Africa RiskView

MID-SEASON RANGELAND REPORT | SUDAN (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 mid-season-sowing reports are also being continuously refined with a view to providing early warning to ARC member countries.

HIGHLIGHTS:

RAINFALL:

- Normal to above normal vegetation conditions over most parts of the country, except for localised areas over East Darfur, West Kordofan, Blue Nile and Sinnar.
- The good vegetation development benefited from the above normal rainfall received since the start of the season.

AFFECTED POPULATIONS:

- Based on the Africa RiskView rangeland model projections, 54,800 of the vulnerable pastoral population are projected to be affected by drought at the end of the season.

RAINFALL

The rainfall performance since the start of the season on the 21st of June 2020 up to 31 August was generally above normal over most parts of the country (Figure 1). At the start of the rangeland season, all the states received above normal rainfall except for South Kordofan. As the season progressed into July, some localised dry spells were recorded over Blue Nile and Sinnar.

.During the month of August, the below normal rainfall initially recorded in few States in the previous months, gradually expanded to cover the west-

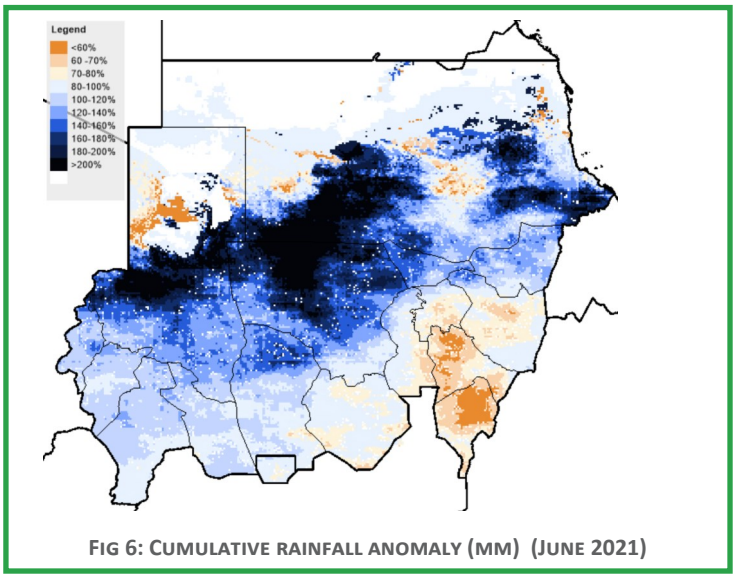

FIG 6: CUMULATIVE RAINFALL ANOMALY (MM) (JUNE 2021)

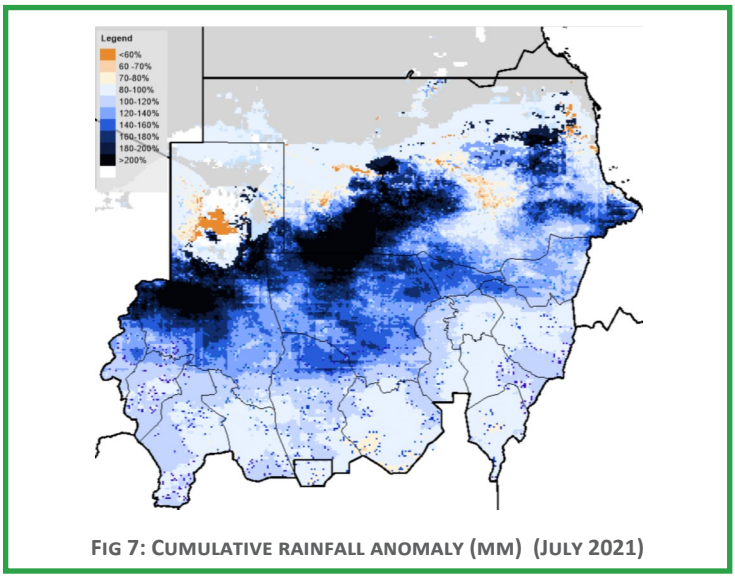

FIG 7: CUMULATIVE RAINFALL ANOMALY (MM) (JULY 2021)

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ern half of the country (Figure 1). The most significant rainfall deficits were observed over West Kordofan and East Darfur which received below normal rainfall for all the three dekads of August (Figure 2)

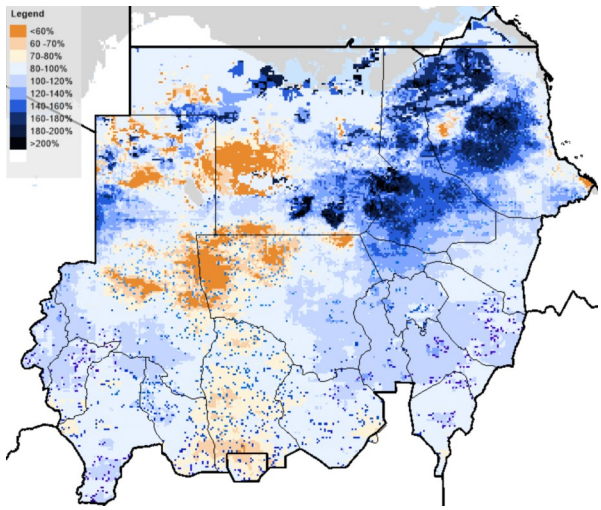


FIG 8: CUMULATIVE RAINFALL ANOMALY (MM) (AUGUST 2021)

Despite the below normal rainfall received in August, the total cumulative rainfall since the start of the season (21 June -31 August) was above normal for most parts of the country. (Figure 3). Few localised places bordering North Darfur and Northern states received below rainfall. Most of these areas that recorded below normal rainfall lie outside the rangeland mask as such they will not have an impact on the rangeland.

