Africa RiskView

Special Report: Mauritania (End of Season)

December 2014

Highlights:

- ***Rainfall:***
  - **Below normal** cumulative rains throughout most agricultural areas of the country
  - **Poor spatial and temporal distribution** of rainfall
- ***Drought:***
  - **Below normal WRSI** in most agricultural areas compared to the 2001-2013 average, with the exception of pockets of south-central and south-eastern Mauritania
- ***Populations Affected:***
  - ARV estimates that **around 558,000 people are directly affected by drought** conditions in the country after the end of the 2014 agricultural season
  - The areas most affected include Assaba, Gorgol and Hodh El Gharbi regions
- ***Insurance:***
  - Given the high modelled drought response costs, **Mauritania is eligible for a pay-out of around USD 6.3 million by the ARC Insurance Company Limited**
  - These funds will be used to **activate a Final Implementation Plan** (FIP), which the country is currently finalising

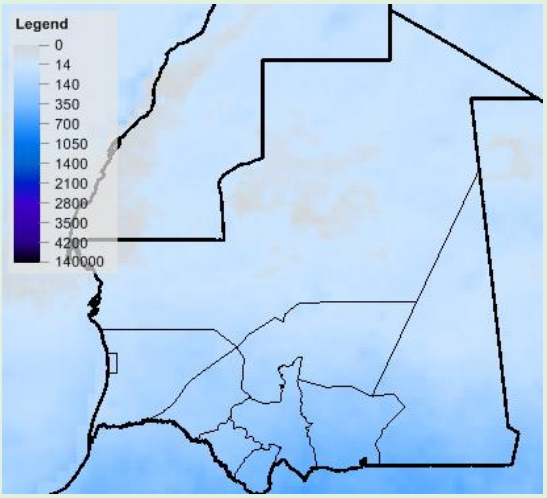
Introduction

This ***Africa RiskView*** **Special Report** will analyse the situation in Mauritania at the end of the 2014 agricultural season, as detected by the software *Africa RiskView* (ARV). Mauritania is amongst the five countries that form the **first risk pool** of the ***African Risk Capacity*** **(ARC)**, together with Mozambique, Niger, Kenya and Senegal. These five countries insured their respective agricultural or rangeland seasons against the cost of a drought-related intervention, within the context and mandate of ARC. Before participating in the first risk pool, Mauritania customised ARV to model the impact of drought as accurately as possible. The agricultural season in Mauritania extends from **July to late November**, and the country chose **sorghum** as the reference crop for its participation in the insurance pool. During the customisation process of ARV, all the parameters of the drought index were adjusted to the conditions and agricultural practices on the ground, in order to allow for accurate modelling.

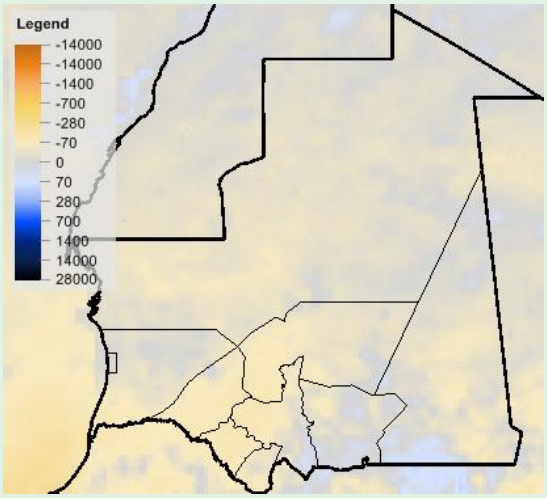
This **end-of-season report** will review the agricultural season in Mauritania, and present ARV's modelled results. It is part of a **validation exercise** of ARV, which is conducted in each country after the end of each insured season. This exercise is aimed at verifying the model's performance in order to identify potential improvements for drought monitoring and insurance coverage. The ARV Special Report covers the following topics: **rainfall**, **drought**, **affected population and response cost estimates**, and discuss these in the context of **external sources**.

