

# El Nino: Implications and Scenarios for 2015



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# El Nino: Regional Highlights for 2015-2016

Red=Negative; Orange=Watch; Green=Positive

The current El Nino will last through 2015 and extend into early 2016. The intensity of the event is now increasing towards the peak expected in late 2015. It may become one of the strongest El Nino on record.

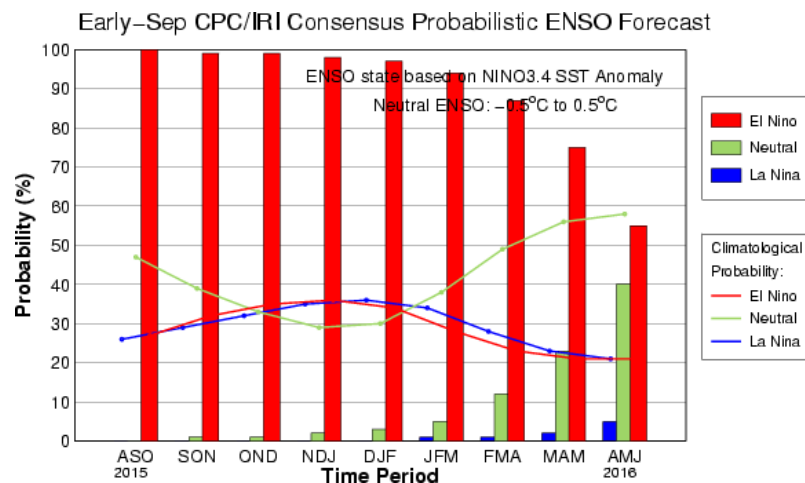
Region	Current Status	Outlook	Likely Outcomes
Central America	Widespread drought during Primera (first) season, which provides the bulk (>60%) of the regional maize annual production.	Pessimistic perspectives for the Postrera (second) growing season, providing most of the bean crop.	The region is likely to suffer two consecutive poor growing seasons. Most affected are Haiti, Salvador, Honduras, Guatemala and Nicaragua. Affected countries maize production may drop 20% (FAO).
West Africa	In the Sahel, after a very poor start, a close to full recovery is expected. Dry conditions in the Gulf of Guinea countries since late July.	Wetter than average and later than usual end of the rainfall season. Continuing drier than average conditions for the Gulf of Guinea countries.	No major impacts expected. Some localized areas may suffer effects of delayed season and early season deficits. Only central Chad shows seasonal deficits of some significance. The situation for Gulf of Guinea countries requires monitoring.
East Africa	Ethiopia (north and central) facing a dry second (main) season after an already poor first season. Drier than average conditions affecting Sudan, Eritrea and Djibouti. Dryness now affecting areas of South Sudan (East).	Ethiopia and Sudan end of season rainfall (till mid October) likely at average levels at best. South Sudan may face drier than average conditions during last stages of rainfall season.	Ethiopia expected to face two consecutive poor seasons and severe impacts on Afar pastoral areas. Sudan to face rainfed production shortfall unless later rains improve markedly. South Sudan late harvests may be affected by continuing dryness.
Indian subcontinent and South Asia	Favourable season in Pakistan and Afghanistan. India and most of SE Asia countries with an unfavourable monsoon season. Philippines (main season), Indonesia (secondary season) also drier than average.	Indonesia and Pacific islands expected to endure drier than average conditions until early 2016.	Strong negative impacts already felt in PNG are likely to worsen. Indonesia expected to face impacts on national crop production, and on livelihoods of poorer communities in eastern province.
Horn of Africa	Short rains season: October to December	Above average rainfall expected for the region in accordance with typical El Nino impacts. Rainfall may reach excessive amounts, durations or intensities.	Possibility of floods along Somalia and Kenya's river systems. Favourable pasture and marginal agricultural conditions in arid and semi-arid areas due to enhanced rainfall.
Southern Africa	Season: October to April	Likelihood of drier than average conditions affecting the growing season over most of the region.	Likelihood of maize production shortfalls in South Africa (main producer), Zimbabwe and Malawi (risk of impact of large cereal deficits on vulnerable populations). Outcomes crucially dependent on rainfall during planting and flowering stages of the maize crop.

# Evolution of the El Nino Event of 2015-2016

## Onset & Duration

The on-going El Nino event started (was officially declared) in March, will remain active throughout 2015 and is very likely to extend into the first quarter of 2016.

The Event is now strengthening towards its peak intensity which should be reached in late 2015.



Plot shows the probability of an El Niño event taking place (red bars) versus those of conditions turning neutral or towards a La Niña event (green and blue bars respectively).

El Niño probabilities remain very high: above 90% until the first quarter of 2016.

Source: International Research Institute and NOAA's Climate Prediction Centre.

## Intensity

Current forecasts from a variety of international institutions unanimously favour a strong El Niño at its late 2015 peak. There is a significant chance that this event could be close or even exceed the strongest levels on record.

