REGIONAL FOOD SECURITY PROGRAMME

Special Agromet-Update

Seasonal Climate Forecast

2004/2005 Agricultural Season

SPECIAL ISSUE

Month: September **Season: 2004/2005** **Release date: 17-09-2004**

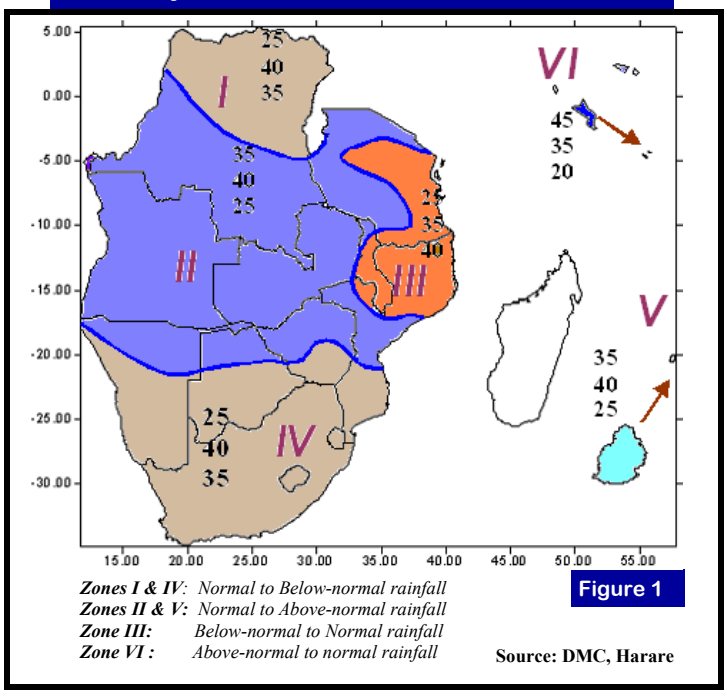
Summary: The eighth Southern Africa Regional Climate Outlook Forum was held from 1 to 2 September 2004 in Harare, Zimbabwe. The main objective of the forum was to come up with a consensus forecast regarding the prospects for the 2004/2005 rainy season. Indications of the forecast are that the central parts of the SADC region and the Indian Ocean Islands have an increased chance of receiving normal to above normal rainfall during the October to December 2004 season (Figure 1), while northern DRC and the extreme southern parts of the SADC region have increased chances of receiving normal to below normal rainfall. Other parts with increased chances of normal to below normal rainfall are northeastern parts of Tanzania, most of Malawi and northern Mozambique. Despite the development of a weak El Niño, its impacts on some parts of the SADC region are expected to be weak. However, during the JFM 2005 period, the bulk of the region has increased chances of receiving normal to above normal rainfall (Figure 2) with exceptions of Zimbabwe, Botswana, central Mozambique, South Africa, Mauritius and eastern Tanzania.

Normal to below normal rainfall expected in parts in 2004/2005 season

Although scientists have observed anomalous warming over the eastern equatorial Pacific Ocean, which has been associated with a developing El Niño phenomena, its influence on rainfall over some parts of the SADC region is expected to be weak. This was established at Southern Africa Regional Climate Outlook Forum (SARCOF) meeting held in Harare, Zimbabwe, organized by SADC DMC, from 1-2 September 2004.

The 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. Annually, the amount of rainfall varies considerably across the SADC region. Users need to interpret these predictions relative to what they are used for. National Meteorological Services, may provide additional guidance relative to the situation in each country as the season progresses. This applies to tropical cyclone conditions that cannot be predicted at the moment. Both timing and amount of rain cannot be predicted precisely, and it was reiterated that rainfall is more difficult to predict in the absence of unusual climatic indicators.

