CENTRE AFRICAIN POUR LES APPLICATIONS DE LA METEOROLOGIE AU DEVELOPPEMENT

AFRICAN CENTRE OF METEOROLOGICAL APPLICATIONS FOR DEVELOPMENT

Institution Africaine parrainée par la CEA et l'OMM African Institution under the aegis of UNECA and WMO

# TEN-DAY CLIMATE DIAGNOSTICS BULLETIN

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## *HIGHLIGHTS*

- ✓ *During the third 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, Southern of the East Africa regions, most of parts of SADC region. Below-average to well below-average rainfall was recorded over most of the Northern Africa, western and central part of Central Africa, central parts of the Eastern Africa, central west and south-eastern of the SADC region.*

- ✓ *The dekad was characterized by warm SSTs conditions over the most Atlantic SST basins, In addition, in the equatorial Indian SST basins, guiding by persistence of La Nina conditions. And also some local wave conducted the wet conditions in the most parts experienced above normal rainfall.*

- ✓ *The outlook for next two weeks is expected to observe from 8 to 21 January 2023 depicts a general bias for below to normal precipitation over northernmost of Morocco, Algeria, south-eastern Tanzania, north-eastern Mozambique, and northern Madagascar and central of South Africa. Normal to above and above normal rainfall is expected over southern Congo, DRC, western Tanzania, much of Zambia, Malawi, Mozambique, Zimbabwe, eastern Botswana, north-eastern South Africa, most parts of Eswatini and southern Madagascar.*

## 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 1023hPa, a 6hPa strengthening compared to the climatological mean (1991-2020). It was located at 41°W and 32°N. It moved to the weat over the northern Antarctic Ocean.
- **St. Helena High** observed a central pressure value of 1020hPa; it weakened by 1hPa from previous dekad and strengthening by 1hPa to the climatological mean (1991-2020). It was located at 12°W and 30°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 84°E and 36°S, it moved to the east over the south Indian Ocean.

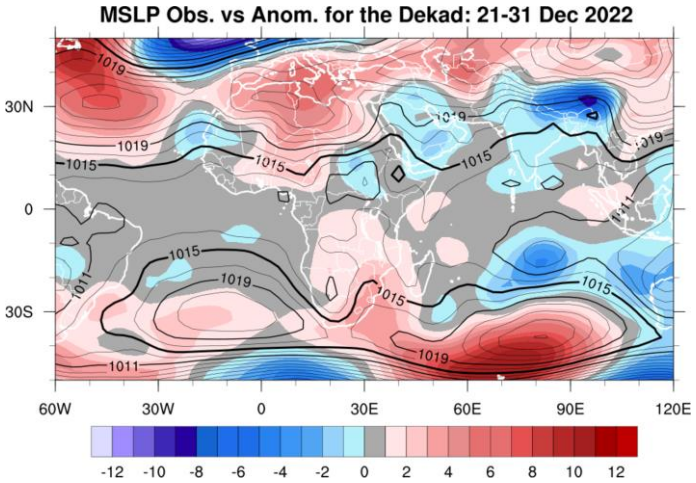


***Figure 1**. Observed Mean Sea Level Pressure (Contour) and anomaly (shaded) from 21th to 31st December 2022*

- **Heat Low:** Thermal low was observed with the value of 1009hPa over west of the South-Sudan and f to its climatological mean.

### 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 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 Southern parts of Africa region.

