



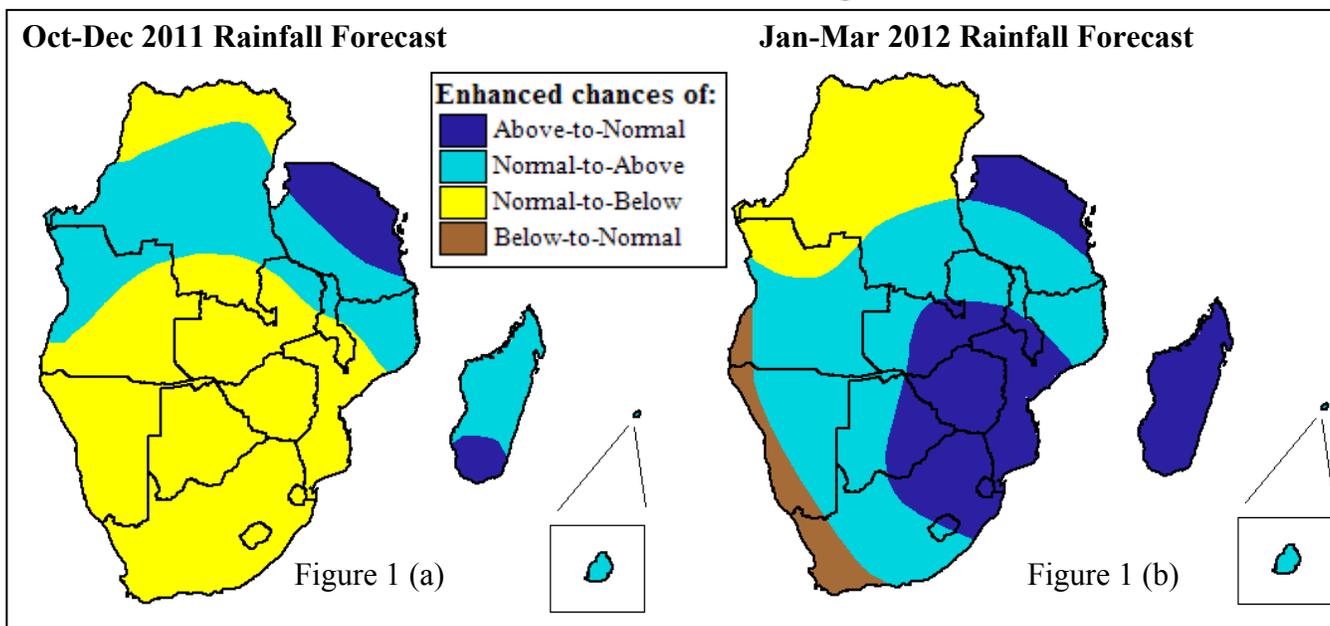
Food Security Early Warning System Agromet Update



2011/2012 Agricultural Season

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Climate Forecast for the 2011/2012 Agricultural Season



Source: Forecast graphics derived from forecast issued by SARCOF.

The Fifteenth Southern Africa Climate Outlook Forum (SARCOF-15) was convened from 29 to 30 August 2011 in Windhoek, Namibia by the SADC Climate Services Centre (CSC) to formulate consensus guidance for the 2011/2012 rainfall season over the SADC region. A rainfall outlook covering the period October 2011 to March 2012 was prepared by climate scientists from the National Meteorological and/or Hydrological Services (NMHSs) of the SADC region, the CSC, and well as international cooperating partners.

SARCOF Forecast for October to December (OND) 2011:

Two seasonal forecasts were issued at the SARCOF, covering the periods October to December 2011 (figure 1a), and January to March 2012 (figure 1b). For the period October to December 2011, the SARCOF forecast indicates that the southern and central parts of the SADC region, and the northern parts of D.R. Congo, have enhanced chances of normal to below normal rainfall during the first half of the season (yellow colours, Figure 1a), while the northern parts of the region and most of Madagascar and Mauritius have increased chances of normal to above-normal rainfall (light colours, Figure 1a). North-eastern half of Tanzania and southern-most parts of Madagascar have increased chances of above-normal to normal rainfall, with the most likely outcome being above normal rains in these areas. The impacts of these most likely outcomes need to be considered in the context of normal rainfall amounts, rain bearing systems, and the water table levels in the different areas where the forecast is being applied.

