

Climate Services for Disaster Risks Reduction in Africa

DROUGHT SERVICE AND SEASONAL CLIMATE FORECAST

ISSUED: March 30, 2022

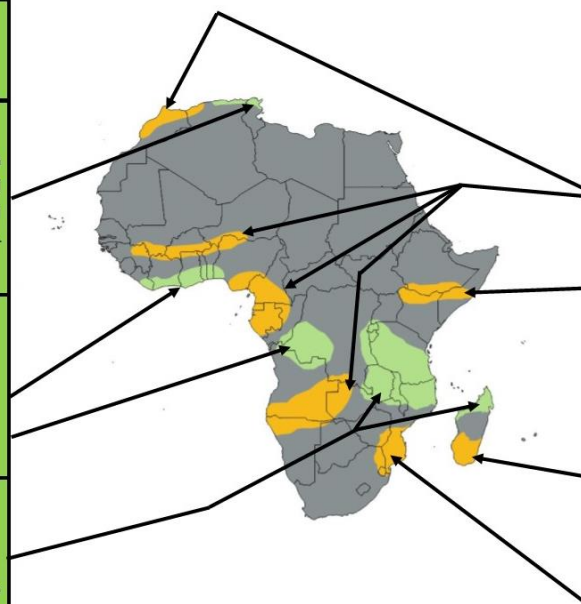
**Selected Significant Weather and Climate events'updates : Valid for
March to June 2022.**



CONTINENTAL
BRIEF FOR POLICY AND DECISION MAKERS BASED ON
SIGNIFICANT WEATHER AND CLIMATE EVENTS UPDATE.
VALID FOR: MARCH TO JUNE 2022



CLIMATE ANOMALIES
Wetter than average season very likely
HAZARDS
Heavy rainfall events may lead to flash flood, riverine flooding, landslides and soil erosion. High chance of lightning, hail formation and stormy weather are expected
POTENTIAL IMPACTS
Waterlogging, pest and diseases Infestation, Outbreak of water borne diseases damage to infrastructures(dams, reservoirs, bridges, roads...) Displacement of people due to floods.
MEASURES
Select excess moisture tolerant crops, wide tree planting campaigns Develop new and rehabilitatethe existing drainage structure, Update and implement flood contingency plans improve water management in reservoirs and dams



CLIMATE ANOMALIES
Drier than average season very likely
HAZARDS
Weak to Moderate drought, dry spells, near average to late onset very likely.
POTENTIAL IMPACTS
Moisture stress, decreased river discharge, reduced rain-fed crop yield prospect, degradation of pastures and high food prices.
MEASURES
Develop and implement policy to support drought tolerant and short cycle crops, soil and water conservation practice, maximize full irrigation farming. Use watershed based in-situ water harvesting structures Develop and Implement policy in support of weather based insurance and dam management

DROUGHT SERVICE AND SEASONAL CLIMATE FORECAST

BULLETIN No.3, 2022

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HIGHLIGHTS

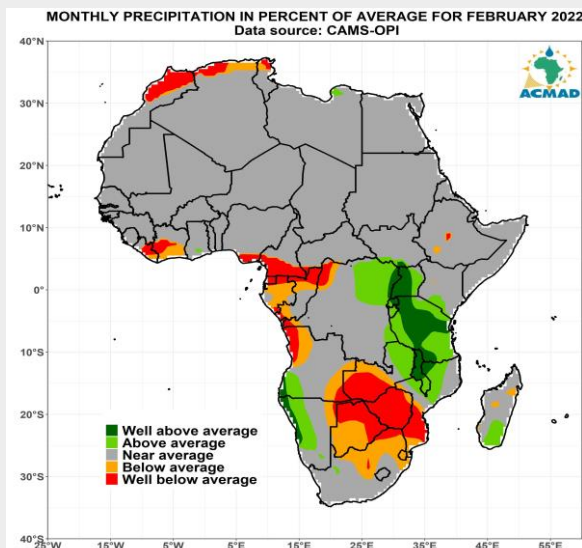
Performance of the past season and impacts

During February 2022, Floods and severe weather including tropical Cyclone Batsirai and Storm Dumako have affected countries such as Madagascar and South Africa as well as heavy rainfall in DRC triggering floods causing at least 128 deaths and more than 160000 people have been affected: with at least 148813 people in Madagascar, 325 people in South Africa and 13325 people affected in DRC (floodlist, February 2022).

