

# West Africa: The 2015 Season

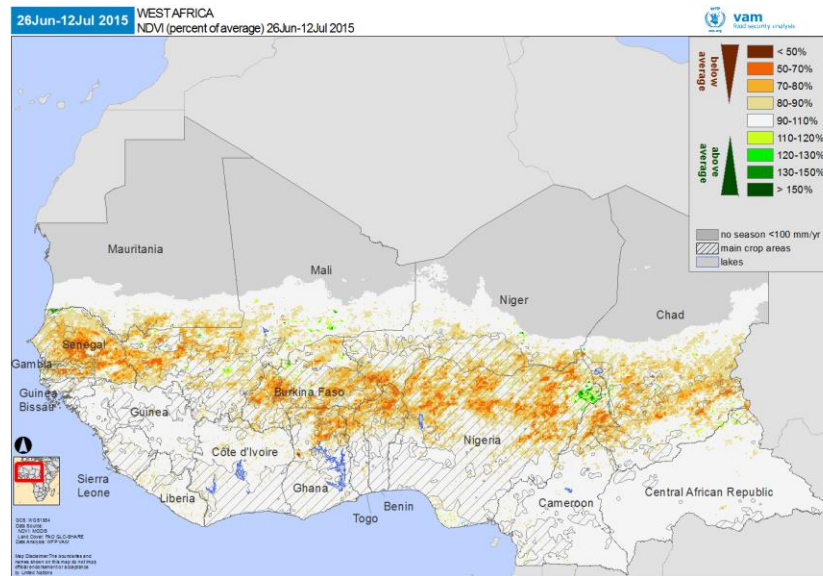
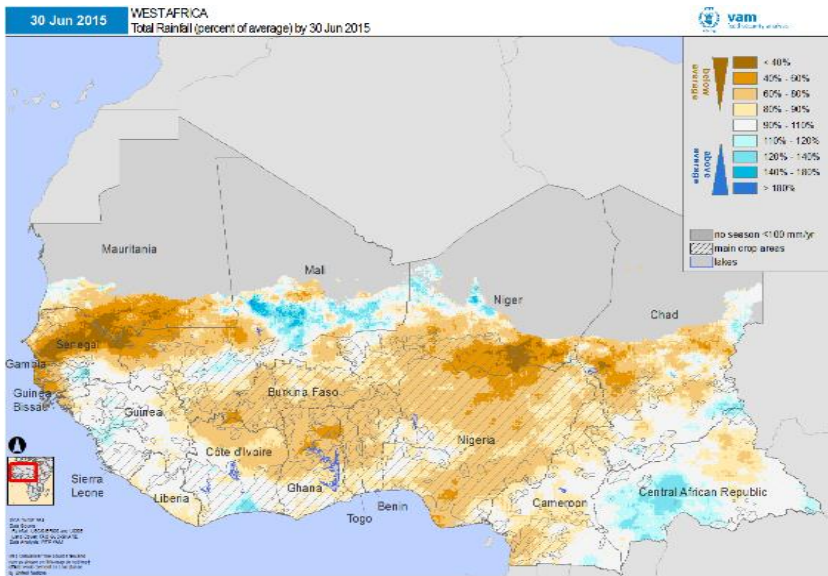


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## HIGHLIGHTS

- The West Africa 2015 growing season developed under an **evolving El Nino** event that will peak in late 2015. This region tends to have **seasonal rainfall deficits** in the more marginal areas during El Nino seasons.
- Accordingly, the **first stages** of the season (until mid July) were marked by pronounced **rainfall deficits** leading to delays in the start of the growing season and poor conditions for early crop development. This affected a wide region extending from Senegal, across Burkina and northern Nigeria, to Chad and eastern Niger.
- However, from mid July onwards, Atlantic sea surface temperatures became warmer than average off the West African coast and colder than average in the Gulf of Guinea. This enhanced rainfall in the Sahel; as a result, persistent wetter than average conditions from late July to September wiped out seasonal rainfall deficits and led to a full recovery in crop and pasture conditions. Near average crop production is now the expected seasonal outcome, though concerns remain in marginal areas of Chad and eastern Niger.
- These beneficial outcomes for the Sahel were however countered by much drier than average conditions along the Gulf of Guinea coast, from Liberia to southern Nigeria with Ghana particularly affected. This has hit the second cropping cycle in bimodal areas – seasonal rainfall forecasts for the next 3 months are pessimistic for this region and crop production is likely to be hit.

# The Season at a Glance...



## 1. March to June, off to a poor start...

Slower than average progress of the rainy season accompanied by significant rainfall deficits led to considerable delays in the start of the season and very poor conditions for early crop development, lasting until mid to late July.

*June 2015 rainfall as a percentage of the average and NDVI in early July 2015 as a percentage of the average. Warm shades for below average conditions, cool shades for above average levels.*

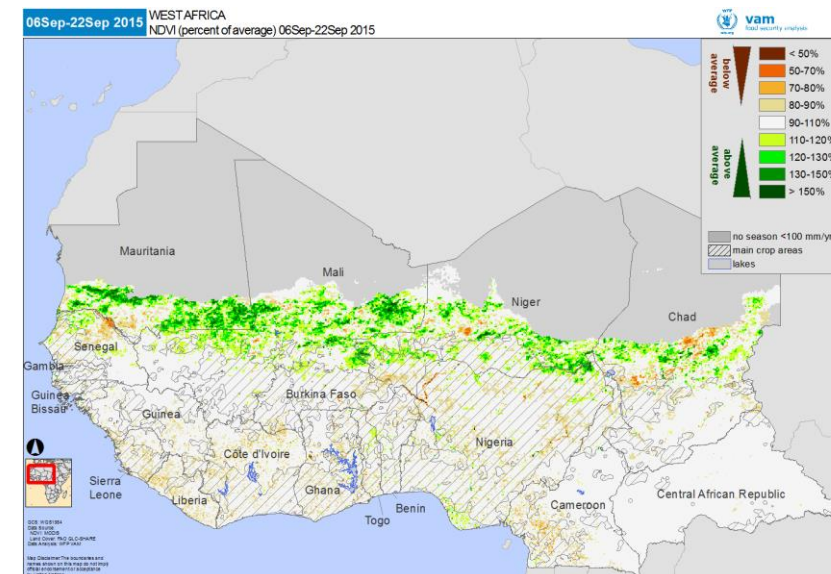
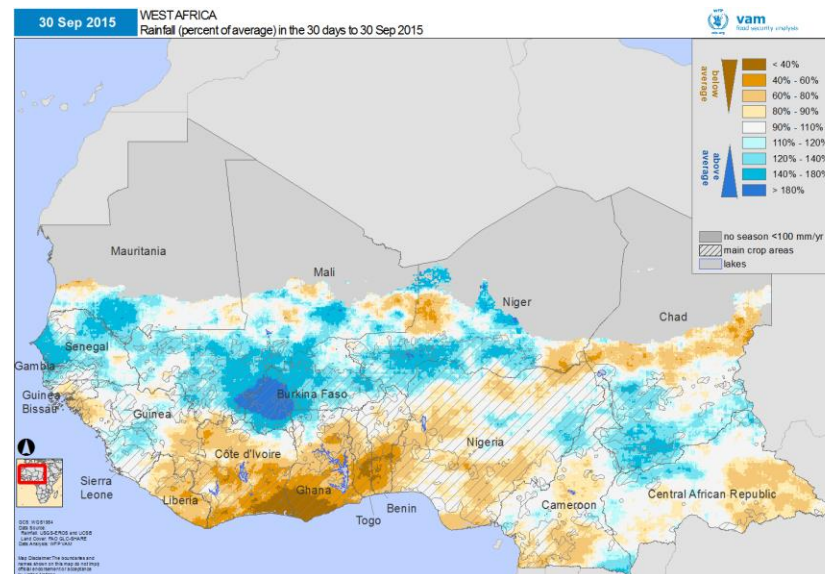
## 2.... Followed by a good recovery from July

From mid to late July onwards, a marked improvement in rainfall along the Sahel with regular and steady distribution led to a near full recovery in growing season conditions.

