Africa RiskView

END OF SEASON REPORT | ZIMBABWE (2021)

This ***Africa RiskView*** **End of Season Report** is a publication by the **African Risk Capacity (ARC)**. The report discusses *Africa RiskView's* estimates of rainfall, drought and population to be affected, comparing them to information from the ground and from external sources. It also provides the basis of a validation exercise of *Africa RiskView*, which is conducted in each country at the end of an insured season. This exercise aims at reviewing the performance of the model and ensuring that the country's drought risk is accurately reproduced by *Africa RiskView* for drought monitoring and insurance coverage. The end of season-reports are also being continuously refined with a view to providing early warning to ARC member countries.

HIGHLIGHTS:

RAINFALL

- Overall, rainfall for the first half of the growing period, spanning from the start of the sowing window up to the third dekad of January (31 Jan, 2021), was above normal throughout Zimbabwe.
- In general, the rains recorded in the 2020/21 agricultural season, covering the period from 11 Oct to 31 May , were above normal for most parts of the country.

DROUGHT INDEX

- The end-of-season WRSI values compared to the average WRSI for the past 10 years chosen as benchmark by the country shows normal to above normal performance in the whole country.

AFFECTED POPULATION

- Based on the customisation of *Africa RiskView*, a total of about 9.3 million people are modelled as vulnerable to drought in Zimbabwe. Of these, the agricultural drought model indicates that no one was affected by drought conditions at the end of the 2020/21 season.

ARC RISK POOL

- Due to the overall good performance of the season, the trigger for a pay-out from ARC Ltd was not reached at the end of the 2020/21 agricultural season.

RAINFALL

The 2020/21 rainfall performance in Zimbabwe has largely been above average over the agricultural season. During this period, the cumulative rainfall varied across the country from as low as 650 mm in Beitbridge to as high as 1321 mm in Chirumhanzu (Fig. 1). Overall, rains throughout Zimbabwe were very good with these the southern provinces (Beitbridge, Chiredzi and Mwenezi) receiving less rainfall when compared to the rest of the country (Fig: 1).

Compared to the long-term average (2000-2019), RFE2 satellite rainfall estimates suggest that above normal rains were received throughout the country see Fig: 2.

Regarding the spatial and temporal distribution of the rains, an analysis of dekadal (10-day) rainfall estimates suggests that at national and regional level, the season started on time in October, and progressed with normal to above normal rainfall until the end of the sowing window. However, the end of the season was met with below normal rainfall.

Sowing in *Africa RiskView* is triggered when the country-specific dekadal rainfall criterion is met. This criteria for Zimbabwe requires at least one event within the sowing window in which a minimum of 20mm of rainfall is received in one dekad followed by at least 5mm of rainfall in

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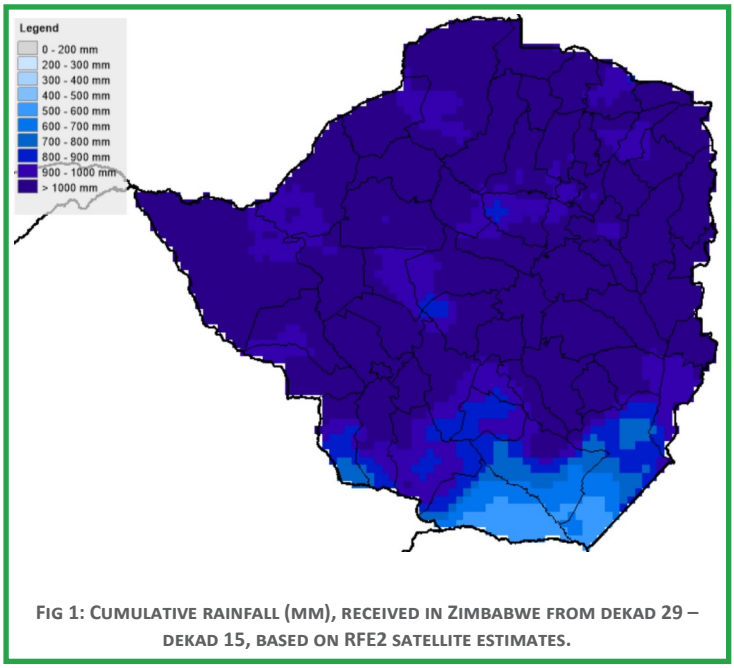

FIG 1: CUMULATIVE RAINFALL (MM), RECEIVED IN ZIMBABWE FROM DEKAD 29 – DEKAD 15, BASED ON RFE2 SATELLITE ESTIMATES.