- ✓ At least 127 people have died in Madagascar and 1 death in South Africa following severe weather mentioned above.

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

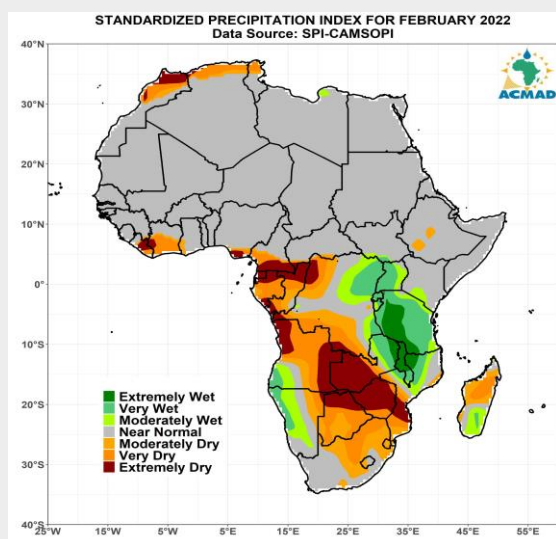
- ✚ Since October 2021 to February 2022, the Equatorial Sea surface temperatures (SSTs) have been below average conditions across most of the Pacific Ocean. During the March to June 2022 period, La Niña is favoured to decreasing phase.
- ✚ Near to above average SSTs were observed over the Tropical North Atlantic (TNA) during February 2022. Most model outputs and expert judgments favour persistence of these conditions during the evolution of the seasons (MAM and AMJ 2022).
- ✚ December 2021 to February 2022, near to average Sea Surface Temperatures characterized the North Atlantic Tropical (NAT) during. This pattern is expected to persist during the coming months.
- ✚ Near average to below average Sea Surface Temperatures characterized the South Atlantic Tropical (SAT) during the month of February 2022 and it is expected for below normal conditions during the coming months
- ✚ The SST over the Tropical South Atlantic (TSA) has been near to above average during February 2022. Model outputs and expert judgment favours a decrease in SSTs during the coming seasons (MAM and AMJ 2022).
- ✚ Sea Surface Temperatures in the Western Tropical Indian Ocean (WTIO) and South-Eastern Tropical Indian Ocean (SETIO) have been near average during February 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 in February 2022. Model outputs and experts' judgment predict persistence of these conditions during the next seasons (MAM to AMJ 2022).

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

During February 2022, above to well above average was observed over North East DRC, Uganda, Rwanda, Burundi, Tanzania, Northeast Zambia, Malawi, central Mozambique, South East Madagascar.

Below and well below average precipitation was observed over northern Morocco and Algeria, Gabon, South Cameroun, southern and northern Gabon, Southernmost, Nigeria, South Cote d'Ivoire, South East Liberia and most parts of Zambia, Zimbabwe, Botswana, and northern South Africa, and Eswatini.

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

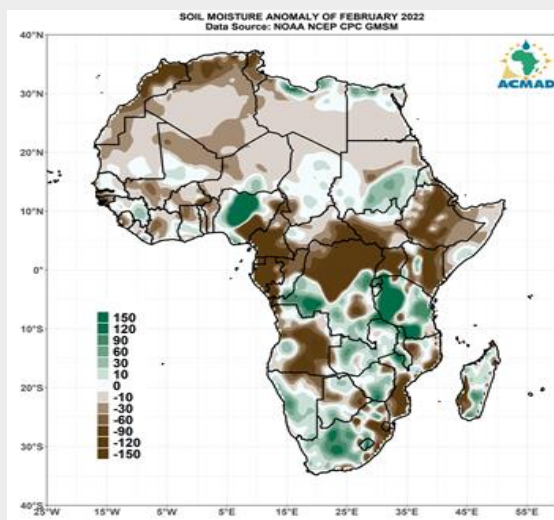
1.2. STANDARDIZED PRECIPITATION INDEX (SPI)

The SPI for February 2021 reveals that very dry to extremely dry conditions were observed over north Morocco, north Algeria, South Cote d'Ivoire, East Liberia, Southernmost Nigeria, southern Cameroon, Gabon, Congo, Northwest and Southwest DRC, much of Angola, much of Zambia, Zimbabwe, Botswana, most parts of South Africa, North Madagascar.

