SOUTHERN AFRICAN DEVELOPMENT COMMUNITY

CLIMATE SERVICES CENTRE (SADC-CSC)

REGIONAL CLIMATE MONTHLY MONITOR

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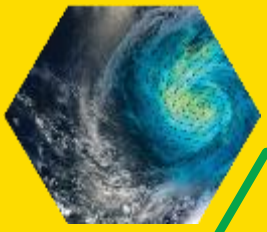

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INTRA-ACP CLIMATE SERVICES AND RELATED APPLICATIONS PROGRAMME

An initiative of the Organisation of African, Caribbean and Pacific States funded by the European Union

BENEFICIARIES

A. HIGHLIGHTS

- **Rainfall during the month of December 2023 was below the long-term mean** for that month over the bulk of the contiguous SADC region and over most of Madagascar.
- As of end of December 2023, **seasonal rainfall onset was not yet started** over most of Botswana, central and south Namibia, and central parts of South Africa
- **Persistent long term drought conditions continued** over much of the central and western parts of the sub-continent.
- **Sporadic extreme rainfall events** (more than 50mm) were recorded over a small portion of central Mozambique, pockets of northern Tanzania, southwestern DRC and the extreme southeastern areas of Madagascar.
- **Minimum temperatures close to above the long-term average over most parts of the SADC** region. Some regions (southern parts of Angola, most parts of Namibia, north Botswana and eastern Zambia) had anomalous high minimum temperatures (anomaly above 2^{o}C).
- **Anomalously high maximum temperatures, 2-4^{o}C were recorded** in some parts of western Angola, east Namibia, and central Madagascar**.**
- **Maximum temperatures above the 95th percentile consecutively over a 3-day period (heatwaves)** were recorded over most of the central contiguous SADC region and over Madagascar.

1. REGIONAL RAINFALL PERFORMANCE

Rainfall during the month of December 2023 was below the long-term average over most of the southern half of the contiguous SADC region. Most of the northern half of Democratic Republic of Congo (DRC), the southeastern parts of Angola, west and central Zambia, north Zimbabwe, the north Mozambique, eastern half of Botswana, Namibia, extreme eastern parts of South Africa and the southern and western fringes of South Africa and most of Madagascar received below normal rainfall. South DRC, Tanzania, western Angola and some localized regions in southern parts of Mozambique and central parts of South Africa received above monthly mean rainfall (Figure 1).