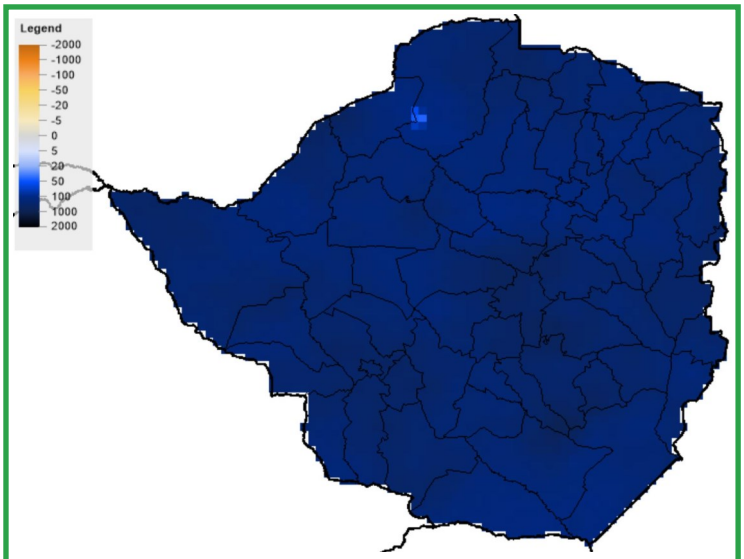

FIG 2: CUMULATIVE RAINFALL (MM) RECEIVED IN ZIMBABWE FROM DEKAD 29 TO DEKAD 15 COMPARED TO THE 20-YEAR AVERAGE (2001-2020), BASED ON RFE2 SATELLITE ESTIMATES.

two subsequent dekad following the first.

Conditionally, if this sowing criterion is not met, it is assumed that farmers would not have planted, or would have had unsuccessful planting. Additionally, the "First" sowing opportunity aggregation method was assumed to model farmers response to sowing chances. According to this assumption, farmers are expected to take advantage of the first sowing opportunity when and if realized.

According to these criteria, sowing was successful throughout Zimbabwe. However, delay in sowing was experienced in some parts when compared to normal planting dakads, with sufficient rain to support early crop development beginning in dekad 31 of 2020 (01 November to 10 November 2020). Some parts of southern Matabeleland South and Masvingo had the first sowing opportunity in dekad 35 (11 December to 20 December) (Fig. 3).

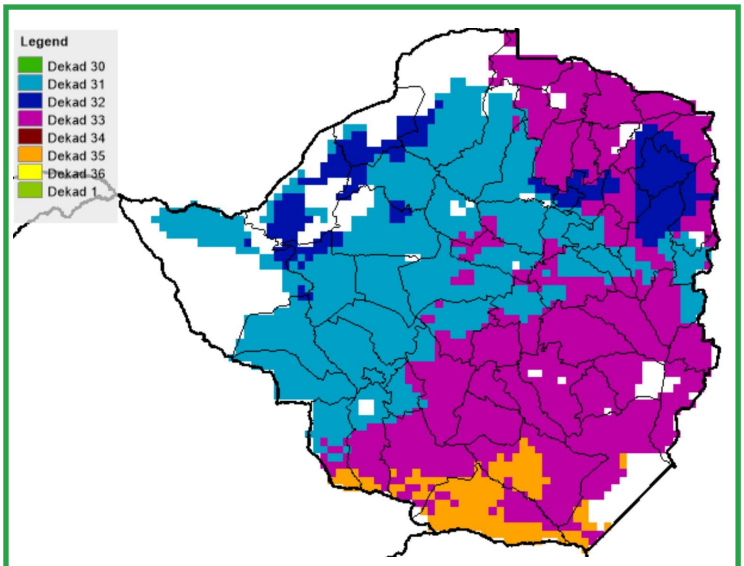

FIG 3: FIRST SOWING OPPORTUNITY IN ZIMBABWE FROM DEKAD 29 (21 OCTOBER 2020) TO DEKAD 2 (20 JANUARY 2021)

DROUGHT INDEX

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 Organization of the

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United Nations (FAO), which, based on rainfall, calculates whether a particular crop's water requirements are met at different stages of its development. In Zimbabwe, maize has been used as a reference crop and parameters in *Africa RiskView* have been customised to reflect the local conditions and agricultural practices.

