SILENT CRISIS

INFORMATION, DECISION-MAKING, AND COMMUNITIES ON THE FRONTLINES OF CLIMATE CHANGE

By Stephanie Diepeveen PhD, Tanya Filer PhD, Eszter Czibor PhD, Tendai Ganduri, and Leila Molana-Allen

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Silent Crisis

Information, Decision-Making, and Communities on the Frontlines of Climate Change

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About StateUp

StateUp bridges the gap between the worlds of policy, technology, and climate change to address major public needs. We are a trusted partner in unlocking resilience and fostering public-purpose innovation for governments, sectors, countries, and communities. Our platforms, research, and networks enable diverse policy participants, from public servants to startups, to collaborate on systems-level problems, unlocking progress and democratizing policy participation. Systems-level change requires crossing disciplinary as well as sectoral silos, and our work is therefore underpinned by world-class expertise in public policy, technology, behavior change, and information environments. We work with international organizations, governments in every global region, research institutions, and firms. We believe context is key.

The report is co-authored by Dr. Stephanie Diepeveen, a Senior Research Fellow at ODI, Expert at StateUp, and Research Associate at the University of Cambridge, leading research on digital inclusion, governance and information environments; Dr. Tanya Filer, Founder and CEO of StateUp, an expert on technology and climate-focused policy innovation and information environments who leads StateUp's expert multidisciplinary team; Dr. Eszter Czibor, Head of Research at StateUp, shaping its research direction, and a University of Chicago-trained behavioural economist with a focus on robust policy design in areas demanding innovation to address critical public needs; Tendai Ganduri, an in-country researcher in Zimbabwe and doctoral candidate on climate change and disinformation; and Leila Molana-Allen, an accomplished journalist who has covered Iraq and the Middle East for The Telegraph, Economist, PBS and more. Drs. Filer and Diepeveen lecture on international relations, public policy, and information environments at the University of Cambridge.

This project was conducted by StateUp, in collaboration with ODI. ODI is an independent, global affairs think tank, which seeks to deliver high-quality, internationally recognized research that informs policy design and convenes leadership across the global challenges.

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About the Rooted in Trust Project

This research report was commissioned by the Rooted in Trust Project at Internews. Rooted in Trust is a global pandemic information response project that, since 2020, has aimed to address the rapid spread of rumors and misinformation related to health issues during and after the COVID-19 pandemic. It focuses on assisting crisis-affected communities in 15 countries, including Afghanistan, Brazil, Central Africa Republic, Colombia, DRC, Haiti, Iraq, Lebanon, Madagascar, Mali, the Philippines, South Sudan, Sudan, Yemen, and Zimbabwe. The project is funded by the USAID Bureau of Humanitarian Assistance (BHA) and managed by Internews.

The Rooted in Trust methodology is embedded in a broad understanding of accountability towards affected populations, ensuring that communities' information needs, questions and experiences guide risk communication and community engagement responses. Our approach acknowledges the key role of community structures (civil society organizations (CSOs), associations, local media) to lead prioritization of content, adaptation, and dissemination. Finally, it aims at informing other levels of decision-making on communities' needs, with the overall goal of program adaptation and greater participation of communities. Rooted in Trust's work consists of four main streams: (1) Understanding the Information Ecosystem, (2) Tracking Misinformation, (3) Fostering two-way communication through community engagement and local media work, and (4) Liaising and providing evidence for greater accountability to affected populations (AAP) and trust-building.

As the project approaches its end, Rooted in Trust has undertaken and commissioned several research projects to broaden its knowledge base and explore future potential applications of lessons learned. These research efforts delve into the application of the Rooted in Trust methodology in various humanitarian concerns, stages of emergency response, and less-explored drivers of trust and misinformation. This specific piece centers on the strategic opportunity to investigate an information ecosystem approach and the **role of listening** to communities in early warnings, responses, and adaptations to the impact of climate crises in humanitarian contexts.

Acknowledgements

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Glossary

Climate change / global environmental change – changes in the physical and biogeochemical environment, either caused naturally or influenced by human activities such as deforestation, fossil fuel consumption, urbanization, land reclamation, agricultural intensification, freshwater extraction, fisheries over-exploitation and waste production." (Leemans et al., 2009).

Climate change impacts - An observable consequence or effect on the environment, ecosystems, societies, and economies resulting from shifts in climate patterns and conditions, including rising temperatures, altered weather patterns, and sea level rise, primarily driven by human activities. (source: **NOOA**)

Disinformation - misleading or incorrect information that is deliberately spread to cause harm.

Humanitarian crises - For this report, we consider these to include an event or series of events that immediately threaten community health, safety and/or well-being, which can be due to human conflict, natural disasters, pandemics, etc. (sources: **OHCHR**, **Concern Worldwide**)

Information environments -The aggregate of individuals, organizations, and systems that collect, process, disseminate, or act on information, as well as their properties, interactions, and mutual relations (sources: **NIST**; **Röttger and Vedres**, 2020). In this report we occasionally refer to "information ecosystems" interchangeably with information environments.

Informational actors - Individuals, organizations, and systems that create, process, disseminate, and/or act on information, including journalists and media professionals, content creators, humanitarian organizations, community leaders, and individuals in local communities.

Internet shutdown - An intentional disruption of internet or electronic communications, rendering them inaccessible or effectively unusable, for a specific population or within a location, often to exert control over the flow of information. (source: **Access Now**)

Misinformation - incorrect or misleading information regardless of its intent to deceive (source: Gadjanova et al., 2022).

Natural disaster - A sudden and extreme event caused by natural processes, resulting in significant damage and destruction, and often posing a threat to human lives and local places.

Engaging the Language of Climate Frontiers

In this report, we use the term "climate frontiers" to acknowledge the extreme and new experiences that the communities with which we engage are facing. We use the term not to suggest geographic or cultural distance, but to signal the arrival of devastating experiences and impacts on lives and livelihoods that may prove more commonplace and geographically widespread in months and years to come. While Iraq and Zimbabwe are particularly climate-vulnerable countries by all independent measures, summer 2023 has seen climate-related humanitarian disasters from Hawaii to Canada and Greece. We do not claim that the countries and communities we study are heralding an experience that will prove universal – the communities with which this study engages are distinctively "frontier", not least in having comparatively small carbon footprints, while still being the ones to most intensely suffer the consequences. We engage the language of climate frontiers both from the perspective of global justice, bringing to the fore those places already devastated by climate change impacts with the aim of better and urgently supporting them, and because of the specific and distinctive knowledge and experiences they engender. While the climate conversation is global, and impacts can be seen around the world, local realities are very different and therefore conversations should also be organized on that level. It is valuable to acknowledge today's climate frontiers as contextually specific starting points for vulnerabilities that are only expanding in different forms the world over. We must also recognize communities living, surviving on, and leaving the most climate-vulnerable settings now as possessing "frontier" knowledge and experiences of climate-related impacts, of which, often, little is known elsewhere.

Executive Summary

This report examines the often-overlooked lived realities of communities on the frontlines of climate change. It explores the dynamics, challenges, and opportunities for strengthening local information environments in humanitarian contexts, where communities are suffering from unprecedented climate impacts. Global climate discussions tend to focus on timelines to action and statistical thresholds, rather than the immediate impacts already affecting people, particularly those in vulnerable communities. Recent severe climate events have underscored the dire consequences of these changes on both nature and people, resulting in and contributing to humanitarian crises.

The report studies local information environments to determine whether they are evolving to support decision-making in the face of these escalating climate change impacts. It highlights the importance of understanding how people's access to and engagement with information affects their capacity to make decisions about their well-being and livelihoods, especially in existing humanitarian crisis contexts. Despite the considerable global attention on climate change impacts, there remains a dearth of bottom-up, evidence-based research into the intersection of climate experiences and local information contexts, particularly in high-risk communities. This gap in knowledge hinders our understanding of the informational needs of these local communities and effective strategies for supporting their information ecosystems.

While there is an emerging body of work regarding support for local information actors during health crises, the specific information needs related to climate change impacts remain less clear, given the mix of immediate and long-term consequences. This report contributes empirical insights into these informational contexts, needs, and preferences in humanitarian settings, encompassing a wide range of "information actors" from individuals to formal and informal organizations involved in information creation, sharing, and engagement.

The report focuses on two case studies: central and southern Iraq and southwestern Zimbabwe, areas that have experienced visible climate change impacts alongside humanitarian crises. These regions have received limited research attention regarding citizen experiences, beliefs, and perceptions of climate change impacts and responses. Our detailed case studies examine existing information environments, beliefs, narratives, and trust dynamics influencing people's engagement with climate-related information in these regions.

Key findings that cut across both case studies include

- Communities need localized, context-specific information to inform responses to both immediate impacts and to enable sustainable livelihoods into the (unpredictable) mid- to longer-term
- Deep-rooted mistrust, particularly of institutions and actors external to hyperlocal communities, persists due to histories of political neglect and real and perceived self-interest.
- Intense climate impacts drive interest in actionable information from various sources, complementing local knowledge.
- Climate change has psychosocial effects, influencing people's sense of agency and hope.
- The effectiveness of local information is often seen as contingent on its connections to those in power and resource holders.
- Limited formal opportunities exist for community participation in information creation.

Based on these findings, the report suggests five key focus areas for effective information-based interventions, and suggests specific actions that different actors, from humanitarian organizations to journalists and policymakers, can take to respond to each. The focus areas are:

1. Facilitating better connectivity between local, national, and global climate conversations.
2. Strengthening access to, co-production of, and engagement with actionable and locally relevant information.
3. Understanding trust in information sources as dynamic and negotiable.
4. Recognizing the limitations of individual behavioral change as a mechanism for adapting to climate impacts.
5. Financing the climate crisis holistically, with communications as an integral part.

While the experiences highlighted in these case studies may not be universal, they point to broader informational needs shaped by the immediacy of local climate change impacts. The report emphasizes that the architecture and language of climate impact communications, particularly in humanitarian contexts, are still in their early stages of development. It underscores the urgency of addressing these challenges and highlights the potential for shared learning from other crises that have received more attention in terms of communications strategies. **Ultimately, the report calls for deliberate efforts to develop inclusive climate communications channels that consider the influence and engagement of various actors, especially those within affected local communities.**

01. **Introduction**

Key Messages

- The climate crisis disproportionately affects already vulnerable communities, but their experiences are often overlooked in global climate discussions.
- Information gaps and challenges in accessing trustworthy information can hinder effective decision-making, as demonstrated by the COVID-19 pandemic.
- Understanding local information ecosystems is crucial for supporting vulnerable communities in responding to climate impacts and making informed decisions about their well-being and livelihoods.
- Case studies focus on central and southern Iraq, and southwestern Zimbabwe, where visible climate change impacts intersect with humanitarian crises, emphasizing immediate and longer-term information needs.
- The report seeks to explore information ecosystems and needs from an empirical perspective within communities facing humanitarian crises. We acknowledge methodological and practical limitations associated with this approach

The lived realities of communities living on the frontlines of climate change are rarely front and center of global conversations on the climate crisis. The typical focus of these discussions is on increases in the earth's temperature, timelines for action, and statistical evaluations of a "point of no return". While these analyses are crucial, they do little to underscore how people around the world, particularly in some of the world's poorest communities, are already facing dire impacts related to climate change. Frequent and severe climatological events in the last few years have revealed the profound impacts of changes in the climate on nature and people. Climate impacts ranging from extreme weather events to slower onset heatwaves and desertification are contributing to new and exacerbated humanitarian crises, including increasing numbers of internally displaced people (IFRC, 2020; International Organization for Migration, 2022).

It is critical to understand whether local information environments are developing to support people in decision-making around these unprecedented and increasingly acute climate impacts. COVID-19 highlighted the risks to individual and public well-being that can arise as a result of challenges surrounding the production, engagement and access to information, including information gaps, uncertainties and harmful and misleading content. Uncertainty and mistrust about information on the crisis and how to respond impacted people's decision-making and buy in to different public health responses. The World Health Organization's labelling of COVID-19 as an 'infodemic' reaffirmed just how important trusted and trustworthy information is in increasingly crowded information ecosystems, especially in the context of evolving crises.

COVID-19 also demonstrated the importance of paying attention to contextual factors that affect how and why people trust and engage with different types of information. The urgency of addressing the negative

effects of malicious, hateful and/or misleading information around COVID-19 has often led to a focus on the binary of 'bad' or incorrect information, and good 'factual' information, which is managed through content moderation, removal and fact-checking. This narrow approach, however, neglects to take into account how and why people actually make decisions, which is often informed by different features of information and information sources, as well as neglects how the wider health of local information ecosystems might be sustained and strengthened within and beyond a particular crisis. Recent scholarship shows how information problems manifest for different reasons in different contexts (Gagliardone et al., 2021, 2023), and locally produced and relevant information is important for interventions to be effective and appropriate within a particular place (for example, Scott, 2022).

The urgency of the climate crisis, especially in existing humanitarian crisis contexts, requires us to pay attention to the health of people's information environments as a contributing factor to whether and how they are equipped to make decisions about their well-being and livelihoods. Even amid substantial attention on climate change impacts globally, there is relatively limited bottom-up, empirically grounded research on the intersection of climate change experiences and informational contexts in communities most at risk. This lack of insight into communities living at the frontlines of climate change limits understanding of both their informational needs and how to effectively support their information environments to address these needs.

Photo: aljazeera

This Study

This report was commissioned by Internews to explore the dynamics, challenges and opportunities for strengthening local information ecosystems around climate change impacts in humanitarian contexts. There is a growing body of work on support for local information actors around health crises. But local information needs around climate change impacts remain more ambiguous, especially in light of the mix of immediate and longer-term impacts, and their often unprecedented nature. This report contributes to the evidence base on local informational contexts, needs and preferences on climate change impacts in humanitarian contexts. It takes a broad view of potential "information actors" involved, considering individuals and organizations, both formal and informal, involved in information creation, engagement and sharing, including taking into account opportunities for 'ordinary' community members to participate in information production, debate and exchange. This report aims to contribute new empirically grounded insights about opportunities for **strengthening and supporting resilient, trustworthy, and trusted information ecosystems around climate crises.**

Report objectives and guiding questions

To contribute to improved understanding of the types of information dynamics and challenges that exist among local communities at the frontlines of climate change impacts, and implications for organizations seeking to support community resilience, adaptation and mitigation efforts, this report has three specific **knowledge objectives:**

- To investigate the information ecosystems around specific climate-related impacts, and identify key information-related challenges to supporting local decision-making and action in response to climate crises in vulnerable communities.
- To understand what features of people's information environments are important for shaping whether and how they trust and engage with information related to climate change impacts and responses.
- To understand how interventions aimed at strengthening information ecosystems in humanitarian contexts can be designed and approached in ways that support effective decision-making within communities around key questions of livelihood and well-being.

These translate into two research questions, which we sought to answer through empirically grounded studies into affected communities in central and southern Iraq, and southwestern Zimbabwe:

What elements of local information environments are important for shaping how people trust and respond to information on climate impacts and responses?

How can interventions aimed at strengthening local information ecosystems be designed and approached in ways that support effective decision-making within communities about their well-being and livelihoods?

Case Studies from the Frontiers of Climate change

To address these aims, we looked in-depth at two contexts: **central and southern Iraq, and southwestern Zimbabwe.** We focused on areas with visible climate change impacts which have also been facing humanitarian crises, in other words, events that immediately threaten community health, safety and/or well-being, and climate-related impacts. While both locations have been the subject of some research on climate change impacts, they remain relatively under-researched in terms of citizen experiences, beliefs and perceptions around climate change impacts and responses.

We aimed to investigate information ecosystem dynamics around climate change in areas where the impacts are most acute, and immediate informational needs heightened. Both central and southern Iraq and southwestern Zimbabwe are at high risk for climate change impacts, compounded by long-standing humanitarian crises, and political and economic insecurities. Situated at the forefront of climate change impacts, these contexts are critical to understand in their own right. They also can help illuminate key dynamics to consider when seeking to support other countries facing the growing and increasingly negative impacts of climate change.

Central and Southern Iraq

There is an acute, immediate humanitarian concern around climate change impacts in Iraq, with strong evidence that issues around water scarcity, in particular, will affect livelihoods and well-being across the country. Yet little research has been conducted into how and why Iraqi citizens access, produce and trust information about climate-related impacts and responses, and the extent to which information ecosystems support people's ability to adapt to or mitigate climate-related impacts. Even less is known about the southern regions, despite evidence of severe climate-related impacts in those regions.

The United Nations Environment Program has labelled Iraq the fifth most climate-vulnerable country globally, with climate change intersecting with wider insecurity, governance challenges and demographic pressures. The country faces rapid onset hazards, including droughts, floods, duststorms and heatwaves, and slow onset hazards: desertification, reduced rainfall and sea level rise (United Nations in Iraq, 2023b). These changes are interlinked. Aridity contributes to sand and dust storms, and reduced agricultural output contributes to migration into cities. This puts further strains on food and water access in cities, as well as sanitation and services (Adamo et al., 2018; International Organization for Migration, Iraq, 2022; United Nations in Iraq, 2023b).

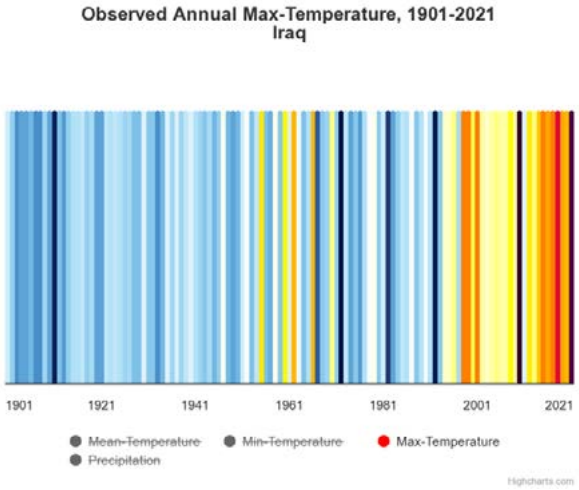
There are regional differences in climate change patterns across Iraq. The Kurdistan region of Iraq in the north has relatively higher water resources than the southern regions, though it is still vulnerable to drought with lower rainfall levels. The southern regions, which depend on the Tigris and Euphrates rivers (ICRC, 2021), experience flooding risks, loss of fertile soil and desertification. Water scarcity is also a concern in central Iraq (Al-Maliki et al., 2022; International Organization for Migration, Iraq, 2022). Precipitation in the Tigris and Euphrates River basins has been shown to be in decline since the 1980s, with declining stream flows. Iraq is vulnerable to actions by neighboring countries' water policies, where the Tigris and Euphrates originate (Adamo et al., 2018).

Iraq's media sector faces some important limitations. While the media sector has diversified over the past couple of decades, it is still restricted in its openness and inclusivity. Private media grew and diversified following the 2003 invasion of Iraq, including some local broadcasts. At the same time, there continues to be evidence of hostilities towards individual journalists and media outlets in the Kurdistan region. Media broadcasts also appeared to divide along ethnic and sectarian divisions. Still, TV has been found to be relatively trusted and popular throughout Iraq (Al-Marashi, 2007; Internews & Rooted in Trust, 2022).

Within this particular set of informational and climate conditions, studies on Iraqis' perceptions, information access and needs are few. While there have been studies into what climate impacts are in Iraq (Adamo et al., 2018; Al-Maliki et al., 2022; International Organization for Migration, Iraq, 2022), we identified very few studies of what Iraqis understand about climate change impacts and responses (for example, Al-Maliki et al., 2021, 2022; Marzouk et al., 2022). One structured questionnaire conducted in the north, in the Kurdistan region found the majority knew about climate change and were interested in it. Most were also able to indicate some human activity that contributed to it, including industrial fumes and waste and transportation. The survey then presented participants with options about mitigation efforts, suggesting to them regulation, renewable energy, new water harvesting methods, and so on. Within this structured set of options, a few reported that humans could not intervene because nothing would be effective, or that only God could control climate change (Marzouk et al., 2022).

