ZAMBIA

Retrospective analysis of the 2018-2020 humanitarian food and water crisis in Western Province, Zambia

Red Cross Red Crescent Climate Centre & International Water Management Institute January 29, 2024

Introduction

2018-2020 Food Insecurity Crisis in Zambia

The **food and water crisis that affected Zambia between 2018 and 2020**, is an example of how natural, socioeconomic, and political drivers can produce compounding impacts that have long-lasting implications for development. This retrospective analysis investigates how the different compounding drivers of risk and response actions came together to produce a severe humanitarian crisis. The aim is to draw lessons from the past to inform anticipatory actions

and long-term risk reduction for similar extreme events in the future.

Note: the full list of references and complete analysis of this study is available online in the published report

Zambia is a landlocked country in central Southern Africa made up of 10 provinces: Central, Copperbelt, Eastern, Luapula, Lusaka, North-Western, Northern, Southern, and Western, each divided into several districts.

This study will focus on the **Western Province**, located in the Zambezi River basin. This province was among the most severely affected regions during the 2018 - 2020 food and water crisis, but relatively little is known about local impacts.

The analysis takes a case study approach with a focus on the **Shangombo, Sioma, and Sesheke** districts in the Western Province, drawing on both primary qualitative data from Key Informant (KI) interviews and Focus Group Discussions (FGD) and quantitative and qualitative data extracted from secondary sources.

Focus group discussions were carried out in **Imusho (in red)** and **Mbao (in yellow)**, two border communities in Sesheke that were greatly affected by the food crisis.

Imusho and Mbao

For a full overview of the Methodology, please see the full report

Water is vital to Zambia's economic development. Although the country has relatively good access to water resources, **dry spells and high temperatures** have been occurring more frequently. These conditions affect food and water security, primarily in the southern and western regions.

The **local economy of communities in the Western Province is anchored on ecosystem services:** agrarian, pastoralist, and small-scale fishing livelihoods that are greatly dependent on rainfall patterns. If rain does not arrive at the expected time during the season, fall intermittently or stops early, this can generate major impacts on crop growth and harvesting, and hence on food insecurity.

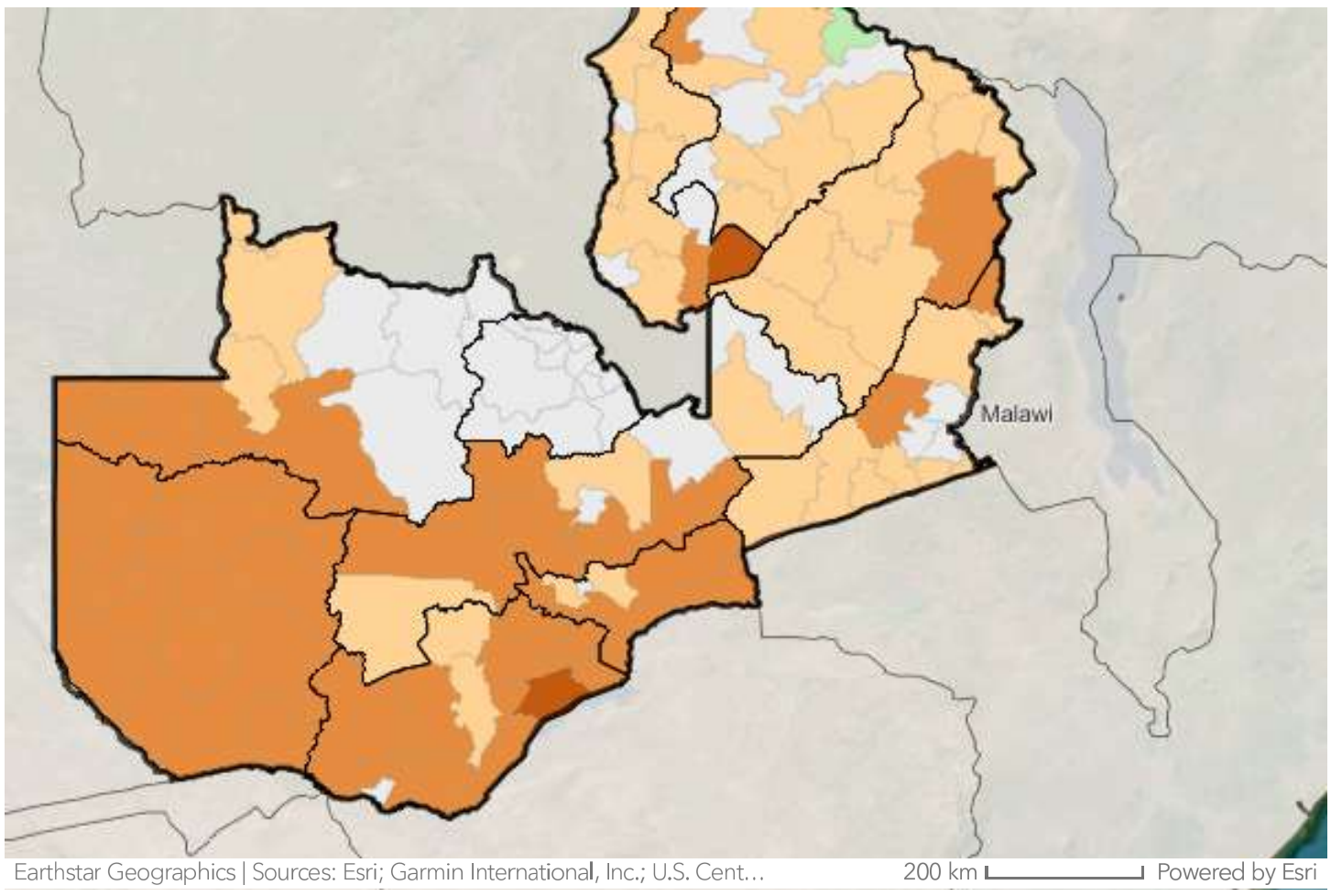
Step into the future: read here a speculative tale inspired by real stories and insights

What happened in 2018-2020?