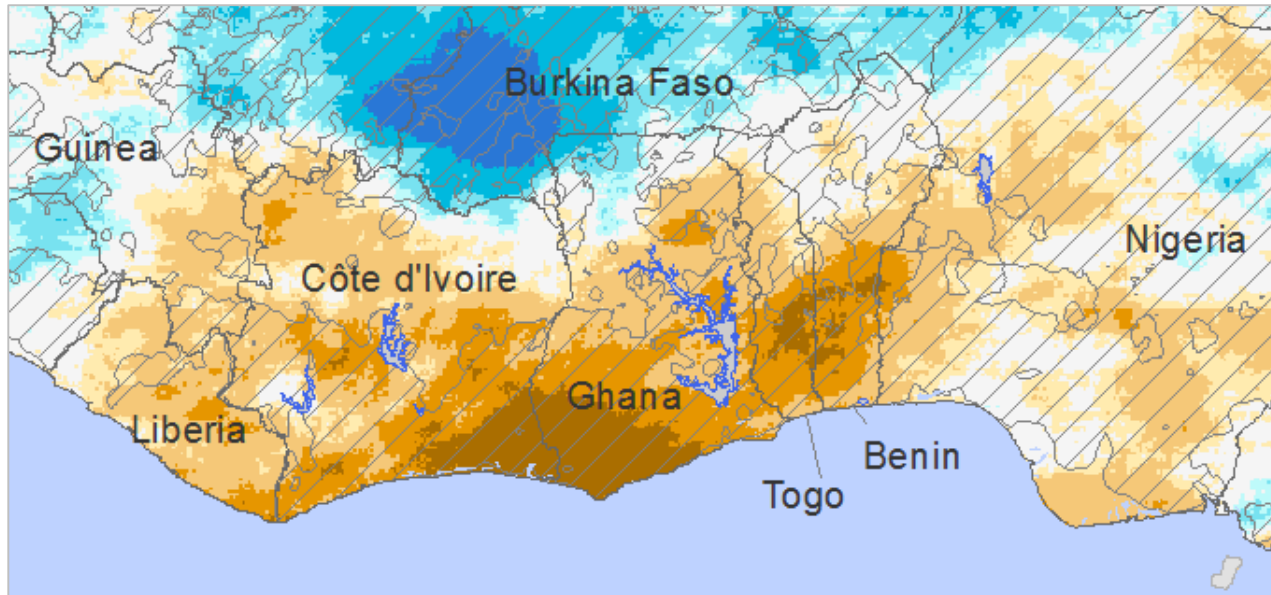
This was due to changes in sea surface temperature in the inter-tropical Atlantic, which became warmer off the west coast and cooler along the Gulf of Guinea – the effect was to reduce and largely eliminate El Nino effects in the Sahelian zone.

However, this also led to the spread of drier than average conditions along the Gulf of Guinea, in particular southern Ghana, Togo, Benin and southwest Nigeria.

*September 2015 rainfall as a percentage of the average and NDVI in mid September 2015 as a percentage of the average. Warm shades for below average conditions, cool shades for above average levels.*



# Areas of Concern: Ghana and Chad-Niger



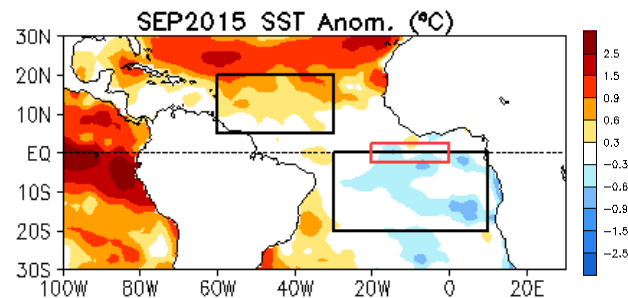
August 2015 rainfall as a percentage of the average and NDVI in early September 2015 as a percentage of the average. Warm shades for below average conditions, cool shades for above average levels.

## 1. Gulf of Guinea countries, in particular Ghana

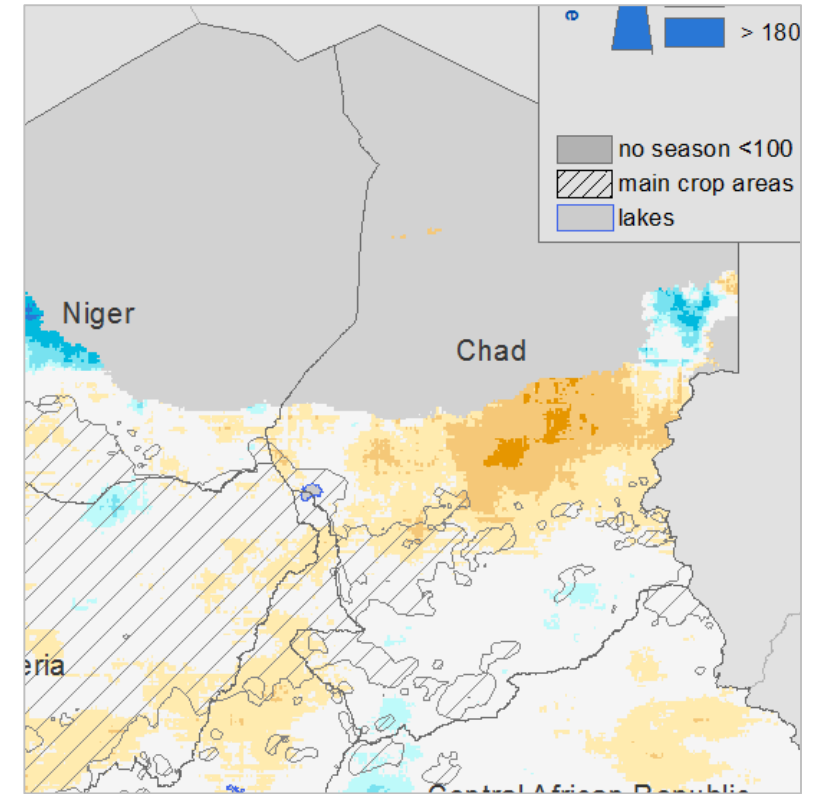
Shifts in Atlantic sea surface temperature patterns that saved the Sahel from what might have been a major drought, have in turn led to significant rainfall deficits affecting Gulf of Guinea countries (southern Ghana, Togo, Benin and southwest Nigeria) since late July.

The situation is more serious in Ghana: northern provinces of the country were part of the extensive Sahelian areas affected by early season dryness. After the reversal in rainfall patterns, it was the turn of the southern half of the country to be hit by lack of rainfall.

Northern cropping areas are now fully recovered from the early season drought. The current drought is severely impacting the second cropping season of maize and to a lesser degree that of cassava.



Warmer than average waters off the coast of West Africa and colder than average waters in the Gulf of Guinea, neutralized El Nino influences in the Sahel and led to drier than average conditions from Liberia to Nigeria.



## 2. Central Chad and eastern Niger

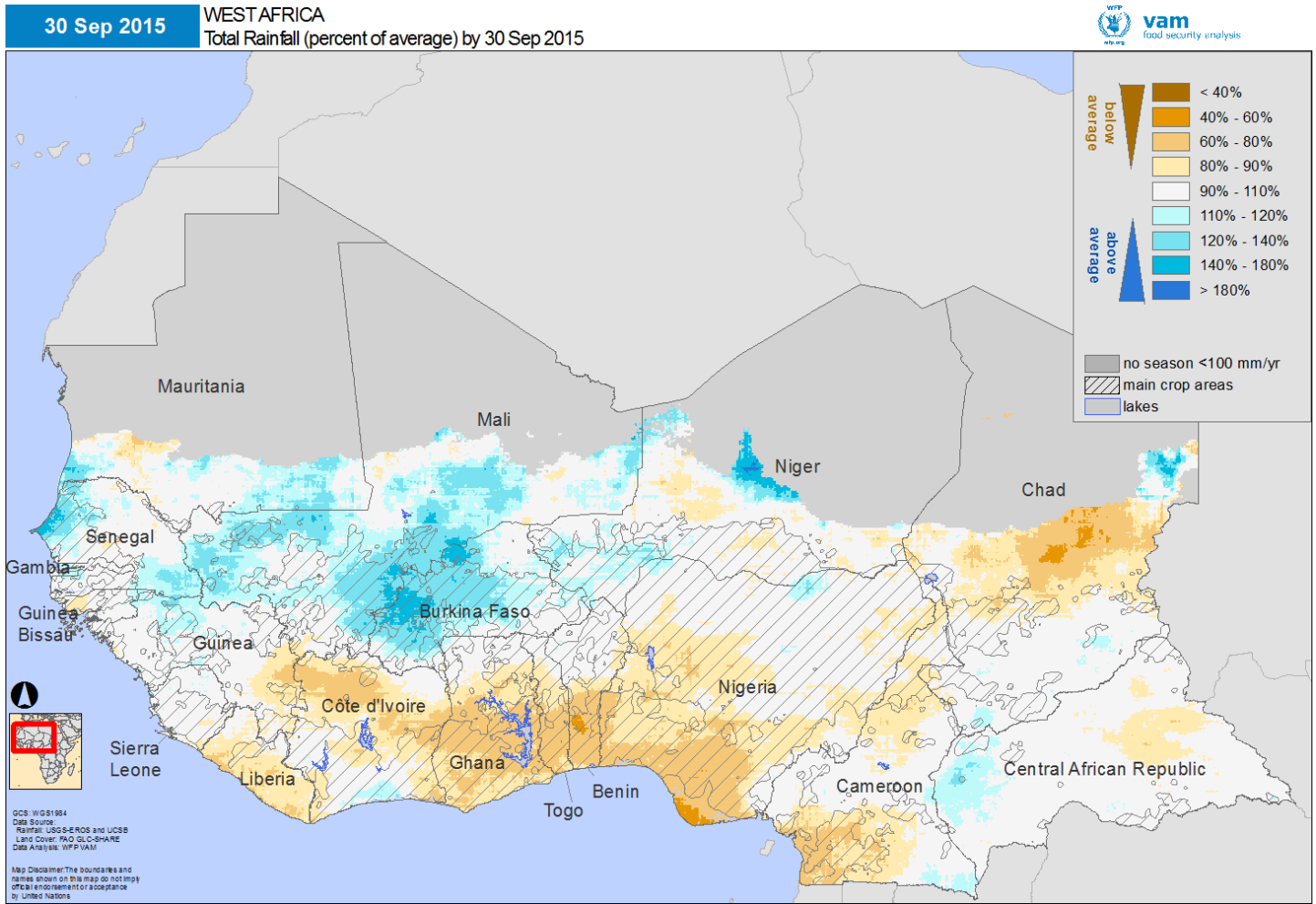
These regions were severely affected by the early season dryness, delaying the start of the agricultural season by 3 or more weeks. The situation only improved from early August onwards – in Chad this was mostly in the regions bordering Sudan; elsewhere there were improvements but drier than average conditions persisted and some impacts on crop production and pasture are likely.