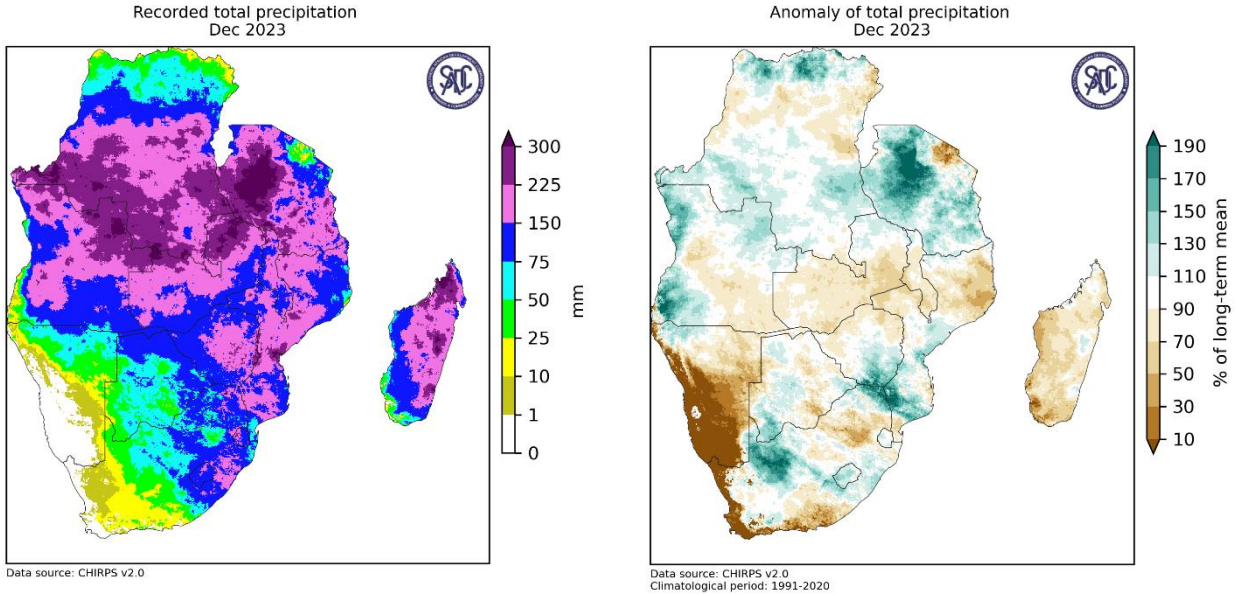

Figure 1: Observed rainfall (left) and rainfall anomaly (right) for the month of December 2023

1.1 Onset of the Rainfall Season

The onset of the 2023/24 season is defined here from agricultural perspective as accumulation of at least 20mm of rainfall over three days, which are not followed by a dry spell in the next 10 days (i.e. there is at least one rainfall event in the next 10 days). According to this definition, the agricultural rainy season was triggered during the month of October over north-western parts of the SADC region and south-eastern coastal areas (such as in South Africa, Lesotho, Eswatini, parts of Mozambique and also over eastern parts of Zimbabwe) The region of rainfall onset expanded to most of Mozambique, over central Angola and parts of Zambia during the month of November and by December onset was also triggered over the extreme northern part of Namibia and south western Zambia and the rest of Zimbabwe. (Figure 2).

Agricultural rainfall season has not yet started over most of Botswana, central and south Namibia, and central parts of South Africa by the end of December 2023. The anomaly map for the onset of rainy season depicts delay in onset by 3-5 dekads mainly over the central and western contiguous SADC region.

