



Mapping and Analysis of Anticipatory Action Initiatives in Senegal and Zambia

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Senegal and Zambia

Lena Nur and Giriraj Amarnath



Authors

Lena Nur¹ and Giriraj Amarnath²

¹ Research Consultant, Rottenburg, Germany

² International Water Management Institute (IWMI), Colombo, Sri Lanka

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The CGIAR Initiative on Climate Resilience, also known as ClimBeR, aims to transform the climate adaptation capacity of food, land, and water systems and ultimately increase the resilience of smallholder production systems to better adapt to climate extremes. Its goal is to tackle vulnerability to climate change at its roots and support countries and local and indigenous communities in six low-and middle-income countries to better adapt and build equitable and sustainable futures. Learn more about ClimBeR here: <https://www.cgiar.org/initiative/climate-resilience/>

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Executive Summary

The frequency and severity of extreme weather events are presenting substantial challenges to communities and nations worldwide. The already escalating impact of climatic hazards is expected to persist due to ongoing climate change. While strides have been made in enhancing forecasting capabilities and establishing early warning systems, global coverage remains inadequate, with just 40% of African countries reporting a multi-hazard early warning system in place as of 2022.

Even where forecasting and early warning systems are in place, the translation of early warnings into timely action remains a persistent challenge, as exemplified by past cases of delayed response to imminent disasters. Addressing this issue, the concept of anticipatory action has gained prominence in recent years. It involves the systematic connection of early warning with pre-arranged finance and contingency planning to enable action before disaster strikes.

CGIAR's ClimBeR initiative, specifically through the development of AWARE platforms, seeks to enhance anticipatory action by fostering coordination in early warning, early action, and early finance. This report, commissioned by the International Water Management Institute (IWMI), a CGIAR member, aims to support the implementation of AWARE in Senegal and Zambia, by: (1) identifying initiatives and stakeholders that can benefit from or support the AWARE platform in both countries; (2) analysing gaps in the current early warning and action systems that AWARE could address, along with identifying potential opportunities it could leverage; and (3) outlining options and suggesting next steps for a more integrated engagement of the AWARE platform.

The following table summarises main findings from the report about the gaps and challenges in anticipatory action and the enabling environment, along with strengths and opportunities for enhancing anticipatory action in both countries:

	Senegal	Zambia
Gaps and challenges in anticipatory action and the enabling environment	<ul style="list-style-type: none"> No government-led contingency plans or SOPs in place that specifically include anticipatory action to be taken ahead of hazard events Many ongoing initiatives for faster disaster response, but these are missing the window to act on seasonal and medium-term forecasts Multitude of stakeholders and initiatives with early warning and disaster response mandates, making coordination for anticipatory action challenging 	<ul style="list-style-type: none"> No government-led contingency plans or SOPs that specifically include anticipatory action Implementation of existing disaster response plans has been hindered by chronic underfunding, which severely limits their effectiveness Disaster risk management coordination functions within relevant government institutions need to be strengthened In the past, a perceived lack of reliability of forecasts and their limited translation into concrete advisory, e.g. for farmers, has represented a major barrier to local level anticipatory action

<p>Strengths and opportunities for anticipatory action</p>	<ul style="list-style-type: none"> • Enhancements in DRM frameworks and capacity for early warning, early action and early finance provide a strong foundation for anticipatory action in Senegal • Experience with an ad hoc anticipatory intervention by the Government of Senegal in 2019 shows the potential of acting even earlier to prevent impacts and provides proof of concept • Improvements in shock-responsive national social protection systems could be leveraged 	<ul style="list-style-type: none"> • Major national policies for DRM and social protection already promote a proactive approach to mitigating disaster risks • Zambian early warning, early action, early finance stakeholders have begun to gain practical experience in anticipatory action • Government of Zambia has established national platforms where seasonal outlooks are discussed and joint response plans developed among stakeholders from various sectors • Southern Africa already has a growing regional anticipatory action community of practice that could provide backstopping
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Based on these findings, the report puts forward several recommendations towards developing or strengthening national anticipatory action frameworks in Senegal and Zambia, specifically aimed at guiding future AWARE activities in both countries:

1. Forge strong partnerships with government agencies and other stakeholders early on, engaging them in all aspects of the process, to generate a sense of ownership and buy-in.
2. Validate and clearly communicate accuracy of forecasts to stakeholders so that they can understand the potential benefits and uncertainties related to the available early warnings.
3. Base anticipatory action frameworks and action plans on needs, starting from the disaster impacts they are seeking to address.
4. Prioritise incorporating anticipatory action within existing disaster risk management frameworks and processes over creating new structures.
5. Focus not only on anticipatory action frameworks, but emphasise and invest in the systems strengthening that is required to implement anticipatory action continuously and reliably through national and sub-national government structures.
6. Make use of existing guidance materials and tools to ensure efficiency in development and implementation of anticipatory action frameworks on the basis of lessons learned.

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Acronyms

ACP	Africa, Caribbean, and Pacific
ADRF	Africa Disaster Risk Financing Initiative
ADRFi	Africa Disaster Risk Financing Programme
AICRM	Africa Integrated Climate Risk Management Programme
ARV	Africa Risk View
AfDB	African Development Bank
ARC	African Risk Capacity
ANACIM	Agence Nationale de l'Aviation Civile et de la Météorologie
ANSD	Agence Nationale de la Statistique et de la Démographie
CLM	Cellule de Lutte contre la Malnutrition
CIRAD	Centre de coopération internationale en recherche agronomique pour le développement
COUS	Centre des Opérations d'urgences Sanitaire
COGIC	Centre Opérationnel de Gestion Interministériel des Crises
AGRHYMET	Centre régional de formation et d'application en agrométéorologie et hydrologie opérationnelle
CIEWS	Climate information and early warning systems
CREWS	Climate Risk Early Warning Systems
CILLS	Comité permanent Inter-Etats de Lutte contre la Sécheresse dans le Sahel
CSA	Commissariat à la Sécurité Alimentaire
CNAAS	Compagnie Nationale d'Assurance Agricole du Sénégal
CASP	Comprehensive Agricultural Support Programme
CIMA	Conférence Interafricaine des Marchés d'Assurances
CMS	Crédit Mutuel du Sénégal
DGPSN	Délégation Générale à la Protection Sociale et à la Solidarité Nationale
CDSA	Departmental Food Security Committee
DP	Dialogue Platform
DGPPE	Direction de la Gestion et de la Planification des Ressources en Eau
DPC	Direction de la Protection Civile
DAPSA	Direction de l'Analyse, de la Prévision et des Statistiques Agricoles
DG ECHO	Directorate-General for European Civil Protection and Humanitarian Aid Operations
DMMU	Disaster Management and Mitigation Unit
DREF	Disaster Relief Emergency Fund
DRM	disaster risk management
DRR	disaster risk reduction
EAP	early action protocol
EWS	early warning systems
AWARE	early warning, early action, and early finance platform
ECOWAS	Economic Community of West African States
EU	European Union
FEWS NET	Famine Early Warning Systems Network
FISP	Farmer Input Support Programme
FIP	final implementation plans

FSDZ	Financial Sector Deepening Zambia
FSN	Fonds de Solidarité Nationale
FAO	Food and Agriculture Organization
GBV AoR	Gender-Based Violence Area of Responsibility
GFDRR	Global Facility for Disaster Reduction and Recovery
GloFAS	Global Flood Awareness System
GIIF	Global Index Insurance Facility
GISC	Global Information System Centre
GSFF	Global Shield Financing Facility
GSSP	Global Shield Solutions Platform
GCF	Green Climate Fund
IPAR	Initiative Prospective Agricole et Rurale
ISRA	Institut Sénégalais de Recherche Agricole
IPC	Integrated Food Security Phase Classification
IFRC	International Federation of Red Cross and Red Crescent Societies
IFC	International Finance Corporation
IFAD	International Fund for Agricultural Development
IRI	International Research Institute for Climate and Society
IWMI	International Water Management Institute
OSB	Livestock Safeguarding Operation
MSAS	Ministère de la Santé et de l'Action Sociale
MDCEST	Ministère du Développement Communautaire, de l'Équité Sociale et Territoriale
MEFP	Ministry of the Economy, Finance, and Planning
NAIS	National Agriculture Information Services
NDMC	National Disaster Management Council
MDMTC	National Disaster Management Technical Committee
NDMTC	National Disaster Management Technical Committee
NFBS	national food balance sheet
NRP	National Response Plan
NDC	Nationally Determined Contributions
ORSEC	Plan National d'Organisation des Secours
PNR	Plan National de Riposte à l'Insécurité Alimentaire
PSE	Plan Sénégal Emergent
PIROI	Plateforme d'Intervention Régionale de l'Océan Indien
PNASAR	Programme national d'Appui à la Sécurité Alimentaire et à la Résilience
PGISS	Projet de Gestion Intégrée des Inondations
RAAWG	Regional Anticipatory Action Working Group
CRSA	Regional Food Security Committees
PRESASS	Regional Forum on Climate Outlook for the Sudano-Sahelian Region
RSMC	Regional Specialized Meteorological Centre
RVAA	Regional Vulnerability Assessments and Analyses
RNU	Registre National Unique
REAP	Risk-informed Early Action Partnership
SE/CNSA	Secrétariat Exécutif du Conseil National de Sécurité Alimentaire
SAWS	South African Weather Service

SADC	Southern African Development Community
SOP	standard operating procedures
SNSAR	Stratégie Nationale de Sécurité Alimentaire et de Résilience
SIDA	Swedish International Development Cooperation Agency
CTA	Technical Centre for Agricultural and Rural Cooperation
TWG	technical working group
UNDP	United Nations Development Programme
UNDRR	United Nations Office for Disaster Risk Reduction
UN OCHA	United Nations Office for the Coordination of Humanitarian Affairs
USAID	United States Agency for International Development
VAC	Vulnerability Assessment Committee
VAA	Vulnerability Assessments and Analyses
WRSI	Water Requirements Satisfaction Index
WARMA	Water Resource Management Authority
WASH	Water, Sanitation and Hygiene
WII	weather index insurance
WFP	World Food Programme
WMO	World Meteorological Organization
ZADMS	Zambia Drought Management System
ZNFU	Zambia National Farmers Union
ZRCS	Zambia Red Cross Society
ZVAC	Zambia Vulnerability Assessment Committee
ZMD	Zambian Meteorological Department

1. Introduction

In recent decades, the occurrence and severity of extreme weather events has noticeably increased. These events, ranging from prolonged droughts to sudden floods and intense storms, have left communities and nations grappling with their far-reaching impacts. Climatic hazard events are projected to become even more frequent and intense in the future as a result of climate change (UNDRR, 2022).

Alongside this trend, significant efforts have been made to enhance forecasting capacity and to establish early warning systems that can enable governments, businesses and households prepare better for extreme weather events and their likely impacts. However, early warning system coverage globally is still insufficient, and there is significant regional variation, with just about 40% of African countries reporting having a multi-hazard early warning system in place as of 2022 (UNDRR and WMO, 2022).

Despite advancements in forecasting technology and early warning system coverage, the translation of early warnings into timely finance and anticipatory action remains an ongoing challenge. This has been demonstrated again and again in cases where early warnings of imminent disasters were issued, but action did not follow, or only followed late. This has been illustrated for example in the case of delayed humanitarian funding for Ethiopia, Somalia and Kenya in the 2011-2012 drought (Hillier & Dempsey, 2012) or in the 2017-2018 drought in the Sahel (Orenstein, 2018).

Aiming to overcome this challenge, the concept of anticipatory action (Box 1) has attracted growing attention in recent years. In its application to disaster risk management and humanitarian response it is often used to refer to the systematic linking of early warning with pre-arranged finance and contingency planning to enable timely action before disaster strikes, to reduce or mitigate the likely impacts and enhance disaster response (Levine et al., 2020). But it can also describe ‘more informal approaches, where – although a mechanism incorporating triggers, financing and activities has not been established in advance – action is taken in anticipation of a crisis or disaster on the basis of a forecast’ (REAP, 2022).

CGIAR’s Building Systemic Resilience Against Climate Variability and Extremes (ClimBeR) initiative has started developing early warning, early action, and early finance (AWARE) platforms¹ in several countries to enable effective anticipatory action. These platforms aim to facilitate coordination in early warning, early action and early finance to trigger action and funding ahead of extreme climate events to enable effective disaster risk reduction, management and response. They do this by providing a space where forecasting, early warning, decision support and contingency planning tools can be brought together and accessed by the various disaster risk management stakeholders across

¹ ClimBeR: Building Systemic Resilience Against Climate Variability and Extremes. Initiative Overview: https://storage.googleapis.com/cgiarorg/2022/05/BRO_ClimBeR_Overview_2022_web.pdf

and beyond government. AWARE thus supports ClimBeR’s larger goal of ‘increasing the resilience of smallholder production systems to withstand severe climate change effects like drought, flooding, and high temperatures’ (CGIAR, 2022).

The International Water Management Institute (IWMI), a member of CGIAR, commissioned this report to support implementation of AWARE in two of the ClimBeR focus countries: Senegal and Zambia. The objectives of this specific work are to:

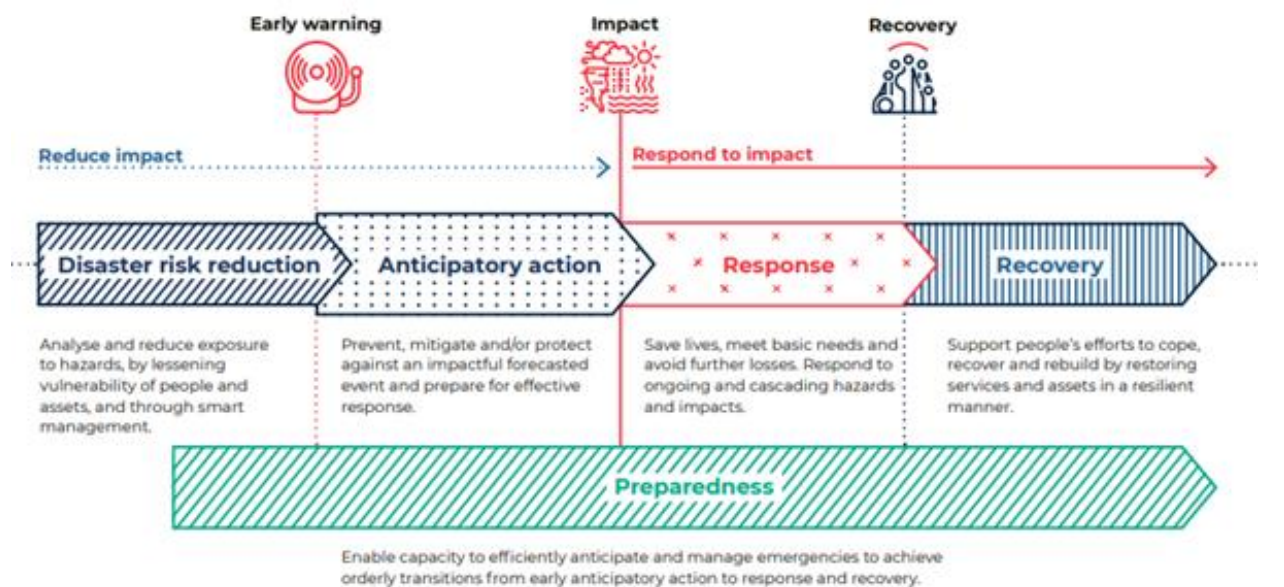
1. Identify existing initiatives and stakeholders that may benefit from AWARE or could support putting the AWARE platform into use in the two countries;
2. Analyse gaps in the current early warning, early action, early financing landscape that AWARE could help address and identify opportunities that AWARE could take advantage of;
3. Outline options and next steps for AWARE platform development.

