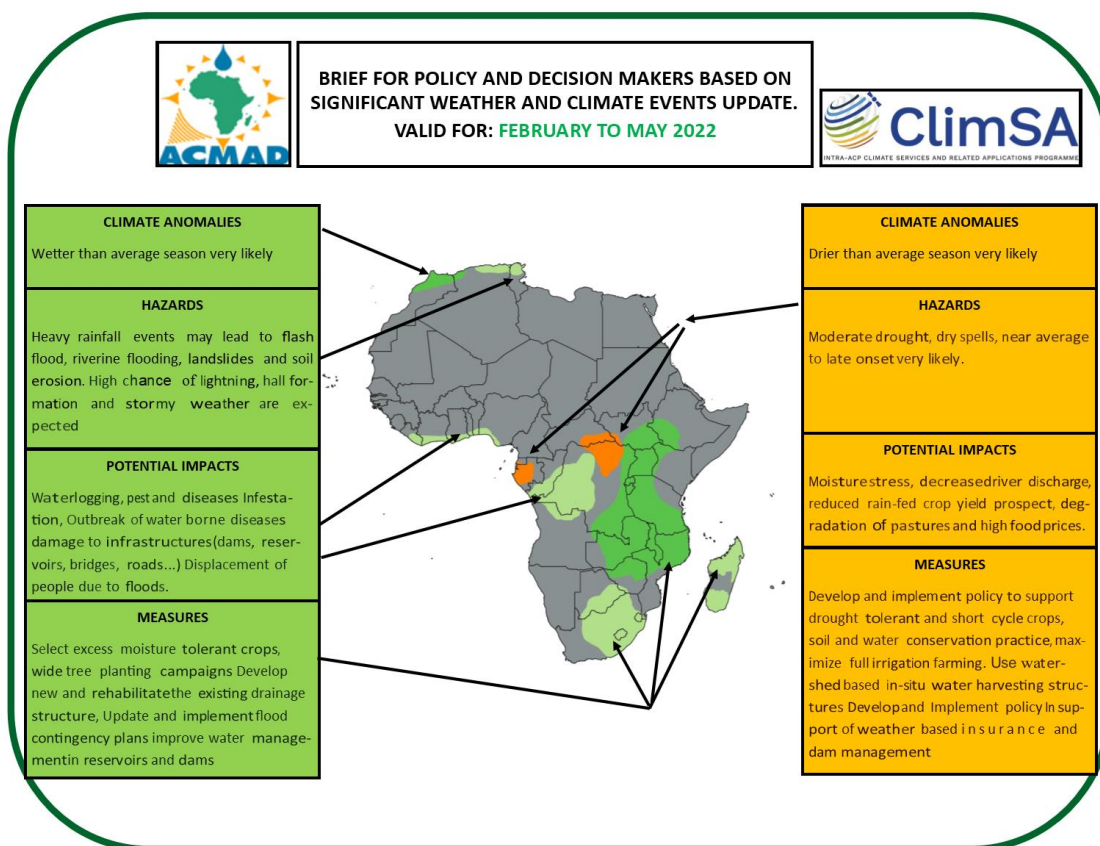


Climate Services for Disaster Risks Reduction in Africa

DROUGHT SERVICE AND SEASONAL CLIMATE FORECAST

ISSUED: February 15, 2022

**Selected Significant Weather and Climate events'updates : Valid for
February to May 2022.**



DROUGHT SERVICE AND SEASONAL CLIMATE FORECAST

BULLETIN No.2, 2022

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HIGHLIGHTS

Performance of the past season and impacts

Floods and severe weather including tropical storm during January 2022 have affected countries such as Madagascar, Mozambique, Malawi, South Africa, Zimbabwe, Zambia, and Uganda triggering floods causing at least 86 deaths and more than 380000 people have been affected (floodlist, January 2022).

