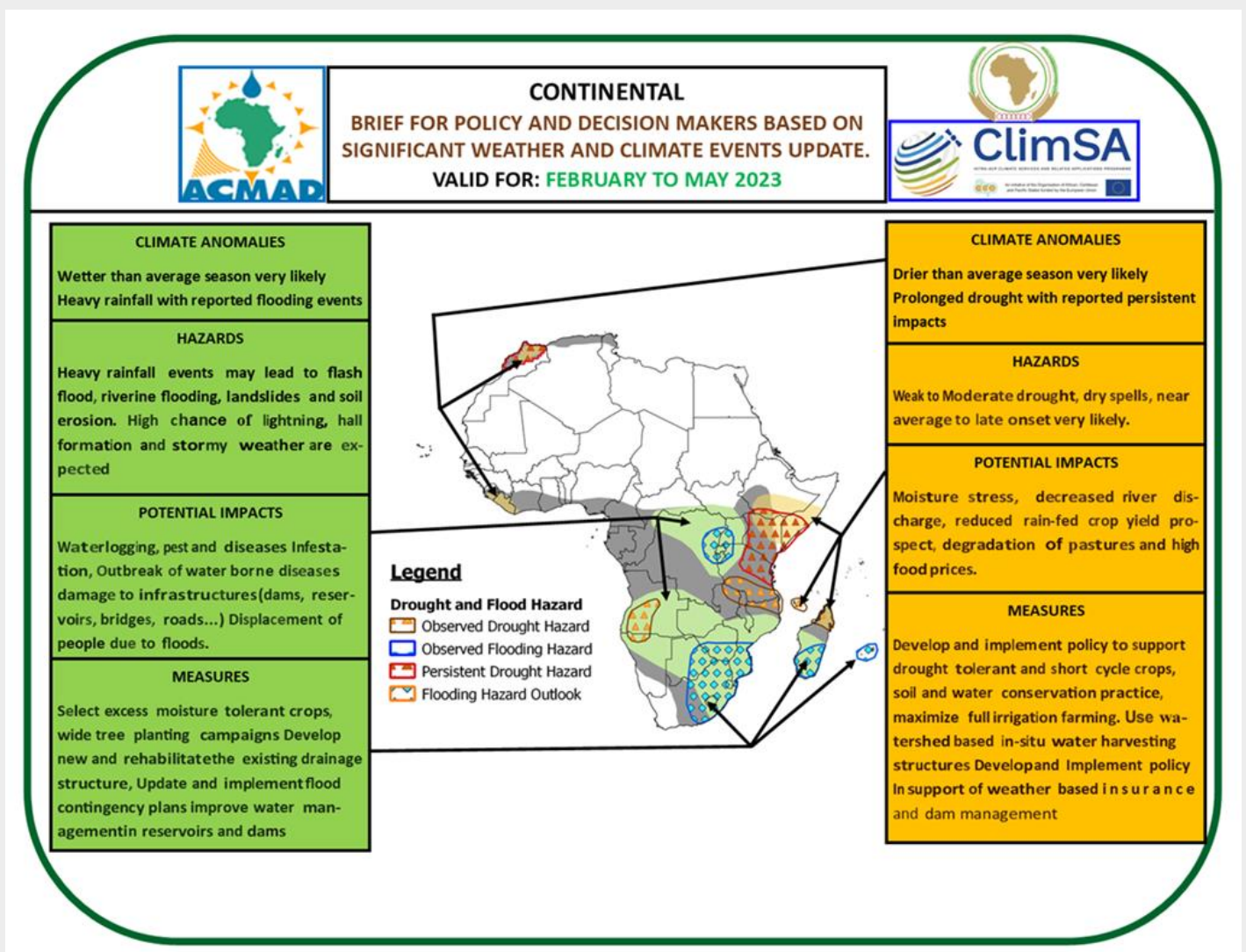


Climate Services for Disaster Risks Reduction in Africa

DROUGHT SERVICE AND SEASONAL CLIMATE FORECAST.

ISSUED: 25 February 2023

Selected Significant Weather and Climate events 'updates: Valid for
February to May 2023.