The following chapter 2 outlines the methodology employed to meet these objectives. Chapters 3 and 4 present the results of the mapping and analysis for Zambia and Senegal respectively. In line with the ClimBeR initiative and its ongoing stakeholder engagement in Zambia, the focus is on major natural hazard related disasters in both countries, in particular droughts and their impacts.

Box 1: Anticipatory action terminology and concepts

This box introduces major concepts related to early warning, early action and early finance as used in this mapping report. Figure 1 shows how these concepts relate to disaster risk management more broadly, with anticipatory action between the disaster risk reduction and response stages.

Figure 1: Anticipatory action in disaster risk management



Source: Cash Hub (<https://cash-hub.org/resources/cash-and-anticipatory-action/page/2/>).

Early warning: ‘Information provided in advance of a specific hazardous event, disaster or conflict to enable stakeholders to take timely action to reduce disaster risks. Users [of this terminology] differ on whether early warning(s) relate exclusively to warning of hazardous events (such as drought) or also include the impacts of these events (such as acute food insecurity associated with drought). Humanitarian professionals have generally tended towards the latter (impact-based) meaning, and meteorological professionals towards the former’ (REAP, 2022).

Early action / anticipatory action: Early actions are ‘a set of actions to prevent or reduce the impacts of a hazardous event before they fully unfold predicated on a forecast or credible risk analysis of when and where a hazardous event will occur’ (REAP, 2022). Early action and anticipatory action are used synonymously in this mapping report. ‘The terms ‘forecast based financing/action’ and ‘anticipatory action’ are often used to describe the same or similar processes: the term that is used often depends on the organisation. However, ‘forecast based financing / action’ is even more strongly associated with pre-agreed funding, activities and actors than ‘anticipatory action’ (REAP, 2022).

Response: ‘Actions taken directly before, during or immediately after a disaster in order to save lives, reduce health impacts, ensure public safety and meet the basic subsistence needs of the people affected. (...) Disaster response is predominantly focused on immediate and short-term needs and is sometimes called disaster relief’ (UNDRR, n.d.).

Preparedness: ‘The knowledge and capacities developed by governments, response and recovery organizations, communities and individuals to effectively anticipate, respond to and recover from the impacts of likely, imminent or current disasters. (...) Preparedness is based on a sound analysis of disaster risks and good linkages with early warning systems, and includes such activities as contingency planning, the stockpiling of equipment and supplies, the development of arrangements for coordination, evacuation and public information, and associated training and field exercises’ (UNDRR, n.d.). Effective and timely early action and response require disaster risk-informed preparedness measures.

This mapping report includes interventions that span anticipatory action and early response stages. Especially in the case of drought, the specific point in time when an event starts, when it ends, and when it ‘peaks’ can be unclear and the transition gradual, meaning the lines between anticipatory action and early response post-disaster can be somewhat blurred (Levine et al., 2020). Acknowledging this ambiguity, the Zambia and Senegal country chapters also discuss index-based insurance instruments that aim to provide rapid liquidity for early response. Because they cover climate and weather-related hazards (e.g. droughts and floods), aim to pay out quickly, and share common characteristics with many anticipatory action projects (e.g. in that they release resources not on the basis of already impacts that have already been materialised and assessed on the ground, but on modelled impacts and trigger thresholds), these instruments are considered

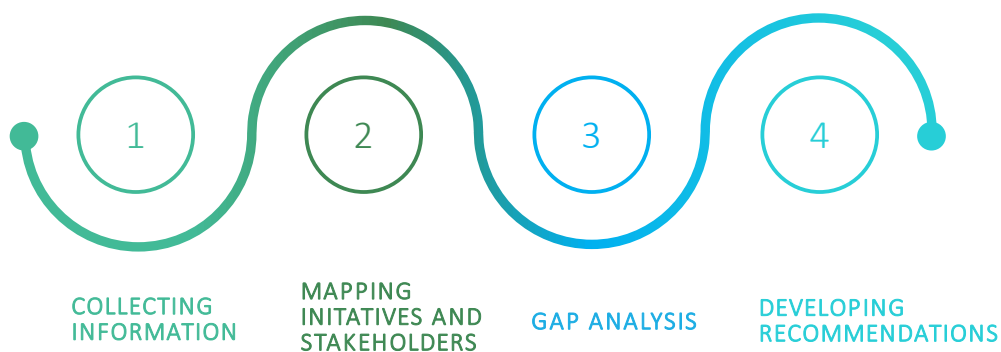
relevant to ClimBeR AWARE interventions. This is particularly important in the case of sovereign insurance, where national contingency plans, technical working groups that calibrate risk models and monitor impacts, and response coordination mechanisms already exist.

2. Methodology

This chapter presents the methodology employed to assess anticipatory action initiatives in Senegal and Zambia. The methodology encompasses four essential steps, each contributing to a holistic understanding of the landscape, followed by the development of recommendations (Figure 2).

The mapping report in its current form is based on a desk review of publicly available materials. Information that is not in the public domain and that would only be identified through more in-depth stakeholder engagement and interviews could therefore not be included in the analysis.

Figure 2: Methodology to map and analyse existing anticipatory action initiatives in Senegal and Zambia



Source: Authors.

Step 1: Collecting Information

The initial phase focused on the collection of information from a variety of sources to establish a comprehensive foundation. Relevant materials were identified through extensive online searches using search engines and dedicated web platforms such as the Anticipation Hub, InsuResilience Global Partnership, and Global Index Insurance Facility (GIIF). Relevant institutional websites were also searched for project documents, policy papers, and reports. These institutions included the African Risk Capacity (ARC), World Bank, African Development Bank (AfDB), World Meteorological Organization (WMO), United Nations Office for Disaster Risk Reduction (UNDRR), World Food Programme (WFP), Food and Agriculture Organization (FAO), as well as relevant country-specific organizations and ministries. This process helped identify relevant information from both global and country-specific contexts.

Step 2: Mapping Initiatives and Stakeholders

Building on the information gathered in Step 1, this step involved a mapping and discussion of existing anticipatory action and early response initiatives. Furthermore, it identified key stakeholders associated with these initiatives. This includes key stakeholders such as implementing

partners and donors from the public sector, private sector, and civil society. Stakeholders of particular interest include Ministries of Agriculture, Ministries of Finance, Disaster Management Authorities, Financial Services Authorities, Civil Protection agencies, National Meteorological and Hydrological Services, and microfinance institutions. Special emphasis was placed on identifying existing coordination platforms and understanding their roles in fostering collaboration among stakeholders.

Step 3: Gap Analysis

To gain deeper insights into the current landscape of early warning, early action, early financing, and coordination initiatives, the report goes on to assess gaps and weaknesses as well as strengths and opportunities. The objective of this step was to identify potential entry points for the AWARE platform that are grounded in an intention to complement and coordinate with existing initiatives.

Step 4: Developing Recommendations

The final step involves synthesizing the findings from the initiatives and stakeholder mapping to derive practical recommendations for the next stages of the AWARE platforms in Senegal and Zambia. It is important to note that the specific recommendations may vary between countries, depending on the outcomes of the assessment and the unique characteristics of each context.

3. Mapping and gap analysis – Zambia

Drought Risk and Impacts

Drought poses a significant risk to Zambia’s population and economy. Parts of Eastern, Muchinga, North-Western and Western provinces are most drought prone, but drought impacts in the form of food insecurity put people at risk countrywide (Pourazar, 2017). Other disaster events that have been occurring relatively frequently and are having large-scale impacts in Zambia are floods and epidemics, mostly Cholera (Pourazar, 2017)².

Zambia’s drought risk is expected to further increase in the future. Current climate projections do not provide a clear picture of future trends in precipitation in Zambia, but they consistently point to an increase in temperature of between 2°C to 4°C in the medium term future (2050-2074) and between 2.5°C and 6°C in the far future (2071-2095), depending on the emission scenario. They also show a likely increase in the share of the country that is prone to drought. As of 2016, CIMA Research Foundation and UNDRR estimated that, on average, about 11% of the total population (1.73 million people) was potentially affected by drought each year, and that this share of people at risk would increase to about 25% (7.3 million people) in the future (considering the 2050-2100 climate under a high emission scenario and accounting for projected population growth). Similarly, the share of GDP potentially affected was estimated to increase from 10% (USD 2 billion, relative to the 2016 GDP) each year on average to 23% (around USD 55 billion, relative to the projected total 2050 GDP) over the same period. These potential direct losses from drought are mostly driven by estimated losses in hydropower generation. Increased crop losses for maize – the major food crop (FAO, 2022) – and other crops such as cassava, sweet potato and groundnut are expected in all except the northern parts of Zambia under future climate conditions, though they remain moderate (under 6%) relative to total income from crops (CIMA and UNDRR, 2018).

Relevant early warning, early action, early finance initiatives

Drought-related early warning systems (EWS)

EWS for drought and its secondary impacts on agriculture and food security require methods, tools and data that span seasonal meteorological information (climate and weather forecasting), hydrological information (river and dam levels), crop forecasting and monitoring, vulnerability and capacity assessments, as well as market, price and commodity monitoring (Braumoh et al., 2018).

² Earthquakes are also considered a significant risk in Zambia due to its location in the East African Rift Valley (Pourazar, 2017), but not discussed further in this report as the potential for early warning is currently limited.

In Zambia, the Zambian Meteorological Department (ZMD) produces and disseminates weather and climate information, supporting a range of downstream EWS. One of them is the Zambia Drought Management System (ZADMS), which was developed by IWMI and launched by the Zambian Ministry of Agriculture in early 2023. The ZADMS online platform³ currently provides drought early warning information in the form of seasonal to short-term weather forecasts, combined with information about past and current drought frequency and severity to predict and monitor drought. The platform incorporates functions for a drought decision making tool and contingency plan, with the aim of directly linking early warnings with modalities that enable the implementation of early actions (IWMI, 2023). As of June 2023, preparations were ongoing for supporting the Ministry of Agriculture in developing a contingency plan.

Beyond immediate drought signals, national and regional analysis tools and early warning systems in Zambia and the wider region focus on providing early warning and monitoring of food insecurity, which often follows from drought, but is not solely dependent on drought conditions.

One such tool are national Vulnerability Assessments and Analyses (VAA), which have been implemented in Southern African Development Community (SADC) member countries, including in Zambia. The results from VAA are owned by governments and can be accessed by public officials for public use. VAA are consolidated into Regional Vulnerability Assessments and Analyses (RVAA), a process which was strengthened through the SADC's RVAA Programme, in operation between 2017 and 2022. However, a couple of key challenges were identified in relation to the VAA, and the extent to which they are used to implement early action in southern Africa. These challenges are summarised in Box .

Box 2: Challenges with VAA

The World Bank's 2018 Assessment of Food Security Early Warning Systems for East and Southern Africa identified a range of challenges that have hampered the use of VAA for early action in the region (Braimoh et al., 2018). They include:

- **Timeliness:** VAA reports are only available in June. Initially they did not include projections, meaning they were too late to be effective for EWS. Since 2018, they are integrated with the Integrated Food Security Phase Classification (IPC)'s forward looking projections of food insecurity in Zambia, thus better supporting EWS.
- **Accessibility:** Information is available to regional and national level stakeholders, but not to those at subnational level, and not in languages that are easily understood by communities.

³ <https://zadmsdemo.iwmi.org/home>

- **Perceptions:** VAA are perceived by some people at the local level to block them from accessing food aid, and therefore considered by them as not useful.
- **Political sensitivities:** Food security is a politically sensitive topic in many countries. To address this, VAA reports issued by Vulnerability Assessment Committees (VACs) tend to focus on presenting facts and remaining neutral, leaving analysis, judgements and recommendations on specific actions to the user.
- **Practical relevance:** As a result, not all VAA reports recommend relevant actions⁴, thus requiring an extra step of ‘translating’ VAA into advisory rather than triggering actions directly.
- **Financial sustainability:** VAA relies on external partner funding in most countries.

More recently, and reinforced by the SADC RVAA programme starting in 2017 – Zambia has adopted the IPC and integrated it into its annual VAA (IPC - Integrated Food Security Phase Classification, n.d.-b; SADC; FCDO; Swiss Agency for Development and Cooperation; Landell Mills and WFP, 2017). The IPC process is supported by a regional SADC IPC Technical Working Group (TWG) – chaired by the Famine Early Warning Systems Network (FEWS NET) and including World Vision, Oxfam, WFP, FAO, UNICEF and SADC – and by the Zambia Vulnerability Assessment Committee (ZVAC) at the national level. IPC Acute Food Insecurity Classifications have been conducted for Zambia since early 2018; Chronic Food Insecurity Classification and Acute Malnutrition Classification – the two other types of analyses offered through the IPC – are not currently available in Zambia (IPC - Integrated Food Security Phase Classification, n.d.-a). The IPC’s estimation of current and project acute food insecurity are based on data from the ZVAC’s annual assessments, as well as production data from the Ministry of Agriculture’s Crop Forecast Survey, climate data from ZMD, price data from WFP, relief data from the Zambian Disaster Management and Mitigation Unit (DMMU), and other reports of food security from various organisations (IPC, 2022).

