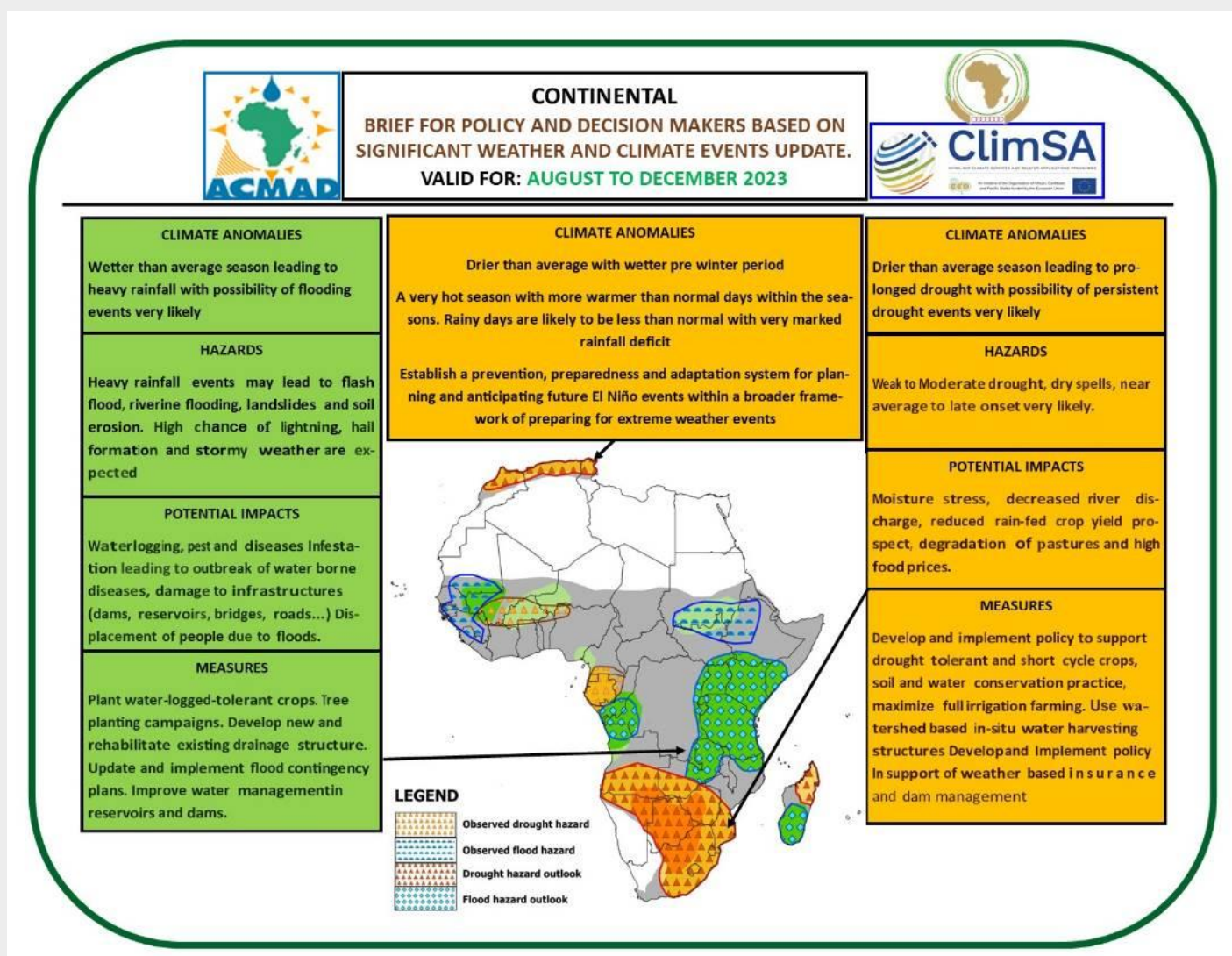


Climate Services for Disaster Risks Reduction in Africa

DROUGHT SERVICE AND SEASONAL CLIMATE FORECAST.

