss of agricultural crops, loss of numerous properties including vehicles, equipment, household items, and agricultural and industrial tools.
- Increased dams flooding disasters on the IDP camps: most notably, the flooding of the Marib Dam and the explosion of the Wadu Dam in in the Hareeb district.
- **Destruction of infrastructure:** telecommunications, transportation, water, electricity networks and roads.
- Spread of epidemics and diseases, such as diarrhea and fevers.
- **Fire outbreaks** in IDP camps are on the rise, over 636 fires in camps during the period (2020 - 2024).
- Estimated losses in Marib alone have exceeded **two billion dollars** over the past four years.

Hajjah

- **8,593 Families**: The average number of households that have been entirely affected by the climate impacts over the past years (2020 – 2024).
- **91 camps**: a total of camps that have been completely affected by floods and torrents.
- **3,160** tents were completely damaged by the floods, while 2,869 tents have incurred partial damage.
- **111 fatalities**: the number of individuals died over the past four years, due to thunderstorms and floods, with 54 lives of them claimed by thunderstorms.
- **37 wells** have been submerged and rendered inaccessible due to the torrential rains and floods laden with mud and stones, which has significantly exacerbated the shortage of drinking water in IDP camps of Hajjah.
- **39 Roads** among the main and secondary roads, were destroyed by landslide, rockslides, and floods, caused traffic congestion.
- Material losses in shelters and supplies caused by flood.
- Emergence of social tensions due to shortages of relief and food supplies from aid organizations.

Al-Maharah and Socotra

- **Socotra:** 194 families displaced from their homes, after being destroyed.
- **Al-Maharah:** 5,000 IDPs, in randomly established settlements.
- **314** houses were completely damaged in Socotra. The main roads linking the South of the island to central Socotra were damaged, difficulty of access to these areas.
- **165 tents** have been completely destroyed by fire outbreaks in the IDP camps in Al-Maharah.
- Significant damage to the infrastructure mainly in Al-Maharah as well as Socotra.
- Food shortages and high food prices due to drought.
- **2.5 million dollars** estimated losses at the water sector in Al Maharah, due to Cyclone Tej.
- **In Socotra, Homhil Reserve lost about 30%** of its trees and endangered species due to the cyclones.
- Shortage of fresh water, leading to a deterioration of the health situation and an increase in the spread of water-related diseases.
- Losses in agricultural land and livestock, and beekeepers suffered when floodwaters hit their hives.

Source: according to interviews with experts, consultants, and local authority officials. Feb 2024. Holm Akhdar Environmental Consultancy.

4.7 Systemic Factors Contributing to the Exacerbation of Climate Shocks on Communities

The findings of the study reveal a range of systemic and institutional factors that contribute to the intensification of climate risks faced by displaced communities, as well as the issue of increasing climate-induced displacement. **Figure 20** illustrates the most significant factors, accounting for 82% of the IDPs respondents, which is absence of early warning systems (EWS) to effectively alert local communities of climate-related disasters. In addition, all shelter camps in Yemen have no EWS for disaster risk reduction DRR, including camps in the regions of Marib, Al Maharah, Hajjah, and Socotra. This is closely followed by 80% limited official awareness regarding the severity of climate change and the necessary preparations to mitigate its impacts. In an interview with Assistant Professor at the University of Saba Region, he stated that "the increase in IDP accidents resulting from rains and floods can be attributed to a lack of awareness among the IDPs themselves, as well as insufficient awareness of disaster risks by government agencies, organizations and society. The sheltering of IDPs in flood-prone areas due to a shortage of suitable camps exacerbates the problem".

Lack of policies pertaining to the environment and climate ranks third among these contributing factors, representing 75.5% according to displaced respondents. Furthermore, the absence of environmental governance and inadequate institutional capacities are identified as additional factors contributing to climate risks, accounting for 75.1% of the total. Insufficient international support provided to Yemen in confronting climate change is also a major factor, representing 74.7%. Notably, the lack of climate emergency funding incorporated into government budgets and aid organizations' allocations, combined with the split in Yemen's authorities and regulatory conflicts, accounts for 72.2% of the contributing factors to the exacerbation of climate shocks on this communities.

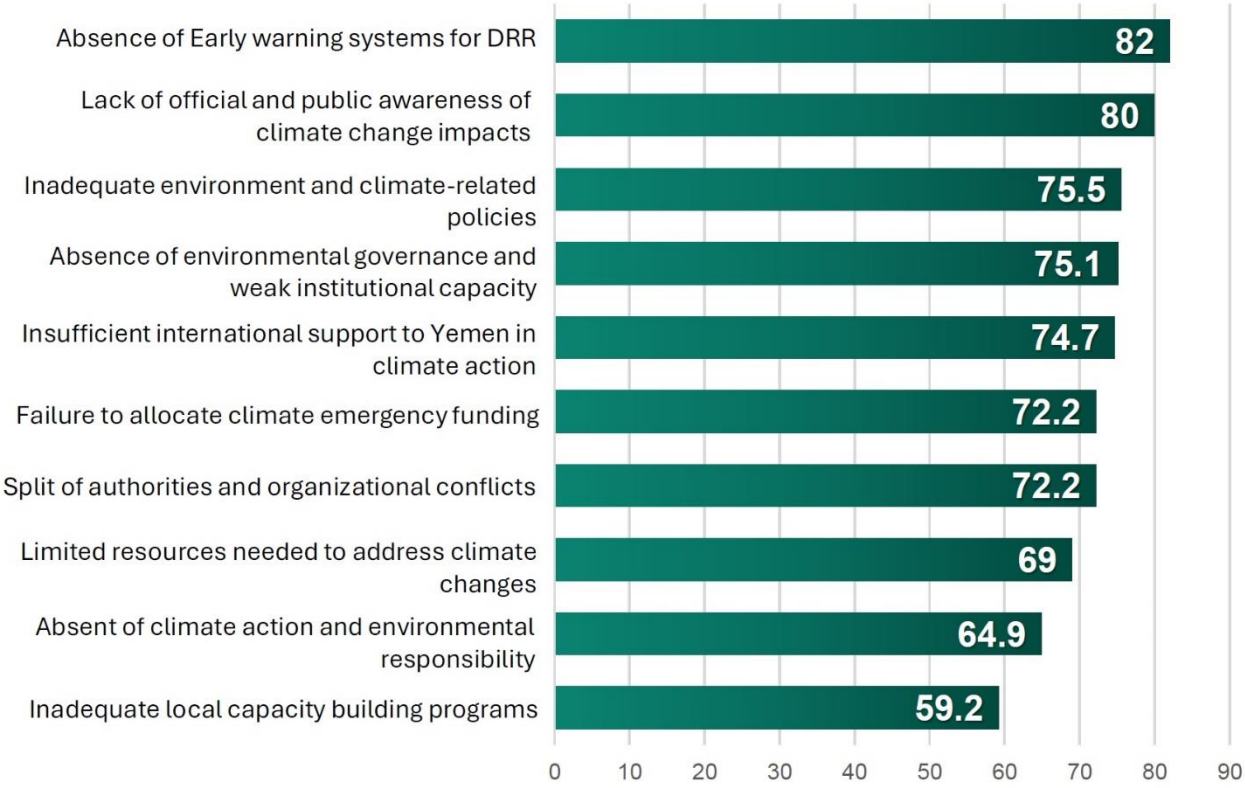
Additionally, 69% of the factors are attributed to limited local resources available to address climate change and mitigate its effects. Lastly, the insufficient focus on local capacity building programs in the realm of climate and environmental action accounts for 59.2% of the contributing factors.

Furthermore, in addition to the reasons mentioned by the IDPs themselves, the FGDs sessions and qualitative interviews identified several additional factors reported by other stakeholders and some actors. These factors have contributed to the escalation of negative impacts from climate events on IDP communities in Yemen, as well as the recurring occurrence of climate-induced displacement year after year. The most significant of these contributing factors include:

- Increasing haphazard establishment of IDP camps in unsuitable locations that lack proper planning, leaving them directly exposed to risks from valleys, torrential rains, and floods.
- Ongoing armed conflicts have resulted in infrastructure destruction and population dispersal, severely hindering climate adaptability.
- Insufficient infrastructure that can withstand or adapt to climate shocks, such as inadequate flood and rainwater drainage systems in the camps, further exacerbate the situation. The majority of IDP camps suffer from a scarcity of sanitation and toilet facilities, posing significant challenges to hygiene and public health.
- Desertification and a lack of attention paid to green spaces, both within the camps and in the governorates where the camps are situated, contribute to the adverse effects on IDP communities.
- Relief organizations often neglect to conduct proper environmental impact assessments when implementing projects for IDP camps, leading to potential environmental consequences.
- The living conditions of the IDPs are often substandard, with limited empowerment and capacity-building programs in place to address the challenges posed by climate change.
- Poor awareness and a lack of interest on the part of authorities and UN agencies in emergency communication programs have resulted in a failure to effectively deliver life-saving information within displacement camps, to take the necessary precautions when disasters occur.

FIGURE 20

Key systemic factors contributing to the exacerbation of climate shocks on communities in Yemen %



4.8 Adapting to a Changing Climate

In the past few years, the persistence of climate-related hazards has compelled tens of thousands of IDPs to seek refuge and take measures to enhance their resilience. The findings, as shown in **Figure 21**, reveal that about 62% of the surveyed IDP respondents resorted to changing their shelters and relocating once again in order to evade the floods and storms that ravaged their initial displacement camps. Among them, 36% had to shift their shelters within their displacement area. Conversely, 26% of the IDPs reported that they relocated to other areas deemed safer from their perspective. The decision to undertake a second displacement was primarily influenced by their proximity to torrents and flash floods course. A significant proportion of these individuals have moved to urban areas and district centers, while some have chosen to reside in rental accommodations.

> “
>
> **62%**
>
> of IDPs have changed shelter, and displaced again due to Climate Disasters.

A notable part of IDPs accounting for 27% **(*see* Figure 21)**, have made a deliberate decision to remain in their camps and collaborate with local IDPs and host communities to mitigate the risk of flooding by establishing buffers and earthen barriers in front of the camps to deter floodwaters. Additionally, they have taken the initiative to educate fellow camp residents through applications such as WhatsApp and others, disseminating knowledge about the hazards of floods, winds, and storms, as well as providing guidance on improving tent installations, in addition to putting up warning signs cautioning against inhabiting in flood-prone areas, forming committees to facilitate these efforts. Another 7% of IDPs have employed alternative energy to stay in their camps. Moreover, due to the challenges posed by climate change and frequent displacement, 4% of IDPs have been compelled to switch professions or occupations based on their new areas of displacement, particularly in the Al-Maharah, and Socotra and Hajjah governorate. Former fishermen, farmers, and shepherds have been forced to seek alternative employment opportunities in their new locations.

The continuous movement and displacement of vulnerable frontline communities *(including women, Muhamasheen, and disabilities)*, coupled with inadequate governance mechanisms, limited local budgets and resources allocated to address climate impacts, and a lack of emphasis on climate reforms, strategies, and action plans in Yemen, have already eroded the resilience and worsened the vulnerability of local communities. The findings of this study demonstrate that the disasters and extreme climate shocks in Yemen have pushed more than a half of surveyed IDPs 62% to adopt maladaptive coping strategies. However, it is important to note that these strategies or measures often fall short of providing long-term solutions, as the majority of IDPs find themselves in a perpetual cycle of relocation and shelter changes in response to climate threats. Without the empowerment of key actors to guide and support IDPs towards comprehensive and effective adaptation strategies, and enhances institutional adaptive capacity at the local level to cope with and adapt to changing climate, the climate displacement crisis in Yemen is likely to worsen.

In recent years, some local governance frameworks have attempted to address climate adaptation, but their effectiveness is limited by broader governance issues in Yemen. However, the findings shown in **Figure (22.A)** 74.7% of the total IDPs who responded reported that they initiated strategies to adapt to climate events in order to maintain their stability. While 25.3% of the IDPs did not take any measures or strategies to adapt to these conditions. At the governorate level, the IDPs in Marib demonstrated the highest level in adapting to the impacts of climate change, with a rate of 95.5% **(Figure 22.A)**. They were followed by the IDPs in Al-Maharah, and Socotra, with a rate of 69.7%. On the other hand, IDPs in Hajjah governorate exhibited the lowest level of proactivity in implementing strategies or measures to adapt to climate incidents, accounting for 31.2% of the total IDPs who responded. This can possibly be attributed to the majority of them being impoverished and destitute families, as their living conditions in the camps are more difficult compared to other governorates, due to the restrictions that hindered relief activities in the districts of Hajjah. This made several organizations work only in the governorate center.