Crop production forecasts are also used by the DMMU to produce an annual national food balance sheet (NFBS). The NFBS is an established tool used to understand food supply, and to enable comparison to the expected demand for food (e.g. for human consumption, livestock feed, seeds or to compensate for food storage losses) for a given reference period. Such information is used, for example to support policy and planning, as well as to inform humanitarian appeals, for instance in the case of the SADC’s regional aid appeal in June 2016, which was launched in response to the El

⁴ It is unclear from the World Bank’s report whether Zambia’s VAA is amongst those not recommending actions, but in any case, the finding highlights the importance of integrating actionable recommendations with EWS if early warnings are to consistently result in early action.

Niño induced drought (Braithwaite et al., 2018). The process of NFBS production in Zambia is outlined in Table 1.

Table 1: Process leading to the production of NFBS in Zambia

Activity	Due date and responsible body contributing to NFBS
Seasonal rainfall forecast	By the end of September, forecasts are generated by the ZMD and submitted to the DMMU and other relevant departments and authorities.
Hydrological conditions	By the end of every month, information on hydrological conditions is generated and submitted by the Department of Water Affairs and submitted to the DMMU and other relevant departments and authorities.
Preliminary crop forecast	By January 31 each year, the Ministry Responsible for Agriculture and Livestock (National Early Warning Unit), the agency responsible for national statistics, and the ZMD will generate the preliminary crop forecast report and submit to the DMMU and other relevant departments and authorities.
Final crop forecast	By April 30 each year, the National Early Warning Unit in the Ministry Responsible for Agriculture and Livestock, the agency responsible for national statistics, and the ZMD will generate the final crop forecast report and submit to the DMMU and other relevant departments and authorities.
NFBS	The NFBS will be published by May 15 each year.
Comprehensive needs assessment	By June 15 each year, the DMMU in collaboration with other multisectoral agencies will publish a report on the impact of drought and vulnerabilities.

Source: Expanded from Table 2.10 in Braithwaite et al., 2018, which is based on Republic of Zambia - Office of the Vice-President – DMMU, 2015.

Beyond the Ministry of Agriculture’s Agricultural Marketing Information Centre – which was established to provide data to the National Early Warning Unit and the Food Reserve Agency that is in charge of the country’s strategic grain reserves – Zambia National Farmers’ Union and FEWS NET also collect their own data for commodity and price monitoring (Braithwaite et al., 2018).

Anticipatory action mechanisms that integrate early warning, early action and early finance

Focusing on availability, accessibility and use of early warning information at the local level, a range of advisory outputs and community-level engagement initiatives exist in Zambia to translate weather and seasonal climate forecasts into actionable advisory for different sectors, including agriculture and water. For instance, WFP supports weather forecast workshops for the dissemination and discussion of agro-meteorological information that are aimed at helping farmers decide when and what to plant at the beginning of a season (WFP, 2020). In addition, the ZMD has been undertaking a range of measures to enhance the generation and provision of early warning information in the agriculture sector in Zambia (Republic of Zambia, 2022). For instance, ZMD established social media dissemination platforms and recently started issuing forecasts in local languages to farmers through local radio stations. This has led to a surge in farmers' interest in the ZMD forecasts, though issues around low perceived skill and limited geographic specificity remain major barriers to the use of forecasts for anticipatory action by farmers (Libanda, 2021). The department also promoted the co-production of agro-meteorological bulletins to provide advisories to farmers and trained agriculture extension officers to understand, repackage and disseminate climate information to farmers and communities (Republic of Zambia, 2022).

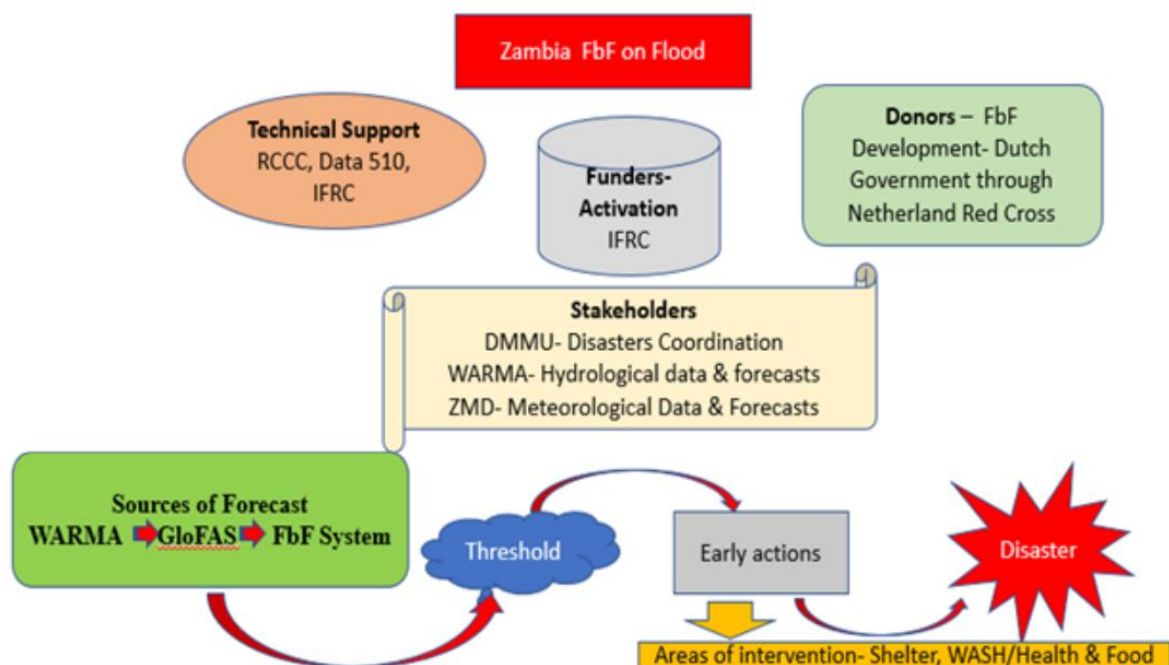
In September 2020, the Zambia Red Cross Society (ZRCS) established an early action protocol (EAP) for floods, covering 13 districts at very high risk⁵, and 20 districts at high risk⁶ of flooding. In case of a forecasted flood, the EAP activation plans to reach 1,000 households (or 6,000 people) with supporting interventions across the shelter, Water, Sanitation and Hygiene (WASH), health, food security and livelihood sectors. Key government partners of the ZRCS include the Water Resource Management Authority (WARMA), the DMMU and the Zambia Meteorological Department (ZMD) (Figure 3). The EAP covers a timeframe of 5 years (2020-2025), with a total allocation CHF 249,955 from the International Federation of Red Cross and Red Crescent Societies (IFRC)'s Disaster Relief Emergency Fund (DREF)⁷ to ZRCS. The EAP can be triggered at two lead times (7 days and 3 days) to implement early actions that were pre-selected through stakeholder engagement to address expected flood impacts as feasible within these lead times (Anticipation Hub, n.d.-a; Red Cross Red Crescent Climate Centre et al., 2021a).

⁵ Namwala, Itezhi Tezhi, Monze, Mazabuka, Gwembe, Sinazongwe. Luangwa, Petauke, Nyimba, and Katete, Mambwe, Chama.

⁶ Chavuma, Zambezi, Mufumbwe, Mumbwa, Kabwe, Mkushi, Serenje, Senanga, Shangombo, Sesheke, : Kazungula, Choma and Siavonga, Lusaka and Kafue, Milenge, Samfya, Lundazi and Muchinga: Chinsali.

⁷ 'The Disaster Response Emergency Fund (DREF) is the quickest, most efficient and most transparent way of getting funding directly to local humanitarian actors—both before and immediately after a crisis hits'. The DREF is available to Red Cross Red Crescent Societies, 'enabling them to deliver fast and effective local humanitarian action' (<https://www.ifrc.org/happening-now/emergency-appeals/disaster-response-emergency-fund-dref>).

Figure 3: Flood FbF in Zambia⁸



Source: Anticipation Hub, n.d.-b.

Throughout the EAP development process, ZRCS has been engaging with relevant government agencies and other stakeholders through national dialogue platforms on forecast-based finance (FbF) and a national Technical Working Group. This has helped generate a common understanding of anticipatory action, facilitated information sharing, and supported coordinated action (Box 3).

Box 3: Timeline of stakeholder engagement for anticipatory action in Zambia, 2018-2021

- 2018**
- National Dialogue Platform (DP) on FbF: The national DP brought all relevant stakeholders together and ensured a common understanding on what FbF entails. The Technical Working Group, comprising of relevant government agencies and ZRCS, was established.
 - Technical Working Group meetings: The regular Technical Working Group meetings were used to share information and conduct joint planning and joint operations on FbF. This ensures that work is not duplicated and resources are combined to enhance response time (efficiency) and effective collaboration.

⁸ RCCC = Red Cross Red Crescent Climate Centre; FbF = forecast-based finance; GloFAS = Global Flood Awareness System.

2019

- African Dialogue Platform in Maputo: During the African Dialogue Platform in Maputo all countries attending were asked to create action plans jointly with all relevant stakeholders in their respective countries.
- Early Action Protocol (EAP) development process: The EAP development was a robust process in defining when and where to take early actions for floods. This process also defined who takes what actions.
- Training in the Global Flood Awareness System (GloFAS): The GloFAS training was attended to by Water Resource Management Authority (WARMA) which resulted in them appreciating the FbF process and approach more, which contributed to the creation of ownership. The training was a result of a collaboration with the University of Reading in the UK.

2020

- Approval of EAP: The approval of the EAP offered a possibility for the ZRCS to be ready to implement early actions when risk of impacts is high, in collaboration with DMMU, ZMD, and other stakeholders.
- Development of standard operating procedures (SOPs): In the SOPs the roles and responsibilities of all stakeholders involved were defined.
- Information sharing by WARMA and ZMD: Just before the rainy season ZMD shared information on forecast menu and WARMA shared information on water points and water levels, enabling ZRCS to communicate accurate information to affected communities.

2021

- EAP light activation and learning sessions after hazard season: After the rainy season, all stakeholders came together to discuss the work done, the challenges faced, the things that went very well, the things that could have gone better, and recommendations for the future.

Source: Direct citation from Netherlands Red Cross, 2021.

In January 2023, the ZRCS EAP's impact-based forecasting and the GloFAS system raised an alert for a riverine flood at the 20 year return period with a 7 day lead time and the EAP trigger was reached on 24 January 2023. Table 2 lists the areas of focus and actions prioritised for implementation in Kitwe district, which the forecast identified as the district likely to record the highest impact. Learning activities are currently ongoing to document lessons from the experience (IFRC, 2023a).

Table 2: Overview of ZRCS early actions

Focus area	Early actions
Shelter	<ul style="list-style-type: none"> - Distribution of waterproof plastic bags for safe keeping of key documents - Distribution of household items to targeted household and post distribution monitoring follow up (Tents, Insecticide Treated Nets, WASH Materials, etc.) - Communities reinforces/digs trenches Embankment to divert water, unclog trenches - Quick assessment of the safe havens - relocation sites and improve the sanitation facilities in the evacuation sites beneficiary Pre-selection/identification
Health	<ul style="list-style-type: none"> - Distribution of Insecticide Treated Nets (2 pieces per household)
Water, sanitation and hygiene	<ul style="list-style-type: none"> - Transportation of wash material and household items from the regional warehouses to the districts for distribution to targeted individuals and families - Community sensitization on early warning on proper hygiene (public system address, radio announcement, door to door, information, education and communication and community engagement and accountability)
Disaster Risk Reduction	<ul style="list-style-type: none"> - Community sensitization on early warning, early crop harvesting, proper food storage and preservation

Source: IFRC, 2023a.

Building on experiences with flood FbF, the ZRCS has plans to develop an EAP that would enable and institutionalise anticipatory action ahead of droughts (Anticipation Hub, n.d.-b). While not yet operational at the time when this mapping report was written, the development of an EAP for drought is likely to follow a similar approach to that of the flood FbF EAP development. This process – and lessons learned from it to date – is summarised in Box .

Box 4: Development of EAP for flood FbF in Zambia – process and lessons learned

In developing the EAP for anticipatory action ahead of floods, the ZRCS worked with a national technical working group along the following seven steps: risk analysis, trigger development, selection and validation of early actions, EAP development, and forecast monitoring (Anticipation Hub, n.d.-a). The working group was established as part of a sub-committee under the DMMU’s pre-existing early warning systems group and meetings were government chaired and hosted by

implementing partners. This meant, the EAP built on existing structures and encouraged stakeholder engagement to support ownership and institutionalisation of anticipatory action (Red Cross Red Crescent Climate Centre et al., 2021a). In developing the trigger, ZRCS collaborated closely with the DMMU, WARMA and ZMD.

The following lessons were learned in the process (direct citation from (Anticipation Hub, n.d.-b)):

- 'FbF promoted engagement of and embeddedness with government stakeholders and structures, which contributed to increase visibility of the National Society and is considered a positive development. Evidence suggests that the relationships established through FbF are likely to continue.
- Enhanced institutional integration for synergy formulation is vital for effectiveness and sustainability. There is need to build national skillset for enhanced prediction capacities and facilitate evidence-based intervention.
- Competing needs within the National society led to delays in the development of the EAP.
- Creation of and working through a technical working group affiliated with the early warning subcommittee propelled the EAP development process'.

Source: Anticipation Hub, n.d.-b.

Microinsurance against drought related risks in agriculture to facilitate early response

By the 2015/2016 farming season, more than 60,000 farming households in Zambia were insured against drought, dry spells and other adverse weather events in Zambia (Musika, 2016). The weather index insurance (WII) product, developed with support from Risk Shield Consultants Limited, has been offered by Mayfair Insurance Company Zambia Limited and Focus General Insurance Limited. Partners – including Financial Sector Deepening Zambia (FSDZ), Musika, the Global Index Insurance Facility, International Fund for Agricultural Development (IFAD), International Research Institute for Climate and Society (IRI) and WFP – have contributed technical and financial support to improve the product and facilitate the scale up of insurance provision in Zambia through a number of distribution channels (Musika, 2016; WFP, 2021), which target different groups of farmers. These distribution channels include:

- Contract farming and farmer organisations: In 2013/2014, NWK Agri-Services – A Zambian agriculture company – began offering WII to cotton farmers as part of its large contract farming scheme. Under this scheme, NWK prefinances the insurance premium payment, along with other agricultural inputs. In return, clients agree to sell their cotton produce to NWK at the end of the season, when sales proceeds and any potential WII payouts offset the outstanding loan with NWK. Surpluses are then paid out directly to farmers. In 2015/2016, 52,000 out of NWK's 70,000 eligible clients chose to purchase the insurance bundle, with over 23,000 farmers receiving a payout (amounting to over USD 200,000) in 2016 as result of drought (InsuResilience

Global Partnership, 2017). Aggregators for the provision of weather index insurance offered by Mayfair Insurance include NWK Agri-Services, the Zambia National Farmers' Union and other local organisations (World Bank Group, 2021).

