FOOD SECURITY EARLY WARNING SYSTEM

Agromet Update

2009/2010 Agricultural Season

Issue 01 Month: September Season: 2009-2010 Release date: 04-09-2009

Climate Forecast for the 2009/2010 Agricultural Season

The Thirteenth Southern Africa Climate Outlook Forum (SARCOF-13) was convened from 26 to 27 August 2009 in Harare, Zimbabwe by the SADC Drought Monitoring Centre (DMC) to formulate consensus guidance for the 2009/2010 rainfall season over the SADC region. A rainfall outlook covering the period October 2009 to March 2010 was prepared by climate scientists from the National Meteorological and/or Hydrological Services (NMHSs) of the SADC region, the DMC, and well as international cooperating partners.

The forecasters concluded that from October to December 2009, most of the western parts of continental SADC will have an increased chance of receiving normal to below-normal rainfall with the exception of extreme west of Angola, northern Mozambique, bulk of Malawi and eastern parts of Zambia which are expected to receive above-normal rainfall. The eastern part of continental SADC is likely to have an increased chance of receiving normal to above-normal rainfall. Eastern Madagascar and Mauritius have an increased chance of receiving normal to below-normal rainfall.

From January to March 2010 most of continental SADC, Madagascar and Mauritius are expected to receive normal to above-normal. Southern parts of continental SADC are expected to receive normal to below-normal rainfall.

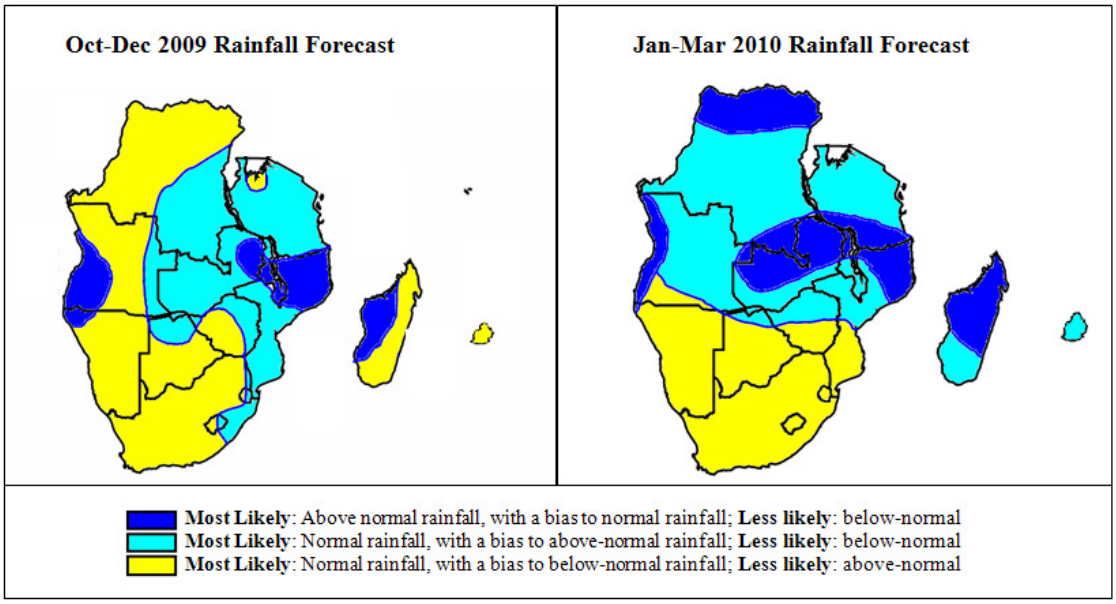

Figure 1. SARCOF Rainfall Forecast for October 2009 to March 2010.

The two forecasts presented by the SARCOF climate experts were adapted into one map to show areas that were forecast to have different likelihoods in the two halves of the season on one graphic. The results of this analysis are shown below in figure 2, together with a detailed interpretation of the forecast implications in different areas of the region in Table 1.