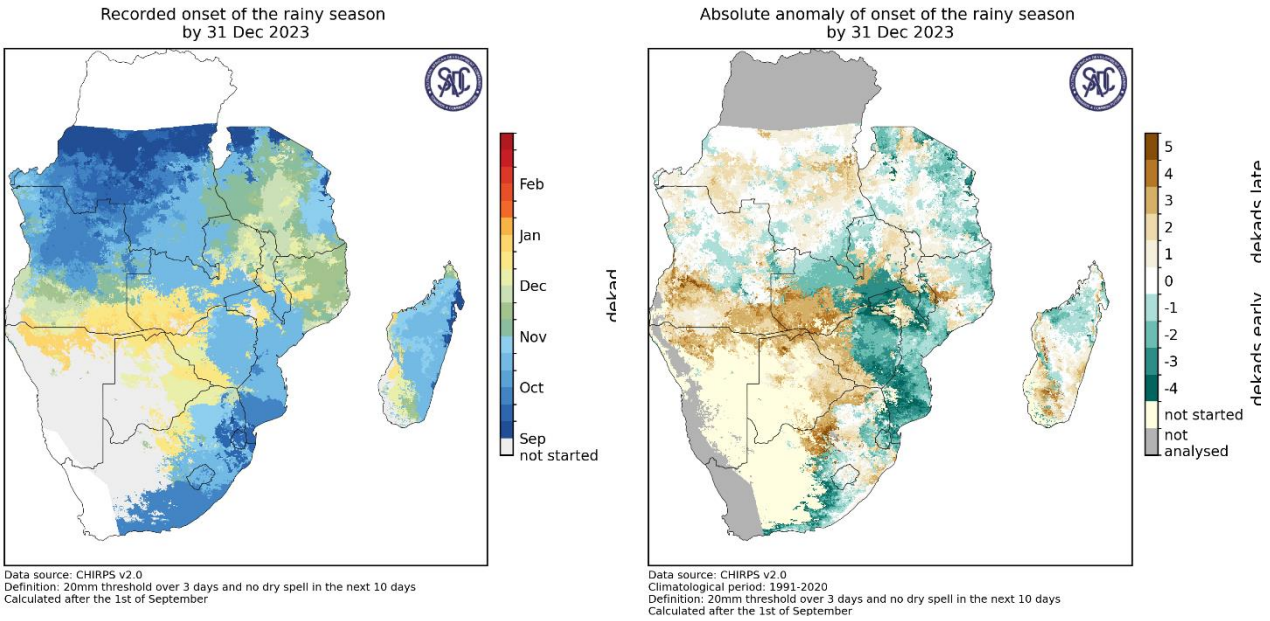

Figure 2: Onset of the 2023/24 rainfall season over the SADC region

1.2 Drought Monitoring

1.2.1 Seasonal and Annual Drought Assessment

Persistent drought conditions, defined by 12-month SPI (SPI12) continued over much of the central and western parts of the sub-continent covering Namibia, southern Angola, Botswana, southwestern Zambia, pockets of western Zimbabwe and central north South-Africa (figure below) (Figure 3).

Early season drought, defined by 3-month SPI, was detected over most of the central and western parts of the SADC region stretching from south Angola all the way down to western and northern parts of South Africa through most of Namibia, encroaching inwardly to Botswana, and west Zimbabwe. Central Tanzania, with some parts of Mozambique. Madagascar on the eastern parts of the SADC region, were also experiencing an early season drought as shown in Figure 3.

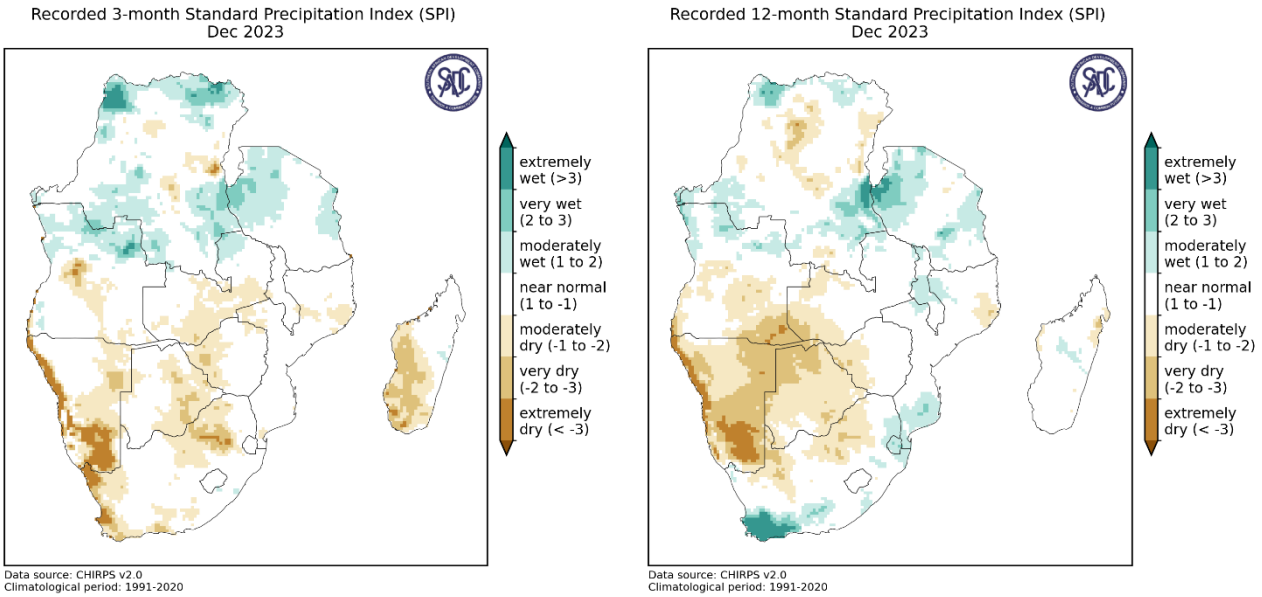

Figure 3: Drought assessment: SPI for 3-months (left) and 12-month SPI (right)

1.2.2 Short term drought (dry spells)

Figure 4 shows that the consecutive number of dry days were ranging from 25 to 30 over west and south Namibia, southwestern Botswana, western half of South Africa and north eastern fringes of Mozambique and including the south western areas of Madagascar: indicating an extended short-term dry spell with no rainfall events almost through the entire month of December 2023.