Recognizing this research gap into Iraq's information environments, we focused on four communities in central and southern Iraq where climate change impacts and humanitarian concerns are acute, but relatively little is known about the local information dynamics around climate change. We focus primarily on livestock and agricultural farming communities, where there is evidence of severe and immediate livelihood impacts, with a lighter touch comparative look at two key impacts in urban areas: air and water pollution around gas and oil industry, and dust storms:

1. Buffalo farmers and fishermen facing displacement from the Chibaysh Marshes in Nasiriyah due to receding water levels,
2. Rice farmers in central and southern Iraq, specifically near Najaf, Amara and al Seeba, who are unable to plant and produce rice because of water shortages,
3. Families in Basra dealing with the effects of dirty water and air pollution linked to oil and gas production, and
4. Residents in Baghdad and Nasiriyah experiencing dust storms, causing respiratory issues.



Source: World Bank Group Climate Change Knowledge Portal

Southwestern Zimbabwe

Compared to Iraq, knowledge production, exchange and dissemination around the environment in Zimbabwe seems to have generated a little more scholarly attention in recent years, especially around information access, education and the role of local knowledge.

The presence and urgency impacts of climate crises in Zimbabwe and southern Africa gained greater global attention around Cyclone Idai in 2019, considered one of the worst to affect Africa and the Southern Hemisphere (International Organization for Migration, 2021; Warren, 2019). Beyond this, over the last three decades Zimbabwe has experienced increased variability in seasonal rainfall, increased average temperatures, intense rainfall with long dry spells in-between, and shortened rainy seasons (Ministry of Environment, Water and Climate, Zimbabwe, 2017). Western Zimbabwe, in particular, is more likely to experience drought conditions. There is also documentation of longer-term changes in terms of dry spells, cyclones, heatwaves and droughts in Zimbabwe (E. Ndlovu et al., 2020). Impacts of climate change intersect with wider economic, food and water crises in Zimbabwe. The World Food Program, for example, estimates 30-38% of Zimbabwe's rural population is food insecure (Human Rights Watch, 2022). Changes in rainfall have a particular impact. 80% of agricultural production is estimated to be rain-fed (World Bank Group, 2021) and 60-70% of employment and income is estimated to be in agriculture (FAO, 2023). Impacts are also heightened for already vulnerable populations, for example, people living with HIV/AIDS are more susceptible to severe effects of water related diseases (Brown et al., 2012).

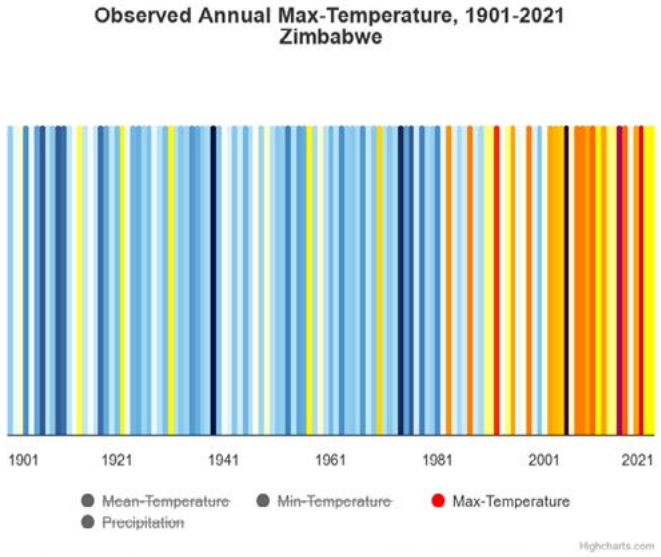
Studies of informational interventions around climate impacts in Zimbabwe provide a mixed picture of the efficacy of efforts to help strengthen people's knowledge and capacity to adapt to climate change effects. One study in south-eastern Zimbabwe finds that people lack technoscientific adaptation methods (for example, dam construction, drilling boreholes) (Tirivangasi & Nyahunda, 2019). It suggested NGOs' efforts to educate people on adapting are often poorly attended, limited in part by an expectation of material compensation/ benefit alongside education. However, another study gave more credence to NGOs' work to strengthen community resilience to climate-related impacts. For example, it looked at Practical Action's program from 2006-2020 to strengthen uptake of improved technologies for food production and diversification, and suggested it helped to show the importance of working with local knowledge, practices and values in developing adaptation strategies (Brown et al., 2012).

Studies of climate-specific information in Zimbabwe have explored different knowledge systems, and how they are valued and engaged, considering divisions between indigenous and scientific, and local and global knowledge systems. One study finds variable uptake and hesitance among farmers towards agricultural adaptations around crop production and livestock (Dhliwayo et al., 2022). Others have focused on the potential value of traditional and/or indigenous knowledge to understanding and adapting to climate change. In other words, knowledge rooted in the behavior and beliefs of indigenous communities (Kupika et al., 2019). Dube et al. (2016) explores the integration of traditional and scientific knowledge systems for weather forecasting, and how this might support decision-making about seasonal weather patterns.

The formal media sector's role in information creation, engagement and dissemination has been constrained. Zimbabwe ranks **126 out of 180 (2023)** in Reporters without Borders Freedom of the Press Index. There is one public state broadcaster, which has a monopoly over terrestrial TV. From 2018, the government has issued commercial and community radio licenses, with 14 licensed community radio stations identified in the early 2020s (Internews & Rooted in Trust, 2023). Also, while access still remains low (with **1.5 million estimated social media users in 2023,** the equivalent of 9.1% of the population), citizen activists have used social media to challenge authority, though they have faced arrests and internet shutdowns (Chitanana & Mutsvairo, 2019).

There have been a few studies of media outlets' reporting on climate change in Zimbabwe (Ndhlovu, 2021; Okoliko & de Wit, 2020), but even less attention to how audiences engage with content through the media (Ndhlovu & Mpofu, 2016). One study explored how people access information on climate change impacts in Matabeleland North, and suggested that people might have different patterns of engagement with climate change information versus other topics, finding people more likely to turn to the radio for climate change information but mobile phones for other topics (Ndhlovu & Mpofu, 2016).

In sum, scholarship draws attention to some particularities and tensions around informational dynamics and needs in Zimbabwe, around media sources and forms of knowledge, including local and scientific discourses. To add to this body of scholarship, we consider people's perceptions of information sources and content within southwestern Zimbabwe where climate change impacts are prevalent and there has been a longstanding humanitarian presence. We focus on Bulawayo city, and two nearby rural communities – Lupane in Matabeleland North and Gwanda in Matabeleland South. We focused on climate impacts related to the different livelihoods and conditions of the areas, most often related to rainfall and water-related issues (for example, health and sanitation, agriculture, urban gardens), and gave specific attention to experiences of women, youth and minority language communities.



Source: World Bank Group Climate Change Knowledge Portal

Research approach and methods

Our approach and methodology was designed to be as open as possible, to provide interviewees with the opportunity to choose the terminology and information problems they saw as most relevant. We took an empirically-driven, bottom up approach to unpick the local information ecosystem dynamics within the two contexts.

The justification for this approach is evidenced by limitations within existing mis/disinformation scholarship. Explained further in Chapter 2, concerns about the COVID-19 infodemic corresponded with a tendency in scholarship to focus on mapping the presence and spread of scientifically incorrect information. This narrowed the focus to misinformation, and efforts to correct or remove falsehoods. However, in so doing, studies have not sufficiently addressed the actual reasons why people engage with misleading information. Studies of COVID-19 within different country contexts in Africa find that why and how people respond to information varies based on what sources they trust, past experiences, and different incentives (for example, Gagliardone et al., 2021; Scott, 2022). In other words, much of the existing scholarship, by approaching studies from a concern with misinformation, has provided valuable insights into misinformation but also narrowed the scope of informational challenges and responses considered.

Our starting point for mapping **local information ecosystems** was any individual, organization, institution and/or channel through which people access, create, mediate and share information around the impacts of climate change, including experiences, causes, responsibilities, mitigation and adaptation measures, prevention, and so on. From here, interviews were designed to give scope for interviewees to discuss any factors related to informational content and sources, as well as the wider political, social and economic context and their individual circumstances. To do this, we created an interview topic guide that adopted a storytelling/narrative approach to interviewing, encouraging interviewees to explain their experiences, and how and why they engaged with information and informational sources. We also started by asking what long-term changes in their environment and weather were experienced, as opposed to using the terminology of 'climate change'.

For the purposes of this report, we adopt the definition of global environmental change put forward by the Earth System Science Partnership to "[Include] changes in the physical and biogeochemical environment, either caused naturally or influenced by human activities such as deforestation, fossil fuel consumption, urbanisation, land reclamation, agricultural intensification, freshwater extraction, fisheries over-exploitation and waste production." (Leemans et al., 2009).

This gives attention to environmental and climate impacts with diverse causes, and which manifest in diverse ways, for example, precipitation, weather extremes, air composition, and so on (Marzouk et al., 2022). To interrogate people's experiences and informational needs around climate change, our entry point for interviews was the lived experiences of the impacts, as opposed to the causes of environmental changes.

Data collection covered four dimensions of people's experiences and their local information environments:

- How people talk about, perceive and experience climate change impacts, and how these intersect with other areas of vulnerability and need, including probing their perceptions of informational challenges (for example, misinformation) in their communities;
- Which individuals and organizations are involved in information creation, dissemination and exchange, and opportunities for community co-creation;
- How and why people engage with different information sources, and what factors shape information they find useful and compelling;

- What people's informational needs are related to climate change impacts; and what factors in the local information ecosystems affect people's abilities to fulfil these needs.

To explore questions of how and why people experience and engage in local information ecosystems, we employed qualitative methods. We relied primarily on open ended, narrative interviews with community members, who were directly experiencing impacts of climate change. These interviews were complemented by key informant interviews with local journalists, government officials, civil society actors and opinion leaders. We also conducted desk-based research on country contexts to situate and triangulate our findings, as well as on information ecosystems, climate change impacts, and behavioral change. The latter is used to situate our findings within wider understandings and approaches to strengthening information ecosystems. The literature review included a targeted search of English-language grey literature and peer-reviewed publications from media and communications, environmental politics, geography, and area studies.

Interviews in Numbers

Iraq

Approximately 30 interviews were conducted with local residents who were affected by the climate-related impacts (for example, farmers and their families, families with respiratory diseases, etc), local journalists and elders, plus additional follow up discussions with community members. This included 12 formal interviews in the Chibasyh Marshes and agricultural farming communities, 5-6 with residents in Baghdad/Nasiriyah, and 5-6 in Basra. A combination of individual and group interviews was used, depending on interviewees' preferences. The estimated number is due to group interviews, whereby others joined during the course of the interview. Data collection in Iraq was supplemented by the field researcher's findings from previous reporting in the region, which involved several trips per year between March 2021-May 2023. ate change impacts.

Zimbawe

18 interviews were conducted across the three locations, including community members, local journalists and radio personnel, and local formal and informal authorities. These were supplemented by shorter, informal conversations with at least nine additional individuals. We also consulted two academic experts on the media sector in southern Africa. Fewer interviews were conducted in Zimbabwe due to logistical constraints.

Scope, Challenges, and Limitations

Our aim to uncover 'bottom up' empirically-driven insights into information ecosystems and informational needs brings specific methodological and practical challenges.

First, most surveys and interview-based research into people's perceptions and information around climate change begin by asking people about 'climate change'. While we wanted to discuss climate-related experiences, we sought to avoid directing interviewees to use particular terminology or language to frame their perceptions.

We were aware that if we asked about climate change, we were directing people to discuss long-term environmental changes or climatological events from this lens. This would make it difficult to assess the extent to which they might discuss impacts and experiences in other ways, for example, without reference to the wider global phenomena and discourse of climate change.

To mitigate this risk, we designed interviews to begin by asking people to explain the long-term changes in the environment and/or weather they have experienced over the last couple of decades, explicitly avoiding the language of 'climate change' or 'climate crisis'. We only introduced the term 'climate change' at the end of the interview. While it is impossible to construct a fully open structure, this approach was designed to help create space for interviewees to choose what to discuss, and how.

Second, we sought to gain insight into popular narratives and experiences of individuals affected by climate change impacts in the communities, as opposed to official narratives of local leaders or established media outlets. Such 'bottom-up' views are inherently difficult to engage, given the power dynamics implicit in any research exercise - between the researcher and the individuals being interviewed, and within the community, as researchers engage with local community structures and gatekeepers to gain approval and access. To mitigate these power dynamics, we selected locations and timing for interviews where people were most comfortable, and worked with a translator for minority languages, for example, Ndebele in Zimbabwe. In both countries we worked with a local fixer with existing rapport in the areas to help make initial introductions. In Zimbabwe, this involved working with the local Internews Rooted in Trust team. We used snowballing techniques to identify interviewees from among those most affected by climate impacts. We began with farmers and other affected individuals, their families and neighbors. Separately, we interviewed local journalists and leaders for their views.

In foregrounding perceptions of local communities and information providers, we did not analyze the content of sources they were actually engaging with, nor did we assess the content of online or offline media. Our primary aim was to gain insight into how people perceive, experience, and understand actors and resources within information ecosystems. Further research could valuably study available content directly, and observe actual interactions with and interpretations of specific online or offline content. There is evidence, for example, that water protests in Iraq have some degree of "water nationalism" to them. We do not know the extent to which specific sources may exacerbate this dimension through either factual content, mis/disinformation, or more conspiracy-type narratives.

Third, research was limited by practical considerations around timing, security and safety of participants and researchers. In both cases, research was guided by circumstances on the ground, and adaptations were made to accommodate emerging security conditions. This meant shifting which communities were interviewed in Iraq. In Zimbabwe, this meant limiting the timing and location of interviews to take into account election campaigning, given general elections were scheduled for just under two months after the research. This limited the time and number of interviewees. Nonetheless, in both cases we were able to achieve some points of saturation in content raised interviews, with clear emerging patterns and parameters in the perspectives shared.

Fourth, and finally, especially as the research involved speaking with individuals experiencing humanitarian crises, specific measures were taken to safeguard interviewees, and seek to do no harm. As mentioned, all interviews were conducted in locations and languages preferred by the interviewees, solely or in groups depending on interviewees' choice. All interviews were also confidential and anonymized, and notes and transcriptions done directly by the research team to limit access. Post-publication we also plan to identify channels to share and discuss findings in the countries and the communities studied.

02. **Climate change and Information in Humanitarian Contexts:** Trends in existing scholarship

Key Messages

1. Existing studies on information ecosystems and climate change often take a narrow approach, focusing on scientific information deficits and overlooking the complexities of human behavior and agency.
2. Strong concern about the negative effects of online communications has led to a focus in scholarship on approaches designed to identify and isolate the problems of misinformation. These sometimes risk over-emphasizing the importance of scientific 'fact' in why people engage with information.
3. This study addresses these limitations by adopting a case study approach that considers community-specific factors and local context, recognizing the diversity of experiences and information needs.
4. The study seeks to understand how people engage with information, what makes information meaningful to them, and what their informational needs are in the context of climate change impacts.

This report is underpinned by an interest in the relationships between information and information environments, and people's perceptions and experiences of climate change adaptation and mitigation. It both draws upon and seeks to inform several fields of scholarship and grey literature, including media and communications, behavioral science, humanitarian and development studies, politics and sociology, each of which consider in different ways how and why information, and information ecosystems, matter to people's perceptions and decision-making around climate-related impacts. This section unpicks trends and tendencies in scholarship exploring these relationships and connections, to situate our own research. It draws attention to key assumptions and parameters in how the relationship between information and climate change has been studied, and perceived as significant. We return to these assumptions in Chapter 4, considering the implications of our empirical findings in relation to assumptions about the linkages between information, climate change impacts and behavior.

Climate change impacts, humanitarian contexts, and an information ecosystem approach

The climate crisis and humanitarian need are inextricably linked: not only does climate change contribute to extreme weather-related events that drive humanitarian crises, but it can also reduce the income and resilience of already vulnerable populations, thereby increasing their likely reliance on assistance (IFRC, 2019). A World Bank report, for example, estimates that:

Photo: Jonathan Ramalho

How the climate crisis compounds existing insecurities and humanitarian crises in many ways reflects and necessitates greater attention to coordinated and joined up working across sectors, encased in the idea of the Humanitarian-Development-Peace nexus. This gained attention around 2016 and emphasizes the importance of joined-up working across sectors - a potential opportunity, for example, to combine longer-standing attention to the environment for sustainable development and climate-related impacts increasingly affecting humanitarian crises.

From the view of the humanitarian actors, then, there are important questions about what is required from the system to respond to emerging impacts, and to support the resilience of those vulnerable to humanitarian need through future intense, frequent and unpredictable climatological events. How can and should the sector adapt (Baxter et al., 2022)?

People's access to and engagement with information to support their decision-making is one key consideration amid bigger questions about humanitarian programming in the context of climate crises. People's information ecosystems are a core component of how they make sense of, and act, within crises and how resilient they are to future shocks. Information ecosystems refer to the complex structures and channels through which people create, access, debate and share information as part of a wider community. An information ecosystem approach draws attention to both information preferences, barriers and needs within communities, and takes into account professional and informal, online and offline, and human and 'artificial' (for example, bots) information actors (Internews, 2023).

Internews' humanitarian programming, and its specific work around the COVID-19 pandemic, has helped to build an evidence base about how uncertainty and trust in information inform people's agency to make informed decisions in crisis contexts. Humanitarian crises are social experiences. Strong local information ecosystems which enable community members to access and engage with locally relevant, reliable information from trusted sources can support their agency to make decisions around their well-being and that of their families and communities (Posada et al., 2022).

Humanitarian programming engages different approaches to try to incorporate and support local information ecosystems. Knowledge, Attitude and Practice (KAP) surveys, which use a structured questionnaire to investigate relationships between knowledge, attitudes and practices of a population or community (Andrade et al., 2020; Liao et al., 2022) is one approach used to inform ongoing and future humanitarian programming. REACH conducted repeated KAP surveys during COVID-19 to inform communications responses in Syria (REACH, 2021). Another example, Internews' Earth Journalism Network (EJN), engages directly with journalists and media organizations to strengthen and support journalists in different ways. EJN supports more than 15,000 local journalists through mentoring, training, networking and by incorporating them into global climate change forums. The aim is to equip environmental journalists in communicating effectively about climate impacts with their local audiences. With Internews' Health Journalism Network, the Earth Journalism Network has also been involved in strengthening journalism in areas of 'One Health', which focuses on interdependencies in the health of humans, plants and animals and the wider environment (Internews, One Health, 2022). Social listening methods have been adapted and taken up by some in the humanitarian sector as a way to facilitate two-way communications, and to monitor and analyze community conversations. It is still limited in use (Posada et al., 2022), as well as in its underlying data, methods and transparency around methods (Scott, 2022).

As climate change is an increasingly central driver and multiplier of humanitarian crises, particularities of climate-related knowledge production become important to those interested in information ecosystem strengthening as part of humanitarian activity. Multi-hazard early warning systems in vulnerable areas are a particular focus of climate communications. This includes improving and updating infrastructure for generating and disseminating information to local populations and decision-makers (UNDRR, 2022; United Nations, 2023). Another concern is how to get climate-related information to humanitarian organizations so that they can more effectively design and implement responses, such as through the use of remote sensing (Meijer & Barnhoorn, 2022). At the same time as these initiatives have moved up on humanitarian agendas, they continue to face challenges, for example, in ensuring that early warning systems and disaster information systems acknowledge local practices, and are adapted to local contexts (for example, GNDR, 2023).

Specific issues and inequalities around knowledge production about climate crises make attention to information ecosystems important, but also challenging. There is ongoing circulation of misleading content about the climate crisis globally and within local communities. Misleading content has often been linked to climate denial, skepticism and contrarian views. This includes malicious content, intended to deceive about the nature of climate crises. Second, climate change experiences are marked by huge inequalities, in terms of who is responsible and who is affected. This includes the contribution of colonial inequalities to environmental decline (van Ryneveld & Islar, 2023). Concerns about injustice and inequality are core to shaping what narratives are likely to be compelling. Finally, and importantly, while there is a growing scientific consensus that climate change is real and immediate, albeit with varying models and predictions, there is heterogeneity about how to respond, and whose and what knowledge is valued, especially within specific contexts.