Impacts of the food and water insecurity crisis.

Between 2018 and 2020, the **country faced severe dry conditions** due to two back-to-back seasons with insufficient rainfall (2018/2019 & 2019/2020), resulting in dire consequences, notably a **food and water insecurity crisis**. These dry spells coincided with the onset of the **COVID-19 pandemic and various other factors.** This period was marked by widespread food insecurity among households relying on subsistence farming and fishing, along with a significant decrease in surface water availability and access to drinking water in Western Province. The ensuing humanitarian impacts will be outlined in the following section.

Impacts on Food Insecurity



Western Province, along with various other areas in Zambia, saw a **rapid deterioration in food security** from 2018 onwards.

In September 2019, **1.7 million people** and by September 2020, still **1.42 million people** out of the total 18.4 million inhabitants in Zambia faced severe food insecurity (IPC class 3+). IPC data shows that Western Province had the highest

percentage of people facing severe food insecurity (IPC class 3 or higher), with up to **34% in 2019 and 40% in 2020**.

Click on buttons below to compare between the two years. Note: districts in grey were not analyzed.

IPC Food Insecurity (May - Sept 2019)

IPC Food Insecurity (Jul - Sept 2020)

> *"Farmers who had planted crops experienced complete crop loss, and at the community level, the impact translated into heightened levels of hunger. This period marked a time when the country recorded significantly elevated hunger levels, accompanied by various other challenges. People became malnourished due to a lack of sufficient food"*
>
> *KI14*

Food Insecurity Impact Timeline

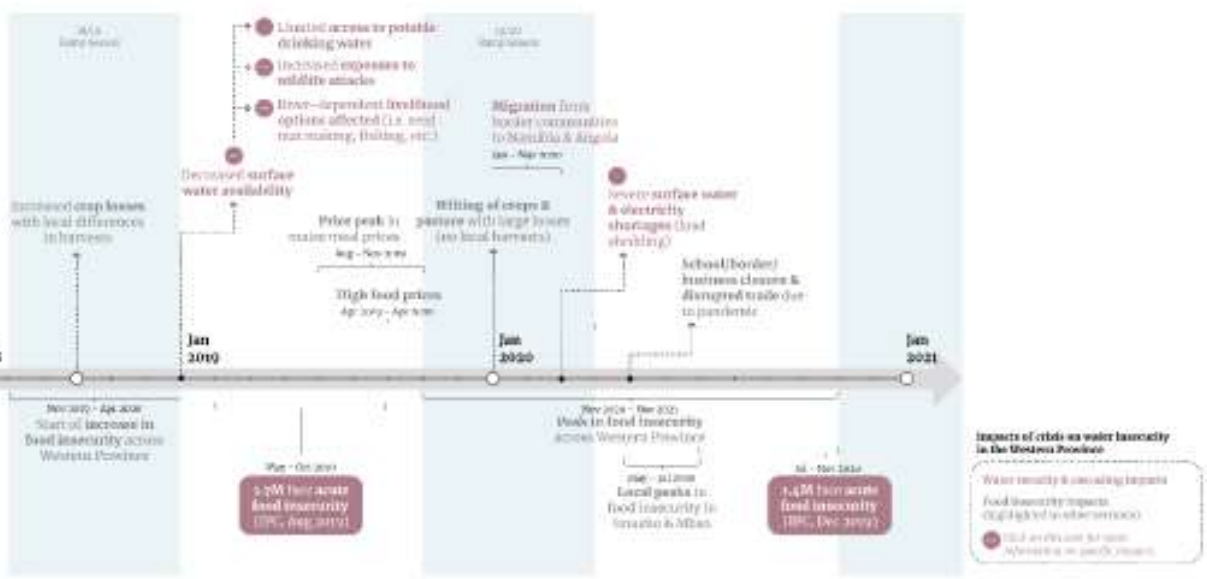
Edited 11 months ago

> *“No one harvested anything. The only people that had food are those that reserved maize from the previous growing season, and they were selling it at very high price.”*
>
> *FGD1*

Impacts on water resources

Between 2018 – 2020 **surface water availability drastically reduced** in the Western Province, leading to water shortages. This greatly impacted rural communities who are reliant on rivers, streams and lakes for both their own drinking water, water for livestock and for fishing and other water-based livelihood strategies such as reed-mat making.