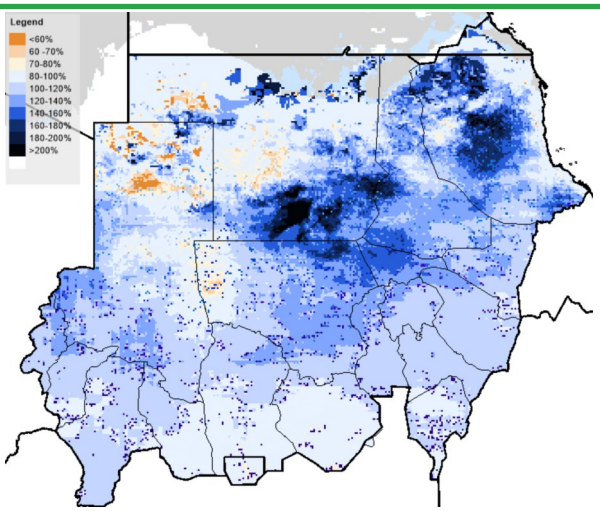


FIG 2: CUMULATIVE RAINFALL ANOMALY (MM) (11 JUNE -31 AUGUST)

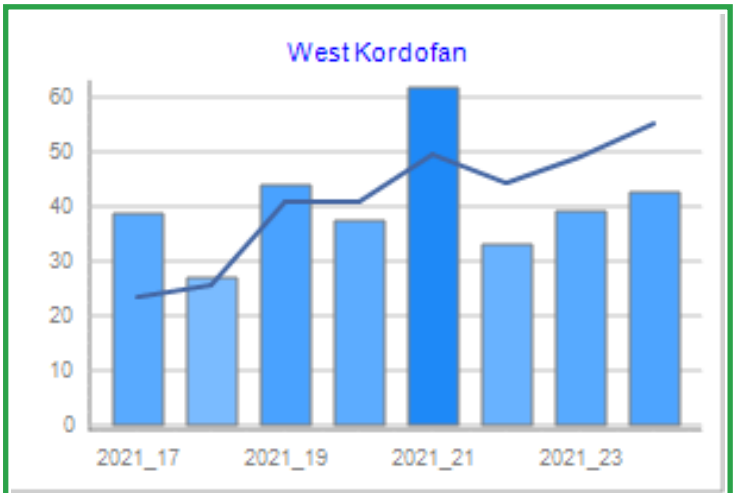
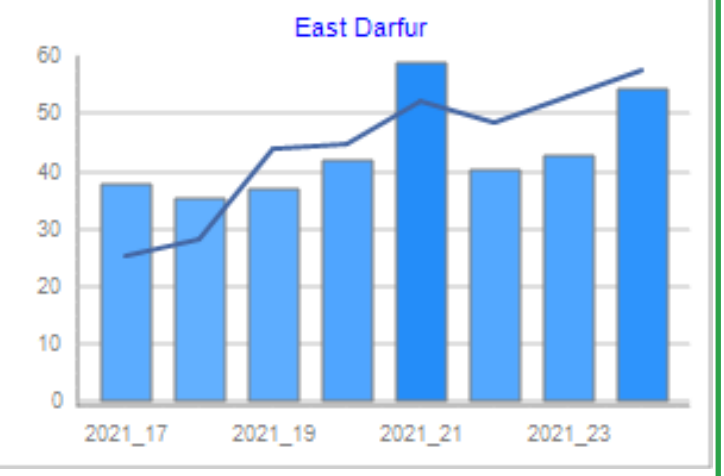


FIG 22: TEMPORAL DISTRIBUTION OF RAINFALL IN SOUTHERN COMPARED TO THE LONG-TERM AVERAGE (DEKAD 32 TO DEKAD 12), RFE 2.



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VEGETATION CONDITION

At the start of the rangeland season on 21 June, the vegetation development was generally characterised by normal to above normal conditions (Figure 5). As the season progressed into July and August, the below normal rainfall received mostly in August slightly impacted negatively on the vegetation development mostly over the southern parts of the country (Figure 4).

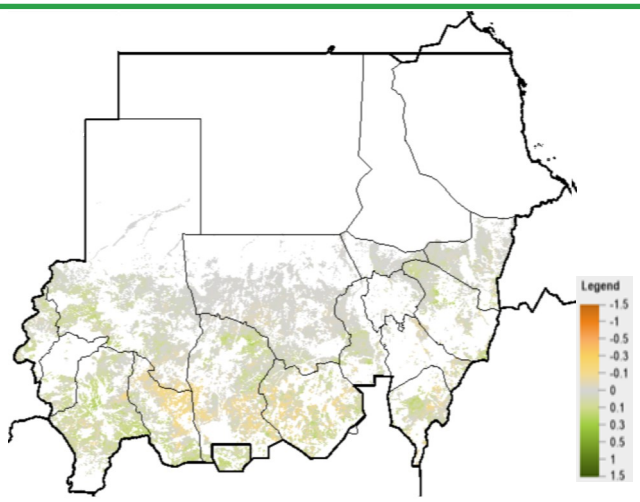

FIG 6: NDVI ANOMALY (%) (21-30 JUNE 2021)

