

# Southern Africa Growing Season 2016-2017:

*Recovery Hampered by Floods and Drought?*



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## HIGHLIGHTS

### Southern Africa: The 2016-2017 Season

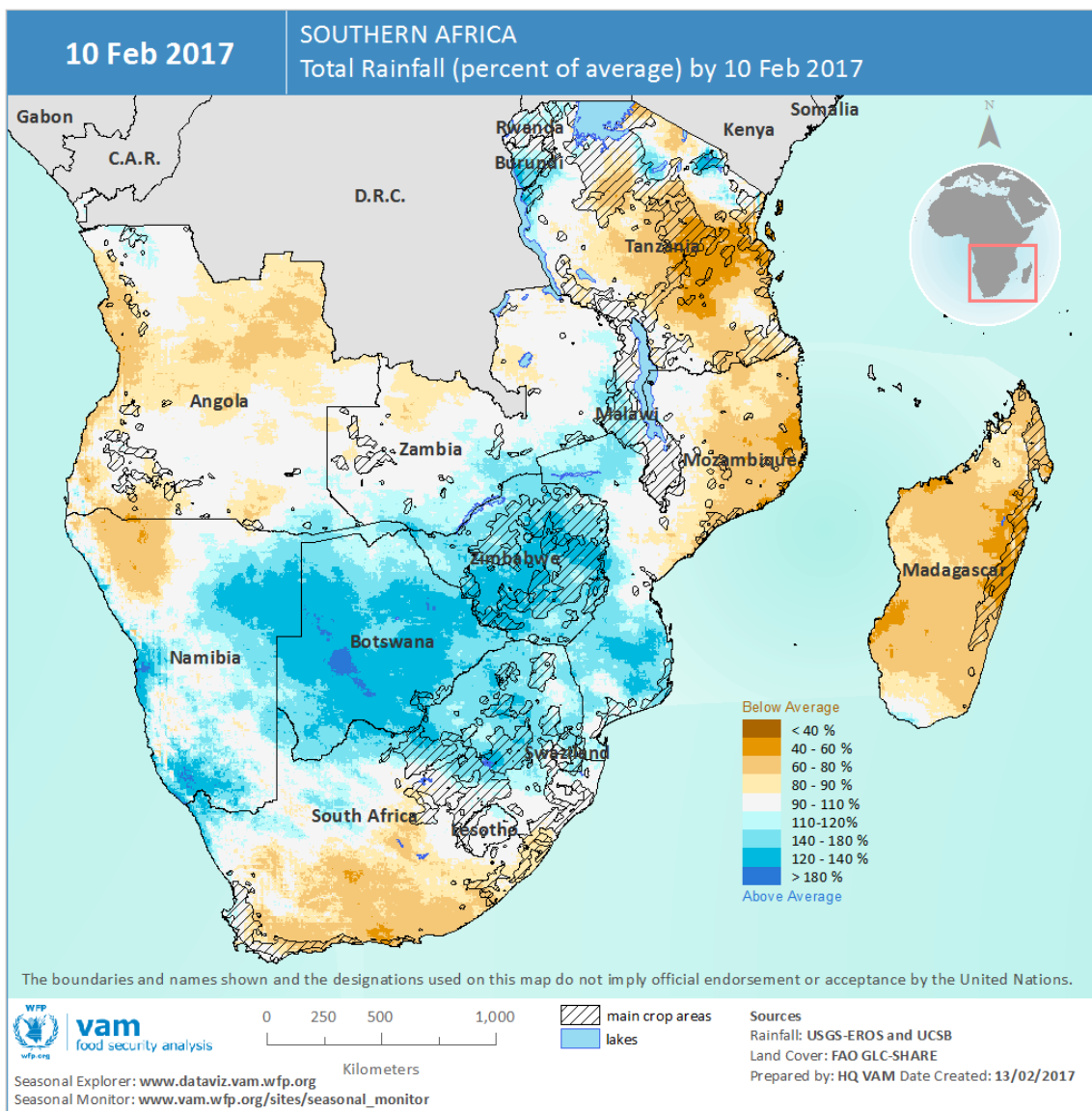
- **Good performance** of the current growing season (October 2016 - April 2017) is **badly needed** for Southern Africa after **two consecutive El Nino induced droughts** that led to unprecedented levels of food insecurity.
- The growing season is now well established with **favourable growing condition** observed in **most of** Botswana, Zimbabwe, Mozambique and NE South Africa. However, excessive rains have led to instances of localized flooding and higher incidence of pests and diseases.
- **Tanzania** is being affected by a **severe drought**. Even if rainfall improves for the rest of the season, considerable impacts on crop production and pasture conditions are expected. **Madagascar** is also affected but to a lesser degree, with **drought conditions** particularly intense in **eastern and northern** provinces.
- **Other areas** affected by **drier than average** conditions include western Namibia and southwest Angola as well as the Eastern Cape region of South Africa.
- **Seasonal forecasts** indicate **wetter than average conditions** for February to April over most of the region. However, **Tanzania** and **Madagascar** are likely to remain **drier than average**. **Elsewhere**, seasonal outcomes are balanced between favourable crop production and flood/waterlogging risk. In any case, major improvements in crop production relative to the past two years are expected.

# 2016-2017 Growing Season: Current Status



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# Current Rainfall Patterns



## Mixed Seasonal Perspectives Across Southern Africa

The 2016-2017 season has had a variable start: maize production areas of NE South Africa have been receiving steady and above average rainfall, which refilled severely depleted soil moisture and allowed a timely start to the growing season.