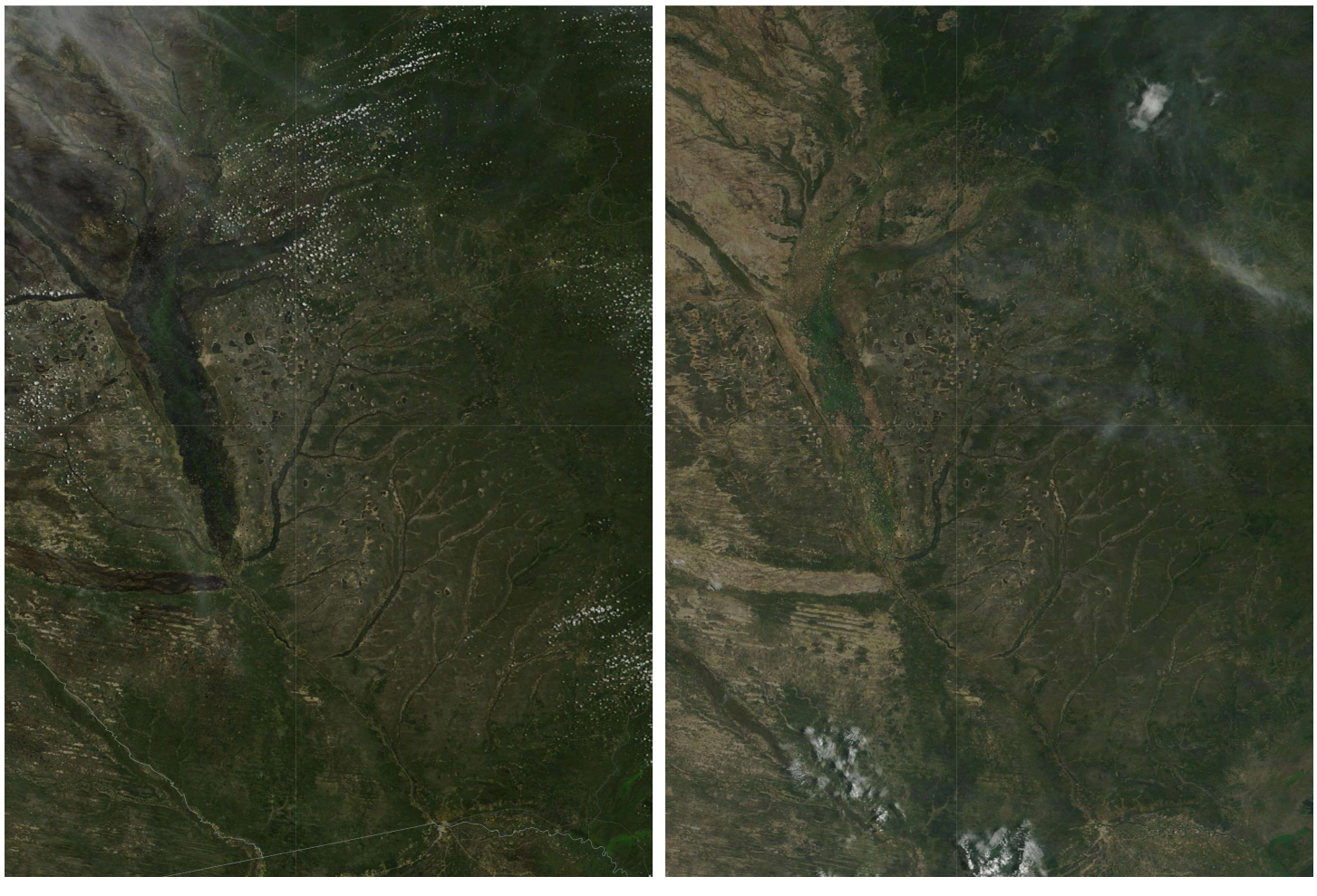
> *“Perennial rivers dried up, patches in the rivers with water were not healthy for drinking and boreholes dried up by May 2020. Men accompanied women to fetch water 5-10km away to protect women from wildlife (jackals, lions, leopards, elephants, and crocodiles).”*
>
> *FGD1*



1 / 6

Water Availability Impact Timeline

Edited 1 year ago



Move the bar to see the impact of the dry spells in the Barotse floodplains between 15.03.2017 (left) and 05.03.2019 (right).

> *“When the river water levels decrease, animals go to deeper waters, where people also fish, and reports of attacks by hippos, elephants, and crocodiles increase”*
>
> *KI07*

The imagery below shows deforestation in Imusho from 2017 (left) and 2020 (right).

Cascading impacts

Due to the socio-economic effects of severe food insecurity and limited livelihood opportunities, **communities experienced numerous negative consequences and employed various (negative) coping mechanisms**, leading to increased long-term vulnerability.

Cascading impacts

During this period, there was a notable increase in **early marriages and heightened tensions between genders within households**, leading to a rise in gender-based violence (GBV) at the local level. In border districts like Sesheke,

Remember you can read here a speculative tale inspired by real stories and insights

Shangombo, and Sioma, **migration to Namibia and Angola** emerged as common coping strategies, although it's worth mentioning that migration can often be a positive coping mechanism. However, discussions revealed instances of mistreatment and challenges faced by migrants. Estimates suggest that between 75% to 90% of the population migrated based on focus group discussions and interviews, with a significant portion relocating permanently, particularly women seeking piecework in Namibia. Unfortunately, these women encountered mistreatment, low wages, and even detention due to lack of proper travel documentation. The exodus of the young workforce and parents left the elderly and children more vulnerable to future crises.

Why did this happen?