For example, in parts of northern Namibia where the water table is likely to still be high after the flooding that occurred during the previous season, an outcome of normal or below normal rains would have different impacts than the same outcome in other areas which were not flooded. Northern Namibia (Caprivi and Kavango) and northern Botswana (Okavango) experienced flooding in the previous season, and the currently relatively high water levels imply an increased risk of flooding in the event of high rainfall. In Zimbabwe, central Mozambique, and southern Malawi, the forecast for normal to above normal rains will provide a good opportunity for increased agricultural production should this forecast be realized, after an extended dry spell in many of these areas during the previous season significantly reduced crop yields.

In general, most areas in the SADC region experience an onset of rains between October and December, and it is likely that this OND forecast can be associated with the start of the rainfall season. This augers well for areas in blue in Figure 1a, but may have a negative implication for areas in yellow, where a likelihood of below average rainfall may be associated with a possibly slow or erratic start to the rainfall season. However, it should be noted that the forecast does not address the timing of the rains, but only rainfall totals, summed over the three-month period from October to December.

Users should note that SARCOF forecast is a consensus forecast designed for a regional audience. Users requiring higher accuracy, national-level forecasts should contact their respective national meteorological agencies for downscaled national seasonal forecasts, as well as updates to those forecasts, which can increase in accuracy as the lead time to the forecast decreases.

SARCOF Forecast for January – March (JFM) 2012:

Initial indications from the SARCOF process suggest that during the second half of the season, there is an increased chance of above-normal to normal rainfall (dark blue colours, Figure 1b) in the central and eastern parts of the region, as well as throughout Madagascar, and in the north-eastern half of Tanzania. In most of the remaining areas in the southern two-thirds of the region, and in Mauritius, there is an increased likelihood of normal to above-normal rainfall occurring (light blue colours, Figure 1b). These areas include northern Mozambique, northern Malawi, southern Tanzania, eastern and western Zambia, southern D.R. Congo, most of Angola, most of Namibia, western Botswana, and south-western half of Lesotho. South western-most parts of Angola, western-most areas in Namibia, and western-most parts of South Africa, all of which are traditionally very dry areas, are all forecast to have a higher likelihood of below normal to normal rainfall. Users are advised when applying the forecast, to take into account the relative lead times associated with the OND and JFM forecasts. Due to various factors, forecast models generally exhibit less skill for longer lead times, though this is not always the case. DMC will issue an update on the JFM forecast towards the end of December.

Interpretation of Forecast Maps (Figure 1)

Figure 1 is a simplification of the SARCOF forecast. The figure represents chances of 3 different rainfall scenarios occurring, namely above normal, normal or below normal rainfall. The rainfall scenarios considered are focusing on 3-month rainfall totals (total rainfall for October to December; and January to March, respectively for figures 1a and 1b).

 : The dark blue areas (“Above-to-normal”) are areas where the highest likelihood is for above-normal rainfall, though there are also significant chances of normal rainfall occurring. Below normal rainfall is less likely in these areas, though there are still chances that it can occur.

 : The light blue areas (“Normal-to-above”) are areas where the highest likelihood is for normal rainfall, though there are also significant chances of above normal rainfall. Below normal rainfall is less likely in these areas, though there are still chances that it can occur.

 : The yellow areas (“Normal-to-below”) are areas where the highest likelihood is for normal rainfall, though there are also significant chances of below normal rainfall occurring. Above normal rainfall is less likely in these areas, though there are still chances that it can occur.

 : The brown areas (“Below-to-normal”) are areas where the highest likelihood is for below-normal rainfall, though there are also significant chances of normal rainfall occurring. Above normal rainfall is less likely in these areas, though there are still chances that it can occur.