Global climate change debates tend to privilege knowledge from western institutions, devaluing the contribution of local or indigenous knowledge to shaping more sustainable futures (as considered in Potter et al., 2022; Vogel et al., 2022). Amid an already vast and growing literature on climate change communications, there is a specific body of work that looks at how climate scientists communicate with the public, seeming to focus on a potential information deficit between 'scientists' and 'the public' (Ceyhan & Saribas, 2022). Equally, western scientific information is not necessarily appropriate for local decision-making in humanitarian contexts. For example, looking in southeastern Zimbabwe, Tirivangasi and Nyahunda (2019) argue there is a gap between scientific knowledge of climate changes, and the knowledge that is required for decision-making about climate change adaptations. Scientific projections often give a general sense of future trajectories, but not specific changes in specific timeframes. These gaps and inequalities in climate-related knowledge production and valorization indicate the importance of attention to more information ecosystems, especially in contexts of crisis, where needs are immediate, inequalities present, and uncertainty about future well-being is heightened.

Photo: Ntepe-Manama FM

Information-related problems beyond online mis/disinformation

Alongside scholarship on information ecosystems within humanitarian contexts, this report engages a body of work concerned with the nature of information ecosystems themselves, and specifically, how to consider 'problems' within information ecosystems within crisis contexts.

Over the past decade, there has been a growing sense of crisis in policy and academic circles about whether people's information ecosystems actually support them in making decisions to benefit individual and collective well-being. In the context of the COVID-19 pandemic, the ease and scale of creating and spreading misleading content online (Fuchs, 2021), including disinformation campaigns with malicious intent, contributed to a sense of peril about content online (for example, Cinelli et al, 2020; Ferrara et al, 2020). Beyond concerns with the effects on people's decision-making, there have been further concerns about what mis/disinformation does to the health of the information ecosystem, as it adds confusion and makes it more difficult for people to form opinions around consistent, agreed 'facts' (Arendt, 1972; Bessi et al., 2015; Diepeveen, 2022b). This sense of peril is a normative swing from earlier scholarship on the internet which emphasized the internet's participatory potential.

Strong concerns about the negative effects of online communications has led to specific approaches in scholarship designed to identify and isolate the problems of misinformation, but which also risk over-emphasizing harm, as well as the importance of scientific 'fact' to how people choose to engage with information.

Discussed in detail in Gagliardone et al. (2021, 2023), a push for actionable insights has tended to de-prioritize time-consuming qualitative methodologies that contextualize and seek to establish deep understandings of informational phenomena. A growing number of studies use increasingly sophisticated computational methods, for example, drawing on supervised machine learning techniques. These methods are designed to make sense of massive datasets of online information and interactions. However, methodological choices, designed to distil insights from large datasets tend to ignore or further marginalize digitally disconnected communities. They also make it more challenging to understand and respond to dynamics in the wider (on- and offline) information ecosystem. Further, such methods give little attention to the dynamic interactions between users and platform features, which can mean people engage differently with content on different platforms. For example, the image- and video-based feed on Instagram seems to give way to more performance content, versus platforms that emphasize user anonymity (for example, Tumblr) or closed conversations (for example, private groups on Facebook or WhatsApp) (Diepeveen, 2022a).

Some key challenges are linked to:

1. **Using proxies to isolate information of interest:** Dealing with massive datasets requires filtering and detecting patterns in the data. This requires the use of proxies. Such proxies are appropriate to specific problematics, for example, where there is a clear piece of content or behavior that can be isolated, but they have "limited ability to parse the nuanced meaning of human communication, or to detect the intent or motivation of the speaker" (Duarte et al., 2017, p. 3). In contexts where 'harmful' content is not necessarily so clear cut, for example, around ongoing climate change adaptation across diverse and changing conditions, the insights from such proxies are limited.

2. **Focusing on English-speaking users on the most accessible platforms:** There has been a lack of diversity in who, which languages and which geographies are represented in training data and models through which information online is studied (Joshi et al., 2020). Reflecting wider biases in academic activity and publication, often, populations of interest are English language populations, usually located in the United States and higher income countries. Universal conclusions, for example, about the prevalence or spread of misinformation, are extrapolated from these particular datasets, ignoring the cultural variation of communication (Pohjonen & Udupa, 2017, p. 1174). Also, studies often focus on online communications for ease of information access, most often in recent years, using Twitter data given accessibility through its APIs. This excludes from view those offline and those communicating through other online channels (Scott, 2022).

Gagliardone et al. (2021) suggest that these approaches to studying informational problems can direct attention to specific types of intervention, for example, fact checking or content removal, and fail to engage why and how people find meaning in information. In the case of COVID-19 and health crises, some studies suggest interventions to correct or remove misinformation have done little to counter vaccine hesitancy, particularly where public health systems are already weak (Badrinathan, 2021).

There are interventions that aim to take more contextualized approaches to intervening in information ecosystems, for example, Internews' **Rooted in Trust** project, which began with the phenomena of COVID-19 misinformation, but diagnosed the problem in relation to local contexts and relations of trust. In the case of Rooted in Trust, this led to a theory of change whereby the intervention intended to make sense of why and how specific rumors resonate in a community, and to support locally 'trusted' actors in providing relevant and reliable information, and engaging audiences in agenda setting and information production. This example points to a broader view of potential informational challenges, beyond specific pieces of (mis)information or specific (malicious) behaviors.

Climate change impacts, information and behavioral change

Our work also speaks to a body of research examining the role that information plays in facilitating adaptation behaviors (such as migration, or adoption of resilience-enhancing agricultural methods or technologies) among vulnerable communities. Much of this literature is underpinned by theories and methodology from development economics and behavioral economics. As a consequence, these studies are often primarily concerned with establishing the causal impact of specific information-based interventions on individual decision-making regarding certain adaptation behaviors, typically by means of randomized controlled trials (RCTs). As critics of this approach warn, "the emphasis on identifying causal impacts using RCTs has deflected attention from observational studies" (Ravallion, 2020) which could provide valuable qualitative data to inform the choice and design of the evaluated interventions in the first place and has skewed funding and effort towards the types of programs which are well-suited for randomized evaluations (disadvantaging programs with longer time horizons and/or delivering public goods with benefits shared across many people).

Despite this narrower focus, the literature on information-based interventions has yielded several interesting insights relevant for our research.

1. **Across contexts and regions, people often face "informational barriers" affecting their climate adaptation behaviors:** they lack the information required to make optimal decisions. For example, a review of the role of information in internal and international adaptive migration decisions concluded that a lack of access to information may be a key reason for both non-migration as well as for suboptimal migration choices, resulting in worse outcomes in both cases (Huckstep & Clemens, 2023).

2. **People tend to be aware of the information gaps they face, and they show a demand for reliable, actionable information.** This was found to be the case, for instance, among small-holder cotton farmers in India, who showed significant demand for new information accessed through a voice-based farming advisory service for mobile phones (Cole & Fernando, 2021), and among recipients of text-message based air pollution forecasts in Lahore, Pakistan, who were willing to pay 60 percent of the cost of mobile internet for continued access to the forecasts (Ahmad et al., 2022).

3. **Media and telecommunication channels can be effective in reducing information gaps,** with broadband internet (Porcher, 2020), newspaper (Wilson, 2021) and television (Farré & Fasani, 2013) coverage all shown to improve people's ability to gather labor market information from other regions, thereby helping potential migrants make better choices. However, these studies tend to focus on access to information through these channels, without exploring different approaches to producing and programming content, and their consequences for mistrust and information gaps.

4. **Social networks play a complex and important role in facilitating learning about adaptation options in communities.** In Northern Mozambique, farmers' decisions to adopt a new crop are influenced by the adoption choices of their network of family and friends (Bandiera & Rasul, 2006). In Malawi, targeting central farmers in the village's social network with information helps boost the diffusion process of a new agricultural technology (Beaman et al., 2021)). However, further insights from Mali suggest that targeting 'influential' members of the network excludes less-connected members, particularly women (Beaman & Dillon, 2018).

5. **Relatively simple design choices can strengthen existing elements of information ecosystems.** For example, network theory can increase the efficiency of agricultural extension services by enabling better targeting of information (Beaman et al., 2021). Randomized evaluations of information interventions can also boost support for local information infrastructure by producing quantitative evidence of their value, by showing that, for example, farmer field day demonstrations are cost-effective ways of closing knowledge gaps, particularly among poorer farmers (Emerick & Dar, 2021).

When evaluating these insights, it is important, however, to keep in mind the (often unspoken) assumptions underpinning much of the research that has produced them:

1. **By and large, this literature models information as an input into decision-making, as a means to an end to facilitating "utility-maximizing" choices.** In doing so, they impose implicit judgement over the "correct" response and rule out inaction as a possible outcome of a rational decision-making process. Many of the studies reviewed above focus on a single decision related to an adaptive behavior (for example, migration, adoption of an agricultural technology) and evaluate a small number of approaches to providing information that may improve that particular decision-making process.[1] They often treat this decision in isolation from all the other climate-adaptation and livelihood-related decisions that people are continually required to make amidst changing conditions, alongside the broader information needs arising from them, and the associated impacts of trust dynamics that change over time. A consequence of this focused approach is that sustained access to trustworthy, localized information (and the ecosystem able to provide it) is not necessarily recognized as desirable and valuable in its own right.

2. **Another common implicit assumption made in the literature is that the individuals, households and communities targeted by information-based interventions are passive recipients of information,** rather than active participants in the production, prioritization and dissemination of information. The language used is often revealing: interventions' objectives are characterized as "correcting expectations" or "closing information gaps", neither of which suggests a participatory approach. Social contagion models used to describe how "exposure to information" affects beliefs (and ultimately behavior), and models of "diffusion of information through social networks" fail to incorporate the agency of people in the targeted communities in deciding what information they would like to access in the first place, and their desire and ability to shape or produce information. Relatedly, the literature is skewed towards "formal" or "official" information sources, largely studying information from public media or government programs and ignoring the role of civil society organizations or celebrities/influencers.

A notable example of a different approach comes from a collaboration between UK, Ghanaian and Kenyan researchers exploring how local information ecosystems in various rural East and West African communities affect local women's ability to combine indigenous and externally-sourced knowledge in relation to climate change adaptation activities. As emphasized in the project report (Surm, 2022), their research "recognizes local people as sources of knowledge and highlights the mismatch between technocratic climate change communication and the gendered, lived experience of adapting to climate change."

Their work has led to the recommendation of a hybridized approach – incorporating both indigenous and scientific knowledge and employing a number of different communication channels – to communicating about climate change adaptation and mitigation among rural women.

1 This narrow focus is likely a consequence of the use of randomized controlled trials (RCTs) as one of the preferred empirical research methods in this field, as RCTs are uniquely well fitted to estimate the average treatment effect of a specific intervention on a small number of outcomes of interest.

Conclusion

This chapter has highlighted some key areas of concern and assumptions within scholarship on information, climate change and humanitarian contexts. Importantly, we find some common tendencies in how informational challenges and behavioral change have been conceptualized. While not conducting a systematic review into existing literature, our targeted search indicates that there are common assumptions that repeat across studies of information environments, and humanitarian crises and interventions, indicating a 'common sense' or familiar theory of change in which:

1. The problem is one of an information deficit equation: the lack of accurate information, vis a vis the presence of false/misleading information.
2. The individual of concern is a passive consumer of information (whether misinformation or accurate information).
3. Interventions are focused on specific information (whether correcting or removing false information, or providing specific information around a behavior).
4. There is a specific desired behavioral outcome of information consumption, and this outcome is often determined externally, rather than in consultation with local stakeholders.

We do identify studies that take a more contextualized approach and complex view of information ecosystems, but often, especially in studies focused on interventions, there has been a narrow treatment of information, crisis, and people's behaviors and agency.

At this point, we identify a potential disconnect between the information-related challenges that surround climate change impacts in humanitarian contexts, and approaches supporting information-strengthening and informed decision-making. From one view, studies focusing on the problem of climate-related information to be one of a scientific information deficit, and gap between scientists and the public, align well with the narrow set of assumptions identified above. From another perspective, such a view jars with humanitarian programming aimed at strengthening the agency of people to make decisions, including by strengthening locally relevant, reliable and participatory/engaging information provision.

These considerations inform the approach taken in this study. To advance existing knowledge our study begins from two key take-aways from trends in existing scholarship. First, we cannot assume that experiences, responses and trustworthy information are equivalent across diverse contexts. Therefore, we have focused on a case study approach that considers community specificities and is sensitive to local context. This enables us to start from local experiences, and consider how and why they might compare to other contexts. Second, we note that climate change invokes uncertainties, injustices and inequalities in knowledge production. Also, impacts and responses to climate change can depend strongly on local circumstances. Therefore, we also give space to inquire how people engage with information, how and why information becomes meaningful to them, and what their informational needs are.

In the next chapter, we detail experiences, information ecosystems, and informational beliefs and needs in two humanitarian contexts: 1) central and southern Iraq; and 2) southwestern Zimbabwe.

We consider informational dynamics around climate change impacts in these two contexts on their own terms, and what factors shape informational challenges and opportunities. In Chapter 4, we return to the assumptions and considerations about climate change, information ecosystems and agency in humanitarian contexts introduced in this chapter. We analyze what our empirical insights suggest for how to approach and conceptualize information ecosystem strengthening around climate change impacts.

03. **Case Studies from Climate Frontiers:** Local information ecosystems and climate change in Iraq and Zimbabwe

Key Messages

1. Through detailed descriptive case studies, this chapter explores the existing information ecosystems, beliefs, narratives, and trust dynamics that influence how people engage with climate-related information in southwestern Zimbabwe, and central and southern Iraq, providing insights into factors that shape informational needs and engagement.
2. Looking across the two cases, specific historical, environmental and social dynamics seem critical to how community members engage in local information ecosystems, and how they define their information needs. What these dynamics mean for engagement with specific information sources and content diverge, but there are particular features and mechanisms of change that appear important to understanding the challenges and possibilities of local information ecosystems around climate in both.
3. In both cases, there is a dual need for information that, incorporating local knowledge and contexts, addresses immediate climate impacts and supports sustainable long-term livelihoods, given the unpredictability of future changes.
4. Widespread mistrust, especially of external institutions and actors, hinders effective information dissemination, and the intensity of climate impacts drives a strong interest in locally relevant and actionable information.
5. The psychosocial dimensions of climate change, including a sense of hopelessness, affect people's agency and decisions, highlighting the importance of addressing both local and external communication channels and promoting active community participation in information creation for more relevant and reliable information.

This chapter addresses the first of our two overarching research questions: **What elements of local information environments shape whether people trust information on climate impacts and responses and how they engage with this information?**

Both southwestern Zimbabwe and central and southern Iraq reveal the many immediate and longer-term ways in which changes in climate impact people's lived experiences -from the cumulative effect of changes in the timing of seasons and rains, to more intensive storms. They provide opportunities to explore informational dynamics and needs both in the short term, as well as in relation to the development of longer-term climate 'resilience'.

To establish a bottom-up perspective on how different features of information ecosystems relate to people's engagement with information and informational needs, this chapter offers two descriptive case studies, each case organized in a similar way: We begin with the impacts people experienced and the existing information ecosystems in which they find themselves. We then consider the types of beliefs, narratives and dynamics of trust that emerge through the intersection of these experiences and informational contexts. We conclude each case study by reflecting on the factors that emerge as salient to why and how people engage with climate-related information in each context. We look at each country context in turn, before concluding with hypotheses that emerge across the two contexts about how and why different factors matter to how they engage with information and their informational needs and challenges.

Our Case Study Approach

Our bottom-up approach to answering the research questions necessitated that we take a slightly different approach to the case study parameters and focus within each country, to take into account the nature, intensity and distribution of climate-related impacts. Decisions about the scope and focus for country-based research was led by the in-country researcher and local Internews office.

In Iraq, there are clear, immediate impacts on livelihood and well-being affecting some communities most intensely. Data collection was designed to explore communities in which specific impacts are acute. This meant looking in depth at two rural contexts (around livestock farmers and agricultural farmers), as well as comparatively at two urban contexts, with specific health-related impacts.

In Zimbabwe, we also considered impacts in both rural and urban areas. Here, we chose to focus within the southwestern region, where there is a relatively higher proportion of indigenous language communities who face particular challenges around information access. As a whole, this region is vulnerable to water and food insecurity, and climate-related effects specifically tied to reduced rainfall. Therefore, in Zimbabwe we look at multiple impacts within rural and urban communities. Given the nature and degree of climate-related impacts experienced at present in Zimbabwe, it did not make sense to select communities according to specific, acute impacts.

Case 1: Central and southern Iraq

Our research in Iraq focused on four communities in the central and southern regions facing four climate-related challenges:

1. Loss of livelihood in livestock farming and fishing around the Chibaysh Marshes;
2. Failed crop production in rice farming near Najaf, Amara and al Seeba;
3. Challenges to health among residents in Basra next to oil and natural gas installations;
4. Challenges to health among residents in Baghdad and Nasiriyah experiencing dust storms.

Due to scope and feasibility, we focused primarily on rural communities experiencing climate change impacts, with a lighter touch analysis of the urban areas. As mentioned, we begin first with how interviewees are experiencing climate impacts, before turning to explore the information environment and how it supports them (or not) in decision-making in the face of these impacts.

Experiences of climate-related impacts

In this section, we focus on the impacts of environmental and weather changes that interviewees emphasized as most critical to their experiences, considering each community in turn.

Livestock farmers in the Chibaysh marshes

People living in the Chibaysh Marshes survive entirely on buffalo farming and its dairy products, fishing, and water-associated business, including trucking of produce/fish, tourism on the canals, and so on. Few children in the area attend school beyond the age of 12, moving quickly into the family farming or fishing business, which is often labor intensive. Historically, the people living in the marshes, known as the Ma'adan, have been neglected by successive governments and face significant discrimination outside the areas in which they live. In the 1990s Saddam Hussein completely dried out the marshes and burned them to the ground to stop a local rebellion; thousands of families were displaced. Since the marshes were re-flooded in 2003 livelihoods have thrived. In 2016 the marshes were declared a UNESCO World Heritage Site.

Once the most biodiverse area in Iraq, the southern marshes of Iraq are now dying out at an alarming rate. At their largest the marshes spread across 5,600 km; now, **it is estimated to cover only 15% of that area** (Nature Iraq Foundation, Chibaysh). **Since 2022, large swathes of water have disappeared, leaving arid land.** Changes in water levels were visible around 2016, when there was no snow in the north and few rains. The marshes also depend on the Euphrates, which loses a lot of water to evaporation as it flows south through the country, so increased heat levels have had an impact.

Interviewees explained that **since 2020 there have been no rains and severe drought.** The Nature Iraq Foundation in Chibaysh estimates the level of the Euphrates as it runs through Chibaysh, the center of the two largest marshes, is dropping by 50-75 cm per year. In the summer of 2022, the marshes were at 1.16,m above sea level. In 2023, they were at 74 cm (Nature Iraq Foundation, Chibaysh). Further, in July of the same year, **the UN reported that 70% of the marshes are now devoid of water** (United Nations in Iraq, 2023a). The area supports thousands of buffalo farming and fishing families, but their number has drastically reduced as they migrate in search of water or move to the cities. If this continues, **interviewees indicated that a generation of farmers who have been raised to live in this specific ecosystem will be left homeless and unemployed**.

Agricultural farmers (near Amarah, Najaf (Mishkhaab), Al Seeba)

The agricultural sector is one of the main employers in Iraq outside of the government and the oil/gas sector, though the numbers have substantially declined in the last few years. Interviewees noted very few employ modern drip irrigation methods (as per interviews, see also UNICEF, 2021). Most farmers in Iraq use the more water intensive Sumerian-era flood irrigation.