In terms of adequacy and spatial distribution of rainfall received within the sowing window, *Africa RiskView* reveals that the crop water requirement for maize was largely met in Zimbabwe. The end-of-season WRSI values were very good to excellent in all of Zimbabwe (see Fig: 15).

Compared to the benchmark of mean WRSI for the past 10 years, end-of-season WRSI values in all of Zimbabwe were above normal, indicating very good growing conditions (Fig: 16). In line with this finding of *Africa RiskView*, the Famine Early Warning Systems Network (FEWS NET) reported that favourable rainfall for the 2020/21 season facilitated above -average area planted and significant improvements in water, pasture, and livestock conditions. The SADC Food Security Quarterly Update also indicated that, rainfall for the 2020/21 season was evenly distributed throughout the country. While most parts received normal to above normal rainfall, some part of the north eastern parts of the country received below normal rainfall.

Zimbabwe crop conditions have been fair to good overall. Area planted for all crops increased during this season as compared to the previous. According to SADC, overall bumper harvest is expected this season in the country for all cereals.

POPULATION AFFECTED

Based on the customisation of *Africa RiskView*, around 9.3 million people are modelled as vulnerable to drought in Zimbabwe in total. Of these, the ARC agricultural drought model indicates that no one was affected by drought conditions at the end of the 2020/21 season.

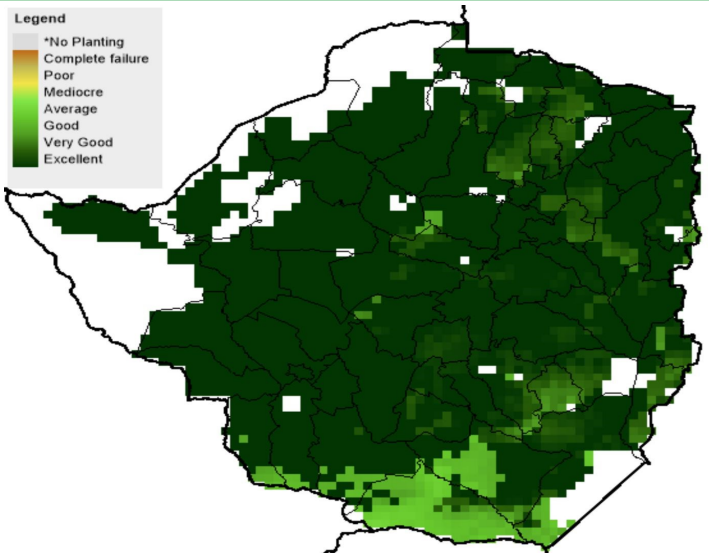

FIG 4: END-OF-SEASON WRSI FOR ZIMBABWE FOR THE 2020/2021 AGRICULTURAL SEASON.

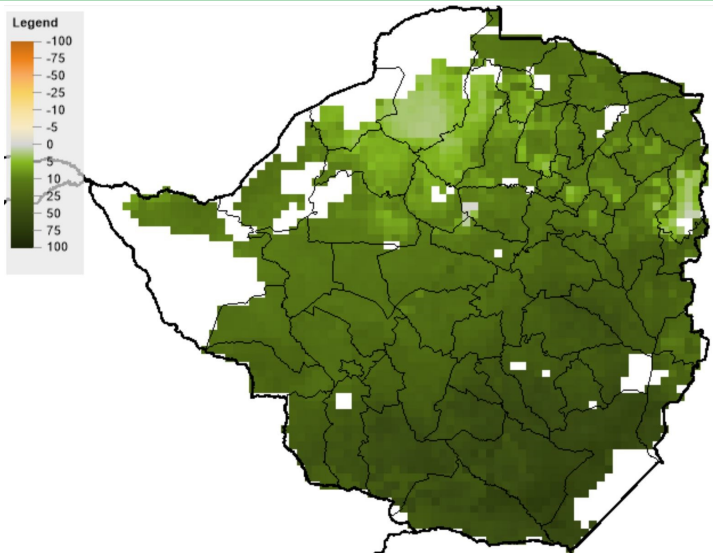

FIG 5: END-OF-SEASON WRSI FOR THE 2020/21 AGRICULTURAL SEASON COMPARED TO THE NORMAL (AVERAGE WRSI FROM 2001 TO 2019)

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ARC Risk Pool

Due to the overall good performance of the season, the trigger for a pay-out from ARC Ltd was not reached at the end of the 2020/21 agricultural season.