# Current Status and Near Future Perspectives



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# Seasonal Performance



Seasonal cumulative rainfall until end of September 2015, as a percentage of the 20-year average.  
Hashed pattern indicates main agricultural areas.  
Brown shades indicate below-average rainfall; blue shades indicate above-average seasonal rainfall.

## After a bleak start, conditions turn favourable

Significant rainfall deficits dominated the early stages of the growing season across most of West Africa.

This situation lasted until mid to late July – by then, central areas of Senegal, southern Mauritania and western Mali had received less than half of the usual rainfall. South-eastern Niger, eastern Chad and northern Nigeria experienced similar conditions. Rainfall was also irregular and poorly distributed across northern Cote d'Ivoire, northern Ghana and Togo-Benin.

From late July onwards, there was a comprehensive reversal in this situation. This is linked to a particular pattern of sea surface temperatures in the Atlantic – warmer than average water off the coast of Senegal and colder water in the Gulf of Guinea. This pattern enhances rainfall in the Sahel and suppresses rainfall along the Gulf of Guinea coast (Cote d'Ivoire to Cameroon).

As a result, regular and above average rainfall spread across the Sahel, from August onwards. Seasonal rainfall deficits were nearly wiped out and a delayed agricultural season was able to develop normally. The rainfall season also lasted well, with abundant rains being registered until late September.

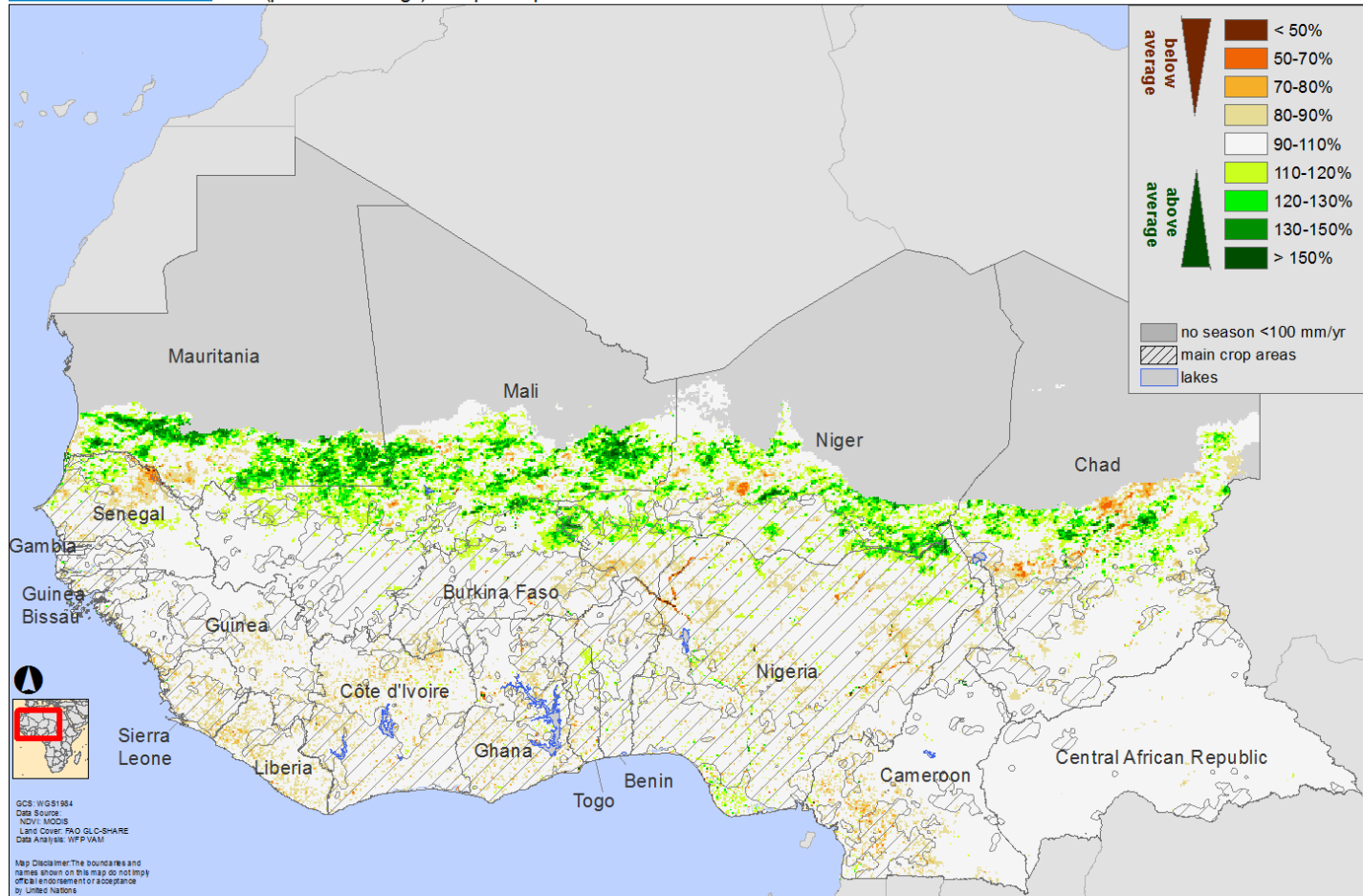
Conversely, rainfall was suppressed in the countries along the Gulf of Guinea, from Cote d'Ivoire to southern Nigeria. Ghana has been hit particularly hard: the northern areas endured drier conditions during the early stages of the season and the southern half rainfall deficits since late July.

# Seasonal Performance

06Sep-22Sep 2015

WEST AFRICA

NDVI (percent of average) 06Sep-22Sep 2015



NDVI by mid September 2015 as a percentage of the 12-year average.  
Hashed pattern indicates main agricultural areas.  
Brown shades indicate below-average vegetation; green shades indicate above-average seasonal vegetation.

## Favourable conditions for crops and pasture

The rainfall deficits extending across the Sahel in the early stages of the season, led to generalized delays in the onset of the growing season, or replanting and stressed early crop development where the season had started on time. The most affected areas, as revealed by satellite vegetation data, were located along a belt from Senegal across southern Mali, Burkina, northern Nigeria and central Chad.

The reversal of rainfall patterns led to a corresponding reversal in vegetation conditions: this is most noticeable across the Sahelian region, from Senegal to Chad.

Note that current above average vegetation in the Sahel does not imply better than average crop and pasture production: rather seasonal delays mean vegetation levels are typical of mid August rather than mid September i.e., higher than the average for this time of year.

South of the Sahel, a pattern of moderately but widespread below average vegetation indicates less favourable conditions.