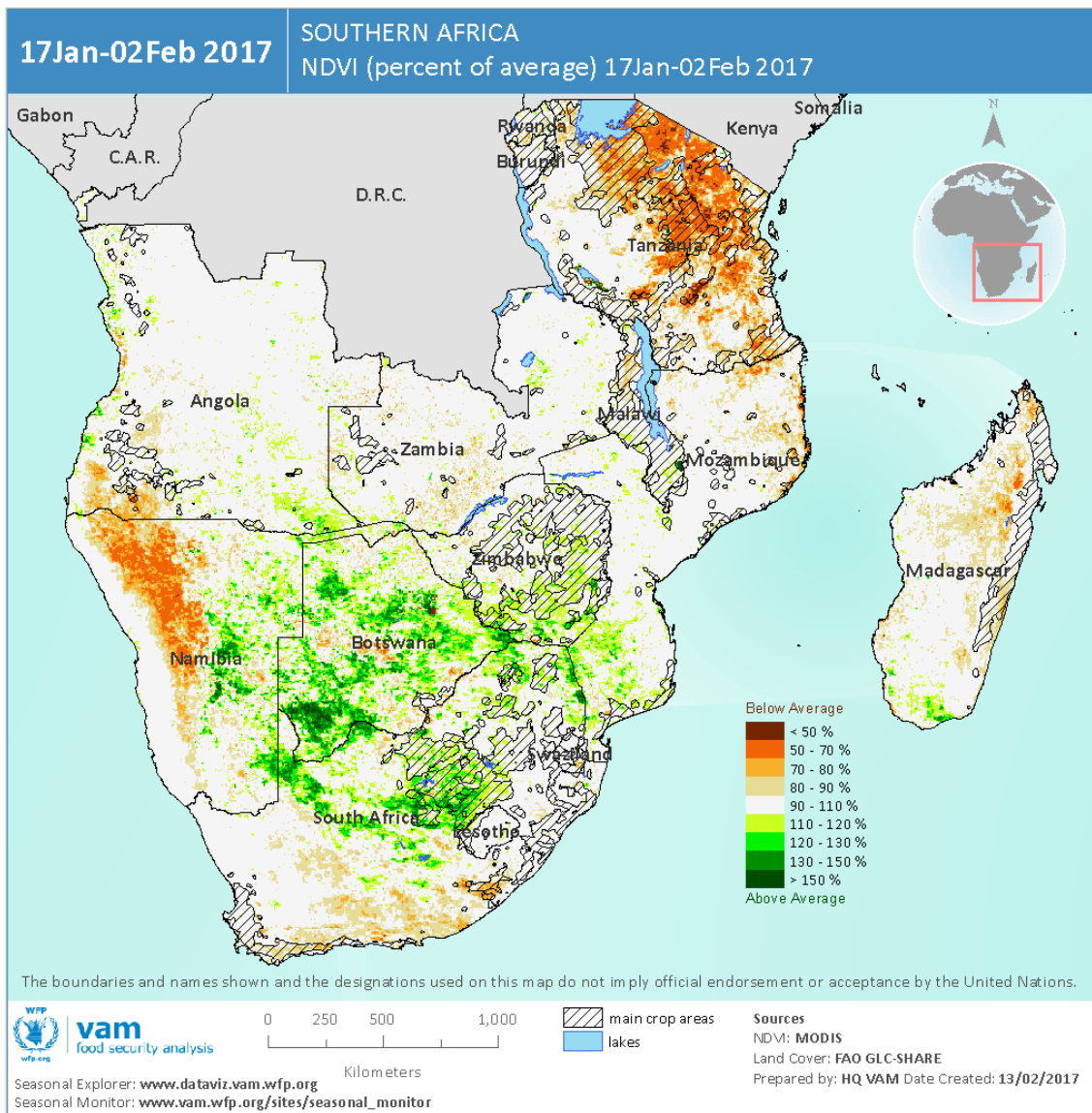
Northern Mozambique, Malawi, NE Zambia, Tanzania, Namibia and SW Angola received above average rainfall early in the season. However, this was short lived and from early December onwards dry conditions led to substantial rainfall deficits. Tanzania has been particularly affected.

Despite a good start, Madagascar has been experiencing drier than average conditions since early December, particularly in the southeast and east of the island. These regions need better than average rains for the rest of the season to avoid significant impacts on crop performance.

In Botswana, Zimbabwe, central Mozambique, a drier than average start was followed by very intense and heavy rains since mid December which led to localized flooding. These regions were severely hit by the droughts of the past two seasons – a good performance of the current rainfall season is essential to bring meaningful relief to the harsh conditions endured by poor and vulnerable households.

Seasonal cumulative rainfall until mid January 2017, as a percentage of the 20-year average.  
Hashed pattern indicates main agricultural areas.  
Brown shades for below-average rainfall; blue shades for above-average rainfall.

# Current Start of Season and Vegetation Cover Patterns



## Vegetation Cover Responds to Better Rainfall

The multi-year drought had severely depleted soil moisture at the outset of the current season.

Although the growing season in Mozambique, Zimbabwe and Zambia started moderately late, steady and above average rainfall since then has resulted in above average vegetation. The danger is that excessive rainfall could damage crops due to waterlogging.

In Botswana, eastern Namibia, and the maize producing regions of NE South Africa the growing season started early and was followed by consistent and above average rains. The resulting above average vegetation cover indicates an expansion in cultivated area and favorable early crop development.