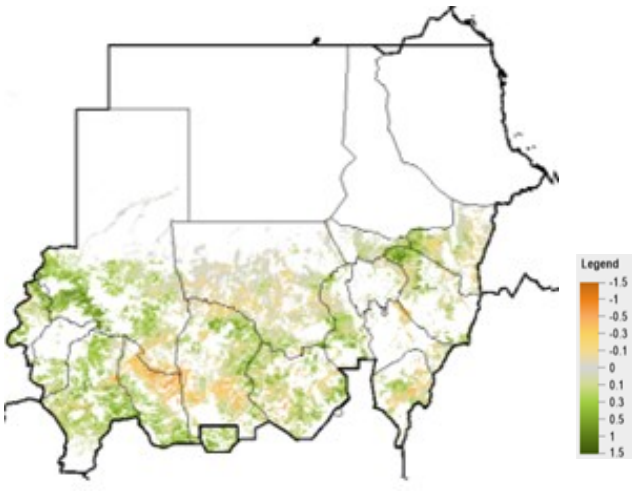

FIG 6: NDVI ANOMALY (%) (21 JUNE—31 AUGUST 2021)

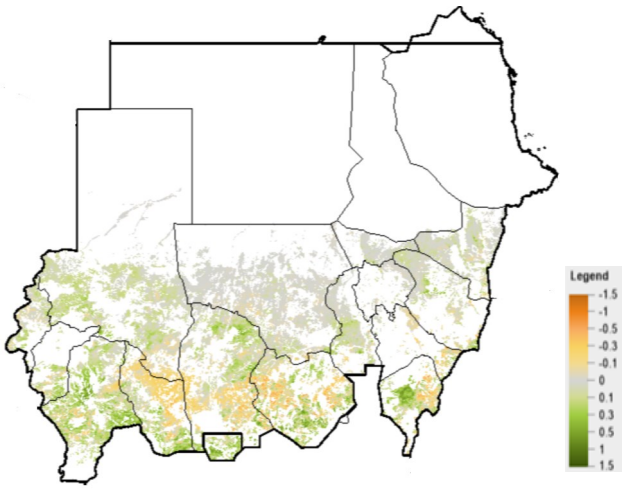

FIG 6: NDVI ANOMALY (%) (JULY 2021)

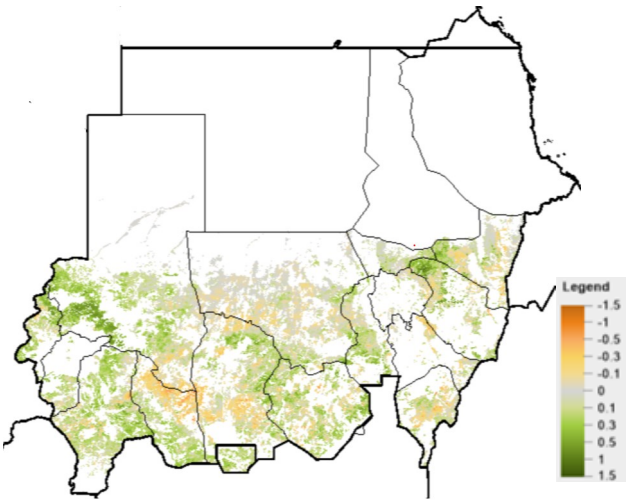

FIG 7: NDVI ANOMALY (%) (AUGUST 2021)

The dekadal NDVI time series graph since the start of the season up to 31 August (Annex 2) generally shows normal to above normal vegetation conditions over most parts of the country except for East Darfur, West Kordofan, Blue Nile and Sinnar (Figure 6). The favourable rainfall condition received since the start of the season (Figure 3) helped to support vegetation development in most parts

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of Sudan. However, the GEOGLAM crop monitor report (No. 64: published September 2nd , 2021) noted that locust invasion is posing a threat to the crop and rangeland in the East Africa region including Sudan. This is mainly due to the fact that wetter conditions provides favourable conditions for locust breeding.

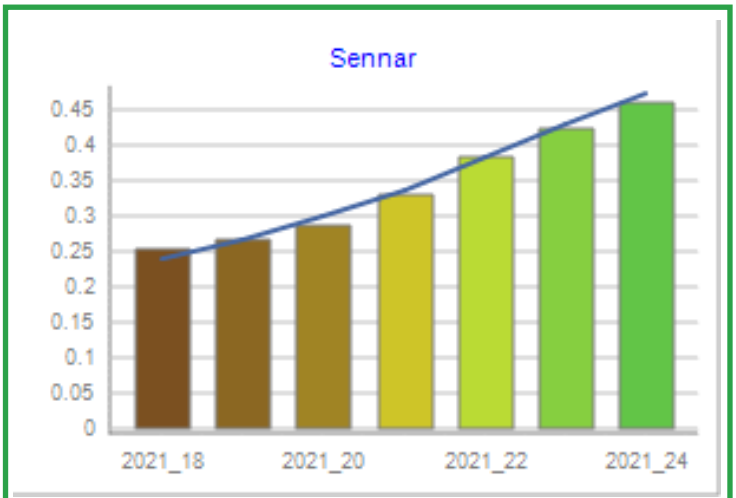

FIG 20: TEMPORAL DISTRIBUTION OF RAINFALL IN NORTHERN COMPARED TO THE LONG-TERM AVERAGE (DEKAD 32 TO DEKAD 12), RFE 2.