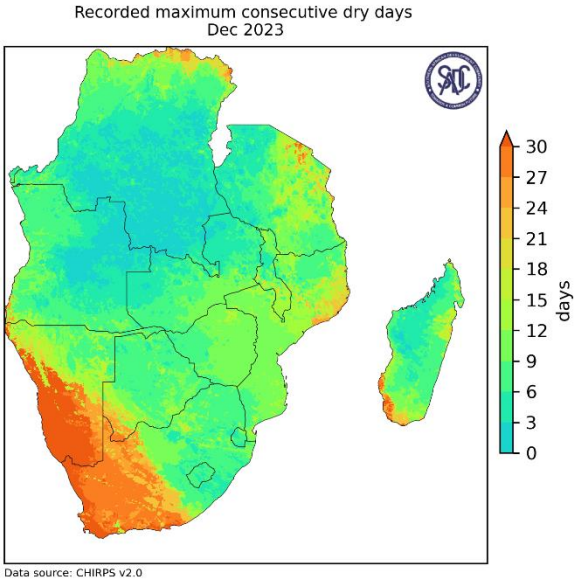

Figure 4: Dry spells prevalence during the month of December 2023

1.3 Extreme Rainfall

Sporadic extreme rainfall events (more than 50mm) were recorded over a small portion of central Mozambique, pockets of northern Tanzania and south western DRC and the extreme south eastern areas of Madagascar during the month of December. Most of the rainfall amounts between 25mm to less than 50mm per day were prevalent over south DRC, Tanzania , central and south Mozambique and east Madagascar(Figure 5).

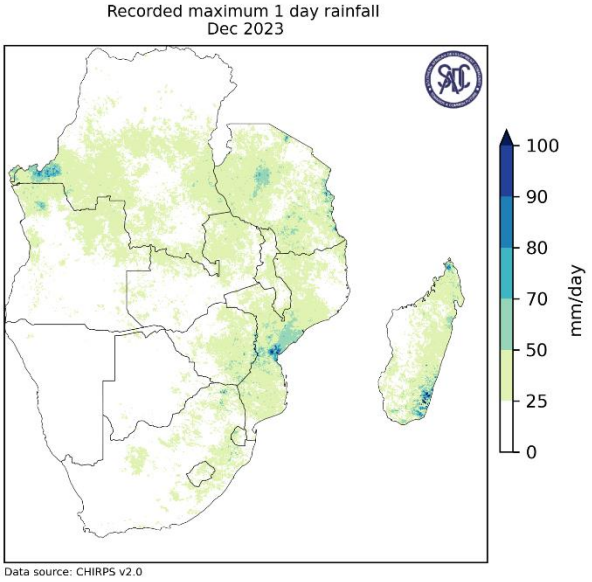

Figure 5: Maximum rainfall recorded over a one-day period during the month of December 2023

2. REGIONAL TEMPERATURE

2.1 Minimum Temperature

Most of the SADC region recorded minimum temperatures above 20 ^{0}C which was 1-2 ^{0}C above the long-term average over most parts central of the sub-continent. Anomalous high minimum temperatures (anomaly above 2^{o}C) were recorded in some parts of western Angola, east Namibia, and central Madagascar. However, most of northern DRC, south Zimbabwe, south Mozambique, South Africa and southern Madagascar recorded close to normal minimum temperatures (Figure 6).