ISSUED: 21 June 2023

Selected Significant Weather and Climate events 'updates: Valid for
August to December 2023



DROUGHT SERVICE AND SEASONAL CLIMATE FORECAST

BULLETIN No.6, 2023

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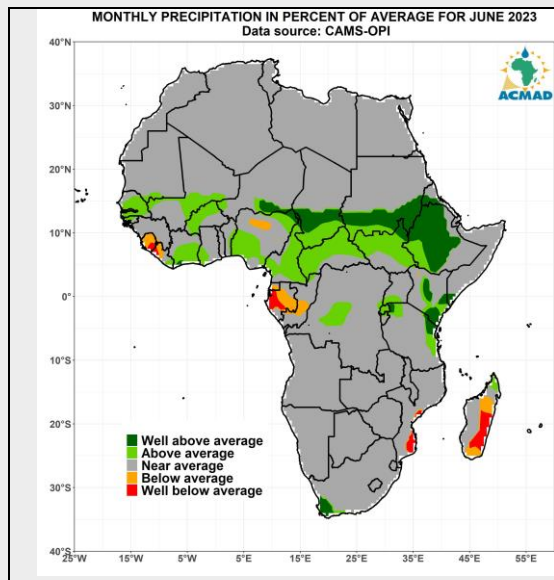
HIGHLIGHTS

Performance of the past season and impacts.

- ✦ In South Africa, at least 7 people have died following heavy rain occurred Floods in KwaZulu-Natal Province ([Floodlist, 30 June 2023](#)).
- ✦ It has been reported that at least 8 people died in Ghana after heavy rain-triggered floodings in several regions of ([Flooding, 25 June 2023](#))
- ✦ Abidjan and Cote d'Ivoire have received heavy rainfall of about 180mm in 24h triggering flooding and landslides causing at least 5 deaths([Flooding, 12 June 2023](#)).
- ✦ At least 6 people have lost their lives after heavy rain caused flooding in multiple provinces of Algeria ([Floodlist, 5 June 2023](#))
- ✦ In Somalia, The United Nations Office for the Coordination of Humanitarian Affairs (OCHA) has reported that over 460,000 people have been affected by devastating floods since March this year ([Floodlist, 18 May 2023](#))

OUTLOOK FOR AUGUST-SEPTEMBER-OCTOBER AND SEPTEMBER-OCTOBER-NOVEMBER 2023 SEASONS

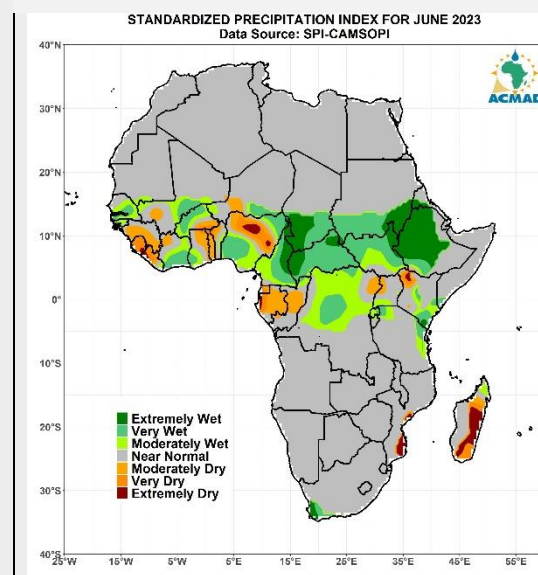
- ✦ The Equatorial Sea surface temperatures (SSTs) have been above average conditions across most of the Pacific Ocean from May to July 2023. During the August to November 2023 period, ENSO is favoured to transition from a weak and moderate El Nino phase.
- ✦ Above average SSTs were observed over the Tropical North Atlantic (TNA) from January to July 2023. Most model outputs and expert judgments favour the persistence of above average conditions during the evolution of the seasons (August to November 2023).
- ✦ Above average SSTs characterized the North Atlantic Tropical (NAT) during April to July 2023. During the coming months, August to November 2023, above average SSTs is expected to persist.
- ✦ Near to above average SSTs characterized the South Atlantic Tropical (SAT) from February to July 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 January to July 2023. Model outputs and our expert judgment favour the persistence of these conditions during the coming seasons (ASO and SON 2023).
- ✦ Sea Surface Temperatures in the Western Tropical Indian Ocean (WTIO) and South-Eastern Tropical Indian Ocean (SETIO) have been near average during February to June 2023. Model outputs and our expert assessments are in favour near to above average conditions for the coming four months.
- ✦ The Sea Surface Temperatures over the Mediterranean Sea have been above average during January to June 2023. Model outputs and our expert judgment predicted near-average conditions during the next seasons (ASO and SON 2023).