- ✓ At least 70 people have died: in Madagascar (41 deaths), Mozambique (18 deaths) and Malawi (11 deaths) following severe weather including the tropical storm Ana, and more than 370000 people have been affected (floodlist, 27 January 2022)
- ✓ At least 9 deaths have been recorded in Uganda following a heavy rain caused flash flood and mudslides in Kisoro District in the Western Region (floodlist, 25 January 2022)
- ✓ At least 7 people have died following severe flash flooding that affected parts of Eastern Cape Province in South Africa (floodlist, 9th January 2022)

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

- ✦ From October to December 2021, The Equatorial Sea surface temperatures (SSTs) have been below average conditions across most of the Pacific Ocean since October 2021 to January 2022; and La Niña is favoured to reach moderate phase during February to May 2022 periods.
- ✦ Near to above average SSTs were observed over the Tropical North Atlantic (TNA) during December 2021 to January 2022. Most model outputs and expert jugements favour persistence of these conditions during the evolution of the seasons (FMA and MAM 2022).
- ✦ December 2021 to January 2022, near to average Sea Surface Temperatures characterized the North Atlantic Tropical (NAT) during. This pattern is expected to persist during the coming months.
- ✦ The Sea Surface Temperature in the South Atlantic Tropical (SAT) has been to near average from December 2021 to January 2022 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 to above average during January 2022. Model outputs and expert judgment favours a decrease in SSTs during the coming seasons (FMA and MAM 2022).
- ✦ 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).
- ✦ Sea Surface Temperatures in the Western Tropical Indian Ocean (WTIO) and South-Eastern Tropical Indian Ocean (SETIO) have been near to above average during December 2021 to January 2022. Model outputs and experts assessments are in favour of persistence of this condition for the coming months
- ✦ The SSTs over the Mediterranean Sea have been to near average since during January 2022. Model outputs and experts' judgment predict persistence of these conditions during the next seasons (FMA to MAM 2022).

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

1.1 PRECIPITATION IN PERCENT OF AVERAGE

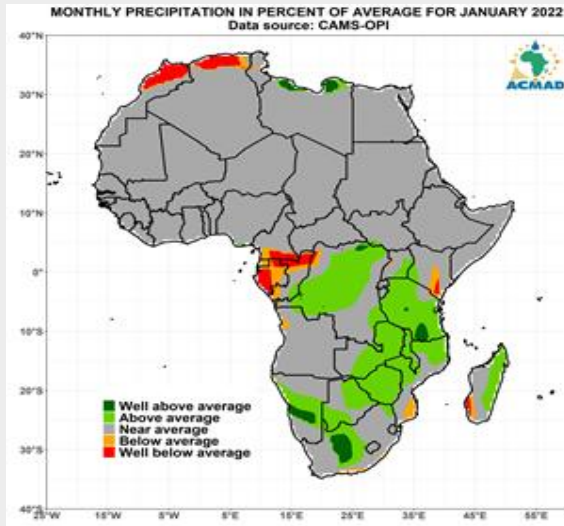


Figure 2: Precipitation in percent of average for January 2021 (Data source: https://iridl.ldeo.columbia.edu/SOURCES/.NOAA/.NCEP/.CPC/.CAMS_OPI/.v0208/.mean/.prcp/)

During January 2022, above to well above average was observed over northernmost Libya, Central parts of DRC, much of Tanzania, Southeast Uganda, Malawi, much of Mozambique, Zimbabwe, much of Zambia, north-west and South Botswana, central Namibia and central South Africa

Below and well below average precipitation was observed over northern Morocco and Algeria, Gabon, South Cameroon, parts of southern Kenya, parts of south-west Madagascar and the southern coastal area of Mozambique.