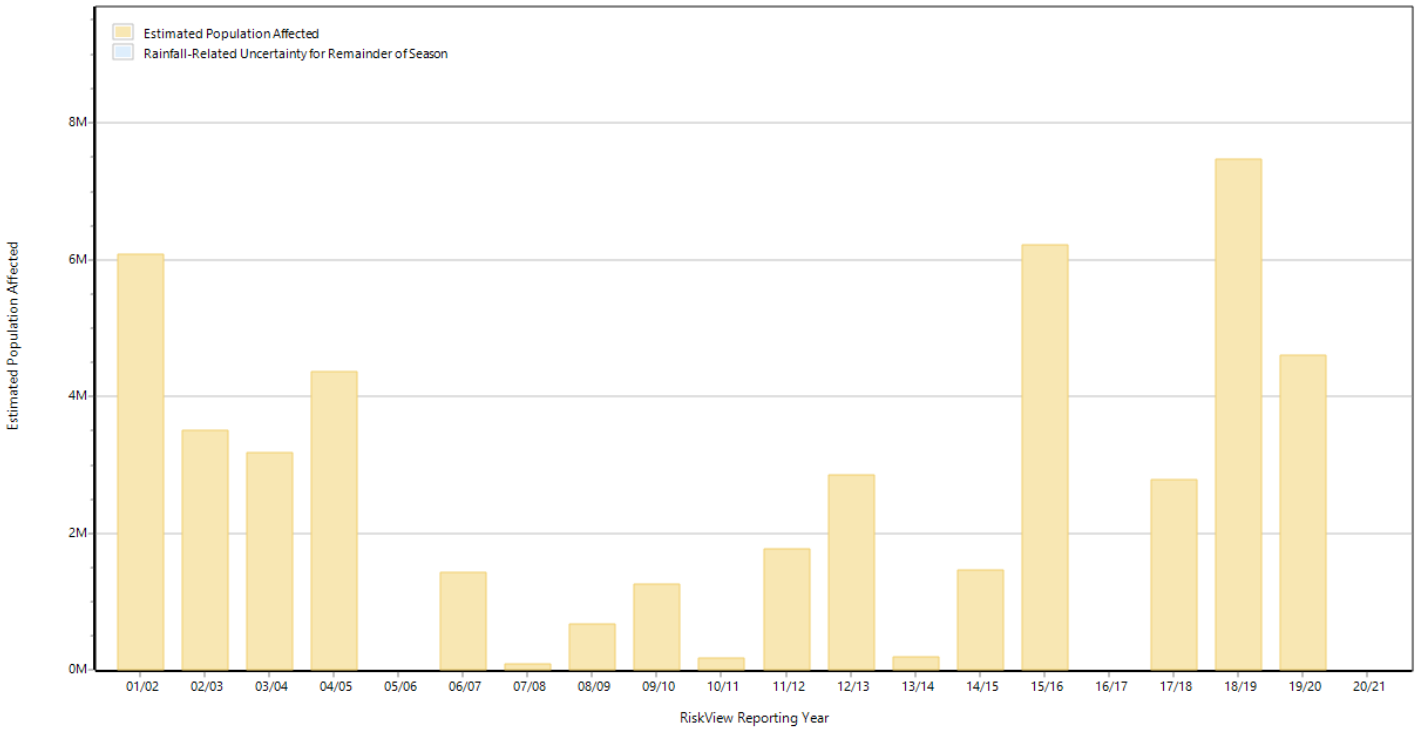

FIG 6: ESTIMATED POPULATION AFFECTED BY DROUGHT, ZIMBABWE, 2020/21 AGRICULTURAL SEASON.

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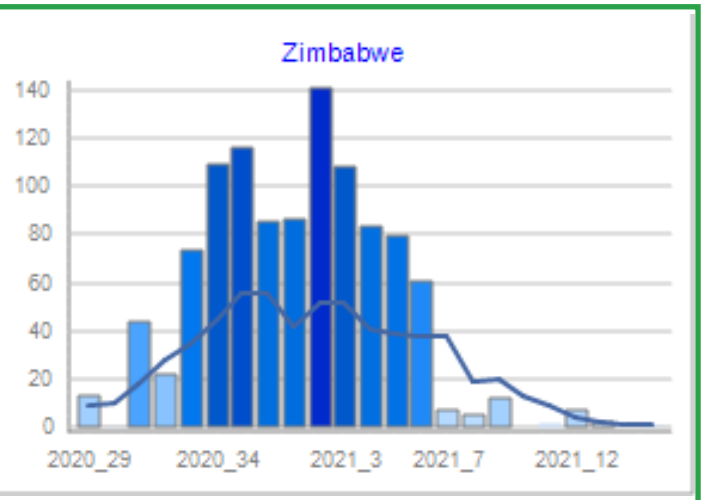