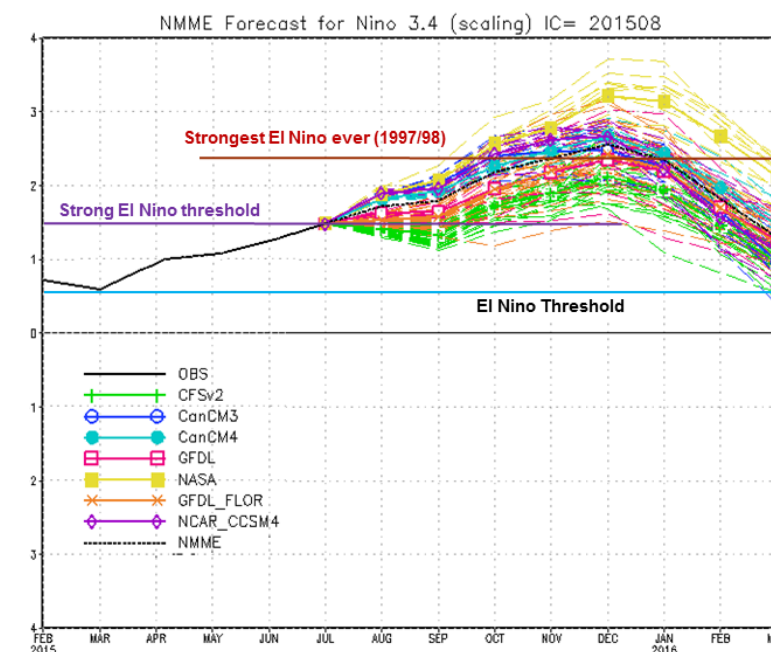
### The evidence

Forecasting centres run many models in groups ("ensembles"), each model with a slightly different behaviour related to the uncertainties about the state of the ocean and atmosphere.

As the models forecast the El Niño evolution into the future, they diverge more and more. This divergence allows us to figure out how certain we can be about a certain outcome.

This analysis (plot shown right) allows us to know that:

- We are sure to endure an El Niño event until early 2016 – all models are well above the El Niño threshold
- The El Niño is extremely likely to peak above the "Strong" threshold – nearly all models go over this threshold
- The peak intensity remains fairly uncertain – there's a considerable spread in the forecast "plume"; however, a record breaking El Niño remains a possibility



# WFP Regions: Current Growing Seasons

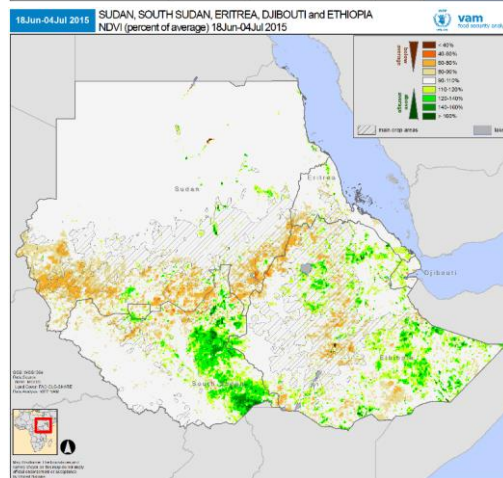
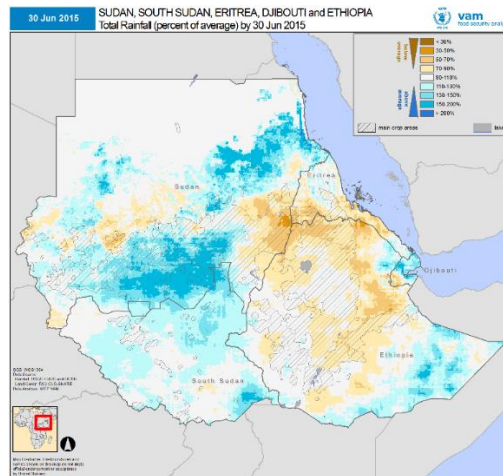


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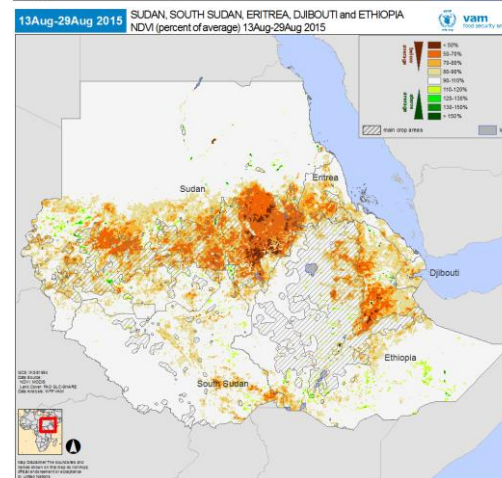
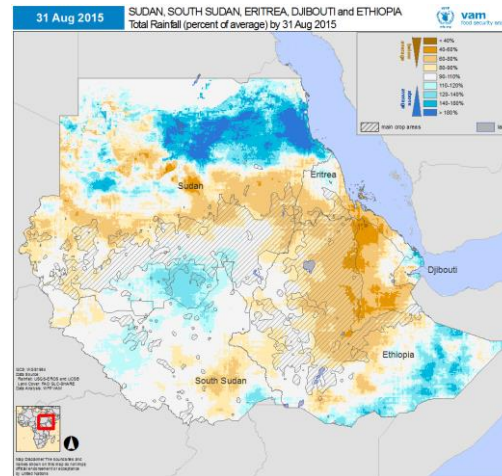
## Recent Changes and Current Status

