CENTRE AFRICAIN POUR LES APPLICATIONS DE LA METEOROLOGIE AU DEVELOPPEMENT

ACMAD

AFRICAN CENTRE OF METEOROLOGICAL APPLICATIONS FOR DEVELOPMENT

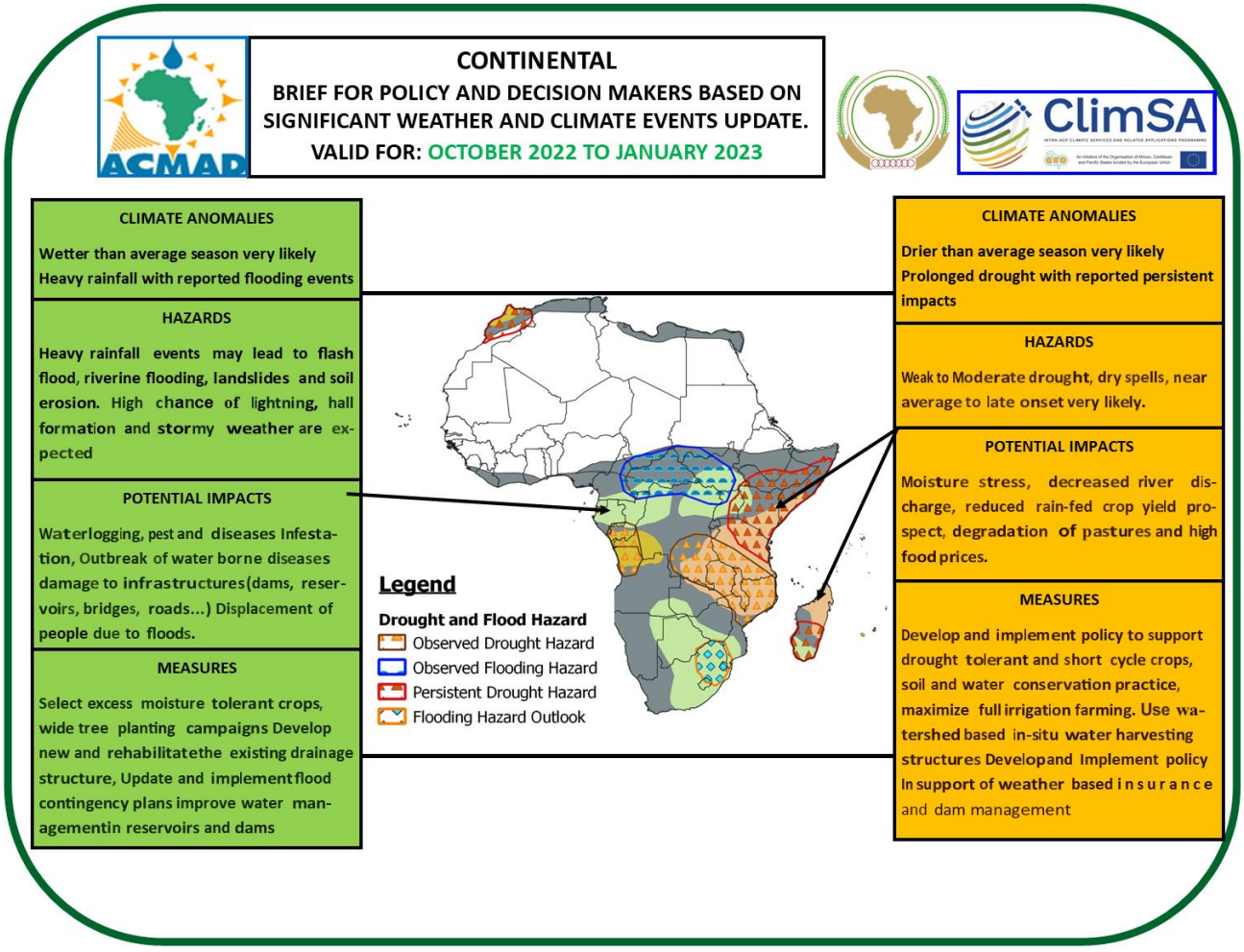
Institution Africaine parrainée par la CEA et l'OMM • African Institution under the aegis of UNECA and WMO

Climate Services for Disaster Risks Reduction in Africa

DROUGHT SERVICE AND SEASONAL CLIMATE FORECAST

ISSUED: 20 October 2022

Selected Significant Weather and Climate events 'updates: Valid for October 2022 to January 2023.