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

Above to well above average precipitation was observed over the northernmost Sahel belt: a large part of Senegal, Gambia, central-east Mali, north Burkina Fasso, south Ghana, Southwest Nigeria, Southwest Niger, South Tchad, Cameroon, much of central Africa, south Soudan, much of South-South Sudan, Ethiopia and Rwanda during June 2023.

Below and well below precipitation was recorded over Sierra Leone, western Liberia, northern parts of Nigeria, Gabon, and the central part of Congo Brazzaville, eastern Madagascar.

Figure 2: Precipitation in per cent of the average for June 2023 (Data source: https://iridl.ldeo.columbia.edu/SOURCES/.NOAA/.NCEP/.CPC/.CAM5_OPI/.v0208/.mean/.prcp)

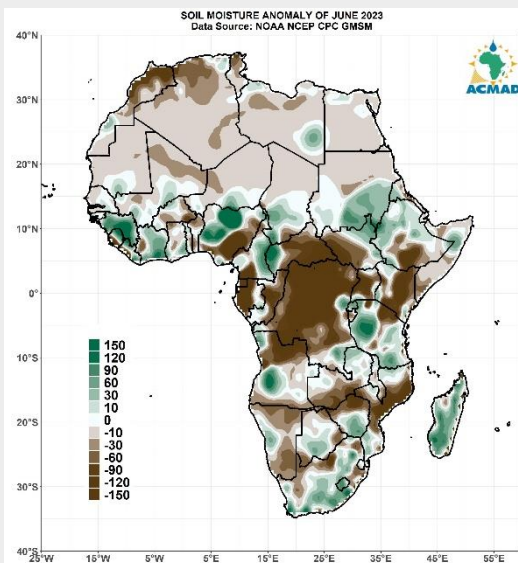
1.2. STANDARDIZED PRECIPITATION INDEX (SPI)

During June 2023, the SPI index shows a dry to extremely dry situation over Guinea, Sierra Leone, Liberia, central to east Cote d'Ivoire, northwest Nigeria, Gabon, central Congo Brazzaville, northwest Uganda, north Kenya, Eastern part of Mozambique and Madagascar.

Wet to extremely wet conditions were recorded over Senegal, Gambia, central-east Mali, north Burkina Fasso, south Ghana, Southwest Nigeria, Southwest Niger, South Tchad, Cameroon, north of DRC, much of central Africa, south Soudan, much of South-South Sudan, Ethiopia and Rwanda

Figure 3: Standardized precipitation index for June 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/.CAM5_OPI/.v0208/.mean/.prcp/

1.3. SOIL MOISTURE ANOMALY

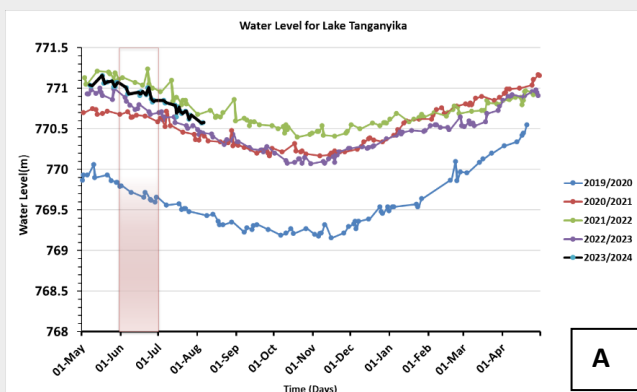


Strong to moderate moisture deficit was located over Morocco, Tunisia, north Algeria, southern Nigeria, south Cameroon, most of DRC, Congo, Gabon, Much of Angola, parts of south Ethiopia, south South Sudan, Uganda, Kenya, much of Angola, Namibia, north Zimbabwe, East Mozambique and south Zambia.

