

TEN-DAY CLIMATE DIAGNOSTICS BULLETIN

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REPORTING PERIOD: Dekad 2; 11th–20th December 2022

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HIGHLIGHTS

- ✓ *During the second dekad of December 2022, rainfall activities were observed over some parts of subequatorial and tropical bands of the Continent, with dominate by above-average to well above-average rainfall conditions observed over south-eastern parts of Central Africa, South-western of the East Africa regions, most of parts of SADC region. Below-average to well below-average rainfall was recorded over Gabon, northern Congo, western and central of DRC, most parts of Kenya, eastern Tanzania, northern Angola, Mozambique and Madagascar.*
- ✓ *The dekad was characterized by warm SSTs conditions in the over the most Atlantic SST basins, In addition, in the equatorial Indian SST basins, guiding by persistence of La Nina conditions. And also the Kelvin wave conducted the wet conditions in the most parts experienced above normal rainfall.*
- ✓ *The outlook for next two weeks is expected to observe during 25 December 2022 to 7 January 2023 depicts a general bias for below to normal precipitation over northernmost of Morocco, Gabon, central of Congo, most the central part of SADC region and northern Madagascar. The above normal rainfall is expected over southern Congo, most of the southern DRC, central and southern Tanzania, northern Zambia, Malawi, Mozambique, south-eastern South Africa, and much of Lesotho.*

1.0 GENERAL CLIMATOLOGICAL SITUATION

Subsection 1.1 provides the strength of the surface pressure systems, ITD, CAB and ITCZ displacements, while subsection 1.2 is discussing the state of the troposphere and gives a summary of monsoon and relative humidity thresholds.

1.1 SURFACE

Pressure Systems

- **The Azores High** observed a central value of 1019hPa, a 1hPa weakened compared to the climatological mean (1991-2020). It was located at 23°W and 26°N. It moved to the east over the northern Antarctic Ocean.
- **St. Helena High** observed a central pressure value of 1021hPa; it weakened by 4hPa from previous dekad and strengthening by 1hPa to the climatological mean (1991-2020). It was located at 17°W and 32°S.
- **Mascarene High:** The central value for Mascarene High was 1023hPa. It is stable from the previous dekad and strengthening by 13hPa from the climatological means (1991-2020). Positioned at 81°E and 34°S, it moved to the east over the south Indian Ocean.
- **Heat Low:** Thermal low was observed with the value of 1007hPa over north of the South-Sudan and deepened to its climatological mean.

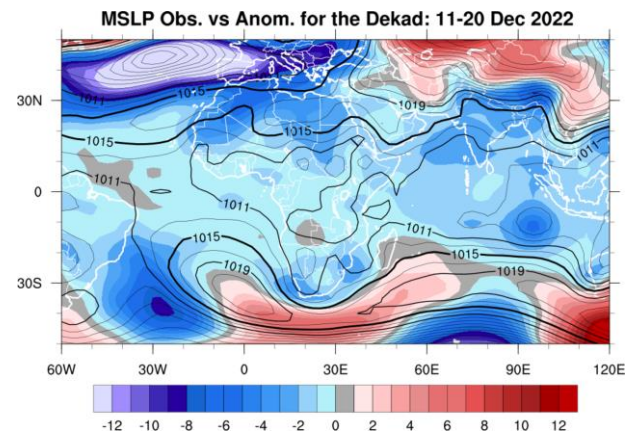


Figure 1. Observed Mean Sea Level Pressure (Contour) and anomaly (shaded) from 11th to 20th December 2022

1.2 TROPOSPHERE

1.2.1 African Monsoon

The African Monsoons combined influence of the Indo-Pacific and the Atlantic Oceans drive the inter-annual and the decadal monsoon variability over these regions.

Figure 2.a shows the dekad average wind at 850hPa. Positive vortex wind from north-easterly to easterly anomalies was observed over Libya, Egypt, Sudan and Chad. Negative wind anomalies from east to south easterly and north easterly were observed over Chad, Uganda, Burundi, Rwanda, Namibia, Tanzania, Botswana, Zambia, Cameroon, Mali and South Africa.

At the 700hpa level (see Fig.2b), the vortex wind anomaly was observed over north west parts of North Africa, in the central parts of the Continent neutral wind from east to western were observed.

At 200hpa level (see Fig.2c), the vortex wind anomaly was observed over south west parts of East Africa. Very strong westerly wind vector anomalies at 200hPa observed mainly over Northern and Southern parts of Africa region.