DROUGHT SERVICE AND SEASONAL CLIMATE FORECAST

BULLETIN No.10, 2022

Contents

HIGHLIGHTS

Performance of the past season and impacts

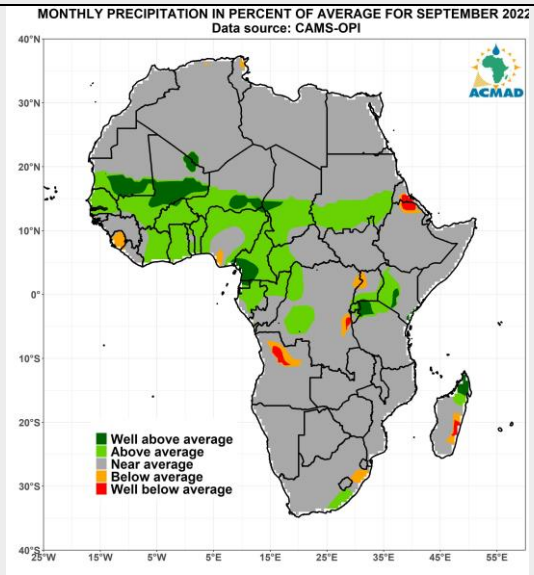
- In Cameroon, as of September 20th, at least 2 people have died and around 95 were injured because of floods triggered by heavy rainfall (OCHA, 20 September 2022).
- In Niger, as many as 168 people have lost their lives and 227,000 affected since the start of the rainy season started(floodlist, 23 September 2022).
- In Guinea, at least 3 people have lost their lives after heavy rain and flooding in Conakry and affecting 2,576 people, including 137 children(floodlist, 23 September 2022)
- In Nigeria, as many as 300 people have died and 100,000 displaced following floods triggered by heavy rainfall(Floodlist, 22 September 2022)
- In South Africa, A Mining Dam in Jagersfontein Collapsed and left 3Dead and 4 missing following flooding triggered by heavy rainfall(floodlist, 12 September 2022).
- In Uganda, at least 17 people died following flooding and landslides caused by heavy rainfall during September (floodlist, 7 September 2022)
- In Senegal, at least 3 people have died in severe flooding in the city of Dakar, and surrounding areas as a result of heavy rainfall that started in earlier September 2022(Floodlist, 5 September 2022).

Outlook SEPTEMBER -OCTOBER-NOVEMBER AND OCTOBER-NOVEMBER-DECEMBER 2022 SEASONS

- Below average Sea Surface Temperatures (SSTs) were observed over most of the Equatorial Pacific (ENSO region) since August 2021. During the period of May to August 2022, the negative anomalies persisted over the Pacific equatorial region; the models' output and experts' judgment are in favor for the persistence of the weak La Nina is very likely from October 2022 to January 2023.
- Near-average SSTs were observed over the Tropical North Atlantic (TNA) during September 2022. Most models' outputs and expert judgment are favorable for the persistence of neutral conditions during October 2022 to January season 2023.
- Near-average Sea Surface Temperatures characterize the North Atlantic Tropical (NAT) since September 2022. The persistence of this condition is very likely during the August-November season.
- Near-average Sea Surface Temperatures characterize the South Atlantic Tropical (SAT) during 2022. This condition expected to persist is very probable in the coming months.
- The tropical south Atlantic (TSA) has been near average from July to September 2022. Models' outputs and expert judgment are favorable for a neutral to below average of this pattern during the coming seasons.
- Sea surface temperatures of the western tropical Indian Ocean (WTIO) and South-eastern tropical Indian Ocean (SETIO) have been near to below average. Models' outputs and experts' assessments are favorable to the persistence of these conditions during the coming months.
- The sea surface temperatures of the Mediterranean Sea have been near average from July to September 2022. Models' outputs and expert judgment are favorable for the persistence of this condition during the coming few months.