Overall, crop production perspectives for the main cropping season are neutral: recent reports from Aghrymet point to variations in production of +3% to -11% compared with the average for the past 5 years.

Current dryness in Gulf of Guinea countries is affecting the second cropping cycle that is underway. Production perspectives remain unfavourable because of pessimistic rainfall forecasts until the end of the year.

# Outlook for the Remainder of the Season

## Seasonal timing

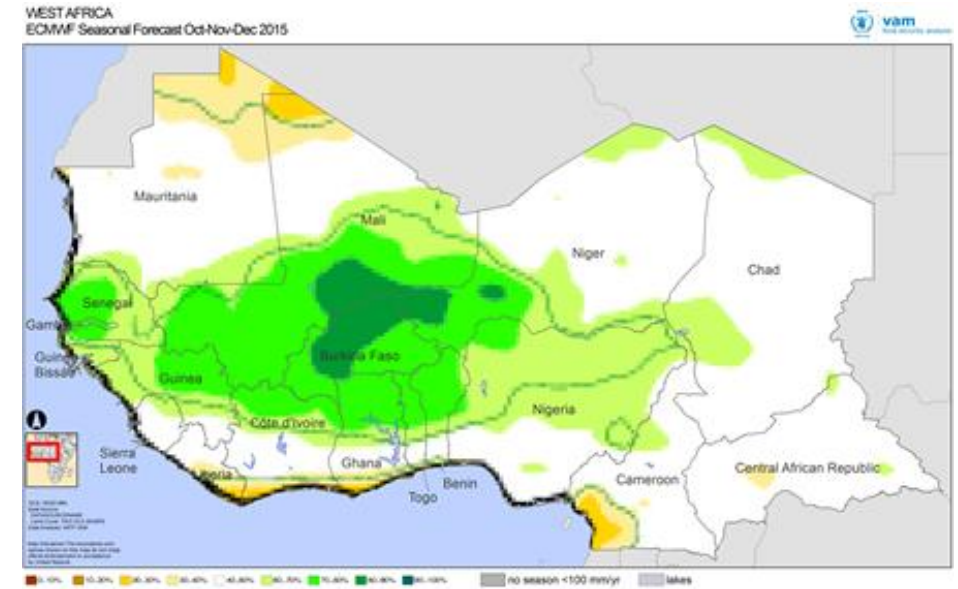
This Sahelian growing season is now approaching its last stages as the rains start their southwards retreat. By early November they are confined to Sierra Leone, Liberia, Cote d'Ivoire, Togo, Benin and to southern Nigeria.

## Late season forecast

Seasonal rainfall forecasts for this last stage of the season (October-December) point to above average rainfall across the region, except for the Gulf of Guinea coast which is forecast to keep enduring drier than average conditions.

This should translate into a later than usual end to the rainy season accompanied by wetter than average conditions.

With good moisture supply crops should conclude their development cycle leading to late and extensive pasture development along the more marginal regions dominated by pastoral livelihoods.



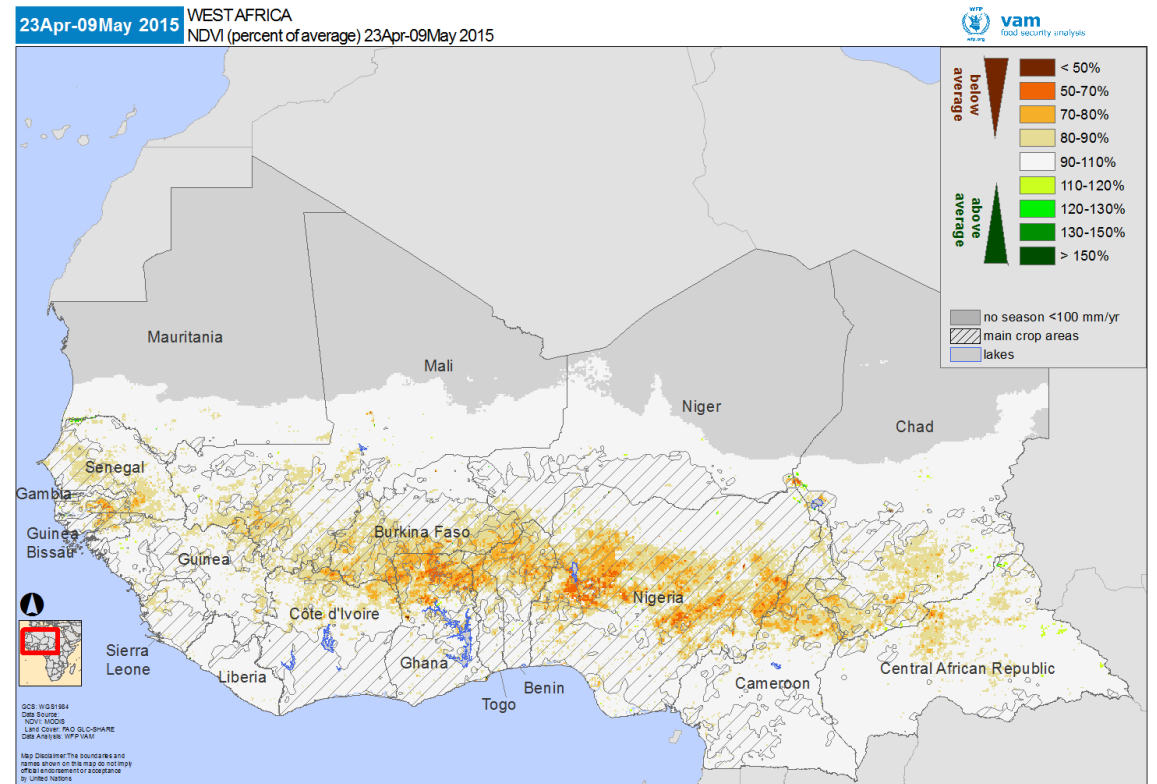
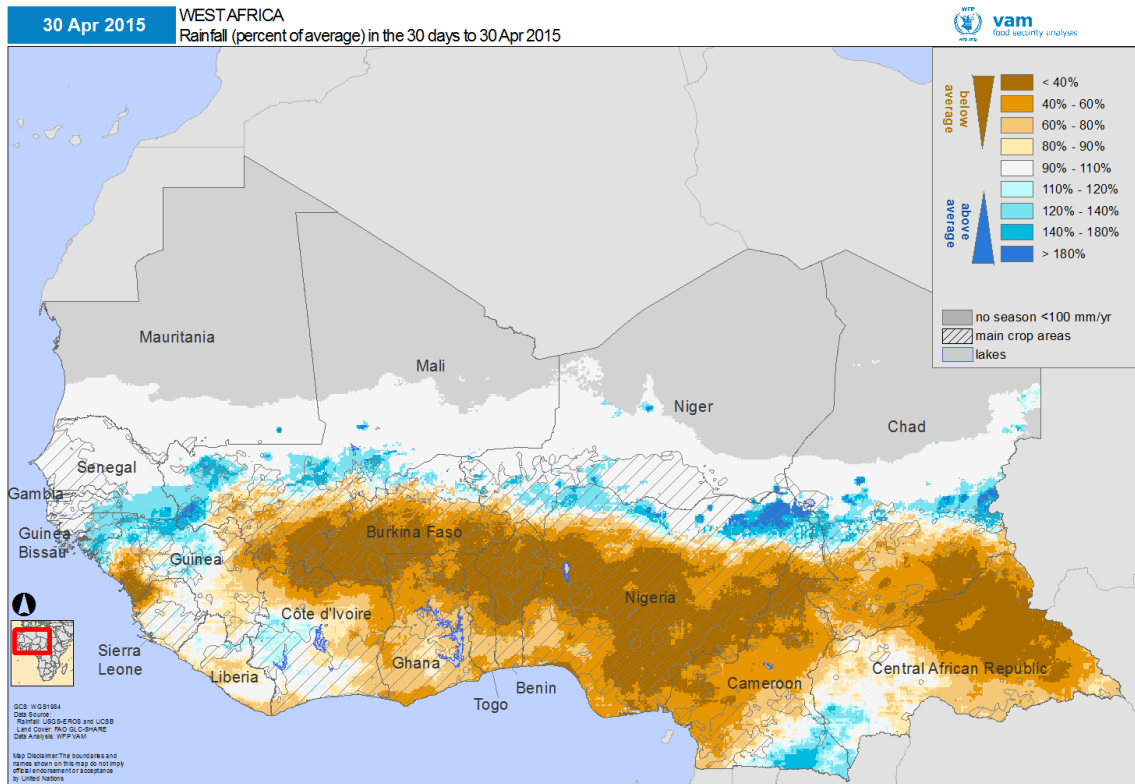
ECMWF forecast for October-December 2015 rainfall.  
Green shades = wetter than average conditions more likely.  
Brown shades = drier than average conditions more likely



