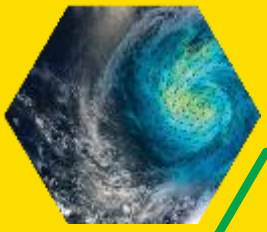
# SOUTHERN AFRICAN DEVELOPMENT COMMUNITY

## CLIMATE SERVICES CENTRE (SADC-CSC)

# REGIONAL CLIMATE MONTHLY MONITOR

**REPORTING MONTH:** JANUARY 2024

**ISSUE NO.** 04 **SEASON:** 2023/24 **ISSUE DATE:** 12 FEBRUARY 2023



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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 January 2024 was **below the monthly long-term** mean over most of the SADC region, except over eastern Tanzania where it was above normal.

- As of end of January 2024, **seasonal rainfall onset has not yet started** over **Botswana**, **Namibia**, and western parts of **South Africa**

- Persistent long term drought conditions continued over much of the central and western parts of the sub-continent.

- Extreme precipitation of around **100mm per day** were recorded over the eastern fringes of Madagascar and over Mauritius, mostly **due to tropical cyclone Belal.**

- Minimum temperatures were **close to above the long-term average** over most parts of the SADC region. Some regions recorded 2-3$^{o}$C above the long-term average (central Namibia and some parts of southwestern South Africa).

- Except for eastern Tanzania, most of the contiguous **SADC region recorded normal to above normal monthly mean maximum temperatures**.

- Maximum temperatures above the 95th percentile consecutively over a 3-day period **(heatwaves) were observed over southwestern DRC, north and southeastern Angola, west Zambia, south Malawi, northwestern Mozambique, and over north and central Madagascar**.

## 1. REGIONAL RAINFALL PERFORMANCE

Rainfall during the month of January 2024 was below the monthly long-term average over most of the contiguous SADC region, except over eastern parts Tanzania where it was above normal. The northern region of Mozambique, central DRC, southern Angola, over the central parts of South Africa, and Lesotho monthly accumulated rainfall were mostly close to the monthly mean. Most of southern Madagascar received below normal rainfall and the rest of the island received mainly close to normal rainfall (Figure 1).

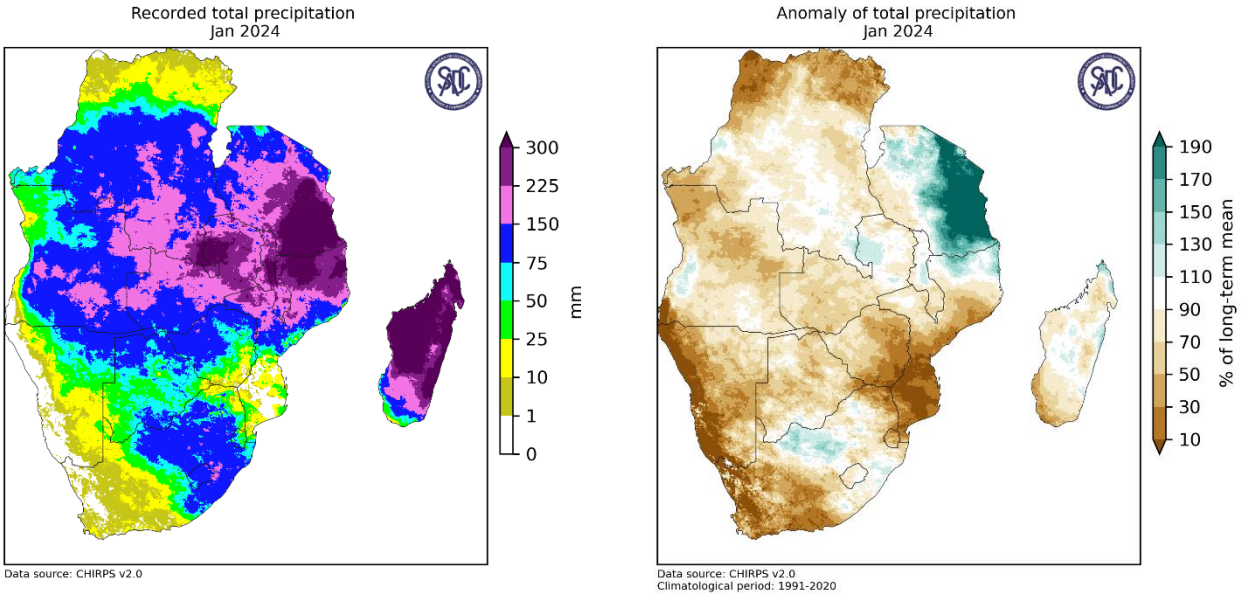


Figure 1: Observed rainfall (left) and rainfall anomaly (right) for the month of January 2024

### 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 over eastern parts of Zimbabwe) and some eastern and northern parts of Tanzania. The region of rainfall onset expanded to most of Mozambique, over central Angola, and some parts of Zambia during the month of November and by December onset was also triggered over the extreme northern part of Namibia and southwestern Zambia and the rest of Zimbabwe, Malawi, and Tanzania. (Figure 2).