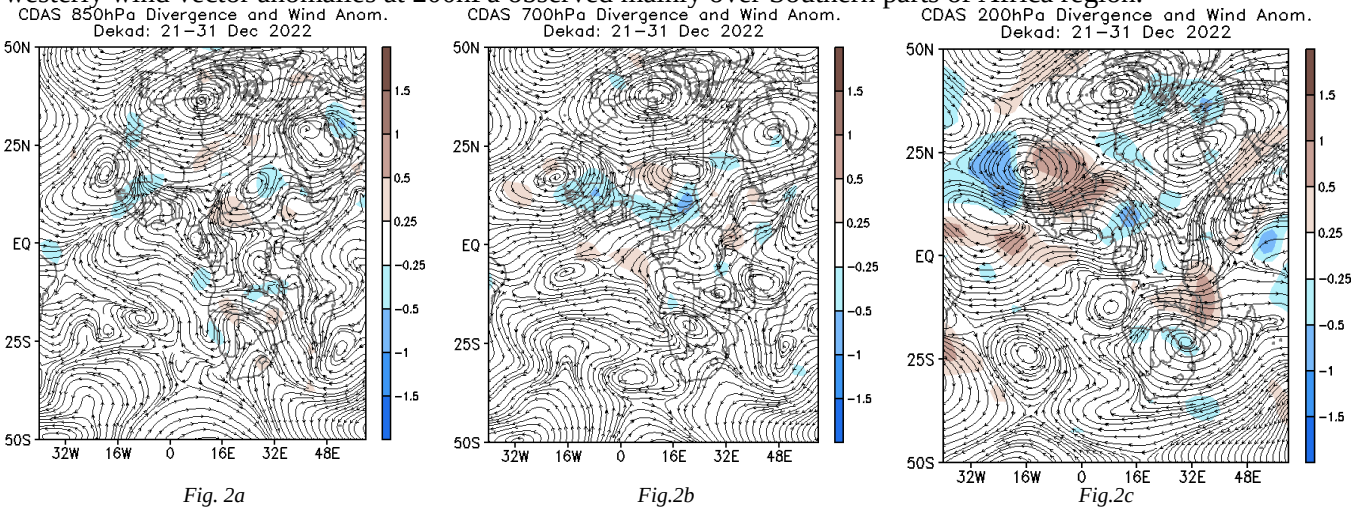


*Fig. 2a* *Fig.2b* *Fig.2c*

*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 dekad of 21th to 31st December 2022 (from 1th 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 third dekad of December 2022 compared to the reference period of 1991-2020.

At 850hPa (*see Fig.3a*), wet atmospheric conditions (relative humidity ≥ 60%) were observed over northern parts of Algeria, Libya, Egypt, southern and eastern of Central Africa, western of the Eastern Africa and northern Southern Africa regions. The rest of the continent observed RH values ≤ 60%. Negative anomalies were observed during the third dekad of December 2022 over northern Algeria, Tunisia, southern parts of the Guinea Gulf region the positive anomalies were recorded over the rest of the continent.

At 700hPa (Fig.3b), high relative humidity (≥ 60%) were observed over west of Western Africa, north of the Eastern Africa, most parts of the Central Africa and western of SADC region. Relative humidity anomalies for the third dekad of December 2022 were negative over Algeria, Tunisia, Libya, south-eastern of the Western Africa, west of the Central Africa, eastern Tanzania, much of Zimbabwe, central of Mozambique. While the rest of the Country had positive moisture anomalies observed.