FIGURE 21 Strategies used by surveyed IDPs to adapt to climate change %

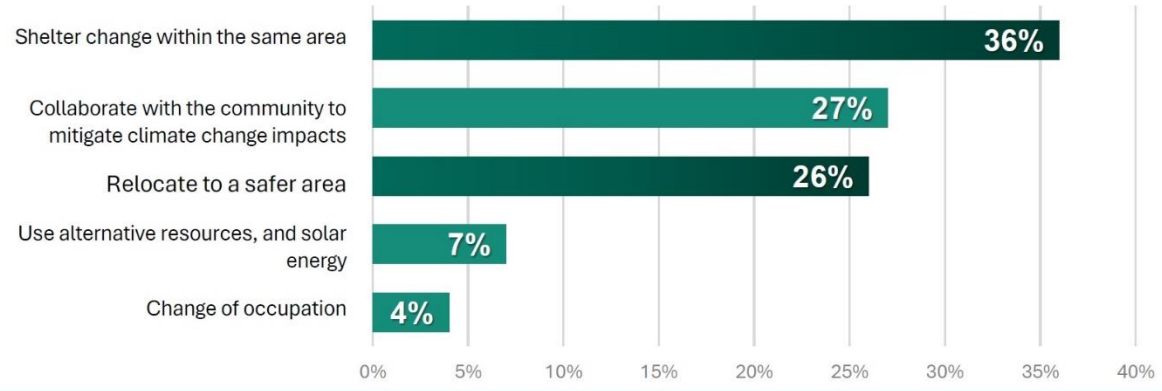


FIGURE 22 IDPs climate adaptation by governorates, gender, age group, education %

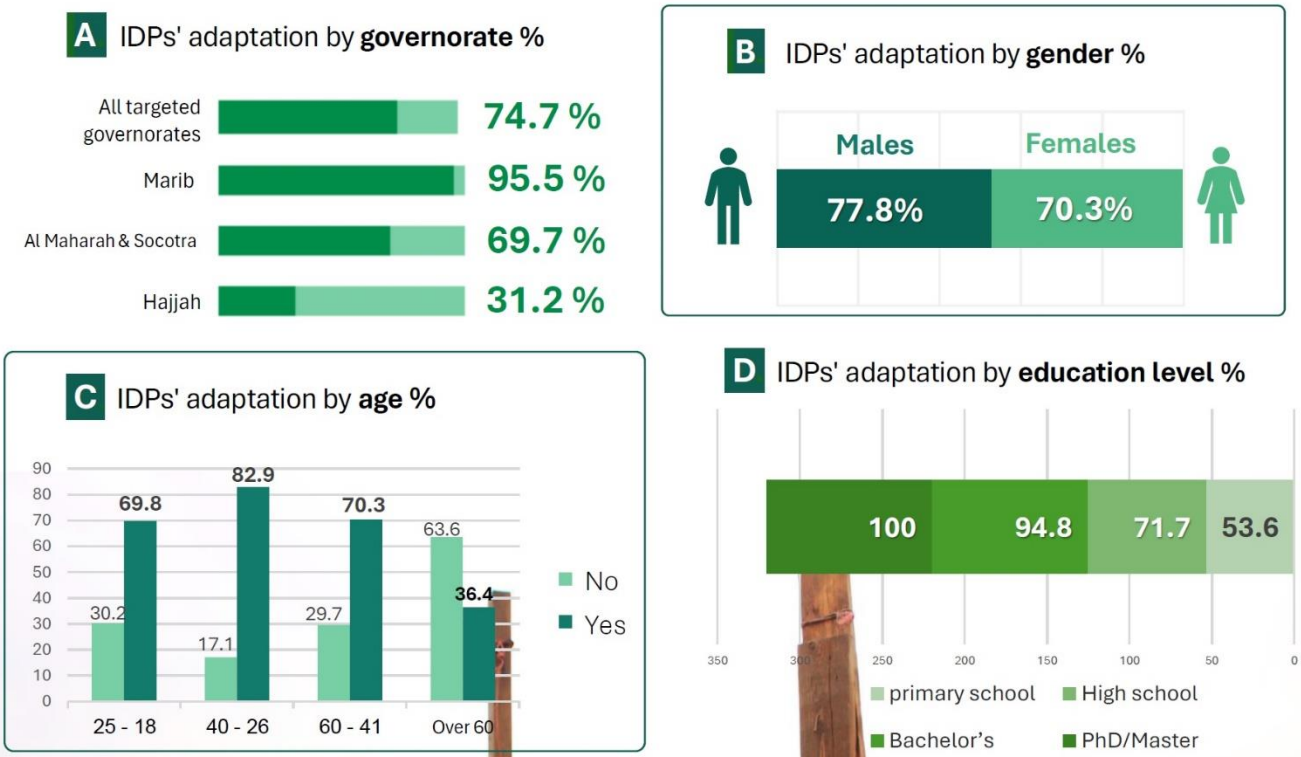


Photo: IDPs are trying to install windbreaks to adapt to the climate.© Holm Akhdar / Issa Ahmed. March 2024.

In FGDs, *Suaad* (32 years old), a displaced mother, said; "When the camp is affected by rains and floods, we, along with some affected families, are forced to move to another location or a different camp because we are unable to take any protective measures."

The findings shown in **Figure 22B**, highlight that male IDPs displayed a higher level of proactivity than females in adapting to climate change, with 77.8% of males reporting adaptation measures compared to 70.3% of females. Furthermore, IDPs in the age group of 26-40 years **(*see* Figure 22-C)** showed the highest level in adopt coping strategies, comprising 82.9% of the total IDPs within this age group. Conversely, the age group of 60 years and above displayed the lowest level of climate adaptation, with only 36.4% of individuals taking adaptive measures.

In contrast, the study reveals a positive correlation between the educational attainment of IDPs and their ability to make adaptive decisions in response to climate changes. The percentage of IDPs **(*see* Figure 22.D)** initiating adaptation measures demonstrates a notable increase, rising from 53.6% among those IDPs with a basic education or below (primary school), to 94.8% for IDPs holding a university degree (bachelor's), and reaching 100% for individuals with higher qualifications such as master's/PhDs. This finding underscores the critical role of education in enhancing informed decision-making, enabling individuals to effectively address life's challenges and pressures.

In interviews, a stakeholder in Marib Governorate described the state of climate vulnerability as follows: "Several factors have hindered the work of the office responsible for climate monitoring and follow-up, including the general state of the country, conflict, budget suspension, and the absence of an early warning center in the governorate to predict climate changes and document climate-related information."

> The **Findings** of this **Study** demonstrate that the disasters and extreme climate shocks in Yemen have **pushed** more than **a half** of IDPs to **adopt maladaptive coping strategies.**

A valuable lesson can be learned from the Yemeni IDPs' efforts to adapt to climate-related incidents in the affected regions. It becomes evident that they are not mere helpless victims, as commonly perceived, but rather individuals driven by a strong determination to rebuild their lives and withstand climate shocks, despite the potential shortcomings in their adaptive strategies. However, with adequate support, empowerment, and access to pertinent information on adaptation measures from relevant actors, IDPs possess the capacity to make well-informed decisions and devise solutions to the challenges they are truly aware of. Moreover, this capacity fosters effective communication and interaction with the broader community, thereby enhancing the long-term sustainability, resilience, and adaptability of IDP communities. **Key actors in Yemen should focus on climate change mitigation and adaptation as the main strategies to respond to climate change.**

"People are constantly adapting to their changing circumstances, even after displacement. Aid actors should incorporate the strategies already used by displaced people into their policy and programming, but without leading to an adaptation burden where the onus to act is on displaced people." (Sturridge & Holloway, 2022) "The best defense against future shocks is to transform systems now, to build resilience by addressing climate change and to reduce the vulnerability, exposure and inequality that drive disasters." (UNDRR, 2022)

Strong winds destroy tents of IDPs in camp © Holm Akhdar/ I. Ahmed

4.9 The Role of Key Actors

> "When a climate disaster occurs, authorities visit the camp and appeal to organizations for help. However, the assistance provided is often limited and delayed. Sometimes we have to wait for months until an organization comes and provides us with new tarps or tents. However, we often repair our destroyed homes ourselves."
>
> IDP from Marib Governorate

As the country's environmental and humanitarian crisis continues to worsen, the climate-induced displacement crisis is concurrently escalating. The government and its local authorities, along with local and international aid organizations, are the primary actors that communities rely on to alleviate their suffering and effectively confront the threats posed by climate change.

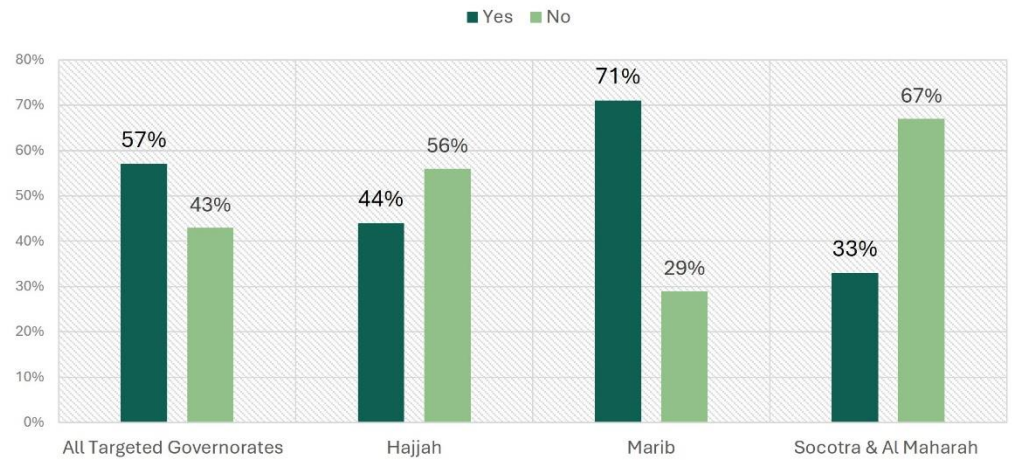
These entities play a pivotal role in enabling communities, whether displaced or hosting, to adapt to the changing climate in ways that enhance resilience and stability. "Understanding the role of national governments is crucial to developing policy and programmatic interventions that effectively address the root causes of resource scarcity and displacement." (Furlow, 2022)

4.9.1 The Role of Local Authorities and Aid Organizations

The communities facing the highest vulnerability to climate risks are often the ones with the least capacity for adaptation and resilience. This places a significant burden on authorities and humanitarian organizations to effectively respond to their needs, mitigate the crisis, and efficiently manage climate-induced displacement. Sustained efforts are crucial to address these escalating challenges. According to **Figure (23)**, 57% of surveyed IDPs reported that local authorities, NGOs and international humanitarian organizations have undertaken some interventions to assist their communities in adapting to climate change and its adverse effects. However, 43% of the respondents confirmed that no measures have been taken by the authorities and relief organizations to safeguard them from climate-related disasters. Regrettably, they have not witnessed any substantial assistance that facilitated their adaptation to these changing circumstances.

FIGURE 23

Role of local authorities and NGOs in mitigating climate impacts %



By governorates, it is evident that IDPs in Marib have observed relatively better interventions from various actors compared to other governorates. Approximately 71% of IDPs in Marib reported that local authorities and organizations have implemented certain measures to adapt to climate change, while 29% reported that local authorities and organizations did not intervene. In contrast, IDP respondents in the eastern regions (Socotra and Al Maharah) 67% and in Hajjah 56% indicated that local authorities and organizations have not taken any measures to assist them in adapting to climate change and mitigating its risks. **(see Figure 23)** However, 33% of respondents in the eastern regions and 44% in Hajjah governorate believe that local authorities and international organizations have implemented limited measures to adapt to climate change, which fail to adequately meet their needs and promote stability. Some have emphasized that these measures are disproportionate to their requirements.

FIGURE 24

Measures taken by actors (local authorities and organizations) to mitigate climate impacts on IDPs %

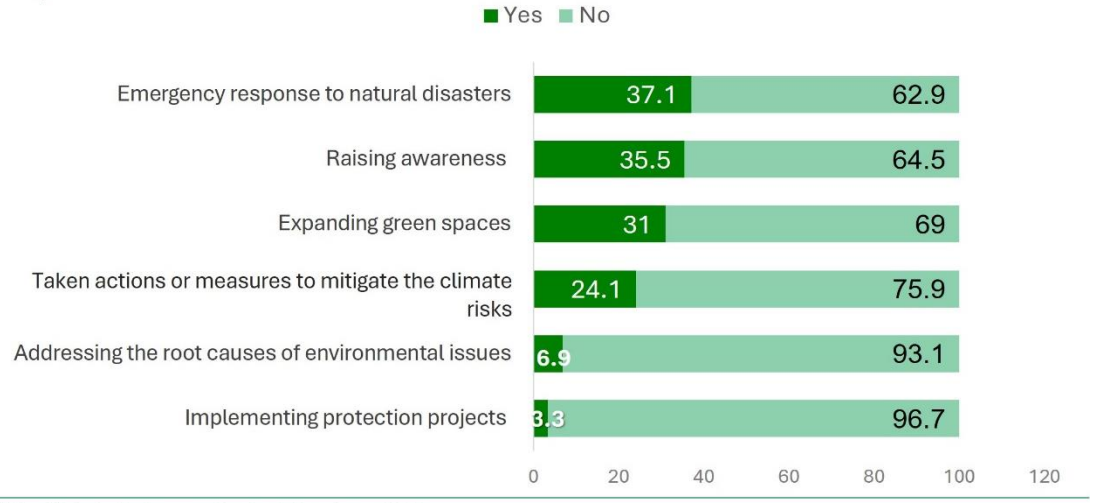


Figure 24 sheds light on the actions taken by local authorities, local and international humanitarian organizations in climate-displaced communities. It reveals that these measures encompass disaster response and providing assistance to affected individuals, as reported by 37.1% of respondents in Marib and Hajjah. Awareness-raising activities regarding climate change risks come second, accounting for

35.5% of responses. Efforts to increase green spaces within displacement camps were reported at a rate of 31%. Furthermore, 24.1% of IDP respondents indicated the implementation of administrative measures aimed at mitigating the impact of climate disasters in the camps.

