

Climate Services for Disaster Risks Reduction in Africa

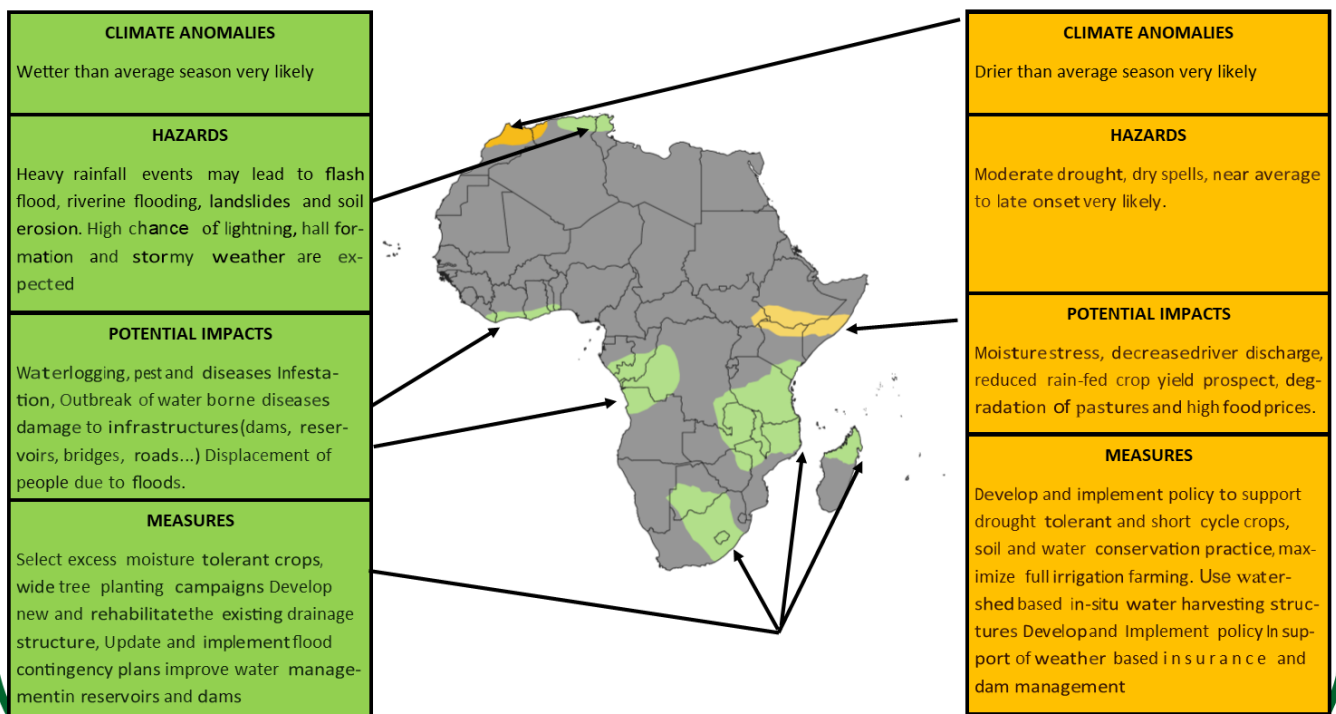
DROUGHT SERVICE AND SEASONAL CLIMATE FORECAST

ISSUED: January 17, 2022

**Selected Significant Weather and Climate events'updates : Valid for
January to April 2022.**



**BRIEF FOR POLICY AND DECISION MAKERS BASED ON
SIGNIFICANT WEATHER AND CLIMATE EVENTS UPDATE.
VALID FOR: JANUARY TO APRIL 2022**



DROUGHT SERVICE AND SEASONAL CLIMATE FORECAST

BULLETIN No.1, 2022

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HIGHLIGHTS

Performance of the past season and impacts

Heavy rains and floods during December affected countries such as Congo-Brazzaville, South Sudan and Kenya triggering floods causing at least 47 deaths (floodlist, December 2021).