# The Season: Month by Month



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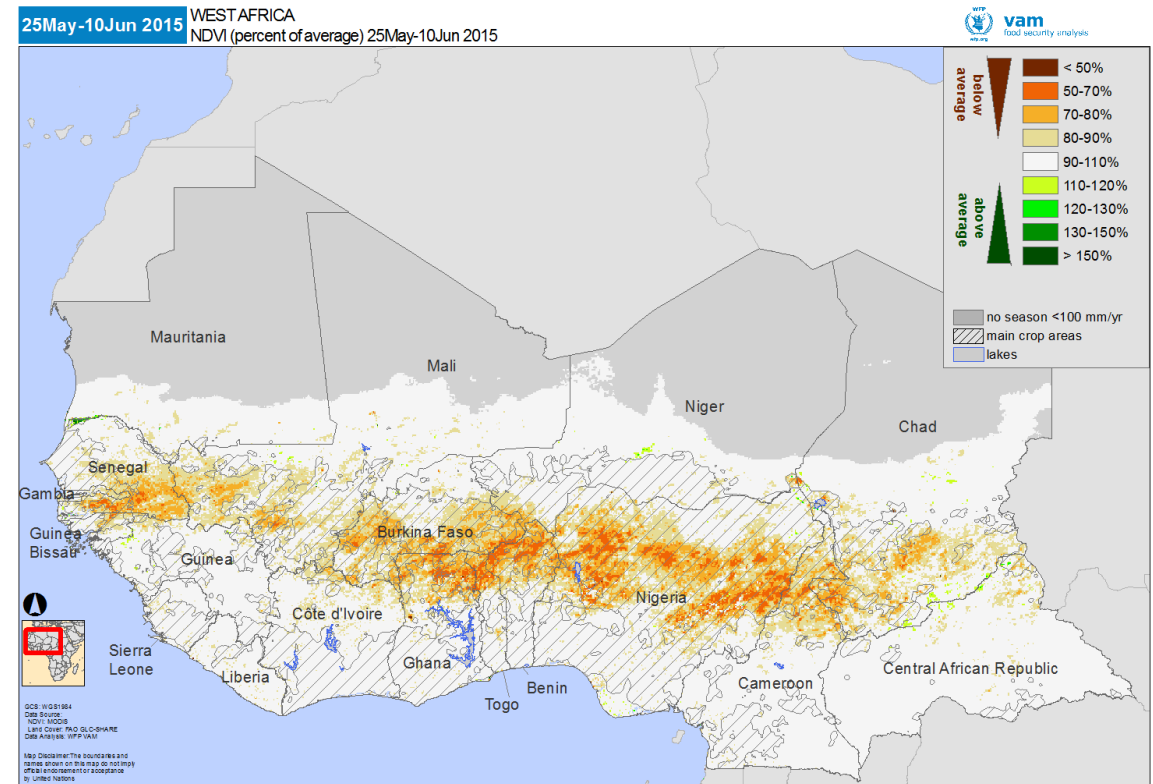
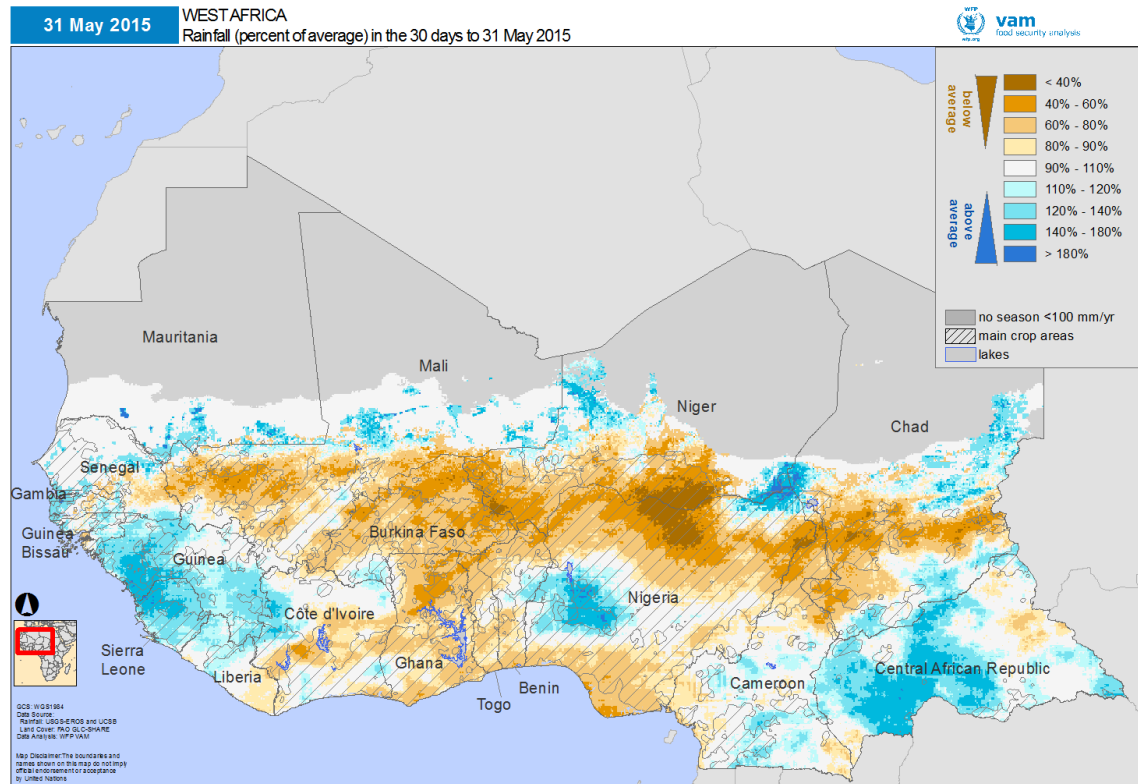
April 2015 rainfall as a percentage of the 20-year average (left). Brown shades for drier than average, blue shades for wetter than average conditions.

Early May 2015 vegetation index as a percentage of the 12-year average (right). Orange shades for below-average, green shades for above-average vegetation.

Hashed pattern indicates main agricultural areas.

April marks the early stages of the growing season across the regions of West Africa south of the Sahel. In 2015, severe rainfall deficits were widespread from Burkina Faso to southern Chad and eastern CAR and further south across Ghana and western Cameroon. This was due to a slower than usual northwards advance of the African monsoon.

This delayed the start of the growing season and led to lower than average vegetation cover across wide areas.