Agricultural rainfall season had not yet started over most of Botswana, Namibia, and central parts of South Africa by the end of December 2023, however by January rainfall onset occurred over most of Botswana and central parts of South Africa. 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.

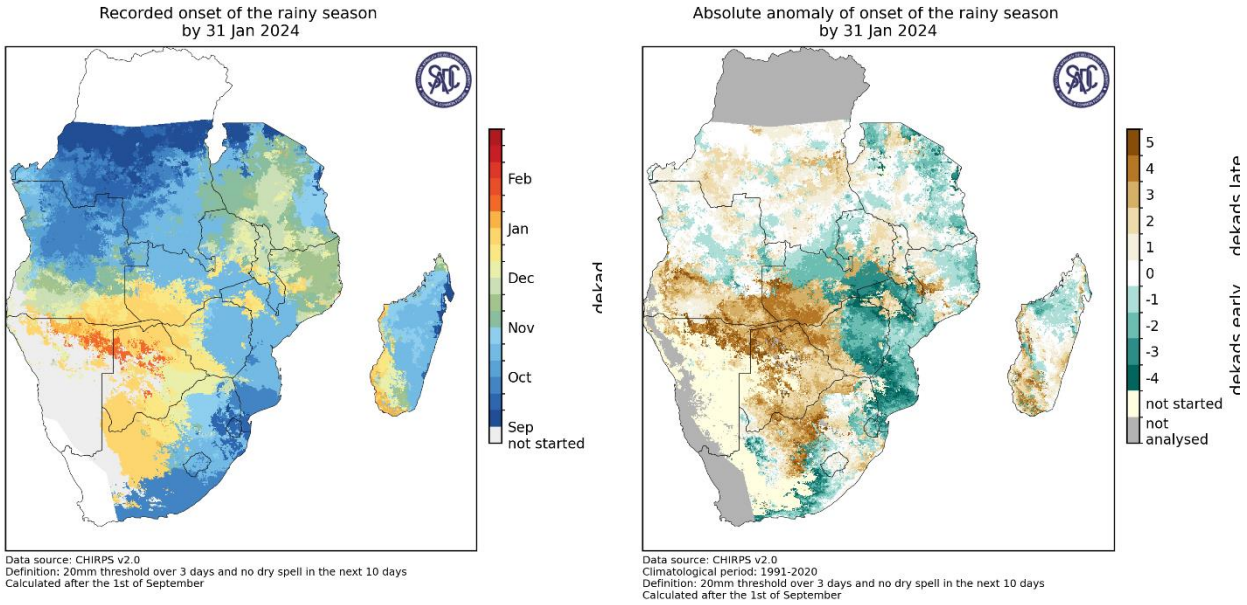


Figure 2: Onset of the 2023/24 rainfall season over the SADC region

## 1.2 Drought Monitoring

### 1.2.1 Seasonal and Annual Drought Assessment

Persistent drought conditions, defined by 12-month SPI (SPI-12) 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 northern South-Africa (figure below) (Figure 3).

The 3-month Standardized Precipitation Index (SPI-3) is a meteorological drought indicator to monitor precipitation anomalies over 3-month accumulation periods and is a proxy indicator for immediate impacts of droughts including reduced soil moisture. Such short-term drought of moderate dryness was detected over most of the central and western parts of the SADC region stretching from central Angola, south Zambia, central Mozambique, all the way down to South Africa. However, the 3-month SPI also indicated extreme dryness over some region of central Angola, western Namibia, and extreme southwestern parts of South Africa. Madagascar is also experiencing moderate dry condition particularly over the southern parts of the island as shown in Figure 3.

