Rainfall

The rainy season in Senegal normally starts in dekad 14 (11 May) and ends in dekad 31 (10 November). Spatial distribution of rainfall in 2017 indicates that the Southern regions of Senegal received cumulative rainfall of more than 800mm during the 2017 rainfall season (Fig 1). Total cumulative rainfall in the central regions of Fatick, Kaolack, Kaffrine and Tambacounda ranged from 600mm to 800mm. In the northern regions of Saint Louis, Louga, Matam and Thies, the cumulative rainfall received ranged from 200mm to about 600mm. Whereas the southern most areas of Matam and Louga received about 600mm of rainfall, the northern areas of these regions received only about half the sum of rainfall realised in the southern parts. The lowest amounts of rainfall, as expected, were realised in Saint Louis.

In terms of temporal distribution, the first significant amounts of rainfall of more than 20mm were received in dekad 11 (2 May) and in the most regions of the country (as shown in Figures 3 – 17). Only Kedougou, located in the south-eastern tip of Senegal received consistent rainfall of more than 20mm right from the start of the season in dekad 14 (Fig 9).

Comparison of the cumulative rainfall received in 2017 to the long term mean (1983-2016) at the pixel level reveals that most parts of Senegal received between 110% and 150% of their long-term average, implying that above average rainfall was received during the 2017 season.

Drought

The final end-of-season WRSI for the 2017 season shows that 95% to 100% of crop water requirements were met for the southern and central regions of Senegal—a pointer of adequate precipitation.

Comparison of the end-of-season WRSI with the benchmark (median WRSI for the previous five years) indicates that the final WRSI in 2017 was more than 110% of the median of the previous five years in the central parts and 90%-110% of the median in the western and southern parts of Senegal.

The overall performance of the 2017 cropping season was modelled as better than average by Africa RiskView in most parts of Senegal.

Affected Populations

The modelled estimates of Africa RiskView indicate that no households were affected by drought in the 2017 production season.

Risk Pool

Since a payout of over USD 16 million in 2014/15 due to the poor performance of the 2014 agricultural season in West Africa, Senegal has not received a payout. Similarly, no payout is expected this year.

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Country Technical Working Group (TWG) in Senegal for Pool 4, groundnuts, which is a major source of income and an important food security crop for many households was retained as the reference crop in the areas shown in the calculation mask (groundnut growing areas) in Fig 18. The final end-of-season WRSI for the 2017 season shows that 95% to 100% of crop water requirements were met for the southern and central regions of Senegal—implying that precipitation was adequate (both absolute rainfall quantities received and the temporal distribution of rainfall) to meet crop water requirements and crop development needs in these regions. In the western regions of Thies, Fatick and Diourbel, the final WRSI ranged from mediocre to average based on Africa RiskView modelling. In Louga region where groundnut is also widely grown as shown by the calculation mask, the final WRSI was poor to mediocre (only 50% to 80% of the crop water requirements were met). During the customisation of Africa RiskView for Pool 4, the TWG selected a WRSI aggregation method of 20mm, 5mm, 5mm during the sowing window. This implies that at least 20mm of rainfall had to be received in one dekad and 5mm each in the two subsequent dekads for Africa RiskView to model sowing as successful. Although these conditions were largely met in most of Senegal, a few pixels in Matam, Louga and Saint Louis regions did not meet these conditions during the planting window, thus no planting was deemed to have taken place in these selected locations (Fig 18). In Louga in particular, less than optimal rainfall was received in dekads 19 and 20 after the commencement of the season in dekad 18 (see Fig 11), probably the reason for the mediocre to average end-of-season WRSI.

Comparison of the end-of-season WRSI with the median for the previous five years, which was selected by the TWG as the benchmark WRSI, indicates that the final WRSI in 2017 was more than 110% of the median of the previous five years in the central parts and 90%-110% of the median in the western and southern parts of Senegal (see Fig 19). A few localised areas in Louga and Matam were modelled as having WRSI of less than 50% of the five-year median. It can be concluded that performance of the 2017 cropping season was better than average in most parts of Senegal, based on the final WRSI values and compared to the median WRSI of the previous five years.

**Modelled Drought Impacts**

In order to model drought conditions on the ground, the region-level WRSI at end of a season is compared to the benchmark, which in the case of Senegal was determined as the median WRSI value of the previous five years (2012 to 2016 in this case). Drought conditions are triggered if the end-of-season WRSI falls below the benchmark. Both the severity of the drought (the extent of the deviation of the WRSI from the benchmark) and the vulnerability of the population in the affected area are used to determine the number of people affected.

As discussed in the previous section, the end of season WRSI was above or equal to the benchmark for most parts of Senegal. Only a few localised spots in the northern parts of the country (Matam and Louga) had WRSI of less than 50% of the benchmark. Moreover, groundnut or crop production for that matter is undertaken on a very limited scale in these areas, as shown in Fig 19. As a consequence of the average to above average rainfall received in most of Senegal, little or no water deficits were experienced (Fig 20) and the modelled estimates of Africa RiskView indicate that no households were affected by drought in the 2017 production season compared to the modelled estimate of 730,000 people.
Affected by drought in 2016 and the average of 370,000 affected by drought annually (Fig 20). This is consistent with the projections by FEWS NET that food insecurity in Senegal is currently minimal (IPC Phase 1) and projections till May 2018 indicate that the food security will remain stable.

**Arc Risk Pool**

Senegal has been a member of the ARC Risk Pool since the first pool in 2014/15. In that year, the country benefited from a payout of over USD 16 million, due to the poor performance of the 2014 agricultural season in West Africa. Since then, the country has not qualified for a payout since the Africa RiskView estimate of people affected by drought has been lower than the attachment points (the point at which the insurance begins to pay out) during the subsequent risk pools.
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.

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**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.

**Disclaimer:** The data and information contained in this report have been developed for the purposes of, and using the methodology of, Africa RiskView and the African Risk Capacity Group. The data in this report is provided to the public for information purposes only, and neither the ARC Agency, its affiliates nor each of its respective officers, directors, employees and agents make any representation or warranty regarding the fitness of the data and information for any particular purpose. In no event shall the ARC Agency, its affiliates nor each of its respective officers, directors, employees and agents be held liable with respect to any subject matter presented here. Payouts under insurance policies issued by ARC Insurance Company Limited are calculated using a stand-alone version of Africa RiskView, the results of which can differ from those presented here.