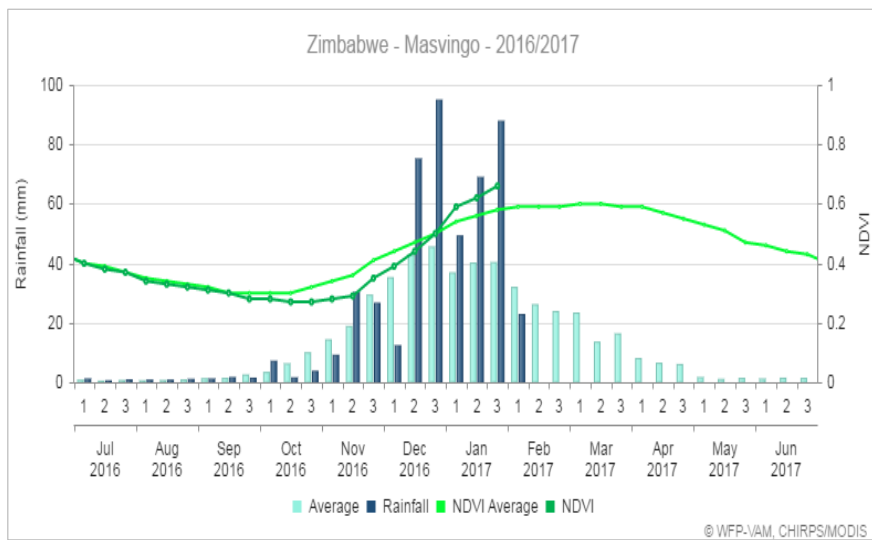
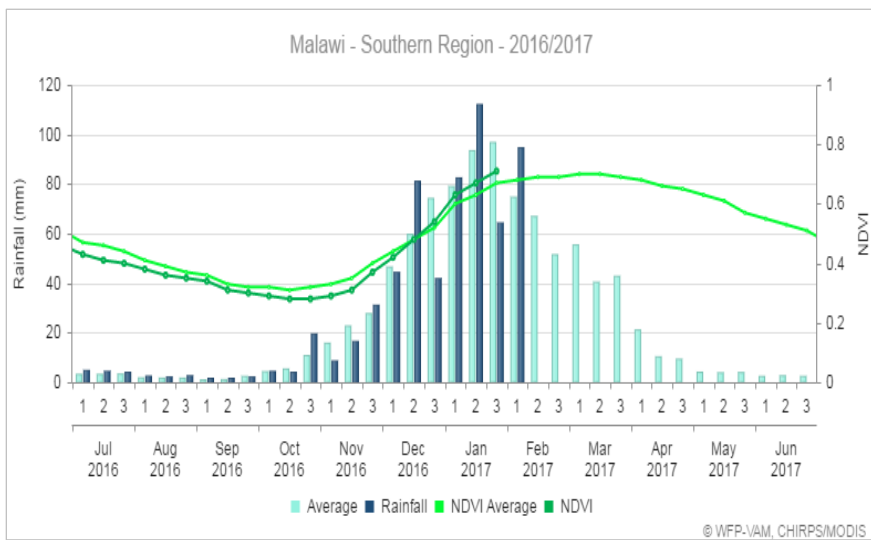
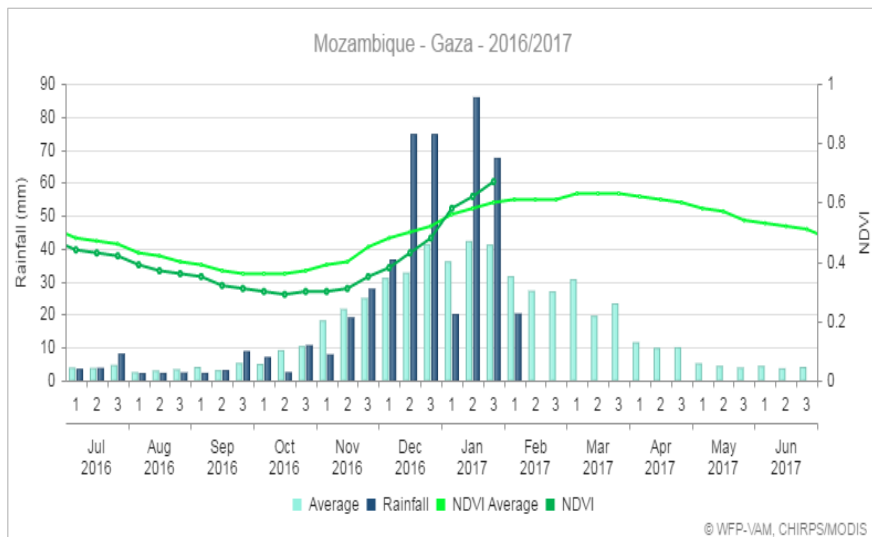
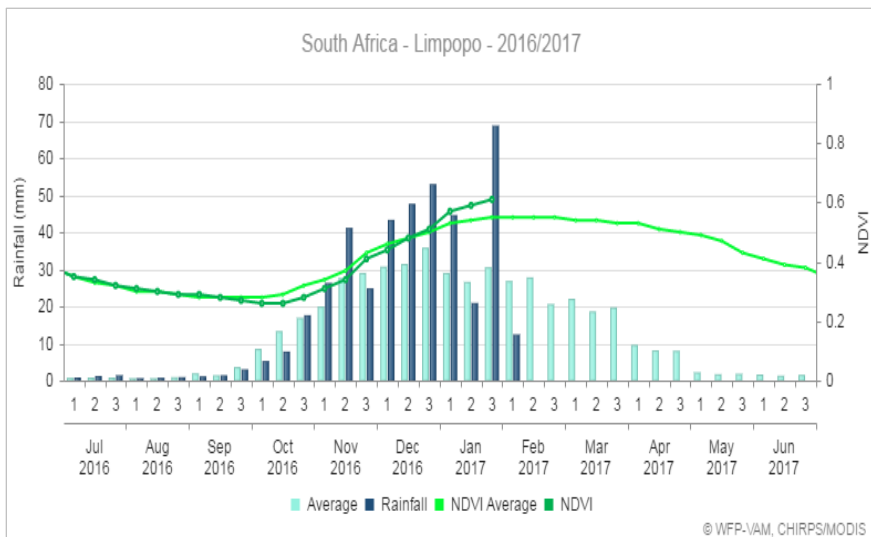
In contrast, in Tanzania, the collapse of the rains after a promising start resulted in severely below average vegetation cover – this is a sure sign of severe impacts on crop performance across most of the country. Similar situations are developing in northern Mozambique and Malawi, though at more moderate levels – much improved rainfall is required in Feb-Mar to avoid serious impacts on crops and pasture resources.

NDVI in early January 2017, as a percentage of a 12-year average. Orange shades for below-average vegetation; green shades for above-average vegetation.

Hashed pattern indicates main agricultural areas.

# Season 2016-2017: Previous Drought Affected Areas

Southern Africa: The 2016-2017 Season



The charts left show broad similarities between regions that endured the most severe drought in 2014-2016:

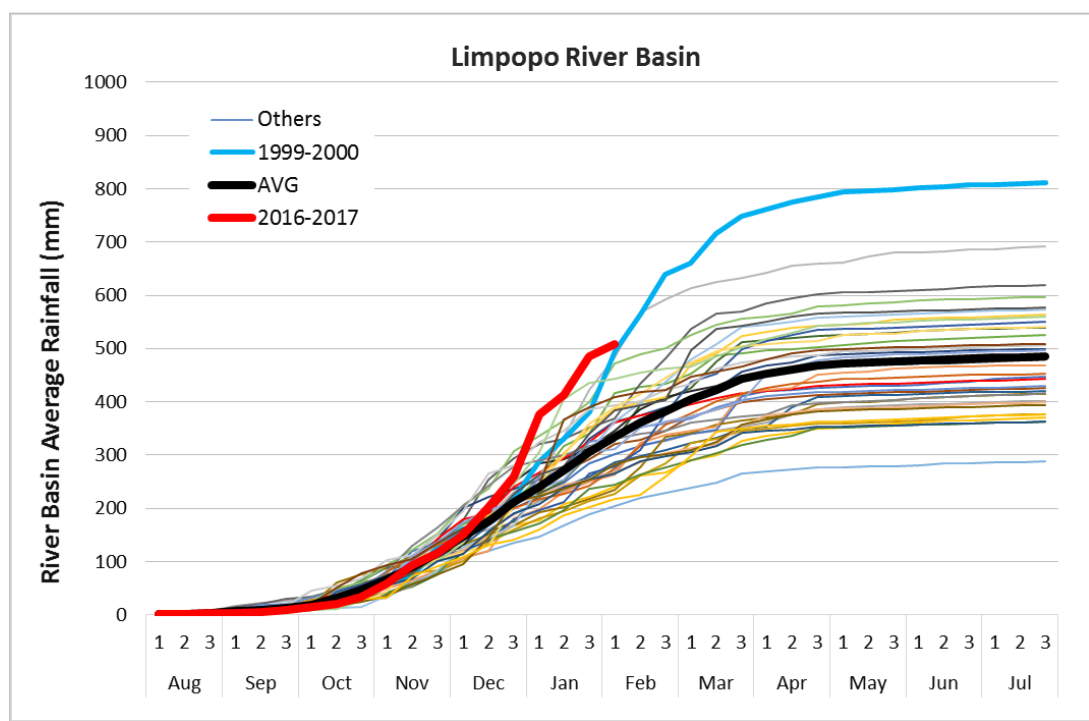
- An irregular start of the current season with lower than average rainfall (except SA).
- Wetter than average conditions starting from mid December onwards.
- Recovery in vegetation cover helped by wetter than average conditions.