I.REVIEW OF DROUGHT INDICATORS: Precipitation, SPI, Soil Moisture, NDVI and Water Level

1.1 PRECIPITATION IN PERCENT OF AVERAGE

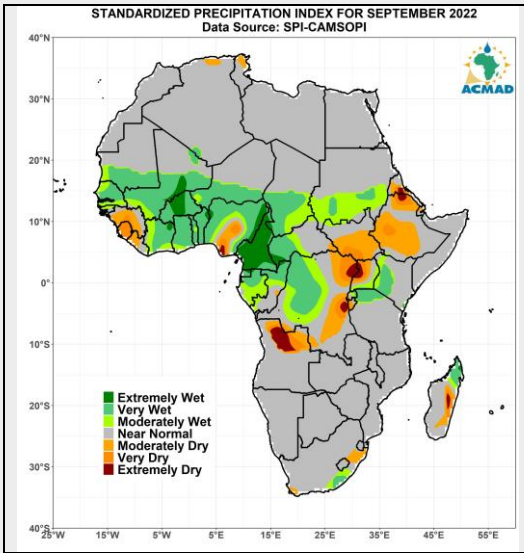


During September 2022, above to well above average was observed over Senegal, south Mauritania, Gambia, Sahel belt: from Mali, south-central Niger, Burkina Faso, Ivory Coast, Ghana, Togo, Benin, much of Nigeria, Cameroon, Gabon, north Congo south-central Tchad, Central African Republic, Parts of the northwest and central DRC, Rwanda, Burundi, western Kenya, northern Tanzania and northern Madagascar.

Below and well below average precipitation was observed over Sierra Leone, parts of northern Angola, north-east Ethiopia towards Eritrea, some pocks areas of eastern DRC, and eastern Madagascar.

Figure 2: Precipitation in per cent of the average *for September 2022 (Data source: https://iridl.ldeo.columbia.edu/SOURCES/.NOAA/.NCEP/.CPC/.CAMS_OPI/.v0208/.mean/.prcp)*

1.2. STANDARDIZED PRECIPITATION INDEX (SPI)

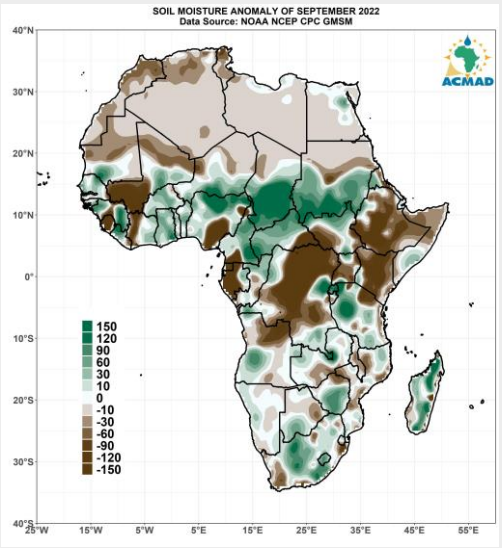


The SPI for September 2022 reveals that very dry to extremely dry conditions were observed over, south Sierra Leone, Liberia, Guinea, Central Nigeria, much of South Sudan, east DRC, South-South Sudan, Uganda, much of Ethiopia, northern Angola, Burundi, northernmost Algeria and Tunisia and east Madagascar.

Very wet to extremely wet conditions were recorded over Senegal, Southern Mauritania, much of Mali, Gambia, Ivory Coast, Benin, northern Nigeria, central to southern Niger, central to southern Chad, central to southern Sudan, Rwanda, northern Tanzania and northernmost Madagascar.