The available options for addressing the root causes of environmental issues and implementing protective projects to mitigate these risks were found to be extremely limited, as indicated by the IDPs in these areas. Only a small percentage, not exceeding 6.9% and 3.3% of the total participants, reported the existence of such options. This clearly highlights the limited policies, procedures, and programs pertaining to climate action undertaken by government authorities, as well as local and international organizations, in terms of finding viable solutions or initiating projects to address the impacts of climate threats and minimize their current and future ramifications.

To understand the nature of interventions or actions carried out by local authorities in the targeted areas, **Table (3)** presents the most significant interventions based on focused group discussions and interviews conducted with relevant government agencies, experts, and consultants who specialize in climate change and its impact on displacement communities, specifically within the targeted regions.

TABLE 3

Local authorities' interventions in climate-induced displacement from disasters

Marib
• Developing in-advance plans to effectively address potential floods or overflow of the Marib Dam. • Collaborating with relevant organizations to install protective barriers and flood-resistant structures. • Conducting workshops for competent authorities on climate change and DRR. • Raising community awareness among IDPs and farmers through distributing informative brochures and providing advice and warnings about all climate risks. • Coordinating the projects of local and international humanitarian organizations, with a focus on covering actual needs. • Establishing committees and community initiatives both inside and outside the camps to support the camp managers and leaders in their efforts to combat the effects of climate change. • Using digital platforms to disseminate information and increase public awareness regarding the perils associated with climate change.
Hajjah
• Enhancing public awareness about the importance of afforestation, particularly emphasizing the cultivation of climate-resistant trees, the benefits of establishing home gardens to ensure food security, and the need to stay away from housing in the torrent course. • Developing an emergency response plan by the Yemen Red Crescent. Supplying the strategic warehouses with essential supplies, preparing for potential disasters, and equipping ambulances or a volunteer team. • Conducting training and rehabilitation programs in the fields of first aid and disaster management. • Establishing effective coordination mechanisms with relevant government authorities such as civil defense and humanitarian partners to foster collaborative efforts. • Providing emergency aid and food baskets. Offering shelter and WASH utilities for IDPs in camps. • Implementing water projects for IDPs and ensuring water supply to some camps via water tanker trucks.
Al Maharah and Socotra
• Implementing interventions to address the urgent needs of shelter, food, and water. However, these efforts are insufficient when considering the scale of the large displacement community in Al-Maharah governorate. • Socotra seeks to develop a strategy or plan for the local authority to effectively manage and respond to disasters. • The local authority in Al-Maharah is seeking to establish an early warning system, but there are still obstacles. As for Socotra, there are no trends towards EWS.

Source: Outcomes of FGDs and stakeholder interviews, February 2024.

IDPs bring the water from wells, March 2024 © Holm Akhdar / I. Ahmed.

BOX 3

The role of organizations in exacerbating the climate crisis

Many Yemeni organizations–governmental, non-governmental, civil society groups, and private sector institutions–fail to adequately consider environmental and social risks in their operations or activities, whether in urban or rural areas. Numerous organizations lack established environmental, social, and governance (ESG) standards into their regulations, resulting in significant deficiencies in assessing the environmental and social impacts of their projects.

For example, certain interventions, projects by humanitarian and relief organizations have inadvertently aggravated Yemen's climate crisis. Studies indicate that "projects using solar energy for agricultural irrigation caused a massive depletion of groundwater in 2018." (CEOBS, 2021) Furthermore, most organizations do not prioritize compliance with the National Water Sector Strategy and Investment Program (NWSSIP), when implementing water and sanitation projects. Consequently, ongoing groundwater over-extraction, coupled with government institutions' inability to prevent illegal well drilling, has resulted in critical declines in water levels across five major basins in the country. (Al-Salehi, 2022) In 2019, the total water usage in Yemen was estimated to be 5.1 billion m^3, with a water deficit of 2.6 billion m^3. (NWRA, 2021) So, the amount of water needed during the next decade to meet the growing demand for water in Yemen is estimated at about 6 billion cubic meters per year. (NWRA, 2021)

In interview with a stakeholder stated that "Local and international organizations implementing projects related to water resources without coordination with the National Water Resources Authority (NWRA), which leads to the occurrence of some imbalances that could have been avoided in the event of prior coordination with the NWRA."

4.9.2 Government Actions Required to Enhance Climate Resilience

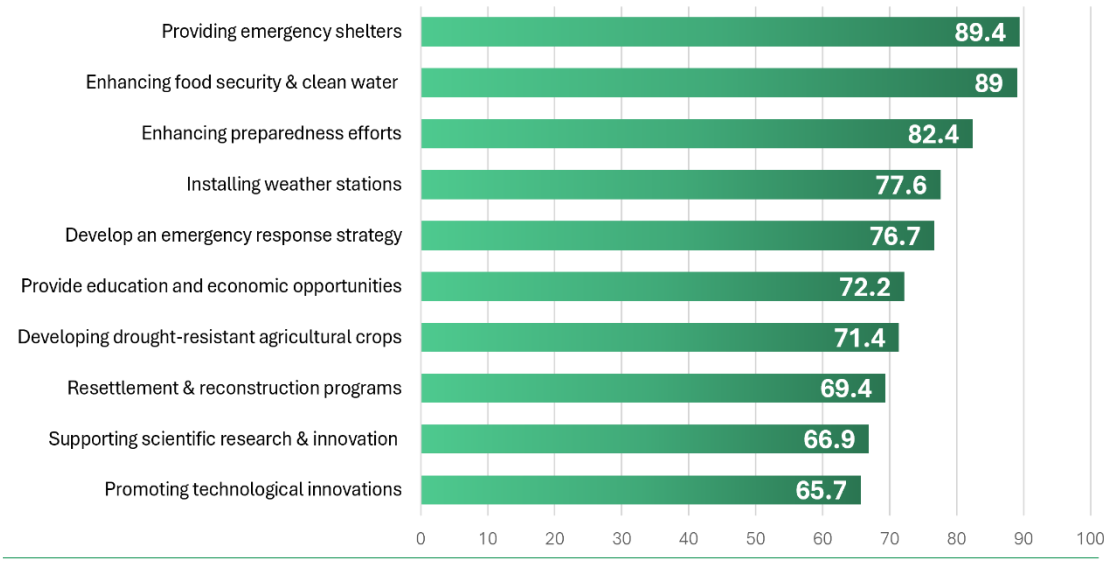
Field results **(Figure 25)** obtained from IDPs residing in displacement areas indicate that local and central government authorities [2] should undertake various interventions and measures to address the needs of these communities. The majority of IDPs, 89.4%, expressed the need for emergency shelters to cope with the potential consequences of climate-induced displacement. Similarly, 89% of IDP respondents emphasized the importance of improving food security and ensuring access to clean water at both the camp and host community levels.

Furthermore, 82.4% of IDPs stressed the need for enhancing preparedness and emergency response capabilities. Approximately 77.6% of respondents specifically mentioned the necessity for the government to reoperate weather stations in their respective governorates, which have been ravaged by conflict, to gather climate data, monitor changes, and provide early warnings of upcoming weather events. In an interview with Abdul Jalil Al-Mughalis, the head of the Agriculture and Irrigation Office in Marib Governorate, he stated that "The interventions by local authorities and international organizations fall short of meeting the needs of those affected by disasters. The services provided are temporary and inadequate in addressing the challenges posed by climate change. Efforts to assess and enumerate the damages and identify the actual needs of those affected IDPS are insufficient."

Figure 25 provides a comprehensive overview of the essential actions and priority needs identified by IDPs and host communities that the government should undertake to mitigate the impacts of climate change. As per the IDPs themselves, these actions include the provision of education and healthcare services 72.2%, the development of drought-resistant agricultural crops and modern farming techniques 71.4%, the establishment of resettlement and reconstruction programs 69.4%, and support for scientific research, development and innovation 66.9%. Finally, 65.7% of respondents emphasized the importance of promoting technological innovations to facilitate adaptation to climate change.

FIGURE 25

Government actions required to mitigate climate change impacts on IDPs %



[2] The Internationally Recognized Government of Yemen (IRG) and its local authorities.

4.9.3 Interventions Required from INGOs and Donors

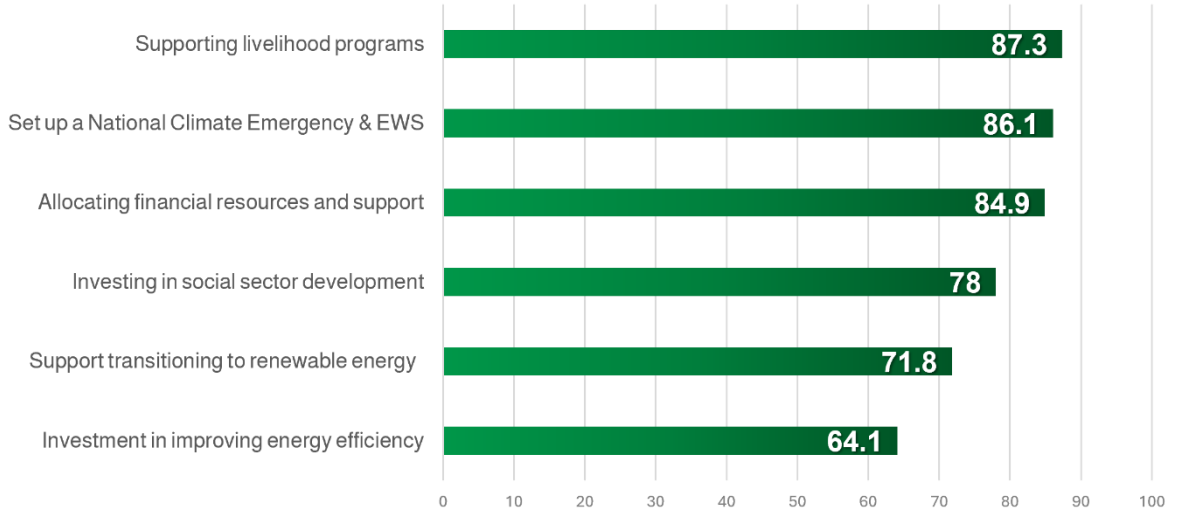
Amid the current circumstances, donors should not leave Yemen behind, but should rather increase their commitments to address the climate emergency response projects in the country, including, the allocation of funds for climate finance. Data in **Figure 26** show that about 87.3% of IDPs responding to the questionnaire in Marib, Hajjah, Al-Maharah, and Socotra, expressed the need for continued support to their existing livelihood programs, including expansion into cash-for-work and assets rehabilitation interventions to enhance the resilience of vulnerable communities.

Furthermore, 86.1% of respondents stressed the importance of supporting the establishment of a National Climate Emergency and Early Warning Center, as it would contribute to meeting the urgent needs for climate data and enable the all to take precautionary measures, thereby reducing the risk of climate-related shocks. Additionally, 84.9% of IDPs suggested that organizations and donors should allocate resources and provide support for climate emergency response projects in the country.

Respondents, accounting for 78% also highlighted the need for investment in the development of social sectors such as education, health, and social care, with a focus on vulnerable groups such as IDPs, women, children, Muhamasheen, and disabilities. While 71.8% of respondents emphasized their support for the transition to renewable energy sources including solar energy **(*see* Figure 26)**, 64.1% advocated the importance of investing in improving energy efficiency.

FIGURE 26

Interventions required from INGOs and donors to enhance IDPs' climate resilience %



Low-pressure in the eastern regions of the country, Aug 2020 © Holm Akhdar / Ammar Nomish.

4.10 Future Climate Threats on IDPs

In the western Tehama plain, located east of the Abs district in Hajjah governorate, Safiya, a widow and mother of four with no breadwinner, experienced the devastating consequences of flooding. Her tent was inundated, resulting in the loss of her remaining food supplies and blankets, which were essential for keeping her young children warm. Safiya expressed her distress, stating, "There is no longer a response to those affected by these disasters, and recently aid has been discontinued. The organizations that were once present here are no longer available." The vast majority of IDPs in this region feel a sense of isolation and apprehension about the future. They are uncertain about how their basic survival needs will be met, with women being particularly vulnerable in these circumstances. During extreme weather events, women bear an additional burden compared to men. In addition to caring for their children and preparing meals, they endure the hardship of fetching water and firewood, especially in camps where IDPs lack access to cooking gas cylinders provided by authorities or aid organizations. Gender inequality within displacement communities exacerbates the vulnerability of both women and girls to climate-related security risks.

IDPs in Yemeni governorates are disheartened by this secondary displacement, which compounds their existing challenges. The history of displacement resulting from war and violence is now intertwined with ongoing climate shocks affecting their communities and host communities. IDPs are plagued by fears that their situation will continue to deteriorate due to climate change in the coming months and years, leading to a sense of disappointment.

4.10.1 Food Insecurity and Increased Climate Displacement

Figure 27 displays the most prominent fears expressed by the IDPs, reflecting their expectations regarding the consequences of impending climate changes. In the governorates of Marib, Hajjah, Al Maharah, and Socotra, an alarming 89.4% of IDPs fear food insecurity and hunger. Additionally, 88.6% of respondents express concerns about experiencing climate-induced displacement once again, with an increased likelihood of being relocated to unknown places and destinations. Moreover, other Yemeni governorates not covered in this study may witness new waves of climate-induced displacement as a result of environmental and climatic shocks in these governorates.