The wet weather implies that crop water requirements are satisfied while the risk of water logging and greater incidence of pests and diseases is also elevated.

**Dark blue bars:** current rainfall season  
**Light blue bars:** long term average (LTA) rainfall  
**Dark green line:** current vegetation index (NDVI)  
**Light green line:** long term average (LTA) NDVI

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# Season 2016-2017: Extensive Rainfall Raises Flood Risk in Limpopo Basin



Very heavy and continuous rains have fallen across many areas of the Limpopo River basin, during late December and through January. By end of January 2017, this season's total river basin rainfall has been the highest since 1981, though lighter rainfall in early February alleviated the situation.

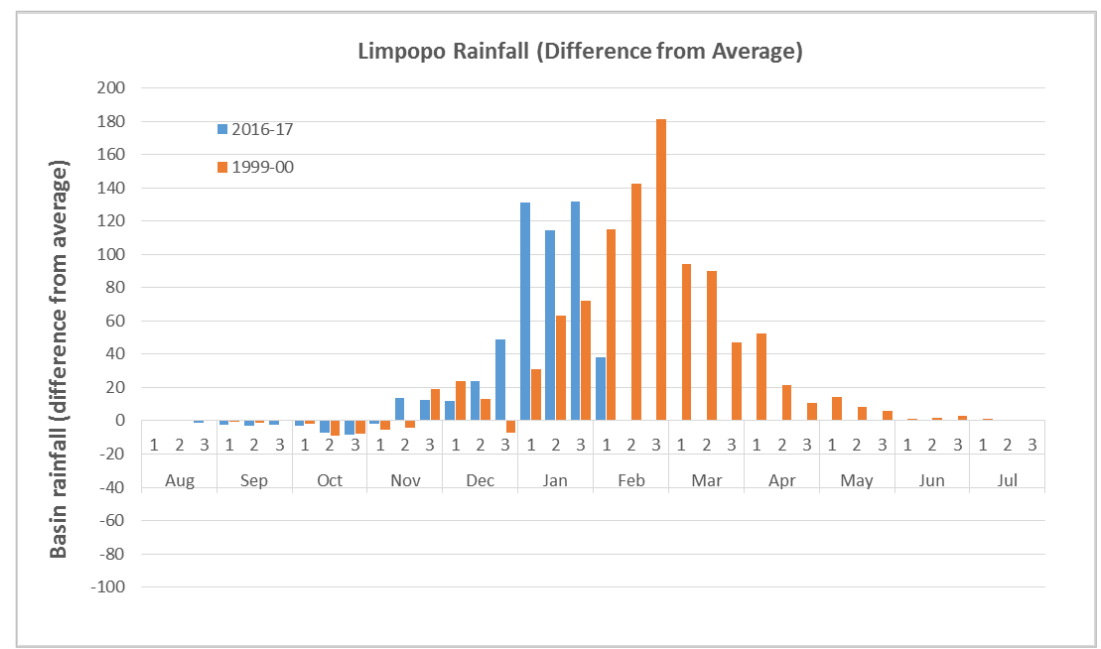
The plot left shows the current cumulative rainfall in red, the average in black and in blue the cumulative rainfall curve for 1999-2000 when massive floods occurred across the basin, particularly affecting Mozambique.

There have been floods within the Limpopo basin already and in smaller basins within Mozambique.

The evolution of rainfall in the next few weeks is crucial for the way the basin will behave. Comparisons with 1999-2000 are inevitable, but the fact that this year has been the rainiest so far, does not necessarily imply major floods will take place. There are different circumstances at play:

- The current season has been preceded by one of the driest two year periods in the 36 year record. In contrast, the two year period before the 1999-2000 season was one of the wettest 12. Therefore, the current season rainfall had to compensate a very sizeable moisture deficit, absorbing some flood potential.
- The 2000 flood was tied to record rainfall in February, preceded by steady and consistently wetter than average conditions (see orange bars in plot right). The wet period of late December to late January 2017 came too early to benefit from such build-up.

While a drier than average early February alleviated some of the risk of major flooding, this remains a possibility if heavy rainfall resumes at levels similar to those of 2000. Such floods would most probably hit Mozambique more severely. The type of simple river basin rainfall analysis shown here cannot yield much more in terms of information.