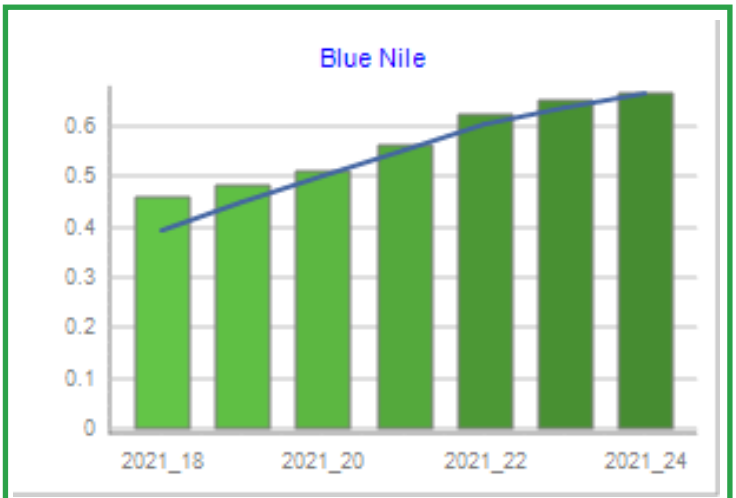

FIG 21: TEMPORAL DISTRIBUTION OF RAINFALL IN NORTH-WESTERN COMPARED TO THE LONG-TERM AVERAGE (DEKAD 32 TO DEKAD 12), RFE 2.

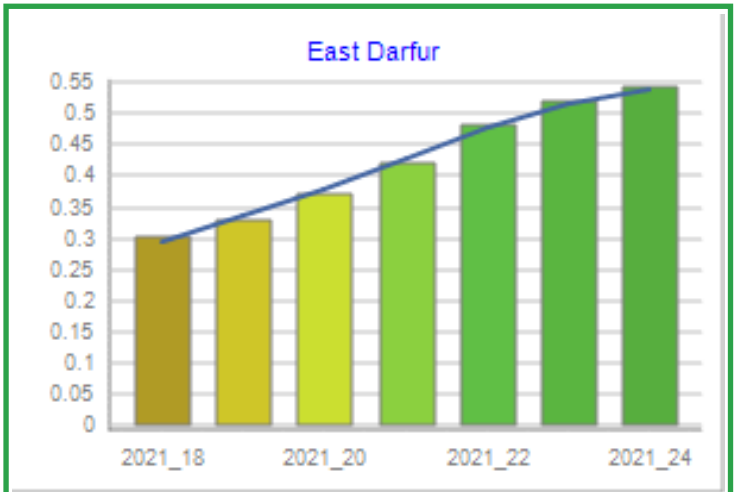

FIG 22: TEMPORAL DISTRIBUTION OF RAINFALL IN SOUTHERN COMPARED TO THE LONG-TERM AVERAGE (DEKAD 32 TO DEKAD 12), RFE 2.

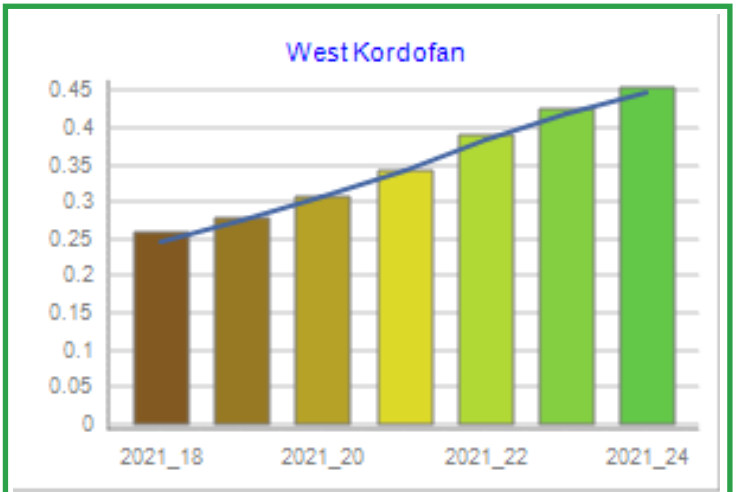

FIG 23: TEMPORAL DISTRIBUTION OF RAINFALL IN WESTERN COMPARED TO THE LONG-TERM AVERAGE (DEKAD 32 TO DEKAD 12), RFE 2.

POPULATION AFFECTED

The rangeland model uses the Vegetation Condition Index (VCI) to assess the drought impact. The relationship between the VCI and the number of people affected by drought is shown in Figure 7. The rangeland model estimates the number of people affected during moderate, severe, and extreme droughts (Table 1). The numbers of population affected by drought is based on a linear model defined by the drought detection point which is also used as the trigger (VCI =35) and the exit trigger (VCI<10). The exit trigger refers to a drought severity level where the maximum number of vulnerable population can be affected. This linear model assumes that 100% of the vulnerable population will be affected by drought once the trig-

ger for an extreme drought is reached (VCI<10) (Figure 7). The VCI calibration points of 10, 20 and 35 which corresponds to extreme, severe, and moderate drought events, are used to estimate the number of people affected by drought at different magnitude. The number of people affected by drought magnitude in between the calibration points is calculated via interpolation (Table 1).

VCI	Classification	Colour
<10	Extreme vegetation deficit	
10-20	Severe vegetation deficit	
20-35	Moderate vegetation deficit	
35-50	Normal vegetation greenness	
>50	Above normal vegetation greenness	