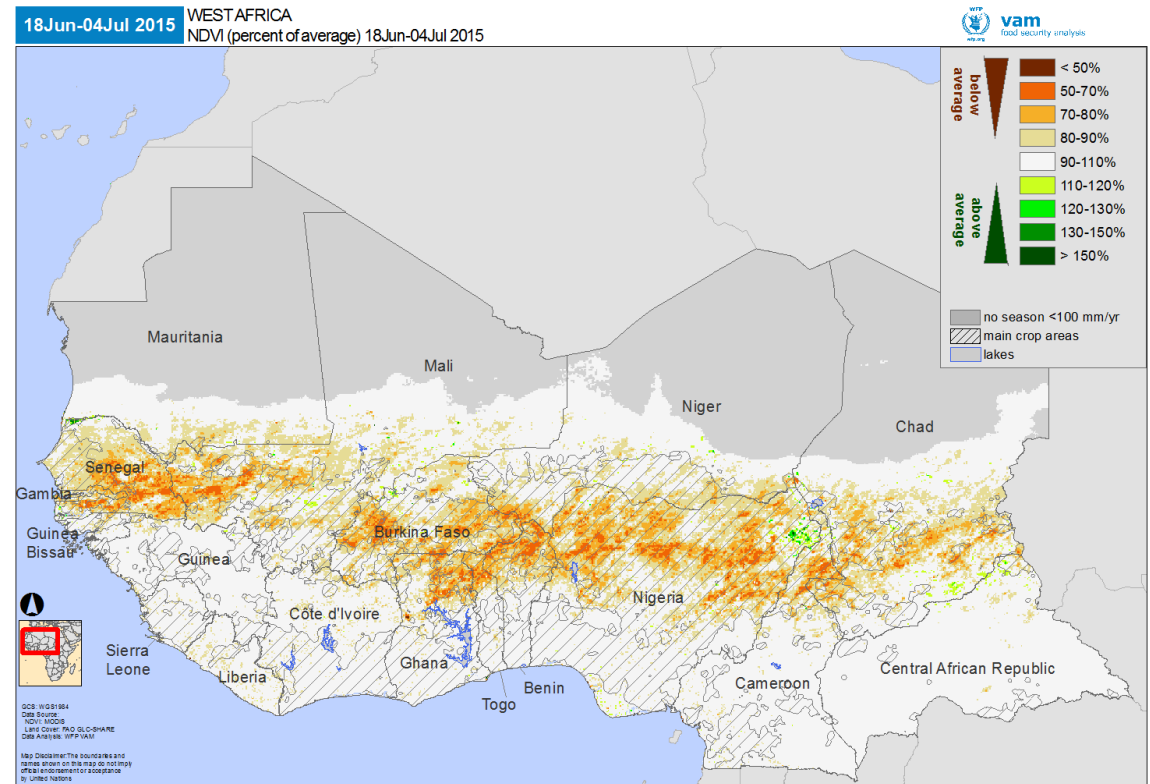
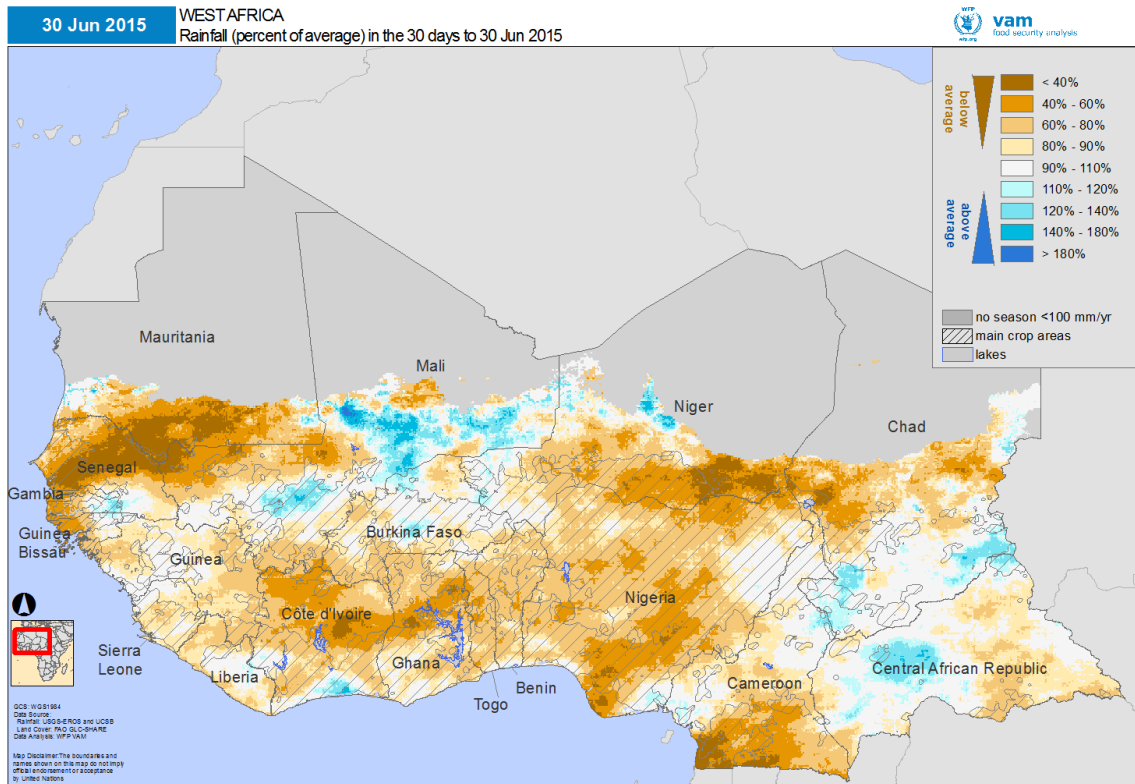
May 2015 rainfall as a percentage of the 20-year average (left). Brown shades for drier than average, blue shades for wetter than average conditions.

Early June 2015 vegetation index as a percentage of the 12-year average (right). Orange shades for below-average, green shades for above-average vegetation.

Hashed pattern indicates main agricultural areas.

In May, as the rains moved northwards, there was an improvement in conditions in western (Cote d'Ivoire to Senegal) and eastern areas (Cameroon, CAR). However, significant rainfall deficits persisted in Ghana, Burkina Faso, Mali, southern Niger, northern Nigeria and western Chad because of slow movement of weather systems and lower than average rainfall.

This had clear impacts on vegetation levels, with lower than average cover intensifying and spreading across a wide belt from southeast Senegal to southwest Chad.



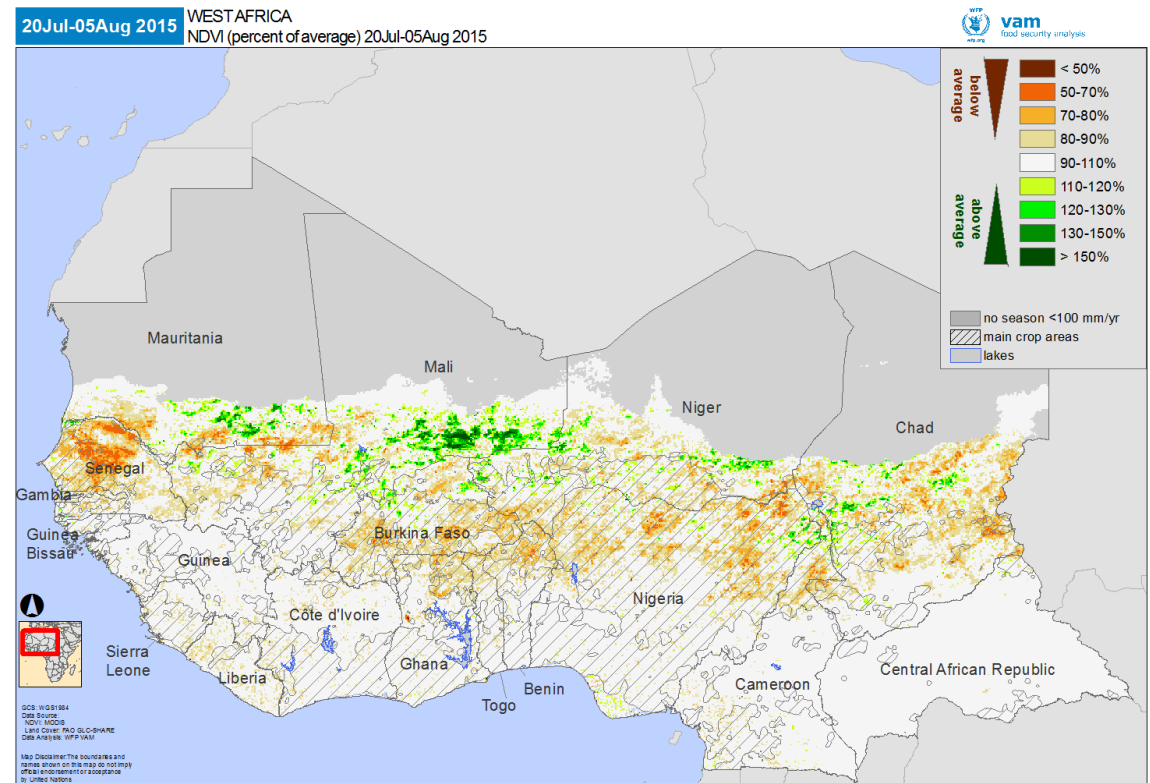
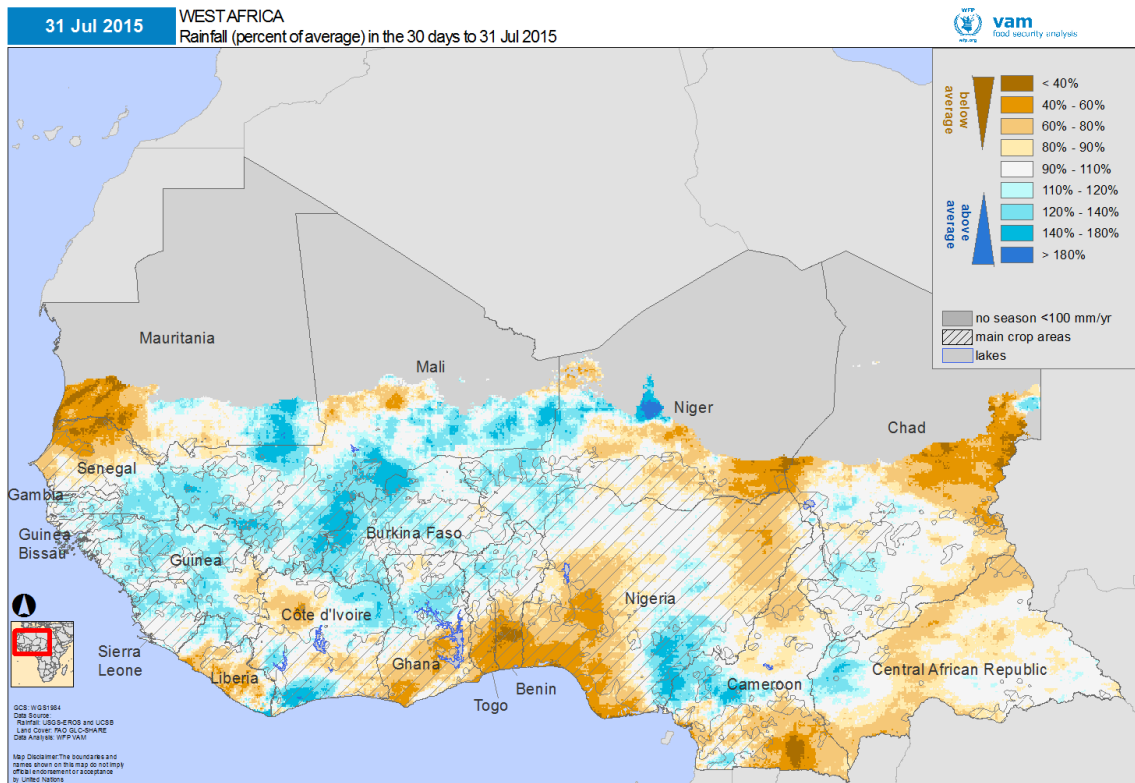
June 2015 rainfall as a percentage of the 20-year average (left). Brown shades for drier than average, blue shades for wetter than average conditions.