1.2. STANDARDIZED PRECIPITATION INDEX (SPI)

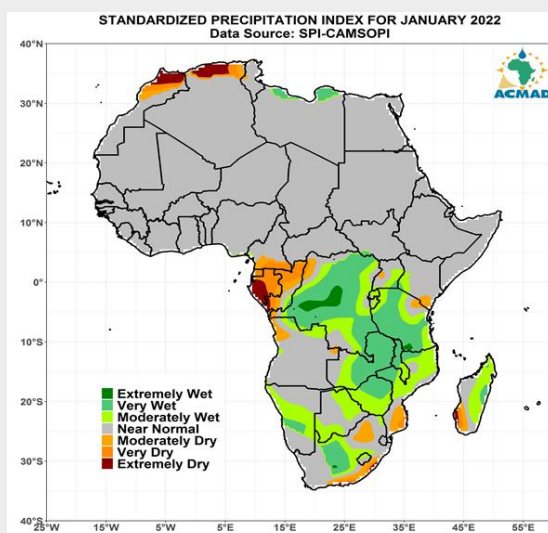
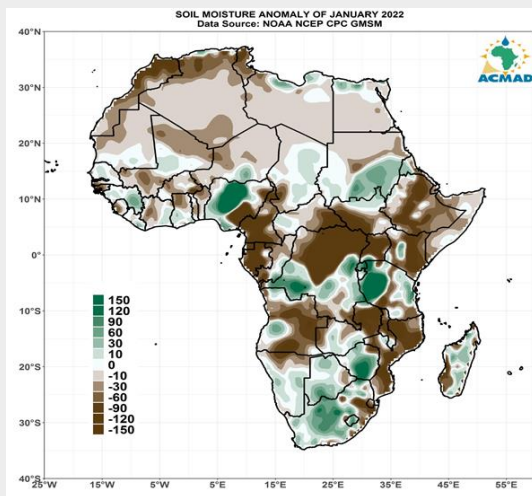


Figure 3: Standardized precipitation index for January 2021. Green correspond to wet, grey to near-normal SPI conditions, orange, brown and dark brown indicate very dry to extremely dry conditions. http://iridl.ldeo.columbia.edu/SOURCES/.NOAA/.NCEP/.CPC/.CAMS_OPI/.v0208/.mean/.prcp/

The SPI for January 2021 reveals that very dry to extremely dry conditions were observed over Gabon, much of Congo, Southern Cameroon, Parts of north and Southern South Africa, southern Mozambique, South-West Madagascar, North Morocco and North Algeria.

Very wet to extremely wet conditions were recorded over DRC, Rwanda, Burundi, Malawi much of Zambia, Zimbabwe, Mozambique, parts of Botswana, parts of Namibia, and Central parts of South Africa and Central-East Madagascar.

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, much of DRC, much of Angola, Zambia, Malawi, Mozambique, Uganda, much of Kenya, South Sudan and Ethiopia, Malawi, Mozambique.

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

Figure 4: Soil moisture anomaly for January 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>

1.5. WATER LEVEL

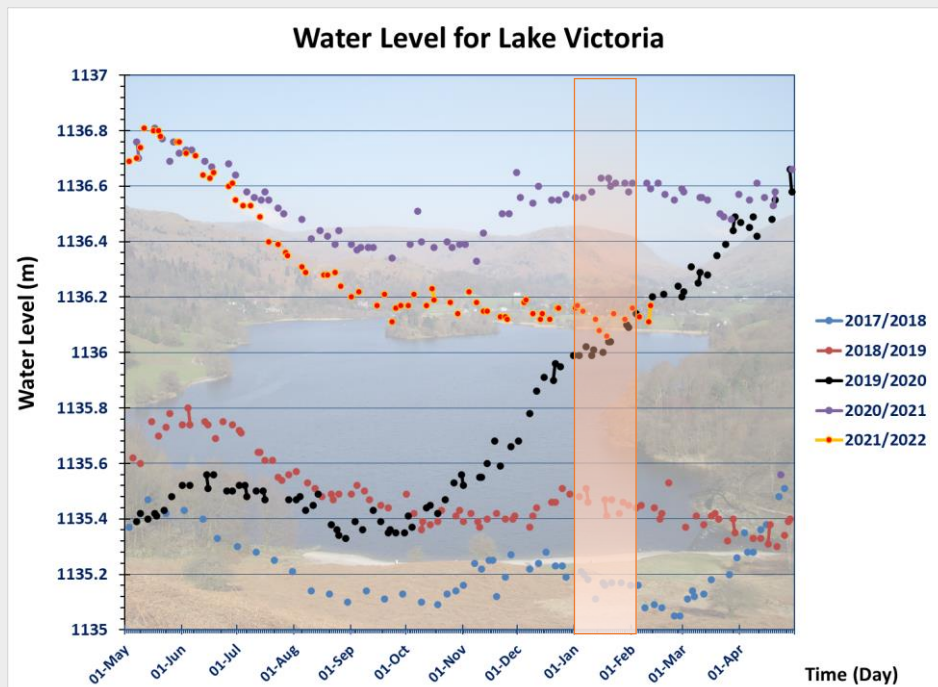
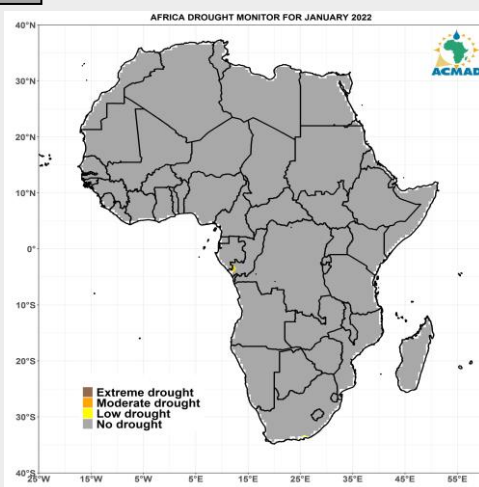