# Outlook for 2017



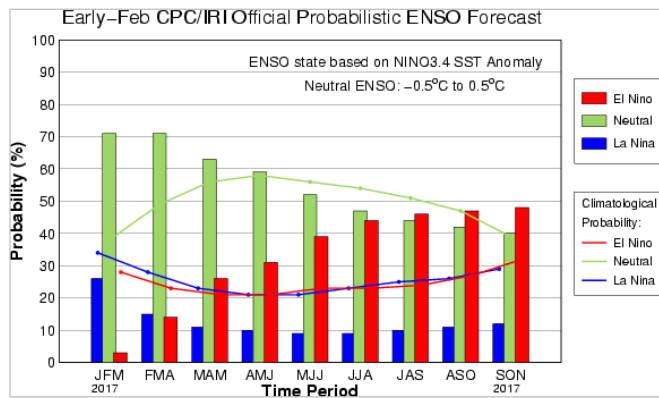
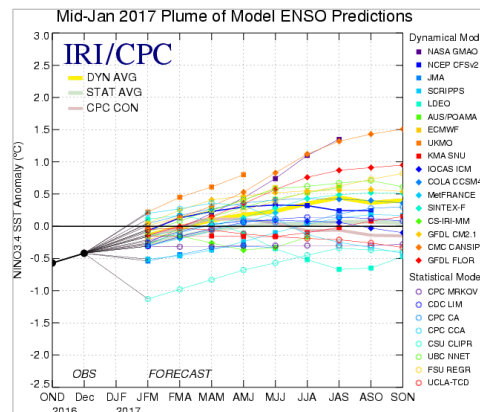
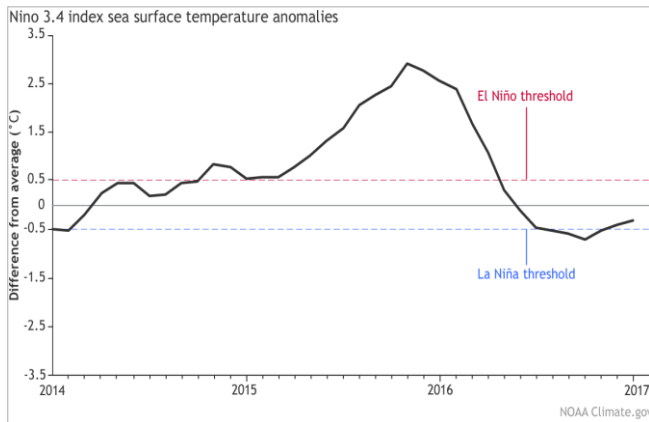
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# La Nina Outlook

## La Nina is over...

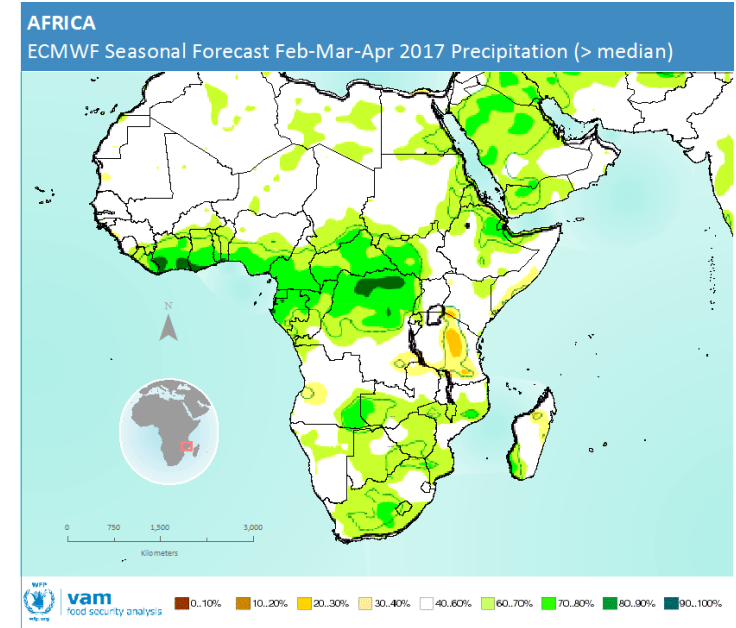
The La Nina episode that started last August has just come to an end, making it one of the weakest and short lived on record. The El Niño index (chart below left) is now back into neutral territory; model forecasts indicate a continuation of neutral conditions at least through the first half, possibly the third quarter of 2017. Some models are predicting a return to El Niño conditions in late 2017, but forecasts made at this stage have low predictability – the situation will become clearer by mid-2017.



Above left: Evolution of central Pacific sea surface temperatures (blue line). Note the return to neutral conditions (above La Niña threshold).

Above right: ensemble model forecasts of ENSO evolution. Nearly all models indicate a return to neutral conditions.

Right: ENSO forecasts from IRI/CPC – overall probabilities of the event



ECMWF Forecasts for February-April rainfall for Africa. Greens for wetter than average conditions, oranges for drier than average conditions.

## Outlook: Continuing wetter than average conditions...

Current seasonal forecasts from a wide variety of sources for February-April 2017 indicate wetter than average conditions across most of the region. The situation is less clearly defined for Namibia and Angola.

The outlook for the next harvest therefore remains positive though tempered by enhanced flood risk and higher pest and disease impacts.

Tanzania will continue to endure drier than average conditions throughout this period, reinforcing pessimistic perspectives for crop and pasture production. Madagascar will see at best near average conditions and hence seasonal outcomes will remain poor.

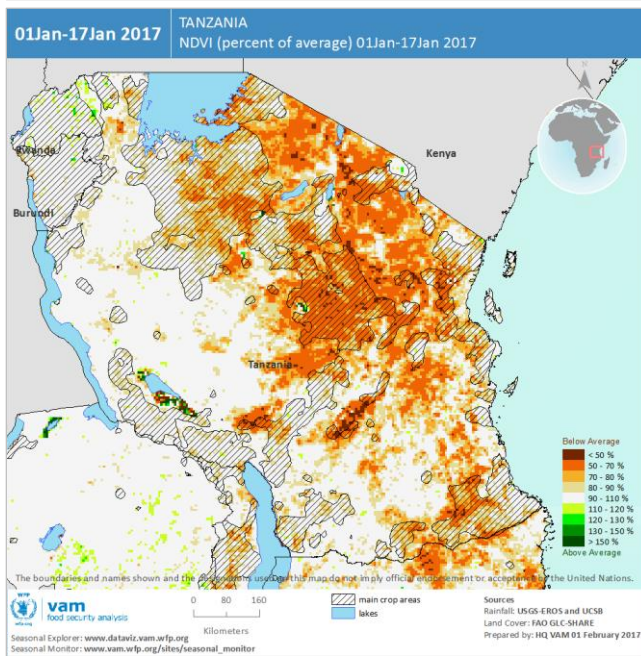
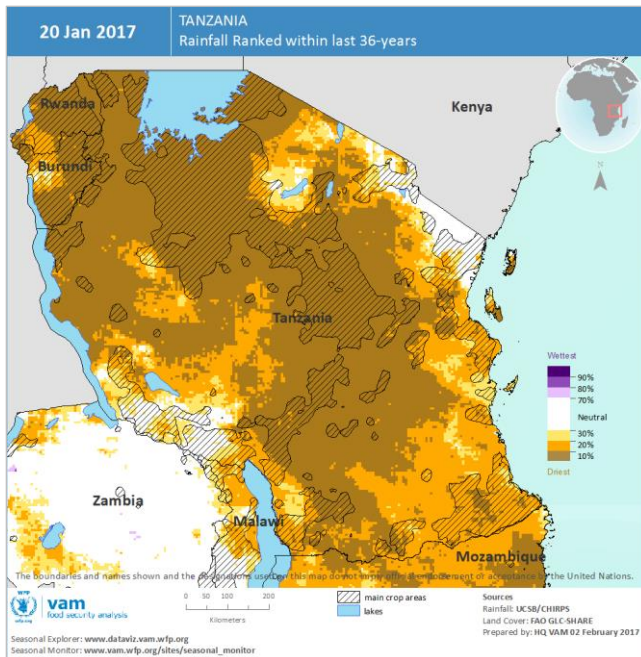
**Areas of Concern:**

**Tanzania, Mozambique, Madagascar**



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# Tanzania: Severe drought affecting the country



Tanzania is enduring a severe drought across most of the country, due to persistent below average rainfall since October onwards. This is part of the same regional scale drought that has been affecting greater eastern Africa.