Composite SARCOF Rainfall Forecast for Oct 2009 to March 2010

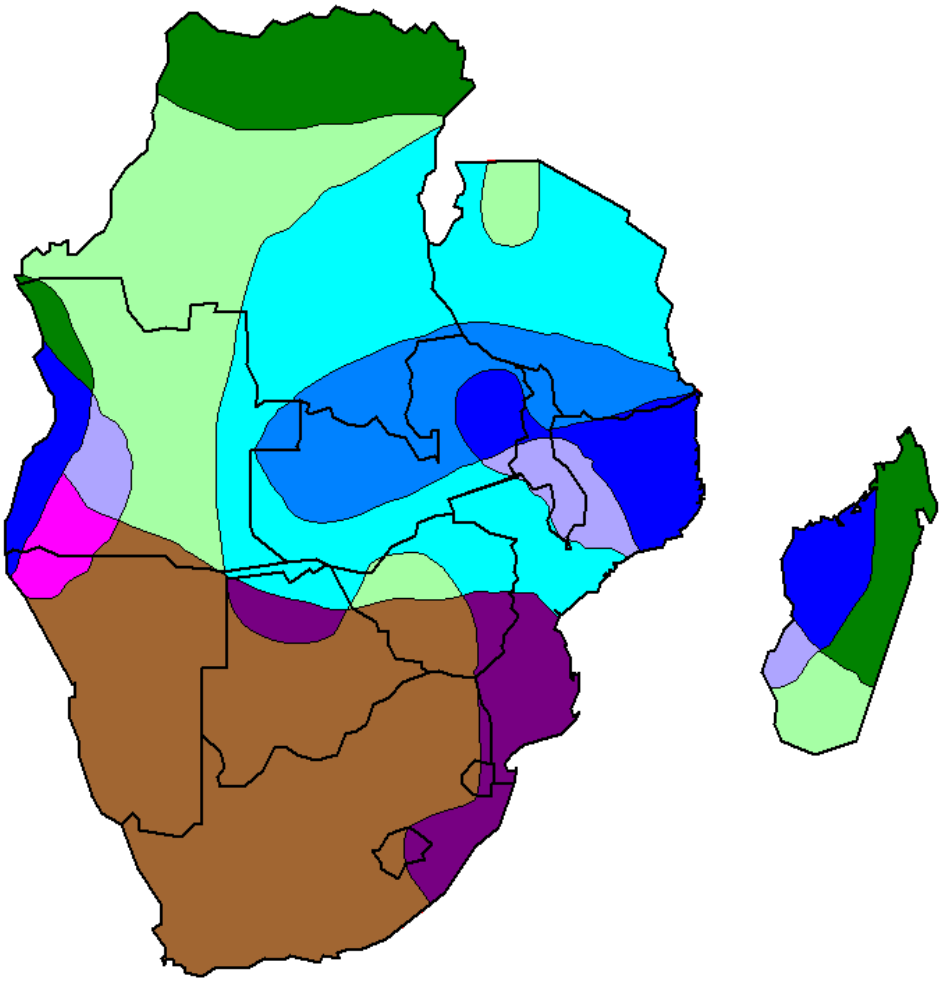

Figure 2.

Color	SARCOF Forecast
	1. Likelihood of above-normal throughout the rainfall season
	2. Likelihood of normal to above normal in first half, increasing to likelihood of above-normal to normal in second half of season
	3. Likelihood of above-normal in first half, decreasing to likelihood of normal to above-normal in second half of rainfall season
	4. Enhanced likelihood of normal to above-normal throughout the rainfall season
	5. Likelihood of above-normal in first half, changing to likelihood of normal-to-below-normal in second half of rainfall season
	6. Likelihood of normal to above-normal in first half, decreasing to likelihood of normal-to-below-normal in second half
	7. Likelihood of normal to below-normal in first half of season, changing to likelihood of above-normal to normal
	8. Likelihood of normal to below-normal in first half of season, increasing to likelihood of normal to above-normal
	9. Enhanced likelihood of normal to below-normal throughout the rainfall season