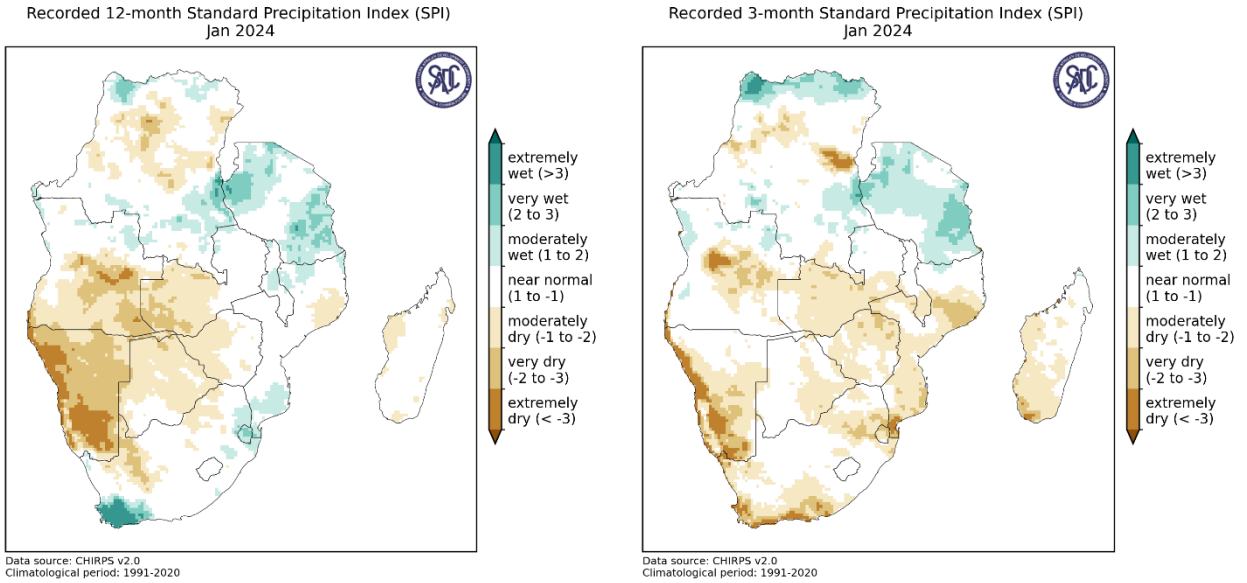


Figure 3: Drought assessment: SPI for 3-months (left) and 12-month SPI (right)

### 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 the extreme northern fringes of DRC, western fringes of Angola, west and south Namibia, extreme southwestern Botswana, western half of South Africa, southeastern fringes of Zimbabwe, south Mozambique and including the southwestern fringes of Madagascar: indicating an extended short-term dry spell with no rainfall events almost through the entire month of January 2024.

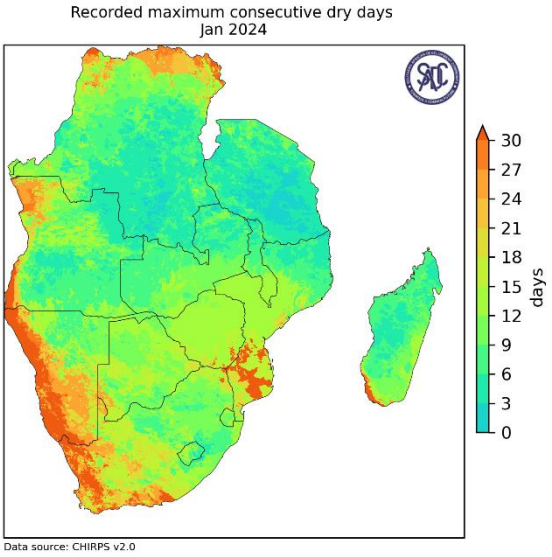


Figure 4: Dry spells prevalence during the month of December 2023

## 1.3 Extreme Rainfall

Sporadic rainfall events of 25-50mm were recorded over eastern Zambia, west Zimbabwe, Malawi, southern Tanzania, north and central Mozambique, eastern part of South Africa, Lesotho, Eswatini and over most of Madagascar (Figure 5). The latter also recorded extreme precipitation of around 100mm per day particularly over the eastern fringes of the island. Most of this precipitation was due with clouds bands associated by the cyclone Belal. This tropical cyclone also poured extreme rainfall of over the island of Mauritius.