As the center of the fertile crescent, Iraq's rich soil, irrigated by the Tigris and Euphrates, has previously provided more than enough produce for the population, and supplied exports to the whole surrounding region. **In the last couple of years water resources have dropped to such low levels that traditional rice, fruit and vegetable farming have almost been wiped out.** Research between 2021-2023 indicates poverty levels have increased in regions known for produce (for example, Najaf for rice, Diyala for fruit and dates), in areas that previously tended to have decent standards of living due to plentiful crops. Now, cheap imports from Iran and Turkey have presented farming communities with a catch 22: they cannot afford their own produce because purchasing water for irrigation makes the product so expensive. Interviewees explained that by buying cheap imports to live on they are killing their own businesses.

Iraq has a feudal system for farming. Identified through interviews and reporting between 2021-2023, tribal landowners lease land to farmers and split profits. Iraqi landowning farmers have tended to have a relatively high standard of living and wealth. For example, more than half the landowners interviewed had sent their children to university. At university, landowners' children have learnt new methods and brought ideas back but lack the incentive to invest in developing and continuing farming. By contrast, children of most serf farmers are not educated and have no other option than farming. As highlighted through observations and interviews (2021-2023), the livelihoods of the wealthier and more privileged half of the ecosystem are dying out, leaving future workers facing destitution.

Residents around oil and gas sites in Basra

The latter two communities examined reside in urban areas and have experienced health-related effects of climate change. We focused on two distinct climate-related impacts: health effects linked to the oil and gas industry, and respiratory diseases linked to dust storms. Basra is the second largest urban center in Iraq, with the country's largest oil fields, main port and historically surrounded by fertile agricultural land (United Nations in Iraq, 2023b). Basra produces approximately 70% of Iraq's crude oil but is one of the poorest areas (UNICEF, 2021). Climate-related impacts in Basra are linked to oil and natural gas installations. This includes toxic fumes from oil and gas flares. One local TV journalist interviewed explained,

"We know there's lots of CO2 in the air. There are toxins in the air and there are not resources to turn this CO2 into oxygen. Until now we have not addressed or reduced the pollution coming from the oil fields."
– Local TV journalist, 30, Basra, June 2023

Also, the city's canals are largely empty, with sewage mixed with fresh water. Local water experts and other interviewees explained that the Shatt al-Arab, which provides the main source of fresh water to the sea, is increasingly saline. Low levels prompt it to draw in salt water from the sea.

2 It is difficult to give a more accurate reading on population here as no one tracks it in detail; in the early 1990s, local authorities said there were nearly quarter of a million Ma'adan living in these marshes, now, local activists estimate only a few thousand families remain.

"Drinking water we buy, and for washing etc when the tap water is sweet, we use it, when it's salty we buy water too. There are times in the summer when the salty water is so bad (above 10,000 TVS) that we have to buy water for all purposes." – Mother of 7-year-old child in Basra with breathing difficulties, June 2023

Water shortages are a significant and longstanding concern in the city (International Organization for Migration & Social Inquiry, 2021). In 2018 a water shortage resulted in at least 118,000 people in the hospital and violent protests (Human Rights Watch, 2019b). Finally, **cancer cases are rising in the city, likely linked to gas flaring (Juhasz, 2023), and children across the city and rural areas suffer skin infections and gastrointestinal complications from putrid water.** Increased proportions of people's salaries are spent on drinking water, generator power and medicines (Human Rights Watch, 2019a).

Residents in Baghdad and Nasiriyah experiencing dust storms

Alongside impacts associated with oil and gas production, dust storms are a growing health issue. Sandstorms have long been a problem in Iraq, but dust storms are a newer phenomenon. The removal of plants and trees, whose roots keep the earth moist and compacted together with increasing temperatures drying out the top layer of soil, have led to thin particulate matter flying around in the desert winds and embedding itself in people's lungs with serious consequences.[3] Dust storms tend to be more damaging to human lungs than sandstorms, because the smaller particles settle lower in the lung and are harder to cough out. The health challenges are heightened as Iraq's population already has a high propensity for weak lungs due to a significant number of adult males in Iraq who smoke (Ibrahim et al., 2018).[4]

In 2022, dozens of sand and dust storms closed businesses and schools throughout Iraq throughout the summer (Guardian Staff, 2022), **and has been estimated to send up to 10,000 people to hospital with respiratory complications** (Gross et al., 2018). Experts predict that if nothing is done by 2035, Iraq could face dust storms 272 days of the year (The Climate Centre, 2022).

Interviews with residents suggest that thus far most of them adopt a curative rather than preventative attitude to health effects, as basic health care at government hospitals tends to be affordable.

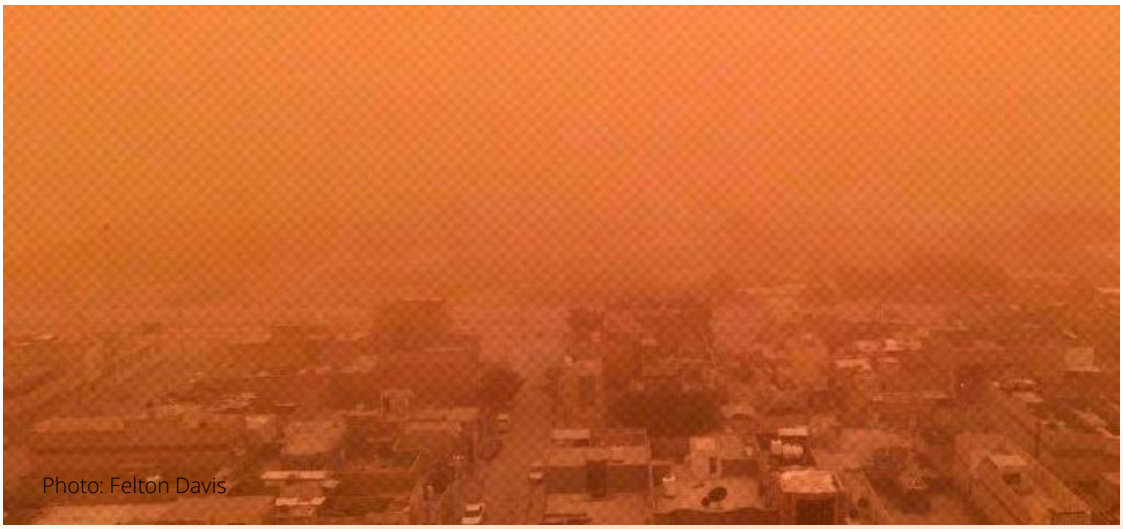


Photo: Felton Davis

3 Based on expert interviews between 2021 and 2023.
4 Figures indicate around 30%, reports; interviewees and observations indicate potentially much higher numbers.

The structure and scope of local information ecosystems

Key Findings

- **Interviewees often rely on communication via word of mouth** for access to information on climate-related impacts and adaptation. Many factors contribute to this practice, including illiteracy among some communities (for example, older livestock farmers) and a general view that individuals known within a community were more reliable than outside individuals.
- **TV is popular across communities**, but it has been limited in providing practical, actionable information to address specific livelihood and well-being concerns.
- **Farmers indicate a growing receptivity to information through social media,** driven by the immediate nature of climate-related impacts on their livelihoods.

The presence of direct impacts of climate changes on well-being and livelihoods is thus very clear across interviewees in all four communities. Common sources of information on climate change impacts and responses across all four communities in southern Iraq are word of mouth, through family, friends and opinion leaders, TV and, increasingly, social media. Only two people interviewed read print media (on- or offline).

Direct communication within communities - between community members and with locally-based organizations - is the main way in which interviewees indicated they could participate in, discuss and access information. Specifically, **oral forms of communication** are important in the Chibaysh Marshes. Farmers interviewed, as well as a specialist from the Nature Iraq Foundation, stated that it is common for people in the area to leave school at the age of 12 to help with labor intensive livestock farming, also limiting potential engagement with written information sources. Alongside, interviewees suggested most older people are illiterate. They depend on word of mouth (and in some cases TV) for information.

"What will happen is unknown, we are uneducated and don't read and write so we don't have any information. We are afraid of time; we don't know what is coming for us. For those of us who can't read and write it's all through word of mouth – we can't read and on the news they speak in difficult formal language that we can't understand." – Buffalo farmer migrated to Babylon, June 2023.

For both older and younger people, TV news is central and the most consumed and trusted source of news. This reflects wider trends in Iraq, with one survey from 2012 by the International Research and Exchange Board estimating that 97% of Iraqis get news from national TV channels, and a 2016 Gallup poll suggesting that 90% of Iraqis trust news broadcast on TV (cited in Internews and Rooted in Trust, 2022). Basra, in particular, has a relatively robust and extensive local media network. Iraqi journalists appeared at the forefront of reporting on and spreading information about climate change and its impact. Journalists indicated relative freedom to report on climate change impacts, though with some limits in reporting on oil and gas company activity:

"There is one red line for us – the oil companies. We're not allowed to talk to them. In 2020 I was sued by the government for saying that even though Kadimi's government said they support climate change action, they're still backing these polluting companies." - Local TV journalist, 30, Basra, June 2023

Content on specific impacts and how to mitigate their effects is, however, limited, across the board. Observation of local media reports indicated a tendency to provide concise updates and reporting on current climate events rather than more detailed information on responding to impacts, or mid- to longer-term goals for reduction. For example, while popular, in the Chibaysh marshes, interviewees suggested the type of information provided through TV is limited. One local female TV reporter explained that news segments are often restricted to two-minute segments.

A feature across communities is the increasing use of **social media,** for example, creating and accessing video content in TikTok, to access information on climate-related impacts and adaptation. Older community members tended to rely on young men to access information through social media, with one 78-year-old man with bronchitis in Baghdad explaining, 'they're in media'. In the Chibaysh marshes, where illiteracy remains relatively high among older community members, social media is more often directly accessed by young people. However, its reach is also growing as people seek out any useful information that could help them adapt amidst severe water loss. Young people who have access to social media and understand the internet are increasingly trusted to source and communicate information on climate threats and solutions to their families and the elders in their communities. Elders would then debate information received from young people.

"The young people have social media. I have a phone and I logged in to Facebook, Instagram, Tik Tok, following news of the marshes and hoping I will have good news for my family." – Unemployed former buffalo farmer, 23, Babylon, June 2023

Increased social media use seems to be part of an effort among agricultural farmers interviewed to look for information anywhere it might be found. Some farmers are learning to use social media to search for ideas.

"We're not into science, we're simple people, we don't know. Facebook, Tik Tok, [we] watch all these things. We believe everything, we follow anyone who talks about this crisis. We're just looking for solutions we believe everything. We want to cling on to hope even if you're lying. And I still believe in God too." – Rice farmer, 50, Abu Qasaf village, June 2023

There were varying views on whether school is a place to learn about changing weather. In the Chibaysh marshes, school was mentioned as a place where children could learn about changing weather. In Basra, interviewees noted that schools teach basic information on environmental changes.

"There's absolutely no education about this in school. They teach the basics: Iraq is hot in summer [and] cold in winter. They don't even know the term climate change, the meaning of that term." – Local TV journalist, 30, Basra, June 2023

Within this context, some interviewees saw schools as a missed opportunity to learn about climate change impacts and how to respond effectively. However, some interviewees suggested that climate change impacts are yet effectively covered:

"The kids don't learn anything at school about the science, about what's happening or about how to try to protect themselves. When there's a dust storm, we are locked in our houses for 3 or 4 days and the hospitals are filled with people with respiratory problems." – Rice farmer, 50, Abu Qasaf village, June 2023

Finally, interviewees highlighted the conspicuous absence and/or lack of practical information provision by **government,** and to a lesser degree, **NGOs** about climate-related impacts and responses. A particular concern is the government's lack of presence within the local information ecosystem.

In the Chibaysh Marshes, interviewees asserted that communities have been neglected by the government for decades.

"We are poor here; we are very exhausted. Now we have nothing. We demand that the state provides us with the equipment and the methods to survive. There is no life here. My blood is boiling at this situation. - Buffalo breeder, dried out former marsh, June 2023

"The main cause I think is government neglect. They don't have a vision, no idea how to increase green areas, where to put factories, how many cars to let into the city. We are optimistic that this new government can improve our situation. All we have now is hope and we need to hold on to that to stay alive. – Migrated former buffalo farmer's son, 29, Nasiriyah, June 2023

Agricultural farmers similarly discussed the lack of active government presence. Here, interviewees also noted that NGOs could play a greater role in providing practical information. Interviewees expressed that while they are aware foreign organizations are making efforts at this, they had not seen any evidence themselves. Two interviewees noted they had seen limited health training carried out by the UN and Red Cross, but nothing else.

"I don't really understand why, they're not giving us our water, it's all politics. No one has come to explain anything to us. Politicians and NGOs come and look and take pictures, but nothing ever happens. We don't have any information, we just improvise. We can't change much, it's as it was 50 years ago. We don't expect much, even if they come, we know their ability is limited. – Fruit farmer, Al Seeba Village, June 2023

"We would welcome any efforts from international groups to come and help and train us, but we haven't seen anything. We're not aware of these local NGOs either. – Fruit farmer, Al Seeba Village, June 2023

The lack of active NGO or government presence means interviewees find little opportunity to speak and inform wider climate change discussions. This was a key difference to their engagement with local organizations and individual information providers. Interviewees suggested that discussion about climate change impacts and solutions is confined to high level international conferences. They perceived no attempt, especially by government authorities, to visit affected communities, listen and respond to their needs. One interviewee in Nasiriyah commented that a politician from the area had driven through on a rare visit the other day, but did not stop anywhere to speak to anyone about the crisis and what they need.

In sum, across rural and urban communities, interviewees cast a broad net to access any information on climate change impacts and solutions, in particular TV, word of mouth and social media. However, information on local challenges and solutions is thin. Interviewees explained that NGOs and government are largely inactive in the information environment, let alone providing opportunities to listen to communities or have them actively engage with, and debate information.

Beliefs and narratives about climate-related impacts and responses

Key Findings

- There is little **scope for climate denial** given the immediate reality of climate-related impacts on farmers' livelihoods.
- A strong degree of **hopelessness** runs through narratives of climate-related changes.
- Interviewees consistently express a **strong desire for information** and resources that could enable them to do something to adapt and sustain their livelihoods in their communities.

Within the context of rapid and severe climate impacts in the marshes, interviewees indicated little to no room for debate over whether climate change is impacting livelihoods and well-being. A common refrain is **"we're seeing it and living it every day, no one needs to tell us this is happening."**

Across rural and urban areas, the immediacy of climate-related impacts served to quickly debunk climate myths. Most interviewees recognized that the earth is heating, and that water is scarce because of mismanagement of polluting gases, rubbish, and the removal of green spaces. Interviewees also recognized that government mismanagement of water and established agricultural practices that waste water are major contributing factors.

The urgency of impacts is most visible among livestock farmers around the Chibaysh Marshes. Direct experiences of reduced water, impacting on the livelihoods of farmers and fisherman, mean that the presence and scale of environmental changes is a lived reality.

"The people right now are aware of the climate change impacts because they're living it, but the problem is they're still not taking action. For instance, everyone knows we should reduce our water use but they don't. There are awareness campaigns not to throw waste into the river but they do. The problem is they're still not aware of the size of the danger. – Local journalist, Nasiriyah, June 2023

"They didn't believe it would happen so fast. We used to have short bursts of drought, but now the waves are lasting longer, a year or two, so that's making people believe in climate change. – Climate activist, Chibaysh, June 2023

"We are afraid of time; we don't know what is coming for us. For those of us who can't read and write it's all through word of mouth – we can't read and on the news they speak in difficult formal language that we can't understand." *– Buffalo farmer migrated to Babylon, June 2023.*

They didn't believe it would happen so fast. We used to have short bursts of drought, but now the waves are lasting longer, a year or two, so that's making people believe in climate change*– Climate activist, Chibaysh, June 2023*

Photo: Jerry Zhang

Similarly, in urban areas, interviewees did not entertain debate about health effects as a result of environmental changes.

"The weather in Basra affects everyone, and my son specifically. Even when I take my son to the doctor, I see many similar cases. Just said avoid exposure to dust, try to keep him indoors. My niece who lives at my house is the same age and has the same problem. – Mother of 7-year-old child in Basra with breathing difficulties, June 2023

"The dust has increased hugely, that's the first thing. We are noticing the effect on our health; we're all starting to have respiratory problems. They're wiping out the green areas to build housing projects, the green belt project has been postponed and postponed. – Local female TV reporter, Nasiriyah, June 2023

The economic and political power of the oil and gas industry loom large within narratives in Basra about climate-related impacts:

"I've seen changes since '88, but it's been very bad in the past 5 years. For example, this gas plant – it produces waste in the water, poison in the air, and chemicals in the sea. Entirely environmental pollution. So, we have increased cancer cases. A few years ago, we even noticed oil in the water. – Mukhtar of Seeba Village, Basra, June 2023

The rise in dust storms was discussed as the result of industry and urbanization.

"I believe these changes are because of the changes here, there are so many factories and there are so many cars in Baghdad now, and they've wiped out all the green areas that's why the environment is changing. Now the marshes are drying up too. – Bronchitis sufferer, 78, Baghdad, June 2023

While there is a shared sense among interviewees that climate change is a reality, and that immediate adaptations and mitigation efforts are needed, there is some variation in the degree to which interviewees attributed changes to geopolitics. Often, foreign countries tend to be blamed for the water shortages, specifically Turkey due to its dams, even amidst widespread hostility among interviewees to inaction and inefficiency by the Iraqi government. Each interviewee varied in the extent to which they blamed geopolitical battles over water, versus scientific climate change concepts, and the extent to which they felt solving it is the Iraqi government's responsibility. However, otherwise, interviewees tended not to focus on cause and responsibility, but instead were oriented to their direct experiences.

Widespread hopelessness

The harsh reality of climate-related impacts on livelihoods and health generates widespread hopelessness, with particular concern for young people. Despite the majority clearly expressing a desire to act, some commented that the situation was in God's hands, surrendering their future to their faith as they felt powerless to take control of the situation. Buffalo farmers interviewed, facing the immediate drying up of the Chibaysh Marshes, could not imagine or identify clear pathways through which to preserve buffalo farming now, let alone for the younger generations. For agricultural farmers, the contrast between farming as traditionally a stable, good livelihood and the ways that climate change was decimating crop production underpinned their fatalism in discussing climate-related impacts:

The farmers here got used to a certain income, that has dried up and now they don't have any alternative. They're specialized in one thing and it's hard for them to adapt." – Rice farmer and runs local NGO, 33, Mishkhaab, June 2023

We're thinking of emigrating, maybe even to Europe. We want to go to a rich country like Germany. We might use a smuggler and go through Belarus. Here's death and there's death, what's the difference." – Former rice farmer's nephew, 30, June 2023

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– Former rice farmer's nephew, 30, June 2023

The only thing we know how to do is plant rice and wheat. So now we just lie inside and sleep all day. *– Former rice farmer's son, 27, June 2023*

Photo: Haidar Hamdani/AFP

Farmers are nostalgic for their livelihoods prior to the environmental changes of the past few years. Livestock farmers, in particular, are resigned that the ways of life and communities they value are lost given the unprecedented changes in the climate.

"I want to finish school and be a teacher. Buffalo farming doesn't have a future. Of course it makes me sad to lose this way of life and it hurts my heart anytime we lose a buffalo. I have lots of friends whose family sold everything and left. We used to have fun together and know everyone and now it's a different place. Everyone is somewhere else. – Child buffalo farmer, 14, Chibaysh, June 2023

"We cry when we think of the old days, when our buffalo were big and strong, they would swim and then relax. But now we're dying. – Buffalo farmer, 47, moved from Chibaysh to Babylon in search of water, June 2023

In Basra, real and perceived power dynamics around the oil and gas industry make it especially difficult for residents interviewed to express hope of solutions. Both frustration and fear are present. There is fear of confronting oil companies, to halt or mitigate their contribution to impacts on health. Interviewees tended to explain that oil companies were responsible for poor air quality, but explained oil companies were protected by the government. There is also a fear among some interviewees about confronting Iran over factories, power plants and release of waste into the water system.