### Late June



Seasonal rainfall by end of June (above) and NDVI in late June (below) both as percent of average. Blues and greens for above average, oranges and browns for below average

### Late August



Seasonal rainfall by end of August (above) and NDVI in late August (below) both as percent of average. Blues and greens for above average, oranges and browns for below average

## Summary

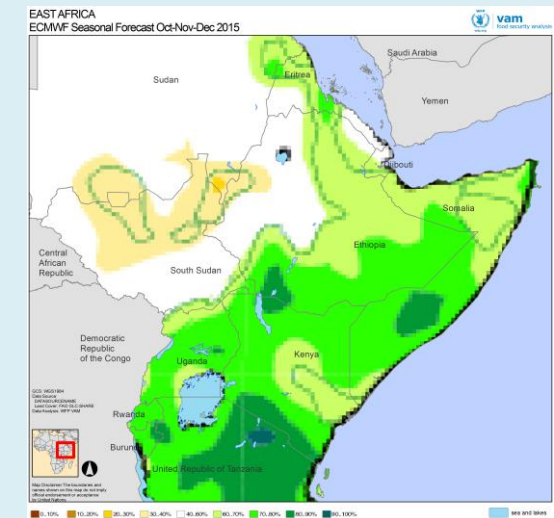
After the end of August, the growing season enters its last stages in the more northern areas of this region (Sudan, N Ethiopia), while in South Sudan and SW Ethiopia it extends into late November.

Ethiopia faces a delicate situation with widespread rainfall deficits affecting northern and central Ethiopia, including bimodal areas which had already endured a very poor first season (Belg, March to May). Pastoralist areas are particularly affected. Similar situations affect Djibouti and Eritrea.

In South Sudan and southern areas of Sudan, after a good start of the season, conditions turned dry from early July, with strong rainfall deficits in the semi arid areas from Darfur to the major crop regions of eastern Sudan. Better rains in August improved the situation, but above average rainfall in September is required to avoid significant impacts on rainfed crop production, particular of the poorer subsistence farmers.

Eastern regions of South Sudan (Central and East Equatoria and Jonglei) have been affected by rainfall deficits in July and August; impacts on local crop production may result if these conditions last during the late stages of the season.

## Outlook



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

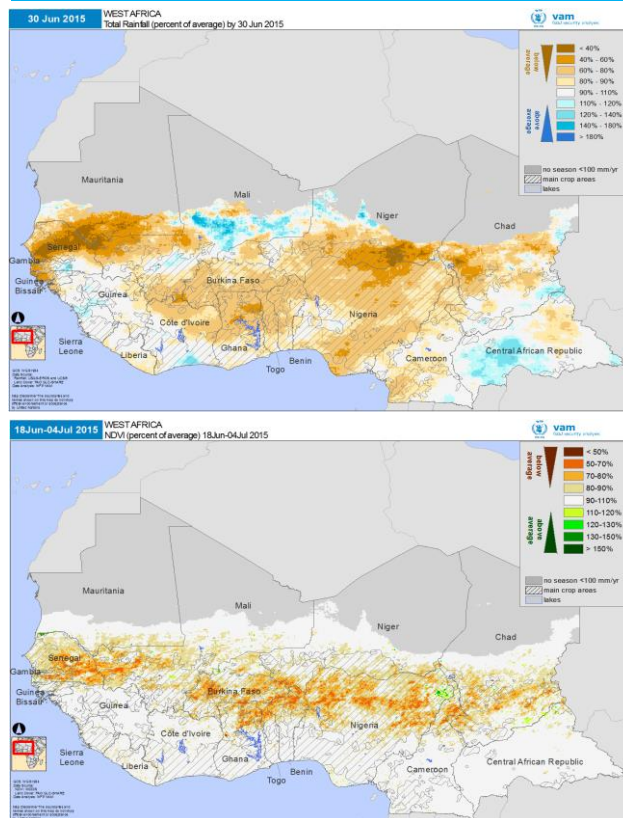
### Forecasts for late stages of season:

Forecasts for the later stages of the season from ECMWF and IGAD indicate below or near average rainfall for Sudan, northern Ethiopia and parts of South Sudan. Major improvements in pasture and crop status in these areas are unlikely.

Significant impacts on pasture and crop production are therefore expected for Sudan, Ethiopia, Eritrea and Djibouti.

Perspectives for South Sudan are less well defined, with possible impacts in southern areas of the country.