TABLE 1: VCI CLASSIFICATION USED TO DETERMINE THE DROUGHT CALIBRATION POINTS

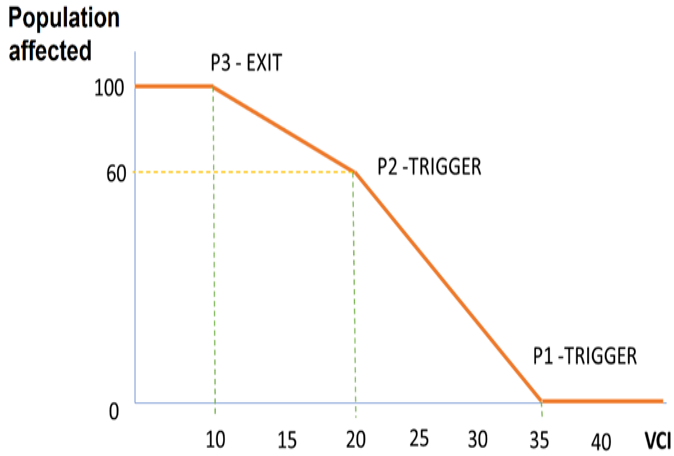

FIG 20: RELATIONSHIP BETWEEN VCI AND THE POPULATION AFFECTED

Based on the customisation of Africa RiskView rangeland model, as at 31 August, 54,800 people were projected to be affected by drought at the end of the season (Figure 8). The normal to above normal vegetation conditions across most parts of the country (Annex 2) helped to support livestock. Consequently, a lower number of people are projected to be affected by drought. However since the season is still progressing these figures can change based on the performance of rainfall.

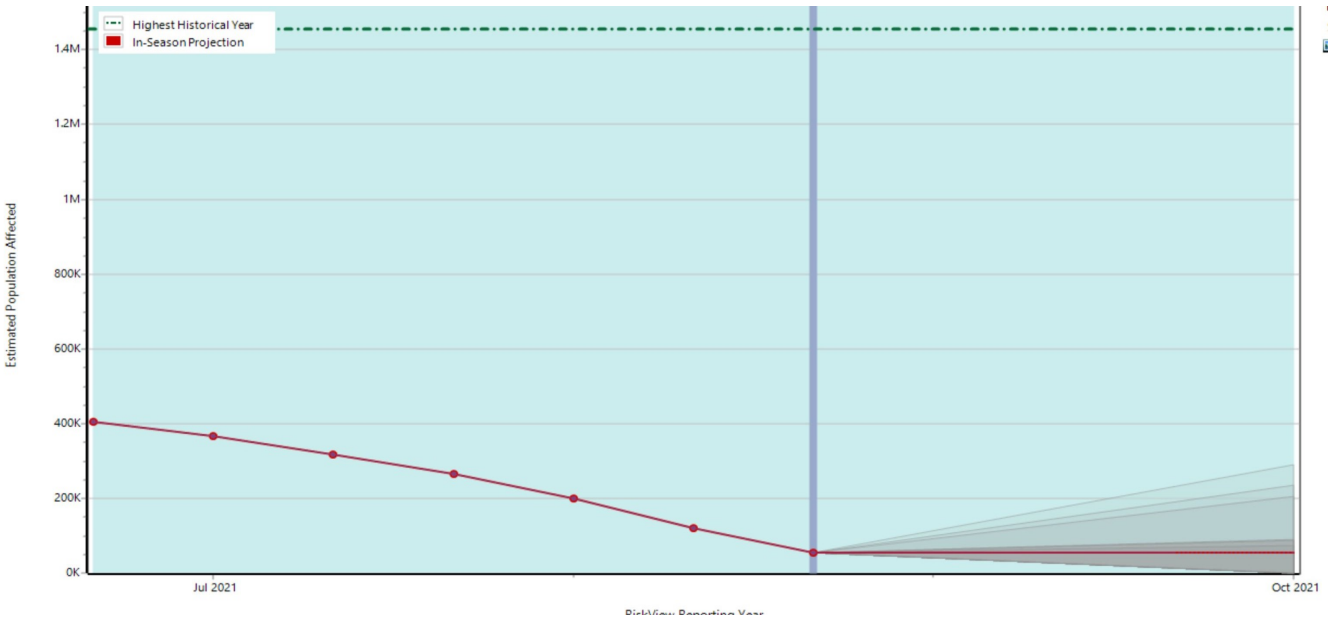

FIG 13: ESTIMATED NUMBER OF PEOPLE AFFECTED BY DROUGHT THE END OF SEASON

The results presented in the report are in line with other reports and assessments done by other agencies eg GEOGLAM crop monitor report number. 64: Published September 2nd, 2021. The IPC report also indicate that most of the localities were in IPC phase 2 (stressed) with fewer localies in IPC phase 3+. The only localities in IPC phase 3 (crisis) were mainly located in the northern parts of North Kordofan & North Darfur, southern part of Blue Nile and Eastern parts of Kassala. This is inline the vegetation anomaly map which generally shows below normal performance over those areas (Figure 5) .

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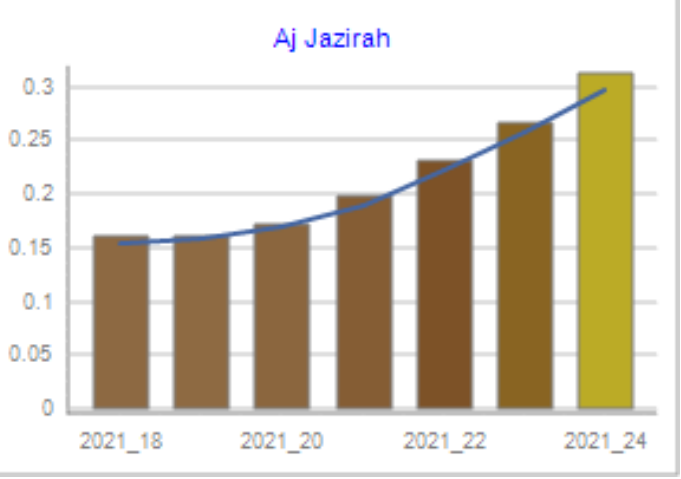