Drivers of risk

Drivers of risk & impacts timeline

Physical Drivers

The 2018-2020 food insecurity crisis was directly linked to **prolonged dry spells** that occurred during the 18/19 rainy season and, in some cases, the 2019/2020 rainy season as well. However, the definition of dry conditions behind the crisis is not straightforward, due to **local differences in climatology and hydrology.**

In the southern half of the Western Province, both the 2018/2019 and the 2019/2020 rainy seasons were below average. Impacts in Western Province, where people are strongly connected to and dependent on the rivers that flow through the province, are not only driven by rainfall dynamics locally, but also Zambezi River basin-wide dynamics that determined river flows. As a result, many households faced a **second consecutive season with prolonged dry spells, exacerbating the crisis.**

2018 - 2019 Rainy Season

The rainy season of 2018/2019 was characterized by **prolonged dry spells, late start, early cessation and below-average total rainfall across the Western, Southern, Lusaka and Central province**. According to the Zambia Meteorological Department (ZMD), the 2018/2019 rainy season was one of the poorest in the southern half of the country since 1981. **Surface soil moisture** levels, useful for monitoring planting and harvesting activities for most crops, also greatly decreased along with the **Vegetation Health Index (VHI)**, primarily in the areas most affected by the dry spells.

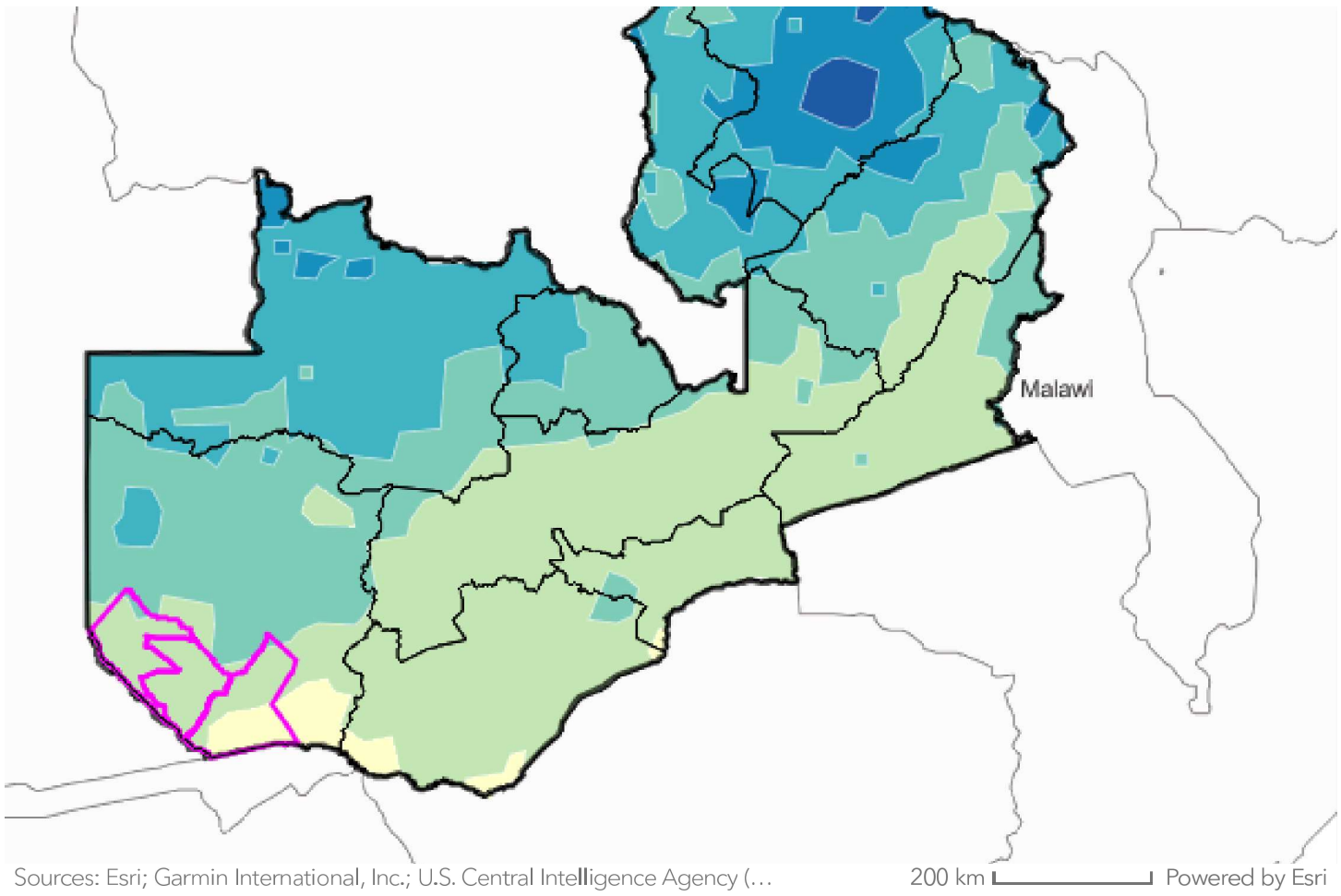
2019 - 2020 Rainy Season

In 2019/2020 total rainfall was slightly better but characterized by **multiple false starts to the rainy season, prolonged periods of little to no rain and short periods with very intense rainfall, and overall, still below average rainfall in the South and West of the country**. Similarly, surface soil moisture and VHI improved, although various regions in the south of the Western Province continued to be affected.

Sesheke Rainy Season Rainfall (mm).
Click on image to enlarge.

Although both seasons show anomalies, the 2019-2020 rainy season shows more variability in rainy season onset in the Western Province. In Sesheke, for example, rainfall in 2020 peaked very late in comparison to crop seasons.