FIG 7: TEMPORAL DISTRIBUTION OF RAINFALL IN ZIMBABWE COMPARED TO THE LONG-TERM AVERAGE (DEKAD 29 TO DEKAD 15), RFE2.

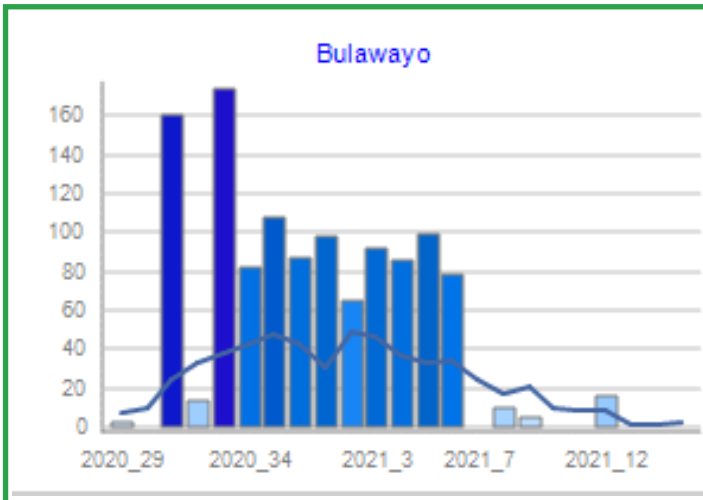

FIG 8: TEMPORAL DISTRIBUTION OF RAINFALL IN BULAWAYO COMPARED TO THE LONG-TERM AVERAGE (DEKAD 29 TO DEKAD 15), RFE2.

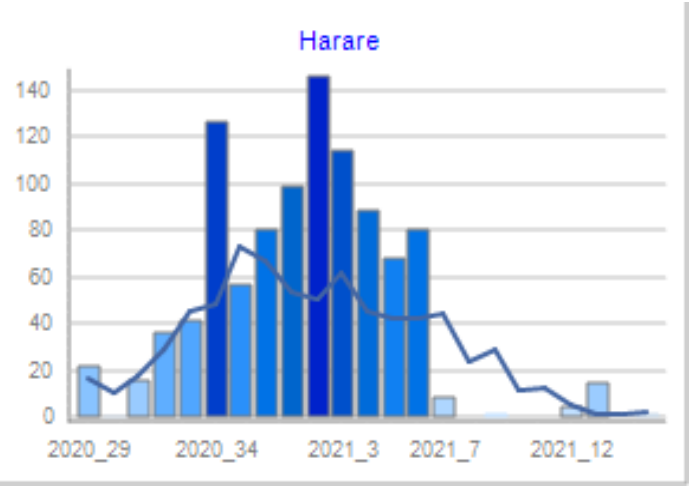

FIG 9: TEMPORAL DISTRIBUTION OF RAINFALL IN HARARE COMPARED TO THE LONG-TERM AVERAGE (DEKAD 29 TO DEKAD 15), RFE2.

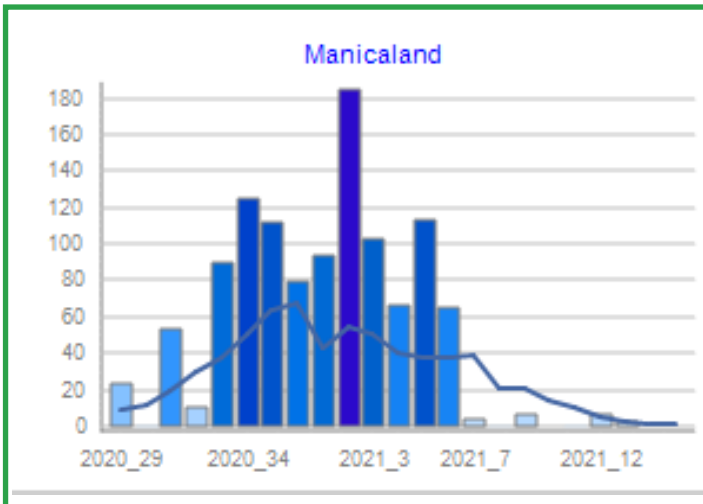

FIG 10: TEMPORAL DISTRIBUTION OF RAINFALL IN MANICALAND COMPARED TO THE LONG-TERM AVERAGE (DEKAD 29 TO DEKAD 15), RFE2.