- International organisation: In 2018/19, Mayfair Insurance collaborated with WFP to offer insurance to farmers under the R4 Rural Resilience Initiative (WFP, 2022). In Zambia, R4 provides farmers with service bundles that include advisory consultations, access to credit and savings accounts, and insurance coverage (World Bank Group, 2021). By 2020, 39,250 farmers and 25,000 livestock owners benefitted from WFP supported microinsurance policies (InsuResilience Global Partnership, 2020).
- Government programme: Under this distribution channel, the WII product (in some cases combined with funeral insurance) was first linked to agricultural input supplied via an 'e-voucher' pilot programme as part of the Zambian government's Farmer Input Support Programme (FISP) in one of the 13 pilot districts in 2015/2016 (Musika, 2016). Following challenges with the full rollout of the e-voucher approach in 2017/2018, the Zambian government reverted to direct input support for the FISP (Government of the Republic of Zambia, 2022), but retained the insurance component. Between 2016 and 2019, around three million insurance contracts – just over 1 million per year – were issued via the FISP to cover farmers from loss due to drought or excessive rainfall (World Bank Group, 2021). In the last two agricultural seasons (2021/22 and 2022/23), the FISP has been covering 1,024,434 farmers through direct input supply (in the form of fertiliser, maize seed and soya bean or groundnut seed), requiring farmers to make contributions of K400 (about USD 20) (Lusaka Times, 2022; Money FM, 2022). Starting with the 2023/24 agricultural season, there are plans to evolve the FISP into the Comprehensive Agricultural Support Programme (CASP), to move away from direct input support and towards a more flexible e-voucher system (Government of the Republic of Zambia, 2022). The FISP is targeted at 'vulnerable but viable' farmers, i.e. those unable to afford sufficient input on their own, but who are in a position to use and generate a surplus from the inputs provided through the programme (Lusaka Times, 2022; Money FM, 2022).

In addition to WII aimed at crop farming households, Mayfair introduced an index-based livestock product for pastoralists in 2020 (World Bank, n.d.) and several indemnity livestock insurance products, including some with drought and flood coverage, are available on the Zambian market (Moyo and Luhana, n.d.).

Sovereign drought insurance

Zambia has been part of the African Risk Capacity's risk pool since the 2020/2021 agricultural season (African Risk Capacity, n.d.-c). Table 3 summarises Zambia's ARC risk pool participation to date. The country's participation in the risk pool is being supported through the Africa Disaster Risk Financing Programme Multi-Donor Trust Fund. This fund is managed by the African Development Bank (AfDB) and supported by the UK (Foreign, Commonwealth and Development Office) and Switzerland (Swiss

Agency for Development and Cooperation). Ahead of the 2021/2022 season, ARC insurance premiums were co-financed through the Zambian Government’s national budget allocations, the Swiss Agency for Development and Cooperation and the AfDB (African Risk Capacity, 2022; Jimenez-Sanchez, 2022).

Table 3: Zambia's participation in the ARC risk pool

Year	Coverage (USD)	Payouts (USD)
Risk Pool VIII (2021/22)	5 377 892	5 377 892
Risk Pool VII (2020/21)	7 122 400	-

Source: African Risk Capacity, n.d.-b, 2022.

The Government of Zambia received its first payout from ARC following the 2021/2022 agricultural season (African Risk Capacity, 2022). Zambia does not currently have complementary ARC Replica⁹ coverage, but the Government has expressed interest for WFP and civil society to expand ARC coverage via the Replica programme, and for them to partner with Government to invest in the expansion of micro insurance (African Risk Capacity, 2022). Further, ARC is collaborating with United Nations Office for the Coordination of Humanitarian Affairs (UN OCHA) to pilot the concept of ‘anticipatory insurance’ in Zambia and Malawi (Box 5). This means a modification of existing ARC products to enable payouts straight after the sowing window that would enable earlier action (Maslo, 2022).

Box 5: ARC anticipatory insurance pilot

In partnership with UN OCHA, ARC pilots ‘anticipatory insurance’ in Zambia by ‘modifying its existing products to develop an innovative parametric insurance solution that enables payouts right after the sowing window. The amount paid would be calculated on the level of failed sowing and the forecasted impact of these failures by the end of the season. The current ARC Ltd. drought policy does cover drought impacts in the sowing window, but it does so along with other shocks that may materialise during the season, offering coverage from November to April, with activities, including planning, lasting up to six months after the payout, starting typically in May.

In the case of the anticipatory insurance product, coverage is for November up to mid-January with an immediate payout still within the month, and activities taking place from February to April. The implementation is capped at three months and approval and planning processes are streamlined to enable quick action. Emphasis is also placed on preparedness and making contingency planning more anticipatory, provided for within the ARC programme and supported by UN OCHA. (...) In this way anticipatory insurance will offer dedicated sowing protection by, for

⁹ ‘African Risk Capacity’s Replica Coverage allows UN agencies and other humanitarian actors to match ARC country insurance policies’ (<https://www.arc.int/arc-replica>).

example, distributing seeds for subsistence crops, e.g., potatoes that can be sowed later in the year. Farmers could grow crops mitigating the considerable impacts that late rains or periods of dryness during the start of the rainfall season have had on food and income security. (...)

To be successful, these actions require an even higher level of preparedness, both operationally and financially, than ARC's usual parametric insurance because the time for action is extremely narrow. Part of UN OCHA's mandate is to support governments and partners with enhanced contingency planning and preparedness, which will be harnessed in the pilot. For financing this, a third trigger based on pre-seasonal forecast could activate anticipatory action so that, for example, if the forecast is bad at the beginning of the agricultural season, a provision on alternative seeds is made'.

Source: Excerpt from Maslo, 2022.

Disaster preparedness for anticipatory action and response

As evident from the initiatives discussed above, a number of contingency plans, SOPs and early warning plans exist in Zambia to support anticipatory action and response to droughts. However, experiences with past disaster events have repeatedly highlighted gaps and weakness in preparedness and response planning, as well as in the implementation of disaster preparedness measures such as simulation exercises. Complementing the ongoing drought management interventions and products described earlier, a range of internationally supported projects are / were recently implemented in Zambia to strengthen early warning, early action and early finance. These are summarised in Box 6.

Box 6: Past or ongoing projects aimed at strengthening early warning, early action and early finance

Regional risk financing framework for agriculture and food security in Southern Africa project

This project aimed at informing public policies and programmes of countries in the Southern African Development Community (SADC) region, including Zambia, to enhance the management of systemic climate-related risks to the agriculture sector and food security. More specifically it supported the implementation of risk modelling, and identified policy actions and programmatic investments to enhance financial resilience. The project also delivered new agriculture risk financing tools and methods adopted in several SADC countries and helped create a network of institutions (including Ministries of Finance and Agriculture at the national level) working on risk financing in agriculture and food security. The project was active between October 2019 and June 2020 and was implemented under the African, Caribbean, and Pacific – European Union (ACP-EU) Natural Disaster Risk Reduction Programme, which is a joint initiative of ACP, EU, the World Bank and the Global Facility for Disaster Reduction and Recovery (GFDRR) (GFDRR, n.d.).

Strengthening Climate Information and Early Warning Systems (CIEWS) for climate resilient development and adaptation to climate change in Zambia.

The CIEWS project aims at enhancing the ZMD's capability to monitor and forecast extreme weather and climate change; and to enhance the use of hydrometeorological and environmental information for early warnings (e.g. to farmers) and long-term development planning, e.g. by tailoring weather and climate information to specific sections (such as agriculture, water, health, energy). Pathways to achieving these outcomes include expanding the coverage of Zambia's meteorological observation network, establishing communication channels for the effective dissemination of early warnings, and two-way community-based early warning systems in particularly flood and drought prone districts (Gwembe, Mambwe and Sesheke) (Zambia Meteorological Department, n.d.).

Strengthening national systems for disaster preparedness through support to drought insurance premiums and capacity building

Between November 2021 and October 2026, the Swiss Government is making available CHF 7.3 million (about USD 6.7 million) towards drought insurance premium support and capacity building interventions. The project is implemented by ARC, and in partnership with WFP. It aims at increased budget allocations towards ARC drought insurance premiums in Zambia and Zimbabwe, and at enhanced disaster risk management and preparedness in both countries. Intended project results contributing to the latter include the development of national disaster risk management and financing frameworks, disaster risk management (DRM) monitoring and evaluation plans, an expansion of social protection registries, and a pilot study on using technology and innovation to enhance beneficiary targeting (Swiss International Cooperation, 2023).

Africa Disaster Risk Financing (ADRFi) Programme

ADRFi is an African Development Bank programme running from 2019 to 2023, though a second phase of the programme is currently under development (African Development Bank, 2023). It aims to strengthen government capacity to respond effectively to disasters, with the ultimate goal of enhancing rural household resilience to climate-related shocks. Zambia is one of several countries where ADRFi has been active (African Development Bank, 2021).

Strengthening climate resilience of agricultural livelihoods in Agro-Ecological Regions I and II in Zambia

This 7 year project (2018-2025) targets smallholder farmers across five Zambian provinces (Eastern, Lusaka, Muchinga, Southern and Western) to enhance access to climate information services, provide support for climate-resilient agricultural inputs and practices, strengthen sustainable water management and promote alternative livelihoods through a value-chain approach. The Green Climate Fund (GCF) approved co-financing of USD 32 million for this project

with a total value of over USD 105 million in 2018. The project is coordinated by UNDP as accredited entity and involves the Zambian Ministry of Agriculture as executing entity. The climate services component of the project includes capacity strengthening includes training for ZMD extension staff in weather data generation, interpretation, and dissemination; the installation of automatic weather stations; and improved packaging and dissemination of weather information to farmers (UNDP, 2022).

Key anticipatory action policies and stakeholders in Zambia

Regional coordination

Southern Africa has a Regional Anticipatory Action Working Group (RAAWG), which published a regional anticipatory action roadmap in August 2022 (Regional Anticipatory Action Working Group (RAAWG), 2022). This is aimed at collaboration between stakeholders to scale up anticipatory action along four priority areas: (1) Strengthening coordination frameworks for anticipatory action, (2) Harmonisation of triggers, (3) aligning anticipatory financing instruments, and (4) evidence-based advocacy and awareness raising. Compared to some of its neighbouring countries – especially Malawi, Mozambique and Zimbabwe – the roadmap shows few anticipatory action programmes operational in Zambia. The RAAWG’s secretariat consists of FAO, WFP and the Red Cross Red Crescent Movement.

In July 2023, a Joint Early Warning Anticipatory Action Programme in Southern Africa was launched by SADC and the RAAWG Secretariat to support implementation of the regional roadmap priorities over the coming two years. The programme aims to ‘scale up early warnings and anticipatory action effectively and efficiently in the region. [It] will adopt an innovative approach towards putting inter-agency, harmonized interventions into operation’ (Anticipation Hub, 2023).

Key policies and stakeholders at the national level

Disaster risk management in Zambia is governed by the national **Disaster Management Act of 2010** and the **Disaster Risk Management Policy**, which was last revised in 2015 (Pourazar, 2017; Republic of Zambia - Office of the Vice President, 2015). The Policy outlines disaster risk management mandates under the overall leadership of the Office of the Vice President. It does not explicitly reference ‘anticipatory action’ or ‘early warning, early action’ concepts (and pre-dates the more recent surge in use of this terminology), though the policy highlights many measures and actions to be undertaken that are critical for advancing anticipatory action in Zambia under the categories of ‘disaster preparedness’ and ‘disaster prevention’ (Republic of Zambia - Office of the Vice President, 2015). To support disaster preparedness, the Zambian Government developed a **2016/2017 National Contingency Plan in 2015**. This was a response to risk scenarios that anticipated prolonged dry spells from rainfall shortage, as well as flash floods in low lying parts of the country with normal

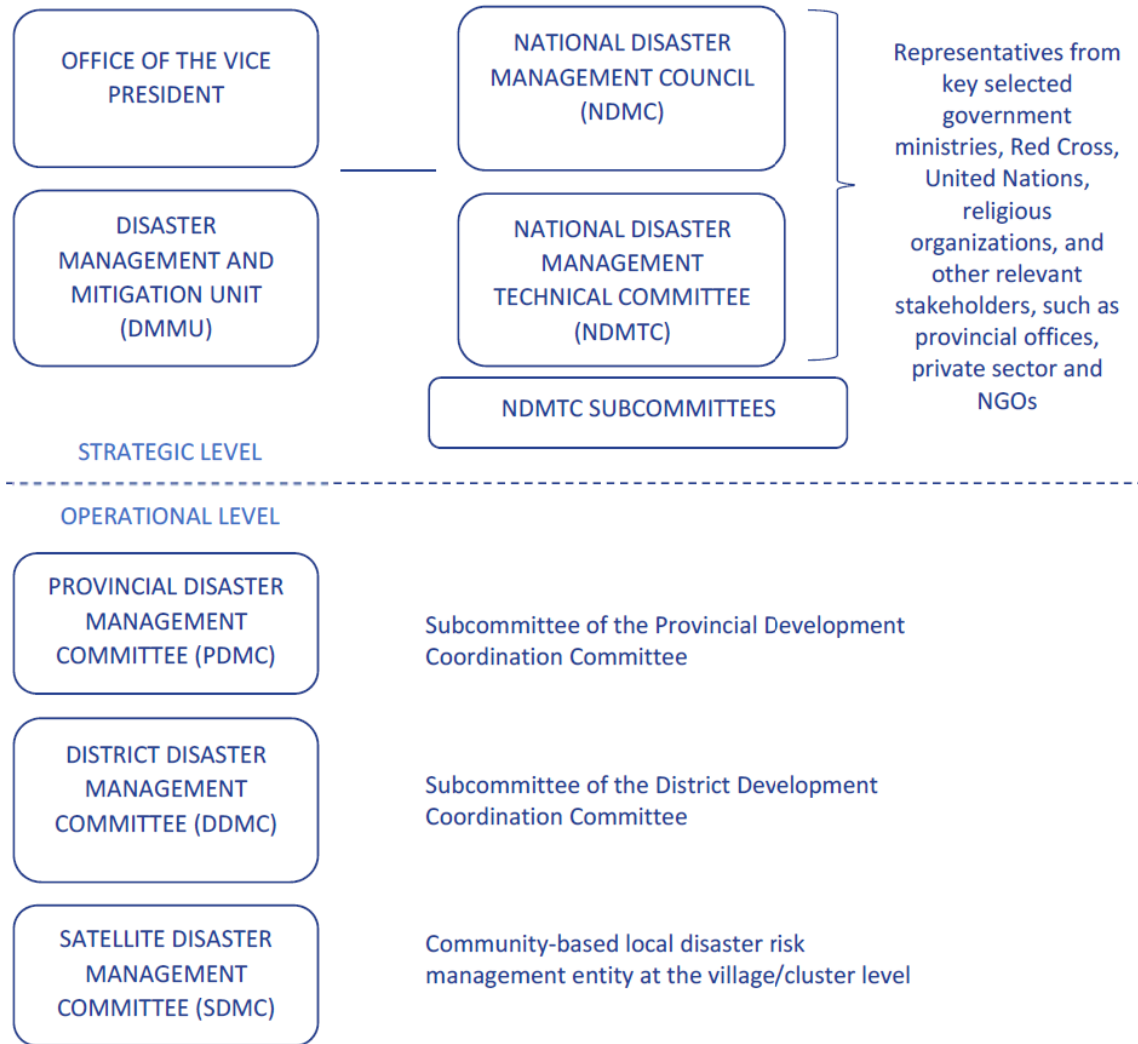
rainfall. However, implementation was underfunded, with the plan estimating a 60% resource gap (Pourazar, 2017).