Scroll to see analysis of rainfall, surface soil moisture and VHI between 2018 - 2020



Total Rainfall (mm) during rainy seasons

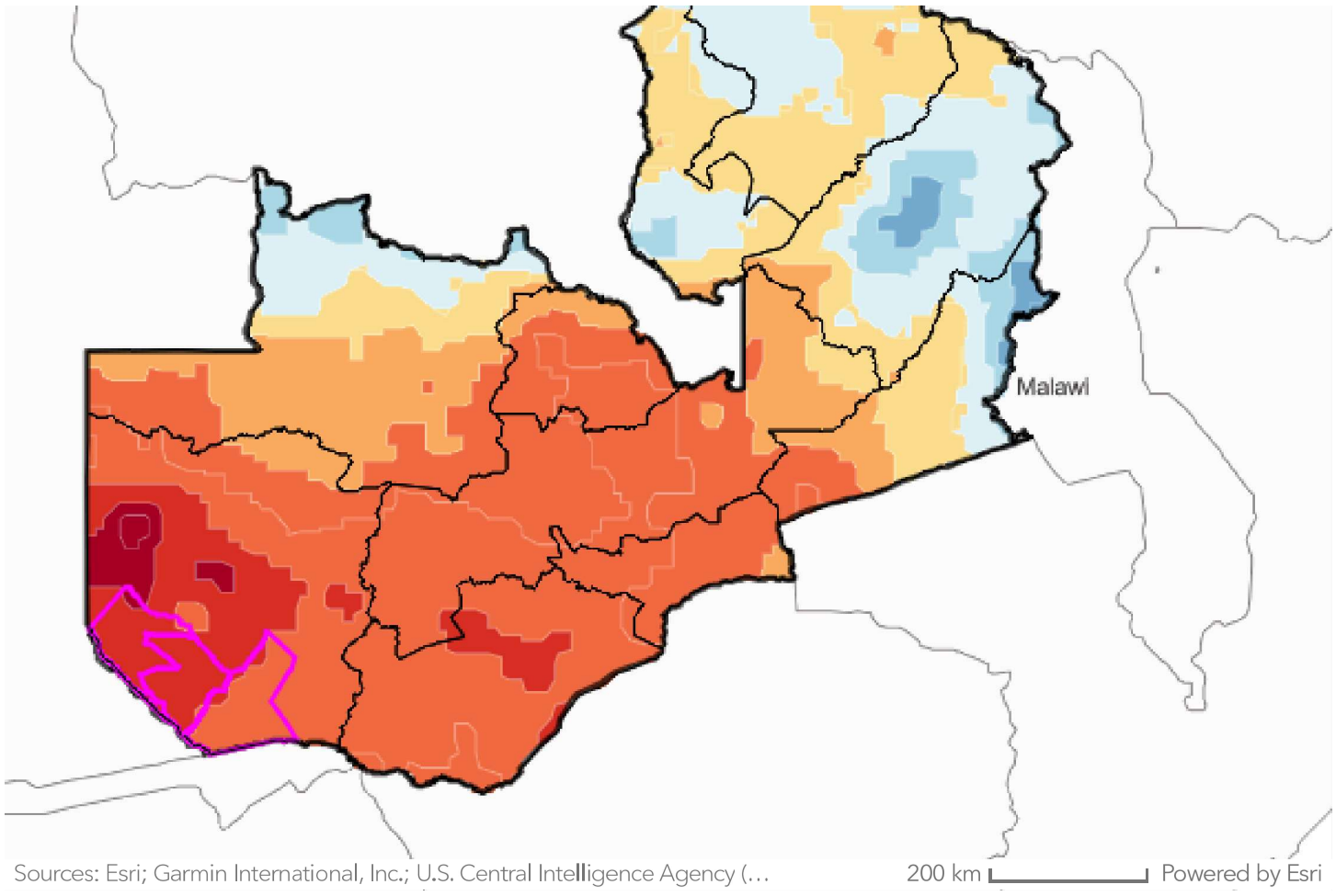
Average rainfall (1997-2017)

Rainfall Nov 2018 - March 2019

Rainfall Nov 2019 - March 2020

Source: CHIRPS 2023

Open legend on the bottom left to see the specific values for all maps. Zoom in to any section of the map.