Rainfall

Overall, the 2014 **rainy season performed below normal** throughout most of Mauritania. The bulk of the rains were received in August and September, and the cumulative rainfall map (see Map 1) indicates that the southern parts of the country such as Hodh el Gharbi, Guidimaka and Assaba were the wettest areas of Mauritania, with cumulative rains between 250 and 360 mm throughout the season. By contrast, the northern and western agricultural areas such as Tagant and Trarza only recorded cumulative rains of 80 to 105 mm.



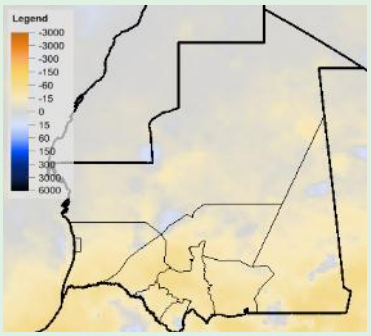
Map 1: Cumulative rainfall, Mauritania, 1 Jul-20 Nov 2014 (RFE2)



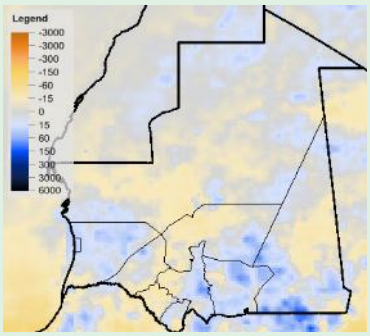
Map 2: Rainfall compared to normal, Mauritania, 1 Jul-20 Nov 2014 (RFE2)

Compared to the 13-year average (2001-2013), the **cumulative rains were below average** in all areas of the country, with the exception of some localised areas in south-eastern Mauritania (in southern Assaba, Hodh El Gharbi and Hodh Ech Chargui regions), which recorded localised rainfall surpluses of up to 100 mm. However, all regions in south-western Mauritania experienced a drier than normal season, particularly Trarza, Brakna and Gorgol regions, where the cumulative rainfall was up to 35% below average. These significant rainfall deficits are in line with the generally poor rainy season in West Africa in 2014, particularly in countries on the Atlantic coast.

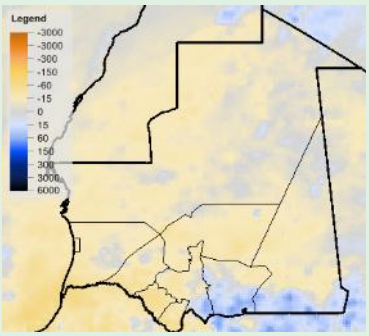
The **temporal and spatial distribution** of rainfall in 2014 indicates that Mauritania experienced a **delayed start of the season** in all agricultural areas, followed by an **uneven distribution of rains** in the following months. While some areas, particularly in the south-east, received above average rains, the western parts of the country remained drier than normal. The maps below show the progression of the seasonal rains compared to average. In July, all areas recorded rainfall deficits, which were particularly pronounced in the south-east, exceeding 65 mm (see Map 3). This drier than normal month of July was followed by below normal rainfall in August. Most agricultural areas, with the exception of Gorgol region, experienced wetter than normal conditions, with rainfall surpluses of over 120 mm in some areas (see Map 4) in August. Overall, the rains received in July and August were sufficient to allow for sowing activities to start across most agricultural areas of Mauritania during the sowing period, which lasts from the beginning of July until 20 August. However in many parts of the country this threshold was only reached towards the end of the sowing window. In some localised areas along the Atlantic coast, the rainfall sowing threshold of 20 mm was not reached.



