African Risk Capacity
Sovereign Disaster Risk Solutions
A Specialized Agency of the African Union

Africa RiskView
END-OF-SEASON REPORT: SOUTHERN AFRICA

April 2020, Dekad 12 | 2019/2020 season

Highlights :

- ***Covered countries :***
  - *Madagascar, Malawi, Mozambique, Zambia and Zimbabwe.*
- ***Rainfall:***
  - *Persistent abnormal dry conditions throughout much of southern and central parts of Southern Africa; and*
  - *Above-normal rainfall resulted in flooding in eastern and northern Zambia and northern parts of both Madagascar, Malawi, and Mozambique.*
- ***Drought :***
  - *Large crop sowing failures in the southern parts of: Madagascar, Mozambique and Zimbabwe due to dry conditions; and*
  - *The WRSI estimates for the end of the season were as low as 60% to 77% below normal for some of the drought affected areas.*
- ***Potentially Affected populations and pay-out***
  - *Mozambique, Madagascar and Zimbabwe were severely affected by drought, with 448,000, 1.47 million and 4.64 million people estimated as affected respectively, at the end of the season.*
  - *The two countries that participated in the ARC insurance pool, Madagascar and Zimbabwe will receive pay-outs of USD 2.13 and USD 1.75 million, respectively, to fund response interventions.*

Overview:

This *Africa RiskView* Report provides an analysis of the performance of the agricultural season in Southern Africa by the end of the 2019/20 season (dekad 12, 2020). It discusses seasonal rainfall patterns, *Africa RiskView's* drought projections, and their implications for the ARC Risk Pool for the five countries in the region where the ARC drought model has been fully customised.

The *Africa RiskView* Report is part of a validation exercise which aims to verify the model's estimates on the ground together with the in-country Technical Working Groups (TWGs) and to inform policy makers about the performance of ARC's drought model in the customised countries.

The agricultural season in Southern Africa runs from November to mid-May in most countries. A review of the performance of the growing season in *Africa RiskView* for the countries where customisation has been fully or partially undertaken reveals a highly varied season.

This report focuses on the performance of the 2019/2020 agricultural season in Madagascar, Malawi, Mozambique, Zambia and Zimbabwe (see Fig.1)–countries where full or partial customisation of the *Africa RiskView* drought model has been undertaken - and makes projections on the modelled number of people be affected by drought conditions by the end of the growing season, as estimated by *Africa RiskView*. External data and analyses are used to assess the performance of the planting season in other countries where customisation of *Africa RiskView* has not been undertaken in Southern Africa.

Fig 1. Southern African countries customized by ARC

Rainfall

Southern Africa typically receives the bulk of its rainfall between the months of November through to mid-April. During the review period (dekad 28 to dekad 12), southern and central parts of the region experienced drier than normal rainfall conditions, including