Figure 5: Daily water levels of Lake Victoria. Data Source: <http://hydroweb.theialand.fr/collections/hydroweb>. A cumulative precipitation deficit was recorded during the past months over Eastern Africa, leading to the observed decrease in water levels in Lake Victoria during January 2021.

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



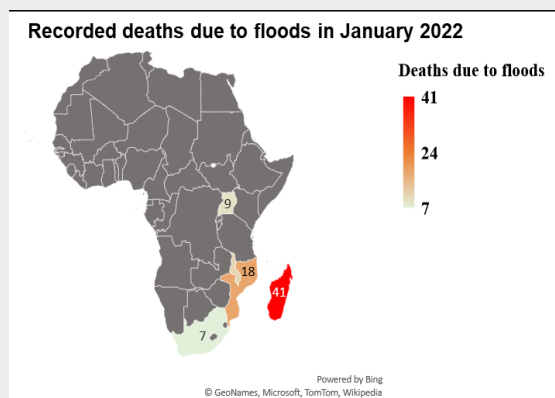
Given the cumulative precipitation deficits during the past and the month of January, SPI and soil moisture deficits, the adjacent map characterizes the drought situation in Africa during January 2021.

Moderate drought during January was observed over a small part of southwest Gabon. This is due to the poor rainfall 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 January 2021.

III. RECORDED IMPACTS

More than 380,000 people have been affected and at least 86 have died during January following heavy rainfall in Madagascar, Mozambique, Malawi, South Africa, Zimbabwe, Zambia, and Uganda (floodlist, January 2021).



A Total of 86 deaths due flooding have been recorded during January

At least 70 peoples have died in Southern Africa : Madagascar (41 deaths), Mozambique (18 deaths) and Malawi (11 deaths) ; At least 9 deaths have been recorded in Uganda and 7 people have died (floodlist, 9 January 2022).

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) 2022 seasons across Africa (see the figures: Fig7, Fig8, Fig9 and Fig10):

During the January to April 2022 period :

During January 2022 the western parts of Northern Africa, Gabon, northern parts of DRC, and southern Madagascar experienced below normal rainfall, the next three months below average are expected from February to May 2022 in western parts of Gabon and south-eastern CAR and central north parts of the DRC.

Normal to above-normal precipitation is most likely during February to May 2022 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 southeastern of SADC region and northern Madagascar. During January 2022 those regions have been characterized by normal to above and above average rainfall.

Near to above average temperature is very likely over Morocco, Algeria, Mauritania, Mali, south-eastern Angola, and south-western Zambia. Northern Botswana and Zimbabwe