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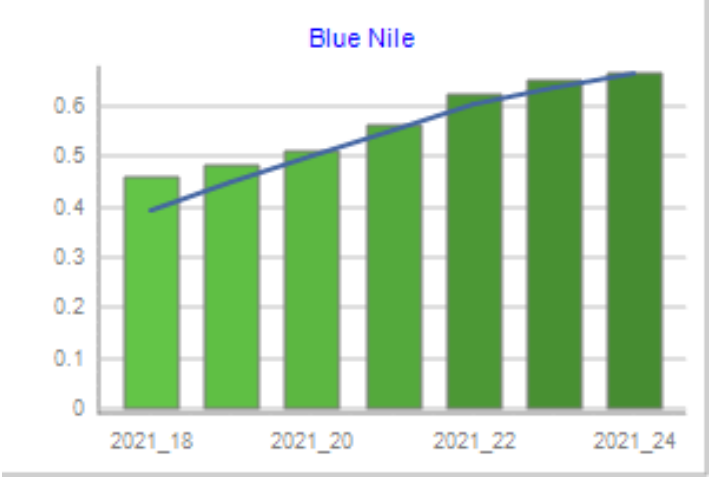

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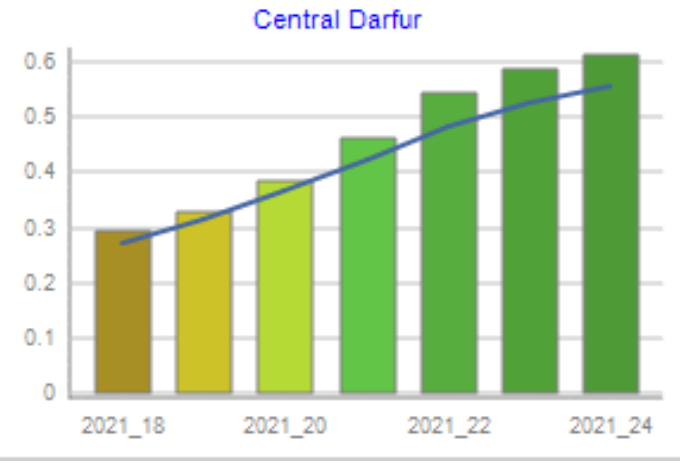

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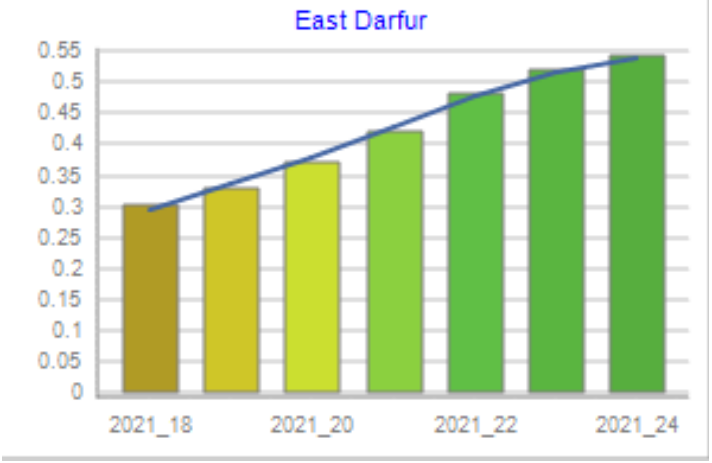

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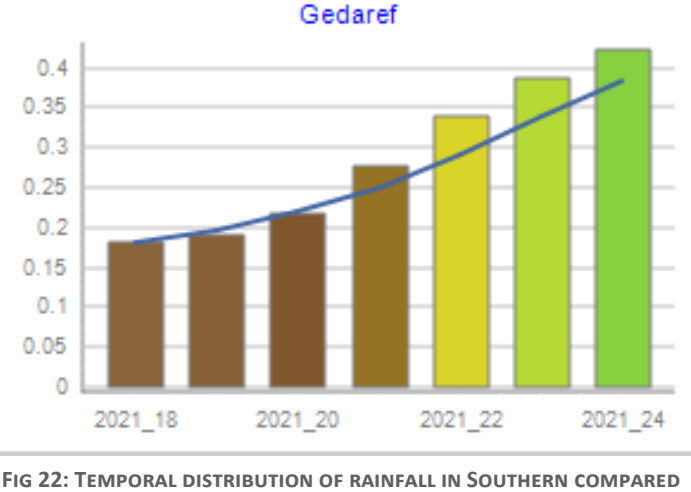

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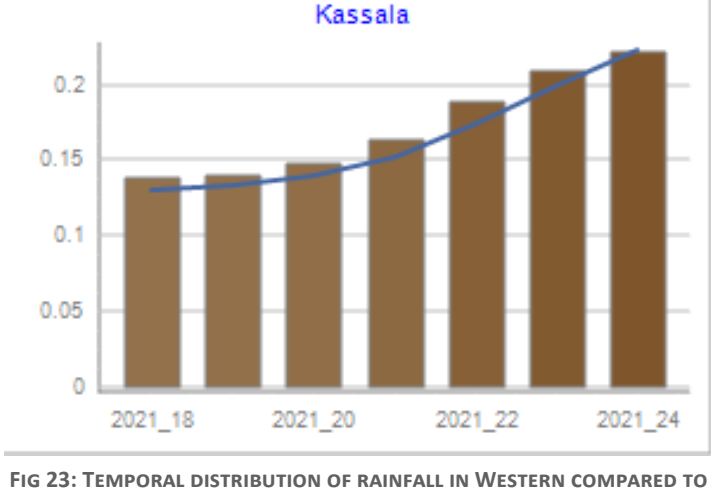