Probability Rainfall Forecast for Oct-Nov-Dec 2004

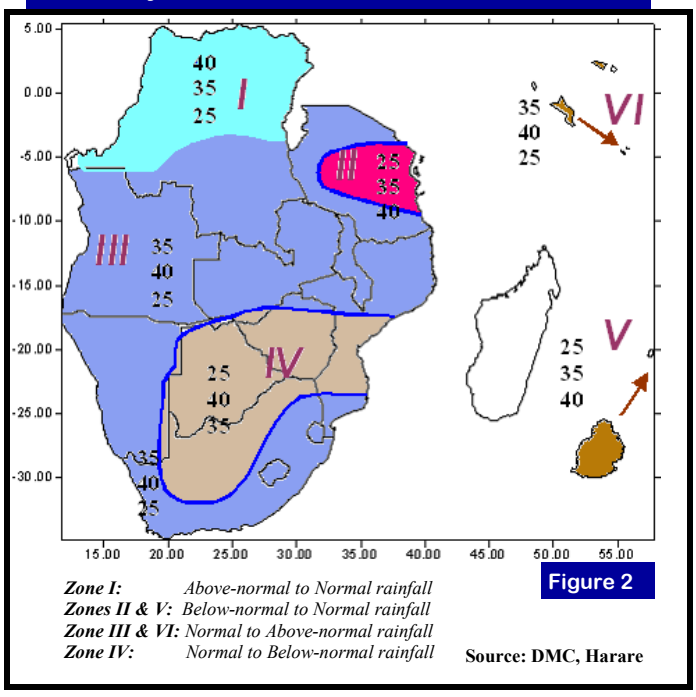


Zones I & IV: *Normal to Below-normal rainfall*
Zones II & V: *Normal to Above-normal rainfall*
Zone III: *Below-normal to Normal rainfall*
Zone VI : *Above-normal to normal rainfall*

Figure 1

Source: DMC, Harare

Probability Rainfall Forecast for Jan-Feb-Mar 2005



Zone I: *Above-normal to Normal rainfall*
Zones II & V: *Below-normal to Normal rainfall*
Zone III & VI: *Normal to Above-normal rainfall*
Zone IV: *Normal to Below-normal rainfall*

Figure 2

Source: DMC, Harare

Explanation: "Above normal to normal" forecast is different from a forecast of "Normal to above normal". "Normal to above normal" implies that the "Normal" (or about average rainfall) is the most likely scenario, with a likelihood for a bias towards "above normal" rainfall conditions. In contrast, "Above normal to normal" implies that the "above normal" conditions are most likely, with a likelihood for a bias towards "normal" rainfall conditions.

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Interpreting and Applying a Seasonal Forecast to Agriculture

Planning for agricultural production should ideally start with a seasonal forecast that gives an indication of what the climatic conditions may be like during the coming season. The forecast provides information that can help the farmer make important decisions such as which crop varieties to cultivate, whether to use water conservation techniques, and whether to sell livestock. The seasonal forecast is probabilistic in nature, and addresses only the *chances* of either above normal, normal, or below normal rainfall occurring - there is still therefore a chance that any of the scenarios may be realized. What the forecast does say however is to tell which is the most likely rainfall scenario and which is the least likely rainfall scenario. This allows the farmer to plan for all three scenarios (above, normal, and below), while placing his/her "best bet" on the most likely scenario. Therefore, in a season where the forecast suggests that the season is most likely to have above normal rainfall, the farmer, for example, may decide to plant 70% of his/her fields to a high yielding crop that requires more water and has a longer maturity period; and to plant 30% of his/her fields to a more drought-resistant but lower-yielding crop variety, just in case the less likely scenario of low rainfall occurs. On the other hand, where the forecast calls for greater chances of below normal rainfall, a livestock farmer may decide to sell off a small portion of his/her herd while prices are still high and reserve the proceeds for a rainy day, in case below normal rains are realized.

Which is more important—OND or JFM

The two halves of the season (October to December, also called OND, and January to March, also called JFM) have differing levels of importance to crop farmers depending on when they plant, and the maturity period of the cultivars they grow. For livestock farmers, both halves are equally important, as pasture needs to be in good condition throughout the season. Figure 3 shows the mean onset of the rainfall season. Knowledge of the mean rainfall onset provides a basis on when planting usually occurs as this information is not provided in a forecast. Figure 4 shows the relative importance of each half of the growing season (Oct – Dec, and Jan – Mar) for a 120-day crop, based on the length of time that the crop grows in each half. Figure 5 shows the same parameter, but for a 90-day crop. The light green colours show that most of the crop's growth cycle occurs in the October to December period, the medium green colours show that the crop grows about halfway in each half of the season, while the dark green shows that most of the crop's growth cycle occurs in the January to March period.

Implications of the 2004/05 Seasonal Forecast on Crop and Livestock Production in the SADC Region

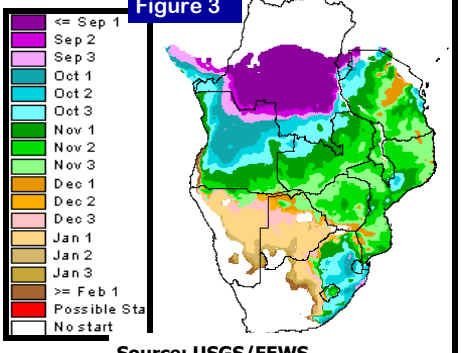
Based on the seasonal forecast issued at SARCOF, the 2004/05 season may turn out to be quite challenging for many countries. In the first half of the 2004/05 season, the most likely scenario is for normal rainfall over most of the region, although there are also high chances of below normal rainfall over much of the southern part of the region (brown areas, Figure 1). In these areas, there is only a slim chance that rainfall will be above normal. Overall, forecasts favouring below-normal rains in the October – December period cover a number of countries where the season did not perform well during the previous 2003/04 season, including eastern Botswana, Lesotho, Malawi, Mozambique, Swaziland, Tanzania (the uni-modal season looks more likely to be affected than the bi-modal), and Zimbabwe. This may call for a need for use of water conservation and water harvesting farming techniques in areas where this may be appropriate, as well planting of a higher proportion of drought tolerant cultivars.