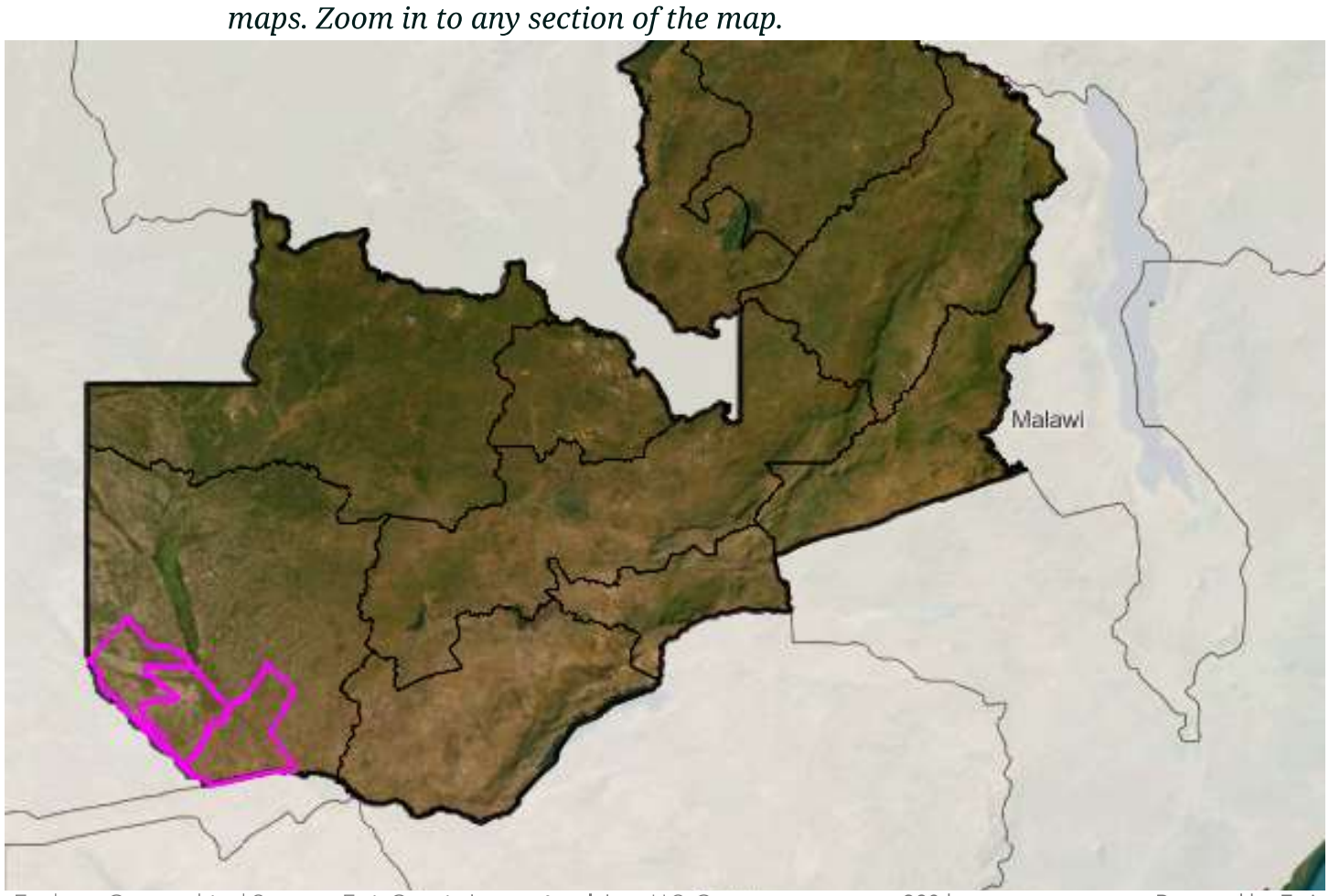
Rainfall Anomalies for the rainy seasons (2018 - 2020)

Anomaly (Nov 2018 - Mar 2019)

Anomaly (Nov 2019 - Mar 2020)

Source: CHIRPS 2023

Open legend on the bottom left to see the specific values for all maps. Zoom in to any section of the map.



Surface Soil Moisture

Surface Soil Moisture 21.03.2018

Surface Soil Moisture 21.03.2019

Surface Soil Moisture 21.03.2020

Source: NASA Soil Moisture 10 days

Open legend on the bottom left to see the specific values for all maps.

Vegetation Health Index (VHI)

Vegetation Health Index 21.03.2018

Vegetation Health Index 21.03.2019

Vegetation Health Index 21.03.2020

Source: FAO Vegetation Health Index 10 days

Open legend on the bottom left to see the specific values for all maps.

Other drivers of risk.

Beyond the dry spells in the rainy seasons of 2018/2019 and 2019/2020, other hydro-meteorological conditions (indirectly) contributed to the observed impacts in Western Province. These include additional **physical drivers, but also biological and socio-economic drivers of risk**.

The cognitive maps below summarize the main findings for **food insecurity impacts and water resource impacts** and their causal relationship to the different drivers.

Food Insecurity (left) and Water Resource (right) Impact Summary

Click on images to enlarge

Analysing how the different drivers relate spatially is key to understanding which areas were most affected:

Please note that the following analysis shows geospatial co-occurrence, and some events have remote knock-on effects in other parts of the country.

Powered by Esri

The **dry spells**, previously mentioned, mostly affected the Southern, Northwestern and Western Province. These were accompanied by high temperatures towards the end of 2018 and start of 2019, which greatly contributed to the loss of soil moisture and evapotranspiration, affecting crops and water sources.

Powered by Esri

In 2019, some northern areas in Zambia were affected by **floods and water logging**. This increased food prices across the country, which impacted food insecurity in the Southern and Western Provinces.

Powered by Esri

In January 2020, some areas in the south and east of Zambia were further affected by **flooding and water logging**. In the

Southern Province, facing a second consecutive season with prolonged dry spells, these flash floods had a massive impact, with some districts, like Gwembe, being affected directly by both hazards.

The global onset of **COVID-19 in February/March 2020** was a major driver of increased food insecurity. The measures initiated in response to the pandemic resulted in limitations on market access, mobility, and households' ability to earn income. Border closures had a major impact on communities' livelihoods and ability to buy food. School feeding programmes had to close, and disaster response efforts were slowed down, and organizations had to limit their budgets to spend funds on the food insecurity response.

At a government level, **rapidly increasing inflation, and Kwacha value reduction** from 2019 onwards influenced budgetary spending, and the costs of debt servicing, with implications for the DRM/response budget. Inflation and depreciation of the local currency, aggravated by the COVID-19 pandemic, also affected food (discussed in the next section) and a rise in commodity prices.