4.10.2 Unequal and Inadequate Availability of Water Resources

The third risk identified by IDPs (**Figure 27**), with a concern shared by 73.9% of respondents, pertains to the unequal and inadequate availability of water resources in their communities. This predicament not only affects displaced communities but also includes a significant number of individuals in rural areas across the country. The water scarcity crisis is escalating due to the overexploitation of groundwater basins, with nearly half of them currently in a critical state.

> “When recent cyclones struck **Socotra,** local **authorities** failed to perform **necessary rescue** operations and relocate residents **from hazardous areas** to safer ones, and **affected individuals didn’t receive any support** and **immediate emergency assistance.**”
>
> IDP from Socotra Governorate.

4.10.3 Social Tensions and Destabilization

Approximately 69.4% of IDPs surveyed in the governorates expressed future concerns about the potential destabilization of host communities, leading to increased social tensions as a consequence of climate change (***see* Figure 27**). This is particularly evident in the camps located in Marib and Hajjah. The areas where conflicts and confrontations have taken place, coupled with worsening climatic problems like drought, high temperatures, torrential rains, and floods, such as the coastal districts in northern Abs, Hiran, Bakil al-Mir, Kushar and Haradh district, have become unable to host IDPs and provide them with essential services. Similarly, social tensions are rising among IDPs in Marib camps, especially in those camps that face immediate eviction by landowners.

Some areas are no longer receptive to accommodating and establishing camps for the IDPs, as the feel that resources and services are dwindling due to hosting IDPs. The ongoing war has made it difficult to maintain essential services such as electricity and water, leaving many IDPs in camps without access to these necessities. Consequently, some are compelled to return to their original areas despite the inherent dangers involved.

4.10.4 Adaptability and Resilience

Amidst these prevailing fears, the study uncovered a glimmer of hope and optimism for the future among certain IDPs. In Marib, Hajjah, Al Maharah and Socotra, **59.2%** of IDPs anticipate that their communities will enhance their adaptive capacity and resilience to withstand the challenges posed by climate change (***see* Figure 27**). They believe that some degree of stability will be achieved over time. Meanwhile, 40.8% of displaced people believe that their communities will not be able to adapt to a changing climate.

4.10.5 Increased death among IDPs

Contrary to the previous expectations, another 57.1% of IDPs in the four governorates (**Figure 27**) hold the opposite view, expecting an upsurge in the number of deaths resulting from the effects and consequences of climate change, both within their communities and among host communities. This outlook aligns with recent studies and reports, which predict the continued progression of climate change in Yemen in the upcoming years and its increasingly detrimental impact on local communities, particularly those who are most vulnerable and marginalized, namely the IDPs (including women, children, Muhamasheen, and disabilities). The impact of climate change on IDPs in Yemen will not be limited to the current situation but will extend to successive generations within each local community. Addressing these issues necessitates diligent and concerted efforts from all relevant actors, including climate reforms and the implementation of numerous measures aimed at mitigating the exacerbation of climate displacement and the humanitarian crisis in the country.

FIGURE 27

Future climate concerns of IDPs surveyed in targeted governorates %

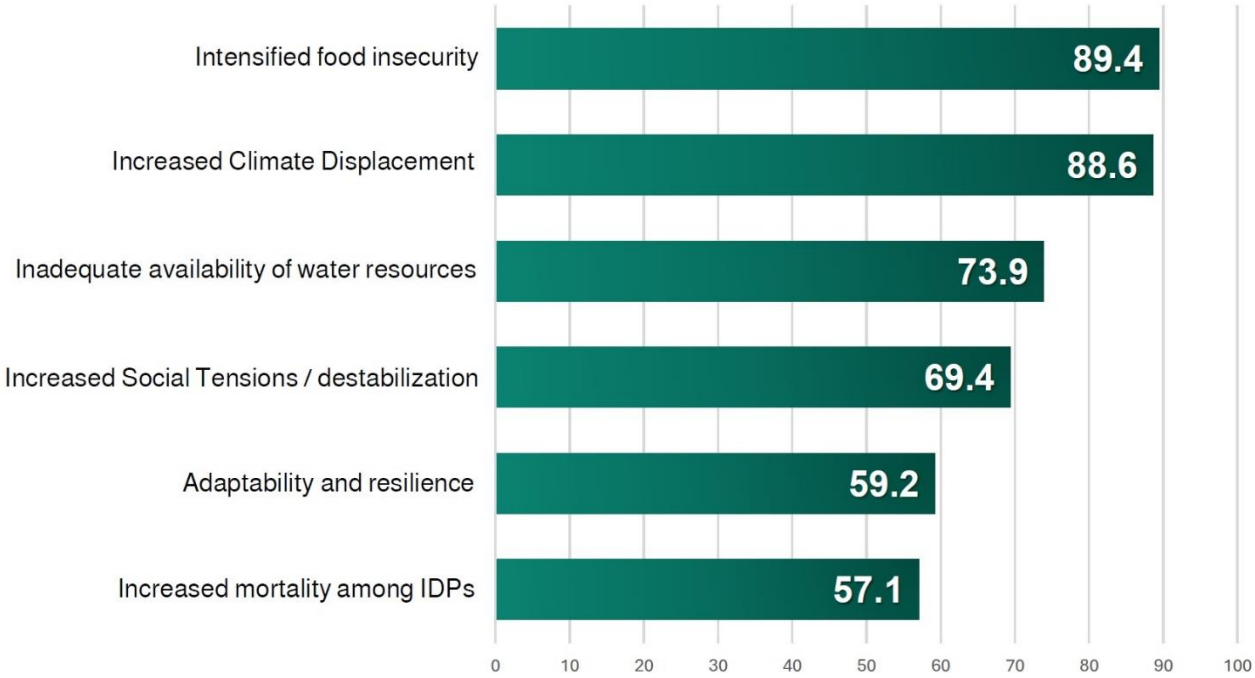


Photo: Displaced people's tents under heavy rain.
© Holm Akhdar / Issa Ahmed.

Chapter

5

Findings

Severe storms are becoming more dangerous for IDP camps in Yemen.
© **Holm Akhdar** /*I. Ahmed.*

The biodiverse Qishn area, Al Maharah Governorate, Jan 2024 © Holm Akhdar / Abdullah Saleh.

In Yemen's decade of war and conflict, the majority of IDPs are still living in poorly equipped makeshift camps lacking essential services. These camps are located in vulnerable areas prone to climate disasters like floods, storms, and sand encroachment. The study aimed to understand how climate change affects internally displaced communities in four governorates (Marib, Hajjah, Al Maharah, and Socotra) over four years. The goal is to improve local and international response to managing displacement caused by ongoing climate fluctuations in these communities.

The study reached several important findings regarding its questions and objectives, which are as follows:

i. **Field results indicated that a significant proportion of IDPs, approximately 86.1% of respondents in Marib, Hajjah, Al-Maharah, and Socotra, were displaced primarily as a result of war and conflict**. **In contrast, 13.9% of the total respondents reported being displaced due to the impact of climate changes** in their areas of origin. Among those displaced due to climate changes**,** around 10.2% experienced displacement triggered by floods and landslides, leading to the destruction of housing in their areas of origin. Additionally, 3.7% of them were displaced by drought and shortage of rainfall in their areas of origin, leading to water scarcity and affecting sources of income, with disruption of various livelihoods such as agriculture, grazing and other economic activities.

ii. **The study findings indicate that a significant proportion 94.3% of the total IDPs in the governorates of Marib, Hajjah, Al Maharah, and Socotra have already experienced** a wide range of climate change-related impacts within their temporary camps. At the governorate level, the study revealed that IDPs in the eastern regions, namely Al Maharah and Socotra, were most severely affected, with 100% of them reporting these effects. In Marib and Hajjah, the percentages of affected IDPs were 95.5% and 90%, respectively. This discrepancy can be attributed to the successive and concerning occurrence of extreme weather events in the eastern regions, including cyclones, tropical storms, strong winds, torrential rains, floods, and landslides.

iii. Annually, from March to the end of August, IDPs in Marib, Hajjah, Al-Maharah, and Socotra have encountered significant climate changes that have adversely affected their stability and livelihoods. Particularly, **91.4%** of these changes were attributed to rising temperatures, while approximately **84.5%** were associated with shifts in rainfall patterns, including changes in both timing and intensity of precipitation. Furthermore, **73.9%** of the affected IDPs reported experiencing cyclones and severe storms, which have increasingly become recurrent weather events in Yemen, particularly in the eastern regions of Al-Maharah and Socotra. Among other climatic phenomena, flash floods were reported by **49.8%** of the IDPs, followed closely by

droughts at **49.4%.** Besides, **35.1%** indicated issues related to the depletion and damage of water levels in underground wells.

iv. **Climate change has contributed to disease outbreaks,** with **73.1% of IDPs affected by fevers, cholera, diarrhea and other epidemics** due to swamps created by rainwater, flooding and sewage polluting it. The limited availability of functional healthcare facilities further worsens the crisis. Electricity disruptions and road blockages affect **68.2% and 64.1%** of IDPs, respectively, limiting access to essential resources and markets.

v. **61.2% of IDPs across the four surveyed governorates identified fires in camps and shelters as significant recurring risks**, intricately linked to climate-related factors. The study team noted an increase in fire incidents within IDP camps in Marib, Hajjah, and Al-Maharah, forcing IDPs to seek alternative shelters. Fires often occur due to elevated temperatures in summer, floods, storms, high winds, electrical malfunctions, or cooking practices within tents, and mostly exacerbated by the absence of fire safety and prevention tools (e.g. fire extinguishers, fire blankets) in all IDP camps.

vi. **Social tensions are a major cumulative effect exacerbated by extreme climatic events affecting IDP communities**. Approximately **44.1%** of displaced respondents reported an increase in social tensions and threats from the host community regarding land issues associated with the camps, which are often owned by local residents. After nearly a decade of displacement, landowners are increasingly motivated to invest in their properties, most of which lack formal rental agreements. Additionally, tensions arise from competition over scarce services and resources in host communities. Furthermore, approximately **69.4% of IDPs** surveyed in the governorates expressed future concerns about the potential destabilization of host communities, leading to increased social tensions as a consequence of climate change. This is particularly evident in the camps located in Marib and Hajjah.

vii. **The climate shocks experienced in the governorates of Marib, Hajjah, Al-Maharah and Socotra have forced displaced families to adopt maladaptive coping strategies**, due to their inability to effectively cope with climate risks. Remarkably, **62% of the IDPs** in these areas resorted to changing their shelter and endured second displacement to escape the floods and storms that ravaged their camps. While this adaptation strategy may provide temporary relief from immediate climate threats, it could further deepen the climate displacement crisis in the country. Among these IDPs, 36% opted to relocate their shelter within the same area of displacement, while 26% were forced to undergo displacement once again to seek refuge in other safer areas. The decision to flee for a second time was driven by the fact that their initial settlements were situated in flood-prone zones.

viii. **The study found that a notable part of IDPs, accounting for 27%, have made a deliberate decision to remain in their camps, adapt, and withstand floods and climate threats.** They collaborated with local IDPs and host communities to mitigate the risk of flooding by constructing buffers and earthen barriers in front of the camps to deter floodwaters. They collaborated with their displaced and host communities to mitigate the risk of flooding by constructing buffers and earthen barriers around the camps. Additionally, they have taken the initiative to educate fellow camp residents through applications such as WhatsApp and others, disseminating knowledge about the hazards of floods, winds, and storms, as well as providing guidance on improved tent installation techniques. Another **7%** of IDPs have employed alternative energy technologies in their camps as a means of adapting to climate risks. In Al-Maharah, Socotra and Hajjah governorate, **4%** of IDPs were compelled to change their professions or occupations.

ix. **The findings of the study reveal a range of systemic and institutional factors that contribute to the intensification of climate risks faced by displaced communities.** Data illustrates the most significant factors, accounting for 82% of the IDPs respondents, which is absence of early warning systems (EWS) to effectively alert local communities of climate-related disasters. In addition, all shelter camps in Yemen have no EWS for disaster risk reduction DRR, including camps in the regions of Marib, Al Maharah, Hajjah, and Socotra. This

is closely followed by 80% limited official awareness regarding the severity of climate change and the necessary preparations to mitigate its impacts. Lack of policies pertaining to the environment and climate ranks third among these contributing factors, representing 75.5% according to displaced respondents. Furthermore, the absence of environmental governance and inadequate institutional capacities are identified as additional factors contributing to climate risks, accounting for 75.1% of the total. Insufficient international support provided to Yemen in confronting climate change is also a major factor, representing 74.7%. Notably, the lack of climate emergency funding incorporated into government budgets and aid organizations' allocations, combined with the split in authorities and regulatory conflicts, accounts for 72.2% of the contributing factors to the exacerbation of climate shocks on this communities. Additionally, 69% of the factors are attributed to limited local resources available to address climate change and mitigate its effects. Lastly, the insufficient focus on local capacity building programs in the realm of climate and environmental action accounts for 59.2% of the contributing factors to the intensification of climate risks in Yemen.

x. **The study results also highlighted a weak response to the climate emergency**, revealing significant shortcomings among local authorities and aid organizations. Specifically, **57%** of IDPs reported that local authorities and humanitarian organizations have implemented limited interventions to mitigate climate risks and facilitate adaptation efforts. Furthermore**, 43%** of IDPs indicated that no meaningful actions were taken in their IDP sites to protect them from climate disasters. The lack of climate risk reduction interventions was particularly pronounced in the governorates of Socotra and Al-Maharah, as reported by **67%** of IDPs, followed by 57% in Hajjah and **29%** in Marib. Overall, IDPs in these sites indicated that they have not seen any effective interventions to assist them cope with the challenges impacting their camps

xi. **The study revealed that interventions by local authorities and international organizations in Marib governorate to address the impacts of climate change were relatively effective**. However, in Hajjah and Al-Maharah, despite a larger population of IDPs, these interventions were severely limited and failed to meet their needs adequately. Government interventions primarily focused on providing assistance, raising climate change awareness, and increasing green spaces in displacement camps and throughout the governorates. Nonetheless, when it came to addressing the underlying causes of environmental problems and implementing projects for protection against environmental risks, which could have significantly contributed to mitigating environmental hazards, the interventions were very limited.

xii. **The findings indicated that 89.4% of IDPs' future concerns revolve about food insecurity** and increased hunger. Additionally, 88.6% of IDPs expressed fear of experiencing climate-induced displacement once again, increasing the likelihood of being forced to relocate to unknown locations and destinations. Moreover, the study anticipates that other Yemeni governorates, not covered in this study, would experience new waves of climate-induced displacement among their population due to environmental and climatic shocks. The third major concern, feared by 73.9% of respondents, was the unequal and scarce availability of water resources within their communities. On the other hand, another 57.1% of IDPs in the four governorates, expecting an upsurge in the number of deaths resulting from the effects and consequences of climate change, both within their communities and among host communities.