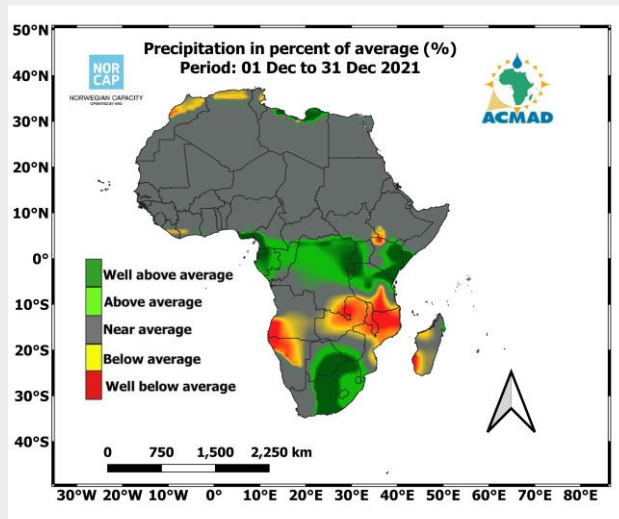
In Congo-Brazzaville, at least 15 people have died, 9 missing and a total of 46,652 have been affected, 6,552 displaced and thousands of homes have been damaged following weeks of heavy rainfall which triggered flooding in the city (Floodlist, 15 December 2021).

In South Sudan, the ongoing heavy rainfall from the onset triggered the worst flooding in 60 years affecting more than 835,000 people in 33 of South Sudan's 78 counties. It has reported that the worst impacted states are Jonglei with 305,000 people affected, Unity 220,00 affected and Upper Niles with 141,000 affected (Floodlist, 15 December 2021).

In Kenya, at least 32 people have died in a tragic accident of a bus swept away by floods following a heavy rainfall in the Kitui County (Floodlist, 6 December 2021).

Outlook January-February-March and February -March-April 2022 Seasons

- ✚ From October to December 2021, The Equatorial Sea surface temperatures (SSTs) have been below average conditions across most of the Pacific Ocean; and La Niña is favored to reach moderate phase during January to April 2022 periods.
- ✚ Near average SSTs were observed over the Tropical North Atlantic (TNA) in November to December 2021. Most model outputs and expert judgments favor persistence of these conditions during the evolution of the seasons (JFM and FMA 2022).
- ✚ Near to above average Sea Surface Temperatures have been observed in the North Atlantic Tropical (NAT) during December 2021. This pattern is expected to persist during the coming months.
- ✚ Near average Sea Surface Temperatures have been observed in the South Atlantic Tropical (SAT) from November to December 2021 and it is expected to decrease to near to below normal conditions during the coming months.
- ✚ The SST over the Tropical South Atlantic (TSA) has been near average during December 2021. Model outputs and expert judgment favors a decrease in SSTs during the coming seasons (JFM and FMA 2022).
- ✚ The SSTs in the Western Tropical Indian Ocean (WTIO) and South-Eastern Tropical Indian Ocean (SETIO) have been near average during November to December 2021. Model outputs and experts assessments are in favor of persistence of this condition for the coming months.
- ✚ The SSTs over the Mediterranean Sea have been above average since June to December 2021. Model outputs and experts judgment predict persistence of these conditions during the next seasons (JFM to FMA 2022).

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

During December 2021, above to well above average was observed over northern Libya, southern Est Nigeria, southernmost Cameroon, Gabon, Congo-Brazzaville, Equatorial Guinea, much of DRC, Uganda, Burundi, Rwanda, much of Kenya, parts of Tanzania, much of Botswana, southernmost Zimbabwe and much of South Africa.

Below and well below average precipitation was observed over northern Morocco and Algeria, south-west Angola, central to northern Namibia, Zambia, Malawi, southern, Tanzania, Mozambique and Madagascar.