In the second half of the season (January – March), chances of below normal rainfall decrease significantly, and there is increased chances of above-normal rainfall in many areas across the region (Figure 2, blue colours). It is during this second half that most of the crop may be realised. However, in a number of areas in some countries, including Botswana, South Africa, Mozambique, Tanzania and Zimbabwe, there are high chances of below normal rainfall throughout the rainfall season. In these areas particularly, the season may be most challenging, and there is a need for careful decision making on the farming techniques that need to be used to overcome these potential challenges. The necessary socio-economic production conditions will also need to be in place for the season to be a success. For example, Governments, NGOs and International organizations may pay particular attention to those areas where poor harvests were realized in the last few seasons and humanitarian assistance is being administered.

Some areas have a split forecast, in which above normal rainfall is more likely in the first half of the season, while below normal rainfall is more likely in the second half. The reverse situation also exists in other areas. Careful management is required in such scenarios. For example, countries requiring special attention include Namibia, Tanzania and Zimbabwe which need to maximize the first half of the season; while Lesotho, Swaziland and Mozambique need to maximize the second half of the growing season. In Zimbabwe, the first half offers better prospects as productive areas have good chances of normal rainfall.

It should be noted that this forecast is at regional level and detailed forecast will be issued by individual National Meteorological Services. Close monitoring of pastures in Botswana, South Africa, southern Zimbabwe and Namibia will be extremely important as livestock contributes significantly to the economies of these countries.

Figure 3



Source: USGS/FEWS

For more details, contact: SADC Regional Early Warning Unit, Gaborone, Botswana. Tel: 267-3951863;
Email: RMasundire@sadc.int or SADC Regional Remote Sensing Unit, Harare, Zimbabwe. Tel: 263-4-722717;
Email: rrsu@fanr-sadc.co.zw; Web: http://www.sadc-fanr.org.zw

Which is more important—OND or JFM (cont)

It needs to be noted that the mean onset of rains used in this analysis is based on a 30 year rainfall time series. Recent trends however have been generally favoring a later start of season. This tends to push up the relative importance of the January – March period. As a general rule therefore, the more delayed the onset of rains, the more critical the JFM period becomes. The 2003/04 season had an erratic and late onset in many areas, and yields were affected significantly in some countries.

In addition to the factors mentioned above, the OND period also has critical importance because in most areas, it is at this time that the reproductive stage of the crop occurs. The reproductive stage of the crop is a critical stage that requires much water.

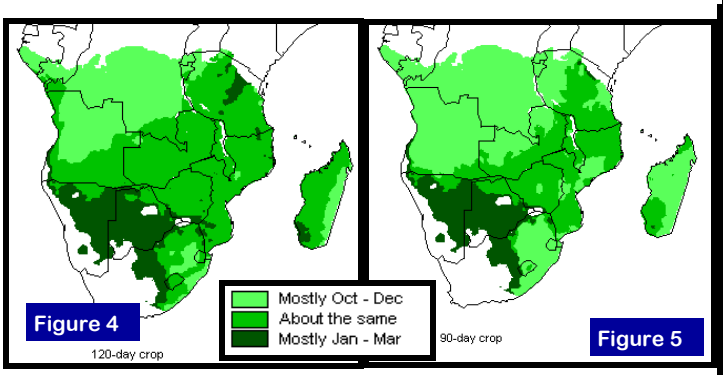


Figure 4 Figure 5

Probability of getting enough crop water in 2004/05

Maize, is the main staple food crop in southern Africa. Based on the seasonal forecast for the 2004/05 season (Figure 1 and 2), an analysis was carried out of the probabilities associated with the total water requirements of maize crops. The objective of this analysis was to determine the chances of getting (a) an average crop or better, and (b), a crop that was not a complete failure. Varieties requiring 90 and 120 days to mature were used in the analysis. The analysis was carried out using a combination of the FEWSNET AgroClimatology Toolkit (FACT) and Water Requirements Satisfaction Index (WRSI) principles. The assumption is made that planting occurs at the average onset of rains (Figure 3).