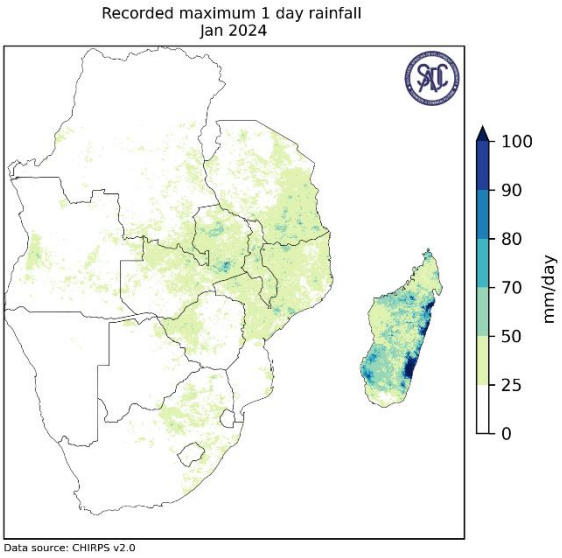


Figure 5: Maximum rainfall recorded over a one-day period during the month of January 2024

# 2. REGIONAL TEMPERATURE

## 2.1 Minimum Temperature

Except for Lesotho and the southeastern parts of South Africa, most of the SADC region recorded mean minimum temperatures of above 20$^0$C. Over most of DRC, Mozambique. Malawi, north Zimbabwe southwestern Botswana, southeastern Namibia, northwestern Angola, and most of Madagascar the mean minimum temperatures hiked to 25 $^0$C.

The minimum temperature anomalies were of the order of 2-3 $^0$C above the long-term average over central Namibia, and locally over some parts southwestern South Africa (Figure 6).

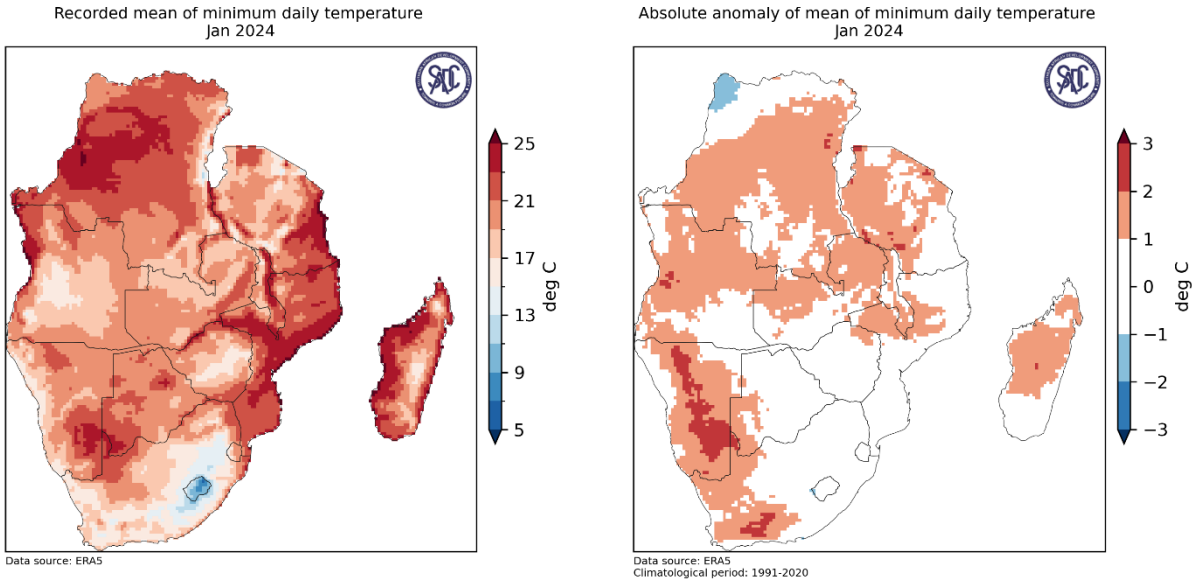


Figure 6: Observed average minimum temperature (left) and anomalies (right) for January 2024

## 2.2 Maximum Temperature

The average maximum temperatures peaked to 35$^0$C over north DRC, most of Namibia, western South Africa and locally over the southern parts of Mozambique. Maximum temperatures, 2-3$^o$C above average, were recorded over north and west DRC, northeastern Angola, west Zambia, central /Mozambique, west Botswana, central South Africa and most of Namibia. On the other hand, eastern Tanzania recorded 1-2 $^0$C below monthly maximum mean temperatures. The rest of the SADC region recorded mostly close to normal temperature during the month of January 2024 (Figure 7).