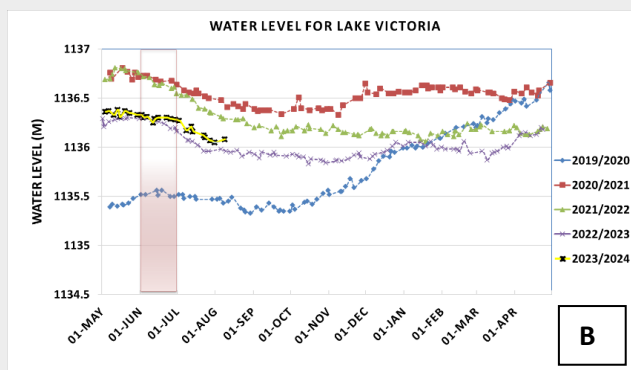
Over most of these areas, below average precipitation has been recorded between April and May. This resulted in large moisture deficits and below average vegetation conditions.

Figure 4: Soil moisture anomaly for June 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>

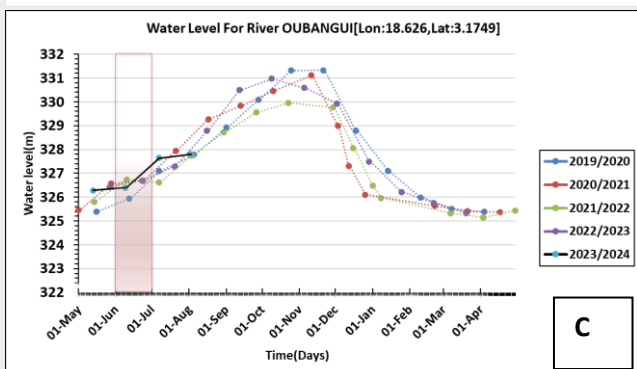
1.5. WATER LEVEL



A



B



C

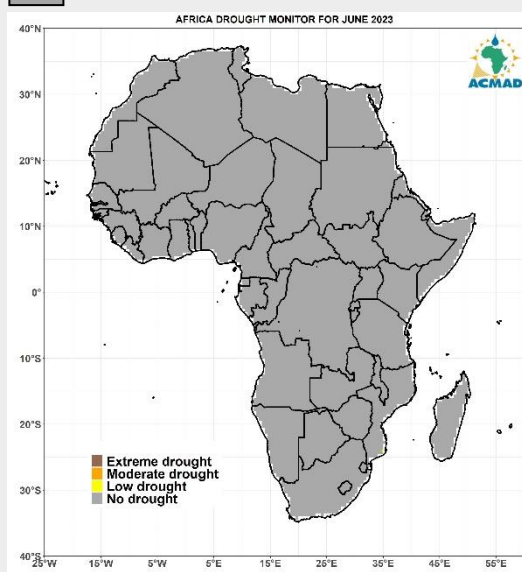
A decrease in water levels is observed in the Tanganyika and Victoria Lakes. This is the result of a cumulative rainfall deficit recorded over the last few months in some parts of Eastern Africa. It is also due to the start of the dry seasons in these parts of the region. An increase in the rainfall situation observed in some parts of DRC has contributed to an increase in water levels in River OUBANHUI.