The **Disaster Management Operations Manual**, also issued in 2015, includes a **drought code, a flood code, an epidemics code and a pests code** that define disaster management activities and responsibilities for the respective hazard. The codes refer to different types of forecasting and early warning activities, but does not provide further detail, nor does it determine actions to be taken on the basis of these warnings, beyond the dissemination of early warnings. The request of funds, preparation of appeals and implementation of response activities proposed in the codes, instead, are contingent on the declaration of a disaster by the President of the Republic of Zambia (Republic of Zambia - Office of the Vice-President - DMMU, 2015), thus missing the window for taking anticipatory action ahead of a disaster.

The Government of Zambia has since identified a need to develop a **national drought management policy, legislation and preparedness plan** to enhance drought risk reduction, preparedness and resilience of people and ecosystems to drought (Mwitwa, 2018). However, this process is not yet fully operationalised (World Bank et al., 2021) and it is unclear whether the resulting policies and plans would specify anticipatory actions.

The primary national government entities focused on disaster risk management in Zambia are the DMMU, the National Disaster Management Council (NDMC) and the National Disaster Management Technical Committee (NDMTC) (see Figure 4, also for abbreviations). The NDMC's mandate is policy and the NDMTC is responsible for technical support, while the DMMU implements programmes and coordinates disaster risk management stakeholders. However, the DMMU faces capacity constraints and requires support to develop the human and financial resources required for effective coordination of disaster risk management policy and planning, including anticipatory action (World Bank et al., 2021).

Figure 4: Disaster risk management governance in Zambia



Source: Pourazar, 2017.

Beyond the disaster risk management institutions at various levels of government, several centralised institutions, line ministries and sectoral agencies are engaged in early warning, early action and early finance related to drought in Zambia. This includes the Ministry of Agriculture, the Ministry of Finance, the Water Resource Management Authority, and the Zambia Meteorological Department in core functions (see Table 4). Furthermore, the Ministry of Community Development, Mother and Child Health outlines a mandate for social protection that clearly aligns with anticipatory action in that its objective is 'to contribute to the well-being of all Zambians by ensuring that vulnerable people have sufficient income security to meet basic needs and protection from worst impacts of risks and shocks' (Republic of Zambia - Ministry of Community Development; Mother and Child Health, 2014), as outlined in the **National Social Protection Policy**. In particular,

social assistance is highlighted in the policy as a measure to provide support in response to disasters, to people who are 'at risk of rapid deterioration in economic and social well-being and security' (ibid.). The 2018 **Integrated Framework of Basic Social Protection Programmes and its Implementation Plan 2019-2023** build on this understanding under a DRM programme with the objective of strengthening DRM and mitigation for sustainable social protection. This covers covariate shocks including droughts and climate shocks, accidents and disasters and market shocks. The implementation plan activities under DRM include hazard and risk mapping, capacity building in risk awareness and early warning and the provision of coordinated relief support to affected households. The current plan does not envisage the delivery of assistance to at-risk households before a shock, but it does provide entry points for better linking early warning systems with shock-responsive social protection programming in Zambia going forward (Republic of Zambia, 2018, 2019).

Table 4 lists further key stakeholders, and their involvement in early warning, early action, and / or early finance in Zambia, with a particular focus on drought.

Table 4: Key stakeholders and donors in early warning, early action, early finance in Zambia

	Zambia early warning, early action, early finance stakeholders
Existing national and regional coordination platforms	<ul style="list-style-type: none"> • National Disaster Management Technical Committee and Early Warning Sub-Committee • ARC technical working group • Zambia Vulnerability Assessment Committee • Regional anticipatory action working group (RAAWG) (Secretariat: FAO, WFP, Red Cross Red Crescent; Members: SADC, South African Weather Service (SAWS), Météo-France, UN OCHA, Start Network, Welthungerhilfe, FEWS NET, Oxfam, World Vision, Gender-Based Violence Area of Responsibility (GBV AoR), Plateforme d'Intervention Régionale de l'Océan Indien (PIROI))
Government	<ul style="list-style-type: none"> • Ministry of Agriculture - operating the Farm Input Support Programme (FISP); focal point for ZADMS; Operates National Agriculture Information Services (NAIS), which includes promotion of FISP-linked WII • WARMA - partner to ZRCS in flood FbF • Disaster Management and Mitigation Unit (DMMU) - focal point for ARC in Zambia; partner to ZRCS in flood FbF • NDMC - involved in disaster management • MDMTC - involved in disaster management

	<ul style="list-style-type: none"> • Disaster Management Committees at provincial, district and satellite levels - involved in disaster management • Zambia Meteorological Department (ZMD) (part of the Ministry of Transport and Communications) - main partner to ZRCS in flood FbF; issuing decadal crop weather bulletins, seasonal rainfall, 7 day weather and daily weather forecasts • SADC - supporting regional framework for disaster risk finance and disaster risk management community; regional risk monitoring and capacity strengthening • Ministry of Finance – sovereign disaster risk finance mandate • Ministry of Community Development, Mother and Child Health - national social protection mandate
<p>Domestic civil society and emergency response organisations</p>	<ul style="list-style-type: none"> • ZRCS - operating flood FbF via DREF (EAP in place), planning drought FbF • Zambia National Farmers Union (ZNFU) – delivery channel in commercial WII product
<p>International development and humanitarian partners</p>	<ul style="list-style-type: none"> • DG ECHO - funding RAAWG joint regional anticipatory action programme • Red Cross Red Crescent Climate Centre / IFRC and FAO - Co-leading RAAWG Secretariat together with WFP • WFP - implementing R4 Rural Resilience programme (including WII provision, in collaboration with Mayfair Insurance); technical assistance to government on insurance distribution via the FISP; RAAWG secretariat • UN OCHA – Anticipatory insurance pilot with ARC • German Government - providing donor support to R4 Rural Resilience, supporting commercial WII via GIZ • Swiss Agency for Development and Cooperation - donor support to R4 Rural Resilience; co-financing Zambia's ARC premium and funding DRM capacity support • Swedish International Development Cooperation Agency (SIDA) - donor support to R4 Rural Resilience • GCF - donor support to R4 Rural Resilience • Technical Centre for Agricultural and Rural Cooperation (CTA) funding regional project (Zambia, Malawi, Senegal) for provision of insurance (as part of a package of other interventions, e.g. forecast access, climate smart agriculture,...)

	<ul style="list-style-type: none"> World Bank International Finance Corporation (IFC) and GIIF - providing product development support and technical training for WII development; technical support and capacity building for Mayfair Insurance African Development Bank - co-financing Zambia's ARC premium
Regulatory agencies	<ul style="list-style-type: none"> Pensions and Insurance Authority - Zambian insurance regulator
Financial service providers	<ul style="list-style-type: none"> Mayfair Insurance Company Zambia Limited - major crop and livestock WII product provider FSDZ provided technical and financial support to scale up of WII ARC Ltd. – Providing insurance coverage to Government of Zambia and piloting anticipatory insurance with UN OCHA
Other private sector	<ul style="list-style-type: none"> Risk Shield Consultants - actuarial and technical consultancy services, involved in product design, marketing, capacity building and implementation of WII in Zambia Musika - non-profit company supporting roll out of crop and livestock insurance and facilitating complementary interventions, e.g. livestock health or CSA; supporting FISP Louis Dreyfus Company (formerly NWK Agri-Services (purchased in 2016) - offering WII through its contract farming scheme with smallholder cotton farmers since 2013/2014
Academia / think tanks	<ul style="list-style-type: none"> Mulungushi University - partner with ZRCS in flood FbF University of Zambia - conducting research on WII uptake; partner with ZRCS in flood FbF University of Reading - TAMSAT research group providing satellite-based rainfall estimates, supporting trigger development by Risk Shield

Gaps and opportunities

Based on the review of existing early warning, early action, early finance initiatives and stakeholders in Zambia, this section summarises key opportunities and gaps for the AWARE platform.

Gaps in anticipatory action and the enabling environment in Zambia

A significant gap exists in Zambia in terms of government-led contingency plans or standard operating procedures for anticipatory action, particularly concerning clear guidelines for government entities on what actions should be taken and by whom when acting upon early warnings of drought or floods. While the country has disaster management operations manuals and

contingency plans for disaster response, these documents do not adequately define specific anticipatory actions that should be initiated in anticipation of impending disasters.

The implementation of existing disaster response plans has been hindered by chronic underfunding, which severely limits their effectiveness (Mwitwa, 2018; Pourazar, 2017). If not connected to a reliable budgetary instrument or financing mechanism that can release resources quickly when they are needed to implement anticipatory action, any new anticipatory action contingency plans or standard operating procedures may remain ineffective.

Disaster risk management coordination functions within relevant government institutions need to be strengthened. The DMMU formally holds this function in the management of drought and flood related events, but has struggled to coordinate proactive disaster management efforts by the various sectoral stakeholders in the past. To fulfil the coordination function effectively, DMMU requires further capacity to coordinate and harness financial and human resources from the different stakeholders (Mwitwa, 2018), and to ensure anticipatory action efforts by different entities are well aligned and complementary.

In the past, a perceived lack of reliability of forecasts and their limited translation into concrete advisory, for example for farmers, has represented a barrier to anticipatory action. Forecasts have been perceived as insufficiently accurate and lacking geographical specificity to be useful for local level action by many farmers, though the recent start of ZMD forecast transmissions in local language over the radio has increased interest of farmers to listen to forecasts (Libanda, 2021). These findings highlight the importance of forecast validation and substantial improvements in the delivery of early warnings to better serve end-users.

Strengths and opportunities for anticipatory action in Zambia

In Zambia, major national policies for disaster risk management and social protection already promote a proactive approach to mitigating disaster risks, even though the terms 'anticipatory' or 'early' action may not be explicitly mentioned. One example is the Zambian National Disaster Management Policy, which emphasises the need to prioritize risk reduction takes and a proactive stance in dealing with disasters. While the terminology may vary, the underlying principles engrained within Zambia's disaster management policies align with anticipatory action objectives. Reforms such as the revision of the DMMU bill provide opportunity to further institutionalise the Government's commitment to anticipatory action and build the legal basis for expanding anticipatory action within national contingency plans (Red Cross Red Crescent Climate Centre et al., 2021b).

Zambian early warning, early action, early finance stakeholders have begun to gain valuable experience in anticipatory action, notably through the ARC and UN OCHA 2022 drought anticipatory insurance pilot and through ZRCS and its flood EAP which was triggered for the first time in early 2023. In the experience of the latter, the involvement of key stakeholders, including government

entities such as DMMU, WARMA and ZMD has been instrumental in the development of EAPs and the implementation of anticipatory actions over the past several years. This collaborative approach is fostering increased appreciation among government agencies for stakeholder engagement and enhanced partnerships to enable and institutionalise anticipatory action. In addition to its existing relationship with the Zambian Ministry of Agriculture through ZADMS, engagement with DMMU, ZMD, the Ministry of Finance, as well as relevant line ministries such as WARMA and the Ministry of Community Development, Mother and Child Health, and the Zambia Red Cross, a forerunner of anticipatory action in the country, will be critical entry points for AWARE in the early warning, early action and early finance space in Zambia.

The Government of Zambia has established national platforms where seasonal outlooks are discussed and joint response plans developed among stakeholders from various sectors (World Bank et al., 2021). This includes the ZVAC as well as the contingency plan and national working group under ARC drought insurance coverage. These platforms aim to ensure a more effective and coordinated response and provide entry points for any anticipatory action initiative to engage and support a seamless transition across different disaster management stages, from anticipatory action to response and recovery.

Southern Africa already has a growing regional anticipatory action community of practice. This includes a regional working group, the RAAWG, which in 2023 initiated a new regional program with the primary goal of enhancing inter-agency coordination around anticipatory action. This regional approach could foster greater exchange and collaboration among neighbouring countries and international partners, and provide technical backstopping for anticipatory action initiatives in Zambia going forward. At the regional level, SADC (a member of the RAAWG) and the RAAWG Secretariat are important stakeholders for the AWARE platform to engage with to promote the approach and to foster collaboration.

4. Mapping and gap analysis – Senegal

Drought risk and impacts

Senegal is highly vulnerable to droughts and floods that result from erratic rainfall and long-term climate variability. Drought impacts often include food insecurity, while floods cause damage to infrastructure, public assets and private property, along with disease outbreaks (ANACIM et al., 2014; GFDRR, 2016; Peters et al., 2022). Between 2010 and 2019, the Government of Senegal implemented post-drought response interventions in half of the crop years, namely in 2011/2012, 2013/2014, 2014/2015, 2016/2017 and 2018/2019 (Republic of Senegal, 2021).