## Late June



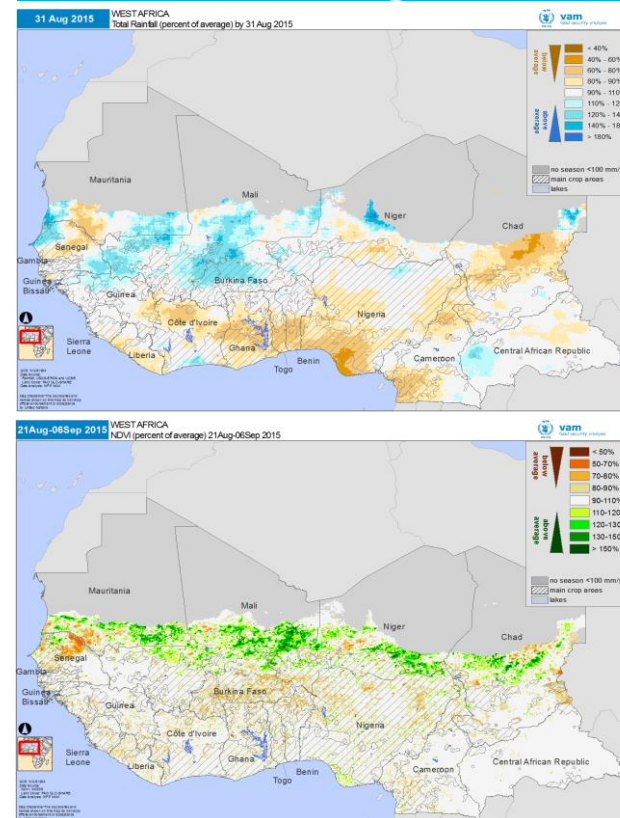
Seasonal rainfall (above) and NDVI (below) in late June, as a percentage of average. Blues and greens for above average, oranges and browns for below average

## Summary

After the end of August, the Sahelian growing season enters its last stages.

There have been remarkable changes in the situation – after a fairly poor start of the season, enhanced rainfall from mid July onwards led to a noticeable recovery in conditions, with cumulative rainfall and vegetation reaching on or above average levels, except for areas of central Chad.

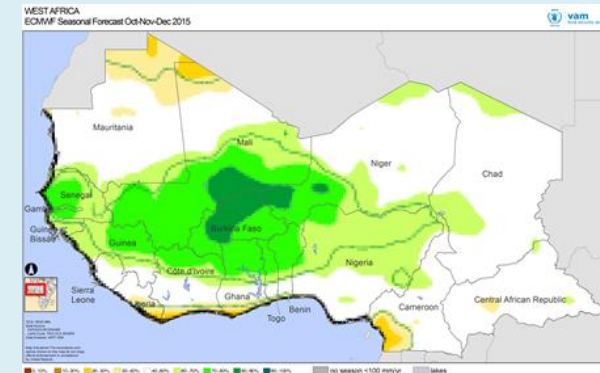
## Late August



Seasonal rainfall (above) and NDVI (below) in late August, as a percentage of average. Blues and greens for above average, oranges and browns for below average

This reversal is due to a change in sea surface temperature patterns in the Atlantic; from July these became warmer on the west coast, colder in the Gulf of Guinea, which has the effect of balancing and overcoming earlier El Nino influences.

The flipside is the spread of markedly drier than average conditions from the southern half of Ghana to southern Nigeria and SW Cameroon.



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

## Forecasts for late stages of season:

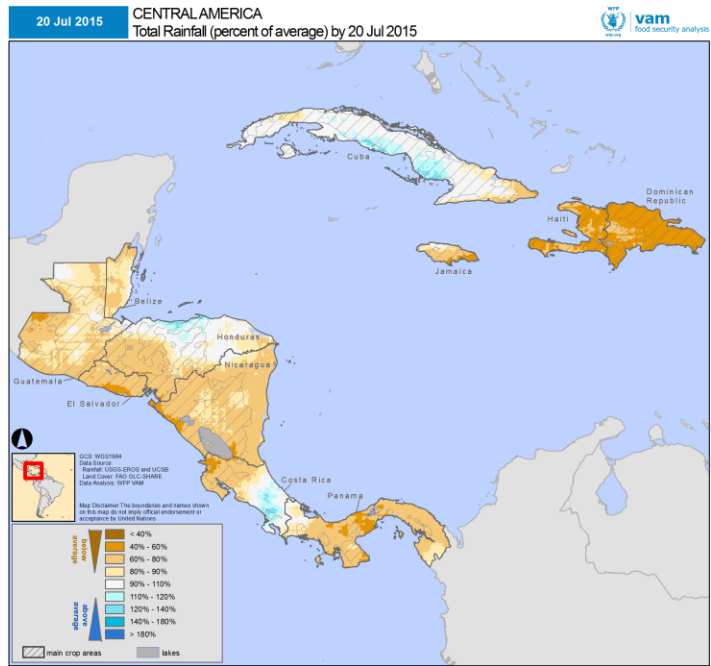
The October-November period includes the last stages of the Sahelian season and the second season in the countries and regions of the Gulf of Guinea.