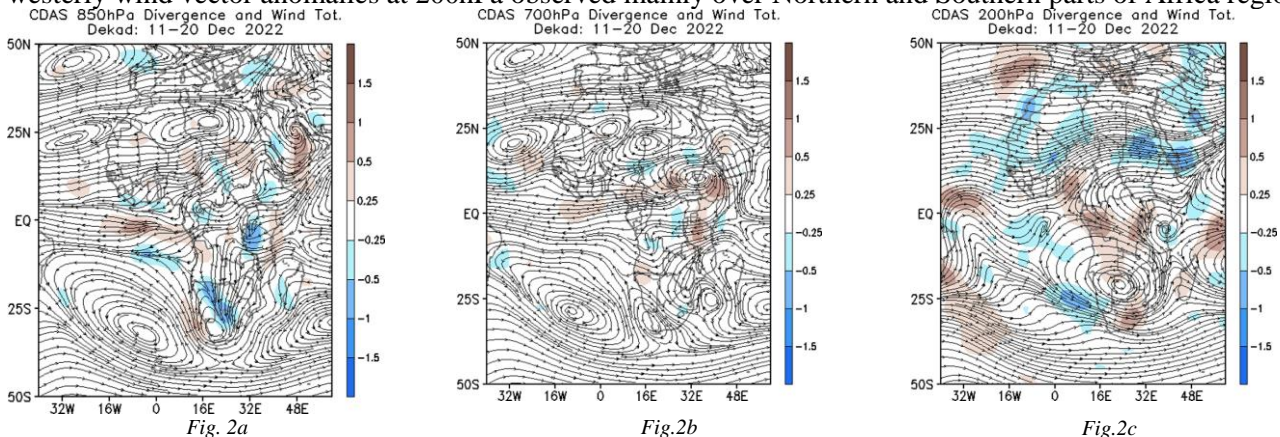


Figure 2: Mean wind (streamlines: m/s) and divergence (shaded; s^{-1}) observed at 850hPa (Fig.2a), 700hPa (Fig.2b) and 200hPa (Fig.2c) during the third dekade of 11th to 20th December 2022 (from 1st to 10th Dec). Source: NOAA/NCEP

1.2.2 Relative Humidity (RH) at 850hPa and 700hPa

Figure 3.a and 3.b respectively show the dekadal observed relative humidity and related anomalies at 850hPa and 700hPa for the second dekad of December 2022 compared to the reference period of 1991-2020.

At 850hPa (see Fig.3a), wet atmospheric conditions (relative humidity $\geq 60\%$) were observed over northern parts of Morocco, Algeria, Tunisia, southern Gulf of Guinea, Central Africa, Southern Africa and East African regions. The rest of the continent observed RH values $\leq 60\%$. Negative anomalies were observed during the second dekad of December 2022 over northern Libya, southern Sudan and most of Tanzania, the positive anomalies were recorded over the rest of the continent.

At 700hPa (Fig.3b), high relative humidity ($\geq 60\%$) were observed over South-Sudan, Ethiopia, Somalia, Kenya, Uganda, Rwanda, Burundi, DRC, Angola, Namibia, Zambia, Tanzania, Mozambique, South Africa and Madagascar. Relative humidity anomalies for the second dekad of December 2022 were negative over Mali, Niger, Burkina Faso, eastern Tanzania, northern Mozambique. While the rest of the Country had positive moisture anomalies observed.