Temperatures are likely to rise in the future in Senegal, with a mean increase of 1.17 and 1.41°C expected by 2035, and a 1 to 3°C increase by 2060 (Republic of Senegal, 2020; USAID, 2017). The Senegalese Government expects average rainfall to decrease across all regions of the country by 2035 (Republic of Senegal, 2020). While uncertainties still exist about whether overall rainfall will decrease or increase in the medium to longer term, increases in heavy rainfall events are likely (USAID, 2017). Increased temperatures together with reduced or more variable rainfall risks negatively impacting the quality of major rainfed food crops (maize, sorghum, millet) and cash crops (groundnut). It also threatens the livelihoods of large parts of the population that are dependent on rainfed agriculture (USAID, 2017). Climate change contributes to rising sea levels in Senegal (Republic of Senegal, 2020). Sea level rise combined with increasingly intense storms, in turn, exacerbates coastal erosion and flood risks (GFDRR, 2016; Republic of Senegal, 2020).

Relevant early warning, early action, early finance initiatives

Drought and flood-related early warning systems

Senegal has a drought and food security early warning system in place that collects, processes and disseminates food security information to inform government authorities in managing food security risks. This is supported technically through a national multidisciplinary working group. In addition, the Ministry of Health and Social Action (*Ministère de la Santé et de l'Action Sociale*) and the Malnutrition Control Unit (*Cellule de Lutte contre la Malnutrition*) (CLM)'s Nutrition Reinforcement Programme provide nutritional monitoring and manage acute malnutrition in case of a disaster (Republic of Senegal, 2021). In Senegal and the wider region, the Harmonized Framework (*Cadre Harmonisé*) developed by the Permanent Interstate Committee for drought control in the Sahel (*Comité permanent Inter-Etats de Lutte contre la Sécheresse dans le Sahel*) (CILSS) has been used as a tool – similar to the IPC – to produce analysis of the current and projected food and nutrition situation that can help identify at risk geographic areas and populations for countries in the Sahel and West Africa (AGRHYMET, n.d.). The Government of Senegal uses the Harmonized Framework

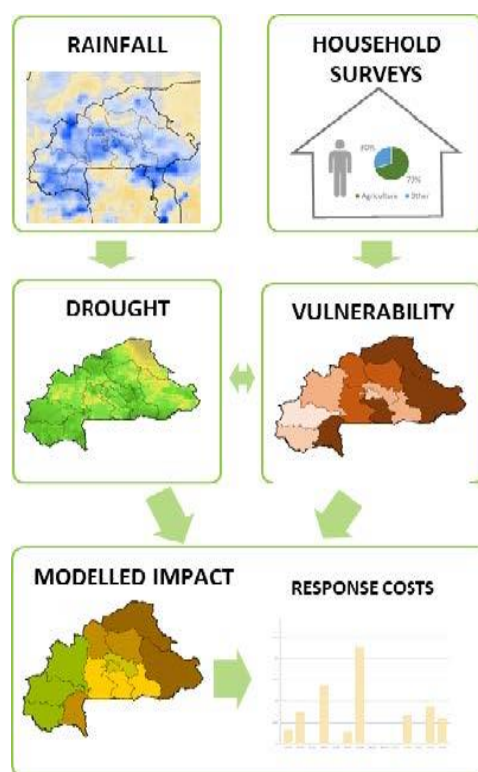
to estimate requirements for assistance that then guide disaster response operations (Jones, 2021). Through its ARC membership, Senegal also has access to Africa Risk View (ARV) and uses it as part of its early warning system (see Box 7 for further details on ARV).

Box 7: ARC Africa Risk View

ARC uses the Africa RiskView model to estimate drought impacts in terms of agricultural production, number of people affected and response costs (Figure 5). For this purpose, Africa RiskView combines a drought index – the Water Requirements Satisfaction Index (WRSI), which requires datasets on rainfall estimates, soil water holding capacity, crop type, sowing dates, and water demand of the respective crop type¹⁰ – with vulnerability assessments, which are conducted outside of Africa RiskView and used as input data into the model. The Africa RiskView can be customized to country conditions, for instance by specifying crop types, sowing dates or season start and end dates; and by selecting the most suitable rainfall estimates dataset and vulnerability profiles and benchmarks (African Risk Capacity, n.d.-a).

Africa RiskView is used to develop country risk profiles that enable countries to select coverage options and payout amounts; it triggers payouts according to pre-defined thresholds; and it can be used as a seasonal monitoring tool that provides near real-time information and forecasts of end of season conditions during the agricultural season (African Risk Capacity, n.d.-a).

Figure 5: Africa risk view data and outputs



Source: African Risk Capacity, n.d.-b.

Flood risk is monitored by the National Committee for Flood Prevention, Supervision and Monitoring, in collaboration with the National Agency for Civil Aviation and Meteorology (*Agence Nationale de l'Aviation Civile et de la Météorologie*) (ANACIM). Monitoring is supported through observation stations and processes for continuous assessment. The Directorate for Water Resources Management and Planning (*Direction de la Gestion et de la Planification des Ressources*

¹⁰ For a more detailed overview of the datasets and indices used in Africa RiskView, see (African Risk Capacity, n.d.-a, n.d.-b)

en Eau) (DGPRES) coordinates flood EWS and issues flood alerts and updates to the public (Peters et al., 2022).

ANACIM is responsible for weather surveillance and the issuance of weather forecasts. Various resilience and development projects, such as R4 (WFP, 2022), support the dissemination of early warnings and advisory to farmers – for instance through text messages or local radio stations. In the past, research and evaluations have found some shortcomings in the availability and dissemination of early warning information for agriculture risk management in Senegal. This includes gaps in the accuracy, timeliness and downscaling of seasonal and short-term weather forecasts. Addressing these gaps would make early warning information more relevant, and improve the accuracy of rainfall estimate and vegetation index modelling in the face of high spatial variability. There is great demand for seasonal and short-term weather forecasts and early warnings in the agriculture sector in Senegal (D’Alessandro et al., 2015). Research has found potential for seasonal and decadal forecasts to enhance farming practices, particularly when farmers can capitalise on conditions that are anticipated to be favourable, in contexts where they have options for intensification and varietal choice (Roudier et al., 2014). Yet, dissemination of early warnings can be hindered by challenges such as intermittent or unavailable internet and mobile network access of individuals and disseminators such as local radio stations (D’Alessandro et al., 2015). A further challenge to multi-hazard early warning systems has been weak inter-institutional collaboration around exposure, vulnerability and historic impact and loss data (Peters et al., 2022).

Anticipatory action mechanisms that integrate early warning, early action and early finance
Unlike in Zambia, there are no currently active mechanisms for anticipatory action or forecast-based finance / action put in place by the national Red Cross Society or international development partners in Senegal. However, the Senegalese Red Cross has plans to develop forecast-based action, including early action protocols, for drought and flood hazards in 2023. These plans are being supported by the Belgian Red Cross and other Red Cross Red Crescent movement partners (IFRC, 2023b).

Micro and meso-level insurance against drought related risks in agriculture to facilitate early response

Parametric insurance to cover farmers against rainfall variability and deficit has been available in Senegal since 2012 through the National Agricultural Insurance Company (*Compagnie Nationale d’Assurance Agricole du Sénégal*) (CNAAS). CNAAS is a public private partnership and the only agricultural insurer in the country. Products currently on offer can cover food crops (e.g. rice, maize, millet, sorghum) and cash crops (e.g. groundnut and cotton) through rainfall or yield indices (CNAAS, n.d.). Parametric crop insurance premiums are subsidised by the Government of Senegal at 50% and further supported through tax exemptions. This is part of the Senegalese government’s strategy to manage climate and weather-related risks in agricultural development (Government of Senegal, 2014). Parametric insurance development in Senegal has been supported by a multitude of development partners, including the World Bank / GIIF, the United States Agency for International

Development (USAID), WFP, the West African Development Bank and the Canadian Cooperation and – similar to Zambia – is now available via different distribution channels.

These distribution channels include arrangements where organisations act as intermediaries (but not policy holders themselves) that make insurance available to individual farmers (micro-level insurance) and cases where the organisations act as the policy holder and even though insurance parameters are set at the individual farmer level, the organisation signs the insurance contract and there is no direct contractual relationship between CNAAS and individual farmers (meso-level insurance) (Syll et al., forthcoming).

- Farmer organisations and processors: From the beginning, CNAAS has collaborated with farmer organisations that incorporate crop insurance into the package of inputs they supply to their membership at the start of the agricultural season. Under this model, seeds, fertilizer, the insurance policy and any other inputs are purchased on credit, and repayments made in cash or in the form of produce after harvesting. In case of a rainfall deficit or variability that is covered by the insurance policy, the payout is deducted from the outstanding loan repayment. Initially, farmer organisations acted mostly as intermediaries, offering the insurance coverage as an optional add on to the agricultural input package for their individual members or smaller local groups, but in recent years, many farmer organisations and processors have shifted to meso level insurance.
- International organisation: Through the R4 Rural Resilience initiative, WFP has worked with the government of Senegal to implement interlinked risk reduction, risk transfer, risk retention and calculated risk interventions. Local savings associations deliver insurance policies, which farmers can either pay for individually, or participate in asset rehabilitation activities and WFP paying premiums fully or partially on the farmers' behalf. As of 2021, the programme – supported financially through the Green Climate Fund – covered 23,000 farmers – 8,000 of them paying their own premium in cash and 15,000 through the insurance for asset rehabilitation work option (WFP, 2022).
- Financial institutions: CNAAS' collaboration with financial institutions such as La Banque Agricole and Crédit Mutuel du Sénégal (CMS) in particular has helped increase coverage against rainfall-related risks across the country over the past five years. This expansion also means that the majority of ARC's parametric insurance business is now made through larger portfolio insurance contracts with financial institutions, large farmer organisations and agricultural processors, rather than through microinsurance products offered to individual farmers or small groups of farmers (Syll et al., n.d.).

Sovereign drought insurance

Senegal has been one of the first countries to take out ARC insurance coverage and has joined most risk pools since the 2014/15 season (Table 5). Senegal’s ARC policy paid out in 2014/15, 2018/19 and 2019/20. In those years, payouts supported implementation of the governments national drought response plans.

Table 5: Senegal's participation in the ARC risk pool

Year	Coverage (USD)	Payouts (USD)
Risk Pool VIII (2021/22)	25 000 000 (Government) 11 107 700 (Replica)	-
Risk Pool VII (2020/21)	-	-
Risk Pool VI (2019/20)	20 000 000 (Government) 17 022 967 (Replica)	12 522 508 (Government) 10 658 512 (Replica)
Risk Pool V (2018/19)	25 000 000	67 200
Risk Pool IV (2017/18)	21 148 867	-
Risk Pool III (2016/17)	24 799 273	-
Risk Pool II (2015/16)	30 000 000	-
Risk Pool I (2014/15)	30 000 000	16 506 656

Source: African Risk Capacity, n.d.-b.

Over the course of Senegal’s ARC participation, the country has developed and revised its ARC operations plan, which defines how payouts will be used when the policy pays out in the event of a drought. Since 2019/2020, the Start Network has taken out ARC Replica coverage to complement the Government’s policy and support a coordinated response of Start Network members involved with the ARC Replica Initiative in Senegal (Action Against Hunger, Catholic Relief Services, Oxfam, Plan International, Save the Children and World Vision International) through an operations plan that is aligned with that of the Government. Table 6 describes the different payout scenarios and response measures. This operations plan is the basis for harmonised Final Implementation Plans (FIPs) of the Government and Replica partners, which are developed and submitted to ARC the event of a payout (Republic of Senegal, 2021).

Table 6: Senegal ARC scenarios, payout levels and response measures

Scenario	ARC payout level	Response measures
Scenario 1: Normal year	No payout	Distribution of cash to the most affected households in the departments classified in phase 3 of the Harmonized Framework.

		If no department is in phase 3, the State and its partners will not implement the National Response Plan (NRP). The PRN and MSAS ¹¹ will carry out standard nutritional surveillance and management of acute malnutrition activities using their own systems and with the support of their partners (...).
Scenario 2: Severity of the drought event with a frequency of once every 5 years	Small payout (US\$1 million)	(...) Cash distribution operations will be carried out to support the affected populations after distribution of the areas to be covered between the State and the members of the Start Network. The departments targeted will be those classified in phase 3 of the Harmonized Framework. If no department is in phase 3, the intervention will target the most vulnerable departments with the highest proportion of people in phase 3 of the Harmonized Framework. The Livestock Safeguarding Operation (OSB) will be implemented in the Departments with a fodder deficit.
Scenario 3: Severity of the drought event with a frequency of once every 10 years	Medium payout (US\$7,5 millions)	In this case, the NRP would integrate the pastoral and nutritional component. In total, 25% of the payment would be devoted to the purchase of feed for livestock in pastoral areas and areas hosting transhumant livestock and 5% for the nutritional component (...). The remaining funds would be used to help populations suffering from food insecurity in the departments in phase 3 of the Harmonized Framework after distribution between the State and the members of Start Network.
Scenario 4: Severity of the drought event with a frequency of more than once every 30 years	Large payout (US\$13 million or more)	(...) A vast national response plan will be implemented. It would have three components: cash distribution (60%), livestock feed distribution (30%) and nutrition activities (10%). Acute malnutrition screening campaigns and acute malnutrition management activities will take place every two months. In-depth geographical targeting will be carried out to determine the departments and communes most affected by the drought and the distribution between state agencies and Start Network partners (...).

Source: Republic of Senegal, 2021.

Senegal's ARC and ARC Replica payouts have been part of several monitoring and evaluation activities which shed light on major improvements and challenges to the provision of timely and effective drought response (African Risk Capacity, n.d.-c; Hillier et al., 2022; Jones, 2021; Start Network, 2020). This includes lessons learned about general progress in the Senegalese

¹¹ Ministry of Health and Social Action (*Ministère de la Santé et de l'Action Sociale*)

Governments' DRM capacity, and ARC's contributions towards strengthening DRM capacity that could also support future anticipatory action interventions (Box 8). In addition, ARC and ARC Replica have been found to enhance commitment and cooperation for the provision of timely drought response among DRM stakeholders through its structured preparedness processes – such as preparation of the operational plan and the FIP (Jones, 2021; Start Network, 2020). Other major lesson from past payouts in 2014/15 and 2019/20 that are also critical to consider for the provision of timely assistance in anticipation of drought include (1) the importance of expedited procurement processes and clear, fast and robust procedures for the receipt and disbursements of funds from Ministry of Finance to implementing entities that has resulted in delays in the past; (2) the need for continued DRM capacity strengthening and coordination to enable effective response funded through ARC and beyond; and (3) the critical role that perceptions of, and trust in, the accuracy of risk models can have on decisions to take out insurance, and how these issues can be compounded when basis risk materialises (African Risk Capacity, n.d.-c; Hillier et al., 2022; Jones, 2021).