DROUGHT SERVICE AND SEASONAL CLIMATE FORECAST

BULLETIN No.2, 2023

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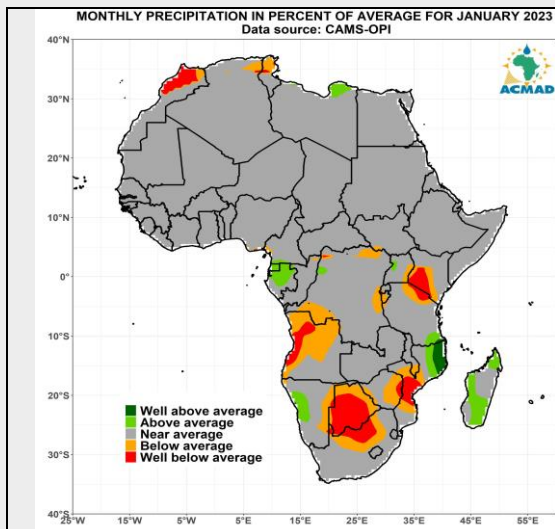
HIGHLIGHTS

Performance of the past season and impacts.

- ✚ In Madagascar, tropical storm Cheneso leaves 30 dead and 40000 displaced people ([Floodlist, 31 January 2023](#)).
- ✚ In Angola, Authorities reported at least 11 people lost their lives, many as a result of electrocution after power lines came into contact with rain or flood waters following heavy rain in 5 provinces([Floodlist, 8 January 2023](#)).
- ✚ In DRC, at [least 9 people](#) died in South Kivu, following heavy rain that triggered flooding and landslide ([Floodlist, 6 January 2023](#)).
- ✚ In Malawi, at least 40 people have died as a result of severe weather since the start of the season in November([Floodlist, 3 January 2023](#)).
- ✚ In Uganda, at least 10 people have lost their lives and hundreds have been displaced after floods in southern parts of the central region of Uganda([Floodlist, 3 January 2023](#)).

✚ OUTLOOK JANUARY-FEBRUARY-MARCH AND FEBRUARY-MARCH -APRIL 2023 SEASONS

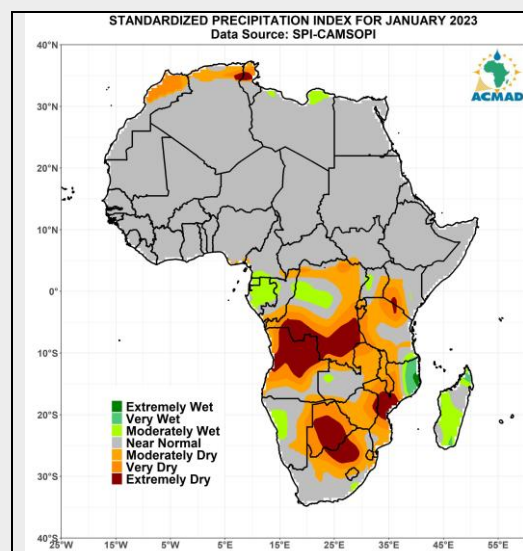
- ✚ Below average Sea Surface Temperatures (SSTs) were observed over most of the Equatorial Pacific (ENSO region) during November -December 2022 to January 2023. During the March to June 2023 period, ENSO is favoured to transit from La Nina (negative SSTs) to neutral and later on to an almost El Nino (positive SSTs) phase.
- ✚ Near to above average SSTs were observed over the Tropical North Atlantic (TNA) during November-December-2022 to January 2023. Most model outputs and expert judgments favour persistence of near average conditions during the evolution of the seasons (March to June 2023).
- ✚ Near to average SSTs characterized the North Atlantic Tropical (NAT) during November-December-2022 to January 2023. During the coming months, February to May, near average SSTs are expected.
- ✚ Near average SSTs characterized the South Atlantic Tropical (SAT) from November-December-2022 to January 2023. These conditions are expected to remain near normal during the coming seasons.
- ✚ The SSTs over the Tropical South Atlantic (TSA) have been near average during November-December-2022 to January 2023. Model outputs and our expert judgment favour persistence of these conditions during the coming seasons (MAM and AMJ 2023).
- ✚ Sea Surface Temperatures in the Western Tropical Indian Ocean (WTIO) and South-Eastern Tropical Indian Ocean (SETIO) have been near average during November-December-2022 to January 2023. Model outputs and our expert assessments are in favour of persistence of this condition for the coming four months.
- ✚ The Sea Surface Temperatures over the Mediterranean Sea have been above average during November-December-2022 to January 2023. Model outputs and our expert judgment predicted near average conditions during the next seasons (MAM and AMJ 2023).