"You can't say anything because it's Iran and the politicians support them. The political situation is complicated on this, if I say something I could be killed or forced to flee. There have been lots of demands, but nothing happens." - Mukhtar of Seeba Village, Basra, June 2023

This frustration reflects a longer-standing perception raised among residents in Basra that it is the most neglected area in Iraq. Despite contributing more to the budget than any other governorate, Basra has been underfunded relative to other areas in Iraq (France 24, 2021).

A strong desire for agency

Hopelessness, however, is not the end of the story for interviewees. Interviewees explained that amidst this, discussion of climate-related impacts was driven by a desire to find ways to adapt. Among livestock farmers, all but one interviewee commented that they could sustain their livelihoods if they could get access to water. If the marshes could survive, they had the local knowledge and experience to continue their livelihoods.

While a key preoccupation in discussions, finding solutions is challenged by power and knowledge inequalities. Livestock farmers, agricultural farmers and urban residents interviewed do not see themselves necessarily as the main barrier to adaptation: instead, they are limited by political and economic interests.

Agricultural farmers interviewed explained the government is refusing to supply water and refusing to supply benefits. As a result, interviews and observations reveal how some farmers have been illegally syphoning off water, risking incarceration if caught.

"The government is doing nothing to help. It's affected the whole village, everyone's income has dropped. No one has come to help us with healthcare or advice. Yesterday the governor passed here in his convoy and he didn't even stop to check on us [if there is a] problem or they have to provide government jobs for our sons. – Rice farmer, 50, Abu Qasaf village, June 2023

"The state isn't encouraging and supporting us to start modern methods of agriculture. The whole world is using drip irrigation except us, it's successful there. Maybe the government can increase the money given to us to make the situation better – but then the government will be broke, that concerns us. Or we can leave the rice if they provide – Former rice farmer, 49, father of six, June 2023

The reality and severity of impacts leaves little room for technical and/or global climate change debates. Interviews largely did not engage with debates over climate change projections and global frameworks. Instead, specific frustrations were raised about ongoing high level discussions of climate change, which generate little to no investment in practical, local knowledge creation about local solutions.

"Instead of constant lectures and conferences, we should do a field experiment and when we have a successful one then we can replicate it elsewhere." – Rice farmer and runs local NGO, 33, Mishkhaab, June 2023

Another example, one mother in Basra stated, *"What are the government providing? Nothing. They mostly sit inside closed walls in their conferences, talking about how dangerous the issue is, and that's it. – Mother of 7-year-old child in Basra with breathing difficulties, June 2023*

Trust and mistrust of information sources

Key Findings

- Interviewees suggest that government and international NGOs are largely absent, driving mistrust in their commitment to community needs and interests.
- The sense that political interest equals self-interest shapes most discussions of trustworthy and untrustworthy information sources.
- Local opinion leaders within communities are most trusted to provide locally-relevant and community-oriented information.

Widespread mistrust in government and other institutions is a core theme in narratives of climate change impacts. TV and direct acquaintances are relatively trusted; beyond this, varying degrees of mistrust surround interviewees' discussion of and engagement with institutions.

The interests and motivations of actors affect trust and mistrust. NGOs were suggested by some interviewees to have their own agendas, focused on achieving their narrow objectives as opposed to seriously helping people in the community. Interviewees also often mistrusted government due to the perceived self-interest of those in politics.

"I go for the sources that I think are neutral, not the ones that have an agenda. Their agenda is destroying Iraq, because they're linked to the government, they're just thieves. I don't trust anyone who is in politics (politicians and clerics), anything they say they're either trying to steal something or lie. I know my rights, but how can I demand them from criminal people? " – Shop manager and asthma sufferer, 34, Baghdad, June 2023

Interviewees assumed political actors primarily care about power and economic gain. Narratives about the oil and gas industry in Basra, and how it is propped up by the government to the neglect of residents, is one example given of this self-interest and profit motive. Across all communities, interviewees did not trust government actors to prioritize citizen well-being over personal gain:

"The government is corrupt. All they care about is stealing money. They don't care about us. Before an election the government come and tell us they'll do these things, and then we never see them again." – Buffalo farmer, 47, moved from Chibaysh to Babylon in search of water, June 2023

"The officials lie, promise they will have negotiations and then don't after demonstration stops. There is a trust crisis with the government. Then we hear that they banned farmers from planting rice in Amarah, but they allowed it in Najaf and Diwaniyah because the minister is from there." – Nature activist, Amarah, June 2023

While several interviewees suggested the current government was less corrupt than any in their recent memory, they still did not believe it would prioritize supporting agricultural communities voluntarily. Therefore, there seemed to be mistrust in both the information from government, and its willingness to proactively take action to support communities.

The lack of government presence and support in communities reinforces mistrust, especially when contrasted with anecdotal evidence that other areas receive more attention from the government. Given their absence within the local community, some interviewees commented that it is not surprising that government actors do not provide locally tailored and timely information. They do not listen to or know the situation in the communities.

Still, while mistrust of political interests is common, this does not preclude some trust of government-run media stations, especially in rural areas. Incongruously, while no interviewee expressed trust in the government, all people interviewed in rural areas - except one - stated they trust the government-run media stations. Especially in rural areas, there seems to be a general inclination to accept information from formal media broadcasts. Interviewees in urban areas are more skeptical about journalists and media institutions. Even still, across all communities, TV is generally popular and trusted, evetn despite one interviewee commenting that the media might limit its coverage due to political interests.

Individuals interviewed tended to rely on their own agency to find and assess information. A theme among community members interviewed is that people seek information where they can find it, and assess it based on their direct experiences and in discussion with other community members, for example, elders debating social media information from young men.

"If you tell [a] farmer don't waste water but he says I saw on Facebook that's false, you have to wait for him to see it with his own eyes you can't convince him." – Rice farmer and runs local NGO, 33, Mishkhaab, June 2023

Finally, within each community, interviewees identified some local actors that they trust to provide information for the community, with the community's interests at heart. They identified some educated and informed local opinion leaders on the ground who have built up trust over years of working locally. Direct experience and knowledge of these individuals seems to help build trust in their intentions and the accuracy of their information.

Informational needs within local information ecosystems

Key Findings

- There are different areas of emphasis among farmers and urban residents. Especially among farmers, there is a high demand for actionable information to adapt to sustain livelihoods in their current communities and areas of residence.
- All communities explain they need information to be more oriented to solutions, and accompanied by action.
- Across communities, there is a clear view that the government, most importantly, and also NGOs are not fulfilling their potential roles in enabling or enacting solutions.
- Interviewees suggest that the government and international community also need information. More information about local, urgent challenges has to get to these institutions and be accompanied by more locally relevant support.

Interviewees' discussion of their information needs reveal stark gaps between what information is present and accessible, and what information people want. Most apparent, there is a strong demand for actionable information that can benefit both immediate and longer-term health and livelihoods. All community actors involved in information creation and dissemination who were interviewed also expressed a desire for informational and practical assistance, including collaboration and funding from foreign organizations to carry out their work on a bigger scale.

Within this general demand for relevant and actionable information, specific needs vary among rural and urban communities. These differences are tied to 1) the urgency of impacts on livelihoods and, 2) the extent to which national and local industry is viewed as the problem.

In rural areas, livestock and agricultural farmers identified two key gaps in the information ecosystems that are perceived as critical to adapting to severe livelihood challenges. First, and most strongly, both livestock and agricultural farmers identified a need for practical information that can assist them in mitigating immediate risks to their livelihoods. They suggested such information is not forthcoming through existing information channels.

Livestock farmers are desperate for information that could enable them to avoid livelihood failure.

"People's main obsession is how to get through the day, they can't get beyond that. We watch TV, social media channels. We watch the news to see if government will give social support to the unemployed." – Migrated former buffalo farmer, 63, Nasiriyah, June 2023.

Climate change impacts seem to have passed a tipping point. According to local experts interviewed, who have been monitoring water levels over decades, the marshes are nearly gone, and remaining water will likely be gone by the end of the summer. Once buffalo are sold or die, interviewees asserted it is unlikely families will be able to re-establish themselves later without outside financial support. In this context, practical, localized information on how they can act now to retain and rebuild alternative sustainable livelihoods is critical.

Agricultural farmers show a strong appetite to learn about alternative crops and new methods to adapt to the novel changes to land and water supply. Most are not yet inclined to emigrate from their farms and wanted information that can enable them to adapt and remain.

"... skills on how to grow better things with no water, we would love that. If somebody would come and give us instructions or dig us wells, we would welcome that." – Rice farmer, 50, Abu Qasaf village, June 2023

"Of course we would like to learn more and have more information. If they give us more steps to take we will abide by them and make things better." – Migrated former buffalo farmer's son, 29, Nasiriyah, June 2023

All interviewees in rural areas stated that they would welcome and engage with tools and education to help adapt to water shortages. The knowledge systems that underpinned such information - whether newer technological practices or those based on traditional knowledge - did not matter, if the information is useful. An example of this openness is the ways in which older generations are engaging with information from younger people on challenges and potential solutions found through social media. This is a shift from past generational dynamics.

Second, in addition to practical information on livelihoods, farmers expressed a desire for information to help them to better understand, claim, and have their rights respected.

"We have no idea what our rights are, what our government owes us. We get no information on TV or online on how to survive. We have adapted to the situation now. We don't believe what the government says, but we need to keep some hope. We went and did demonstrations before and tried, but there was no result. The country is going well, it's making money, but we are the only ones who are being neglected, we are the poorest category.– Unemployed former buffalo farmer, 23, Babylon, June 2023

"How can we demand our rights? We can only protest, and the government doesn't do anything. Legal recourse wouldn't work in this country. We don't have the system to do that here." – Fruit farmer, Al Seeba Village, June 2023

One local journalist in Nasiriyah explained that there were no clear channels through which to effectively get the government's attention.

"There are no serious real movements by the government. People do protest and do demand their rights, they close the roads, they go on TV, but the government are turning blind eyes and deaf ears to them." – Local journalist, Nasiriyah, June 2023

Finally, a couple of interviewees were concerned about a lack of discretion as people look for information anywhere. A nature activist in Amarah suggested that young people working in the media sector did not grasp the full extent of the challenges they faced.

"People are manipulated by the media, they hear only from the media, some are realistic and taking their info from credible websites, and the others are amateurs who will say anything. Most young media people underestimate the size of the disaster or they exaggerate it. " – Nature activist, Amarah

In urban areas of Baghdad and Basra, residents seem to have a clearer idea of who they believe is responsible for health impacts, and what can be done. Around the duststorms, interviewees explained they are aware that green belts can mitigate the intensity and frequency of duststorms and associated health effects. Their main concern, then, is not for information on potential solutions. Rather, they are concerned with why green belts are not forthcoming, and how to effectively pressure government for them. A key problem identified by interviewees was the government's unwillingness to fund green belts. Research and reporting by a member of the research team earlier in 2023 found that the government had pulled funding for green belts. The only active project in 2023 is in Karbala, privately funded by the city's religious organization.

In Basra, interviewees also could articulate potential solutions to air and water pollution and scarcity, but see the problem as the power and unwillingness of government actors to limit industry.

"Everybody's talking about it, everyone just wants fresh air and water but it's outside their control. All we have is talking and diagnosis but no solutions. No one here is paying attention to the environmental solutions. They should bring people who are experts and help us with advice, and create a solution. There should be an engineer, an expert in charge." – Mukhtar of Seeba Village, Basra, June 2023

There is a view, then, among interviewees that the issue is not information per se, but the government's and international community's unwillingness to tackle the causes of air pollution and water scarcity in cities.

"The problem is there are lots of words but no action, and I don't think we'll ever see any action on this. The main responsibility is the government's and they're not addressing any of the issues they have conferences, even the one here in Basra, but we don't see any action on the ground." – Local TV journalist, 30, Basra, June 2023

"There are areas, especially north of Basra, where people are living right next to the oil fields. Most of these areas are agricultural areas. These areas are dying day by day because of the flares and the smoke that's killing the soil. The local and central governments are not tackling any of these issues, they just give statements and condemn it." – Local TV journalist, 30, Basra, June 2023

"If the international community can support us with building green areas, we can't self-fund that so this would make a real difference. Recently at the climate conference Sudani said we'll plant 5 million palm trees in Basra, but when we checked with the ministry, they said there aren't any funds for that." – Local TV journalist, 30, Basra, June 2023

Linked to this, some local journalists interviewed explained they are constrained in reporting of oil and gas companies' activities. Iraq **ranks** 167 out of 180 countries on the Press Freedom Index published by Reporters without Borders, as well as on Freedom House's **assessment** of freedom online and civil liberties. Research (Internews and Rooted in Trust, YEAR) in the Kurdistan region identified ongoing hostilities towards individual journalists and media outlets. Despite this, local journalists working on climate change issues in southern Iraq interviewed suggested that overall they feel free to report on the issue without controls by their media companies or by the government. There is one exception - three journalists explained they had been warned to stay away from reporting on the negative impacts of foreign oil and natural gas installations, for fear of reprisals by both the government and militias, as this could affect their profits. One local journalist reported that he had been sued and taken to court for criticizing the environmental policy of a senior politician. In the end, his media company and the courts backed his case, and it was dismissed. This indicates that while there are constraints on journalists' freedom, there is some institutional and judicial support for journalists' rights.

At an individual level, there appears to be some need for information and resources around preventative and long-term cures. Interviewees with breathing issues and skin problems reported that they can access health treatments to deal with their symptoms in cities. This includes at-home oxygen tanks, inhalers, staying home during a dust storm, and/or emergency oxygen treatment in the hospital emergency room. However, interviewees indicated there is little treatment or information about prevention and long-term cures. While basic public healthcare is generally accessible, most cannot afford exploratory analysis or curative treatments. One interviewee, the son of an elderly patient, commented he feels the government would rather pay for limited healthcare for sufferers than impact its economic prospects by limiting industry, even if the latter can prevent and/or reduce health problems.

Summary: Factors affecting engagement with information

Across the communities in central and southern Iraq, several features stand out as central to how interviewees' experienced local information ecosystems, and engaged with information.

First, **a history of real and perceived government neglect** generates a strong mistrust that government can or will prioritize or meet communities' interests. In Basra, this is linked to experiences of the relationship between the government, and the oil and gas industry. In the Chibaysh Marshes, neglect comes after the use of the Marshes as a weapon, dried out in the 1990s under Saddam Hussein. Government and external actors therefore must contend with a history that justifies mistrust of intentions. At the same time, there seems to be a drive among interviewees to act to improve their situations. Long histories of neglect also gave rise to a desire among communities to act. The sense among livestock farmers that they can survive if they have water suggested that they had some confidence in their local knowledge and practices, even as they generally mistrust the interests of external institutions.

The experience of neglect in urban areas differ slightly, in that it is tied to a longstanding view of the prioritization of oil and gas industries by the government. This, combined with a general understanding of the linkages between oil and gas activity and health impacts of climate change mean that the information interviewees seek is not just about altering their behavior, but also altering that of industry.

Second, the **extreme urgency** of climate-related impacts among farmers, expectedly, affects how people engage with information sources, even amidst mistrust. There is a clearly identified need for actionable information to enable farmers to survive, maintain livelihoods and avoid emigrating. While locally trusted and known opinion leaders still played a key role in communicating and debating information, there is a willingness to look to new sources of information, including social media, with the hope that they might fill a gap that is not being met by traditional media. There is also a strong emphasis on the government as a key actor, who can and must engage, even amidst the mistrust of its priorities and interests.

The urgency of impacts leaves little space within which interviewees might engage with speculative information. What matters more is whether or not information can link to tangible changes in their lives.

Third, among rural farmers, climate changes and their impacts on livelihoods are clearly visible. This provides a comparator from which to consider their current crises. Interviewees can **remember** when they could sustain decent livelihoods, and can see how changes in the environment directly affect their ability to continue to work and live in the areas. Tied to this, the local information environment is marked by a profound sense of loss and hopelessness.

Within these histories and current circumstances, patterns of engagement with information sources around climate-related impacts seem to be defined on one side, by a general mistrust of the interests of external actors, including government, reinforced by their lack of active and visible engagement in the communities. And, on the other side, with a desire to access more, actionable and locally-relevant information from existing and even less familiar sources. This includes actionable information that they can use directly, as well as pertaining to measures that other responsible and able actors (for example, governments) might take. For farmers, the immediacy of threats to livelihood across their community puts a considerable focus on information useful to individual households and to the community to sustain livelihoods, for example, ensuring seed banks for future yields. In the cities, a desire for actionable information by individuals is coupled with an emphasis on wanting to know what could be done, and by whom, to challenge political and economic powers, and compel them to act.

Case 2: Southwestern Zimbabwe

In southwestern Zimbabwe, we focus on three areas: Bulawayo City, Lupane in Matabeleland North and Gwanda, Matabeleland South. As with our case of central and southern Iraq, we begin first with people's experiences of climate impacts, to then situate their discussions of their information environments, and needs.

Experiences of climate-related impacts

All three areas fall within semi-arid areas of Zimbabwe with low levels of rainfall, and are prone to intermittent droughts. Humanitarian agencies have a long-term presence in the wider region, dating back 15 years. The region has experienced long-term food insecurity, and drought, pests and disease affecting livestock. One study suggests that long-term NGO and humanitarian presence in the region has contributed to a sense that food assistance is a permanent state (E. Ndlovu et al., 2020).

Environmental studies of climate-related changes in Matabeleland note recent increases in heat waves, protracted droughts, erratic rains, floods and frost (E. Ndlovu et al., 2020). Intermittent droughts, dating back to the early 1980s, has destabilized and threatened livelihoods (E. Ndlovu et al., 2020). Dube et al., (2021) highlights the particular effects of climate change on urban agriculture in a peri-urban area of Bulawayo,[6] finding all farmers were aware of climate change and most were working to adapt to its effects. In rural areas, long-term environmental changes have affected farming conditions, resulting in lower productivity, declining grazing land, lower quality pastures and water scarcity (E. Ndlovu et al., 2020; S. Ndlovu et al., 2021). The most vulnerable farmers seem to be those who rely to some degree on rainfed agricultural methods, as part of traditional farming practices. These changes have reduced and destroyed crop production leading some to abandon traditional farming systems, and shift to alternative livelihoods where possible, including gold panning and sales (E. Ndlovu et al., 2020).

Interviewees' perspectives on climate-related impacts

Interviewees tended to discuss how over the past few decades, weather conditions have become more unpredictable, more extreme and drier in Matabeleland North and South. Interviewees explained that rainfall is more intense when it comes, but that overall there is much less rain, resulting in drought-like conditions. Temperatures are also more extreme.

Most interviewees were forthcoming in identifying how climate-related changes impacted on their lives. Water scarcity was a primary concern, with rivers drying up, wetlands disappearing, and reduced capacity in boreholes. In rural Lupane and Gwanda, changes in weather were linked to reduced food security, and reduced water security for both people and livestock. Agricultural farmers were particularly affected, with much poorer agricultural yields as a result of drought, erratic rains, and hotter temperatures. Interviewees explained a combination of longer-term water shortages and flash floods has destroyed agricultural crops.

5 Marzouk et al (2022)'s survey in the Kurdistan region found a similar emphasis among respondents that political authorities had a key role to play.

6 Bulawayo City is the second largest city in Zimbabwe, with an estimated population of 653,337 (as per the 2012 National Census) (Dube et al., 2021) and high rates of poverty, crowding and unemployment (S. Ndlovu et al., 2021).

One agricultural vendor interviewed in Gwanda, explained that farmers in the area had already planted crops twice that year; both times they were destroyed by hot temperatures. Farmers in irrigation schemes and with links to Grain Marketing Boards were seen to be relatively better at coping with the weather changes.

Livestock farmers are also affected by extreme temperatures. One interviewee in Gwanda explained that the value of livestock had depreciated given harsh conditions (Female community member, Gwanda, July 2023). Also, livestock are increasingly being moved to reserve grazing areas.