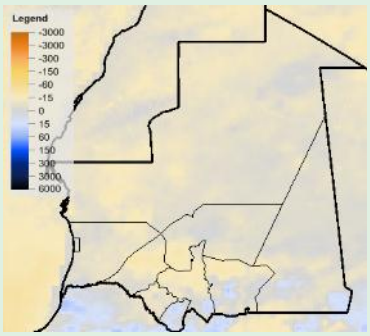
MAP 3: RAINFALL COMPARED TO NORMAL, MAURITANIA, JUL 2014 (RFE2)



MAP 4: RAINFALL COMPARED TO NORMAL, MAURITANIA, AUG 2014 (RFE2)

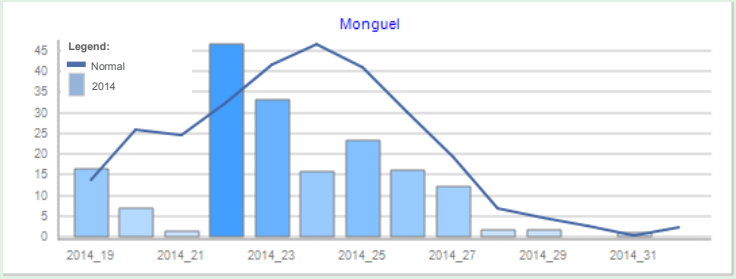


MAP 5: RAINFALL COMPARED TO NORMAL, MAURITANIA, SEP 2014 (RFE2)

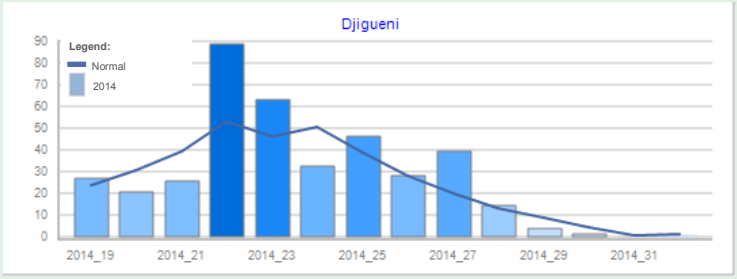


MAP 6: RAINFALL COMPARED TO NORMAL, MAURITANIA, OCT 2014 (RFE2)

During the month of September, the western and central parts of Mauritania experienced below normal rains, with marked deficits in Gorgol and Guidimaka regions, with deficits of up to 60 mm (see Map 5). Trarza and Brakna regions also recorded significantly below normal rains. Conversely, the south-eastern parts of the country recorded above normal rains, particularly the southern parts of Assaba, Hodh El Gharbi and Hodh Ech Chargui regions. Towards the end of the season in October and during the first 20 days of November, the rains throughout most agricultural areas were in line with the long-term average, with the exception of some localised areas which received above or below normal rains (see Map 6).



GRAPH 1: ACTUAL RAINFALL, MONGUEL DISTRICT (GORGOL REGION), MAURITANIA, 1 JUL-20 NOV 2014 (RFE2)



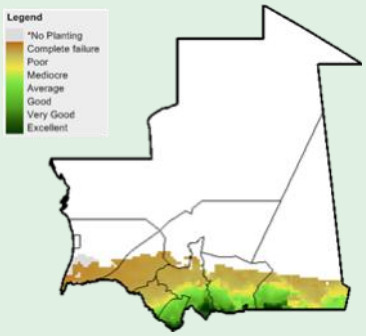
GRAPH 2: ACTUAL RAINFALL, DJIGUENI DISTRICT (HODH ECH CHARGUI REGION), MAURITANIA, 1 JUL-20 NOV 2014 (RFE2)

The two rainfall charts above show the evolution of rains in two different regions at the district level. In Monguel (Gorgol region), the graph shows how the rains started late, experienced a surge in early August but remained consistently below average in late August, September and October (see Graph 1). By contrast, Djigueni district in Hodh Ech Chargui region received above normal rains from early August until the end of the season, despite a slightly below average start of the season (see Graph 2). The impact of these two different rainfall patterns on the resulting WRSI will be discussed in the following section of this report.