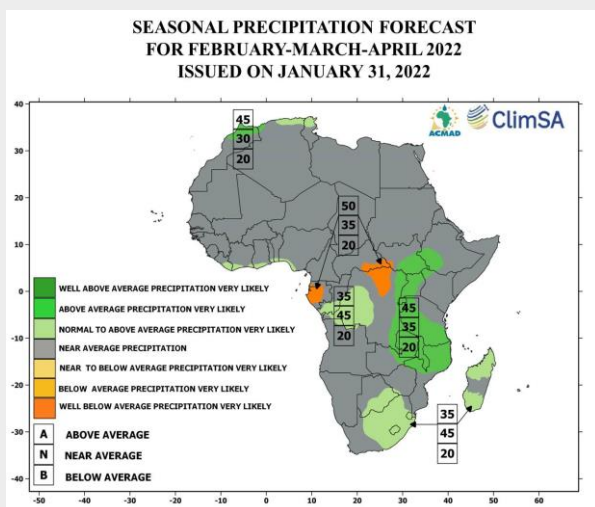


Figure 7: Seasonal precipitation forecast for February-March-April 2022

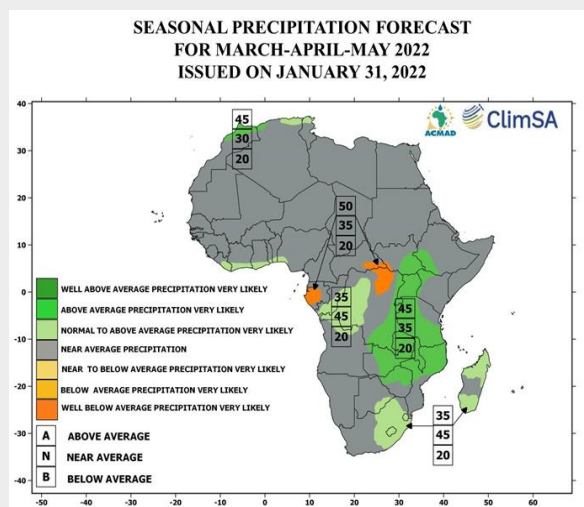


Figure 8: Seasonal precipitation forecast for March-April-May 2022

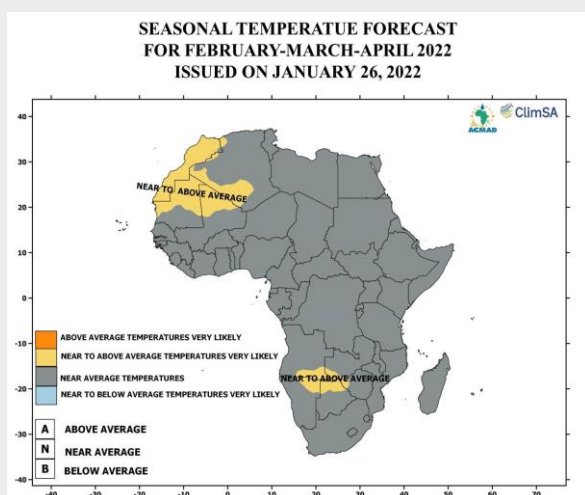


Figure 9: Seasonal Temperature forecast for February-March-April 2022

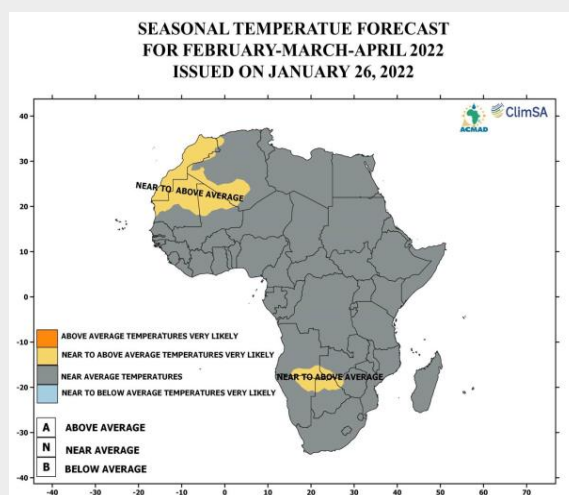


Figure 10: Seasonal Temperature forecast for March-April-May 2022

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

In the next following three months, below average are expected from February to May 2022 in western parts of Gabon and south-eastern CAR and central north parts of the DRC.

Normal to above-normal precipitation is most likely during February to May 2022 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 southeastern 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

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 February to May 2022, normal to above-normal precipitation is most likely during February to May 2022 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 southeastern 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 from February to May 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 massive displacement of people 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-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 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).