Figure 2: Precipitation in percent of average for December 2021 (Data source: https://iridl.ldeo.columbia.edu/SOURCES/.NOAA/.NCEP/.CPC/.CAMS_OPI/.v0208/.mean/.prcp/)

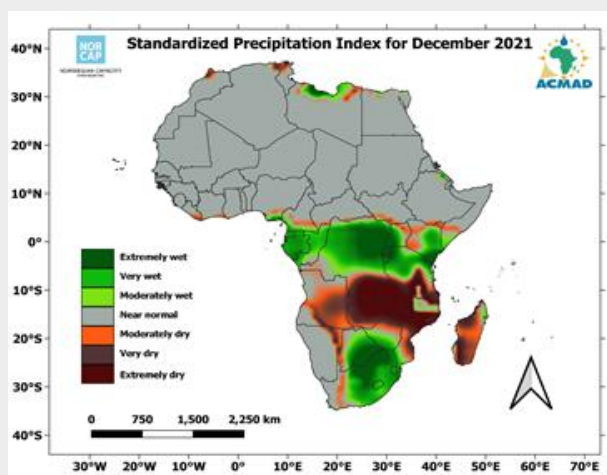
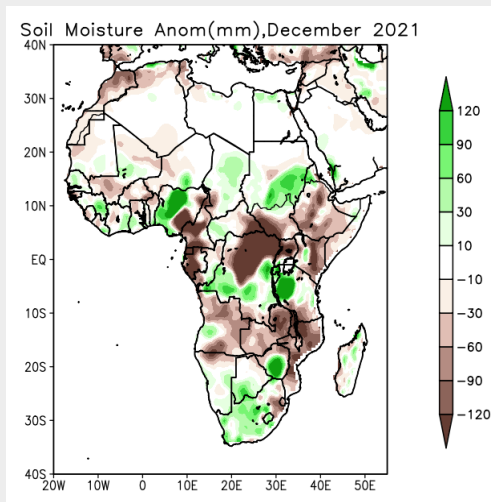
1.2. STANDARDIZED PRECIPITATION INDEX (SPI)

Figure 3: Standardized precipitation index for December 2021. Green corresponds to wet, grey to near-normal SPI conditions, 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/

The SPI for December 2021 reveals that very dry to extremely dry conditions were observed over much of Angola, Southern DRC, Zambia, Malawi, Southern Tanzania, Mozambique and Madagascar

Very wet to extremely wet conditions were recorded over Gabon, Congo, much of DRC, Burundi, Rwanda, Uganda, East Kenya, South Somalia, much of Tanzania, Botswana, South Africa and north Libya

1.3. SOIL MOISTURE ANOMALY



Strong to moderate moisture deficit was located over Morocco, western Sahara, northern Algeria, Tunisia, Southern Mali, West Nigeria, Cameroon, Gabon, north DRC, much of Angola, Zambia, Malawi, Mozambique, Uganda, much of Kenya, South Sudan and Ethiopia

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

Figure 4: Soil moisture anomaly for December 2021. Green corresponds to positive anomalies, white to near-average soil moisture conditions, brown and dark brown denote negative anomalies. Data source: <http://www.esrl.noaa.gov/psd/data/gridded/data.cpcsoil.html>