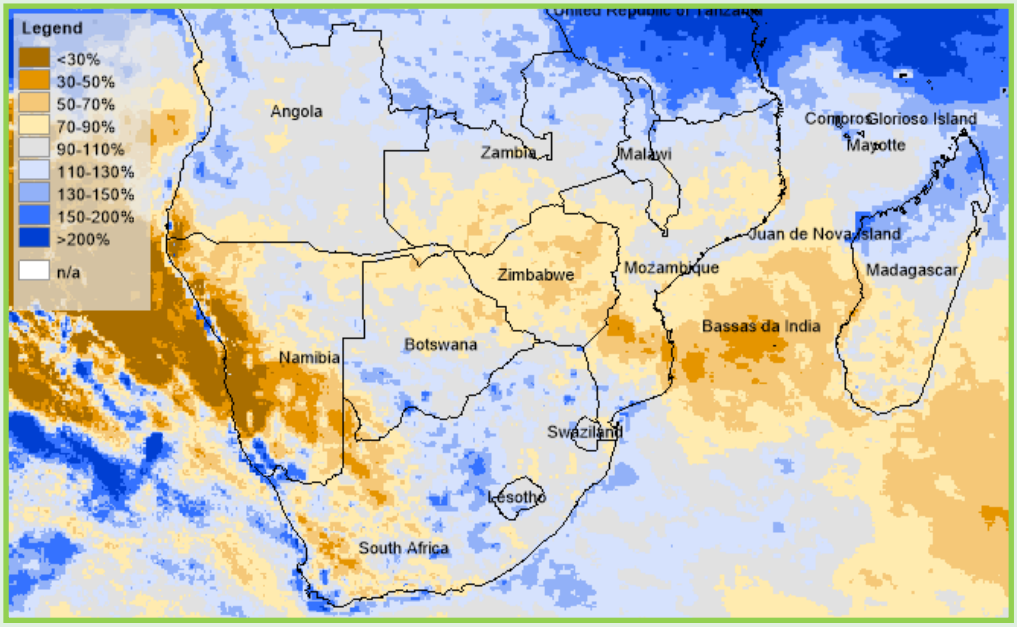

Fig 2. Cumulative rainfall received over Southern Africa (dek 28—dek 12) compared to the 19-year average(2001-2019) based on RFE2 satellite rainfall estimates

western South Africa, much of Namibia and Zimbabwe, parts of Botswana, as well as southern and central Zambia, Mozambique and Madagascar. These regions received little to no rainfall from late February to late March resulting in a four-week dry spell (SADC Food Security Early Warning System 2020).

For many southern and central regions in Southern Africa, it is the second consecutive year of abnormal dryness. According to SADC, the period from Oct to Dec 2019 in central and southern regions of Southern Africa was one of the driest (characterized by erratic and late onset of rainfall) since 1981 (SADC Food Security Early Warning System 2020).

Compared to the average rainfall of 2001–2019, the growing season was particularly dry in Zimbabwe (23% below average), the southern parts of Zambia (up to 23% below average), Madagascar (up to 32% below average) and Mozambique (up to 35% below average), see Fig 2.

By contrast, seasonal rainfall was well above the long-term average in the north-eastern parts of Southern Africa, including, Malawi (11% above average), eastern and northern Zambia (12-24% above average) as well as the northern parts of Mozambique (up to 11% above average in Cabo Delgado), and Madagascar (up to 37% in Sofia and Boeny and 39% in Sava). In parts of those countries, heavy rainfall resulted in flooding.

DROUGHT

Africa RiskView uses the Water Requirement Satisfaction Index (WRSI) as an indicator for drought. WRSI is an indicator of crop performance based on the availability of water to the crop during a growing season. The index captures the impact of timing, amount and distribution of rainfall on staple annual rain-fed crops. The WRSI was initially developed by the Food and Agriculture Organisation of the United Nations (FAO), which, based on rainfall, calculates whether a particular crop's water requirements are met at different stages of its development. In Southern Africa, maize has been used as a reference crop and parameters in *Africa RiskView* have been customised to reflect the local conditions and agricultural practices.

The poor and erratic rainfall during the growing season significantly impacted crop growth throughout Southern Africa and led to poor germination, replanting and permanent crop wilting in various parts of the region. Among the Southern African countries where the ARC drought model has been customised, Zimbabwe, southern Mozambique and southern Madagascar were particularly adversely affected. Within the most affected districts, the WRSI estimates for the end of the season are as low as 60% to 77% below normal (the normal is the average WRSI values from2001-2019 based on RFE2 rainfall estimates).

The following areas are modelled as the most affected by the rainfall deficits: Masvingo in Zimbabwe, Inhambene and Gaza in Mozambique and Androy and Atsimo Andrefana in Southern Madagascar (Fig 3). In several parts of these regions, *Africa RiskView* modelled failed planting, implying that the planting criteria as defined by the in-country

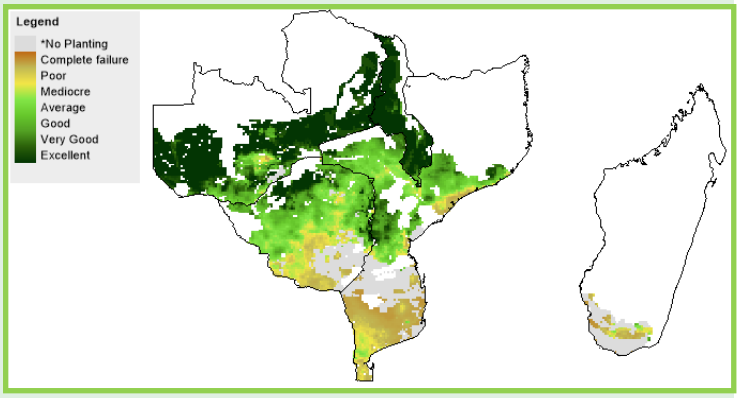

Fig 3: End-of-season WRSI for Southern Africa for the 2019/2020 agricultural season.