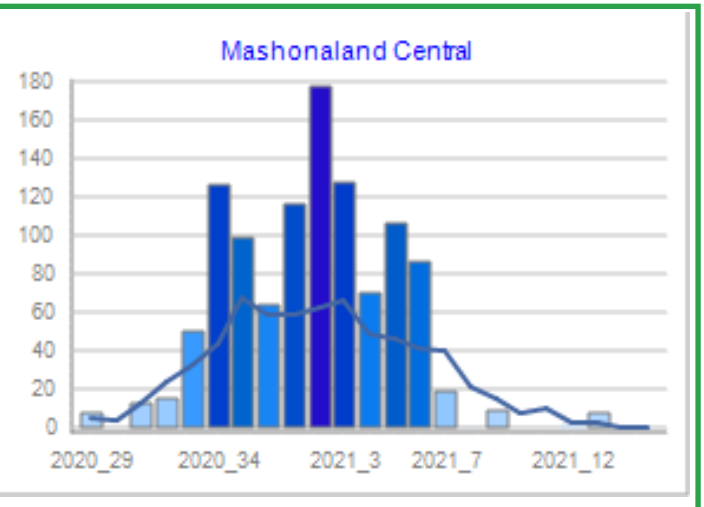

FIG 11: TEMPORAL DISTRIBUTION OF RAINFALL IN MASHONALAND CENTRAL COMPARED TO THE LONG-TERM AVERAGE (DEKAD 29 TO DEKAD 15), RFE2.

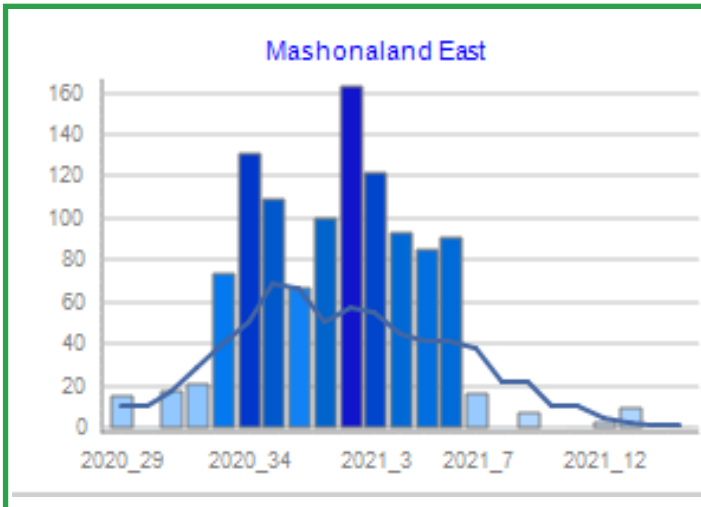

FIG 12: TEMPORAL DISTRIBUTION OF RAINFALL IN MASHONALAND EAST COMPARED TO THE LONG-TERM AVERAGE (DEKAD 29 TO DEKAD 15), RFE2.

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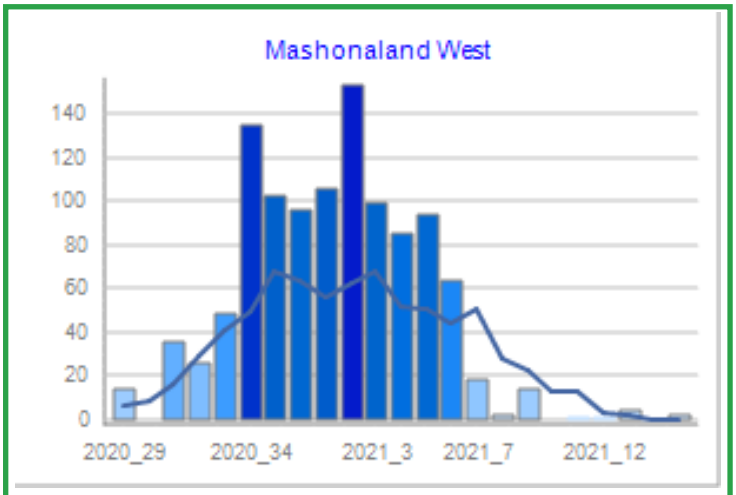

FIG 13: TEMPORAL DISTRIBUTION OF RAINFALL IN MASHONALAND WEST COMPARED TO THE LONG-TERM AVERAGE (DEKAD 29 TO DEKAD 15), RFE2.