Figure 5: Daily water levels of Lake Tanganyika[A], Lake Victoria[B] and River OUBANHUI[C]. Data Source: https://doi.org/10.24400/329360/HYDROWEB_WATER_+%EVELE

II DROUGHT MONITORING

Africa Drought Monitor Intensity:

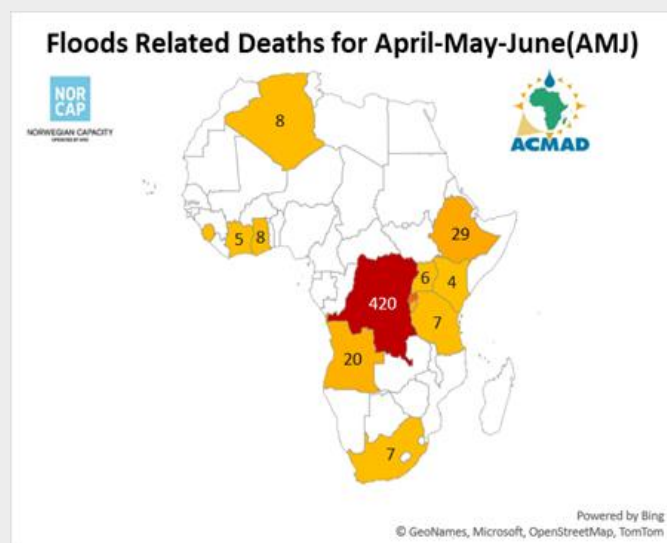
-  RR < [50] % or RR [50; 75] % ; SPI[-3;-2] or SPI<[-3], SM<[-60] & NDVI<[-0.20] **Severe drought**
-  RR [50; 75] %; SPI [-2; -1]; SM [-60; -10]mm & NDVI [-0.20; -0.1] **Moderate intensity drought**
-  RR [75; 100] %; SPI [-1; -0.5]; SM [-30; -10]mm & NDVI [-0.1; 0.05] **Low intensity drought**
- 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



Considering the cumulative precipitation deficits during the past and the month of April and May, SPI and soil moisture deficits, the adjacent map characterizes the drought situation in Africa during June 2023.

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

III. RECORDED IMPACTS



It has been reported that at least 644 people have lost their lives due to flooding during the months of April, May and June 2023 combined. The highest number of deaths in the last three months was recorded at DRC with 420 deaths. 29 deaths were recorded in Ethiopia, 109 deaths in Rwanda, 8 in Algeria, 5, 8 and 7 respectively in Ghana, cote d'Ivoire and Sierra Leone, 20 in Angola, 7 in South Africa, 7 in Tanzania, 4 in Kenya, 14 in Burundi and 6 in Uganda(see adjacent map)

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 August-September-October (ASO) and September-October-November (SON) 2023 seasons across Africa (see the figures below): (see the figures: Fig7, Fig8, Fig9, and Fig10):

During the August to November 2023 period.

- ✚ The outlook for the rainfall season during the August to November 2023 period is that below average and normal to below average rainfall is expected over northern Africa, Gabon, southern Angola, Zimbabwe, Mozambique, much of South Africa, Lesotho, and Eswatini.
- ✚ From August to October 2023 normal to above average rainfalls are very likely over northern Africa, southern Sudan, southern Congo, south-western DRC, north-western Angola, and southern Madagascar.
- ✚ Over south-eastern Mauritania, southern Mali, much of Burkina Faso, south-western Niger, southern Sudan, most part of South-Sudan, Uganda, Rwanda, Burundi, eastern Ethiopia, Kenya, northern and southern Tanzania, northern Zambia and Malawi above normal precipitation is expected from August to November 2023
- ✚ From September to November 2023, near to above and above average temperature is very likely over Morocco, Algeria, Sudan, Chad, Niger, Mali and much of Mauritania, eastern Angola, most of Namibia, southern South Africa, Zimbabwe and Zambia.

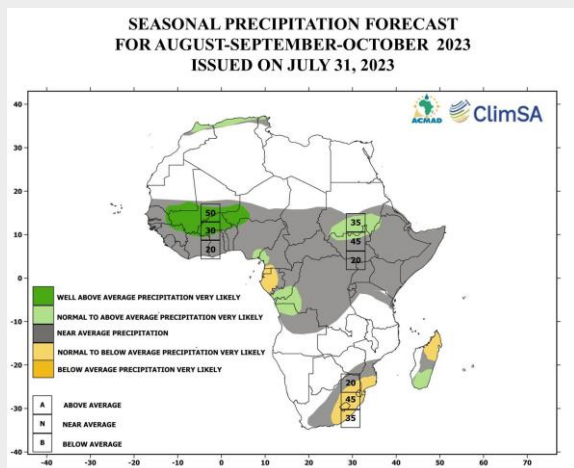


Figure 7: Seasonal precipitation forecast for August-September-October 2023.