I. REVIEW OF DROUGHT INDICATORS: Precipitation, SPI, Soil Moisture, NDVI and Water Level**1.1 PRECIPITATION IN PERCENT OF AVERAGE**

During January 2023, above to well above average precipitation was observed over the northern part of northeast Libya, Gabon, Northern east Mozambique, much of Madagascar, and the westernmost part of Namibia.

Below and well below precipitation was observed over northernmost Morocco, northern Tunisia, much of Angola, Botswana, north South Africa, central Mozambique, easternmost DRC and West Kenya.

Figure 2: Precipitation in per cent of the average for January 2023 (Data source: https://iridl.ldeo.columbia.edu/SOURCES/.NOAA/.NCEP/.CPC/.CAMS_OPI/.v0208/.mean/.prcp)

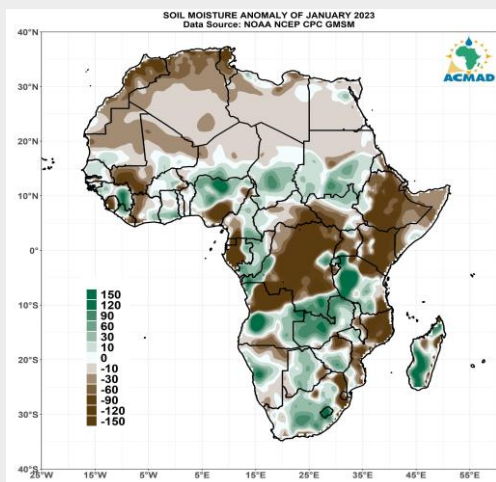
1.2. STANDARDIZED PRECIPITATION INDEX (SPI)

The SPI for January 2023 reveals that very dry to extremely dry has been observed over northernmost Morocco, Algeria, Tunisia, western Kenya, much of Tanzania, Burundi, Rwanda, much of DRC, Malawi, northeast Zambia, Zimbabwe, much of Mozambique, much of South Africa, Botswana and Angola.

Very wet to extremely wet conditions were recorded over the northern part of northeast Libya, Gabon, northern east Mozambique, parts of central DRC, much of Madagascar, and the westernmost part of Namibia.

Figure 3: Standardized precipitation index for January 2023. Green corresponds to wet, grey to near-normal SPI conditions, and orange, brown and dark brown indicate very dry to extremely dry conditions. http://iridl.ldeo.columbia.edu/SOURCES/.NOAA/.NCEP/.CPC/.CAMS_OPI/.v0208/.mean/.prcp/

1.3. SOIL MOISTURE ANOMALY

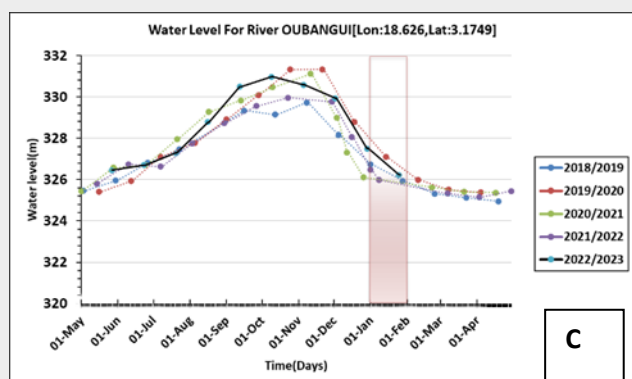
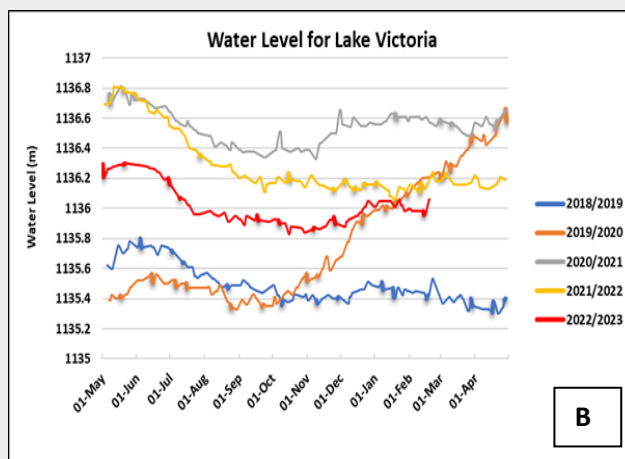
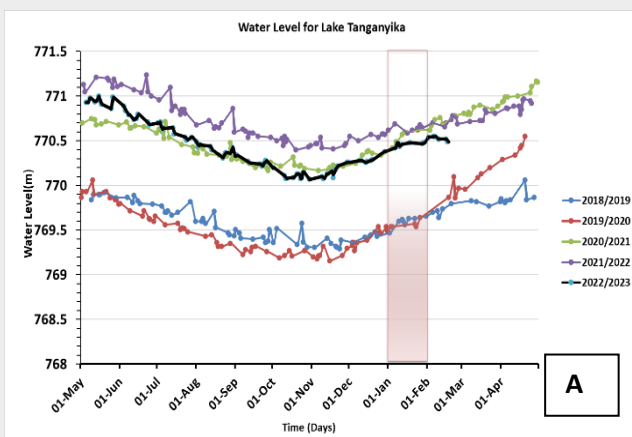