Early July 2015 vegetation index as a percentage of the 12-year average (right). Orange shades for below-average, green shades for above-average vegetation.

Hashed pattern indicates main agricultural areas.

June was characterized by drier than average conditions extending over almost all of the region with the exception of western Mali and the Chad-CAR border areas. There were very severe rainfall deficits (down to about a third of the average) in Senegal, Mauritania and in eastern Niger. Drier than average conditions persisted from Ghana to Nigeria.

This intensified the below-average vegetation cover patterns, extending them further north. Delays in the start of the agricultural season and very poor early stages of crop development were the norm across vast areas. Most severe impacts were felt in eastern Senegal, Burkina, northern Ghana and parts of northern Nigeria.



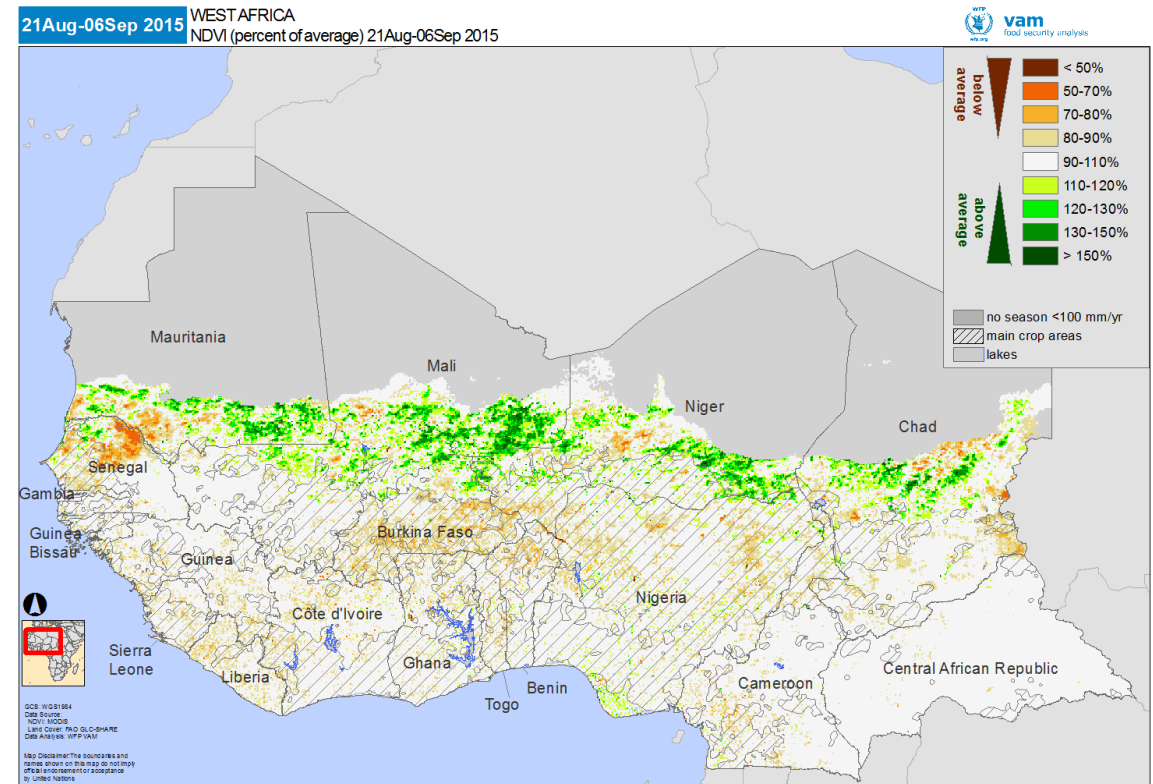
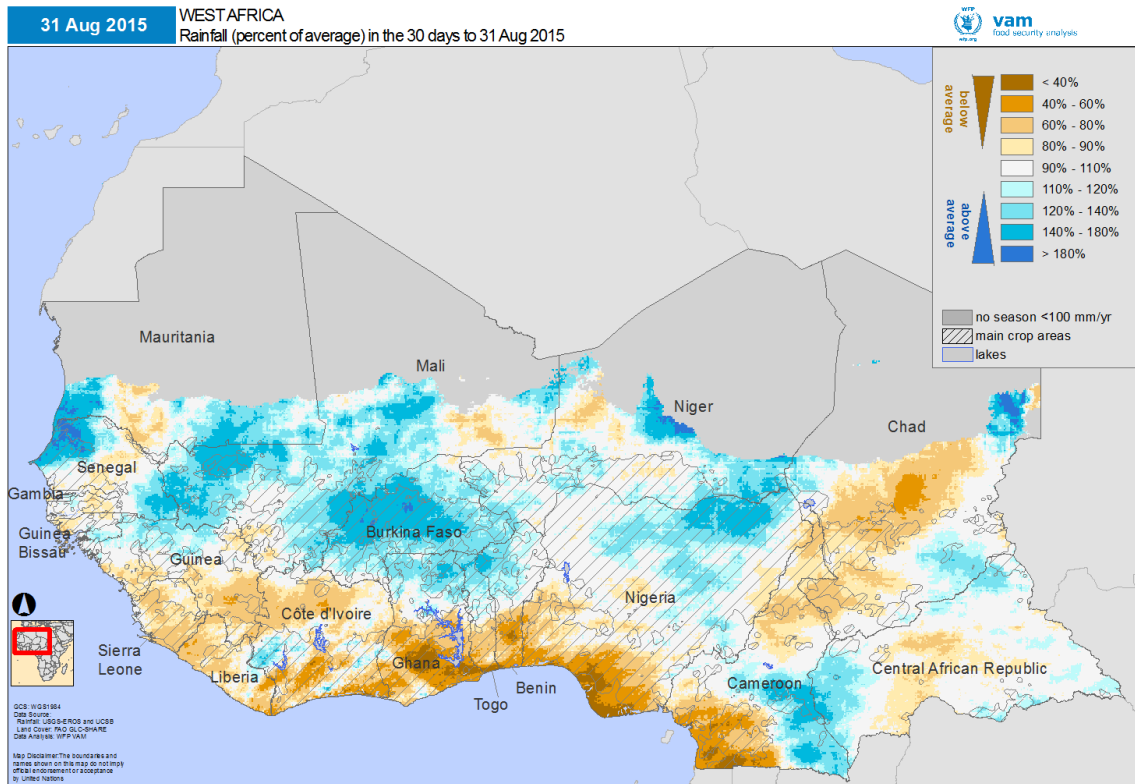
July 2015 rainfall as a percentage of the 20-year average (left). Brown shades for drier than average, blue shades for wetter than average conditions.