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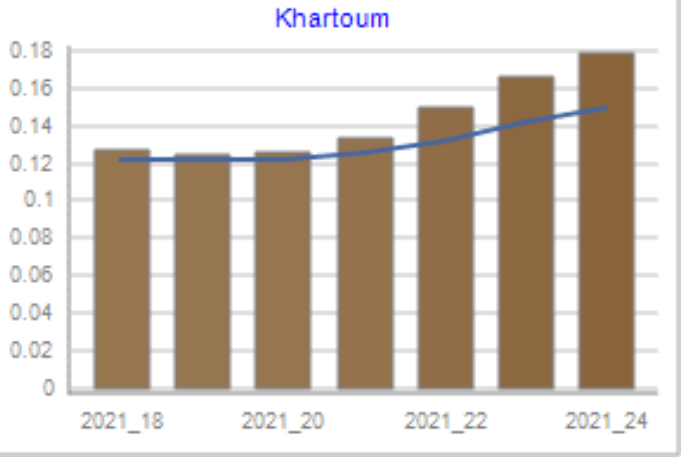

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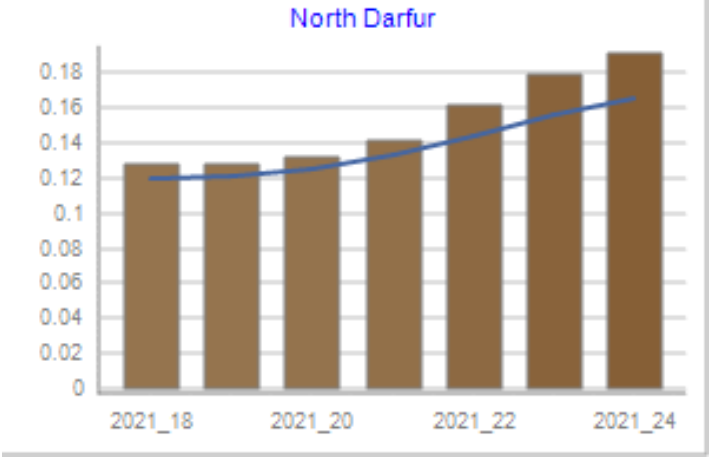

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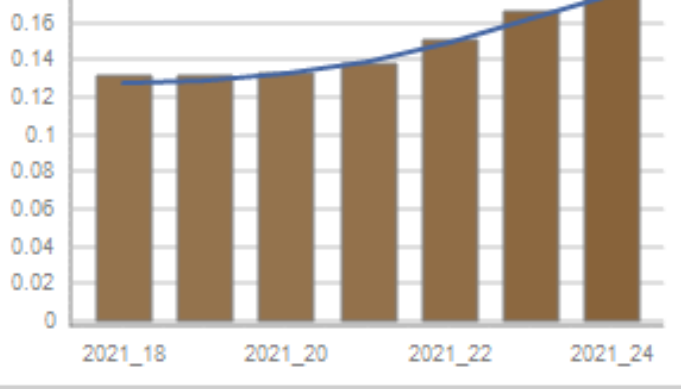

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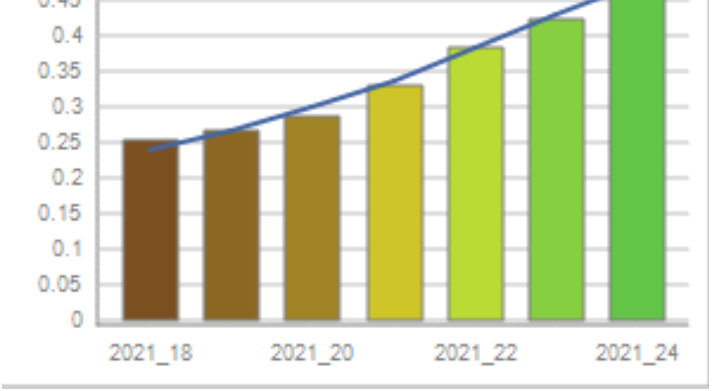

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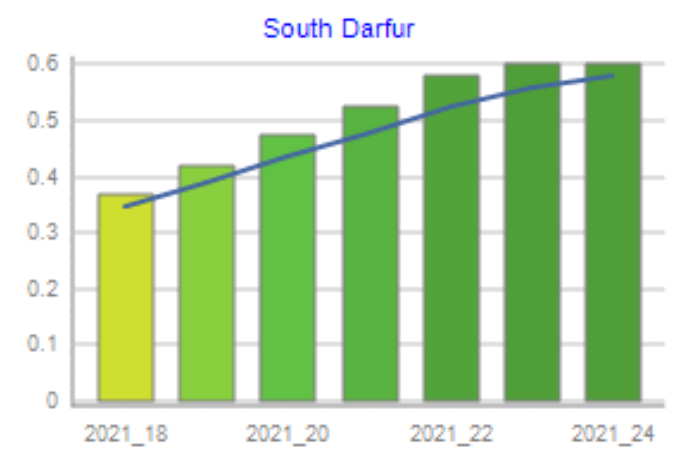