Strong to moderate moisture deficit was located over northern Morocco, northernmost Algeria, Tunisia, Mauritania, much of Mali, Sierra Leone, south Nigeria, west Gabon, much of DRC, central to east Central Africa Republic, west South Sudan, much of Uganda, Ethiopia, Eritrea, Djibouti, Somalia, Mozambique, Malawi and northeast south Africa.

Below average precipitation was recorded over most of these areas during January 2023. This resulted in large moisture deficits and below average vegetation conditions.

Figure 4: Soil moisture anomaly for January 2023. Green corresponds to positive anomalies, white to near-average soil moisture conditions, and brown and dark brown denotes negative anomalies. Data source: <http://www.esrl.noaa.gov/psd/data/gridded/data.cpcsoil.html>

1.5. WATER LEVEL



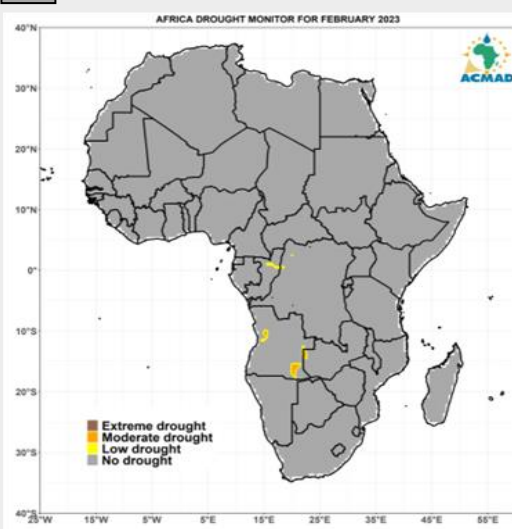
A cumulative precipitation deficit was recorded during the past months over some parts of the central DRC, leading to the observed decrease in water levels in the river OUBANGUI and the rainfall observed in most parts of eastern Africa contributed to an increase in water levels in both Lake Tanganyika and Lake Victoria.

Figure 5: Daily water levels of Lake Tanganyika[A], Lake Victoria[B] and River OUBANHUI[C]. Data Source: <http://hydroweb.theialand.fr/collections/hydroweb>

II DROUGHT MONITORING

Africa Drought Monitor Intensity:

-  RR < [50] % or RR [50; 75] % ; SPI[-3;-2] or SPI<[-3], SM<[-60] & NDVI<[-0.20] **Severe drought**
-  RR [50; 75] %; SPI [-2; -1]; SM [-60; -10]mm & NDVI [-0.20; -0.1] **Moderate intensity drought**
-  RR [75; 100] %; SPI [-1; -0.5]; SM [-30; -10]mm & NDVI [-0.1; 0.05] **Low intensity drought**
-  No drought signal