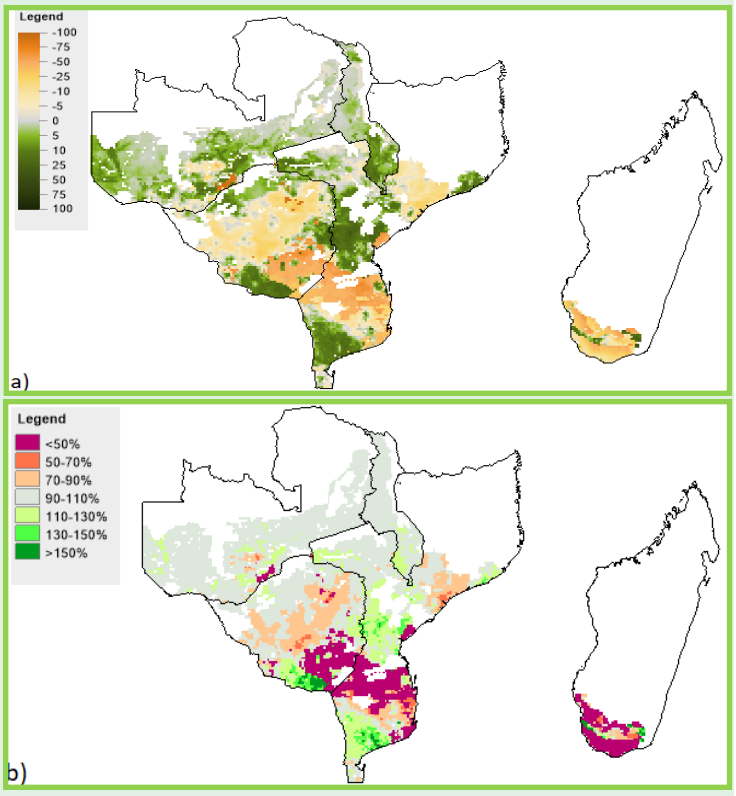

Fig 4. End-of-season WRSI 2020, a) values and b) percentages, for Southern Africa compared to normal (Average 2001-2019)

Technical Working Group (TWG) were not met during the sowing window (Fig 2).

In southwest Angola, western Namibia, several parts of Botswana and northern South Africa, the 2019/20 growing season was adversely affected due to abnormal dryness as well (FEWS NET Global Weather Hazards Summary 01-07 May 2020).

AFFECTED POPULATIONS

Based on the season's progress and historical trends, the *Africa RiskView* software can provide modelled estimates of populations affected by drought by the end of the growing season. The estimates persons affected by drought are obtained by over-laying vulnerability data with the drought index. The vulnerability profiles define what percentage of the population living in each polygon is at risk to mild, medium and severe drought, as defined by the drought triggers, and what percentage of the population is not at risk to drought at all. The profiles are constructed during the intensive customisation process when the different parameters of the model are set by the in-country Technical Working Group. ***All the affected population estimates are as of dekad 12, 2020 (30 April 2020).***

Malawi: The overall rainfall performance in Malawi was 15% above the 20-year long-term average during the 2019/2020 growing season while the country was subject to flooding due to heavy rainfall in December and January. No people have been modelled to be directly affected by drought impacts according to ARC's drought model.