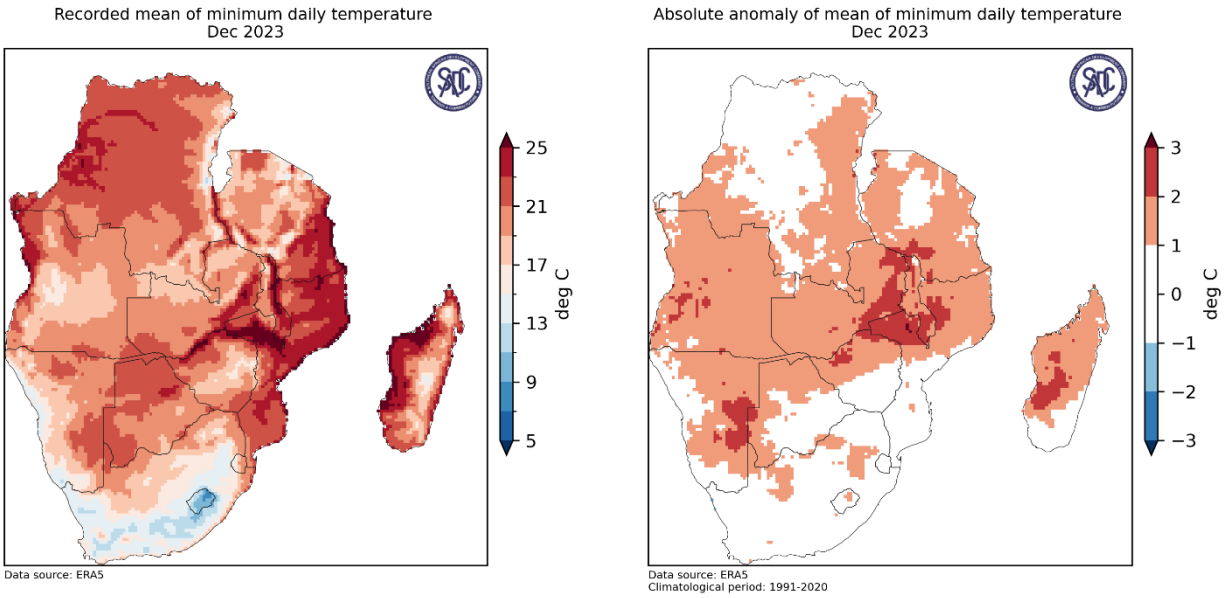

Figure 6: Observed average minimum temperature (left) and anomalies (right) for December 2023

2.2 Maximum Temperature

Anomalously high maximum temperatures, 2-4ºC above average, were recorded over most central contiguous SADC region and over Madagascar. The rest of the SADC region recorded mostly close to normal temperature during the month of December (Figure 7).