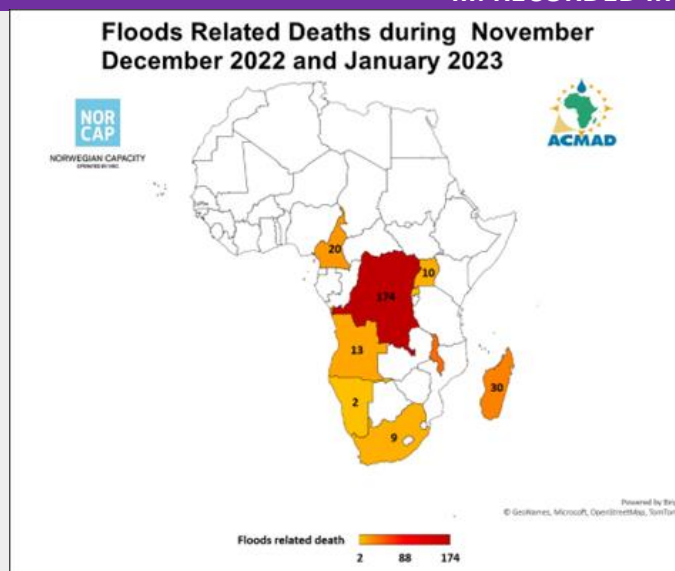


Given the cumulative precipitation deficits during the past and the month of November, SPI and soil moisture deficits, the adjacent map characterizes the drought situation in Africa during January 2023.

According to UNHCR, The Horn of Africa region continues to experience the longest and most severe drought on record, threatening lives and livelihoods. The dramatic food insecurity situation in drought-affected areas is expected to persist, driving high humanitarian needs well through 2023, with forecasts predicting a sixth failed rainy season in March-May 2023 (UNHCR, 28 February 2023).

Figure 6: African Drought Monitor, expressed as a composite of Precipitation, SPI, Soil Moisture deficit, and water level, valid for January 2023.

III. RECORDED IMPACTS



At least 301 people have been recorded to have lost their lives due to flooding during the months of November, December and January 2023 combined. Out of those deaths, DRC recorded 174 deaths, the highest deaths recorded in the last three months, 40 deaths recorded in Malawi, 30 deaths recorded over Madagascar, 20 deaths in Cameroon, 10 deaths in Uganda, 3 deaths in Rwanda, 2 in Namibia, 13 in Angola and South Africa recorded 9 deaths.

Data Source: floodlist. com

IV. CLIMATE AND HAZARDS OUTLOOK

Given these SST anomalies, sub-surface temperature patterns and trends, knowledge and understanding of seasonal climate variability in Africa, and the available long-range forecast products from Global Producing Centers for Long Range Forecasts, the following outlooks for precipitation and temperature are provided for February-March-April (FMA) and March-April-May (MAM) 2023 seasons across Africa (see the figures: Fig7, Fig8, Fig9 and Fig10):

During February to May 2023 period:

- ✚ Normal to above normal precipitation is most likely during February to May 2023 over northern Morocco, north-eastern Algeria and northern Tunisia, southern Côte d'Ivoire, Ghana, Togo, Benin, south-westernmost of Nigeria, southern Congo, Western and astern DRC, south-eastern South-Sudan, south-western Ethiopia, western Kenya, much of Uganda, Rwanda and Burundi, northernmost of Angola, north-eastern and south-eastern of SADC region and northern Madagascar. During January 2023 those regions have been characterized by normal to above and above average rainfall.
- ✚ The outlooks for the rainfall season during the March to June 2023 period is that below average rainfall is expected over most of the western parts of Gabon, south-eastern CAR, central of the northern DRC. Normal to above including the above average rainfall category are very likely over northern Morocco, Algeria, Tunisia, southern Gulf of Guinea region, central Africa, western parts of East Africa region and east of the SADC region.
- ✚ Near to above average temperature is very likely over Morocco, Algeria, Mauritania, Mali, south-eastern of Angola, south-western Zambia. Northern Botswana and Zimbabwe.

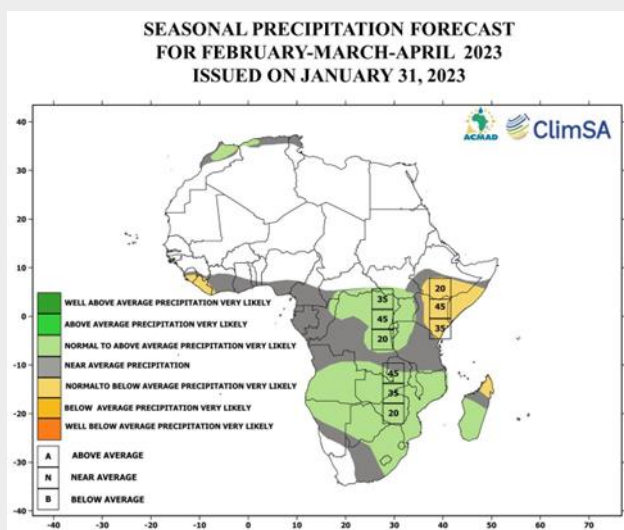


Figure 7: Seasonal precipitation forecast for February-March-April 2023.