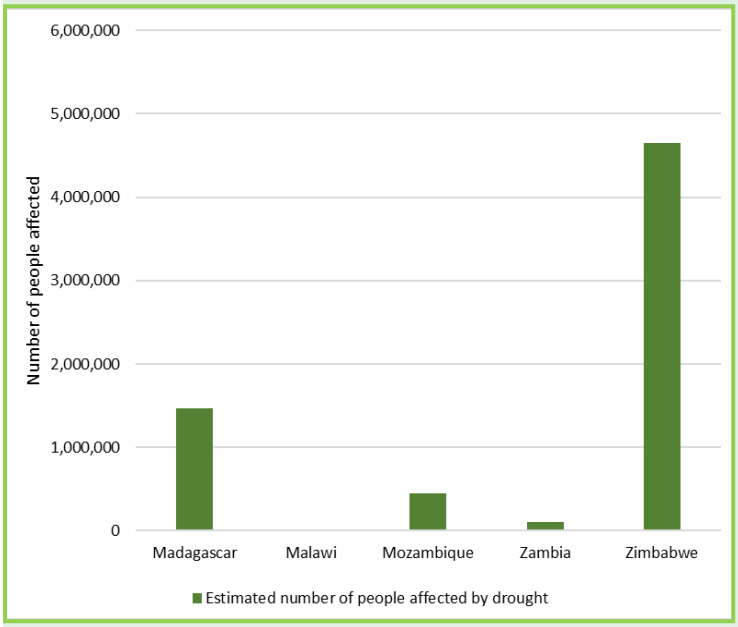

Fig 5. Estimated number of people affected or likely to be affected by drought

Madagascar: As a result of the persistent drier than normal conditions during the growing season, the planting thresholds determined by the in-country TWG were not met through much of southern Madagascar. The rainfall deficits experienced resulted in failed sowing in many districts in most of southern Madagascar, the region for which ARC's drought model was customised. Due to these crop failures, 1.47 million people have been estimated as affected by drought at the end of the season, according to the final estimates of *Africa RiskView.*

Zambia: While rainfall deficits were observed in the south-western parts of Zambia, no major drought problems were detected, and *Africa RiskView* estimates that close to 100,000 people are expected to be affected by drought at the end of the 2019/2020 season.

Zimbabwe: As a result of the below-average rainfall conditions, particularly in southern and central Zimbabwe, crop failures significantly reduced the production of the 2019/20 agricultural season. Failed crop sowings and the wilting of crops was not only reported but also modelled in *Africa RIskView (see Fig. 3 and 4)* The drought model estimates approximately 4.6 million people as affected by drought conditions at the end of the 2019/20 agricultural season.

Mozambique: Planting failures across southern Mozambique, as a result of persistent erratic and below average rainfall during the agricultural season 2019/20 significantly reduced yields, leading to close to 450,000 people being modelled as affected by drought according to *Africa RiskVIew*.

IMPLICATIONS FOR THE ARC RISK POOL

In the fourth and final step, *Africa RiskView* converts the numbers of people affected into response costs. For countries participating in the drought insurance pool, these national response costs are the underlying basis of the insurance policies. Pay-outs will be triggered from the ARC Insurance Company Limited to countries where the estimated response cost at the end of the season exceeds a pre-defined threshold specified in the insurance contracts. Within East and Southern Africa, Madagascar and Zimbabwe participated in the 6th risk pool of ARC Ltd.

Madagascar: As discussed, the southern part of Madagascar experienced severe drought conditions during the agricultural season 2019/20. According to the ARC drought model, the

About ARC :

- *African Risk Capacity (ARC) is a specialized agency of the African Union, whose purpose is to improve the capacity of AU Member States to manage risks related to natural disasters, adapt to climate change and assist populations at risk of food insecurity .*
- *The Africa RiskView is ARC's technical platform. It uses various satellite rainfall datasets to track the progression of agricultural seasons in Africa.*
- *It uses the Water Requirements Satisfaction Index (WRSI) as an indicator for drought.*
- *Based on the WRSI calculations, Africa RiskView estimates the number of people potentially affected by drought for each country participating in the insurance pool.*
- *Payouts will be triggered from the ARC Insurance Company Limited to countries where the estimated response cost at the end of the season exceeds a pre-defined threshold specified in the insurance contracts.*

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drought experienced in southern Madagascar in 2019/20 was the most severe within the last 20 years and the second most severe within the last 36 years. By the end of the season, the Modelled Drought Response Costs (MDRC) reached USD 44.1 million. With this response cost and in accordance with the risk transfer parameters that the country selected, a pay-out of USD 2.13 million was triggered from ARC Ltd to provide assistance to the affected populations. (see Fig 6). ***It is important to note that the amount of pay-out received by a country is not only a factor of the severity of the drought event and number of people affected but also of the level of risk (ceding percentage) transferred to ARC Ltd.***