Color	SARCOF Forecast	Description of potential agricultural impacts
	1. Likelihood of above-normal throughout season	Impacts in these areas (Category 1), particularly those in the eastern parts of the SADC region are related to enhanced chances of above normal rainfall, which may lead to cases of flooding in high rainfall, low-lying areas. This could result from incessant heavy rains typified by convective-related rainfall activity. Areas bordering the Mozambique channel are also prone to cyclone activity, which may be a contributing factor, particularly if this season is forecast for high cyclone activity. In contrast, the enhanced likelihood of above normal rains mean a better chance of good agricultural output in the majority of the concerned areas. In the western area (western Angola), the blue area falls along a mainly dry, semi-arid belt, with high likelihood that above normal rains in these areas will likely improve agricultural activities. However, depending on the active rainfall systems, high intensities of rainfall may result in flash-flooding and other flooding events. Appropriate contingency measures are advisable
	2. Likelihood of normal to above normal in first half, increasing to likelihood of above-normal to normal in second half	Category 2 is mainly found along many parts of the Zambezi river basin and areas slightly north, and the potential impacts are likely to be similar to those noted in Category 1. The enhanced chances of above normal rains mean a better chance of good agricultural output in the majority of the concerned areas, although if rains are incessant, this could lead to waterlogging, and flooding in low-lying areas. These chances are higher in the second half of the season, when the likelihood of above-normal rains is expected to increase. Appropriate contingency measures are advisable.
	3. Likelihood of above-normal in first half, decreasing to likelihood of normal to above-normal in second half of rainfall season	Category 3 is found in 3 locations within the SADC region (1) in the western parts, in central Angola (2) in the eastern parts of SADC, particularly Malawi, eastern Zambia and northern Mozambique, and (3) in western Madagascar. Above-normal to normal rains are expected to occur, particularly in the first half of the season. This provides also reasonably good chances of good agricultural success, although provision should be made for possibility of flooding, particularly in the low-lying areas
	4. Enhanced likelihood of normal to above-normal throughout rainfall season	Much of the area falling in Category 4 is in relatively high rainfall areas, particularly in the second half of the season. This raises chances of good agricultural outcomes. However, some areas in the southern parts of the Category 4 area are sometimes affected by a mid-season dry-spell, whose length tends to have high impact on the success rate of the agricultural season. So despite the higher likelihood of normal to above-normal rains, appropriate balance should be reached between more vulnerable, higher yielding crops, and more drought-tolerant, lower yielding strategies, particularly in the more marginal areas. Though perhaps less so, the possibility of high rainfall leading to flooding in low lying areas should also be considered in contingency plans
	5. Likelihood of above-normal in first half, changing to likelihood of normal-to-below-normal in second half of rainfall season	The area indicated, in the western parts of the region is generally a dry region, and above normal an occurrence of above-normal rains could in most instance indicate a general improvement in water supply in most cases. However, it should be noted that this area is very close to the areas that experienced severe flooding in Angola and Namibia during the 2008-2009 season. Due to the geographic uncertainty associated with the COF process, communities in flood prone areas should be on alert, especially during the first half of the season, while there are increased chances of dryness during the second half of the season
	6. Likelihood of normal to above-normal in first half, decreasing to likelihood of normal-to-below-normal in second half of rainfall season	The possibility of normal to above-normal rains in the first half of the season indicates potential for a good start to the rains. The enhanced likelihood however of normal to below-normal rains in the second half however implies increased chances of below-normal rainfall, and similar impacts and strategies to those suggested in Category 9 below are advised. Potential for a good start to the rains suggests the need to bias more towards early planting in these areas.
	7. Likelihood of normal to below-normal in first half of season, changing to likelihood of above-normal to normal	Category 7 areas are in northern D.R.C., north-western Angola, north-western Tanzania, and north-eastern Madagascar. The climates in these 3 areas are significantly different, resulting in different implications for the same forecast in these 3 areas. Rainfall in northern DRC is typically higher in the first half of the season, which is when the chances of below normal rains are higher in this forecast. North-western Angola is generally moderately dry to wet, although flooding in the recent few years in some of the areas therein suggest some of the areas therein are flood-prone. In north-eastern Madagascar, the pattern suggests possibility of an erratic start to the rainfall season, as well as possibility of high rainfall in the second half of the season. In addition to convective rainfall, cyclones are another source of high rainfall in Madagascar
	8. Likelihood of normal to below-normal in first half of season, increasing to likelihood of normal to above-normal	Much of central Angola, north-western half of DRC, western Zimbabwe, and southern Madagascar are included in this category. Much of north-western DRC is a high rainfall area, and if normal to below normal rains occur as expected in the first half of the season may still allow for significant agricultural activities. In central Angola, the rainfall increases from south to north, and the southern areas are more likely to be impacted by variations in rainfall intensity. In south/central Angola, western Zimbabwe, and southern Madagascar, the enhanced likelihood of below-normal rains in the first half suggest possibility of a poor start to the rainfall season, which may be ameliorated by increased chances of good rainfall in the second half of the season, and staggered planting may be advisable
	9. Enhanced likelihood of normal to below-normal throughout rainfall season	In Category 9, likelihood of normal to below normal rains in the first half of the season implies the possibility of erratic early season rains that may lead to a poor start to the rainfall season. In contrast, several previous El Nino events have been typified by good October rains, followed by dryness in some of these areas, which may be another occurrence to satisfy a below-normal rainfall outcome. Similar below-normal probabilities in the second half indicate enhanced chances of dryness during the second half of the season, possibly associated with prolonged dry spells. It should be noted though that the highest likelihood is for normal rains, which is not very high. Water conservation strategies, short maturing varieties, drought-tolerant crops, and staggered planting should be employed where possible. Staggered planting will be more beneficial in areas with a longer length of growing season, otherwise in many of the marginal areas, early planting appears more beneficial.