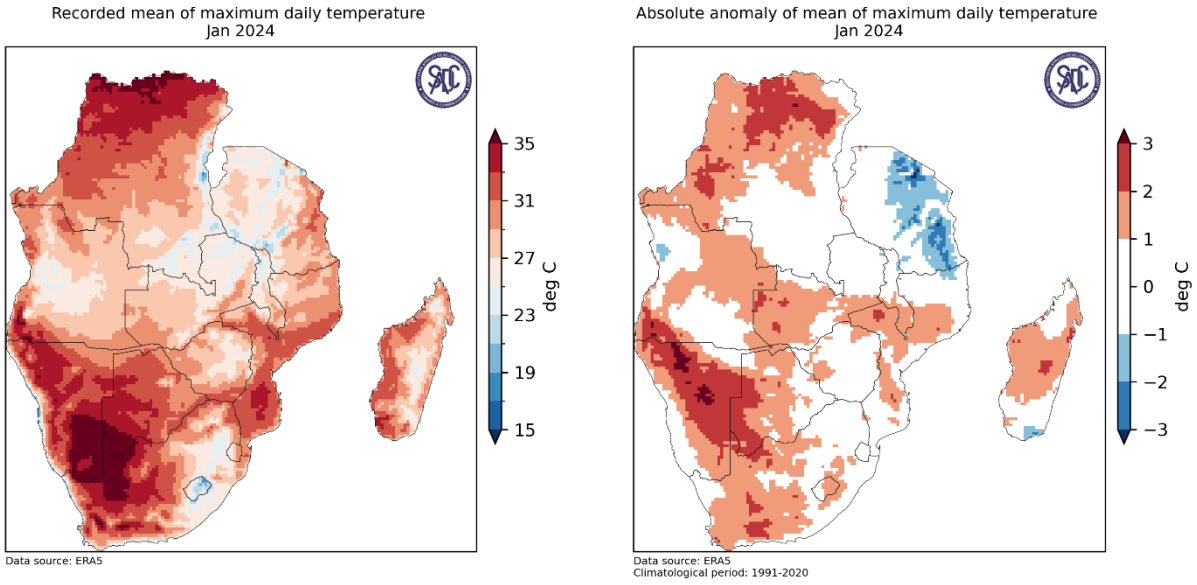


Figure 7: Observed maximum average temperature (left) and anomalies (right) for December 2023

## 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. Approach to derive these indices is described in the Appendix.

Daytime heat waves were recorded extending from southwestern DRC through extreme north to southeastern Angola, west Zambia, south Malawi up to northwestern Mozambique. This region including central and north Madagascar had recorded 10 to 15 days of daytime heat wave conditions in January (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).

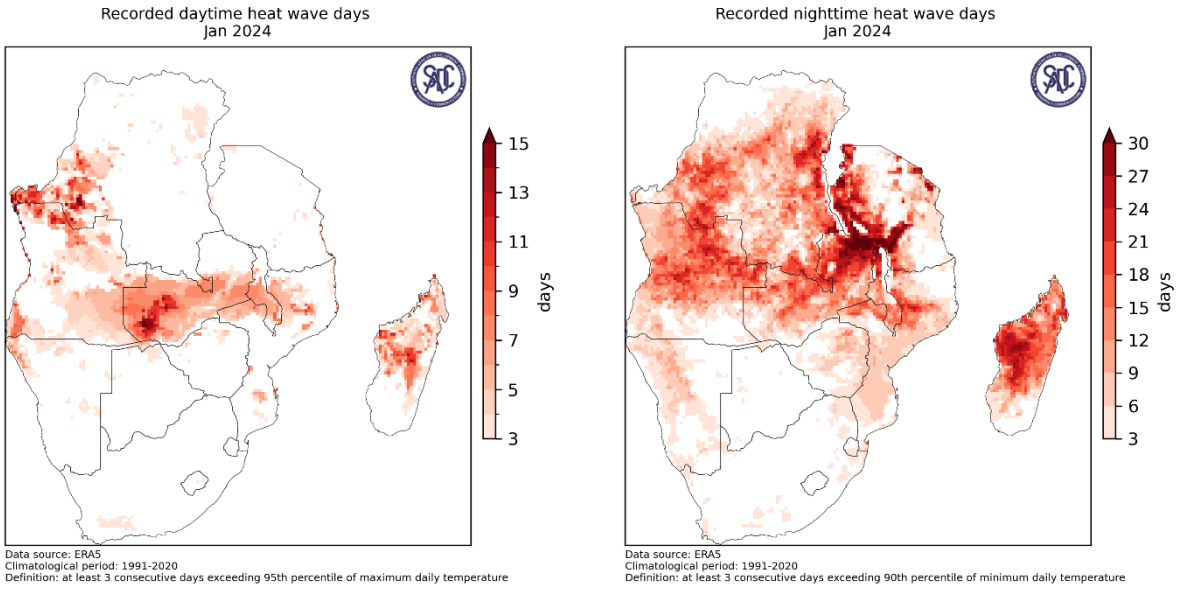


Figure 8: Heatwaves detected during the month of December 2023

**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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