Current forecasts for this period indicate above average rainfall across the Sahelian region. A later than usual end of the rainfall season is likely, which should enable a full recovery in crop and pasture development.

In contrast, the Gulf of Guinea coastal regions are likely to face continuing drier than average conditions.

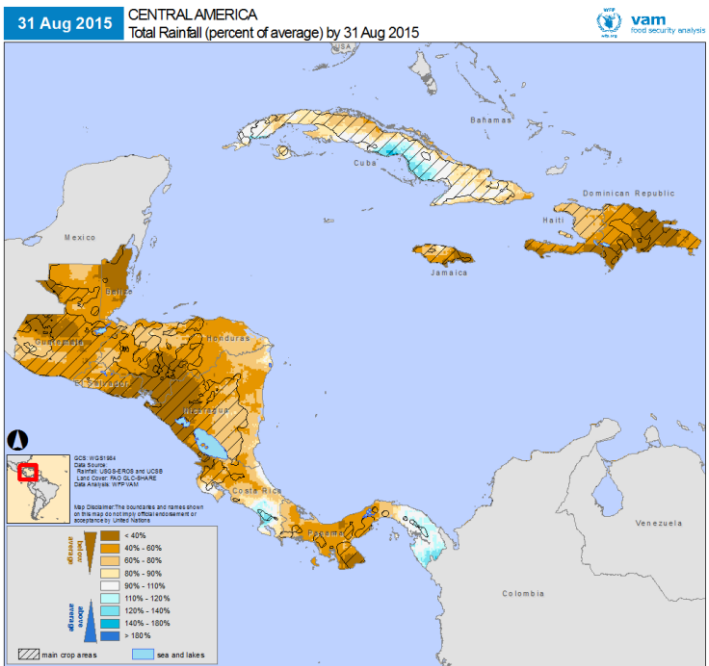


## End of Primera Season

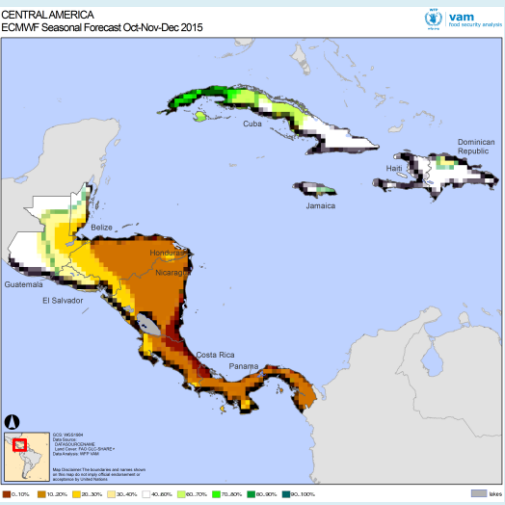


Seasonal rainfall by end of June as percent of average. Blues for above average, oranges and browns for below average

## Early Postrera Season



Seasonal rainfall by end of August as percent of average. Blues for above average, oranges and browns for below average



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

### Forecasts for Postrera season:

A variety of seasonal forecasts consistently indicate below average rainfall throughout the Postrera season (August to November) starting now.

If these forecasts are realized, the two cropping seasons of the region will both be severely affected in 2015.

This will add to the lingering effects of the severe drought of the 2014 Primera season affecting overall food security.

### Summary

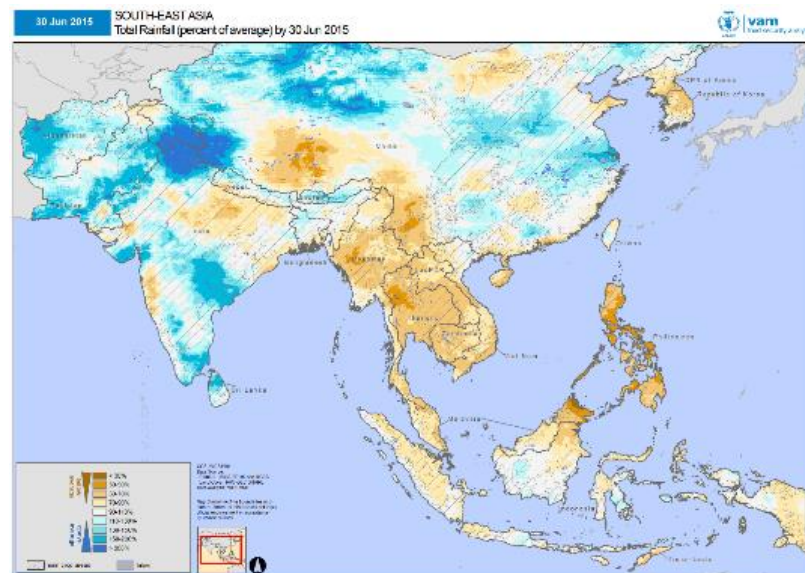
The first growing season (Primera) in the region (April to August) was affected by delayed starts and severe rainfall deficits throughout its duration. This resulted in very poor overall performance with expected crop production impacts in Guatemala, Honduras, Salvador and Nicaragua (possibly a drop of over 20% off the 5 year average). Haiti endured an even worse seasonal development.