Figure 3: Standardized precipitation index *for September 2022. 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

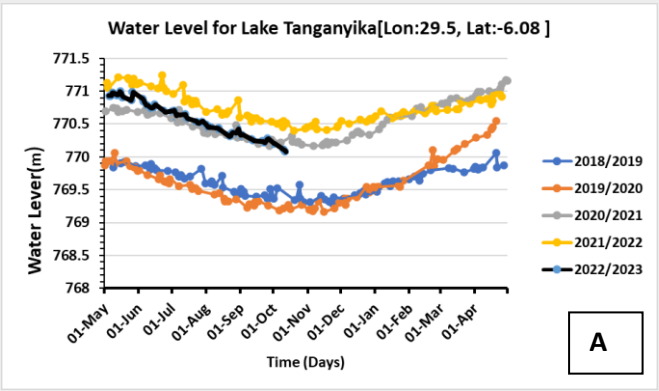


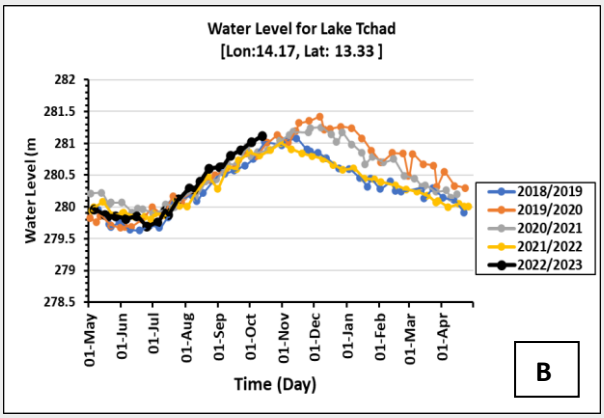
Strong to moderate moisture deficit was located over Morocco, north Algeria, south Mali, Tunisia, Sierra Leone, central Guinea, much of Mali, Parts of south Nigeria, parts of southern Cameroon, Equatorial Guinea, Gabon, much of DRC, Uganda, parts of east Central Africa Republic to west South Sudan, Kenya, Ethiopia much of Angola, Namibia, Botswana, south-east Zambia and Somalia.

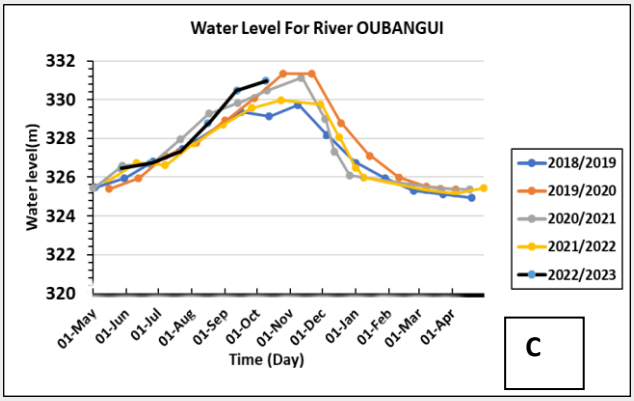
Below average precipitation was recorded over most of these areas during September 2022 which resulted in large moisture deficits and below average vegetation conditions.

Figure 4: Soil moisture anomaly for September 2022. 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 Africa region, leading to the observed increase in water levels in the river OUBANGUI and Lake Tchad during September 2022. Also, the deficit rainfall observed in eastern Africa contributed to a slight decrease in water levels in Lake Tanganyika.