The standard timeline for ARC funded interventions in Senegal means that ARC payouts are available ahead of the lean season, but after the agricultural season and thus after the window of opportunity during which action could be undertaken to reduce or mitigate impacts of rainfall variability or deficit on that season's agricultural production. While ARV provides early warnings before and throughout the agricultural season, Senegal's national ARC operations plan does not currently include any standard operating procedures for how to respond to these early warnings. Nonetheless, in one instance in 2019, the Government of Senegal took early action on the basis of information from ARV before the end of the season, by funding and implementing the distribution of seeds with short maturity times 'in order to try and get a harvest in that season and thus mitigate the impact of the drought' (Hillier et al., 2022).

Box 8: Findings on contribution of ARC to strengthening capacity for DRM in Senegal

'The main developments in Senegal's DRM capacity since 2014 relate to: (i) the intention to develop a stronger policy framework for DRM within the Sendai Framework, though the process for developing a national strategy only began in November 2020; (ii) reorganisation of responsibilities between government agencies in particular following from the abolition of the Prime Minister's Office, though these have left unresolved the status of the ARC Steering Committee and funding arrangements for the TWG; (iii) improvements in the social protection system (with World Bank support) that have improved the identification of vulnerable households and that have developed models for cash transfer for government welfare grants, although these have not been used by the Government of Senegal (GoS) for disaster response, and there are weaknesses in the quality of the [Single National Register (*Registre National Unique*)] (RNU) used to identify vulnerable households; (iv) the establishment of the Start Network as the ARC Replica partner; (v) strengthened capacity for risk modelling, early warning,

risk transfer, and operational planning; (vi) strengthened M&E approaches introduced by the Start Network, although GoS monitoring of disaster response has not improved significantly.

ARC has contributed to strengthening DRM capacity in Senegal principally through: (i) encouraging regular updates of operational plans and providing technical support to this process; (ii) ARC Replica's support to NGO initiatives through the Start Network; and (iii) provision of the ARV system, and training support for it, which has contributed to strengthened analytical capacity, although the ARV is not used for estimating support requirements, with reliance instead on the Cadre Harmonisé (CH) developed by CILSS. The effectiveness of capacity development support provided by ARC has to some extent been reduced by trained government staff moving on to other roles, but in some cases they remain working on DRM within NGOs.'

Source: Excerpt from ARC independent evaluation Senegal country study in Jones, 2021.

Disaster preparedness for anticipatory action and response

The Government of Senegal and its partners are investing in preparedness to strengthen the foundations for effective anticipatory action and response. Box 9 provides a non-comprehensive overview of key internationally supported DRM, development and social protection programmes aimed at enhancing early warning, early action and early finance in Senegal.

Box 9: Past or ongoing projects aimed at strengthening early warning, early action and early finance

Strengthening Disaster Resilience in Senegal

The objective of this 2021-2023 project is 'to support the efforts of the GoS in building resilience against select natural hazards at the national and local levels by providing technical assistance in (i) developing flood risk assessments and plans to inform investments and regulations, and (ii) strengthening flood resilience through preparedness and response capacities. Specifically, the study aims to better inform the preparation of the proposed Stormwater Management and Climate Change Adaptation Project and support the GoS's request to develop an integrated risk-sensitive urban planning and risk-informed urban investments (GFDRR, 2021b).

Supporting DRM Policy Dialogue in Senegal

This 2022-2023 project was funded through the GFDRR Multi-Donor Trust Fund for Supporting Disaster and Climate Resilience in Developing Countries and provided technical assistance to the Government of Senegal 'in reviewing the updating and formulation of legislative, institutional, financial, and sectoral policy and strategic documents to support government disaster resilience reforms. In particular, the grant (...) [contributed] to the preparation of the NDRR Strategy and its Operational Plan as well as a country DRM diagnostic' (GFDRR, 2022).

Senegal Social Safety Net Project (2014-2024) and Adaptive Safety Net Programme (2022-2027)

Both projects are supported by the World Bank's regional Sahel Adaptive Social Protection Program. In Senegal, they focus on strengthening social protection systems, and on strengthening the capacity of these systems to respond to covariate shocks, particularly climate related shocks such as droughts, floods and fires. This includes the establishment of clearly defined triggers and manuals of operation for the provision of shock-responsive social assistance (World Bank, 2023b, 2023a).

Africa Integrated Climate Risk Management Programme (AICRM): Building the resilience of smallholder farmers to climate change impacts in 7 Sahelian countries of the great green wall.

This multinational project is implemented from 2023 to 2027. It was designed by the African Development Bank, IFAD and WFP and is co-funded by the GCF, the African Development Bank, IFAD and ARC. It includes three main components: (1) Climate risk preparedness, which aims to enhance hydrological and meteorological capacity and early warning systems that can inform anticipatory action programmes; (2) Climate risk reduction covering adaptation and mitigation measures across several sectors including agriculture, forestry and energy, and (3) Climate risk transfer, supporting micro and sovereign risk transfer (African Development Bank, 2022).

Africa Disaster Risk Financing Initiative (ADRF)

The 2015-2020 initiative was funded by the European Union and implemented by GFDRR and the World Bank. It supported African countries in developing risk financing strategies to enhance financial resilience and improve post-disaster response capacity for the mitigation of disaster impacts. In Senegal, the initiative provided technical assistance to risk profiling and diagnostics, development of risk information at the national level, costing of scalable social safety nets, analysis of contingent liabilities and insurance placement (GFDRR, 2018).

Global Shield against Climate Risks

The Global Shield was launched at COP27 in 2022 by the G7 and V20 to support countries in managing climate-related damage. It intends to provide a coherent and systematic offer for financial protection through the World Bank's Global Shield Financing Facility (GSFF) – building on the earlier World Bank Global Risk Financing Facility (GRiF) – and the Global Shield Solutions Platform (GSSP) – based on the former InsuResilience Solutions Fund. Senegal is a Global Shield 'pathfinder country', which means it will be supported by the Global Shield to undertake a country-led stocktake, gap analysis and needs assessment. Through this process, Senegal then becomes eligible to submit support requests for climate and disaster risk finance and insurance to the GSSP (Global Shield Solutions Platform, n.d.).

Integrated Flood Management Project (*Projet de Gestion Intégrée des Inondations*) (PGISS)

The PGISS, active from 2016 to 2023 and supported by the French Development Agency and the Green Climate Fund, aimed to enhance flood risk knowledge, risk reduction and early warning. It involved risk zone mapping as well as the provision of tools for real-time flood monitoring and helped

establish protocols for the management of flood protection infrastructure (Agence Française de Développement, n.d.).

West Africa: Seamless Operational Forecast Systems and Technical Assistance for Capacity Building

This regional project covers the 19 Economic Community of West African States (ECOWAS) and Regional Forum on Climate Outlook for the Sudano-Sahelian Region (PRESASS) members, including Senegal. It is funded by the Climate Risk Early Warning Systems (CREWS) initiative and aims to strengthen capacity of regional institutions – in particular the *Centre 46gional de formation et d'application en agrométéorologie et hydrologie opérationnelle* (AGRHYMET)'s CILSS, the Regional Specialized Meteorological Centre (RSMC) at ANACIM in Dakar and the Global Information System Centre (GISC) in Casablanca – and national meteorological and hydrological services to collaborate for enhanced national level risk information and early warning services (WMO, n.d.).

Key anticipatory action policies and stakeholders in Senegal

Regional coordination in anticipatory action

Like southern Africa, West Africa has a regional anticipatory action working group, the Western and Central Africa Community of Practice (CoP). The CoP was launched in July 2023 and is coordinated by Red Cross Red Crescent (Climate Centre and IFRC), FAO, WFP and UN OCHA. Ongoing activities of the CoP include a mapping exercise of anticipatory action in the region, the implementation of a joint workplan, and sharing of online resources like guidance notes, tools and trainings.

Key policies and stakeholders at the national level

Development policy in Senegal is guided by the **Plan Sénégal Emergent (PSE)** and its priority activities, which include disaster risk reduction and management as a key component of social protection and sustainable development (Republic of Senegal, 2018). Senegal submitted **Nationally Determined Contributions (NDCs)** in 2020, which outline climate change mitigation and adaptation strategies for the country that are aligned with the priorities and timeframes of the PSE. The NDCs' adaptation priority activities include the establishment of early warning systems, promoting the use of climate information and services, enhancements in disaster risk management, and insurance coverage against climate related risks in the agriculture and livestock sectors. In the health sector, the NDCs prioritises strengthening of epidemiological surveillance and the prevention and control of climate-related diseases in areas of the country that are at high risk (Republic of Senegal, 2020). The PSE and the NDCs thus are illustrative of a broader shift in how the Senegalese Government manages disasters, from a formerly mostly reactive ad hoc emergency response towards a greater focus on prevention and preparedness (Campillo et al., 2017).

The PSE and the **Stratégie Nationale de Protection Sociale (2016 2035)** – the national social protection strategy – define Senegal’s framework for social protection. Among other objectives, one of five major objectives of the strategy is to have a safety net in place that strengthens people’s resilience against shocks and disasters throughout their lifecycle. This objective is supported through different measures under the strategy: subsidised crop insurance coverage and insurance for work scheme coverage for farmers as well as cash and non-monetary assistance provided in response to shocks (Basse, 2022) (Table 7). To date, social protection measures under the national strategy do not include the provision of direct assistance in anticipation of shocks, but the Government of Senegal – supported by partners such as the World Bank – is actively enhancing the responsiveness of its national social protection systems to covariate shocks (see for example projects in Box 9). This has also included a broader political and technical transition from the provision of in-kind assistance towards cash transfers for shock response in a context where in-kind response measures have often been late in the past and markets are largely functional and supplied with imported staple foods such as rice (Cissokho, 2018). However, in the 2020 Covid-19 / ARC response, the new government decided to deliver in-kind food assistance rather than cash, showing that this transition may have been temporary (Kreidler and Ndome, 2021).

Table 7: Shock-responsive social protection system coverage in Senegal, 2018-2021

Indicator	Responsible entity	Coverage			
		2018	2019	2020	2021
Number of vulnerable farmers covered by the ‘insurance for work’ mechanism	CNAAS	8,977	9,088	12,317	23,801
Number of farmers insured through cash premium payment	CNAAS	134,781	188,317	274,393	389,693
Number of households affected by shocks that have benefitted from cash transfer	SECNSA, FSN	17,677	6,955	83,274	18,856
Number of households affected by shocks that have benefitted from non-cash assistance	MDCEST, FSN, SECNSA	21,853	206	1,107,787	5,227

Source: Basse, 2022.

The Senegalese civil protection directorate (*Direction de la Protection Civile*) (DPC) under the Ministry of the Interior is mandated with protection of people from disasters. It is the national coordinating focal point for implementation of the Sendai Framework for Disaster Risk Reduction and for disaster risk management policies and programmes, and hosts the ARC initiative in Senegal. The DPC also coordinates the **National Relief Organisation Plan (*Plan National d’Organisation des***

Secours) (ORSEC), a mechanism for the coordination of relief operations in case of disaster. The ORSEC has been used mainly in response to floods, with flood activations in 2005, 2009, 2012, 2013, 2019 and 2020. In addition to the ORSEC, there are several sectoral and hazard specific contingency plans in Senegal, though some of these plans are not fully developed, underfunded, do not clearly assign responsibilities for action under different disaster scenarios, or produce overlapping mandates (La Vie Senegalaise, 2021; Peters et al., 2022).

Despite its mandate to coordinate DRM, the DPC has faced capacity and funding constraints in fulfilling this role in practice; and although disaster risk reduction (DRR) and DRM are 'included in various social and economic strategies and related strategic texts, they do not sufficiently describe, institutionalise or provide budgetary allocation to implement the mechanisms required to develop strong disaster risk governance arrangements in the country or fund operational activities' (Peters et al., 2022). Senegal does not currently have an operational comprehensive disaster risk management strategy, and there is limited integration between climate change adaptation and DRM agendas (Campillo et al., 2017). In recent years, the government of Senegal, with support from ECOWAS, has undertaken steps towards revitalising its national DRR platform and operationalising a national **DRR strategy and action plan for 2020-2030** (GFDRR, 2021a). To strengthen coordination in DRM, the Government of Senegal has also been working on establishing a Operational Centre for Interministerial Crisis Management (*Centre Opérationnel de Gestion Interministériel des Crises*) (COGIC), which includes a multi-hazard EWS unit, under the Ministry of the Interior. However, as of August 2021, the COGIC was not yet operational (La Vie Senegalaise, 2021; Peters et al., 2022).

The coordination of health emergencies is under the auspices of the national Health Emergency Operations Center (*Centre des Opérations d'urgences Sanitaire*) (COUS), established in 2014 as part of the Ministry of Health and Social Action (*Ministère de la Santé et de l'action Sociale*). The COUS strategic plan 2019-2023 highlights as its priority to 'prevent, detect and response effectively to emergency situations'. It includes objectives to enhance risk monitoring and early warning communication and emphasises the need to strengthen emergency preparedness and response plans and processes (Ministère de la Santé et de l'Action sociale - Direction Générale de la Santé, 2019).

The Executive Secretariat of the National Food Security Council (*Secrétariat Exécutif du Conseil National de Sécurité Alimentaire*) (SE/CNSA) coordinates matters related to food security and resilience amongst national entities and between national and sub-national agencies. The SE/CNSA is also responsible for coordinating drought assessments, food security early warnings and government food security assistance through **annual national response plans (*Plan National de Riposte à l'Insécurité Alimentaire*) (PNR)** developed to meet food needs during the lean season and in times of crisis on the basis of the Cadre Harmonisé (Campillo et al., 2017; Kreidler and Ndome, 2021; Republic of Senegal, 2021). The PNRs can integrate ARC-funded interventions; as was the case, for example, in 2020 when the Government of Senegal launched a large PNR to address the

economic impacts of Covid-19 and incorporated the 2019/2020 ARC payouts within its PNR targeting and implementation activities (Jones, 2021).