Early August 2015 vegetation index as a percentage of the 12-year average (right). Orange shades for below-average, green shades for above-average vegetation.

Hashed pattern indicates main agricultural areas.

In mid July, there was a dramatic change in conditions thanks to warmer than usual sea surface temperature patterns off West Africa and colder than usual temperatures in the Gulf of Guinea. This balanced the El Nino influences that had prevailed until then. As a result, wetter than average conditions became dominant across the region except for NW Senegal, eastern Niger and eastern Chad. On the flip side, there were rainfall deficits from southern Ghana to SW Nigeria– also linked to the same changes in Atlantic Ocean sea surface temperature patterns.

As a result, vegetation levels improved across the region, bringing them close to average, or even to above average levels in the more marginal areas of eastern Mali.



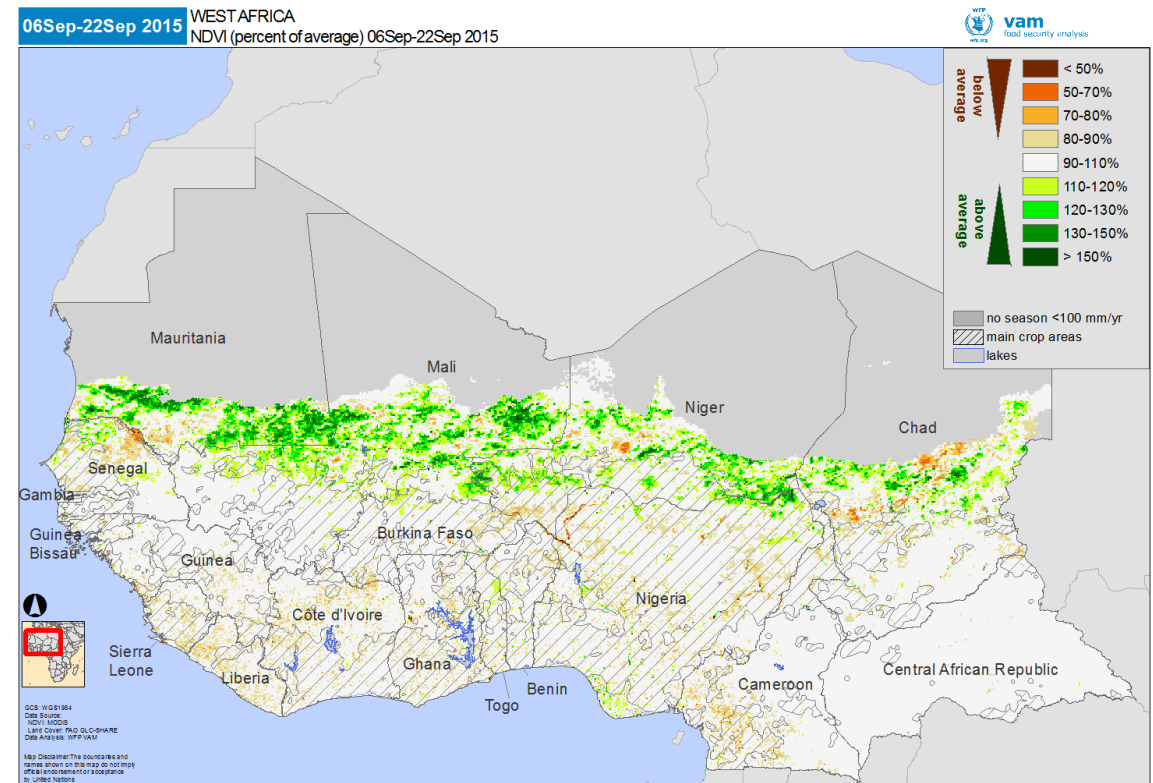
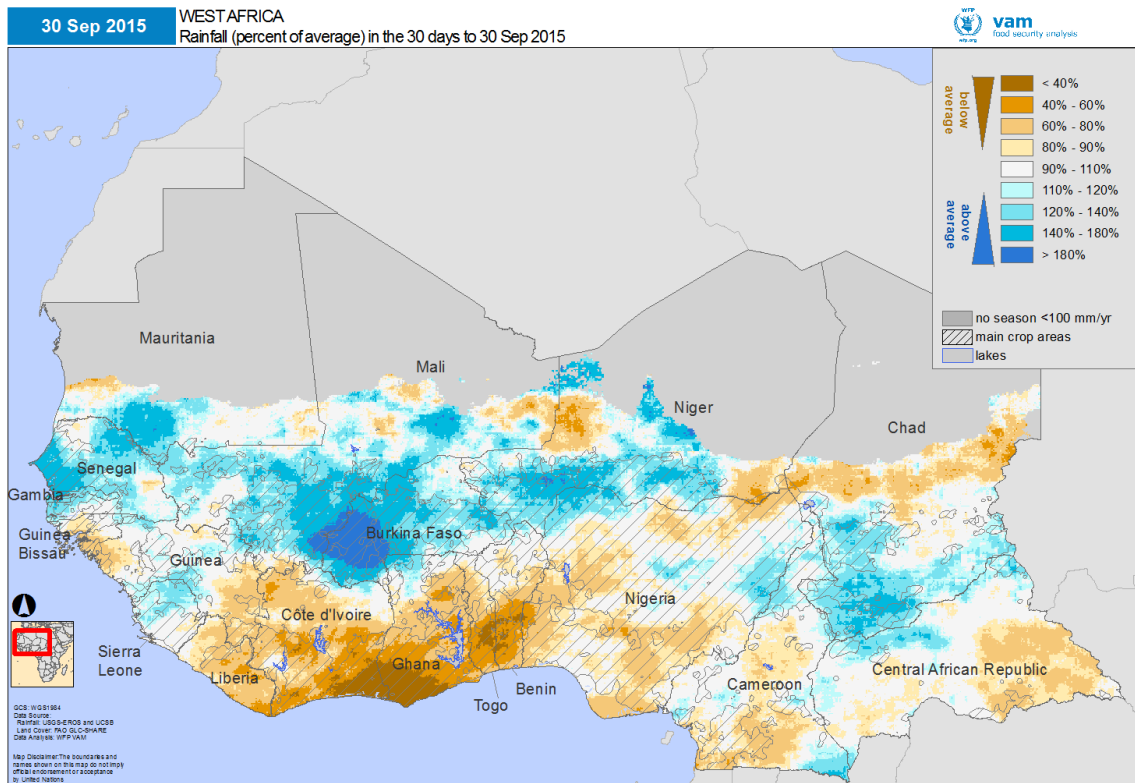
August 2015 rainfall as a percentage of the 20-year average (left). Brown shades for drier than average, blue shades for wetter than average conditions.

Early September 2015 vegetation index as a percentage of the 12-year average (right). Orange shades for below-average, green shades for above-average vegetation.

Hashed pattern indicates main agricultural areas.

August saw a continuation of the same rainfall pattern that made its appearance in mid July: heavy and above average rainfall across most of the region, accompanied by a belt of marked rainfall deficits along coastal regions from Sierra Leone to southwest Cameroon; away from the coast, rainfall deficits were only noted in central Chad.

As a result of the steady wetter than average conditions, vegetation cover continued to improve, becoming above average from the Sahelian marginal areas to the north (Mauritania/Senegal across Mali, Niger and up to the Chad/Sudan border). Elsewhere, vegetation approached average levels.



September 2015 rainfall as a percentage of the 20-year average (left). Brown shades for drier than average, blue shades for wetter than average conditions. Mid September 2015 vegetation index as a percentage of the 12-year average (right). Orange shades for below-average, green shades for above-average vegetation. Hashed pattern indicates main agricultural areas.

The same broad rainfall pattern in place since mid July continued into September: wetter than average conditions along the Sahel region and persistent rainfall deficits in the Gulf of Guinea countries, in particular from eastern Cote d'Ivoire to southern Benin. Eastern Niger and marginal areas of central Chad returned to drier than average conditions during September.

Vegetation development continued to improve – delayed growth led to above average vegetation along the Sahelian marginal areas from Mauritania/Senegal to the Chad/Sudan border). Elsewhere, vegetation remained close to average levels.

## Data Sources:

Rainfall: CHIRPS, Climate Hazards Group, UCSB

Vegetation: MODIS NDVI, EOSDIS-NASA

Land Cover: FAO GLC-Share

## Processing:

VAM software components, ArcGIS

## For more information, please contact:

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