Figures 6 to 9 show the results of this analysis. The analysis was done both for the October-December (OND) and the January-March (JFM) periods, but results here are only shown for JFM. Figures 6 and 7 show the analysis for a 120 day crop in JFM. Figure 6 shows what are the chances of obtaining an average yield or better, while Figure 7 shows the chances of doing better than crop failure. As an example, in Southern Mozambique, there is generally little chance (11% to 30%) that the crop will be at least average, and a moderate chance (31% to 60% probability) that the crop would at least avoid crop failure. In areas like this, where there are not even good chances of avoiding crop failure, then it is not advisable to grow that particular cultivar in that area. Generally, this analysis provides information to help decide whether to plant a particular cultivar in a specific area, depending on whether one is willing to accept the level of risk associated with that crop.

Figures 8 and 9 show similar analyses but for the performance of a 90-day crop in JFM. In many of the areas in white, a 90-day crop will have finished growing by January if it was planted at the average onset of rains (Figure 3).

Forecasting water needs provides vital information for decision making regarding appropriate varieties, management practices, soil moisture conservation methods and planting density. RRSU will monitor throughout the season.

Average 120 day crop in JFM

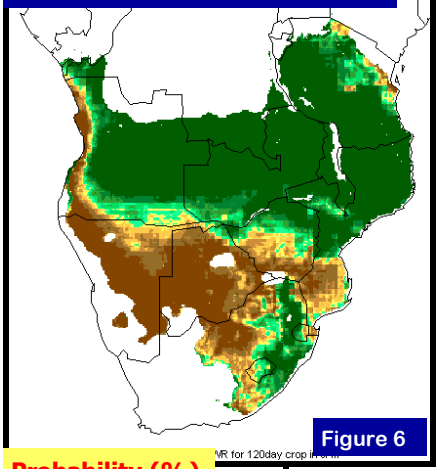


Figure 6

Poor 120 day crop in JFM

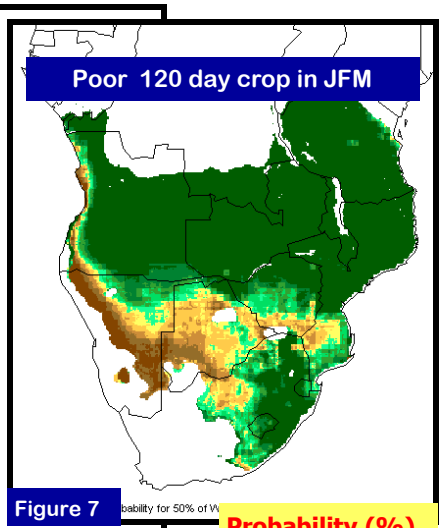


Figure 7

Probability (%)

0 - 10
11 - 20
21 - 30
31 - 40
41 - 50
51 - 60
61 - 70
71 - 80
81 - 90
91 - 100
No Data

Average 90 day crop in JFM

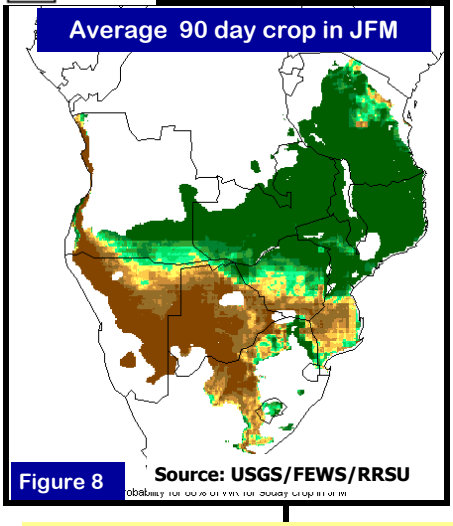
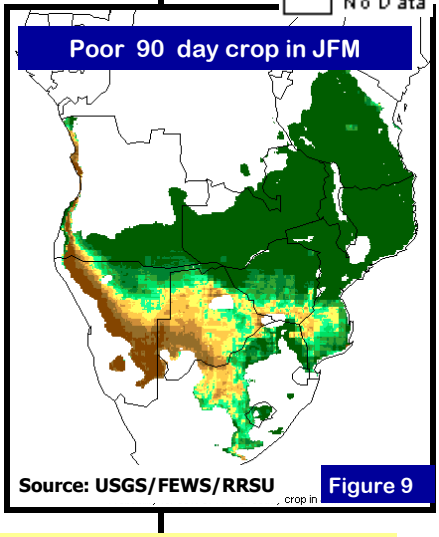


Figure 8 Source: USGS/FEWS/RRSU

Poor 90 day crop in JFM



Source: USGS/FEWS/RRSU Figure 9

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