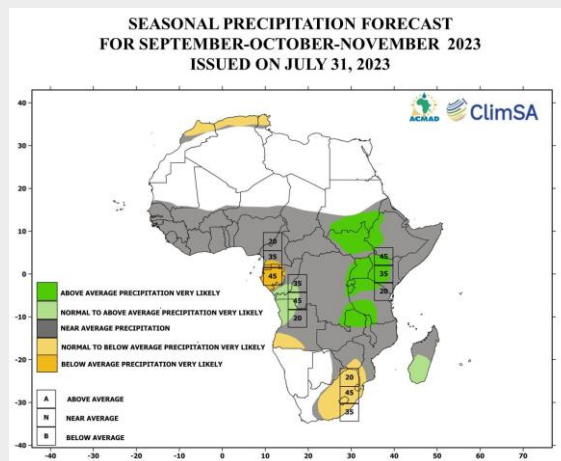


Figure 8: Seasonal precipitation forecast for September-October-November 2023.

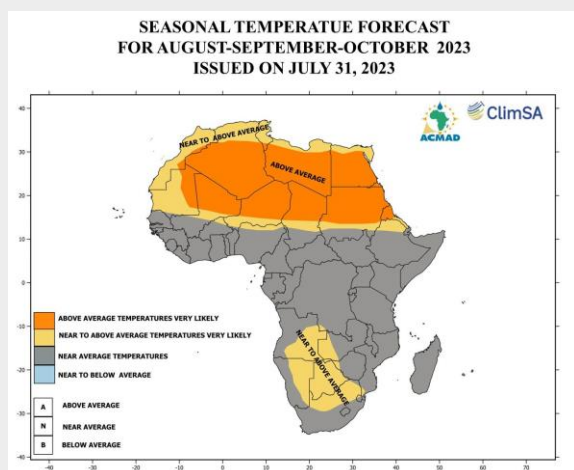


Figure 9: Seasonal Temperature Forecast for August-September -October 2023.

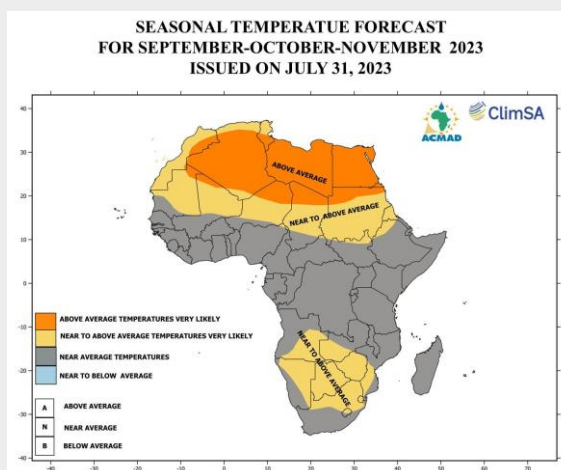


Figure 10: Seasonal Temperature Forecast for September-October-November 2023.

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

The outlook for the rainfall season during the August to November 2023 period is that below average and normal to below average rainfall is expected over northern Africa, Gabon, southern Angola, Zimbabwe, Mozambique, much of South Africa, Lesotho, and Eswatini.

From August to October 2023 normal to above average rainfalls are very likely over northern Africa, southern Sudan, southern Congo, southwestern DRC, north-western Angola, and southern Madagascar.

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 average rainfalls are very likely over northern Africa, southern Sudan, southern Congo, southwestern DRC, northwestern Angola, and southern Madagascar from September to November 2023.

From September to November 2023, near to above and above average temperature is very likely over Morocco, Algeria, Sudan, Chad, Niger, Mali and much of Mauritania, eastern Angola, most of Namibia, southern South Africa, Zimbabwe and Zambia.

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 policies 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> and

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).