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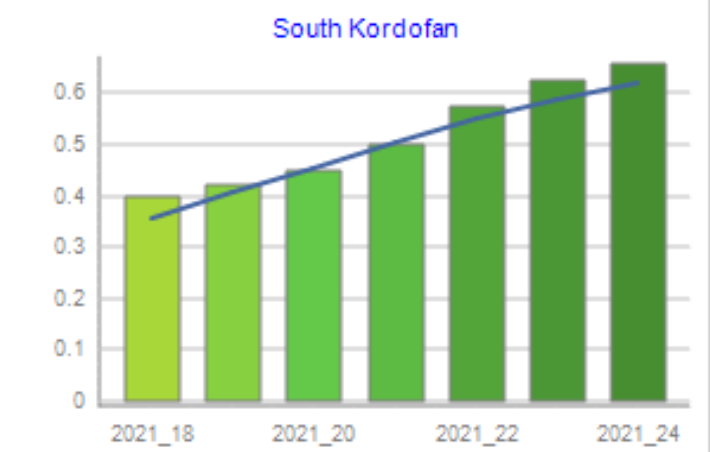

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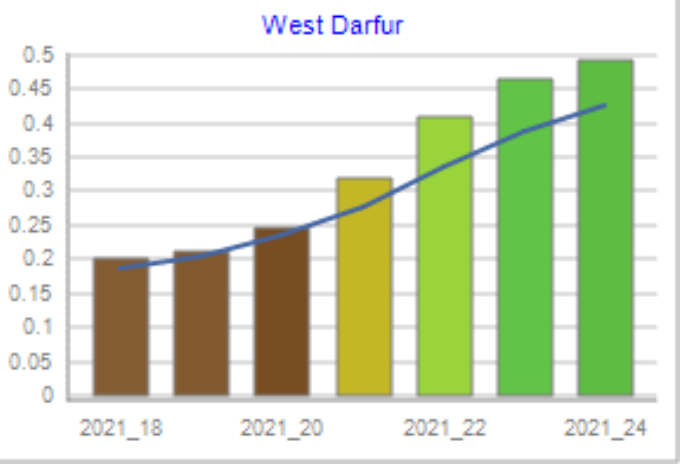

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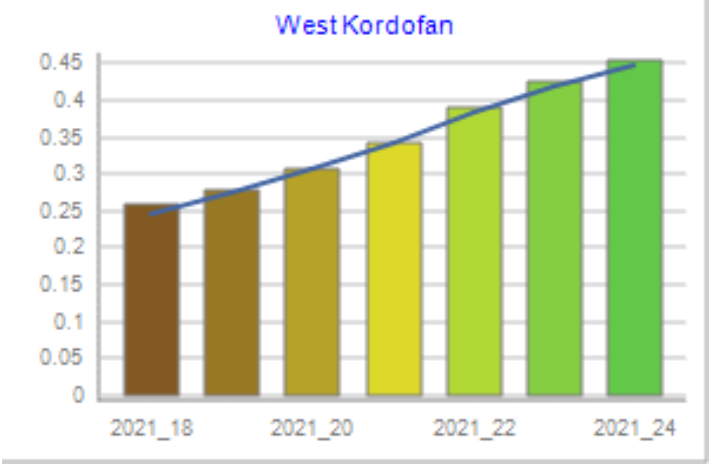

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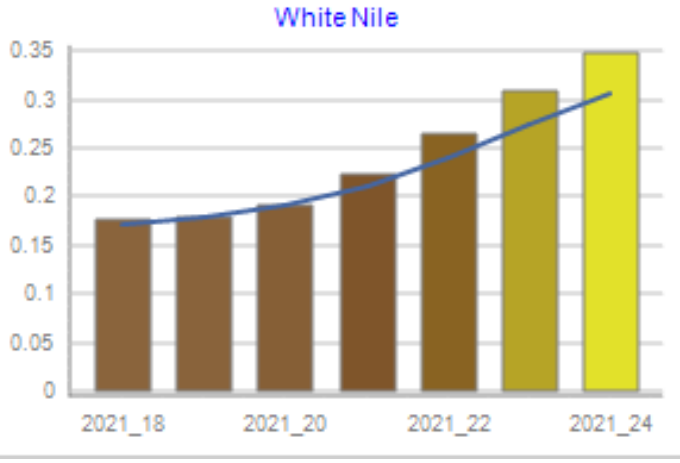

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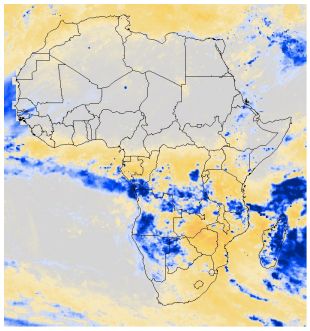
About ARC:

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.

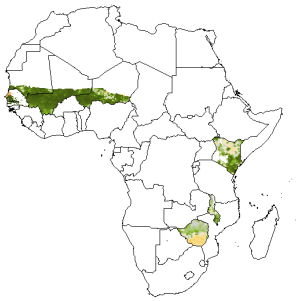
The ***Africa RiskView*** software is the technical engine of ARC. It uses satellite-based rainfall information to estimate the costs of responding to a drought, which triggers a corresponding insurance payout.

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.

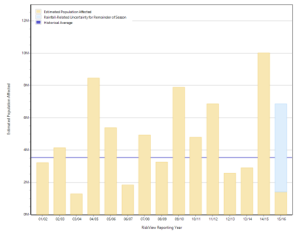
Note on *Africa RiskView's* Methodology:



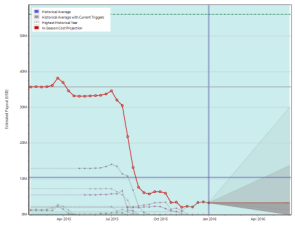
Rainfall: *Africa RiskView* uses various satellite rainfall datasets to track the progression of rainy seasons in Africa. Countries intending to participate in the ARC Risk Pool are required to customise the rainfall component by selecting the dataset which corresponds the best to the actual rainfall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