Table 1. Detailed interpretation of forecast implications

Forecast transition boundaries and spatial uncertainty

The SARCOF-13 Statement indicated that boundaries between zones defined in the forecast. A rough estimate from the climate experts indicated that the nature of these transition areas was such that they could be anything as wide as 200km in width or more. should be considered as transition areas. This concept is visualized in Figure 4, wherein the composite SARCOF forecast is overlaid with red lines on approximately 100km on either side of the zone boundaries to show that the forecast zone boundaries indicated can lie anywhere within the adjacent red lines. As such, area-specific interpretation of the forecasts should take into account this geographic uncertainty when deciding strategic management options and contingency plans based on the forecast

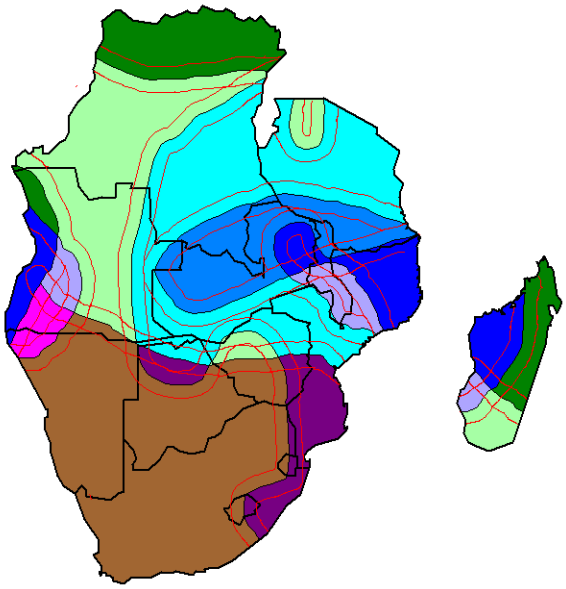

Figure 2: Estimated transitional boundaries for zones

Further Interpretation of the Forecast

The climate experts noted that this outlook is relevant only to seasonal time-scales and relatively large areas and may not fully account for all factors that influence regional and national climate variability, such as local and month-to-month variations (intra-seasonal). Users are strongly advised to contact their respective NHMSs for interpretation of this outlook, additional guidance and updates.

Rainfall Forecast in Context of Previous Season (2008/09 season)

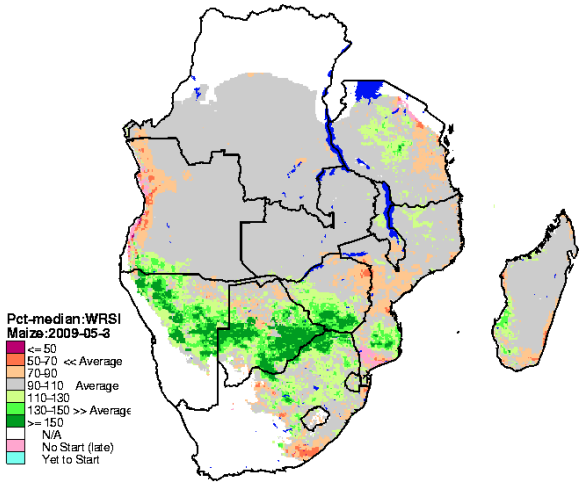

Figure 2. Modelled Crop Performance for 2008-09

Most SADC Member States apart from Lesotho, Namibia, South Africa and Tanzania indicated an increase in cereal production during the 2008-2009 growing season, compared to the previous year. These areas which experienced good harvests, especially those in the southern half of the sub-region should maximize the previous year's production, especially given the enhanced probabilities of below normal rainfall. Figure 2 shows the modelled crop performance based on a Water Requirements Satisfaction Index (WRSI), presented as a percentage of the normal performance, wherein green areas had a potential for good, above average performance, grey areas likely exhibited around average performance, and orange/red areas had below average performance.