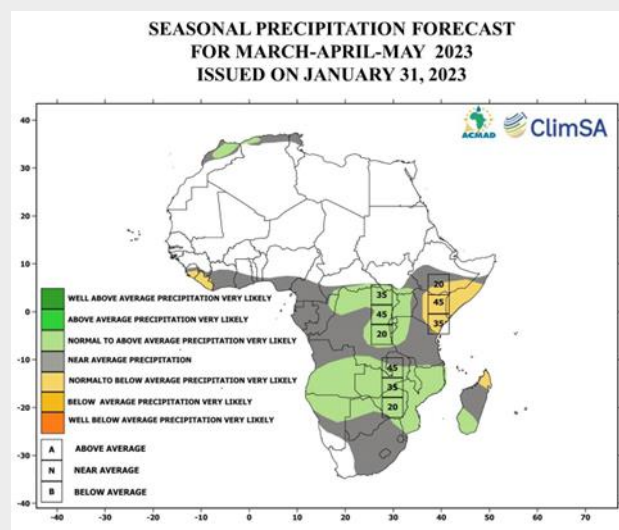


Figure 8: Seasonal precipitation forecast for March-April-May 2023.

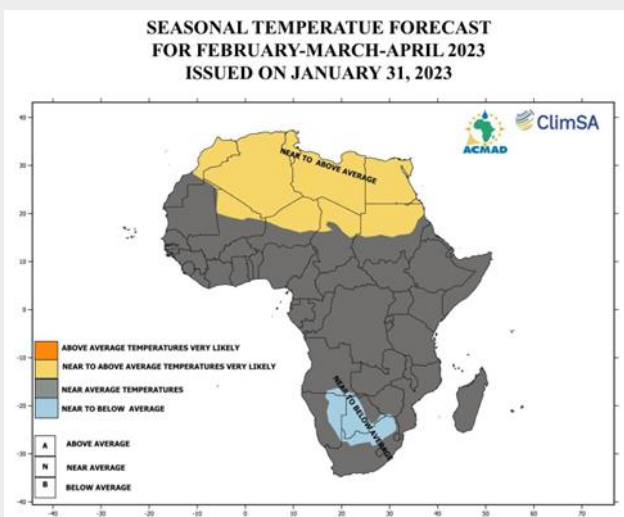


Figure 9: Seasonal Temperature forecast for February-March-April 2023

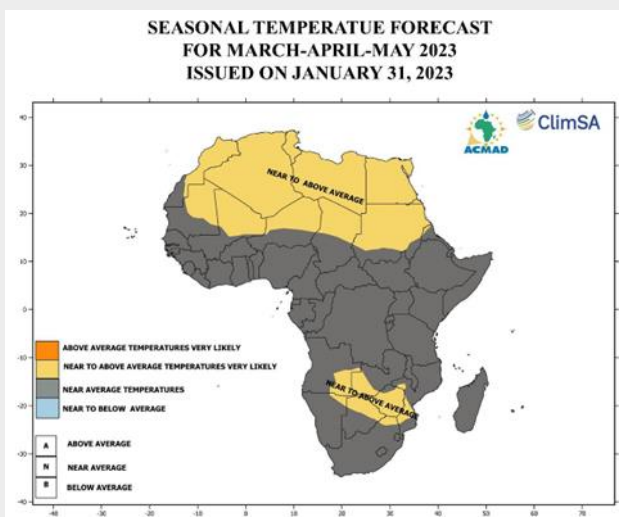


Figure 10: Seasonal Temperature forecast for March-April-May 2023

NB: Users are advised to seek more detailed climate information on the distribution of precipitation during the season, impacts, and action options from the National Meteorological and Hydrological Services and the ACMAD website (www.acmad.net/www.acmad.org)

V. POTENTIAL IMPACTS EXPECTED AND RESPONSE MEASURES

The following impacts are expected during the coming seasons:

5.1 Agriculture and Food Security Sector

- ✚ Normal to above normal precipitation is most likely during February to May 2023 over northern Morocco, north-eastern Algeria and northern Tunisia, southern Côte d'Ivoire, Ghana, Togo, Benin, south-westernmost of Nigeria, southern Congo, Western and eastern DRC, south-eastern South-Sudan, south-western Ethiopia, western Kenya, much of Uganda, Rwanda and Burundi, northernmost of Angola, north-eastern and south-eastern of SADC region and northern Madagascar.
- ✚ Below average rainfall is expected over most of the western parts of Gabon, south-eastern CAR, central of the northern and DRC.
- ✚ Near to above average temperature is very likely over Morocco, Algeria, Mauritania, Mali, south-eastern of Angola, south-western Zambia. Northern Botswana and Zimbabwe.

Above average, rainfall conditions are expected to lead to further excessive rainfall leading to heavy precipitation leading to flash floods and landslides soil erosion events, which will affect livestock products, impact on crop yield and cause erosion, waterlogging, leaching of animal wastes etc. It is therefore important to prepare for emergency assistance. Select excess moisture-tolerant crops, rehabilitate existing drainage structures; and update and implement flood contingency plans. A rainfall deficit will lead to drought. Water supply and demand management; estimate the number of current water supplies; develop ways to reduce water use and identify potential supplemental water supplies are the recommended measures to respond to drought.

5.2 Health Sector

- ✚ Normal to above normal precipitation is most likely during February to May 2023 over northern Morocco, north-eastern Algeria and northern Tunisia, southern Côte d'Ivoire, Ghana, Togo, Benin, south-westernmost of Nigeria, southern Congo, Western and eastern DRC, south-eastern South-Sudan, south-western Ethiopia, western Kenya, much of Uganda, Rwanda and Burundi, northernmost of Angola, north-eastern and south-eastern of SADC region and northern Madagascar.
- ✚ Near to above average temperature is very likely over Morocco, Algeria, Mauritania, Mali, south-eastern of Angola, south-western Zambia. Northern Botswana and Zimbabwe.

The risk of vector and water-borne diseases is particularly high, especially for cholera and malaria outbreaks, and flooding will exacerbate poor water and sanitation conditions. It is therefore advised that hygiene and sanitation be enforced, monitor malaria and cholera cases and preposition drug stocks. Take precautions for heat stress where the expected temperature is above normal.

5.3 Disaster Management Sector

The expected near-to-above-average precipitation with moderate to heavy precipitation is usually associated with floods. These conditions are favourable to massive displacement of people and continued destruction of infrastructure, property and livelihoods. It is thus advisable to update and implement flood contingency plans.

5.4 Water Resources Management and the Energy Sectors

The regions expecting significant precipitation deficits will experience impacts on water resources, including low water levels in reservoirs, dams and rivers, water shortages for domestic use, disruption in hydropower generation, crop failure and reduced livestock productivity as well as reduced income from agricultural labour and livestock exports.

It is advisable to sensitize and prepare the populations and businesses for power brownouts and water restrictions. Develop water conservation practices and implement policy in support of weather-based insurance and dam management. Alternative sources of energy should be considered.

VI. Drought Service and Seasonal Climate Forecast methodology

DROUGHT INDICATORS

a) Precipitation ftp://ftp.cpc.ncep.noaa.gov/precip/data-req/cams_opi_v0208/–
Provides information on Meteorological Drought.

b) Soil Moisture <http://www.esrl.noaa.gov/psd/data/gridded/data.cpcsoil.htm> land

c) Vegetation Index Anomaly (NDVI) USGS Land DAAC MODIS 250m –both

b) and c) provide information on Agricultural Drought.

d) Water level e.g. Lake Victoria provides information on the drought situation in the region.

The Africa Drought Monitor focuses on continental, broad-scale conditions by creating composites of a) to c) with four drought indicator categories (see page 6).

SEASONAL CLIMATE FORECAST

The **Seasonal Climate Forecast** by ACMAD is generated using a probabilistic approach based upon the assessment of outputs from global single and multi-model ensemble forecasting systems, statistical seasonal forecasting tools, analogue years, persistence, composites, patterns and trend analysis as well as available findings from climate studies at local, national, regional and global levels and expert knowledge. Eight (8) steps are integrated into the final forecast (step 9) as listed here (Refer to the ACMAD's Technical Note).