The second growing season (Postrera) is now starting or about to start and will extend until late November. It will therefore develop under the most intense stage of the El Nino event. Early stages have already performed poorly.

# Recent Changes and Current Status

# Outlook

## Late June



Seasonal rainfall by end of June 2015 as percent of average. Blues and greens for above average, oranges and browns for below average

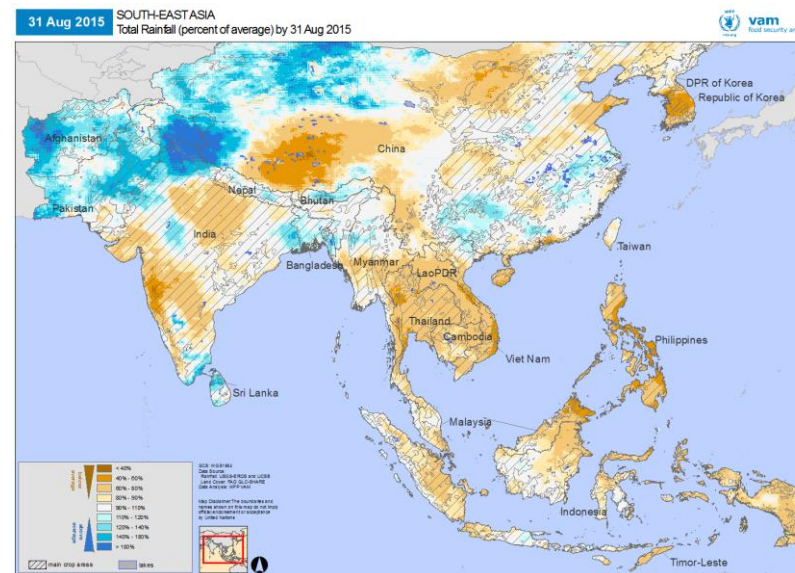
## Summary

Above average rainfall patterns have dominated across Pakistan, Afghanistan and western China thus far.

In contrast, drier than average conditions spread across SW and northern India – India's monsoon rainfall should remain below the Indian Meteorological Service official drought threshold of 90% of the normal (currently at 85% vs projections of 88%).

This is unlikely to be reversed since the monsoon is now drawing to a close.

## Late August

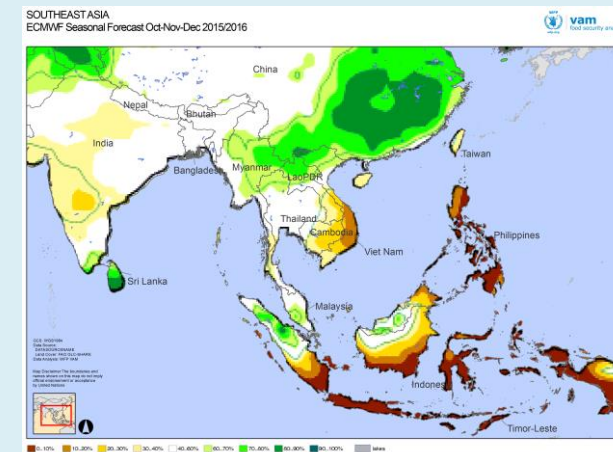


Seasonal rainfall by end of August as percent of average. Blues and greens for above average, oranges and browns for below average

Drier than average conditions have also remained across most of South East Asia (from northern Burma to southern Vietnam), after a fairly poor start to the season, Recent storms hitting Myanmar provided only temporary relief.

Drier than average conditions have continued over the Philippines, NE Borneo and Indonesia; here more severe impacts are expected in areas of Java (on crop production) and in the Eastern province (on livelihoods)

Tropical storms wiped out large rainfall deficits in DPRK, but drier than average conditions remain in NE China.



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

## Forecasts for late stages of season:

Forecasts for the later stages of the season (till end of 2015) remain pessimistic for India and southeast Asia. Improvements in the seasonal rainfall deficits are therefore very unlikely.

Forecasts also indicate a maintenance of drier than average conditions across the Philippines and Indonesia.

In the Philippines, this will affect the second season crops; in Indonesia the planting and early development stages of the main rice and maize crops will be affected.