In contrast, areas in the northern half of the region, where good rains are generally expected, should maximize on the expected good rains and undertake management tactics that support good yields. The possibility for heavy rains also mean that contingencies for waterlogging and leaching should be

taken in the relevant areas that are prone to such occurrences under conditions of heavy incessant rainfall.

Similar Seasons in the recent past (Analogue Years)

Forecasters have indicated that the current El Nino is very similar to the 1972-73 El Nino as well as the 1986-87 El Nino. Although the rainfall patterns in the current season will not be identical to those observed during these analogue years, the 2 seasons mentioned do provide important analogues that can be used to provide scenarios of how the current season may turn out. A run of the WRSI for the 1986-87 season using available data shows a scenario in which most parts of the southern half of the region had below-average crop performance (orange and red areas, Figure 3) while the eastern parts of the region experienced above average crop performance (green areas, figure 4). This particular WRSI output is compared to the average WRSI performance for 2001 to 2007.. This is one potential scenario based on crop performance for the 1986-87 season. White areas in figure 3 show areas which are either not applicable because of limited cereal growth for the specific season (northern Tanzania, and the south-western parts of the region), or where data was not available for that particular time period.

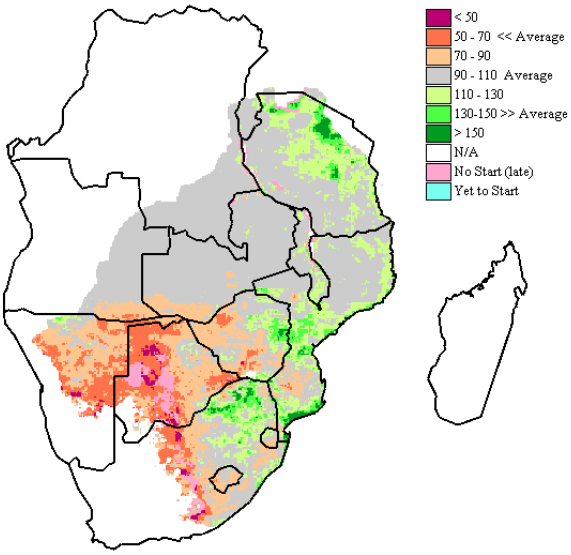

Figure 3. Modelled Crop Performance for 1986-87

Further notes on forecast interpretation

Each forecast zone presents 3 likelihoods – one for below normal rainfall totals, one for normal rainfall totals, and a third for above normal rainfall totals. As such, 3 different rainfall scenarios are a possible outcome for the rainfall season in each different area. Due to the nature of this probabilistic forecast, users who are using this forecast for planning purposes need to consider a range of possibilities and scenarios, while placing greater emphasis on the most likely scenarios. For example, given an area with enhanced chances of normal to below normal rainfall for the period covering October-December, planners need to consider that the most likely scenario is that total rainfall during that period will be around normal; the planners will have to further consider that there are also significant chances that the total rainfall could be below normal; and finally, the planners will also need to keep in mind that there is still a possibility, albeit less likely, that rainfall could also be above normal during that forecast period (October-December). As such, the set of contingency plans for the season should take this whole scenario set into account, with weighting on the contingencies being influenced by the probabilities. As an example, a farmer in the area described above could concentrate on planting the majority of his/her cropping area to a crop that does well under normal rainfall conditions for his/her area, and also plant a significant portion to crops that do well under below normal rainfall conditions, while also putting in a smaller portion of the crop towards the higher-yielding varieties that may only produce well under above-normal conditions.

It is important to note that below normal does NOT necessarily mean drought, and above normal does NOT necessarily mean flood. The terms “above normal” or “below normal” are in explicit reference to the normal rainfall of each and every given area. So in DRC where the rainfall is normally high for most parts of the country during that period, a scenario of below normal rains will probably yield more rainfall than a scenario of above-normal rains for most parts of Botswana for instance, where low rains normally fall over most parts of the country.

For more details, contact SADC Secretariat FANR Directorate.
Gaborone, Botswana. Tel: +267-3951863; E-mail: fanr@sadc.int
Web: http://www.sadc.int