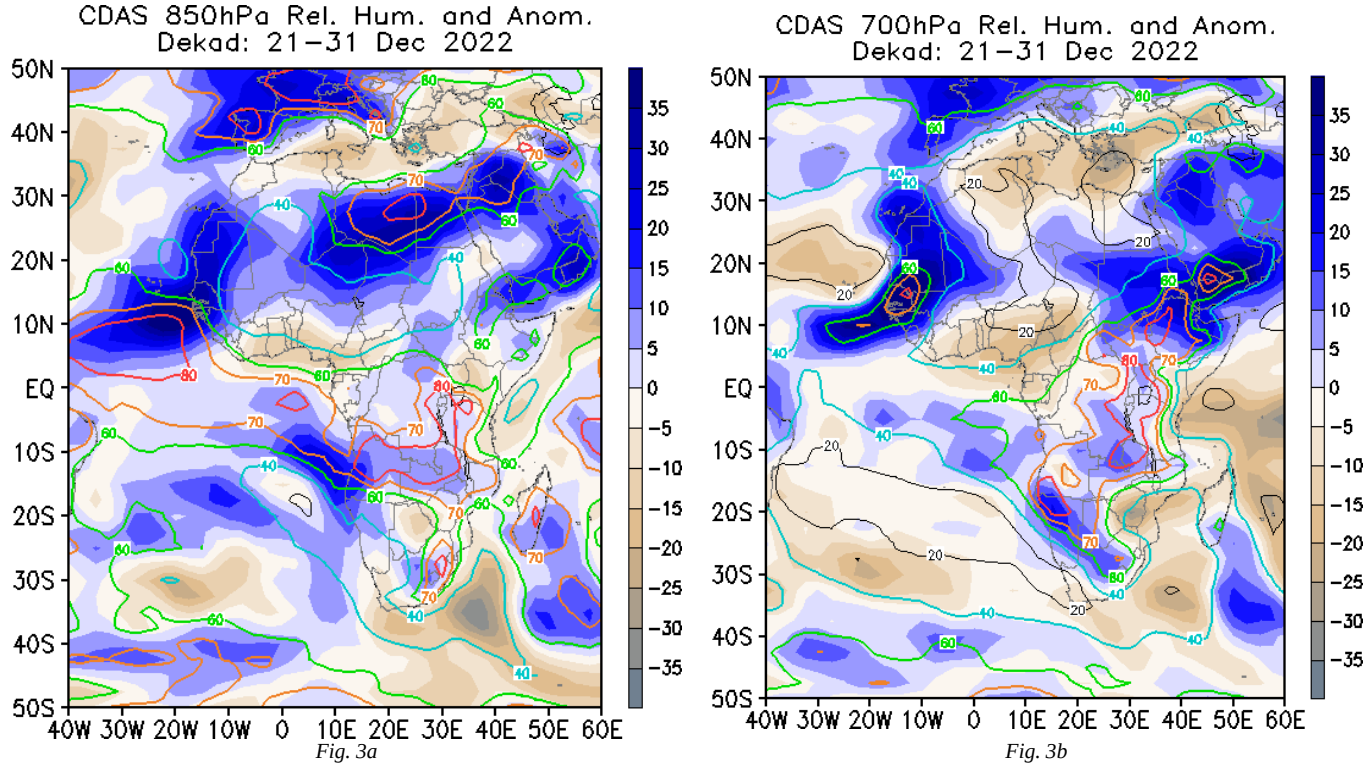


*Fig. 3a* *Fig. 3b*

***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 to120th Dec). SOURCE/. NOAA/. NCEP-CAR/. CDAS1)*

## 2.0 PRECIPITATION

Figure 8 shows, during the third 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, Southern of the East Africa regions, most of parts of SADC region. Below-average to well below-average rainfall was recorded over most of the Northern Africa, western and central part of Central Africa, central parts of the Eastern Africa, central west and south-eastern of the SADC region.