Powered by Esri

In the 2019/2020 agricultural season, an **outbreak of locusts,** one of the most destructive pests in the world, greatly affected crop production in various areas along the Zambezi River (IPC, 2020).

Fall army worm (FAW) outbreaks also contributed towards the destruction of crops **across Zambia** in the 2018/2019 season and the 2019/2020 season. FAW posed a significant threat to farmers, particularly for those who plant maize, as they attack the tasselling stage, when they produce cobs. These species thrive under warmer climates, as temperatures increase their growth rate and shorten their development time.

Powered by Esri

Additional outbreaks of **Foot and Mouth Disease (FMD)** greatly impacted livestock trade and products, leading to devastating socio-economic effects as infected animals experience decreased milk production, weight loss and poor growth.

Powered by Esri

As can be seen when overlaying events, the **impact of all these events on food insecurity is drastic in the Western Province.**

What was done during the crisis?

Early Warning Early Action (EWEA) and crisis response

The analysis explored the following elements of the **early warning early action chain: risk information, forecast monitoring and warnings; dissemination and communication; early action and financing.** The timeline describes the forecast availability and warning, early warning and early action (EWEA) and response actions that took place between 2018-2020 in detail.

In summary, in 2018 and 2019, **various early warning signals were available** that warned of the below-average rainfall conditions and food security impacts, although **no early warnings were produced specifically for the low river levels.**

The dry conditions in the 2018-2019 season were anticipated in advance, with high-confidence outlooks available in November. Government and non-governmental actors made **extensive efforts to communicate risks and advised measures to the public.** However, both localized findings from focus group discussions and the key informant interviews brought up **challenges in access to communities, clarity of warning information, actionability of information, lack of resources to take action, and limited trust in information that hampered warning dissemination and early action.**

In the absence of early actions, **response efforts started towards the end of 2019 and start of 2020, when communities were already one year into the food and water crisis.** This means **key windows of opportunity** for action between the forecast production and the development of impacts were missed, that could have contributed to a reduction of impacts.

Who was most affected?

Root causes of vulnerability

Although the Western and Southern provinces were most impacted by the events that occurred between 2018 – 2020, not all the populations were influenced equally. There are several root causes of vulnerability that increase the impacts on different sectors of the population, summarized below:

Root Causes of Vulnerability

Hover over image to highlight specific pathways

The widespread **dependence on small-scale rainfed maize subsistence farming** was a major root cause of vulnerability. This dependency on ecosystem services, coupled with **limited access to irrigation and agricultural inputs** like seeds and fertilizers, exacerbates their vulnerability to climate shocks. For instance, access to ploughing power, particularly oxen, significantly influences households' ability to cope with challenges. **Gender inequality**

Remember you can read here a speculative tale inspired by real stories and insights

further compounds this vulnerability, affecting access to productive assets, education, employment opportunities, and agricultural inputs.

Water scarcity poses another significant challenge in Western Province, with communities having the **lowest access to improved drinking water sources** across Zambia and remain **highly reliant on surface water and shallow boreholes**. While there is no research exploring in-depth the challenges of water access, across rural Zambia and southern Africa rural water governance, **limited investment and maintenance** challenges are key issues. Furthermore, aquifer characteristics in Western Province make that groundwater is often not potable, with high salt contents, and installation and operation on deeper boreholes to access better quality water is costly.

Imagination & the future

This section is a bit of a departure from the rest of the storymap. Below we introduce a short speculative fiction story that is constructed with information, observations, and experiences from the focus group and one-on-one interviews that informed this project. The hope with the story is that it can help to inspire readers and stakeholders to stretch their imaginations when thinking about the present challenges and possible futures faced in Zambia, but elsewhere as well.

What is speculative fiction? Speculative fiction, which includes science fiction, fantasy, and the new genre of cli-fi, explores alternate realities, futuristic timelines, or scientific and technological elements. Like good fiction writing in general, speculative fiction can simplify complex ideas, such as those that scaffold the climate and humanitarian space. It can foster empathy for “the other” by placing attention within the worlds of individuals to whom we may lack real emotional connection. And, for our imaginations, that can so often be co-opted by short-term news cycles and commercially controlled media, speculative fiction can help show what big-picture, out-of-the-box, and forward-looking inclusive global solutions might actually look like.

In terms of climate change projections and humanitarian challenges, the imaginative foundations of fictional exploration hold potential for a safe exploration of social, political, and technological outcomes connected to different

trends and future scenarios. This experimentation can actually aid in proactive policy development. Indeed, Kim Stanley Robinson points out that sci-fi likely informed some UN developments in 1945.

Speculative fiction, therefore, can serve as a creative catalyst, pushing humanitarian efforts beyond traditional boundaries, and, as The New Humanitarian podcast episode on the subject discusses, help us in imagining and constructing more radically into future. Walidah Imarisha asked us, in her 2017 keynote, to prioritize “What do we want?" over "What is realistic." In today’s reality, what is more sci fi than envisioning what it would truly take to create a world free of poverty or war?

Conclusions & key recommendations for the future

During the 2018-2020 period households in the Western Province experienced **high levels of food insecurity**, particularly those reliant on subsistence farming. The food crisis was exacerbated by high maize prices, limited production, and the economic repercussions of COVID-19. Access to food was particularly challenging for households reliant on the market, such as day laborers and those with depleted food reserves. Additionally, the **reduced availability of surface water** during this period led to further hardships, including limited access to drinking water, loss of livelihood opportunities, increased vulnerability to wildlife attacks, and heightened risks of zoonotic diseases.