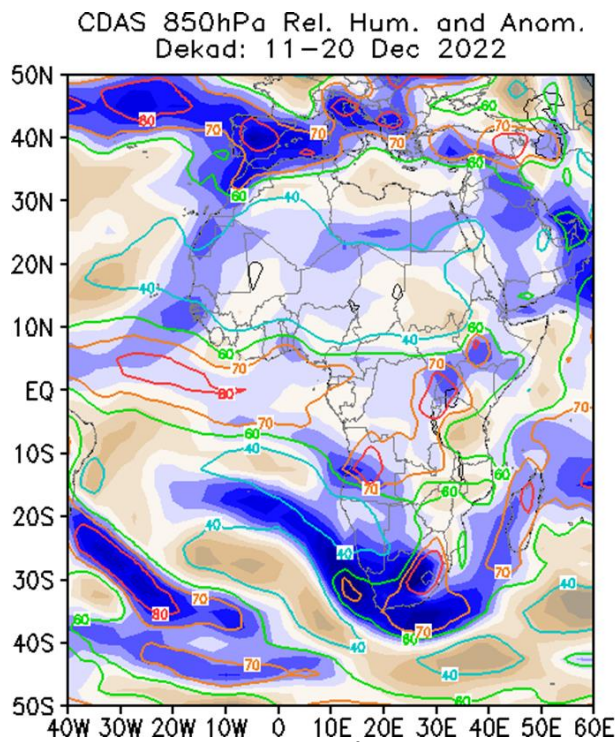


Fig. 3a

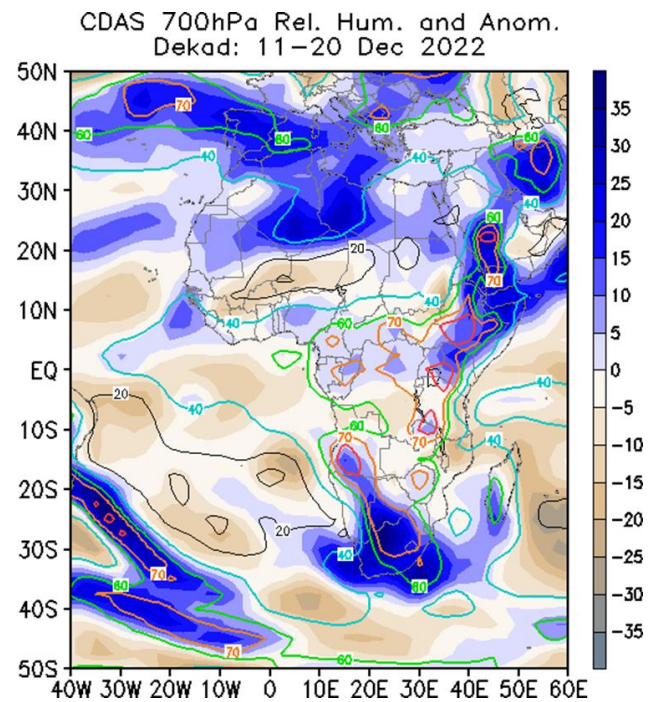


Fig. 3b

Figure 3. Relative Humidity (contour; %) and associated anomalies (shaded) observed at 850hPa (Fig.3a) and 700hPa (Fig.3b) during the second dekad of December 2022 (from 1st to 20th Dec). SOURCE/. NOAA/. NCEP-CAR/. CDAS1)

2.0 PRECIPITATION

Figure 8 shows, during the second dekad of December 2022, rainfall activities were observed over some parts of subequatorial and tropical bands of the Continent, with dominate by above-average to well above-average rainfall conditions observed over south-eastern parts of Central Africa, South-western of the East Africa regions, most of parts of SADC region. Below-average to well below-average rainfall was recorded over Gabon, northern Congo, western and central of DRC, most parts of Kenya, eastern Tanzania, northern Angola, Mozambique and Madagascar.

Details:

- **North Africa:** This region experienced above average rainfall conditions over Morocco and over northern Algeria, Tunisia and Libya experienced below average.
- **Sahel:** This region observed near average rainfall conditions.
- **Gulf of Guinea countries:** normal condition.
- **Central Africa countries:** experienced above to well above normal precipitation over Guinea Equatorial, much of Congo, central and south-eastern DRC, central and eastern Angola. Below normal condition was observed over Gabon, western DRC and northern Angola.

- **East African countries:** some western parts observed above to well above average rainfall conditions over south-eastern Uganda, western and central of Tanzania, below to well below average rainfall were observed over Kenya, eastern parts of Tanzania.
- **Southern Africa countries:** Most of the region received above to well above average precipitation over much of Zambia, Botswana, central and eastern South Africa, southern Zimbabwe, central and southern Mozambique and most parts of Madagascar. Below average over north and central Mozambique and northern Madagascar.