Zimbabwe: Zimbabwe is facing the second consecutive year of severe drought (2018/19 and 2019/20 agricultural seasons were both impacted by drought). The final estimates of *Africa RiskView* indicate total MDRC of USD 185.96 million (see Fig 7) , based on the per capita response cost decided upon by the country for the 2019/20 agricultural season. Based on the risk transfer parameters selected, the Government of Zimbabwe will receive a pay-out of about USD 1.45 million while its replica partner, the World Food Programme, will get a pay-out close to USD 300,000 to implement response activities as defined in the ARC Operations and Response Plan.

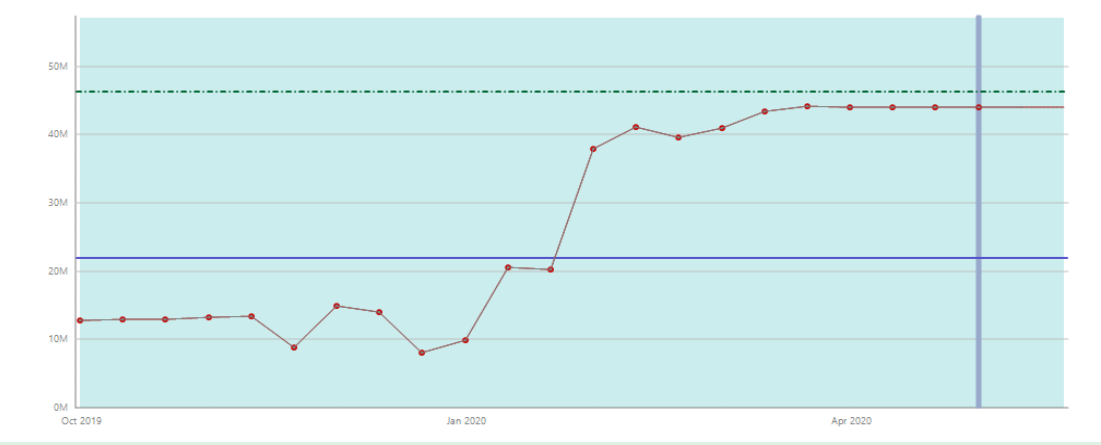

Fig 6. End-of-season Modelled Drought Response Cost (red line) compared with the selected trigger threshold (blue line), Madagascar

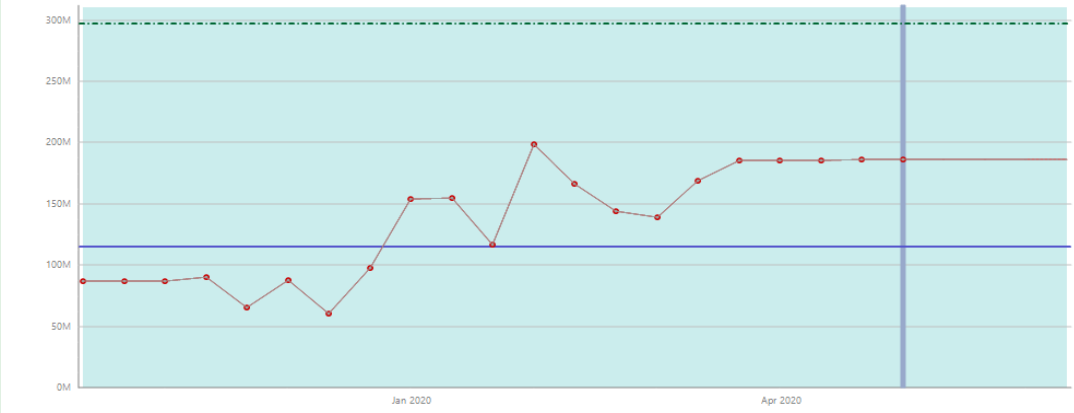

Fig 7. End-of-season Modelled Drought Response Cost (red line) compared with the selected trigger threshold (blue line), Zimbabwe