Very wet to extremely wet conditions were recorded over the northeast and Eastern DRC, Rwanda, Burundi, Uganda, Tanzania, Malawi Northeast Zambia.

Figure 3: Standardized precipitation index for February 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/

1.3. SOIL MOISTURE ANOMALY

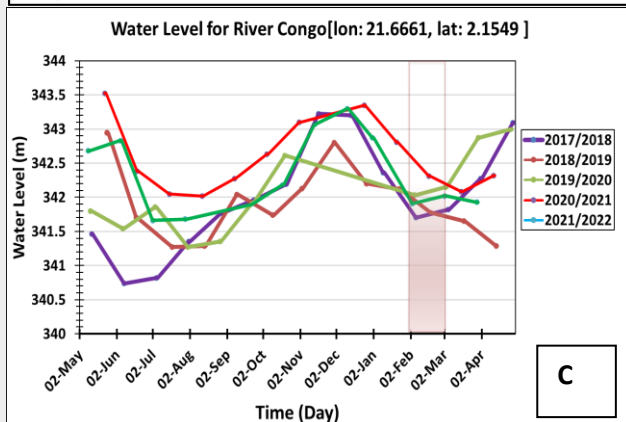
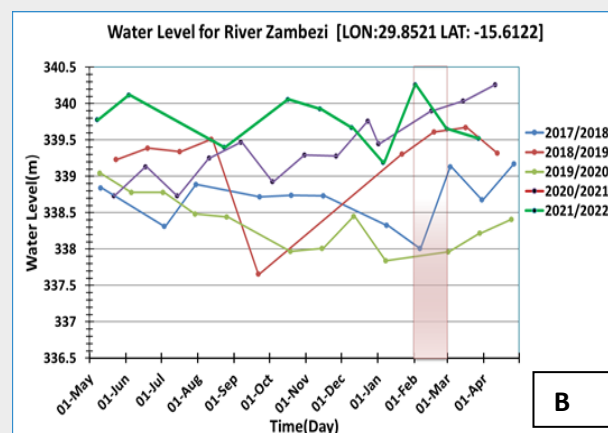
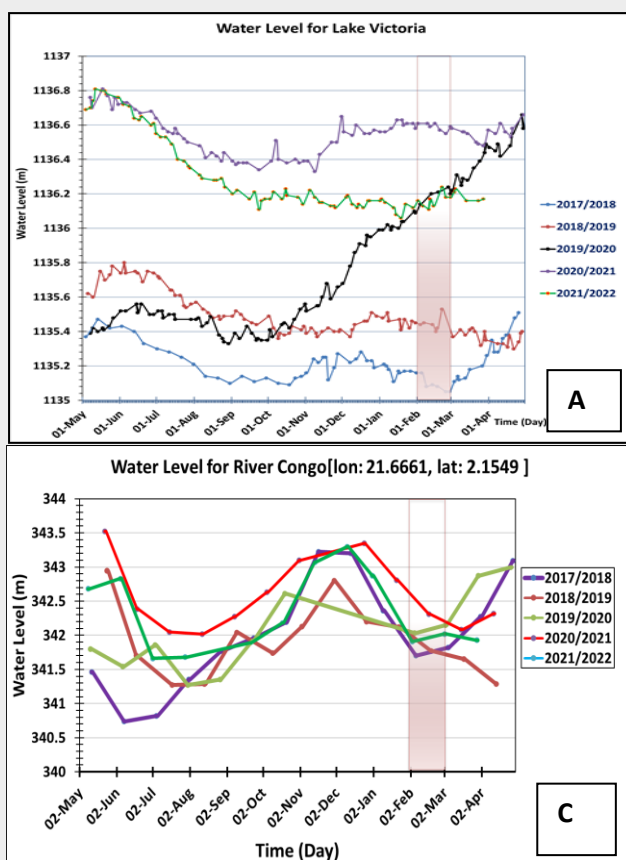