1.4. NORMALIZED DIFFERENCE VEGETATION INDEX (NDVI)

Not considered

1.5. WATER LEVEL

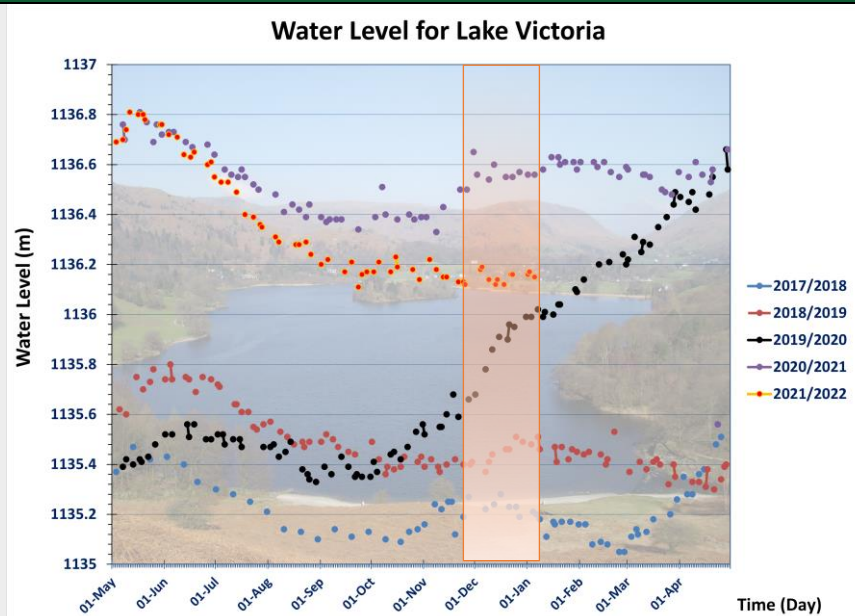
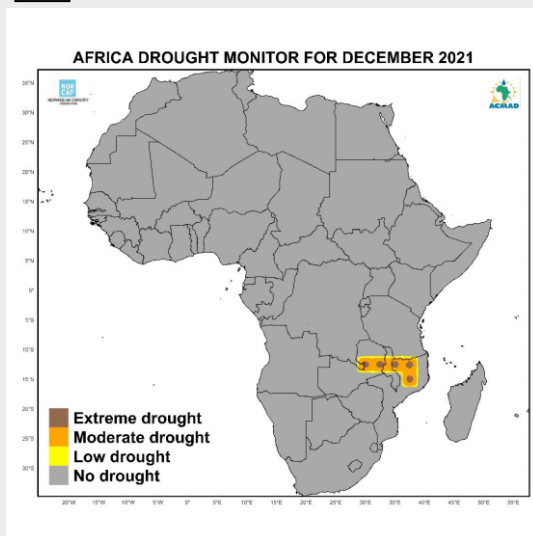


Figure 5: Daily water levels of Lake Victoria. Data Source: <http://hydroweb.theialand.fr/collections/hydroweb>. A cumulative precipitation deficit was recorded during the past months over Eastern Africa, leading to the observed decrease in water levels in Lake Victoria during December 2021.

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 December, SPI and soil moisture deficits, the adjacent map characterizes the drought situation in Africa during December 2021.

Moderate drought during December was observed over the central part of Zambia, Malawi and the northern part of Mozambique. This is due to the poor rainfall and late start of the season; and consistent below-average rainfall since November, leading to negative moisture ground conditions in the region.

Figure 6: African Drought Monitor, expressed as a composite of precipitation, SPI, soil moisture deficit, and water level, valid for December 2021.

III. RECORDED IMPACTS

More than one million people have been affected and at least 47 have died during December following heavy rainfall in Congo Brazzaville, South Sudan and Kenya counties such as (floodlist, December 2021).

A least 15 people have died, 9 missing and a total of 46,6552 have been affected, 6,552 displaced and thousands of homes have been damaged following weeks of heavy rainfall which triggered flooding in the city of Congo-Brazzaville (Floodlist, 15 December 2021).

More than 835,000 people in 33 of South Sudan's 78 counties following the ongoing heavy rainfall from the onset triggered the worst flooding in 60 years affecting. It has been reported that the worst impacted states are Jonglei with 305,000 people affected, Unity with 220,00 affected and Upper Niles with 141,000 affected (Floodlist, 15 December 2021).

In Kenya, 32 people have died in a tragic accident of a bus swept away by floods following heavy rainfall in Kitui County (Floodlist, 6 December 2021).