The drought has spread virtually across the whole country with the provinces of the center-south, Morogoro, Dodoma and Iringa most affected. January was one of the driest of the last 36 years.

The drought has severely affected vegetation cover, which is at extreme if not record low levels. Although the growing season has only reached its midpoint, severe decreases in crop production can be expected unless a major reversal in rainfall occurs from now onwards.

Early February rainfall has indeed improved but so far only in the southern half of the country. This tendency needs to continue further to avoid major impacts on crop production.

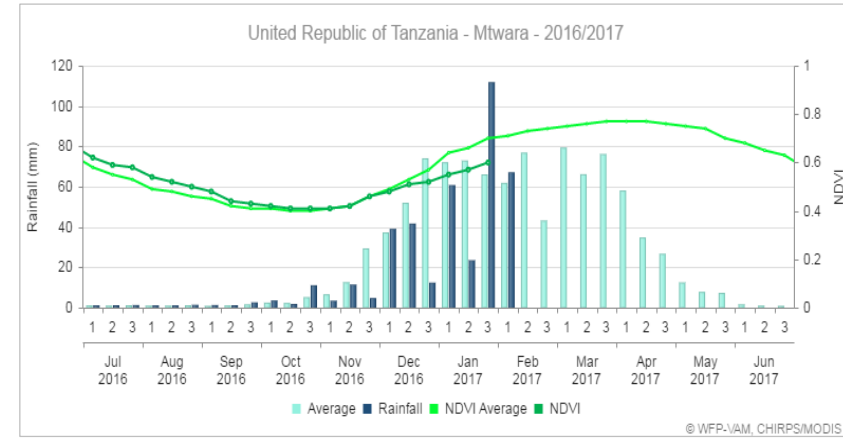
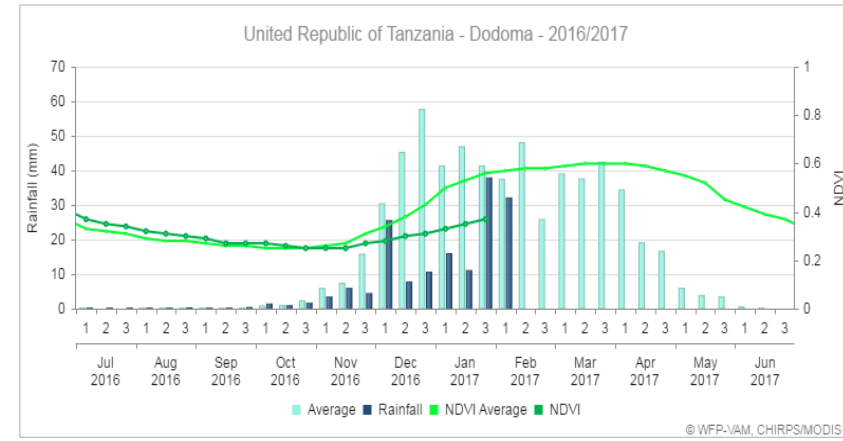
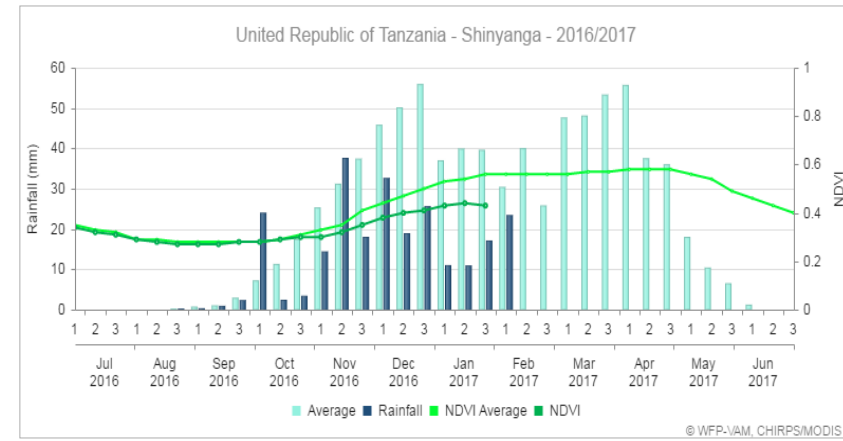
However, seasonal forecasts (see previous section) indicate that a continuation of drier conditions is the most likely scenario until April.

Rank of 30 day rainfall to 20 January 2017 (above): Brown areas in the driest three months since 1981.  
NDVI in mid January (below) as a percent of average. Greens for above average, orange for below average conditions

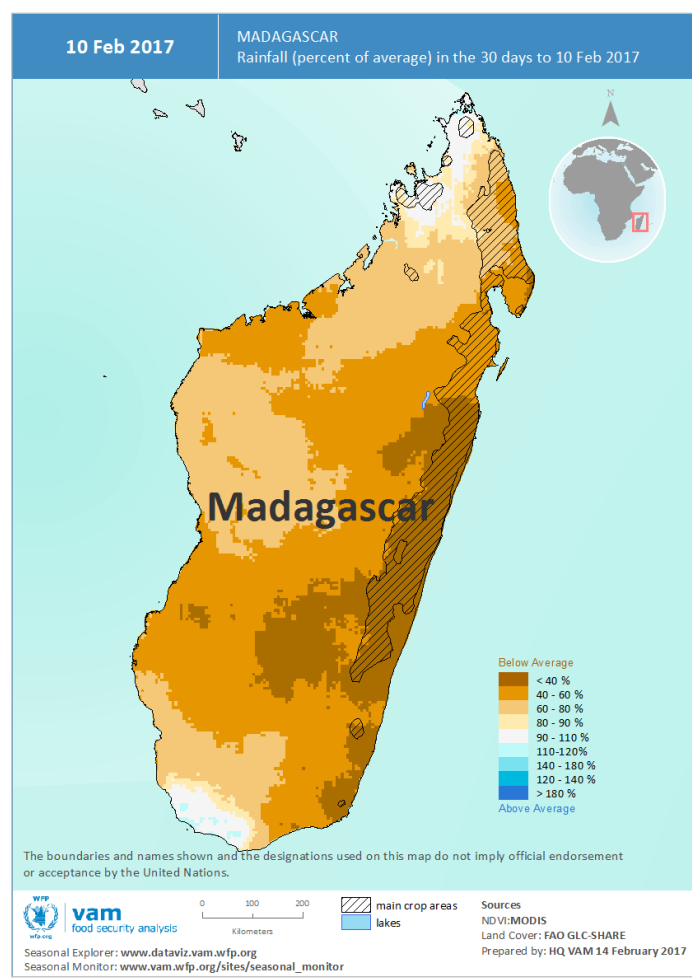
Plots from:

<http://dataviz.vam.org/>

Dark blue bars: current rainfall season  
Light blue bars: long term average (LTA) rainfall  
Dark green line: current vegetation index  
Light green line: long term average (LTA) NDVI



# Madagascar: Pronounced dryness in current season



Rainfall in the 30 days to 10 February 2017 as a percentage of the long term average. Blues for wetter than average, orange and browns for below average conditions

Madagascar has been enduring drier than average conditions across most of the country during the current season. Seasonal forecasts indicate a continuation of drier than average conditions in the northern areas of the island.

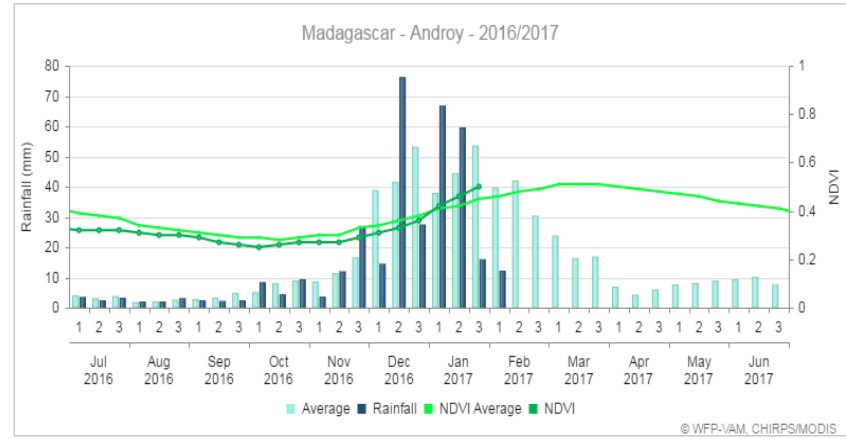
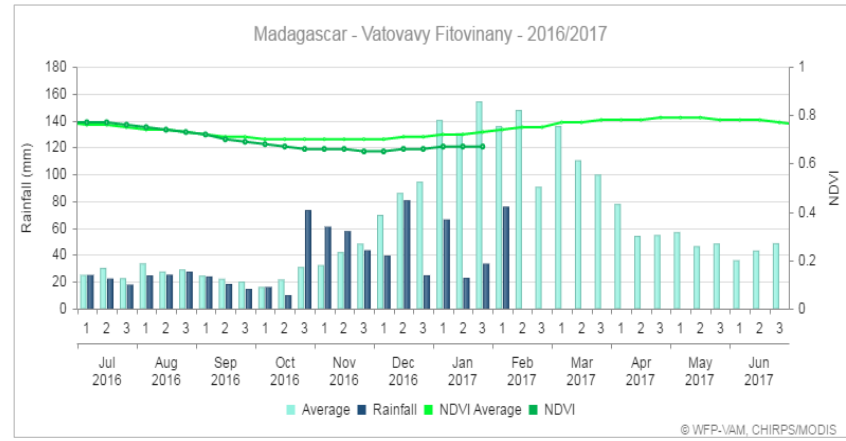
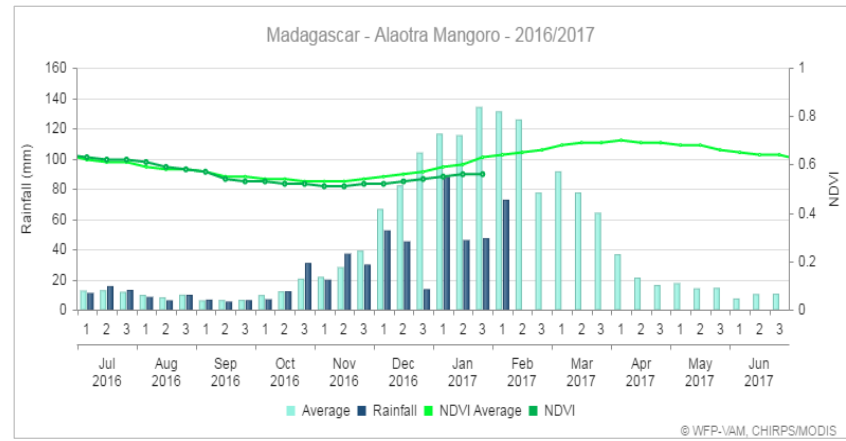
Drought patterns have intensified and are more concentrated in the north and eastern regions of the country, particularly coastal Atsinanana and Vatovavy Fitovinany provinces.

In the south of the island, conditions have remained closer to normal. Rainfall forecasts for southern regions indicate slightly wetter than average conditions leading to moderately favorable growing season perspectives. This is encouraging as these regions have endured two consecutive severe droughts with significant humanitarian impacts. Current developments should ensure some recovery.