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

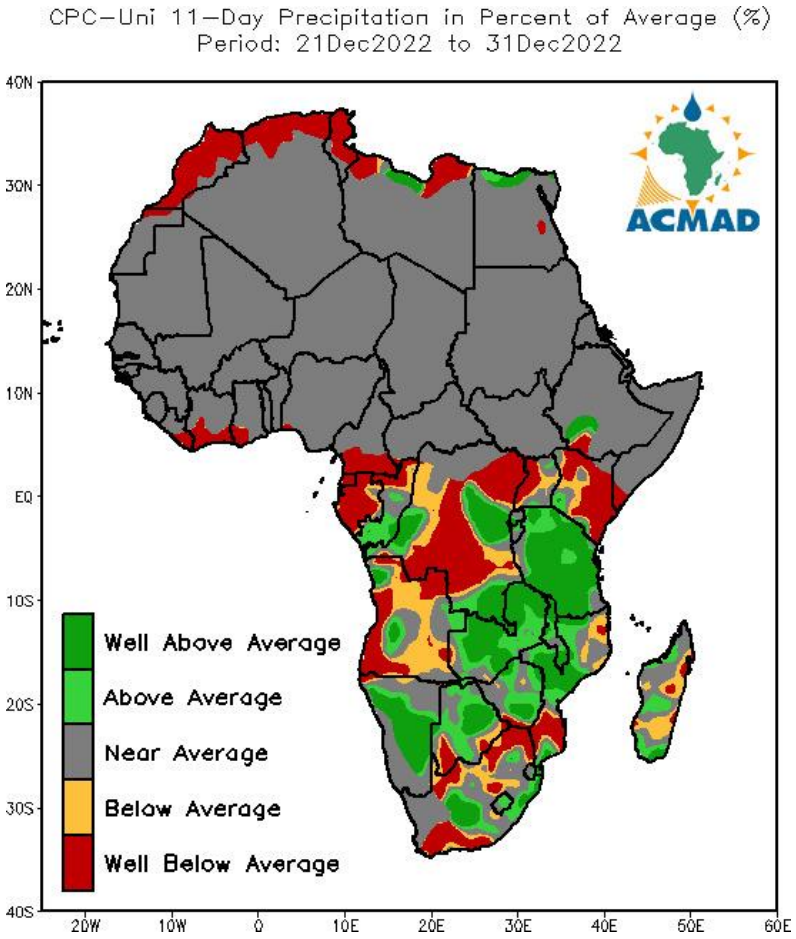


***Figure 6:*** *Precipitation in the percentage of the average for the first dekad 21st to 31st December 2022. The reference period used is 1991-2020. Source: NOAA/. NCEP/. CPC/. UNIFIED/. Africa/. DAILY/)*

## 3.0 RAINFALL OUTLOOK VALID FOR 8 TO 21 JANUARY 2023

The outlook for next two weeks is expected to observe from 8 to 21 January 2023 depicts a general bias for below to normal precipitation over northernmost of Morocco, Algeria, south-eastern Tanzania, north-eastern Mozambique, and northern Madagascar and central of South Africa. Normal to above and above normal rainfall is expected over southern Congo, DRC, western Tanzania, much of Zambia, Malawi, Mozambique, Zimbabwe, eastern Botswana, north-eastern South Africa, most parts of Eswatini and southern Madagascar.

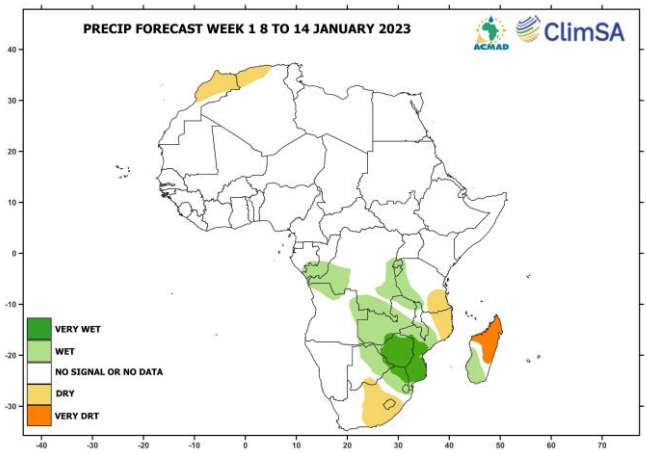


***Figure 9a**: Precipitation forecast for 8-14 January 2023*

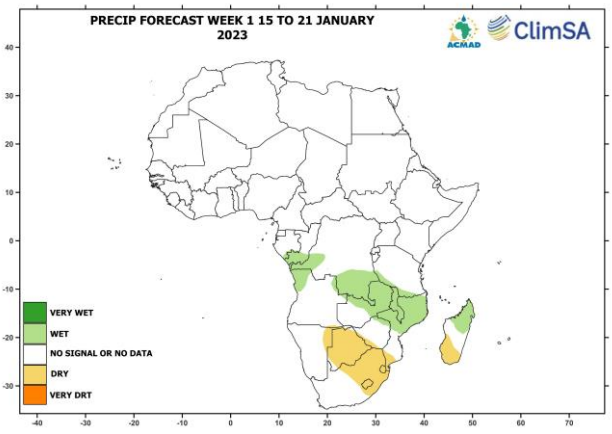


***Figure 9b**: Precipitation forecast for 14-21 January 2023*