Chapter

6

Recommendations

A displaced mother stands outside her tent destroyed by a storm.© Holm Akhdar./ I. Ahmed. March 2024.

In response to the persistent climate-induced displacement crisis in Yemen, it is crucial for the Yemeni government, local institutions, international actors, and local organizations to deeply understand the evolving needs of disaster-affected displacement communities and identify gaps in climate displacement management. Adopting a focus on implementing best and sustainable practices, as well as fostering and supporting innovative initiatives to address the country's recurrent climate displacement crisis, is essential. Based on the survey findings, the focus group discussions and stakeholder interviews, the study recommends the following:

FIRST: Recommendations to the Internationally Recognized Government (IRG) and its local authorities:

To the Presidency of the Council of Ministers:

- Strengthen multi-level governance mechanisms, based on an integrated approach to climate management, through a plan that involves all stakeholders, including the most vulnerable groups in local communities.
- Integrate the topic of climate change and its potentially dangerous consequences into the compulsory education curricula in primary schools.
- Prohibit haphazard construction in valleys areas, flood-prone zones, areas adjacent to water dams, unstable rock and mud masses, or unplanned areas.
- Strengthen the role of specialized bodies in the field of disasters, namely: The Civil Defense Authority, the Meteorological Authority CAMA, the Environmental Protection Authority, the Geological Survey, and the Yemen Red Crescent Society.
- Supporting universities and research centers to improve knowledge production on climate change, adaptation solutions and climate resilience.

To the Executive Unit for IDPs Camps Management (EXUIDPs):

- Update the National Policy for Addressing Internal Displacement to include protection of the most vulnerable groups from the impact of climate change.
    - Ensure safe, comprehensive and just solutions for climate displaced, and support to return to their areas in the same way as conflict displaced people.
- Develop a national plan to address climate displacement that involves active integration and participation of vulnerable communities, including IDPs, women, Muhamasheen, persons with disabilities, and the host community, in proposing solutions.
- **Develop standards for IDP camps:** Ensure that camps and IDP hosting areas are, to the extent possible, in line with the principles of protection-based physical planning, including as regards location, layout and design of services. Considerations will include distance from armed conflict or other sources of violence, should be away from the course of torrents or water dams; community participation in family plot layout; allocation of adequate space per family; safe access to resources, such as food, water and firewood; and services, such as police, camp management offices, WASH, schools, markets and community centers; security lighting; safety and prevention; and establishment of child-friendly spaces. [3]

To the Ministry of Water and Environment (MWE):

- **Start-up formulation of environmental-climate policies with procedures** to support the implementation of Environmental Protection Law No. 26/1995. Additionally, the National Adaptation Program of Action (NAPA) should be updated.
- The focus should be on climate risk management according to potential scenarios for Yemen over the next five years. This will contribute to decision-making based on climate data and the development of appropriate plans to mitigate and adapt to these risks.
- The role of the Environmental Protection Authority in climate action should be reinforced, and it should be linked to climate stations in order to contribute to the preparation of risk

[3] According to standards of the Global Protection Cluster Working Group, (2010). Handbook for the Protection of IDP, (UNHCR).

assessment reports for flood water collection areas, in particular those situated in close proximity to population centers.

- The Ministry of Water and Environment must require international and local organizations and industrial companies to comply with the requirements of Environmental Protection Law, the Water Law, the National Water Sector Strategy and Investment Program (NWSSIP), when implementing wells, WASH, energy or other projects, in order to ensure the preservation of the environment and resources and the sustainable utilization of resources.
- Improving the quality of national data and reports on Yemen's vegetation cover, so that data is followed up by monitoring areas of decline in vegetation cover and fertile land and soil, and proposing solutions to address the environmental degradation.

To the Local Authorities in all Governorates:

- Coordinate with actors to establish an early warning system for storms and floods to include all governorate centers and districts.
- Establish a climate emergency room in each governorate. The function of this room would be to collect climate data and meteorological warnings from national authorities, with a view to sharing these warnings with local residents through communication and media (SMS, radio, TV, platforms, and social media sites), including displacement camps in the governorate.
- Prepare a disaster management contingency plan at the local level in coordination with relevant actors, with a particular focus on the largest flood-prone IDP shelter sites.
- Strengthening local capacities in DRR, with a focus on early flood preparedness in displaced communities.
- Limit haphazard construction practices in general, prevent the establishment of IDP camps on non-state land to avoid future social conflicts.
- Promote reforestation and tree planting activities in the governorates, including displacement sites and desertified areas.

SECONDLY: Recommendations to the Donors:

- Providing technical support to the Ministry of Water and Environment, and capacity building support in the preparation of Yemen's climate governance strategy, with the participation of all relevant parties, including the most vulnerable groups in climate-affected communities.
- Provide the Yemeni Meteorological Authority with climate change analytical modeling tools to enable the development of national and local climate scenarios, as well as risk and disaster planning.
- Supply the necessary equipment, tools, and technical devices to local institutions specializing in disaster management (e.g., Civil Defense Authority, Environmental Protection Authority, Geological Survey Authority, Earthquake Monitoring Center) to enhance their capacity for disaster risk reduction in vulnerable communities.
- Investing in adaptation programs that meet the needs of all sectors, and support innovative community-led initiatives. This contributes to the reduction of climate vulnerability in the most vulnerable communities.
- Leverage the existing partnership with the actors to support the expansion of the early warning systems that implemented in Sana'a and Hadhramout , to include expanding these systems in all affected governorates, in addition to biodiversity areas and nature reserves such as Socotra and Al-Maharah.

THIRD: Recommendations to UN Agencies:

To the Office of the Resident Coordinator (RC) and the UN Country Team (UNCT)

- Adopt contingency planning and disaster risk reduction in all IDP camps in Yemen.
- Support the Executive Unit for IDPs (EXUIDP) on the issue of camps threatened with urgent forced eviction, and ensure the safety of IDPs living in these camps.
- Urge organizations and humanitarian partners in Yemen to apply environmental, social and governance standards to reduce the environmental and social risks that may result from their

projects. While seeking to develop measurable indicators on an annual basis, ensuring the preservation of the environment, climate and natural resources on the one hand, and on the other hand maintaining the reputation and social acceptance of these organizations.
- Promote a climate justice approach, and the governance of risks and social tensions resulting from climate displacement, which may lead to the creation of conditions that increase the likelihood of widespread environmental degradation.
- Channel part of the support towards innovative solutions and creative initiatives that enhance the adaptation and resilience of displaced communities within their temporary communities.

To the United Nations Development Programme (UNDP):

- Increase support for livelihoods programs targeting IDPs in affected areas, providing employment opportunities that improve the income of displaced families while enhancing climate adaptation and resilience.
- Direct some funding to innovative solutions and climate action initiatives to strengthen the adaptation and resilience of vulnerable communities in Yemen.
- Support capacity-building activities on climate action for civil society organizations, institutions, small/medium-sized enterprises, and community-based initiatives to enhance resilience, adaptation, and mitigation.
- Continue to support the transition to renewable energy sources and invest in improving energy efficiency in local communities.

To the International Organization for Migration (IOM):

- Develop a climate emergency plan for all internal displacement sites, including sites managed by the International Organization for Migration.
- Provide adequate rainwater drainage systems and WASH services in camps..
- Provide EWS systems and firefighting equipment to displacement camps, especially the denser ones, including sites managed by IOM.
- Invest in the development of social sectors and the protection of the most vulnerable groups.

To the United Nations Office for the Coordination of Humanitarian Affairs (OCHA):

- Establish a unified coordination mechanism between UN agencies, the Executive Unit for IDP Camps and local authorities to address the data gaps on climate-induced displacement and humanitarian needs. Ensure that the data collected is comprehensive, covering the phenomenon, its impacts and proposed solutions.
- Improving estimates on the number of IDPs in the context of climate change in Yemen. Data should be more transparent, comprehensive, and disaggregated on the patterns and drivers of climate-induced internal displacement.
- Effectively involve key stakeholders, namely IDPs (including women, Muhamasheen, people with disabilities and the host community) in the assessment and monitoring of needs, and find solutions that are tailored to their specific challenges and needs.

References

A beach in Socotra Island.
© Holm Akhdar./ Walid Haddar.

List of **References**

Acacia Water. (2021). *Water Availability in Yemen - Final report.* Retrieved from United Nations Development Programme UNDP: https://www.undp.org/sites/g/files/zskgke326/files/migration/ye/Water-Availability-Study-in-Yemen.pdf

al-Akwa, K., & Zumbrägel, T. (2021). *The Disaster of Yemen's Flash Floods: Impact of and Local Responses to the Torrential Rains and Flooding in 2020.* Retrieved from Center for Applied Research in Partnership with the Orient (CARPO): https://carpo-bonn.org/wp-content/uploads/2021/12/carpo_brief_21_07-12-21_EN.pdf

Al-Hakimi, M. (2018). *Yemen: Conflict and Climate Change*. Retrieved from Holm Akhdar: https://holmakhdar.org/reports/433/

Al-Khalidi, A.-W., & Bazraa, M. (2012). *The National Report on the Status of Genetic Resources of forest and woodland in Yemen.* Retrieved from Ministry of Agriculture and Irrigation, Yemen: https://ye.chm-cbd.net/national-report-status-genetic-resources-forest-and-woodland-yemen

Al-Khorasani, M. (2005). *Agricultural Climate Guide in Yemen (1881-2004).* Retrieved from Agriculture Research and Extension Authority: https://area.gov.ye/uploads/topics/16891144706280.pdf

Al-Salehi, M. (2022). *Yemen: Groundwater Depletion and Possible Solutions*. Retrieved from Holm Akhdar Foundation: https://holmakhdar.org/wp-content/uploads/2022/05/EN_Yemen_GroundwaterDepletion__Possible_Solutions_HolmAkhdar.pdf

Alshamiry, F. (2023). *Climate change in Yemen: risks, realities and solutions*. Retrieved from commonspace.eu. 9 February 2023: https://www.commonspace.eu/young-voices/climate-change-yemen-risks-realities-and-solutions

Al-Yabari, H. (2022). *Yemen: Cooking Gas Crisis Aggravates Logging*. Retrieved from Holm Akhdar: https://holmakhdar.org/reports/5609/

Barry, S., McMurray, S., & Schmelzer, N. (2024). *Weathering Risk: Integrating Climate Security into Policy Frameworks: Roadmap for Yemen.* Retrieved from adelphi research, Germany: https://weatheringrisk.org/sites/default/files/document/Integrating_Climate_Security_into_Policy_Frameworks_Roadmap_Yemen.pdf

Berghof. (2021). *Local Governance in Yemen: Al Mahra*. Retrieved from Berghof: https://yemenlg.org/governorates/al-mahra/

Cazabat, C. (2021). *Addressing Internal Displacement in the Context of Climate Change.* Retrieved from Internal Displacement Monitoring Centre IDMC, Switzerland: https://api.internal-displacement.org/sites/default/files/publications/documents/IDMC_SlowOnsetTypology_final.pdf

CCCM . (2023). *YEMEN - National Cluster Strategy 2023*. Retrieved from Camp Coordination Camp Management (CCCM): https://data.unhcr.org/en/documents/details/98374

CCCM Cluster. (2024). *Yemen - CCCM Cluster IDP Sites Master List (March 2024)*. Retrieved from Operation Data Portal: https://data.unhcr.org/en/documents/details/108242

CCCM Yemen & REACH. (2024). *National IDP Site Flood Hazard-Analysis - Methodology note - Mar 2024.* Retrieved from ODP: https://data.unhcr.org/en/documents/details/108238