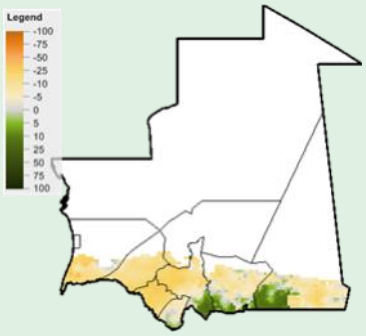
DROUGHT

ARV 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 ARV, **countries intending to take out insurance customise the software's parameters** to reflect the realities on the ground, as discussed above.

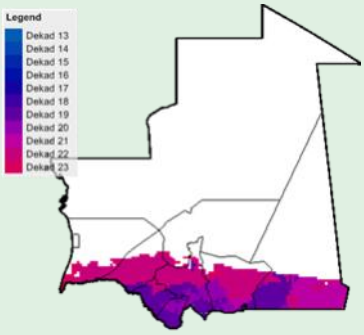
The WRSI at the end of the season varies across the country. In the southernmost agricultural areas, along the border with Senegal in central and eastern Mauritania, the WRSI is higher than in the western parts of the country and the northern agricultural areas, which are usually drier. The actual WRSI map also shows how in some areas along the Atlantic coast, the conditions for planting were not reached according to ARV (grey areas in Map 7). Compared to the 13-year average (2001-2013), it appears that the WRSI is below normal throughout most agricultural areas, with the exception of pockets of Assaba, Hodh El Gharbi and Hodh Ech Chargui regions. Only five districts (Djigueni, Timbedra, Kankossa, Tintane and Kobenni) have a normal or above normal WRSI, while all other agricultural areas of the country have a WRSI that is up to 65% below normal (Mederdra district). This situation, which is indicative of a high likelihood of a below normal agricultural production in 2014, is induced by the below normal and erratic rainfall discussed in the previous section of this bulletin.



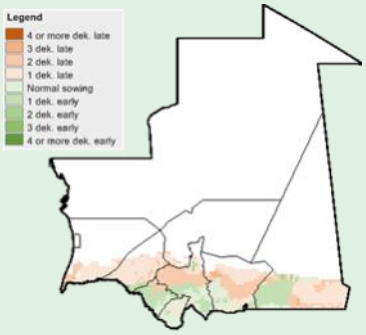
MAP 7: ACTUAL WRSI, MAURITANIA (2014 AGRICULTURAL SEASON)



MAP 8: WRSI COMPARED TO NORMAL, MAURITANIA (2014 AGRICULTURAL SEASON)



MAP 9: BEST PLANTING DEKAD, MAURITANIA (2014 AGRICULTURAL SEASON)



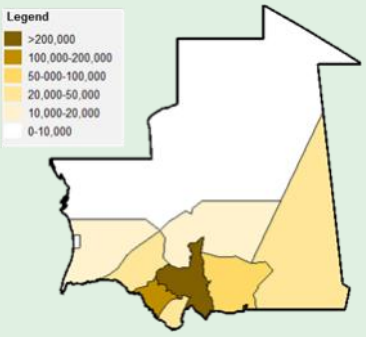
MAP 10: BEST PLANTING DEKAD COMPARED TO NORMAL, MAURITANIA (2014 AGRICULTURAL SEASON)

During the customisation of ARV, the country defined a sowing threshold of 20 mm of rainfall that needs to be reached within the sowing period (1 July to 20 August). Based on this, the best possible planting dekad within the sowing window is then calculated and used for the final WRSI. According to ARV, the best conditions for sowing were reached between dekad 19 (1-10 July) and dekad 23 (11-20 August). Sowing conditions were reached earlier in the central parts of the country than along the Atlantic coast (see Map 9). Compared to a normal year, sowing started 10 to 30 days later in most agricultural areas (see Map 10). Only in agricultural areas in the south-central part of the country and in the south-western parts of Hodh Ech Chargui, sowing started normally or up to 10 days earlier than normal. It is in these areas that the WRSI shows higher values, given that crops were allowed more time to develop normally, while the water needs of the reference crop were not fully satisfied for its different growing stages in the rest of the country.