In urban areas of Bulawayo, interviewees discussed lack of reliable and sufficient water, as well as pollution through burning of garbage, and deforestation through urban expansion. As a result, household gardening is seen as almost impossible to continue, resulting in a loss of food and income. Sanitation is also a concern in urban areas, with limited water for cleaning and hygiene. Across urban and rural areas, community members already have to adapt their economic activity to account for reduced income from gardening, agriculture and livestock. This has included taking up roles as firewood vendors, which interviewees recognized as exacerbating deforestation. Emigration of young people to South Africa and Botswana is also seen to be driven by the livelihood impacts of climate changes. Remittances from family members in Botswana and South Africa are identified as key to mitigating the effects of reduced income and food, linked to rainfall and temperatures.

Climate change impacts are unequally felt by gender, age and disability, exacerbating existing vulnerabilities. Given social norms around household responsibilities, women are responsible for collecting water, and must spend more time searching for water in rivers and boreholes, if unable to afford to purchase water. A few interviewees shared stories of sexual abuse and bribery of women as they ventured further to look for water, and trespassed on land monitored by forest rangers. Also, the elderly are seen to have limited earning capabilities and therefore less able to adapt their livelihood activities. People with disabilities are also identified as less able to adapt.

Local information ecosystems

Key Findings

- There are **few formal opportunities for active engagement by community members** in information creation, potentially contributing to a widespread view among interviewees that they lack information that is relevant and tailored to the communities.
- **Community-based opinion leaders are key** in providing and distilling information within communities.
- **Government departments, agencies and radio are also identified as having a role to play,** but with mixed views on their accessibility and levels of engagement.

A range of actors are involved in providing information about these climate change impacts and how to respond - including government agencies, to national broadcasters and community radio, to local opinion leaders and elders. However, despite this diversity, interviewees' access to and engagement with locally relevant and practical information on climate impacts is limited. Importantly, in each location, there are interviewees who have not encountered information on climate change impacts from media, government or other information providers, even some who actively searched for information on- and offline.

Government departments and agencies are central actors in the provision of information about weather forecasts, and advice on climate-related adaptation. The Agriculture, Technical and Extension Service (AGRITEX), AGRITEX extension officers, the Meteorological Department, and the Environmental Management Agency (EMA) are commonly cited as responsible for providing such information, albeit with skepticism especially in urban areas about the extent to which they deliver on these tasks. In Gwanda and Lupane, interviewees explained that AGRITEX Extension Officers stay in communities, though not all had seen them directly. They are separate to the government actors who provide farming inputs (for example, seeds). The EMA generates some critique about the extent to which it is proactive and works in the community's interests. In Lupane, one interviewee suggested that their main interaction with the EMA was the arrest of perpetrators of environmental laws and charging of fines.

Local Councils and elected ward councilors also have a role in communicating about climate-related impacts, especially related to water scarcity. Again, however, communication is limited. Some cited funding limitations. Others suggested politics affect engagement, for example, Ward Councilors tend to engage more when they are campaigning during election season.

Outside of government, **community radio, schools, NGOs, and family and friends** also feature as potential sources of information about climate change impacts. NGOs identified as providing information on environmentally-friendly practices included the Centre for Natural Resources Governance, Amalima Loko and World Vision. Interviewees in all three locations explained that children learn about climate change in schools and share with their families (see also E. Ndlovu et al., 2020). Further, most frequently in Lupane and Gwanda, multiple interviewees explained that they speak amongst themselves about impacts. WhatsApp groups also are identified as bases for information access, though access to WhatsApp and internet data is unequal, partially due to affordability. A small number of interviewees also noted that churches provide information on climate change impacts.

Two locations have either **community (Gwanda) or commercial (Bulawayo)** radio stations, which provide an alternative voice to national broadcasters, and potentially more community-focused content. Lupane does not have either, but does receive a podcast service, The Girls Table. The podcast is based in Bulawayo and provides women's perspectives on political, social and other issues. Radio stations include call-in shows, talk shows with experts, WhatsApp platforms and field visits. Their reach and content, however, are limited by funding (for instance, focusing on sponsored content) and government oversight. For example, speaking on ministerial authority requires national clearance from the capital. One study in south Matabeleland, including Gwanda, found that most farmers engaged through focus group discussions did not have radios (E. Ndlovu et al., 2020). Equally, another study in Umguza District in Matabeleland North, found that radio was a key medium, specifically for information around climate change impacts and responses. It was relatively more accessible than other media because of language and literacy levels (Ndhlovu & Mpofu, 2016). However, these conflicting findings suggest more research is needed into the reach and accessibility of radio, taking into account broadcasting reach, access to radios, language and literacy.

TV is less often identified as an accessible and useful source for climate-related information. Interviewees explained that local TV is often not popular, or has limited signal, and satellite channels do not broadcast local information. A few NGOs provide training and education to community members, but they noted they are limited in content as they rely on information from SADC and the government.

Importantly, interviewees emphasized that community-based opinion leaders are key in providing and distilling information within communities. Interviewees tend to prioritize information from individuals within their communities – for example, local radio, local journalists, or local leaders - over those who are external to the community (see also Ndhlovu and Mpofu, 2016).

Collaboration amongst information providers, government and non-governmental and formal and informal, is limited. There are some examples of collaboration around preservation of resources, for example, a local radio station collaborating with the City Council to communicate about how to manage water scarcity. Otherwise, political divisions appear to limit collaboration around climate-related communications. Traditional leaders, for example, are perceived to potentially be in tension with elected ward councilors over their relative authority. Ward councilors and local health officials are also potentially in disagreement, as some local health officers were said to discredit information shared by ward councilors. NGOs' engagement with the government also is affected by power dynamics. One interviewee explained ruling party councilors avoided attending local community group meetings so as not to be perceived as anti-government (female small vendor, Lupane, July 2023).

Photo: Ntepe-Manama FM

Community members as consumers of information

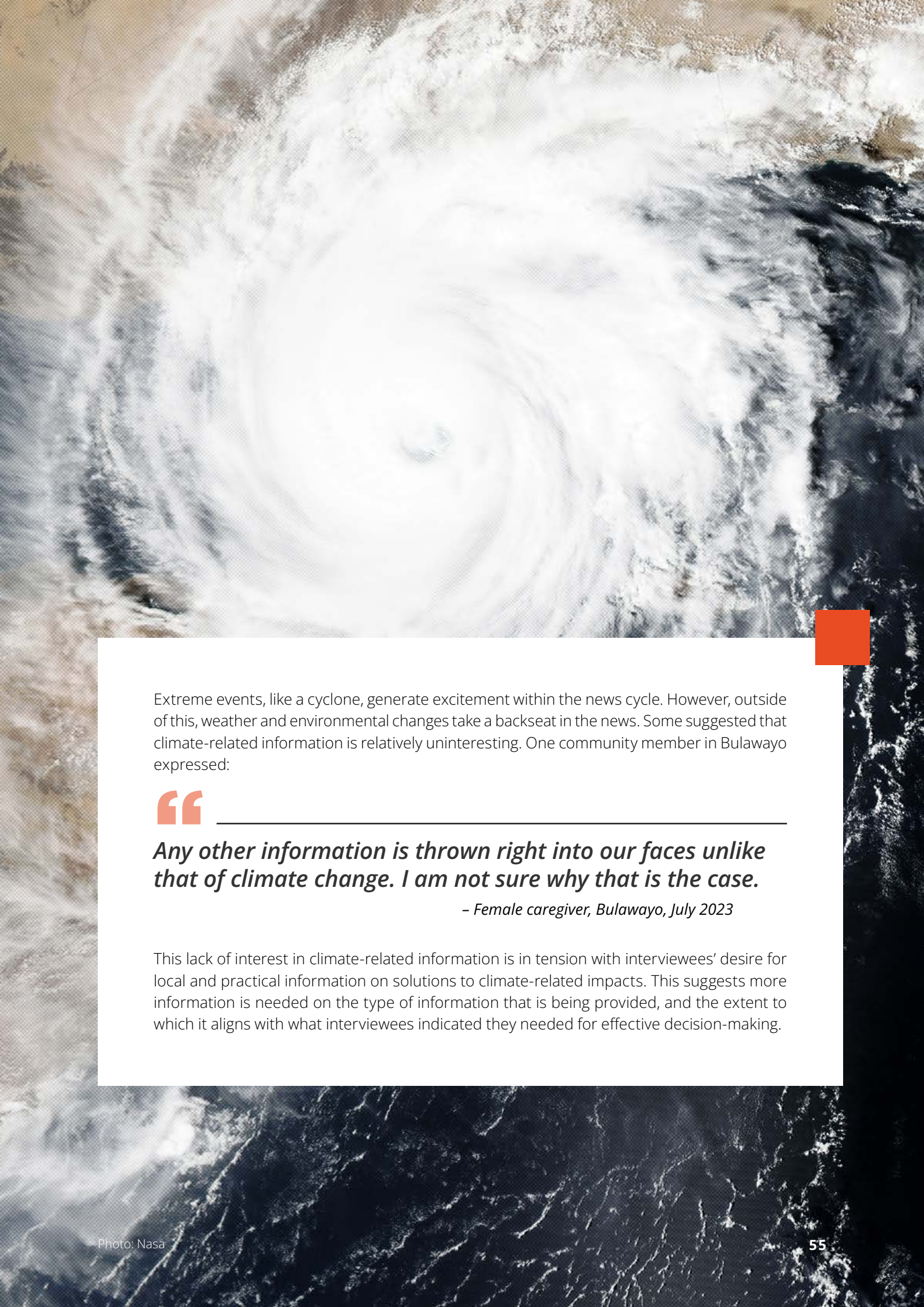
The information environment around climate change impacts and solutions seems to largely confine community members to being 'consumers' of information given by the media, NGOs, religious leaders and elders, government actors, and so on. Active discussion and co-production of information by interviewees most often takes place in informal discussions amongst family and friends. Very few formal opportunities were identified whereby community members can participate in information creation, discussion and sharing. An interviewee from the Bulawayo City Council also noted that the council does not consistently monitor their efforts to obtain and respond to community feedback. Still, EMA, AGRITEX Extension Officers and local councils were identified as available to receive feedback. Though, one suggested these officials tend not to provide clear answers and deliver on concrete change (female community member, Bulawayo, July 2023). Similarly, another interviewee suggested that NGOs do sometimes provide opportunities for feedback, but often without any indication as to how feedback is considered (female small vendor, Lupane, July 2023). Also, feedback can be limited by individual intermediaries, known to the NGO, who mediate back-and-forth communications. Otherwise, community radio provides some opportunities for audience engagement: through invited expert guests, field visits, call in shows and a WhatsApp platform.

Challenges to participation do not all sit on the supply side. Some community members interviewed also expressed a lack of interest in news updates about climate change impacts, despite its real effects.

"Climate change information is boring. It is not talked about as much as other issues. It is better received as jokes and in sarcasm for example,, about Cyclone Freddy; "It was highly anticipated but did not come," thereby causing such jokes as 'It is like an unreliable man whom you anticipatedly wait for but doesn't show up.' – Female small vendor, Lupane, July 2023

Uptake of opportunities to engage is a challenge, and inconsistent among interviewees. Not all community members interviewed are aware that opportunities existed to ask questions and give feedback to the media, NGOs and government. An interviewee from a commercial radio station in Bulawayo explained that community engagement is highest when there is the promise of a stipend for participation.

In addition to lack of engagement opportunities, there was also a lack of intensity around the formal provision of information on climate-related impacts. Not all interviewees had even come across information on climate-related impacts through formal channels, especially some younger individuals who did not listen to the radio. AGRITEX Extension Officers also seemed to be more available in the rural locations than in urban Bulawayo.



Extreme events, like a cyclone, generate excitement within the news cycle. However, outside of this, weather and environmental changes take a backseat in the news. Some suggested that climate-related information is relatively uninteresting. One community member in Bulawayo expressed:

> ***Any other information is thrown right into our faces unlike that of climate change. I am not sure why that is the case.***
>
> *– Female caregiver, Bulawayo, July 2023*

This lack of interest in climate-related information is in tension with interviewees' desire for local and practical information on solutions to climate-related impacts. This suggests more information is needed on the type of information that is being provided, and the extent to which it aligns with what interviewees indicated they needed for effective decision-making.

Photo: Nasa

Beliefs and narratives surrounding climate change impacts and responses

Key Findings

- **People's direct experiences** are their entry point for discussing climate-related impacts.
- There is **sadness and a degree of fatalism** in interviewees' explanations about environmental changes and their effects on well-being, livelihoods and nature.
- **Traditional beliefs, religion and climate science are all drawn upon** to make sense of environmental changes and how to respond.

Community members interviewed are aware that changes to their livelihoods and well-being are linked to long-term changes in the weather and environment. The entry point for talking about climate-related changes is often people's direct experiences of challenges to livelihoods. Two young women in Lupane explained:

"If you say climate change, they will not relate. They speak of the specific changes and how it is affecting them. – female college student, Lupane, July 2023

Often interviewees discussed climate change impacts out of an interest about what could be done to adapt and mitigate the impacts. Interviewees diverged in whether this discussion was focused on what they could do themselves, or what they needed others to do for them. One community member in Bulawayo explained people often lack the capacity to adapt to climate-related impacts:

"They [people in my community] are however largely incapacitated to carry out the proposed initiatives by themselves [for example] expansion of food garden schemes, borehole drilling, greenhouse initiatives and fencing off the forest areas – male community leader, Bulawayo, July 2023

Still, as in central and southern Iraq, there is a sense of hopelessness among interviewees about livelihood and well-being losses. A few commented they are not as happy as they used to be as a result of changes to the environment. There is a lack of clarity on what they can do to mitigate this unhappiness or improve their communities and livelihoods given climate-related changes.

In this context, to varying degrees, interviews drew upon a combination of religious beliefs, traditional beliefs and practices, and scientific teachings to explain what is going on, why, and who was capable of responding. Overall, there is a general acknowledgement of the science around climate change, specifically global emissions, the hole in the ozone layer and deforestation. However, climate science has not given way to accessible solutions. If global emissions, or a hole in the ozone layer, is behind the impacts on their livelihoods, what solutions are accessible to community members in Lupane or Gwanda, for example?

When discussed, traditional beliefs about climate change conceptualize climate change impacts as the result of community wrongdoing and a failure to continue traditional practices. Such narratives seem to offer a route to action. What the community does matters. Erratic and reduced rainfall is linked to the ceasing of rain making ceremonies (see also E. Ndlovu et al., 2020). Rain can be encouraged by collecting animal bones in the forest and burying them.

Interviewees only provide a partial picture into the local and traditional knowledge that exists in the communities about people's relationship to nature. Still, from what was discussed, traditional beliefs seem to shape some interviewees' views of potential solutions. Resuming traditional practices might facilitate a return to 'normal' weather. For others, traditional beliefs contribute to uncertainty and potentially drive inaction.

Religious narratives situate changes in the weather in Biblical narratives of the end of times.

"That it is a fulfilment of the biblical prophecy. Yes, I believe this. The weather conditions have changed and this was predicted in the Bible. We believe that it is the end of times. – female agricultural vendor, Gwanda, July 2023

The 2019 Cyclone Idai which reached Chimanimani, for example, was said to be accompanied by explanations of the cyclone as a reflection of God's decision to sweep the area of evil.

Beyond scientific, traditional and religious narratives, other narratives invoke racial and colonial inequalities, for example, suggesting that changes in the weather are brought on by 'white men', or are the effect of 'developed countries' technologies. One interviewee in Lupane suggested that community members have greater difficulty making sense of climate change impacts in which the human behavior that causes the impact (for example, gas emissions) is in a different location from where the impact is felt. The linkages are clearest where the human activity and impact are both local, for example, around water use and water scarcity (male civil society worker, Lupane July 2023).

Trust and mistrust in information sources

Key Findings

- Most strongly, interviewees assert that trust is based on whether an information source is perceived as being 'pro-people' or for the community.
- Trust must be built within a political context that is marked by widespread mistrust that people are motivated by self-interest. Trust therefore has to be constantly proven and negotiated.
- Features that can help in negotiating trust include: familiarity and personal relationships, transparency about author credentials, and openness to questioning and debate.

There is not a clear consensus that any particular medium or actor is necessarily trustworthy in communicating about climate change impacts.

Consistently, the primary marker of trust in an information source is confidence that an individual or organization is motivated by community interests and well-being. A trustworthy source is one that could be identified as 'pro-people', marked by good will, or 'that they are for us [the community]" (male radio station personnel, Bulawayo, July 2023).

The importance of being 'for the community' as a marker of trustworthiness partially appears to be a reaction to a general mistrust of politicization of actors and interests. Political competition and partisan divisions are often suggested by interviewees to lead to self-interest, as opposed to serving community interests. For example, a city council official in Bulawayo suggested the council is often not trusted because it is perceived to be corrupt and incompetent, the assumed effects of political interference.

Distance from political interests and competition was a sign of trustworthiness (see also Internews & Rooted in Trust, 2023). Information actors who are 'for the community' were contrasted to those who are seen to be influenced by political interests. Interviewees had different views on which organizations and individuals meet this marker of trust. Radio stations and community opinion leaders can be seen as pro-people. Church leaders and NGOs are also suggested to be trustworthy and 'for the community' if they are independent of political leanings.

It is more difficult for interviewees to accept that government bodies are motivated by community well-being (see also Internews, 2023). This is most apparent among interviewees in Bulawayo. One community member in Bulawayo explained,

"I do not trust any of [the] authorities, not even the police, EMA or Met department. They do not have our interests at heart. They take advantage of situations for their own benefit. It does not make sense to then trust them on that single issue when [they] do so much wrong everywhere else. – Female caregiver, Bulawayo, July 2023

In Lupane and Gwanda, some interviewees indicated that AGRITEX Extension Officers can act in community interests, especially if they have working relationships in communities. Even elected leaders can be seen to act in community interests. For example, during election campaigns, leaders would seek to demonstrate their ability to deliver to the community, motivated by the desire to be elected.

Several factors emerge from interviewees as potential signals of trustworthiness, countering mistrust and demonstrating that information is likely to be in the community's interests.

First, a direct experience or relationship can help assure that an information provider is honest or accurate.

"I would trust my older sister and neighbors [or] community members to provide me [with] any information. My sister has never lied to me and updates me on a lot of issues. My neighbors speak of things they would have experienced. – Female caregiver, Bulawayo, July 2023

Experts can be trusted if their expertise is communicated through trusted members in the community. Consistency with direct experiences - either of oneself or someone's family and friends - can be a benchmark to assess whether information from more distant sources, for example, social media, should be trusted.

Relationships thus matter to trust: the presence of traditional leaders, extension officers or church leaders in a community can give reason to trust the information they provide.

Second, verified authorship or verification processes can give someone confidence that information is accurate, or at least traceable. This could be done through indicators like letterheads, signatures, or even the listing of author credentials online. Certain channels or organizations are assumed to require verification before broadcasting content, including radio and Econet telecoms.

Third, the opportunity to discuss and raise questions about information can help to give confidence in its trustworthiness. One interviewee was cautious of individual interpretations of information. They suggested that collectively unpacking and discussing content is more likely to lead to an appropriate interpretation (female college student, Lupane, July 2023).

Even if a source is generally mistrusted as politically- or self-motivated – for example, a government body or political figure - specific types of information might be considered trustworthy, if they could be delinked from self-interest. One city council official gave the example of the Zimbabwe National Water Authority (ZINWA). ZINWA, she noted, might be expected to hide information about the causes of water scarcity (for instance, due to particular interests around the diversion of water to priority projects). However, they are trusted to give information about how people should respond to water shortages (Female city council officer, Bulawayo, July 2023).

Information gaps and needs

Key Findings

- Interviewees tend to express a clear interest in practical information, both pertaining to what they can do themselves, and about what others are doing and could do to support them.
- An interest in practical information is in tension with the relative lack of intensity and dynamism in the provision of climate change information by media and government.
- Interviewees indicate there is a disconnect between real challenges to their survival, and the more abstract and/or limited information available on adapting to climate-related impacts.