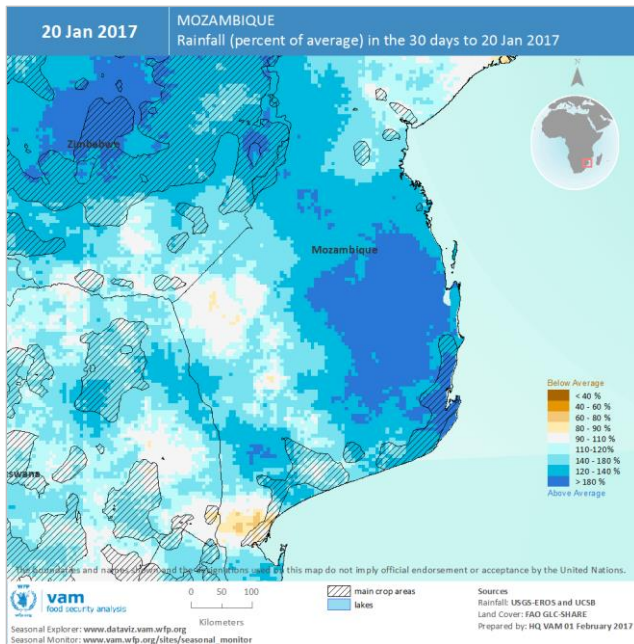
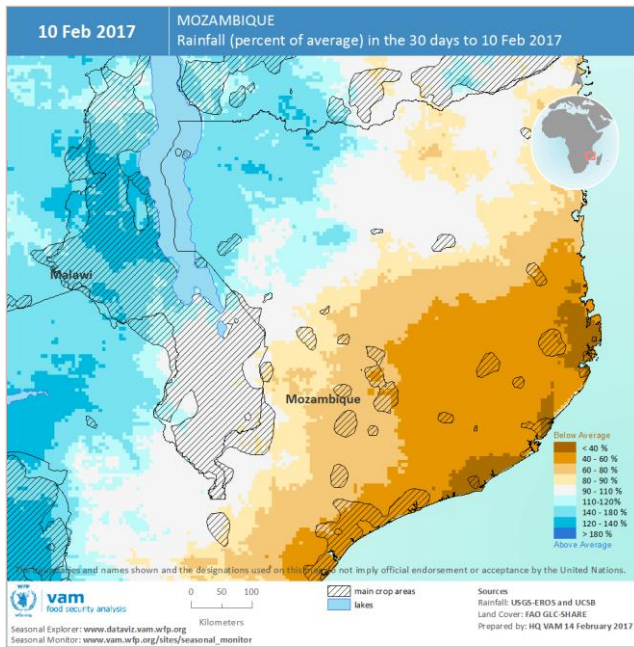
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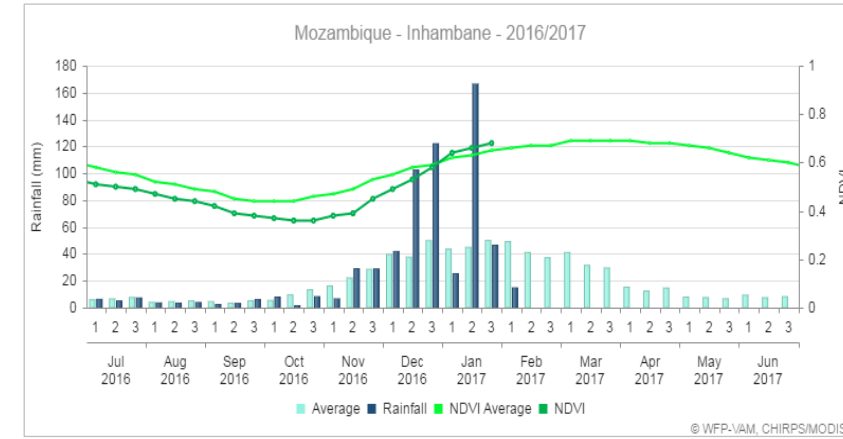
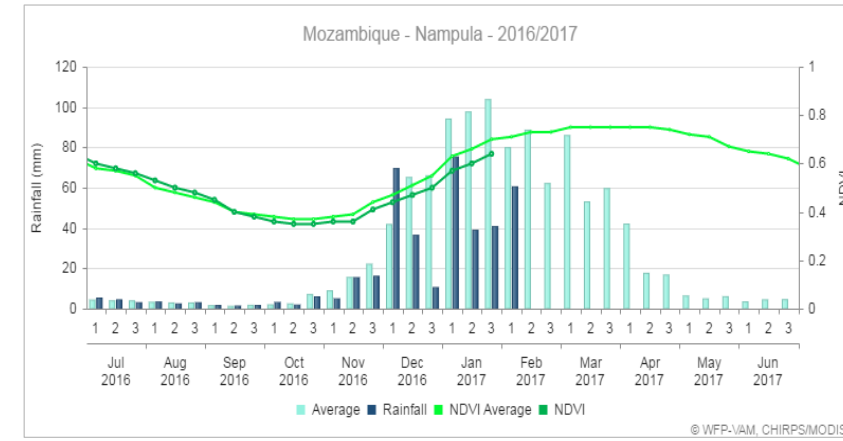
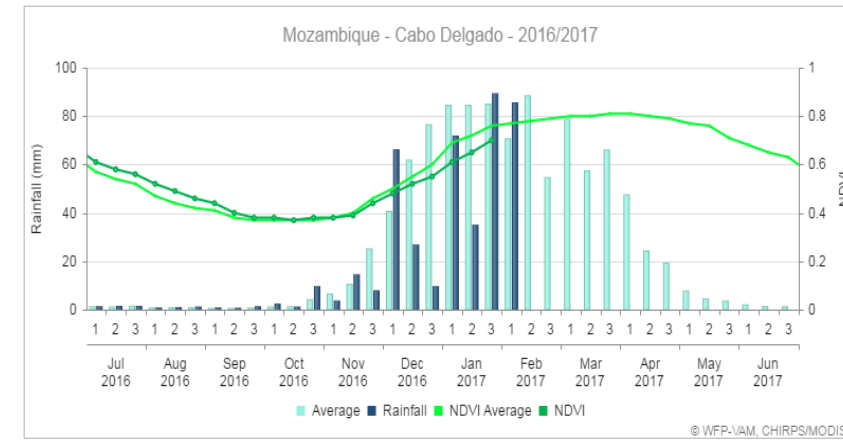
# Mozambique: Northern dryness, southern flood



Mozambique displays contrasting fortunes in weather conditions:

The northernmost provinces are experiencing drier than average conditions caused by the same weather patterns behind the drought in Tanzania. Recent improvements in rainfall if continued will go a long way to minimize impacts on crop production.

In contrast, southern provinces have seen extremely heavy rainfall. So far flooding has remained localized, but excess rainfall across the region's river basins is enhancing the risk of larger scale floods along the Limpopo and Save rivers.



Rainfall in the 30 days ending 10 Feb 2017 (above) and ending mid January (below) as a percent of average. Blues/greens for above average, orange and browns for below average conditions

Plots from:

<http://dataviz.vam.org/>

- Dark blue bars: current rainfall season
- Light blue bars: long term average (LTA) rainfall
- Dark green line: current vegetation index
- Light green line: long term average (LTA) NDVI

## Data Sources:

Rainfall: CHIRPS, Climate Hazards Group, UCSB

Vegetation: MODIS NDVI, EOSDIS-NASA

Land Cover: FAO GLC-Share

## Processing:

VAM software components, ArcGIS

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