POPULATION AFFECTED

Based on the WRSI calculations discussed in the previous section of this report, ARV estimates the **number of people potentially affected by drought**. As part of the in-country customisation process, **vulnerability profiles** are developed at sub-national levels for each country, which define the potential impact of a drought on the population living in a specific area. It is important to note that not all those affected by a drought might be in need of humanitarian assistance. Moreover, needs are often driven by a variety of factors including, but not limited to, the weather.

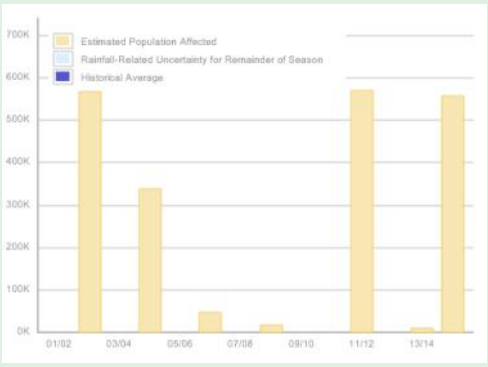
The outcome of the vulnerability profiling exercise in Mauritania indicates that of the around 2.29 million people living in agricultural areas, about 294,000 are exposed to the risk of a mild drought, while about 602,000 and 634,000 people are exposed to the risk of a medium or a severe drought, respectively. The areas with the highest proportions of populations at risk are Assaba, Gorgol and Hodh El Gharbi, with 23% of the population of these three regions being exposed to the risk of a mild drought, and over 45% of the population being exposed to the risk of a medium or severe drought. **After the end of the agricultural season in 2014, ARV estimates that a total of 558,000 people are directly affected by drought conditions in Mauritania**. In terms of geographical distribution, Assaba region accounts for the majority of affected populations (around 212,000), followed by Gorgol (111,000) and Hodh El Gharbi, where about 89,700 people are estimated to be affected (see Map 11). However, the regions are affected differently in terms of magnitude of the impact of the modelled drought. Indeed, all those estimated to be exposed to the risk of a mild or severe drought in Assaba, Brakna, Gorgol, Tagand and



MAP 11: DROUGHT AFFECTED POPULATIONS, MAURITANIA (2014 AGRICULTURAL SEASON)

Trarza regions are expected to be affected in 2014, while the impact of the drought is less pronounced in Guidimaka, Hodh Ech Chargui and Hodh El Gharbi regions, which received better rains. Overall, nearly 90% of all people exposed to the risk of a severe drought in the country are estimated to be affected at the end of the 2014 agricultural season.

These figures highlight the magnitude of this year's drought in Mauritania, and place **2014 amongst the most severe droughts since 2001**. The modelled impact is comparable to the droughts in 2011 and 2002, and more severe than the drought in 2004 (see Graph 3). It has to be noted, however, that these modelled population estimates only estimate the number of people directly affected by a drought in the country. They are not necessarily representative of the wider food security situation, which depends on various other factors such as non-rainfall related issues that affect agricultural production (locust invasions, floods, fertiliser use etc.), as well as broader food security indicators such as market prices, nutrition, food access etc. For instance, while the direct impact of the 2014 drought might be comparable to that of the drought in 2011, the food crisis in the Sahel in that year might have been more severe, having been exacerbated by locust invasions, high food prices and other factors occurring in the region that year.