Local information ecosystems around climate-related impacts in Matabeleland, Zimbabwe, are marked by a series of tensions. The impacts of climate change are lived, immediate and commonly known, especially water scarcity, and there is a demand for practical information to help people to adapt. At the same time, the urgency of climate-related impacts - especially adapting to mid- and longer-term effects - takes a backseat to immediate survival interests and political competition. Also, competing with a desire for practical information, there is a relative lack of interest in existing climate-related information provided by the formal media and NGOs. Finally, a desire for practical information is in tension with an overriding sense that community members lack the agency to respond to changes.

Amidst these tensions, several key features of the local information ecosystem emerge about regarding key information-related needs.

First, even with competing dynamics, there is a clear interest in more information that is locally relevant, practical and focused on adaptation. Interviewees' discussion of climate change impacts was often focused on what they were experiencing and what could be done to respond to their experiences. They wanted information to combat uncertainty about how to adapt daily activities in order to achieve more sustainable livelihoods. This included an interest among some for information about what to expect around future climate impacts, as well as a desire to know what was being done: what projects, timelines and expected outcomes were in place. Delivering on this requires addressing constraints on the type and accessibility of content provided. Access to internet, TV and radio broadcasts varied, with poor access and signals in rural areas. Another study found that farmers in Gwanda felt radio broadcasts were too general (E. Ndlovu et al., 2020). Also, literacy levels and social hierarchies were seen to limit access to information.

Second, interviewees suggested climate change information needs to be given more attention and importance. The degree to which climate-related impacts are discussed, relative to other news stories, does not indicate it was a pressing concern. Immediate survival takes priority, even if survival efforts might compromise future environmental well-being. For example, some turn to firewood collection and vending as an alternative livelihood, even as it furthers deforestation. One radio professional asserted,

"The realities and demands of daily life denigrate the value of the information. While a level of knowledge exists a catalyzed processing of information is stalled by demands of daily life. People are accepting of the reality, but life needs to continue. As such, the information ends up not making any impact, it is mostly for purposes of simply informing/being informed (particularly in urban areas)." – Male radio station personnel, Bulawayo, July 2023

Information that helps people to reconcile opportunities for survival and for climate adaptation are critical to enabling people to improve and sustain their livelihoods across immediate and longer term impacts.

Third, resource provision and information must be aligned. One NGO interviewee expressed frustration with the content and timing of agricultural inputs from government to farmers, which diverges from what is recommended by AGRITEX and NGOs, given changes in rainfall and temperature. Farmers, they alleged, are still being given donations of drought-intolerant seeds and livestock breeds.

Fourth, there is a need to shift from community members being treated as consumers of information, to engaging more actively in the production of locally relevant content, to promote active engagement and to create relevant and useful information that builds on local knowledge, experiences and values.. Very few interviewees could identify opportunities to ask questions or feed information back to providers. Where feedback opportunities are identified – for example, some NGOs or extension officers - interviewees lacked evidence that anything was done as a result. Opportunities for participation are even more limited for rural communities, and indigenous language and ethnicity groups. Informal discussions among family and friends allowed for more active information creation and debate, but without knowing what exactly adaptation and coping strategies might entail, this discussion is limited.

Summary: Factors affecting engagement with information

A key feature of interactions in the local information ecosystems in Zimbabwe is that **trust in information sources is negotiable.** No actor is necessarily assumed to be trustworthy, and different factors contribute to ongoing assessments and demonstrations of trustworthiness. Underlying this, is an overriding mistrust in anyone's interests. The potential for self-interest and/or political interest to be present in government, media, NGOs and so on, means that individuals and organizations have to continually demonstrate and negotiate their trustworthiness.Trust could be demonstrated through factors like proximity, or personal relationships and direct experience, or author credentials, or transparent processes to validate information (for example, by radio).

At the same time, engagement with information is linked to the **intensity and drama** that surround its presence in the public space. Drama and attention are suggested to indicate its relative importance. Climate change impacts are compared to electoral politics and health crises, which interviewees determined attached substantial media attention and political interest. This contrast is likely accentuated by the timing of the research, which took place just under two months before Zimbabwe's general elections. Climate change impacts has not attracted substantial media attention, meaning some interviewees assumed they are less important or interesting, even as they are being experienced. Some media professionals suggested the nature of experiences of climate change, as irregular events or gradual change, makes it difficult to fit within the news cycle.

Alongside, while interviewees generally are clear that climate change changes are impacting on their lives, the relatively **lower levels of intensity compared to Iraq opens up space to discuss different explanations.** As indicated by interviewees, different ways of explaining climate change impacts seem to help counter a sense of hopelessness and helplessness, and also regain some control over their situation. Control over a narrative contrasts with a sense of helplessness by indicating knowledge about the problem and solution, for example, in religion or in a return to traditional practices.

At the same time, this region of Zimbabwe has experienced long-term humanitarian crises and the long-term presence of humanitarian agencies. Emigration of young people is increasing and seen to be one of the primary outlets for improved livelihoods. Also, interviewees could not identify many opportunities for active engagement and feedback with information on climate-related impacts and responses, with NGOs or government. Especially, there seems to be little evidence that feedback would actually inform future action by authorities or NGOs. These dynamics appear to complicate how people perceive their potential agency around climate change impacts. There was a desire for practical changes, which could be seen to directly benefit livelihoods. However, also some interviewees are concerned about a culture of dependency, linked to the long-term reliance on assistance and lack of clarity on decent livelihood options. This affects how interviewees discussed their potential for agency alongside information.

Cross-country insights into local information ecosystems and climate change

Looking across the two cases, specific historical, environmental and social dynamics emerge as critical to how community members engage in local information ecosystems, and how they define their information needs. What these dynamics mean for engagement with specific information sources and content diverge. However, by drawing on qualitative insights into why and how people engage with information in the two cases, we suggest particular features and mechanisms of change that appear important to understanding the challenges and possibilities of local information ecosystems around climate in both.

1. **Both cases reveal information is needed to help communities to adapt to immediate impacts and to enable sustainable livelihoods into the (unpredictable) mid- to longer-term.** Community members in southern Iraq and southwestern Zimbabwe require and seek information that enables them to effectively adapt over time. While impacts are immediate, there is also a recognition that adaptation is needed to sustain livelihoods and well-being for younger generations, and also to ensure that immediate adaptations do not threaten future sustainability.

2. **Histories of political neglect and perceived/real self interest has given way to widespread mistrust,[7] especially of institutions and actors external to hyperlocal communities.** Mistrust is a default state: in both cases, interviewees do not expect external actors to necessarily act in the community interests. In Zimbabwe, this means that trust had to be negotiated, drawing on different elements such as direct experience, or verification of credentials.

3. **The sheer intensity of impacts affects people's interest in actionable information from different sources**. Given climate change impacts are already being experienced, there is little room for climate denial or speculation. Instead, there is a strong interest across communities in locally-relevant information that will support people in making decisions that could ensure theirs, and their families' well-being. The urgency of livelihood impacts was greatest in Iraq; here, this contributed to an openness

7 Internews uses the term 'inequality-driven mistrust' to discuss such dynamics of mistrust (Inequality-Driven Mistrust, 2023).

to access information from any source, provided it is actionable and demonstrated results. Equally, as interviewees seek information to address unprecedented environmental changes, they also indicate local knowledge is important to effective action. For example, almost all livestock farmers interviewed in Iraq are confident they can survive if the problem of water scarcity is addressed. In Zimbabwe, some, especially older interviewees, draw on traditional knowledge to explain impacts and necessary elements of effective solutions.

4. **The effects of climate change have psychosocial dimensions, which affect people's sense of agency and hope.** Across communities, the unpredictability and scale of climate-related impacts, especially for young people, is contributing to a lack of hope. While this does not prevent people from looking for information to help them adapt, it does dampen their sense of agency and hope for sustainable, decent futures. This affects, potentially, the decisions that people feel they can make and the impacts they might have.

5. **The perceived efficacy of local information environments to equip people with relevant and reliable information depends on its linkages 'up to' power holders and resource holders.** For interviewees, a key issue in the information ecosystems is with authorities: they are not necessarily present, engaged or listening to the impacts being experienced. Therefore, a strengthened information ecosystem is not just about strengthening local communications, but also building more effective two-way communication channels out to resource and power holders.

6. **Finally, in both cases, there are little to no formal opportunities for participation and engagement in information creation.** This appears linked to the concern in both for authorities to listen and respond to local concerns. Equally, the lack of opportunities for active engagement means it is not possible to determine if and how a more dynamic information ecosystem, where people are treated as active participants, might foster more relevant and reliable information.

Photo: Johnson Siamachira/CIMMYT.

04. **From Evidence to Intervention:** Strengthening information environments to respond to climate impacts

Key Messages

1. The chapter evaluates the implications of the findings from Iraq and Zimbabwe on local information ecosystems for addressing climate change adaptation and mitigation, emphasizing the need to rethink intervention mechanisms.
2. It suggests five key focus areas for effective climate-related information interventions, including improving connectivity between local, national, and global climate conversations; enhancing access to actionable local information; understanding trust in information sources; balancing urgency with limitations in our understanding of effective behavioral change mechanisms; and financing the climate crisis holistically. The recommendations suggest specific roles and actions for different actors in the information, humanitarian, and policy communities.

This chapter considers the implications of our findings on the challenges and dynamics of local information ecosystems in Iraq and Zimbabwe on how we understand and address the informational aspects of climate change adaptation and mitigation. It addresses the second of our two research questions:

How can interventions aimed at strengthening local information ecosystems be designed and approached in ways that support effective decision-making within communities about their well-being and livelihoods?

As Chapter 2 discusses, the COVID-19 pandemic has galvanized concern within policy and research communities regarding the role of information in people's decision-making processes during crises, and how it impacts their ability to make decisions about individual and collective well-being. An attendant and growing body of research and intervention has also developed. While individuals and organizations have tested a range of approaches designed to tackle information-related challenges – for example, digital literacy, fact checking, trust building and so on – we also noted a clear tendency towards focusing on mis/disinformation and factually incorrect content, and on encouraging specific types of behavioral change in response to specific pieces of information.

This chapter reconsiders some of these trends in light of our findings on the particularities of both information ecosystems and climate-related impacts in central and southern Iraq and southwestern Zimbabwe. Based on how and why people engage with information and conceptualize their needs with regards to climate impacts across the two country cases, we suggest five key focus areas that merit at least as much attention as mis/disinformation when considering effective information-based intervention mechanisms:

1. Facilitating more just and robust connectivity between local, national, and global climate conversations,
2. Strengthening access to, co-production of, and engagement with actionable and locally relevant information,
3. Understanding trust in information sources as dynamic and negotiable,
4. Recognizing the limitations of individual behavioral change as a mechanism for adapting to climate impacts, and
5. Financing the climate crisis holistically, with communications as one part.

The experiences in these contexts will not necessarily be the same elsewhere. However, they do strongly point to a broader set of informational needs, grounded in the immediacy of local climate change impacts, that should inform further research and intervention design.

1. Facilitating more just and robust connectivity between local, national, and global climate conversations

Currently, flows of information can feel one-directional, with communities treated as passive recipients of information. This dynamic is problematic for several reasons. Within communities, the lack of opportunities for active participation prevents the co-design and development of ideas on responding to climate impacts that incorporate local histories and knowledge of the local environment. This lack also can feed a sense of inaction and hopelessness.

At a global level, one-directional communications stifles the possibility of funding contextually relevant approaches that are most likely to have traction and longevity within communities. There is an urgent need for local perspectives to better and more consistently feed into both national decision-making processes, including through the information ecosystems that help to shape them, as well as the global conversations that play an influential role in shaping humanitarian aid. Our findings suggest that to have maximum impact we must move beyond practices that treat communications as a one-way street, towards a more 'systems'-based approach, in which local, national, and global information ecosystems pertaining to climate impact intersect with greater frequency and equity. There is a need to ensure that:

- **Greater flows of information not only to local communities, but also from them,** based on an understanding of local, national, and global information ecosystems and debate as a dynamic "system of systems" that intersect with and inform each other. To draw on a distinction outlined by Danielle Allen, this diversity of voices needs to be not only "expressive", speaking to the community from which it emerged, but also provided with the fora, communications tools, and resources in which to be "influential", impacting policies, debate, the business sector, etc. (Allen, 2015). There are contexts in which local accounts of climate change have been unduly dismissed by government officials as mere "conspiracy theories", removing their capacity for influence (Mathur, 2015). As systems-based approaches emerge, the risks of local narratives becoming disempowered in this way must, then, also be addressed. To develop these informational flows most effectively, we also require a greater behavioral understanding of how global decision-making evolves, and how local narratives can most powerfully contribute to this change.

- **Funding is designed to support these more dynamic information ecosystems,** for example by embedding within funding criteria more robust requirements around (i.) local creation of information; (ii.) dissemination of locally produced information; and (iii.) local representation and the sharing of local narratives within national and global fora. There are already valuable projects underway that could be further boosted, or lessons learned for them in the development of similar initiatives elsewhere. For example, **Internews' Earth Journalism Network** aims to build a network of support for local environmental journalists, including both promoting their stories beyond their communities and helping them to access and report back on high level summits and conferences within their communities.

- **Connections between actions in rich countries and impact on poor countries is communicated more effectively to drive change among global audiences.** Our research has surfaced both devastating stories of climate impacts already happening today, and how little those stories make it into global conversations. Even on rare occasions where coverage does focus on the frontiers of climate change, the connection is not typically made between what is happening on the ground to those most immediately impacted by climate change and those in richer countries whose behaviors are contributing to it, and may need to change. Esther Duflo is one prominent expert who has begun to make this case publicly; in the UK, former politician Rory Stewart is another, engaging his podcasting platform to raise the profile of global inequalities including those related to climate change to, reportedly, one million listeners per an episode. The case that these public figures are beginning to make is not an easy one, requiring a still greater range of influential voices to advocate both within public fora and directly to political and business leaders.

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> ***"We are in a pretty unprecedented situation where the problems are caused in rich countries and they affect first order, mostly poor countries [...] I need to start talking to the rich countries' citizens and their leaders, obviously, and they're just even getting people to understand that it's not charity, it's basic justice.***
>
> ***It's a much different message than to say you've already met your democratic decision, now this is how you can do it just a bit better. There I'm kind of giving what I've been calling [...] plumbing advice, but here I'm trying to tell people this is the social preference you should have.And I don't know if I would be able to do that."***
>
> *Esther Duflo, VoxTalks Economics, PSE CEPR Policy Forum*

2. Strengthening access to, co-production of, and engagement with actionable and locally relevant information

The case studies strongly point to the limitations, around climate-related impacts, of focus on misinformation in local information ecosystems. Across both Iraq and Zimbabwe, community members' primary concern is for locally relevant, actionable information that could enable them to adapt and mitigate immediate threats to well-being and livelihoods, and not misleading information. When discussing their information challenges, interviewees do not often emphasize conspiracies or speculation about climate change interventions. This suggests listening methodologies to capture and respond to people's informational concerns require an open approach, focusing first on understanding how and why people talk about climate change impacts, and when and how different types of content (for example, rumors) are a feature of debates. Interventions where the sole or primary emphasis is on fact checking or education to identify misinformation are not necessarily aligned to what community members in these locations found most challenging. Listening and engaging with communities to better understand local information dynamics is a necessary starting point for externally supported informational interventions.

From here, different approaches for engaging with local communities are likely to emerge, which respond to how people are grappling with climate impacts and responses. In Zimbabwe, different beliefs are used to make sense of problems and potential responses (or not) to climate change impacts, including drawing on religion, traditional knowledge, and scientific education. Paying attention to these different beliefs and narratives could, for example, be a basis from which different actors, from policy makers to journalists, might better understand people's priorities, experiences and concerns around climate change impacts.

In Iraq, such a focus on different narratives and beliefs seems less immediately relevant, especially among farmers. Climate impacts are so immediate that there is little scope for speculation about different causes and premises for solutions. Instead, people seem more willing to bypass such debates and focus on practical information that might cut through an otherwise pervasive fatalism. This directs attention to the type of information capable of supporting perceived and real agency in the face of overwhelming climate-related impacts, versus information that fuels a sense of fatalism. At the same time, interviewees' openness to any information that might help them to act suggests a potential vulnerability to misleading information, and the importance of supporting the provision of locally relevant, actionable and reliable information now.

The diversity of the information environments observed in Zimbabwe and Iraq warn against cookie cutter approaches to interventions. A broader range of case studies would need to be undertaken to fully understand whether there are particular conditions in which misinformation, rumors and conspiracies are likely to play a more dominant role in people's understanding of climate change and its impact on their lives. Notwithstanding, the need for the provision of highly relevant information from trusted sources that individuals are willing to engage with is a commonality throughout, and likely to extend to other contexts too.

3. Approaching trust in information sources as dynamic and negotiable

Trust in information sources in both country contexts is precarious. In both Iraq and Zimbabwe, trust is strongly linked to whether or not an individual or organization is thought to be sharing information that serves the community's interests. Is the information intended to benefit the community's well-being and livelihoods? And, can and will the content benefit the community?

Underlying this emphasis on the importance of being 'for the community' is a general view that often actors or organizations are not focused on community interests. In different ways, the perception that actors are likely to be self-interested has been reinforced and justified over time. For example, interviewees shared anecdotes that communities aligned to the government receive more resources and support, or they suggested that a media organization favors a particular political party and this taints its broadcasting. In Zimbabwe, no individual factor necessarily guarantees an information source is 'trustworthy'. Different

elements, like authorship or personal relationships can help to 'prove' trustworthiness. In Iraq, visibly demonstrating that someone's actions and information are in the community's interests appears important to building trust in that individual's current and future intentions.

These dynamics of trust have three key implications for the design and approach of interventions to strengthen trusted and trustworthy information ecosystems around climate change impacts.

First, interventions cannot treat trust as a static feature or trait of an organization or individual. Instead, trust varies over time, with changing contexts, actions and information, and must be continually nurtured.

Second, in communities where mistrust is high and humanitarian crises are ongoing, the perception that an individual or organization is 'for a community' appears foundational to trust. This implies the need for research into what elements matter to demonstrating this intention and interest within specific communities. Iraq and Zimbabwe show that different considerations can inform assessments of trustworthiness across contexts. Internews' Trust Framework (2023) provides a tool intended to support the consideration of different elements that can contribute to trust in different contexts.

Third, trust in an information source is not always the most important factor in determining if an individual chooses to engage with information from a particular actor. In both Zimbabwe and Iraq, interviewees are suspicious of the interests of government actors, but also see a key role for government actors in supporting adaptation to climate change impacts. Also, an information source might be influenced by political interest, but still trusted to provide relevant and reliable information in specific cases where they had less of a vested interest.

In Iraq, some farmers interviewed are willing to engage with unfamiliar information channels on the chance that they might provide new, actionable climate-related information. Established local actors still are involved in debating information from newer sources. Nonetheless, the immediate threat to livelihood has made some more open to different information sources. This indicates a receptive and engaged context, with community members willing to access and debate new information from newer sources. At the same time, one interviewee noted a potential risk in a lack of discretion or inability to effectively assess information from new sources about unprecedented challenges. Therefore, enabling people to assess new information and sources as relevant and reliable within their contexts becomes an important, new challenge.

Photo: Abbas Raad

Rooted in Trust: An example of a trust-based approach to information ecosystem strengthening

Rooted in Trust's approach to building and supporting trust in information ecosystems considers trust in relation to specific elements of information providers and information - proximity, agency, intention and accuracy. Distrust is not necessarily a problem for strong information ecosystems, at least in terms of when 'healthy' scrutiny of information providers is expected within a strong information ecosystem. However, what is important is the presence of information providers that provide locally relevant and reliable content, shaped through the above four elements, for example, trust could be the outcome of enabling participation or ensuring accurate information for a particular context (Internews, 2023). Our study finds that different 'elements' of trust visible within Internews' Trust framework were important to interviewees, but to different degrees and in different ways (for example, what about an actor showed they were 'local'). This diversity affirms the value of a bottom-up and empirically driven approach to trust, taking into account the local social and political context, information source and type of content.