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

II DROUGHT MONITORING

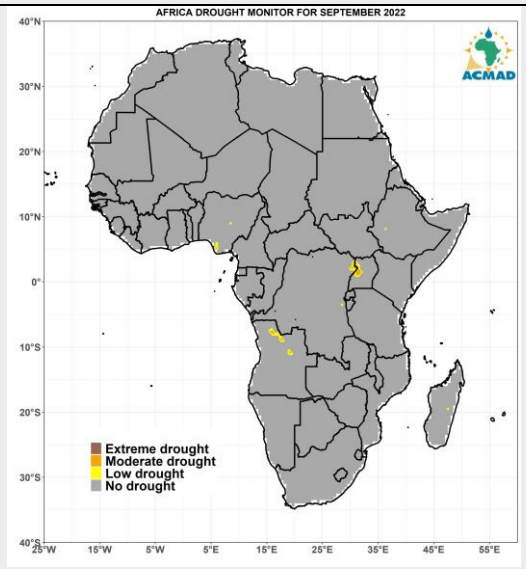
Africa Drought Monitor Intensity:

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

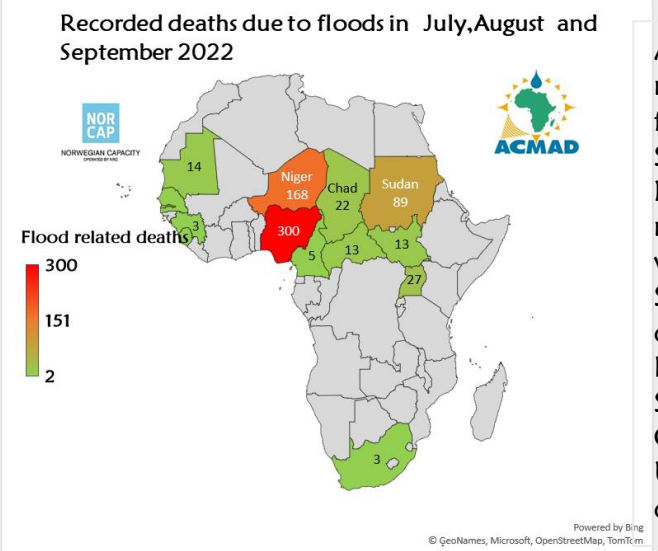


Given the cumulative precipitation deficits during the past and the month of September, SPI and soil moisture deficits, the adjacent map characterizes the drought situation in Africa during September 2022.

According to OCHA, across the Horn of Africa, at least 36.1 million people will be affected by severe drought in October 2022, including 24.1 million in Ethiopia, 7.8 million in Somalia and 4.2 million in Kenya(OCHA 21, August 2022).

Figure 6: African Drought Monitor, expressed as a composite of Precipitation, SPI, Soil Moisture deficit, and water level, valid for September 2022.

III. RECORDED IMPACTS



As of September, at least 671 people have been recorded to have lost their lives due to flooding during the months of July, August and September combined. Out of those deaths, Nigeria recorded 300 deaths, the highest deaths recorded in the last three months, 168 deaths were recorded in Niger ,89 deaths recorded in Sudan , South Sudan recorded 13 deaths, 13 deaths were recorded in Central African Republic, 2 deaths in Gambia, 4 deads in Senegal, 22 deaths in Chad, 5 deaths in Cameroon, 27 deaths were recorded in Uganda, Mauritania recorded 14 deaths , 6 deaths in Sierra Leone, Guinea and south Africa

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 Centres for Long Range Forecasts, the following outlooks for precipitation and temperature are provided for October-November-December (OND) and November-December-January (NDJ) 2022 seasons across Africa (see the figures: Fig7, Fig8, Fig9 and Fig10):

During October 2022 to January 2023 period:

- Below average to normal to below rainfall is expected over Morocco, southernmost of Congo, south-western of DRC, north-western Angola, eastern DRC, much of Rwanda, Burundi, Tanzania, southern Uganda, Kenya, northern Zambia, Malawi, Mozambique, Madagascar, Seychelles, Comoros, Mauritius and Reunion Islands during October 2022 to January 2023 season.
- Normal to above normal precipitation is very likely over southern CAR, south-easternmost of Cameroon, northern and central Congo, northern DRC, southern South-Sudan, northernmost of Uganda, south-eastern of Angola, southern Zambia, much of Botswana, central and southern Zimbabwe, southern Mozambique, western South Africa and southern Madagascar during October 2022 to January 2023.
- From October to December 2022 above normal precipitation is expected over Central parts of South Africa, Lesotho and Eswatini.
- Near to above average Temperature is very likely over Morocco, Algeria, Tunisia Libya, Egypt, Sudan, Chad, Niger, Mali, Mauritania, Angola, Namibia, Botswana, Zambia, Zimbabwe, and Mozambique from October 2022 to January 2023.
- During November 2022 to January 2023, near to below average temperatures are very likely over Angola, Namibia, Botswana and Zambia.

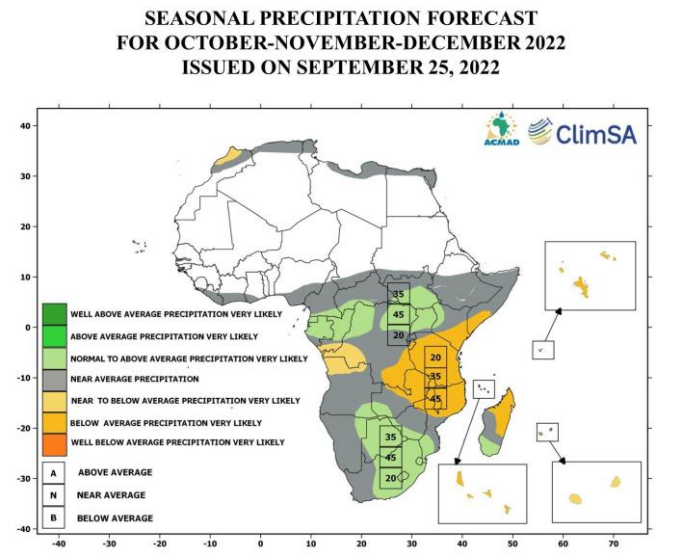


Figure 7: Seasonal precipitation forecast for October-November -December 2022

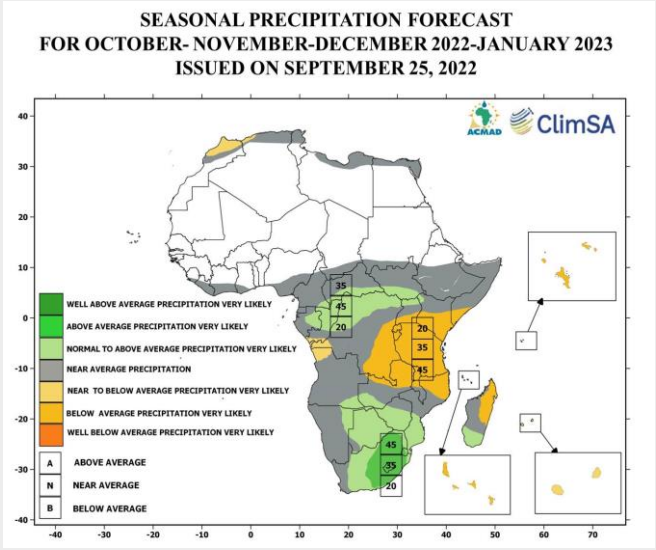


Figure 8: Seasonal precipitation forecast for November- December 2022-January 2023