GRAPH 3: DROUGHT AFFECTED POPULATION, MAURITANIA (2001-2014)

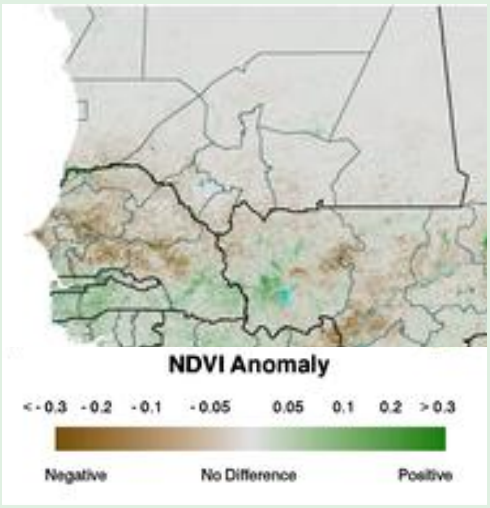
RESPONSE COST ESTIMATION

The response cost estimation, which ARV does in a fourth and final step, consists in the conversion of the numbers of affected people into **response costs**, based on a **pre-defined response cost per person** set by each country. The modelled response costs are the underlying basis of the insurance policies for countries that participate in the ARC insurance pool. 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. Given the drought conditions modelled by ARV, and the associated high response costs in Mauritania, **the country is eligible for a pay-out of around USD 6.3 million by the ARC Insurance Company Limited**. This pay-out is comparable to the pay-outs the country would have received in 2011 and 2002, had it participated in the ARC insurance pool then. It will be used to activate a Final Implementation Plan (FIP), which is currently being finalised based on the pre-defined Operations Plan that the country prepared as a pre-requisite for its participation in the insurance pool. The funds can be used exclusively to fund the drought response as outlined in the FIP, a subset of activities that were included in Mauritania's Operations Plan.

VALIDATION OF ARV WITH EXTERNAL SOURCES

The *Normalised Difference Vegetation Index (*NDVI) allows verification of ARV's estimates using satellite imagery that visualises the **progression of the vegetation** in West Africa. The latest NDVI images suggest that the current vegetation conditions are slightly below normal in most agricultural areas of Mauritania, confirming the assumption of a lower than normal performance of this year's agricultural season (see Map 12). The Famine Early Warning Systems Network (FEWS NET) also produces an independent WRSI model at the regional level. While only a very limited part of Mauritania is included in FEWS NET's WRSI calculation mask, the latest WRSI data available for West Africa indicates that a below average WRSI prevails in the country.

FEWS NET's Food Security Alert for Mauritania, published on 17 November 2014 also projects a poor harvest in some agricultural areas. The report indicates that **up to 600,000 people** in affected areas of the Senegal River Valley and neighbouring agro-pastoral livelihood zones are likely to **suffer from the effect of the drought**, which will result in below normal harvests and reduced agricultural employment opportunities, as well as increased prices. There is a high coincidence between the affected area highlighted by the Alert and ARV's population affected estimates.



MAP 12: EMODIS NDVI ANOMALY, WEST AFRICA (21-30 NOVEMBER 2014)

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*** **(ARV)** software is the technical engine of ARC. It uses satellite-based rainfall information to estimate the cost of responding to a drought, which triggers a corresponding insurance pay-out.
- The ***ARC Insurance Company Limited*** is the commercial affiliate of the ARC Agency, which pools risk across the continent through issuing insurance policies to participating countries.

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IMPLEMENTATION OF THE RESPONSE

As a pre-requisite for its participation in the ARC insurance pool, Mauritania was required to prepare a detailed **Operations Plan** which outlines the response options available to the country in case the trigger, or attachment level, defined in the country's ARV-indexed insurance contract is exceeded at the end of the season. This Operations Plan was reviewed and approved by the ARC Agency Governing Board, enabling Mauritania to enter into an insurance contact with ARC Insurance Company Limited. Given the below normal progression of the 2014 agricultural season, the ARC Secretariat started discussions with the Government of Mauritania before the end of the season. In view of the pay-out, the in-country **Technical Working Group is in the process of finalising the FIP**, which will determine which of the response options defined in the Operations Plan will be activated, taking into account ARV's modelled estimates and the situation on the ground. Once the FIP is submitted to and approved by the ARC Agency Governing Board Peer Review Mechanism, the pay-out will be released to the country. The implementation of the response will be closely monitored by the ARC Agency as well as through an external M&E process audit.