4. Recognizing the limitations of individual behavioral change as a mechanism for adapting to climate impacts

Across countries and communities, our research clearly demonstrates a strong, urgent need for "practical information": advice on potential actions that affected communities could take right now to counter or mitigate the immediate, devastating impacts of climate events on their livelihoods. It may be tempting for central governments or international donors to address this need through rapid, information-based behavior change interventions. Such interventions are focused on effectively delivering the specific information that is required to support certain individual adaptation behaviors externally identified as viable – and imply favoring an information ecosystem that is capable of efficiently disseminating such information in a "top-down, outside-in" way. This approach, however, often ignores the need for the information to be both actionable and locally relevant, and for the recommended adaptation option to be aligned with the holistic needs of the community in question. More broadly, it rarely incorporates the space, time, independence and ultimately trust in communities' decision-making that would allow people to question, criticize - and even ultimately reject top-down solutions.

- **Actionable:** Information-based behavior-change interventions are often built on the assumption that once information frictions are removed, people can make better decisions and engage in helpful adaptation behaviors. But this assumption doesn't necessarily hold. Consider the adoption of resilience-enhancing agricultural technologies or methods as a potential adaptation strategy. Several studies have shown that liquidity (Moser & Barrett, 2006) and credit constraints (Giné & Klonner, 2008) limit the usefulness of learning about new agricultural technologies: raising awareness is not enough when farmers still struggle to afford these options. This is especially true as certain adaptation methods increase resilience to weather extremes, but are costly under "average" conditions: evidence from Zimbabwe suggests that conservation agriculture practices, while effective in mitigating the negative impacts of deviations in rainfall, result in no yield gains, and in some cases yield losses, in average-rainfall years (Michler et al., 2019).

- **Locally relevant:** When it comes to technology-based adaptation, it is not straightforward that available options are applicable to the specific context. Innovative agricultural technologies – typically developed in high-income countries – are often inappropriate for the crops, pests and conditions present in lower-

income countries (Moscona & Sastry, 2022). They may also represent a dangerous trade-off between short-term gains and long-term harms. For example, irrigation may temporarily help farmers respond to lower precipitation levels, but depletes groundwater resources and increases longer-term vulnerability (Fishman, 2018; Hornbeck & Keskin, 2014).

- **Needs-aligned:** Certain adaptation options, despite being economically viable, may not be perceived by communities to be in their best interest. For instance, providing information about labor market conditions in urban centers may help individuals in climate-affected rural areas make better-informed decisions about adaptive internal migration options (Huckstep & Clemens, 2023), but does not address people's desire to preserve their current livelihood – and their identity, traditions and community that are deeply intertwined with it.

Strong local information ecosystems that go beyond disseminating externally determined advice and involve the affected communities in agenda-setting, feedback provision and discussion are crucial for ensuring **that people can access – and produce – actionable, locally relevant information on questions that they themselves want answered.** As discussed at the start of this chapter, such ecosystems also need to be capable of addressing potential divergences between who is affected and whose behavior might need to change: by inviting contributions from and amplifying the voices of people directly experiencing the impact of the crisis, they may be able to draw attention to the problem among decision makers who have the power and funds to support adaptation and resilience building on scales not possible for the affected individuals themselves.

5. Financing the climate crisis holistically, with communications as one part

The urgency (and invisibility) of the challenges faced by the many communities currently living on the world's climate frontiers raises a difficult question about the value of information in and for these contexts. While healthy information environments can support long-term decision-making, under current circumstances people must increasingly make profound decisions about their lives and livelihoods - what crops to grow; whether, where, and how to migrate; educational choices - in the space of weeks, not months. In these conditions, funding information provision in isolation may not be enough alone, but may be better situated within a broader and more holistically designed set of rapid climate impact provisioning that tackles both information needs and the resources to act at speed to mitigate or adapt to climate impacts. As the International Federation of Red Cross and Red Crescent Societies (IFRC) (2020) notes, for example, while flood early warning systems for vulnerable communities are increasingly commonplace, they are only rarely accompanied by efforts to make critical local infrastructure more resilient.

IFRC has drawn attention to the fact that many highly vulnerable countries are "receiving little climate change adaptation support" (IFRC, 2020, p. 6). Our research shows that it is critical to further consider what, where, and who is provided with resources once funding is received in climate vulnerable countries. Iraq, for example, has received many millions of dollars intended to reverse climate change inaction (World Bank, 2022) and regularly hosts Beirut-based, internationally funded climate fora. But citizens in local communities are almost wholly disconnected from this funding landscape, with little sense of being supported financially or otherwise in their adaptation and mitigation needs. They are both bearing the brunt of climate-related behaviors in rich countries, and are seemingly cut off from support mechanisms funded by them. This is all the more startling in places such as Chibayish given the status, and therefore global recognition, of the marshes as a UNESCO World Heritage Site.

These considerations suggest a need to identify financing models that can 1) reach communities directly and 2) be experimentally tested and iterated upon, given both the evolving crises and the relative lack of evidence to date on best financing models in the specific context of climate impacts in humanitarian contexts. Models such as GiveDirectly's Climate Survival Fund could provide inspiration and data from which to evaluate and design similar, contextualized, interventions.

Conclusion

In sum, the in-depth investigations in this report into information dynamics and needs around climate impacts and solutions in two humanitarian crisis contexts – central and southern Iraq and southwestern Zimbabwe - indicate the need for renewed attention to the targets, design and desired outcomes of informational interventions around climate-related impacts and responses at the local level. The implications drawn out in this chapter are intended to present a foundation from which to begin to re-think appropriate and effective interventions, which are grounded in the agency, well-being and experiences of local communities who are already at the frontiers of climate impacts.

They point to the importance of centering local experiences and knowledge. While climate change is a global crisis, it plays out within local communities. Local knowledge and experiences are critical to understanding what the informational challenges are, what forms of knowledge exist that can be built upon, and what the key gaps are. Equally, our cases in Zimbabwe and Iraq point to the need to combine the prioritization of local communities, expanded development of multi-directional information flows between local communities and national and international forums. Also trust is not a static condition but dynamic, and must be understood with reference to past experiences of trust and mistrust, and how both are affected by ongoing interactions.

Finally, the nature, diversity and unpredictability of local climate events means that the goal of interventions cannot simply be to provide advice to affected communities. Instead, as our cases suggest, the aim should be to ensure that the information environment enables people to continue to co-produce, access and discuss relevant and reliable information to deal with immediate and longer-term unprecedented changes affecting their well-being and livelihoods.

Photo: The European Space Agency

05. **Recommendations**

Key Messages

1. The report overall acknowledges climate change's localized and traumatic effects. It underscores the urgent need to refocus on local communities as a primary source and recipient of climate impact information and a locus of action to enable effective climate resilience interventions and to mitigate the risks of future conflicts and individual suffering.
2. The situation is urgent: acting now is crucial to ensuring decent and sustainable futures.
3. The chapter recommends specific actions aimed at enhancing the quality, diversity, and dissemination of climate impact information, serving as a foundational guide for individuals and organizations dedicated to bolstering climate resilience in communities already facing significant and challenging climate impacts.

Our research indicates a need for a vital re-orientation towards the local as both source and recipient of climate impact information, and locus of action, supported by national and global infrastructure and decision-making. The impacts of climate change are experienced in highly localized and often traumatic ways. They intersect with specific beliefs, priorities, livelihoods and, to the degree they exist, institutions and infrastructure. For interventions designed to support climate resilience to be effective, these local places and the communities that inhabit them must, then, be central to their design. Failures to support context-specific decision-making around key climate-impact related global challenges such as migration, resource-use, and health could pose substantial risks to individual lives, and fuel broader conflicts, in the near future.

Acting now is crucial to ensuring decent and sustainable futures. As this report underlines, a lack of locally relevant, actionable and reliable information frustrates people's ability to make decisions about how to adapt to impacts of climate change, often contributing to widespread fatalism. Information ecosystems that are sufficiently robust, targeted, and diverse in perspective are intrinsic to supporting decision-making and action.

The standard, dominant focus of interventions on specific information and specific behavioral adaptations, for example, changing crops, is misaligned to the uncertainty, scale, and complexity of climate change impacts. Instead, people must be equipped with the resources and the informational context to make informed decisions to support their well-being over time, with a view to both immediate and longer-term impacts. Enabling this vision requires a far greater degree of interconnectivity between information providers and decision-makers at local, national, and global levels than is currently the case.

With these observations in mind, we identify specific actions, emerging from our findings, as critical to boosting the quality, range, and flows of information around climate impacts. These recommendations are presented as a starting point for individuals and organizations committed to better supporting climate resilience on the world's ever-expanding climate frontiers today and in the future.

Our research indicates a need for a vital re-orientation towards the local as both source and recipient of climate impact information, and locus of action, supported by national and global infrastructure and decision-making. The impacts of climate change are experienced in highly localized and often traumatic ways. They intersect with specific beliefs, priorities, livelihoods and, to the degree they exist, institutions and infrastructure. For interventions designed to support climate resilience to be effective, these local places and the communities that inhabit them must, then, be central to their design. **Failures to support context-specific decision-making around key climate-impact related global challenges such as migration, resource-use, and health could pose substantial risks to individual lives, and fuel broader conflicts, in the near future.**

Photo: Patrick Hendry

Recommendation 1: Strengthen communication channels between local communities and national and global climate forums and decision-making bodies

Individuals in local communities experience climate change impacts but often the resources and capacity to enable action lie in national and global decision-making forums. Further, as our case studies indicate, effective action isn't always clearcut, but requires discussion about the local impacts and trade-offs, including managing both immediate and longer-term impacts. Our case studies indicate insufficient linkages and channels between climate change conversations at global and national levels, and local communities. Our interviewees identified a clear need for local experiences and expertise to be part of global and national debates about resource allocation and prioritization.

Actions

Media support organizations and networks:

- To support and advocate for channels of communication that are multidirectional. This could include:
- Further developing existing channels that link local climate journalists into global networks, such as the **Earth Journalism Network.**
- Supporting the integration of local journalists into different global and national conversations, and back again to share information with local communities. In practice, this could range from ensuring local journalists are present at major negotiating tables (COPs, etc) and other fora run by experts, donors, national authorities, and academia. Media engagement should extend beyond public relations opportunities to ensure journalists are provided with a space to communicate the reality on the ground to these international audiences.
- Extending support beyond conventional media to include a range of information sources that are trusted within local communities.

Media houses, broadcasters and climate change journalists:

- Explore approaches to facilitating discussion and feedback when reporting on local climate change impacts to center the experiences of those affected.

International organizations:

- Expand the range of local media and other information providers invited to national and global fora, prioritizing engagement with local, in-country networks to identify key community voices including women, who often can be less connected outside their community (Beaman & Dillon, 2018).[8]

8 The need for the creation of spaces for greater coordination and communication between different actors operating at different levels (for example, humanitarian actors, journalists, health experts) was also identified by Inigo et al. (2023) in the area of public health.

Recommendation 2: Design and fund hyper-localized, contextually grounded information interventions

Highly vulnerable communities around the world share an extreme degree of exposure to the impacts of climate change, but they differ vastly in the specific ways their lives and livelihoods are affected, and in the adaptation options available to them. As our research highlights, existing information ecosystems and climate change communication structures also differ (often even within the country/region), including the type of information accessed, who is involved in which role, and which channels are used. Effective intervention design therefore requires a careful assessment of the local context, including a real-time evaluation of informational needs (including, but not centered around, misinformation), and must encompass strengthening trust through a visible, resourced presence in communities. Only programs tailored to local needs and possibilities may be able to counter the sense of hopelessness that many affected communities experience, by increasing people's agency through co-creation of ideas and provision of fora for discussion. Such programs must be:

i) grounded in a deep familiarity with the local context

ii) underpinned by an understanding of local information needs as well as local capacities and capabilities

iii) able to address the psychosocial aspects of climate change impacts

Actions

Humanitarian donors:

- Transition from funding interventions based primarily on evidence on "what has been shown to work" elsewhere, towards a model of hyper-local research and action, accompanied by supportive infrastructure and accountability mechanisms that facilitate rolling out at speed and scale with different communities.

Humanitarian agencies:

- Recognize and build on local expertise by developing strong and sustained relationships with trusted information providers, such as local journalists, opinion leaders or even young people, and invest in local capabilities and institutions, so interventions not only provide temporary relief from immediate climate change impacts but leave a legacy of empowered communities who can continue to make informed decisions in the face of continuing uncertainty.

Recommendation 3. Rethink the criteria for allocation of climate change adaptation funding – and engage local information ecosystems to inform funding and programming decisions.

Our study points to fundamental challenges in the humanitarian system around funding allocation, whereby countries and communities most vulnerable to the impacts of climate change sometimes struggle to access climate change adaptation funding. The criteria that donors have tended to use for allocating funding (including concerns about effectiveness, financial riskiness and absorption capacity) effectively exclude many of the most vulnerable countries facing overlapping risks and crises, who are considered fragile and are often experiencing active conflict. Moreover, even when a country receives adaptation funding, the support does not always reach their most vulnerable regions and communities – and when it does, it is not necessarily aligned to immediate local needs. The current funding paradigm is not designed to enable locally rooted action that is grounded in local experience and expertise. As a result, the global community is missing out on learning about successful adaptation options co-designed in different contexts.

Actions

Humanitarian donors:

- There is a clear need and opportunity to invest in learning about and understanding local realities of climate change. Such knowledge can be generated through patient and predictable funding delivered through devolved funding models (Soanes et al., 2017), meaning they are managed and owned at more local levels, and grounded in local expertise and needs.

Humanitarian agencies:

- Humanitarian agencies need to recognize that "capacity strengthening is a two-way street" (IFRC, 2022): by engaging with key players in local information ecosystems, they can access grassroots knowledge and expertise, and can co-design interventions that are more likely to be trusted and successfully implemented.

Recommendation 4. Fund and deliver a new research agenda at the climate-information-humanitarian nexus

Scaling up support for locally-led information interventions around climate change impacts requires investment into empirical, contextually specific research on intersecting climate and information challenges at local levels. Our study points to three key ways that research on informational challenges and interventions around climate change impacts can be taken forward to better support understanding of climate change impacts in humanitarian contexts.

1. **A more comprehensive portfolio of qualitative case studies** on climate vulnerable communities, with each case providing an evidence-based understanding of informational challenges and dynamics. By looking across contexts in-depth, we may begin to derive findings regarding the conditions under which specific informational challenges (misinformation, hate speech targeting climate activists, lack of access to practical information) arise, and to consider targeted approaches to tackling or working around them.

2. **A renewed approach to behavioral change research,** focusing on:

i) Decision-making over time within changing crisis contexts. The climate crisis compels people to make decisions about well-being and livelihoods amidst immediate challenges, long term change, and uncertain future events. However, much study into what works in informational interventions focuses on promoting discrete pieces of information and behaviors. There is an opportunity for behavioral change research to focus on informed decision-making over time to better support individual and community decisionmakers vulnerable to life-changing climate impacts.

ii) Decision-making within international fora. Adapting to and mitigating climate change impacts in local communities requires decision-making and action at multiple levels, including international fora. Attention to behavioral research focused information and decision-making at international and national levels is therefore also relevant to enabling more resilient futures in local communities.

3. **Resources and support for multidisciplinary research.** Climate change is a complex and multifaceted challenge, implicating local to international politics, economics and social relations. Impacts materialize within local communities, who must also adapt to changing circumstances. Equally, the responsibility and agency to act to mitigate climate impacts does not always lie with the affected communities. Given these different and intersecting dimensions, a compelling research agenda for informational aspects of climate change should bring together different expertise including area studies, ethnographic approaches, computational social science, media and communications, behavioral science, geopolitics and organizational change.

Actions

Research funders:

- Recognize the climate-information-humanitarian nexus as an emerging and under-invested research area requiring robust support and new multidisciplinary programs and initiatives developed with an eye to sustainability.
- Support a diverse portfolio of research including different methodologies and in-depth case studies.

Researchers and research organizations:

- Invest in cross-disciplinary conversations around climate change impacts.
- Even amidst the urgency of crisis contexts, commit to developing more robust analyses of underlying assumptions within intervention-based studies, and their appropriateness to different crises and contexts.

Humanitarian donors and agencies

- Allocate time and resources for research into the dynamics and challenges of informational interventions in specific contexts, including real time review that enables adaptions of operations in response to dynamic contexts.
- Develop evaluation approaches and indicators that look beyond the use of specific pieces of information and adoption of specific behaviors to also consider change at the information ecosystem level.
- Ensure robust two-way communication channels with research communities, and in particular with researchers developing new, multi-disciplinary approaches to understanding climate impacts and improving outcomes.

Recommendation 5: Identify, develop, and resource realistic channels for responsive government and policy reform

Interviewees consistently made it clear that governments have a key role to play in improving their resilience to climate change. Too often, however, they have proven neither effective sources of high-quality information nor providers of resources. There is also a broad sense that they are doing little to integrate the voices of local communities within national policy planning. A complex array of both external and internal factors – for example, lack of resources in globally unequal economies; lack of government will and capacity; competing priorities; corruption, and so on - determine this reality.

Realism is needed in respect to plausible short-term reform. But it is important to identify, and work within, the bounds of the possible. These are politically challenging landscapes, but politically entrepreneurial mechanisms around improving environmental resource management have achieved success previously, even in humanitarian and conflict zones (see, for example, Ide et al., 2021). In different contexts, the emphasis may be on working with key individuals, through institutional reform and/or through coalition-building to broaden the discursive spaces available and develop stronger communications between local communities and policy makers and influencers at the national and global levels.

Actions

Humanitarian donors and agencies

- Work to pinpoint the most likely channels in individual countries for reform and action, with consideration of those individual champions, institutions, and coalitions required, or most open, to broadening communications between local communities and policy makers.

Multilateral Development Banks

- Amidst immediate attention to multilateral development bank reform, for example, through the G20 Expert Group and World Bank Evolution Roadmap, to recognize and advocate for development and climate as synergistic goals, and incorporate opportunities for more local and national direction, leadership and accountability in climate-oriented development strategies (see also Colenbrander et al., 2023).

Media support organizations and networks

- Support robust information ecosystems that enable diverse, evidence-based perspectives. Our research supported evidence of resource nationalism narratives in Iraq. Such narratives are concerning where both environmental resources and climate impacts are transboundary in nature. Under strained conditions, it is not unusual for civil society to be supportive of either grassroots or state-generated or supported narratives that promote resource securitization or vilify neighboring countries as the exclusive "cause" of locally felt climate impacts (Abbas, 2023; Wheeler & Hussein, 2021). For example, some of our interviewees in Iraq labelled neighboring countries responsible for water scarcity given their control over water from the Tigris and Euphrates, in line with a broader set of concerns around Iranian control in Iraq. Nationalist climate impact narratives that could (further) fuel emergent conflicts and threaten regional security would only worsen locally felt humanitarian crises. An information ecosystem that sustains and encourages diverse, evidence-based perspectives, as opposed to a unified 'national' narrative, is critical to helping to mitigate such risks.

Designing Methods for Climate Impact Communications: Towards an intentional approach

The architecture and language of communications on climate impacts, and in support of climate resilience, is nascent. They are all the more urgent, and arguably less developed, in humanitarian contexts. There is no readily available playbook - and the importance of locally specific informational ecosystems amid climate challenges may suggest a playbook is neither feasible nor desirable. Still, there are potential opportunities for shared learning around other crises, where there has been attention to communications. In some cases, such as peacebuilding, climate change impact conversations will start to play a more central role within these fora as impacts impel conflict. In others, there may be lessons to learn for climate communications. For example, peacebuilding efforts, while imperfect and contested, have utilized a triple-track mechanism to integrate different voices, focusing on diplomacy and official channels (Track I), conversations between media and society (Track II), and communication between people (Track III). Such deliberate design efforts around issue-driven communications infrastructure could be a basis from which to learn and deliberately develop inclusive climate communications channels. Future analysis could consider how other approaches have enabled or frustrated the influence and engagement of different actors, especially those within affected local communities.

Photo: Wesley Tingey

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