During December, floods in South Africa have caused 6 deaths and a total of 8837 people were affected (emdat. be, December 2021).

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 January-February-March (JFM) and February-March-April (FMA) 2022 seasons across Africa (Fig7,8,9 and 10) as follow:

During the January to April 2022 period.

- ✚ Below normal and normal-to-below-normal precipitation is most likely over northern Morocco, southern Ethiopia, Somalia, northern Kenya, and south-easternmost South Sudan.
- ✚ Normal to above-normal precipitation is most likely over north-eastern Algeria and northern Tunisia, southern Côte d'Ivoire, Ghana, Togo, Benin, south-eastern and westernmost of Nigeria, southern Gabon, Congo, south-western and south-eastern DRC, north-western Angola, north-eastern and south-eastern of SADC region and northern Madagascar.
- ✚ Near to below average temperature is likely over southern Botswana, central parts of South Africa, and much of Lesotho
- ✚ Near to above, the average temperature is very likely over northern Morocco, southern Algeria, Libya, south-western Egypt, southern Mauritania, Mali, most parts of Niger, Chad and western Sudan.

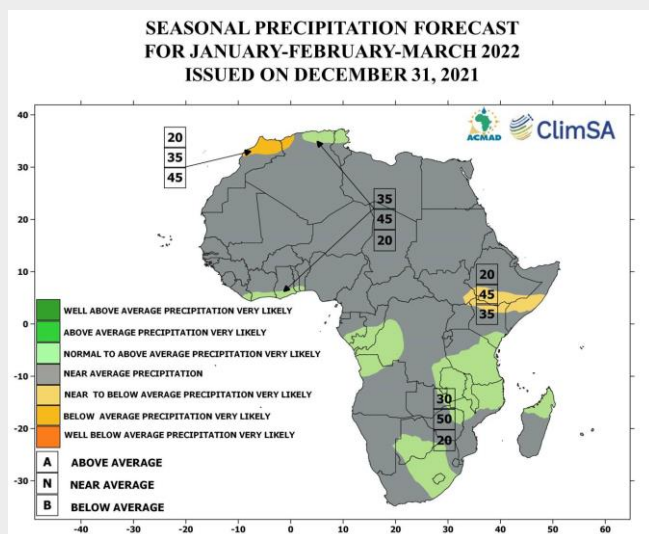


Figure 7: Seasonal precipitation forecast for January-February-March 2022

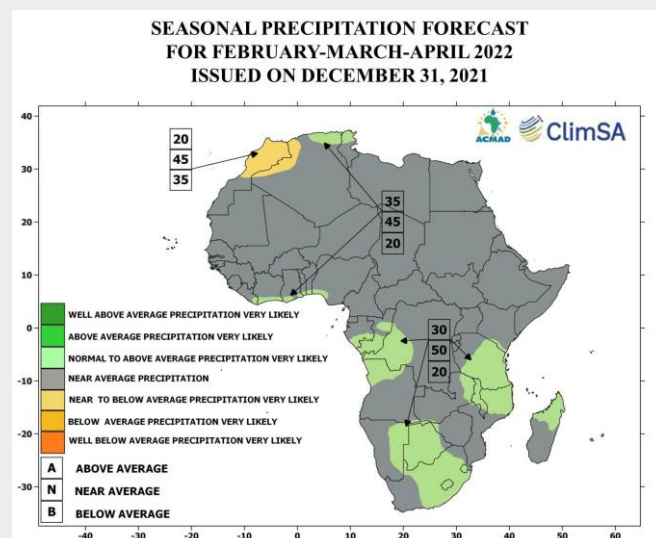


Figure 8: Seasonal precipitation forecast for February-March-April 2022

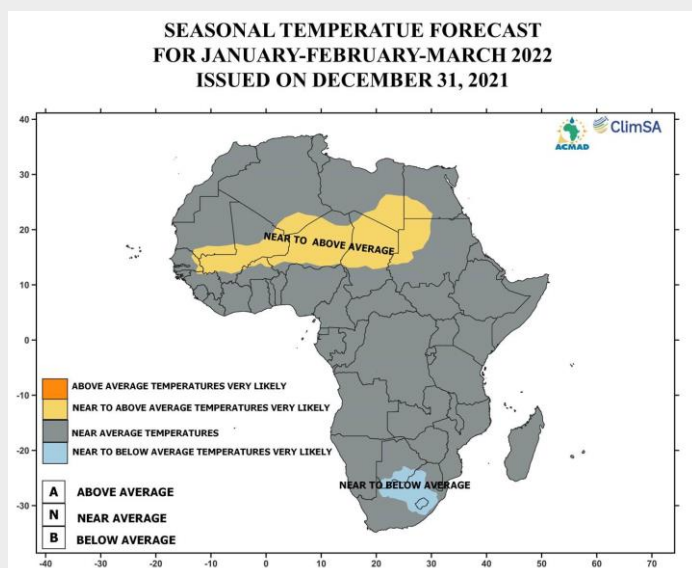


Figure 9: Seasonal Temperature forecast for January-February-March 2022

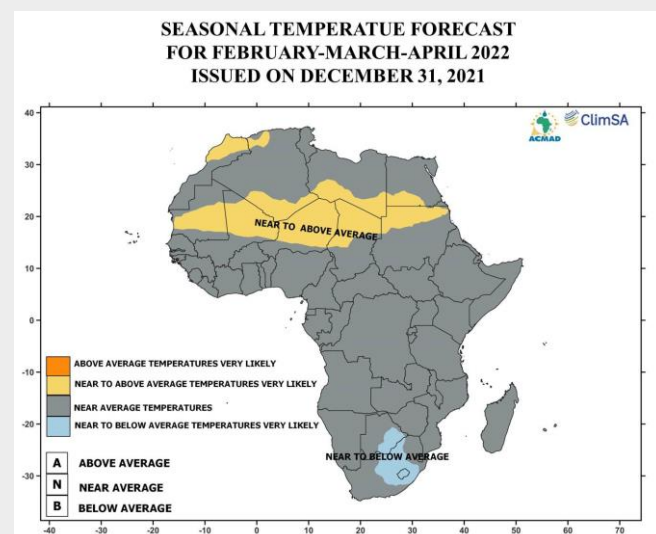


Figure 10: Seasonal Temperature forecast for January-February-March 2022