# WFP Regions: Coming Growing Seasons

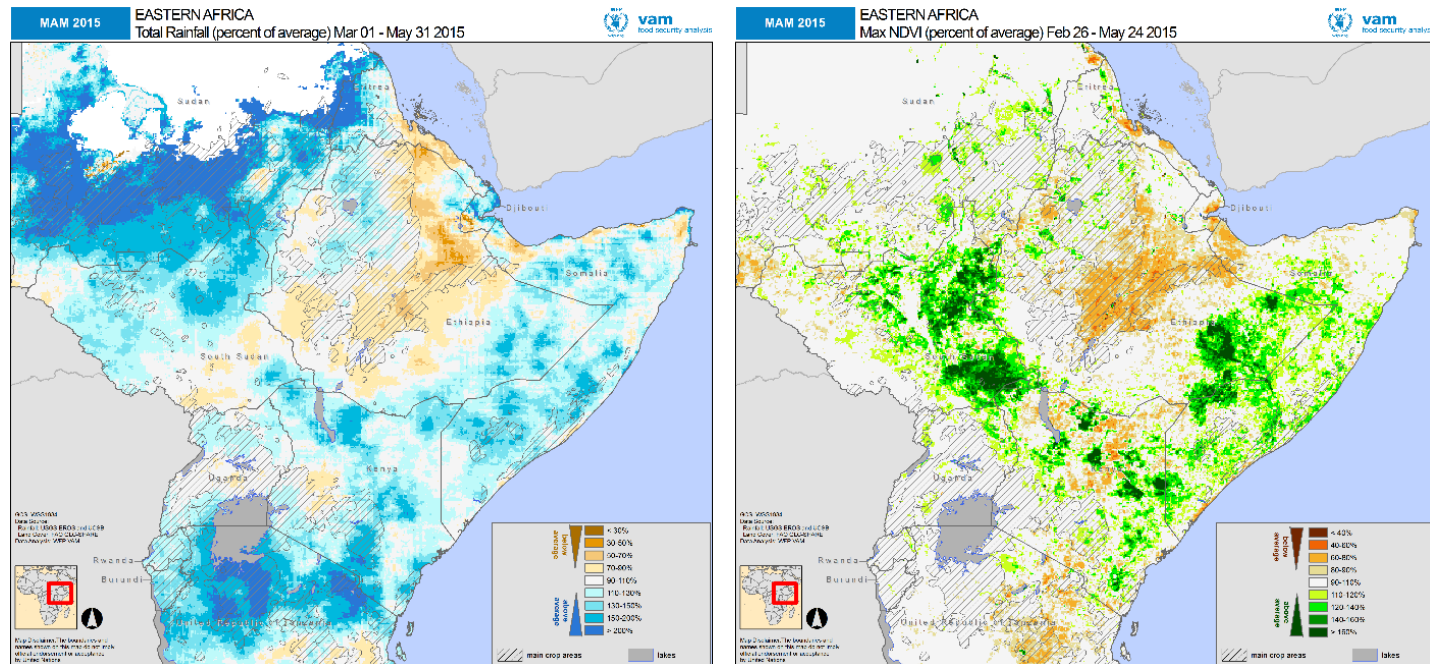


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# Previous Season and Current Perspectives

# Outlook

## Long Rains March-May 2015



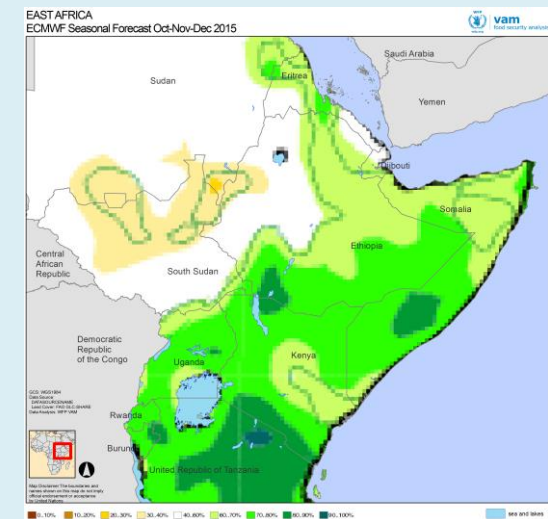
Total rainfall (left) and maximum vegetation (right) during March to May 2015 both as percent of average. Blues and greens for above average, oranges and browns for below average

## Summary

A succession of poor seasons affected the region in 2013-2014. The March to May 2015 Long Rains season was favourable across most of the region, and brought much needed relief to marginal semi arid areas of the region.

The next rainfall season in the Horn of Africa—not considering central and northern Ethiopia—takes place from October to December 2015, precisely at the peak of the El Nino event now unfolding.

Humanitarian perspectives depend on the possible occurrence of large scale flooding along the river systems of Kenya and Somalia. On the other hand, the enhanced rainfall will lead to good pasture and crop development, helping to further rebuild livelihood assets of the pastoralist communities in arid and semiarid regions.