This study concludes that there was **potential for early action** based on available early warnings, yet this **window of opportunity was largely missed at the time**. While early warnings accurately predicted rainy season dynamics and food security risks, challenges in dissemination and structural barriers hindered effective action. Limited financing and bureaucratic procedures delayed early response measures, highlighting the need for streamlined processes and increased investment in disaster preparedness and response mechanisms to enhance resilience in the face of future crises.

Key Recommendations

1. **Improve national-level analysis of local food insecurity and water access risks through enhanced monitoring and evaluation before, during, and after crises.**

   This requires considering factors beyond weather hazards, such as food prices, wildlife exposure, and indigenous knowledge, to improve risk assessments and early warning systems. Addressing data gaps on rural water access, malnutrition, and health impacts will enhance contingency

planning for government and humanitarian response efforts.

2. **Focus on the last mile in early warning dissemination and communication by expanding dissemination channels and localizing warning messages based on forecast impact information and feasible early actions.**

   Utilizing diverse communication methods like cross-border radio, SMS, and local leaders can improve outreach, especially in remote areas. Cross-sector collaboration between agriculture, health, and water management will strengthen early warning messages, while integrating community feedback and traditional warning signals will enhance advisory effectiveness.
3. **Promote and support Early Action at household, community, and national scale.**

   Strengthening early response mechanisms can help communities before crises peak by providing livelihood support, rehabilitating water services, and monitoring vulnerable groups. Embedding early action into disaster response protocols and establishing standardized early action triggers will improve efficiency and coordination.
4. **Strengthen Mechanisms for Pre-Crisis Funding Access: Enhance efforts to access funds before crisis impacts occur.**

   Expanding trigger-based, pre-agreed financing through Zambia's disaster management system will enable proactive early action. Strengthening the country's social protection system to support farmers before harvest failures can further enhance crisis preparedness if accessibility and timeliness challenges are addressed.
5. **To effectively address the impacts of future events and reduce long-term risks, measures must also target the root causes of vulnerability and exposure.**

   Addressing poverty, education gaps, and infrastructure limitations is crucial for long-term resilience. Improving access to agricultural tools, drought-resistant crops, telecommunications, and markets will empower communities to act on early warnings. Integrating Disaster Risk Management (DRM) and Climate Change Adaptation (CCA) efforts will further reduce vulnerability and enhance sustainability.

Overview of potential windows of opportunity for early action in the case of similar events in the future, focusing on food insecurity impacts.

Credits

The full list of references and complete analysis of this study is available online in the published report

Both the published report and this website were prepared by the Red Cross Red Crescent Climate Centre (RCCC) and the International Water Management Institute, with financial support CGIAR Initiative on Fragility, Conflict, and Migration. The CGIAR Research Initiative on Fragility, Conflict, and Migration (FCM) aims to enhance the resilience of food, land, and water systems in fragile and conflict-affected settings, where migration-related challenges are prevalent. By taking a systems approach and working in partnership with local stakeholders, the Initiative seeks to generate evidence to inform effective policies and programs that promote social and gender equity, climate resilience, conflict mitigation, and peace building in these settings. More information can be found at https://www.cgiar.org/initiative/fragility-conflict-and-migration/ .

The lead author was Tesse de Boer (RCCC), with contributions from Catalina Jaime (RCCC), Juan Carlos Sanchez (IWMI), Munyaradzi Mutenje (IWMI), Ngowenani Nohayi (IWMI), Winnie Kasoma Pele (IWMI), Greenwell Matchaya (IWMI), Camila Arretche (RCCC), Cornelia Schulz (RCCC), Dorothy Heinrich (RCCC), Rebeka Ryvola (RCCC), Emmanuel Poan (RCCC), Faith Mitheu (RCCC), Margret Azuma (RCCC) and Evan Easton-Calabria (RCCC).

The authors of this report would like to extend their gratitude to all the stakeholders who contributed to this retrospective analysis of the 2018-2020 food and water crisis in Zambia. Contributors to this report include: Sandra Ruckstuhl, Juan Carlos Sanchez (IWMI), Greenwell Matchaya (IWMI), Cornelia Schulz (RCCC), Dorothy Heinrich (RCCC), Rebeka Ryvola (RCCC), Emmanuel Poan (RCCC), Faith Mitheu (RCCC), Margret Azuma (RCCC) and Evan Easton-Calabria (RCCC). We are grateful for review support from Elizabeth Stephens, Irene Amuron and Erin Coughlan de Perez. Data

collection in Western Province was carried out by IWMI Zambia, and interviews at national level by RCCC. Artwork in the report and storymap was created by Rebeka Ryvola de Kremer. The team wishes to thank all organizations and individuals in Zambia who shared their experiences and contributed to the report. Gratitude goes out to national partners such as the Disaster Management and Mitigation Unit (DMMU), Zambia Red Cross Society (ZRCS), extension department of the Ministry of Agriculture and the Imusho and Mbao communities for the valuable and interactive discussions.

This work was carried out under the CGIAR Initiative on Fragility, Conflict, and Migration, which is grateful for the support of CGIAR Trust Fund contributors (http://www.cgiar.org/funders/).

GIS	Cornelia Scholz
Speculative fiction & art	Rebeka Ryvola de Kremer
Photos	Wikimedia Commons