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 normal and normal-to-below-normal precipitation is most likely over northern Morocco, southern Ethiopia, Somalia, northern Kenya, and south-easternmost South Sudan.
- Normal to above-normal precipitation is most likely over north-eastern Algeria and northern Tunisia, southern Côte d'Ivoire, Ghana, Togo, Benin, south-eastern and westernmost of Nigeria, southern Gabon, Congo, south-western and south-eastern DRC, north-western Angola, north-eastern and south-eastern of SADC region and northern Madagascar.
- Near to above, the average temperature is very likely over northern Morocco, southern Algeria, Libya, south-western Egypt, southern Mauritania, Mali, most parts of Niger, Chad and western Sudan.

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 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

- ✓ During January to April 2022, normal to above-normal precipitation is most likely over north-eastern Algeria and northern Tunisia, southern Côte d'Ivoire, Ghana, Togo, Benin, south-eastern and westernmost of Nigeria, southern Gabon, Congo, south-western and south-eastern DRC, north-western Angola, north-eastern and south-eastern of SADC region and northern Madagascar.
- ✓ Near to above average temperature is very likely over northern Morocco, southern Algeria, Libya, south-western Egypt, southern Mauritania, Mali, most parts of Niger, Chad and western Sudan for the periods of January to April 2022.

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 systems 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 which 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 floods 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-reg/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 LandDAAC 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).