CCCM Yemen. (2023). *Situation Yemen: CCCM Overview*. Retrieved from UNHCR Operation Data Portal: https://data.unhcr.org/en/situations/yemen_cccm

CEOBS. (2021). *Report: Groundwater depletion clouds Yemen's solar energy revolution*. Retrieved from The Conflict and Environment Observatory. UK: https://ceobs.org/groundwater-depletion-clouds-yemens-solar-energy-revolution/

CIG. (2022). *Climate Inequality*. Retrieved from (Climate Impacts Group) University of Washington: https://cig.uw.edu/learn/inequities-in-climate-impacts/

DCAF. (2022). *Women Speak: The Lived nexus between climate, gender and security.* Retrieved from Geneva Centre for Security Sector Governance: https://www.dcaf.ch/sites/default/files/publications/documents/WomenSpeak2022_EN_FINAL.pdf

EPA. (2018). *Third National Communication to the Conference of the Parties to the UNFC on Climate Change.* Retrieved from Environmental Protection Authority, Yemen: https://unfccc.int/sites/default/files/resource/3490581_Yemen-NC3-2-Yemen_TNC_2018_Final.pdf

ESCWA. (2023). *Country Study: Development challenges in Yemen*. Retrieved from United Nations Economic and Social Commission for Western Asia: https://www.unescwa.org/sites/default/files/pubs/pdf/case-study-development-challenges-yemen-english_1.pdf

EXUIDPs. (2013). *National Policy for Addressing Internal Displacement in the Republic of Yemen.* Retrieved from Executive Unit for IDP Camps Management, Yemen: https://www.refworld.org/legal/decreees/natlegbod/2013/en/120331

EXUIDPs. (2024). *Emergency Report on a Devastating Sandstorm in Al Anad Camp, Tuban District, Lahj Governorate.* Retrieved from Executive Unit For IDPs Camps Management: https://www.exuye.org/cmlib/uploads/2024/07/exuye-org-2024-07-09_18-54-03_698037.pdf

EXUIDPs. (2024). *Humanitarian Needs Report for Displaced Persons in Yemen, May 2024*. Retrieved from Executive Unit for IDPs Camps Management: https://www.exuye.org/en/2073

FAO. (2015). *Tropical Cyclone Chapala (28 Oct - 4 Nov 2015).* Retrieved from Desert Locust Information Service: https://www.fao.org/ag/locusts/common/ecg/2312/en/1511_chapalaE.pdf

Friedman, T. (2013). *Postcard from Yemen: Taiz*. Retrieved from The New York Times: https://www.nytimes.com/2013/05/08/opinion/friedman-postcard-from-yemen.html

Furlow, R. (2022). *Addressing the politics of the climate–migration–conflict link.* Retrieved from Forced Migration Review Journal Issue: 69, University of Oxford: https://ora.ox.ac.uk/objects/uuid:357482ca-bdb7-485a-b5dc-0310c56c1007

GFDRR. (2020). *Republic of Yemen: Wildfire*. Retrieved from Global Facility for Disaster Reduction and Recovery: https://www.thinkhazard.org/en/report/269-republic-of-yemen/WF

Hanna, T., Bohl, D., & Moyer, J. (2021). *Assessing the Impact of War in Yemen: Pathways for Recovery.* Retrieved from UNDP: https://recovery.preventionweb.net/media/90425/download?startDownload=20240510

Henderson, M. (2023). *Climate Landscape Analysis for Children in Yemen.* Retrieved from United Nations Children's Fund (UNICEF), Yemen: https://www.unicef.org/yemen/media/9661/file/CLAC%20Report%20-%20Full%20Version.pdf

Holm Akhdar. (2020). *Yemen: Climate Change Exacerbates High Incidence of Fevers*. Retrieved from Holm Akhdar: https://holmakhdar.org/news/investigations/3459/

Holm Akhdar. (2020). *Yemen: War on Animals Amid the Civil War*. Retrieved from Holm Akhdar: https://holmakhdar.org/news/investigations/3508/

Holm Akhdar. (2021). *The Tampering and intentional destruction of Socotra island,*. Retrieved from Holm Akhdar: https://holmakhdar.org/reports/4213

Holm Akhdar. (2021). *YEMEN: DISASTERS OF OIL TANKERS*. Retrieved from Holm Akhdar: https://holmakhdar.org/resources/4423/

ICRC. (2020). *When rain turns to dust.* Retrieved from International Committee of the Red Cross: https://shop.icrc.org/when-rain-turns-to-dust.html?___store=en

ICRC. (2022). *Making Adaptation Work.* Retrieved from International Committee of the Red Cross: https://shop.icrc.org/making-adaptation-work-pdf-en.html

IDMC. (2020). *Global Report on Internal Displacement.* Retrieved from The Internal Displacement Monitoring Centre (IDMC): https://api.internal-displacement.org/sites/default/files/publications/documents/2020-IDMC-GRID.pdf

IDMC. (2023). *Global Report on Internal Displacement and Food Security.* Retrieved from The Internal Displacement Monitoring Centre (IDMC): https://www.preventionweb.net/media/89670/download?startDownload=20240509

IDMC. (2024). *Country Profile: Yemen: Internal Displacements, Conflict, Violence Disasters. (2008 - 2022)*. Retrieved from Internal Displacement Monitoring Centre (IDMC): https://www.internal-displacement.org/countries/yemen/

IFRC. (2021). *Yemen: Dengue Fever Outbreak (DREF n° MDRYE008) - Final Report.* Retrieved from International Federation of Red Cross: https://reliefweb.int/report/yemen/yemen-dengue-fever-outbreak-dref-n-mdrye008-final-report-05-march-2021?gad_source=1&gclid=Cj0KCQjwiYOxBhC5ARIsAIvdH50t3EdUfJTcSDncVxLhRnQZK8y-tRBO90bQqxXEs5ERbNyy-kgQHksaAkPkEALw_wcB

IFRC. (2024). *Yemen: Flood Operation Update 01 (14 Nov 2024).* Retrieved from International Federation of Red Cross: https://reliefweb.int/report/yemen/yemen-flood-operation-update-1-mdrye014

IFRC. (2024). *Yemen: Floods-Simplified Early Action Protocol.* Retrieved from International Federation of Red Cross: https://reliefweb.int/report/yemen/yemen-floods-simplified-early-action-protocol-mdrye015

IOM. (2015). *Yemen - Cyclone Chapala and Megh Displacement Dashboard.* Retrieved from International Organization for Migration (IOM): https://dtm.iom.int/reports/yemen-%E2%80%94-cyclone-chapala-and-megh-displacement-dashboard-13-november-2015

IOM. (2023). *Report on Migration, Environment, and Climate Change in Yemen.* Retrieved from International Organization for Migration: https://environmentalmigration.iom.int/sites/g/files/tmzbdl1411/files/documents/2024-03/yemen-desk-review.pdf

IPCC. (2018). *Special Report on the impacts of global warming of 1.5°C. Annex I: Glossary.* Retrieved from The Intergovernmental Panel on Climate Change (IPCC) : https://www.ipcc.ch/site/assets/uploads/sites/2/2022/06/SR15_AnnexI.pdf

IRIN News. (2008). *Floods wreak havoc in southeast*. Retrieved from The New Humanitarian, 26 October 2008: https://www.thenewhumanitarian.org/news/2008/10/26/floods-wreak-havoc-southeast

Jamil, N. (2008). *Landslides in Yemeni Mountain Roads, their Causes and How to Reduce their Recurrence.* Retrieved from Journal of Science and Technology,, University of Science & Technology, Yemen. Volume 13, Issue 1: https://journals.ust.edu/index.php/JST/article/view/138

Khalil, Y. et al. (2023). *Estimating landslide hazard distribution based on machine learning and bivariate statistics in Utmah Region, Yemen*. Retrieved from Natural Hazards journal 120, 2869–2907 (2024): https://doi.org/10.1007/s11069-023-06310-5

Ministry of Foreign Affairs, Netherlands. (2019). *Climate Change Profile: Yemen.* Retrieved from Govt. Netherlands: https://reliefweb.int/report/yemen/climate-change-profile-yemen

Ministry of Oil and Minerals. (2020). *About Yemen*. Retrieved from Ministry of Oil and Minerals, Aden, Yemen: https://mom-ye.com/site-en/%d8%b9%d9%86-%d8%a7%d9%84%d9%8a%d9%85%d9%86/

Mullen, J. (2015). *Tropical cyclone dumping years' worth of rain on war-torn Yemen in one day*. Retrieved from CNN Network: https://edition.cnn.com/2015/11/03/middleeast/yemen-tropical-cyclone-chapala/

NIC. (1995). *Law No. 26 of 1995 on Environmental Protection in Yemen*. Retrieved from National Information Center, Yemen: https://yemen-nic.info/db/laws_ye/detail.php?ID=6715

NWRA. (2021). *Current Water Status in Yemen (Workshop on Water Resources Management).* Yemen, October (10 -11) 2021: National Water Resources Authority.

OCHA. (2018). *Yemen: Cyclone Luban Flash Update (21 October 2018)*. Retrieved from United Nations Office for the Coordination of Humanitarian Affairs OCHA: https://www.unocha.org/publications/report/yemen/yemen-cyclone-luban-flash-update-3-21-october-2018-enar

OCHA. (2019). *Yemen: Cyclones Kyarr and Maha*. Retrieved from United Nations Office for the Coordination of Humanitarian Affairs: https://reliefweb.int/report/yemen/yemen-cyclones-kyarr-and-maha-1-november-2019-enar

OCHA. (2023). *Yemen: Situation Update - Cyclone Tej*. Retrieved from the United Nations Office for the Coordination of Humanitarian Affairs (OCHA), 5 November 2023: https://www.unocha.org/publications/report/yemen/yemen-situation-update-cyclone-tej-5-november-2023-enar

OCHA. (2024). *Humanitarian Needs Overview ,Yemen.* Retrieved from United Nations Office for the Coordination of Humanitarian Affairs (OCHA): https://reliefweb.int/attachments/44442ea5-fc3d-42ec-ae23-00d52233c561/Yemen_HNO_2024.pdf

OCHA. (2024). *Yemen: Flash Flood Update No. 03 (Milhan District, Mahwit Governorate).* Retrieved from United Nations Office for the Coordination of Humanitarian Affairs (OCHA): https://www.unocha.org/publications/report/yemen/yemen-flash-flood-update-no-03-milhan-district-mahwit-governorate-29-august-2024-enar

REACH. (2024). *Yemen – 2023 Trends Analysis Report (Multi-sectoral analysis of the evolving service access, gaps & needs of IDPs in managed sites in southern Yemen.* Retrieved from REACH: https://repository.impact-initiatives.org/document/reach/e71e815f/YEM1903b_SMT_Trends-Analysis-Report-2023_February2024.pdf

REACH. (2024). *Yemen: CCCM IDP Site Flood Hazard Exposure Analysis - IDP Sites in Marib Governorate – Report.* Retrieved from REACH & CCCM Cluster: https://reliefweb.int/report/yemen/yemen-cccm-idp-site-flood-hazard-exposure-analysis-idp-sites-marib-governorate-report-may-2024

Reuters. (2015). *Yemen cyclone kills 13 on Socotra island, hits mainland*. Retrieved from Reuters (Nov, 10, 2015): https://www.reuters.com/article/world/yemen-cyclone-kills-13-on-socotra-island-hits-mainland-idUSKCN0SZ0RN/

Sinha, S. e. (1999). *DAMAGING FLUCTUATIONS, RISK AND POVERTY: A REVIEW.* Retrieved from ResearchGate: https://www.researchgate.net/publication/241676900_A_REVIEW

Sturridge, C., & Holloway, K. (2022). *Climate change, conflict and displacement: five key misconceptions. HPG briefing note.* Retrieved from Humanitarian Policy Group & ODI: https://www.preventionweb.net/media/83045/download?startDownload=20241107

UN. (2022). *The World Health Organization steps up assistance to flood-ravaged Yemen*. Retrieved from United Nations: https://news.un.org/en/story/2022/08/1124862

UNDP. (2022). *Yemen's First Centre for Infectious Diseases Inaugurated in Hodeidah*. Retrieved from United Nations Development Programme (UNDP), Aug 08, 2022 Yemen: https://www.undp.org/yemen/stories/yemens-first-centre-infectious-diseases-inaugurated-hodeidah

UNDP. (2023). *The Climate Dictionary: An everyday guide to climate change*. Retrieved from Climate Promise, United Nations Development Programme (UNDP): https://climatepromise.undp.org/news-and-stories/climate-dictionary-everyday-guide-climate-change

UNDP. (2023). *The Impact of Climate Change on Human Development in Yemen.* Retrieved from United Nations Development Programme (UNDP), Yemen: https://www.undp.org/yemen/publications/impact-climate-change-human-development-yemen

UNDRR. (2022). *Global Assessment Report on Disaster Risk Reduction 2022: Our World at Risk: Transforming Governance for a Resilient Future.* Retrieved from United Nations Office for Disaster Risk Reduction, Geneva: https://morocco.un.org/sites/default/files/remote-resources/49f1555ef750eb856c133e907c6cc0fa.pdf

UNESCO. (2022). *Nature and People in the Socotra Archipelago.* Retrieved from the United Nations Educational, Scientific and Cultural Organization (UNESCO): https://unesdoc.unesco.org/ark:/48223/pf0000381003