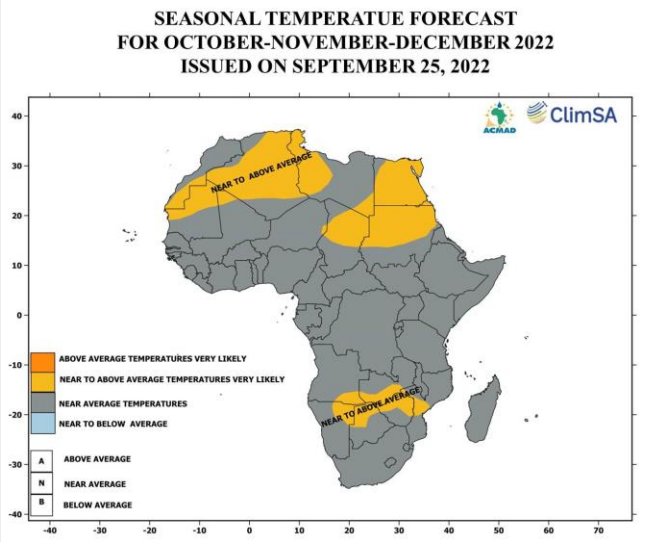


Figure 9: Seasonal temperature forecast for October-November -December 2022

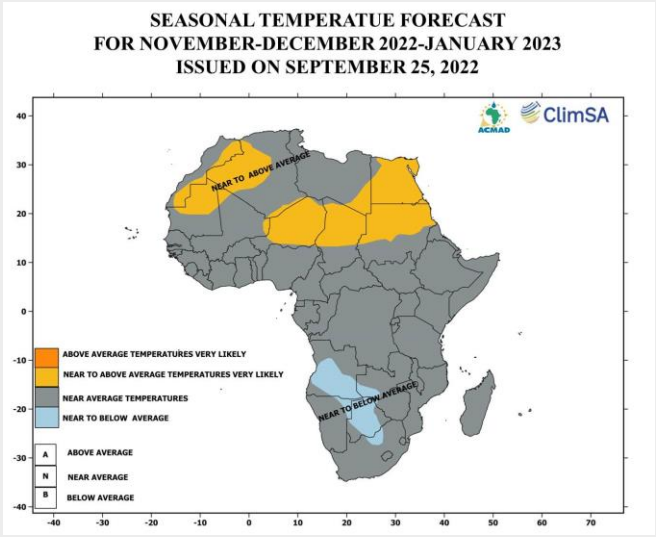


Figure 10: Seasonal temperature forecast for November- December 2022-January 2023

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

- Below average to normal to below rainfall is expected over Morocco, southernmost of Congo, south-western of DRC, north-western Angola, eastern DRC, much of Rwanda, Burundi, Tanzania, southern Uganda, Kenya, northern Zambia, Malawi, Mozambique, Madagascar, Seychelles, Comoros, Mauritius and Reunion Islands during October 2022 to January 2023 season.

- Normal to above normal precipitation is very likely over southern CAR, south-easternmost of Cameroon, northern and central Congo, northern DRC, southern South-Sudan, northernmost of Uganda, south-eastern of Angola, southern Zambia, much of Botswana, central and southern Zimbabwe, southern Mozambique, western South Africa and southern Madagascar during October 2022 to January 2023.

- From October to December 2022 above normal precipitation is expected over Central parts of South Africa, Lesotho and Eswatini.

- Near to above average Temperature is very likely over Morocco, Algeria, Tunisia Libya, Egypt, Sudan, Chad, Niger, Mali, Mauritania, Angola, Namibia, Botswana, Zambia, Zimbabwe, and Mozambique during October 2022 to January 2023.

- During November 2022 to January 2023, near to below average temperatures are very likely over Angola, Namibia, Botswana and Zambia.

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 crops 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 quantity 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 very likely over southern CAR, south-easternmost of Cameroon, northern and central Congo, northern DRC, southern South-Sudan, northernmost of Uganda, south-eastern of Angola, southern Zambia, much of Botswana, central and southern Zimbabwe, southern Mozambique, western South Africa and southern Madagascar during October 2022 to January 2023.
- From October to December 2022 above normal precipitation is expected over Central parts of South Africa, Lesotho and Eswatini.
- Near to above average Temperature is very likely over Morocco, Algeria, Tunisia Libya, Egypt, Sudan, Chad, Niger, Mali, Mauritania, Angola, Namibia, Botswana, Zambia, Zimbabwe, and Mozambique during October 2022 to January 2023.

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.

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).