Convergence of evidence

The SARCOF forecast is a consensus forecast which is produced by considering forecast model outputs from several national and regional climate models. One of these regional models, run by the Met Office Hadley Centre, also gave an indication of skill associated with their model outputs, which were quite similar to the SARCOF outputs. The Hadley Centre model indicated high levels of skill in both OND and JFM, with higher skill levels being observed in the eastern half of the region in OND, and in the southern half of the region in JFM. It should be noted that the model output described here is from one output only, giving only a partial indication of the forecasting process, amidst several models which were considered in arriving at the final SARCOF product. Preliminary results from experimental models for forecasting the start of the season also indicate possibility of a late start of season, providing secondary agreement with the forecast for the normal to below-normal rains in the first half of the season.

Interpretation of Forecast in the Context of Current Conditions

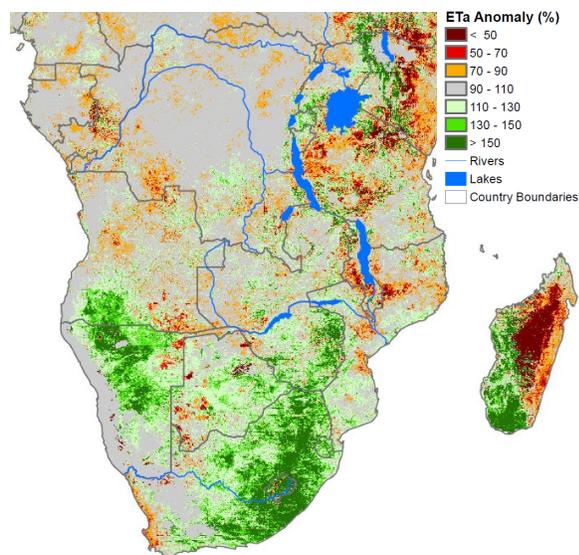


Figure 2. Actual Evapotranspiration Anomaly Estimate for August 2011. Source:USGS/FEWSNET

Figure 2 is the Actual Evapotranspiration (ETa) Estimate for August 2011, expressed as a percentage of the normal conditions. The ETa gives an indication of the water evaporating from the soil and transpiring from the vegetation. The ETa anomaly for a given period expresses the surplus or deficit ET compared to the same period historically. During the non-vegetative stage (for crop or rangeland areas), ETa anomalies are an expression of surplus or deficit in soil moisture. Interpreted in this context, the ETa map suggests that areas in the eastern half of South Africa, Lesotho, Swaziland, parts of Botswana, parts of Zimbabwe, northern/central Namibia, and southern Angola, had higher than usual evapotranspiration (green colours, Figure 2),

and may thus have had above average soil moisture conditions. This therefore suggests that in some areas, even if normal to slightly below normal rains fall in October-December (the Oct-Dec forecast expects normal to below-normal rains in many of these areas), the soil moisture may *possibly* still be adequate for some agricultural activity. This is particularly more applicable in areas where retained soil moisture is relied on in crop agriculture, as well as in pasture areas. In some flood-prone areas, flooding may be a potential risk due to high river levels and soil moisture, depending on how the rainfall systems evolve over the coming months. Closer analysis of the imagery in these areas however reveals that even in these above-mentioned areas, some localized areas have lower-than-usual evapotranspiration, wherein below-average rainfall would not bode well for agricultural activity. Parts of Angola,

eastern Botswana, southern/central Malawi, parts of northern and central Mozambique, north-eastern Namibia (Caprivi area), Tanzania, and parts of western Zambia experienced below average evapotranspiration conditions in August (red and orange colours, Figure 2), which could be related to the low rains received in some of these areas in the last season, especially a dry-spell which affected several areas in the second half of the season. In these areas, a below average rainfall outcome as indicated in the first half of the season may have negative outcomes, particularly for pastures and cropland agriculture partially dependent on retained soil moisture. D.R.C. has experienced a significant hydrological drought in the past season, with river levels in the Congo River at low levels with consequent reduction in hydro-electric power. The forecast for normal to above normal rains in the first half of the season is therefore a welcome forecast in this area, but this is reversed in the second half of the season to enhanced chances of normal to below-normal rainfall. Tanzania has experienced repetitive poor rainfall seasons in the northern bimodal areas, and the below average ETa in this area and other parts of Tanzania provide further corroborating evidence for the poor soil moisture conditions in these areas. The forecast for above-normal to normal rainfall in north-eastern Tanzania throughout the season bodes well for the country, with increased chances for better crop production and improved pasture in the coming season