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

## Forecasts for the next season:

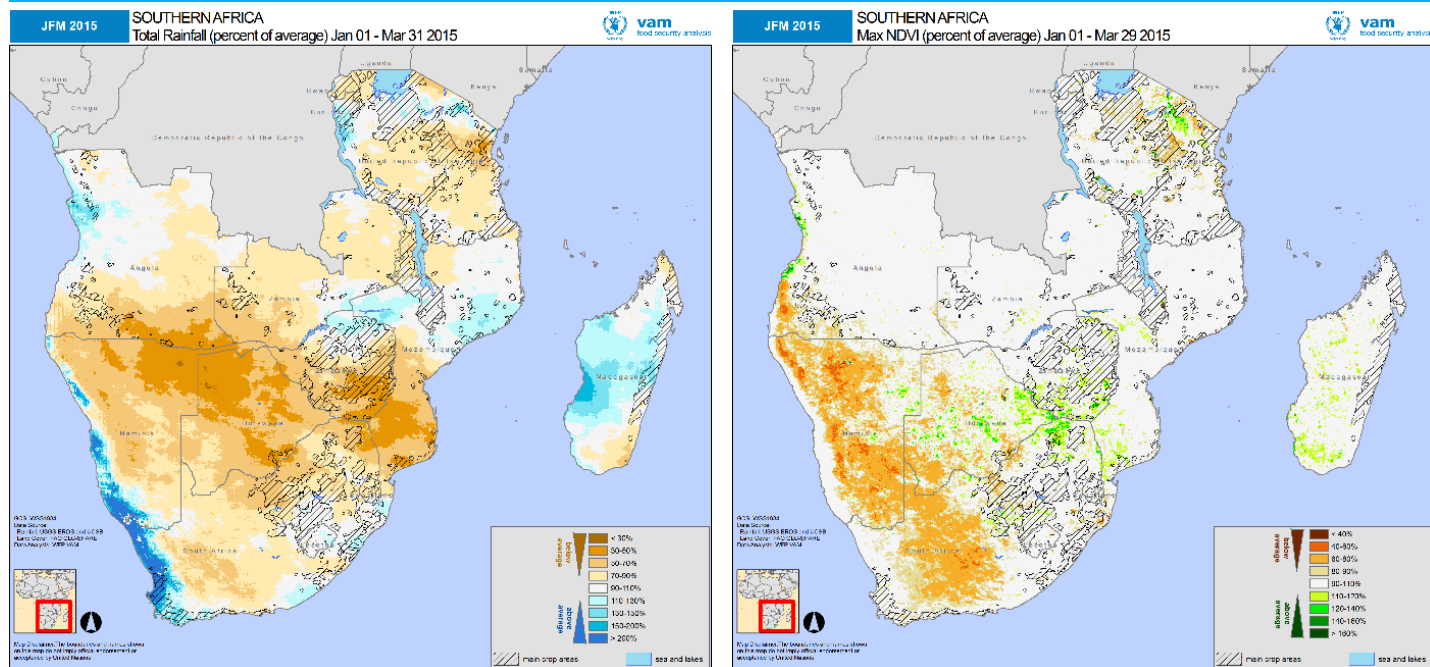
Forecasts from ECMWF, regional Climate Outlook Forum and others all point to above average rainfall across the region during October-December.

These will translate into enhanced risk of flooding but no time specific and localized flood occurrence forecast can be made.

# Previous Season and Current Perspectives

## Outlook

### Growing Season Oct 2014 – May 2015



Total rainfall (left) and maximum vegetation (right) during Jan to March 2015, the core period of the previous southern Africa growing season. Warm shades for below average conditions, cool shades for above average conditions.

### Summary

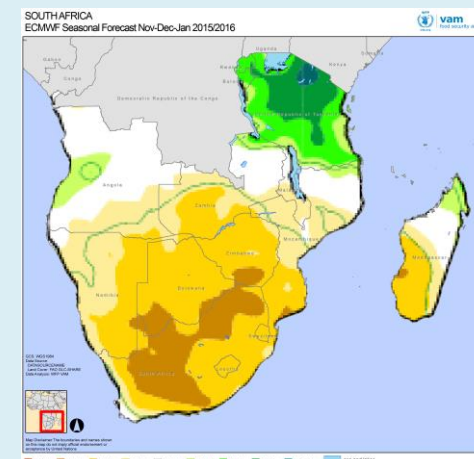
Growing seasons in southern Africa (and in South Africa in particular) typically have strong connections with El Nino events, usually culminating in drier than average conditions and crop production deficits.

The previous growing season in southern Africa that ended in April 2015, resulted in large regional crop production deficits due to rainfall deficits during key stages of the maize crop development.

The next rainfall season (October to April 2016) will take place under a full El Nino influence. Based on current rainfall forecasts and evidence from historical data, unfavourable regional crop production is the most likely scenario.

If this is realised, these impacts will take place against a situation of low regional stocks, which underwent a significant depletion in order to cope with the previous season's crop production shortfall.

Zimbabwe and Malawi are the most susceptible countries, given last season's performance and vulnerability levels of the population.



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

### Forecasts for the next season:

Forecasts from ECMWF, regional Climate Outlook Forum and others all point to below average rainfall across most of the region during October-December.

South Africa, southern Mozambique and Zimbabwe are likely to endure impacts both during the planting stage (November) and possibly during the critical maize crop development stages of early 2016.

In contrast, favourable rainfall is expected in Tanzania, and to a lesser degree in northern Mozambique and NE Zambia.



## Data Sources:

Rainfall: CHIRPS, Climate Hazards Group, UCSB

Vegetation: MODIS NDVI, EOSDIS-NASA

Land Cover: FAO GLC-Share

Seasonal Forecasts: ECMWF, Regional COFs, CPC, UKMetOffice

## Processing:

VAM software components, ArcGIS

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