UNFCCC. (2016). *Introduction to Climate Finance*. Retrieved from United Nations climate change (UNFCCC): https://unfccc.int/topics/introduction-to-climate-finance

UNFPA. (2023). *UNFPA Humanitarian Response in Yemen.* Retrieved from United Nations Population Fund: https://www.unfpa.org/sites/default/files/resource-pdf/2023_UNFPA_Yemen_Humanitarian_Response_Brochure-EN.pdf

UNHCR . (2024). *Yemen: Operation Data Portal*. Retrieved from Data UNHCR: https://data.unhcr.org/en/country/yem

USAID. (2024). *Yemen: Complex Emergency. Fact Sheet (10) .* Retrieved from reliefweb: https://reliefweb.int/report/yemen/yemen-complex-emergency-fact-sheet-10-fiscal-year-fy-2024

Vuylsteke, S. (2021). *The Myth of Data in Yemen.* Retrieved from Sana'a Center for Strategic Studies, Sana'a, Yemen: https://sanaacenter.org/files/When_Aid_Goes_Awry_02_The_Myth_of_Data_in_Yemen_en.pdf

WFP. (2024). *What's Happening in Yemen? An Explainer on the Conflict and Its Impact on Civilian*. Retrieved from World Food Program, USA: https://www.wfpusa.org/articles/whats-happening-yemen-explainer-conflict-impact-civilians/

WHO. (2018). *Safeguarding health during storm season: preparedness and emergency response in the Gulf of Aden*. Retrieved from The World Health Organization (WHO): https://www.emro.who.int/media/news/safeguarding-health-during-storm-season-preparedness-and-emergency-response-in-the-gulf-of-aden.html

WHO. (2019). *Mosquito sterilization offers new opportunity to control chikungunya, dengue, and Zika*. Retrieved from World Health Organization (WHO), 14 November 2019: https://www.who.int/news/item/14-11-2019-mosquito-sterilization-offers-new-opportunity-to-control-chikungunya-dengue-and-zika

WMO. (2006). *Technical Regulations. Volume III: Hydrology, WMO No. 49.* Retrieved from World Meteorological Organization (WMO): https://www.gov.br/ana/pt-br/assuntos/monitoramento-e-eventos-criticos/monitoramento-hidrologico/orientacoes-manuais/entidades/49_vol-iii_ed-2006_en.pdf

World Bank & GFDRR. (2009). *Damage, Loss and Needs Assessment of the Hadramout and Al-Mahara floods, Republic of Yemen.* Retrieved from World Bank: https://www.preventionweb.net/media/75382/download?startDownload=20240621

World Bank & GFDRR. (2010). *Probabilistic risk assessment studies in Yemen.* Retrieved from World Bank & Global Facility for Disaster Reduction and Recovery: https://www.geonode-gfdrrlab.org/documents/680/link

World Bank. (2010). *Yemen National Probabilistic Risk Assessment: Historical Hazard Data Review, Analysis and Data Quality Assessment.* Retrieved from The World Bank: https://www.geonode-gfdrrlab.org/documents/681/link

World Bank. (2023). *Climate Risk Country Profile: Yemen.* Retrieved from World Bank Group: https://climateknowledgeportal.worldbank.org/sites/default/files/country-profiles/16696-WB_Yemen%20Country%20Profile-WEB.pdf

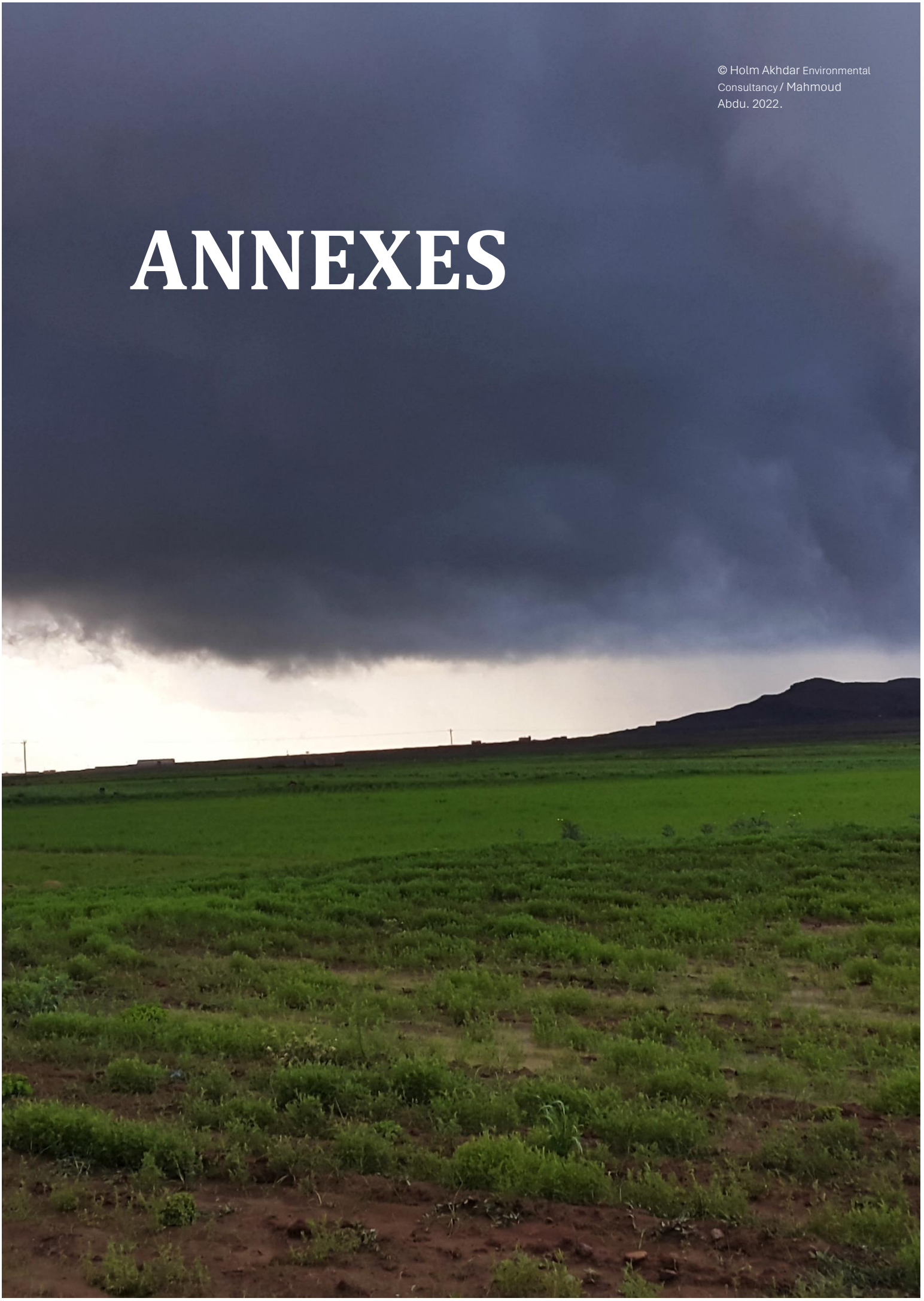
World Bank. (2023). *Population, total - Yemen, Rep*. Retrieved from World Bank Data: https://data.worldbank.org/indicator/SP.POP.TOTL?locations=YE

World Bank. (2024). *Yemen, Tropical Cyclones Historical*. Retrieved from Climate Change Knowledge Portal, World Bank: https://climateknowledgeportal.worldbank.org/country/yemen-rep/tropical-cyclones-historical

YFCA. (2023). *Climate change impacts on Yemen and adaptation strategies.* Retrieved from Yemen Family Care Association, Sana'a, Yemen: https://www.preventionweb.net/publication/climate-change-impacts-yemen-and-adaptation-strategies#:~:text=Desertification%20has%20reduced%203%2D5

Yuen et al. (2017). *Guide to Equitable, Community-Driven Climate Preparedness Planning.* Retrieved from Urban Sustainability Directors Network (USDN), USA: https://www.usdn.org/uploads/cms/documents/usdn_guide_to_equitable_community-driven_climate_preparedness-_high_res.pdf

Zaid, H. H., Jamaluddin, T. A., & Arifin, M. H. (2021). *Overview of slope stability, earthquakes, flash floods and expansive soil hazards in the Republic of Yemen*. Retrieved from Bulletin of the Geological Society of Malaysia: https://gsm.org.my/articles/702001-101898/



© Holm Akhdar Environmental Consultancy / Mahmoud Abdu. 2022.

ANNEXES

ANNEX 1

Questionnaire Forms

Annex 1: Questionnaire Form

The Impact of Climate Change on IDPs in Yemen

This survey aims to prepare a study by Holm Akhdar for Environmental Studies and Consultancy on the impact of climate change on IDPs in Yemen. The objective of this study is to raise awareness and understanding of the impact of climate change on IDPs in Yemen, and provide results and recommendations to local authorities, humanitarian organizations, and donors to contribute to solutions for the recurring climate displacement crisis in Yemen. The study will help improve humanitarian response and manage climate displacement, enhancing disaster risk preparedness efforts for IDP communities in the country. The data collected from this survey will be used solely to enrich the study with accurate information and will not be used for any other purposes.

For further information, please contact with Holm Akhdar for Environmental Studies and Consultancy at: contact@holmakhdar.com.

Sincerely,

Holm Akhdar for Environmental Studies and Consultancy

Demographic information: (Check the appropriate answer ×)

- **Governorate:** ◯ Marib ◯ Hajjah ◯ Al Maharah ◯ Socotra
- **Gender**: ◯ Male ◯ Female
- **Age**: ◯ 18 - 25 years ◯ 26 - 40 years ◯ 41 - 60 years ◯ 60 years and above.
- **Marital Status**: ◯ Single ◯ Married ◯ Divorced ◯ Widowed
- **Education Level**: ◯ Primary and below ◯ Secondary ◯ Bachelor's ◯ Master's ◯ PhD
- **Occupation**: ◯ Farmer ◯ Employee ◯ Laborer ◯ Freelance ◯ Other: _____
- **Current Residence**:

◯ In an IDP camp.
◯ Tent in the open (outside the camp).
◯ In a damaged house.
◯ Rented accommodation.
◯ Private property.
◯ At a relative's/family member's house (hosting).

Section 1: Displacement drivers

- **What caused your displacement?**

◯ War, conflict, and instability.
◯ Floods and/or landslides *(housing damage)*
◯ Drought, Lack of rain and water scarcity *(livelihood and income damage)*
◯ Other: .....

- **How long have you been displaced?**

◯ Less than a year. ◯ One to two years. ◯ More than two years.

- **Did you displace with your family?**

◯ Yes ◯ No

- **How many family members did you displace with?**

Number: _____ children: _____ youth: _____ elderly: _____

Section 2: IDPs community awareness of climate change

- Have you heard about climate change before?

◯ Yes ◯ No

- **If yes,** what is your level of knowledge about climate change?

◯ Good ◯ Medium ◯ Weak ◯ I don't know.

Simplified Understanding of Climate Change in Yemen

Climate change in Yemen is characterized by various environmental impacts, including changes in precipitation, temperature, solar radiation, humidity, evaporation, wind speed, and atmospheric pressure. These climate-driven phenomena have manifested as waves of drought, rising temperatures, altered precipitation patterns (e.g., rain, hail, snow), sudden floods, and intensified monsoon winds caused by low-pressure systems and storms. Additionally, fluctuations in atmospheric and ground humidity which have contributed to the spread of diseases and pests, affecting both human health and the broader environment. The increased evaporation of soil and surface water, coupled with rising sea levels, are further consequences of the climate change observed in Yemen.

- What is your level of interest in climate change?

◯ Good ◯ Medium ◯ Weak ◯ Not interested.

- Have you noticed any climate changes in your camp or area?

◯ Yes ◯ No

- **If yes,** what are the main changes you have observed in your area?

☐ Cyclones and storms
☐ Flash floods
☐ Drought and increased desertification
☐ Temperature changes (increase)
☐ Changes in precipitation
☐ Water depletion *(such as lowering water levels in wells)*
☐ Increased water salinity
☐ Landslide and/or Soil erosion

Section 3: impact of climate change on the IDP community

- Have weather and climate changes such as (storms, floods, or high temperatures) led to your displacement at any time?

◯ Yes ◯ No

- Have climate changes like (storms, floods, and landslide) affected your daily life or community?

◯ Yes ◯ No

- **If yes,** have these changes led to any of the following in your area? (Check the answer)

☐ Change in vegetation cover and land degradation
☐ Depriving girls and boys from attending school
☐ Explosives or mines drifting into displacement areas
☐ Increased social tensions and conflict
☐ Loss of job opportunities
☐ Demolished health centers and schools

- ☐ Disruption of livelihood and source of income
- ☐ Intensified water scarcity and cost
- ☐ Food shortage and inaccessible relief aid
- ☐ Difficulty to access resources and markets
- ☐ Impacted communication network
- ☐ Road erosion
- ☐ Collapsed electrical grid & disrupted solar energy system
- ☐ Infections/diseases & fevers due to climate changes
- ☐ Housing/shelter destruction
- ☐ Home and camp fires
- ☐ Other/ Specify: .....
  .....

■ Have the heavy rainfalls impacted your place / site?

◯ Yes ◯ No

■ Have the intense storms and strong winds affected your tent or your camp?