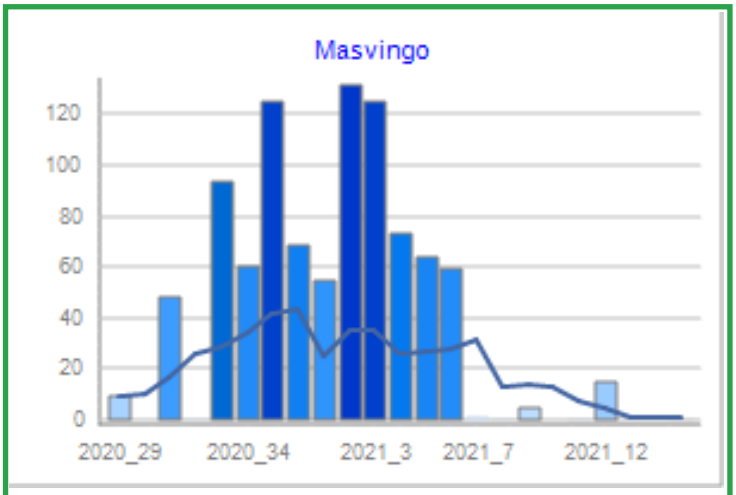

FIG 14: TEMPORAL DISTRIBUTION OF RAINFALL IN MASVINGO COMPARED TO THE LONG-TERM AVERAGE (DEKAD 29 TO DEKAD 15), RFE2.

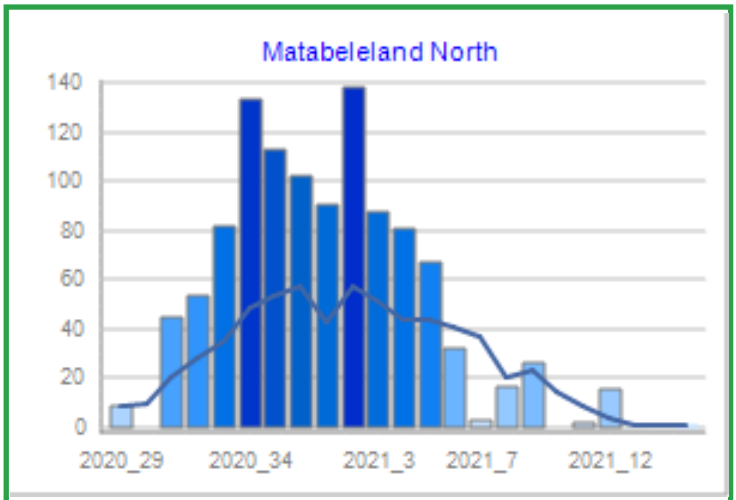

FIG 15: TEMPORAL DISTRIBUTION OF RAINFALL IN MATABELELAND NORTH COMPARED TO THE LONG-TERM AVERAGE (DEKAD 29 TO DEKAD 15), RFE2.

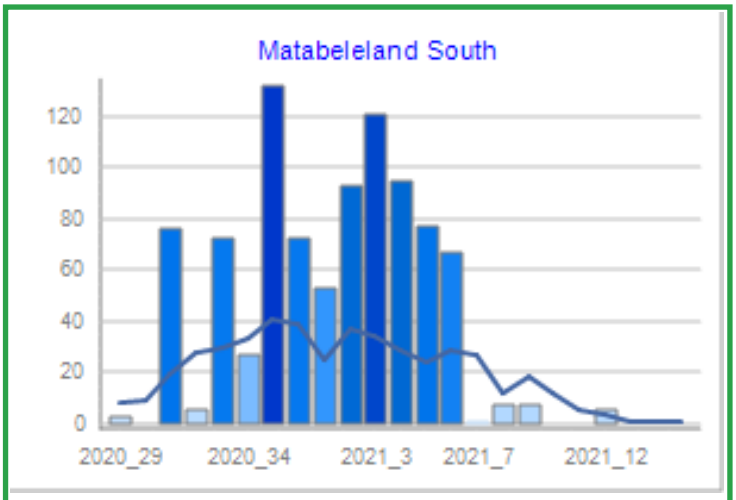

FIG 16: TEMPORAL DISTRIBUTION OF RAINFALL IN MATABELELAND SOUTH COMPARED TO THE LONG-TERM AVERAGE (DEKAD 29 TO DEKAD 15), RFE2.