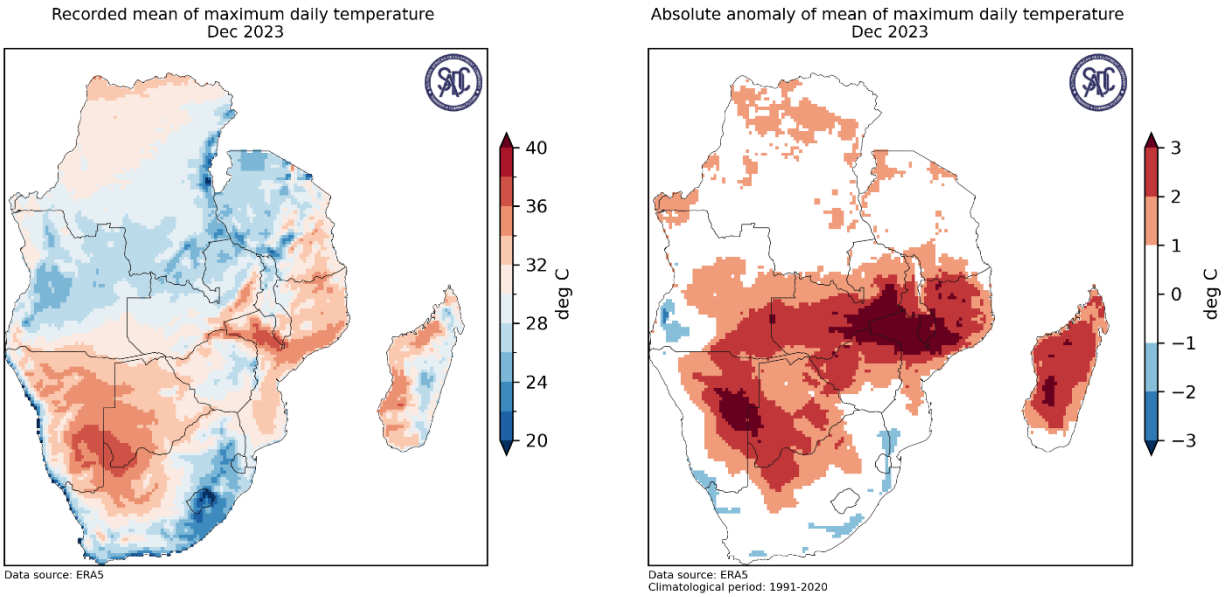

Figure 7: Observed maximum average temperature (left) and anomalies (right) for December 2023

2.3 Heat waves

We distinguish here two types of heatwaves which differ in economic and human health impacts – daytime defined based on maximum temperature recorded during daytime, and night-time, defined based on minimum temperature recorded during nighttime.

Daytime heat waves were recorded over east Angola, most of Zambia, central Namibia, most of Botswana, central South Africa, north Zimbabwe, Mozambique and most of Madagascar. In west Madagascar and Mozambique 15 to 20 days of daytime heat wave conditions were recorded in December (Figure 8). Night-time heatwaves were recorded for over 15 days over the northern half of contiguous SADC region and most of Madagascar.

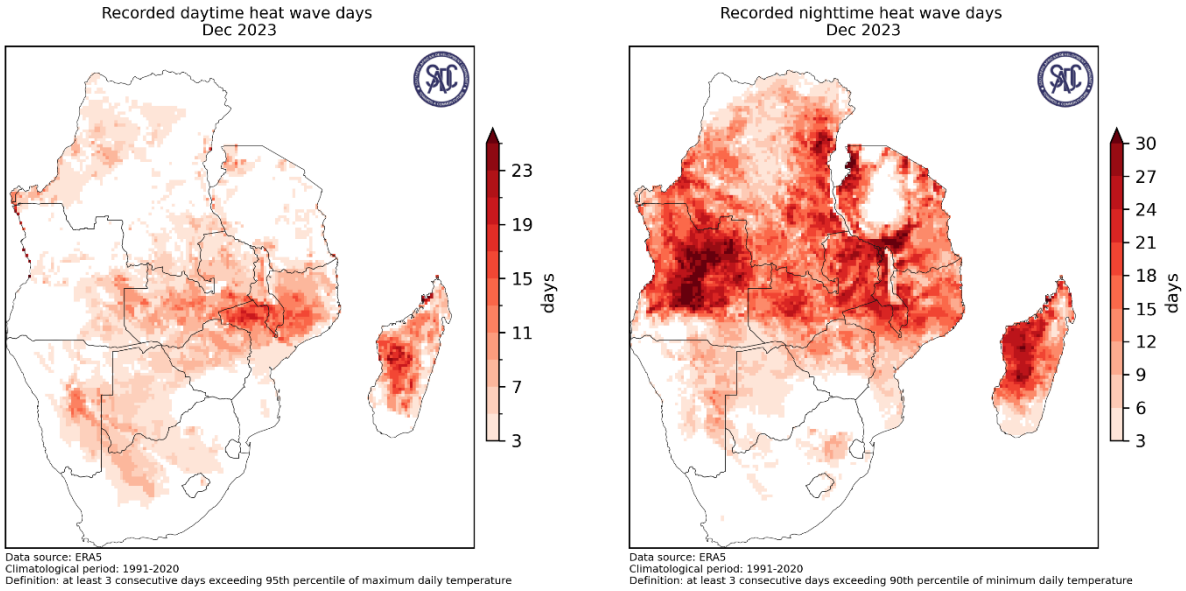

Figure 8: Heatwave detected during the month of December 2023

NOTE:

This bulletin used CHIRPS and ERA5 data. While these datasets are considered broadly representative to local conditions over the SADC region, the results presented here may differ from those derived using local observations from Member States.

Users are therefore, urged to consult the local National Meteorological and Hydrological Services (NMHSs) for local conditions and detailed interpretation of the contents of this bulletin.

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TOWARDS A COMMON FUTURE
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