◯ Yes ◯ No

■ Have the flash floods swept away your tent, shelter or other tents within your camp?

◯ Yes ◯ No

■ Have the flash floods affected your access to water, and/or the wells that you rely on?

◯ Yes ◯ No

■ Have the flash floods hindered your ability to access services such as (WASH or health facilities)?

◯ Yes ◯ No

■ **In your opinion:** What are the most important systemic factors that you believe have contributed to the exacerbation of the negative impacts of climate change on IDP and communities in Yemen? *(You can select more than one answer)*

- Failure to allocate climate emergency funding ☐
- Lack of environmental and climate policies ☐
- Absence of environmental governance and weak institutional capacity ☐
- Absent of climate action and weak environmental responsibility towards the community ☐
- Absence of Early warning systems for DRR ☐
- Insufficient grants and financial resources needed to address climate change ☐
- Limited local capacity building programs in the DRR ☐
- Split of authorities and organizational conflicts ☐
- Limited public and official awareness of the severity of climate change ☐
- Insufficient international support to Yemen in climate action ☐

■ **In your opinion,** what are the potential future concerns and/or threats that you anticipate IDP communities (in your region) will face as a result of extreme climate change? *(You can select more than one answer)*

Destabilization of local communities at large	☐
Increased mortality rates in displacement camps	☐
Increased rates of forced migration due to weather (climate-induced displacement)	☐
Improved adaptive capacity and stabilization of the IDPs	☐
Highly inequitable access to water resources	☐
Continued risk of disasters (such as floods, droughts, and disease outbreaks)	☐
Increased hunger and food insecurity	☐

Section 4 : Adaptation to climate change and the role of actors

■ Have you as an individual and/or community had to take any steps or measures to adapt to climate change, such as (heavy rainfall and floods, and/or drought and rising temperatures, and their consequences)?

◯ Yes ◯ No

■ **If yes:** What steps/actions have you and your community taken to adapt to climate change? **Have you:**

☐ Using alternative techniques and resources, including solar energy.
☐ Shelter change within the same region
☐ Displaced to a safer region
☐ Change the occupation (work) you were engaged in
☐ Cooperated with the IDPs community and/or host community to mitigate the risk of climate

■ Have the local authorities in your region taken any adaptation measures to mitigate the effects of climate change, particularly flash floods?

◯ Yes ◯ No

■ **If yes,** Have they implemented any of the following measures:

☐ Directing immediate assistance to rescue the IDPs from the effects of climate change
☐ Awareness-raising on the need to take necessary precautions to face the effects of floods before the disaster occurs
☐ Providing sustainable projects and solutions to address climate change
☐ Other, please specify: .....

■ In your opinion, was what the authorities and relief organizations in your camp have done sufficient to address or mitigate the effects of climate change?

◯ Yes ◯ No

■ **If yes,** Have any of these actions/measures been taken by the local authorities, local and international organizations in your region/community?

	Yes	No
Raising awareness about the risks of climate change	◯	◯
Taken actions or measures to mitigate the climate risks	◯	◯
Implementing projects to protect against the risks of climate change	◯	◯
Increasing green spaces at the regional/governorate level	◯	◯
Prompt response and provision of necessary assistance in the event of disasters	◯	◯
Addressing the root causes of environmental issues	◯	◯

Other/Specify: .....

■ What measures or actions do you believe the government and its local authorities should take to mitigate the impact of climate change on the IDPs and their communities?
(You can select more than one answer)

- Improve preparedness and readiness processes ☐
- Develop an emergency response strategy ☐
- Provide emergency shelters for the IDPs ☐
- Enhance food security and access to clean water ☐
- Develop programs for reconstruction and the IDPs' return ☐
- Provide education and healthcare services in the areas being reconstructed. ☐
- Supporting scientific research, development and innovation ☐
- Encourage technological innovations for climate change adaptation ☐
- Developing drought-resistant agricultural crops and modern techniques. ☐
- Install meteorological and early warning stations ☐

■ In your opinion: What interventions and/or actions do you think it is important to support by international organizations and donors to enhance resilience and adaptation to climate change in Yemen? *(You can select more than one answer)*

- Allocate support and resources to climate emergency response projects and plans. ☐
- Support the establishment of a National Climate Emergency and Early Warning Center in Yemen. ☐
- Support the transition to renewable energy sources, solar energy. ☐
- Invest in improving energy efficiency. ☐
- Increase support for livelihood programs for the IDPs. ☐
- Invest in the development of social sectors and the protection of the most vulnerable groups in society. ☐

Other / Specify: .....
.....

Thank you very much for your time and cooperation.

ANNEX 2

Focus Group Discussion (FGDs) Guide

Annex 2: Focus Group Discussion (FGDs) Guide

This document provides guidance to facilitators on running an effective focus group discussion (FGDs), including organization, and roles, as well as questions to ask to help you plan a IDPs community engagement session.

Guidelines for Facilitators

- The need to inform the relevant local officials about the purpose of the discussion and study, the collection of data and the explanation of the tools used.
- Get clear consent from people to participate before starting a focus group in IDP camps.
- The facilitator and note-taker should start by introducing himself, giving an overview of the study, its purpose, and the body issuing it.
- The facilitator and note-takers should ensure that they understand the fluency of speaking the popular language or dialect of community members.
- The note-taker should write the name of the camp, the location, the governorate and the date on which the discussion session will take place.
- Conducting a focus group discussion with a maximum of 6-8 participants, for a period not exceeding one to one and a half hours.
- Try to avoid having participants selected by community leaders if it could lead to bias.
- Avoid excluding any participant. Taking into account the scientific and cognitive disparity between the participants. And treat everyone the same.
- Be prepared to discuss any topics mentioned by the participants, even if they are not on the question form.
- Be sure to moderate the discussion and not engage in any controversy of a political, ethnic, religious or cultural nature with the participating community members.
- Give clear instructions to the discussion group participants to ensure conversation with the system (sit in a circle, turn off the phone, etc.)
- The note-taker, with the consent of all participants, must record the discussion by phone or audio recorder.

***Disclaimer:** Before the discussion, the facilitator should read this statement to the group participants.

Welcome, and hello everyone. I am [facilitator's name,] and this is my colleague [note-taker name] who will discuss you. On behalf of our team, thank you for agreeing to conduct this FGDs, for the purpose of preparing a study on the impact of climate change on displaced people in Yemen. We work at [Holm Akhdar for Environmental Studies and Consultancy], an environmental consulting firm, licensed by the Ministry of Industry and Trade of the Republic of Yemen, based in the Interim Capital, Aden. It seeks to make a positive impact in the field of environmental and climate policies. Promote environmental awareness, knowledge and responsibility by working with various business organizations, with the aim of establishing a common understanding of environmental and climate challenges in Yemen.

We are here today to discuss and understand the impact of climate change on internal displacement communities in Yemen. We will conduct this discussion with you to gain a deeper understanding of the context of climate change and its impacts on displacement communities, including your community and camp. Including the damage, you are exposed to, current needs and conditions, capabilities and perceptions. We want to benefit from your experiences and proposals, which will aim to serve the general interest of your community. We'll need to take some of the notes you make. o The duration of this discussion session with you is a maximum of 60-80 minutes. Allow us to clarify the following points:

- No personal data will be shared with others, and the information provided by you will be analyzed anonymously. The data will be treated with the utmost confidentiality.
- It should be noted that there are no correct or incorrect responses to the questions posed. Furthermore, respondents are at liberty to skip any question they are uncomfortable answering.
- Should you feel disinclined to continue the discussion, you are at liberty to withdraw at any point.
- Your participation in this focus group discussion (FGD) is entirely voluntary, and there is no obligation to respond, you can stop at any point.
- The responses and comments provided will be utilized solely for the purpose of producing the study and ensuring the accuracy and integrity of the information presented.
- Your contributions are invaluable and will inform the recommendations that emerge from this process. However, to maintain the integrity of the findings and recommendations, we will not attribute them to any individual or entity.

Thank you for helping us.

FGDs QUESTIONS	
Question	**Answer**
1. Have you ever heard or been informed about climate change? How did you know about it? What is your level of knowledge about it?	
2. Have these weather and climate changes in your locations caused losses and human and economic costs? *How can you describe it to us according to its seriousness?*	
3. What are the most important climate changes that have affected you, both at the regional level and at the level of the site (camp)? *Can they be arranged from top to bottom?*	
4. Have you, as individuals and as a community, faced any damage and risks from climate change?	
5. Have you taken any actions to enhance the resilience to climate change in your communities?	
6. Is the impact of climate change on IDPs equal, or were they different, and are there groups among IDPs that were more affected? *What about women and children?*	
7. Have actors (authorities and aid organizations) intervened to reduce the impact of climate events on displaced communities?	
8. What are the most important systemic factors that contribute to the negative impacts of climate threats on displacement communities in Yemen, including yours?	
9. In your opinion: What steps should be taken to help protect displaced communities from the effects of climate change?	
10. What recommendations can you make to the government and the international community to help IDP communities adapt to the impacts of climate change?	

ANNEX 3

An Interview Guide

Annex 3: Interviews Guide

Instructions and Guidelines Before Conducting Interviews

- Speak / communicate with the interviewee in simple language that everyone can understand.
- The interviewer must write a brief introductory note about the person/entity with whom the interview will be conducted.
- Before conducting the interview, the purpose of the research study must be clarified, and the tools used must be explained.
- Before starting the interview, clear consent must be obtained from the respondent and/or the responding entity.
- Be prepared to discuss any new topics mentioned by the interviewee, even if they are not included in the questions.
- Above all, obtain the guest's permission to record the discussion by phone or audio recording device.

***Note:** The interviewer should read this statement to the guest they will interview before conducting the interview:

Hello. I am [the interviewer's name] and I will be conducting the interview with you. On behalf of the Holm Akhdar for Environmental Studies and Consultancy team, thank you for agreeing to this interview for the purpose of preparing a study on the impact of climate change on the IDPs in Yemen. I will need to take some notes. We are trying to understand the impacts of climate changes on the IDPs in Yemen, in order to provide recommendations and solutions in a study on the impact of climate change on the IDPs in Yemen. We need your help to better understand the climate changes threatening IDPs, and how to address their effects. The duration of this interview will be a maximum of 45 minutes. Your participation in this interview is voluntary. To reassure you, there will be no resulting worry or harm as a consequence of your participation. If you wish not to have your name mentioned in the interview, your name or participation will not be mentioned. Let me clarify the following:

- There are no "correct" or "incorrect" answers to the questions we ask. You can skip any question you do not wish to answer.
- If you feel unwilling to continue and answer the questions, do not hesitate to end the interview and leave at any time.
- Your participation in this interview is voluntary. Your comments will only be used for the purpose of producing the research study.
- The outputs and results of the study will be published on the website of Holm Akhdar for Environmental Studies and Consultancy in February 2025.
- Some answers and comments you provide will be used in the research, but the findings or recommendations will not be attributed to names or individuals.
- Thank you in advance for the time you have given to help us understand the impact of climate change on the IDPs in your community and region.

Interview Questions:

1. First, we welcome you, and we would like you to introduce yourself and your organization/institution and the nature of the services you provide?
2. What are the main issues you work on, specifically issues related to climate change and/or IDP communities?
3. Based on your knowledge of climate change issues in the region/governorate you work in, how do you monitor them, what is the level of damage to communities and groups? Do you have statistics on climate disasters over the past five years?
4. What are the most prominent climate changes that have negatively affected, or are affecting, either at the regional level or the sector you work in? How can they be ranked from top to bottom?
5. What are the damages, losses, and human and economic costs that the governorate has experienced as a result of climate disasters?

6. Have the natural disasters triggered by climate change (storms, floods, droughts, and landslide) caused repeated displacement of people in the governorate? And what are the regions that have witnessed the most displacement as a result of that? How many were they? (Provide examples, if possible)
7. What are the sectors most severely affected by climate changes within the governorate?
8. In your opinion, how have climate changes affected the sector you work in, and what is the scale of the damage that has impacted the sector?
9. Have those climate changes impacted water sources, food security, and access to livelihoods in IDP camps? Explain that.
10. Were the climate impacts on the IDPs equal to the rest of the population in the governorate, or were they different? And are there certain (vulnerable) groups among the IDPs who were more affected than others?
11. Every year during the rainy seasons or unseasonal rains, there are recurring incidents of displacement of the population due to the collapse of their homes, or as a result of the torrents sweeping away the camp or damaging it. In your opinion, what are the reasons that contribute to the annual increase of these climate-related incidents on these communities?
12. Have you, within the framework of your institution/organization, taken any measures to enhance the capacity to adapt to the climate change impact within the governorate? And what are these measures or actions?
13. Have there been measures/actions taken by the local authorities and humanitarian organizations to mitigate the impacts of climate change incidents on the IDPs in the governorate? And were those interventions sufficient?
14. In your opinion, what are the most important systemic factors that contribute to increasing the negative effects of climate threats on IDP communities in Yemen?
15. Finally, what recommendations can you provide to the government, local authorities or to local and international relief organizations or donors, to help the IDPs in Yemen be resilient and adapt to the climate change impact, and to alleviate their suffering?

Thank you very much for your time and attention.

حلم أخضر
Holm Akhdar

Holm Akhdar for Environmental Studies & Consultancy

contact@holmakhdar.com
www.holmakhdar.com