In 2015, the SE/CNSA published the **National Strategy for Food Security and Nutrition 2015-2035 (*Stratégie Nationale de Sécurité Alimentaire et de Résilience*) (SNSAR)**, which is operationalised through an associated programme (*Programme national d'Appui à la Sécurité Alimentaire et à la Résilience*) (PNASAR). The SNSAR suggests the development of contingency plans for disaster prevention and management. It also recommends strengthening the disaster fund and enhancing the speed at which it disburses in order to address diagnosed weaknesses in existing monitoring and alert systems and past delays in assisting disaster-affected populations. One of its four major strategic priorities is thus to strengthen capacity for the coordination, prevention and management of food crises (Republic of Senegal, 2015). The Food Security Commissariat (*Commissariat à la Sécurité Alimentaire*) (CSA), attached to the Ministry in charge of Social Protection (*Ministère du Développement Communautaire, de l'Équité Sociale et Territoriale*) (MDCEST) since 2019, provides food security assistance, including in response to shocks, and staffs Senegal's national ARC coordinator (Kreidler and Ndome, 2021).

Table 8 summarises the main stakeholders that are involved in policy and initiatives related to early warning, early action and early finance in Senegal.

Table 8: Key stakeholders and donors in early warning, early action, early finance in Senegal

	Senegal early warning, early action, early finance stakeholders
Existing national and regional coordination platforms	<ul style="list-style-type: none"> • Multidisciplinary working group - technical support and monitoring of rainy season and food insecurity linked with SE/CNSA to inform disaster response • Western and Central Africa anticipatory action Community of Practice (CoP) • CILLS / AGRHYMET - regional capacity and support to national EWS and <i>Cadre Harmonisé</i>
Government	<ul style="list-style-type: none"> • <i>Agence Nationale de l'Aviation Civile et de la Météorologie (ANACIM)</i> - national meteorological agency • <i>Direction de la Protection Civile</i> (Civil Protection Agency under the Ministry of the Interior) - mandate for civil protection and DRM • National Solidarity Fund (<i>Fonds de Solidarité Nationale</i>) (FSN) - Enabling provision of cash and non-monetary post-disaster assistance under the national social protection strategy

	<ul style="list-style-type: none"> • <i>Secrétariat Exécutif du Conseil National de Sécurité Alimentaire Sénégal (SE/CNSA)</i> - coordinating function in food security and resilience; coordinates development and implementation of national response plan • <i>Commissariat à la Sécurité Alimentaire (CSA)</i> - responsible for procurement and delivery of food assistance, staffs ARC coordinator • <i>Ministère du Développement Communautaire, de la Solidarité Nationale et de l'Équité Territoriale</i> - social protection mandate • <i>Délégation Générale à la Protection Sociale et à la Solidarité Nationale (General Delegation for Social Protection and National Solidarity) (DGPSN)</i> - operates national registry used for drought response targeting • The Ministry of Livestock and Animal Production - responsible for procurement and delivery of livestock feed in drought response • <i>Ministère de la Santé et de l'Action sociale (Ministry of Health and Social Action)</i> - screening and treatment of severe acute malnutrition • Regional Food Security Committees (CRSA) and Departmental Food Security Committees (CDSA) - support emergency plan implementation at sub-national levels • Directorate for Water Resources Management and Planning (<i>Direction de la Gestion et de la Planification des Ressources en Eau</i>) (DGPRE) coordinates flood EWS • National Health Emergency Operations Center (<i>Centre des Opérations d'urgences Sanitaire</i>) (COUS) - management of health emergencies • <i>Agence Nationale de la Statistique et de la Démographie (ANSD)</i> - national statistical agency and DAPSA - Directorate of agricultural statistics (<i>Direction de l'Analyse, de la Prévision et des Statistiques Agricoles</i>) - hold data relevant for risk analysis and impact-based forecasting
<p>Domestic civil society and emergency response organisations</p>	<ul style="list-style-type: none"> • Senegalese Red Cross - planning on developing early action protocols for FbA via DREF for droughts and floods
<p>International development and humanitarian partners</p>	<ul style="list-style-type: none"> • World Bank - supporting government of Senegal in assessing risks and contingent liabilities and the development of a disaster risk finance strategy; development of shock-responsive social protection and crop insurance

	<ul style="list-style-type: none"> • Start Network: Several members involved in ARC Replica implementation (Action Against Hunger, Catholic Relief Services, OXFAM, Save the Children, Plan International and World Vision International) • CREWS - funding West Africa: Seamless Operational Forecast Systems and Technical Assistance for Capacity Building project • WMO - implementing West Africa: Seamless Operational Forecast Systems and Technical Assistance for Capacity Building project • WFP - supporting early warning dissemination and crop insurance via R4 • USAID and Canadian Cooperation - resilience programming that includes strengthening EWS capacity and crop insurance provision • African Development Bank - supporting resilience and insurance programmes in Senegal • Agence Française de Développement - resilience and flood management programming
Regulatory agencies	<ul style="list-style-type: none"> • Direction des Assurances (Insurance Department), Ministry of the Economy, Finance, and Planning (MEFP) - national insurance regulator • <i>Conférence Interafricaine des Marchés d'Assurances (CIMA)</i> - regional insurance regulator
Financial service providers	<ul style="list-style-type: none"> • National Agricultural Insurance Company (<i>Compagnie Nationale d'Assurance Agricole du Sénégal</i>) (CNAAS) - agricultural insurer • ARC Ltd. – Providing insurance coverage to Government of Senegal and Start Network via ARC Replica • La Banque Agricole and CMS - integrating insurance coverage through CNAAS within their agricultural loan portfolios
Academia / think tanks	<ul style="list-style-type: none"> • <i>Institut Sénégalais de Recherche Agricole</i> (ISRA) - agriculture research • French Agricultural Research Centre (<i>Centre de coopération internationale en recherche agronomique pour le développement</i>) (CIRAD) - supporting <i>Cadre Harmonisé</i> and agricultural research in Senegal • <i>Initiative Prospective Agricole et Rurale</i> (IPAR) – AWARE partner and centre for agricultural research • <i>Université Gaston Berger</i> - evaluating impact of agricultural insurance

Gaps and opportunities

Based on the review of existing early warning, early action, early finance initiatives and stakeholders in Senegal, this section summarises key opportunities and gaps for the AWARE platform.

Gaps in anticipatory action and the enabling environment in Senegal

As in Zambia, there are currently no government-led contingency plans or standard operating procedures in place specifically for anticipatory action to be taken ahead of hazard events. The Government of Senegal has contingency plans for disaster response, but these documents do not define specific anticipatory actions that should be initiated in anticipation of impending disasters.

Ongoing efforts to enhance the timeliness of disaster response such as ARC are helping to make disaster response more timely based on the projections of need, but they are currently missing the window to act on seasonal and medium-term rainy season forecasts to help farmers prepare when conditions are likely to be unfavourable, or take advantage when rainfall is likely to be favourable. Dissemination of early warnings and associated advisory, along with assistance to put advisory into practice, should therefore be a key priority to enable farmers and their networks to take anticipatory action.

There are a multitude of stakeholders and initiatives with early warning and disaster response mandates in Senegal, making coordination for anticipatory action challenging. The DPC is in charge of coordinating DRM, but has grappled with capacity to fulfil this function effectively. The COGIC, which was planned to enhance interministerial coordination in early warning and crisis management, has taken a long time to operationalise. The different interventions in place to provide assistance to at-risk or affected populations across the Government of Senegal's social protection frameworks and humanitarian partners would also benefit from better alignment (Basse, 2022; Kreidler & Ndome, 2021).

Strengths and opportunities for anticipatory action in Senegal

Enhancements in DRM frameworks and capacity for early warning, early action and early finance provide a strong foundation for anticipatory action frameworks and interventions in Senegal. This includes coordination platforms for early warning and disaster response that AWARE can build on. Senegal also has extensive experience with parametric insurance at micro, meso and macro levels. Pre-arranged finance and contingency planning processes related to these instruments, especially to sovereign insurance, have helped strengthen DRM capacity and coordination in recent years.

Experience with an ad hoc anticipatory intervention by the Government of Senegal in 2019 shows the potential of acting even earlier to prevent impacts. When it became likely that the sowing window would fail in 2019, the Government of Senegal used its own resources to distribute seeds for varieties with shorter crop maturation time, so that a harvest could still be achieved within that season (Hillier et al., 2022). Parametric insurance products in Senegal currently pay out on the basis of models that estimate agricultural production, impacts and response costs at the end of the agricultural season; during a time window when hazard events (e.g. rainfall deficit) have occurred and primary impacts (e.g. crop failure) have happened, but their indirect impacts (e.g. food insecurity) have not yet fully materialised. The 2019 example demonstrates scope to include

anticipatory action during or before the agricultural season, e.g. on the basis of weather and crop forecasts, more systematically within the Governments' disaster risk management and financing frameworks to get even further ahead of the curve.

The Government of Senegal, with support from partners, has been strengthening the shock-responsiveness of its national social protection systems. While none of the existing social protection programmes currently provide assistance to households on the basis of hazard forecasts, they are increasingly being linked to early response mechanisms such as ARC payouts and contingency plans. Parts of the social protection system may also enable targeting and implementation of anticipatory action in the future, for instance through the RNU; though this would require regular updating and expansion of the RNU to include people on the basis of their vulnerability to disasters, rather than on poverty measures alone (Toukara et al., 2021).

5. Recommendations towards developing anticipatory action frameworks under the AWARE platform in Senegal and Zambia

The following recommendations are drawn from the mapping presented in the previous chapters and from evaluations and process learning from anticipatory action interventions globally.

Forge strong partnerships with government agencies and other stakeholders early on. This is critical to ensure anticipatory action can be effective, coordinated and institutionalised within national disaster risk management frameworks and processes. The ZRCS's experience in Zambia indicates that an emphasis on strong partnerships from the start of any anticipatory action initiative can help generate a sense of ownership and supports efficient use of resources amongst stakeholders.

Validate and clearly communicate accuracy of forecasts to stakeholders so that they can understand the potential benefits and uncertainties related to the available early warnings. This serves as a vital foundation for building trust and confidence in anticipatory action initiatives. When stakeholders are aware of the reliability of forecasts, they can make more informed decisions, for example about the allocation of resources. Therefore, validating and communicating the accuracy of forecasts is not merely a technical exercise; it is a cornerstone of effective anticipatory action, bolstering its credibility and increasing its impact on disaster risk management and resilience-building efforts.

Base anticipatory action frameworks and action plans on needs, focusing on the disaster impacts they are seeking to address. This means, frameworks and action plans need to be designed on the basis of a robust understanding of what the impacts of droughts, floods and other major disasters are, and what actions would need to be taken at which point in time to address these impacts; rather than being driven by supply of a particular forecasting tool or finance mechanism. Early warning systems and tools aimed at supporting anticipatory action implementation – such as AWARE – should then be designed or adapted to enable those actions. However, it is also important to acknowledge that there may be limitations and mismatches between what implementers would like to do to reduce or mitigate likely disaster impacts and what forecasts are currently able to predict in specific locations, at what lead time, and with sufficient accuracy. Discussing such limitations openly among stakeholders is critical to manage expectations.

Prioritise incorporating anticipatory action within existing disaster risk management frameworks and processes over creating new structures. In both Senegal and Zambia, disaster risk management policy and practice has been transitioning from ad hoc emergency response towards a greater focus on risk reduction and the prevention and mitigation of (likely) impacts of droughts, floods and other hazards. Ongoing initiatives such as ARC or FbA by the DREF provide opportunities to integrate anticipatory action within these frameworks to ensure they are complementary, considering

different windows of opportunity for action, and aligned with wider government strategy; rather than duplicating efforts.

Focus not only on anticipatory action frameworks, but also on the systems strengthening that is required to implement anticipatory action continuously and reliably through national and sub-national government structures. While frameworks and contingency plans are important to clarify responsibilities for who should be taking anticipatory action, when and where, stakeholders need human and financial resources to fulfil these functions. Building sustainable capacity is thus critical to ensure the sustainability of any anticipatory action initiatives and tools put in place to support this. Ensuring that anticipatory action is coordinated rather than implemented through many disconnected projects by individual implementing partners backed by different donors has been a major challenge in countries where anticipatory action initiatives are being implemented globally. AWARE should thus put the government departments responsible for DRM related to the respective hazard in the driver's seat in developing and coordinating anticipatory action frameworks in Senegal and Zambia, and support them in that role.

Make use of existing guidance materials and tools to ensure efficiency in development and implementation of anticipatory action frameworks. A growing body of guidance materials, tools and trainings for anticipatory action exists that AWARE can draw on in its effort to enhance anticipatory action coordination in Senegal and Zambia. Key resources that can inform the development of action plans and help pre-arrange finance for anticipatory action through AWARE include:

- [RAAWG roadmap](#) and its proposed activities and materials it intends to produce, e.g. anticipatory action repository in southern Africa, or joint capacity building activities on impact-based forecasting
- [Red Cross Red Crescent FbF Practitioners Manual](#) developed on the basis of Red Cross Red Crescent FbF project experience and aimed to guide national societies, but also contains relevant information to help inform anticipatory action frameworks and development of action protocols by other actors. Research and process learning on early action protocol development and implementation across 18 national societies – including Zambia – is currently ongoing and will be available by late 2023.
- [UN OCHA anticipatory action toolkit](#) offering practical guidance on anticipatory action to UN OCHA staff. Similarly to the Red Cross Red Crescent FbF Manual, some aspects of the toolkit are more widely relevant beyond OCHA and can help inform other initiatives. Process learning from UN OCHA anticipatory action initiatives is available for several countries, including [Bangladesh](#), [Nepal](#), [Malawi](#) and [Somalia](#).
- [Anticipatory action for livelihood protection: a collective endeavour](#) discussing windows of opportunity and different types of actions to consider in defining anticipatory action frameworks aimed at livelihood protection and continuity of businesses and services, including in agriculture.

- [Anticipation Hub learning resources](#) compiling a repository of training resources, guidance and webinars on the topic of anticipatory action.
- [Finance for early action](#) overview produced by the Risk-informed Early Action Partnership (REAP) and [guidance on quality assurance for disaster risk financing](#) relevant to pre-arranging finance for anticipatory action developed by the Centre for Disaster Protection.

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