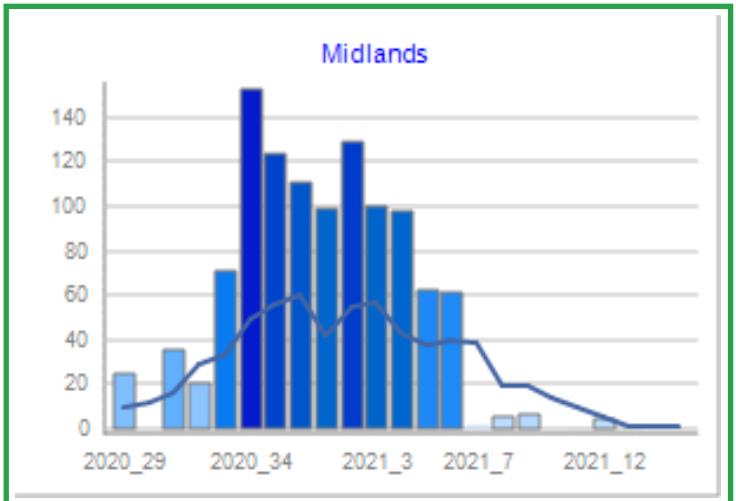

FIG 17: TEMPORAL DISTRIBUTION OF RAINFALL IN MIDLANDS COMPARED TO THE LONG-TERM AVERAGE (DEKAD 29 TO DEKAD 15), RFE2.

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

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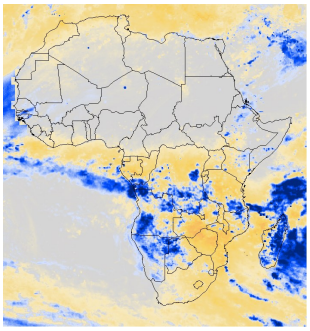
About ARC:

The **African Risk Capacity (ARC)** is a specialised agency of the African Union designed to improve the capacity of AU Member States to manage natural disaster risk, adapt to climate change and protect food insecure populations.

The ***Africa RiskView*** software is the technical engine of ARC. It uses satellite-based rainfall information to estimate the costs of responding to a drought, which triggers a corresponding insurance payout.

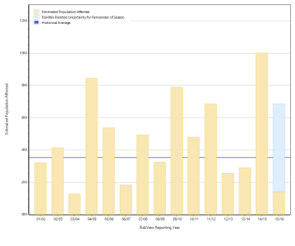
The **ARC Insurance Company Limited** is the financial affiliate of the ARC Agency, which pools risk across the continent through issuing insurance policies to participating countries.

Note on *Africa RiskView's* Methodology:

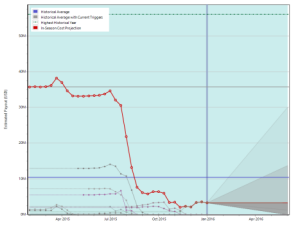


Rainfall: *Africa RiskView* uses various satellite rainfall datasets to track the progression of rainy seasons in Africa. Countries intending to participate in the ARC Risk Pool are required to customise the rainfall component by selecting the dataset which corresponds the best to the actual rainfall measured on the ground.

Drought: *Africa RiskView* uses the Water Requirements Satisfaction Index (WRSI) as an indicator for drought. The WRSI is an index developed by the Food and Agriculture Organisation of the United Nations (FAO), which, based on satellite rainfall estimates, calculates whether a particular crop is getting the amount of water it needs at different stages of its development. To maximise the accuracy of *Africa RiskView*, countries intending to take out insurance customise the software's parameters to reflect the realities on the ground.



Affected Populations: Based on the WRSI calculations, *Africa RiskView* estimates the number of people potentially affected by drought for each country participating in the insurance pool. As part of the in-country customisation process, vulnerability profiles are developed at the sub-national level for each country, which define the potential impact of a drought on the population living in a specific area.



Response Costs: In a fourth and final step, *Africa RiskView* converts the numbers of affected people into response costs. For countries participating in the insurance pool these national response costs are the underlying basis of the insurance policies. 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.