CPC-Uni 10-Day Precipitation in Percent of Average (%)
 Period: 11Dec2022 to 20Dec2022

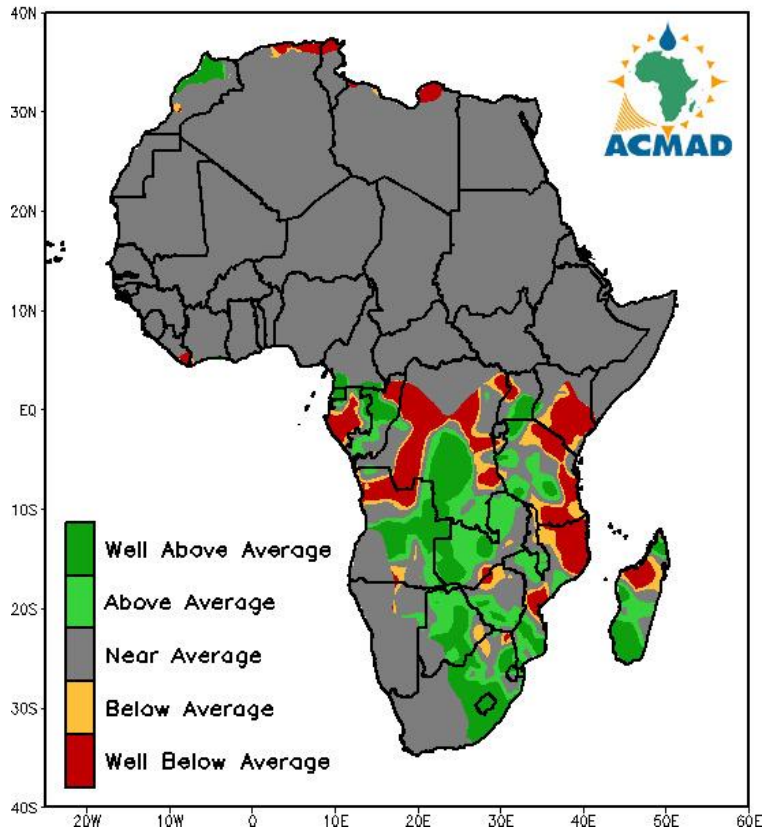


Figure 6: Precipitation in the percentage of the average for the first dekad 11th to 20th December 2022. The reference period used is 1991-2020. Source: NOAA/. NCEP/. CPC/. UNIFIED/. Africa/. DAILY/)

3.0 RAINFALL OUTLOOK VALID FOR 25 DECEMBER 2022 TO 7 JANUARY 2023

The outlook for next two weeks is expected to observe during 25 December 2022 to 7 January 2023 depicts a general bias for below to normal precipitation over northernmost of Morocco, Gabon, central of Congo, most the central part of SADC region and northern Madagascar. The above normal rainfall is expected over southern Congo, most of the southern DRC, central and southern Tanzania, northern Zambia, Malawi, Mozambique, south-eastern South Africa, and much of Lesotho.

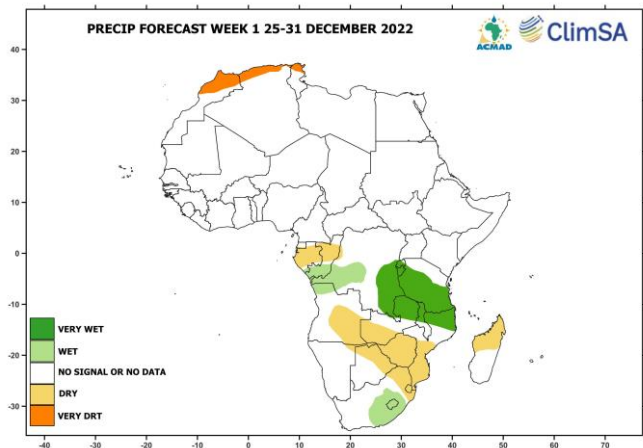


Figure 9a: Precipitation forecast for 25-31 December 2022

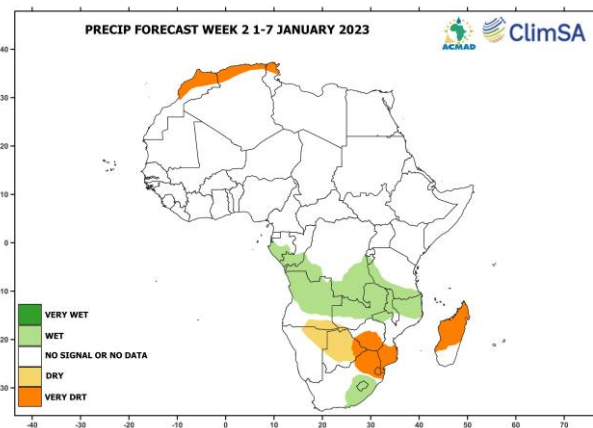


Figure 9b: Precipitation forecast for 1-7 January 2023