Strong to moderate moisture deficit was located over parts of North Africa, West Africa, Much of central Africa: Cameroon, Gabon, central Africa, South Sudan m Ethiopian, Uganda, Kenya, Somalia, North-central DRC, much of Angola, southern Mozambique and eastern Most south Africa, Southwestern Madagascar

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

Figure 4: Soil moisture anomaly for February 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



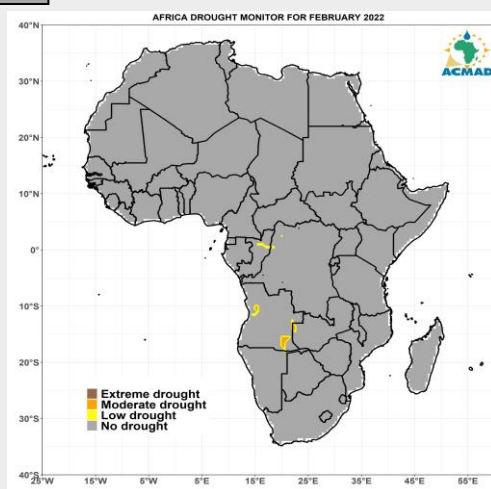
A cumulative precipitation excess was recorded during the past months over Eastern Africa, leading to the observed increase in water levels in Lake Victoria during February 2021 compared to the previous month. Poor rainfall observed in Congo and Zambezi basins contributed to a decrease in water levels at river Congo and Zambezi.

Figure 5: Daily water levels of Lake Victoria[A], River Zambezi[B] and Congo[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



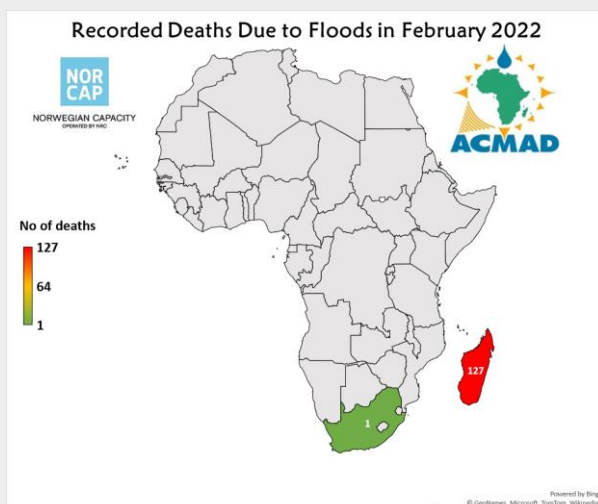
Given the cumulative precipitation deficits during the past and the month of February, SPI and soil moisture deficits, the adjacent map characterizes the drought situation in Africa during February 2021.

Moderate drought during February was observed over some parts of Angola. 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 February 2021.

III. RECORDED IMPACTS

At least 148813 people in Madagascar, 325 people in South Africa and 13325 people were affected in DRC (floodlist, February 2022).



A Total of 128 deaths due flooding have been recorded during February

At least 127 peoples have died in Madagascar and at least 1 person have died in South Africa (floodlist, February 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 March-April-May (MAM) and April-May-June (AMJ) 2022 seasons across Africa (see the figures: Fig7, Fig8, Fig9 and Fig10):

During the March to June 2022 period :

- ✚ From January to February 2022, below average was observed over northern Africa, southern Cameroon, Gabon, central DRC, southern Angola, Botswana, Zimbabwe, Mozambique, South Africa, and western Madagascar. Above average was observed over southern DRC, most of the central Eastern parts of the SADC region and much of Madagascar.
- ✚ The outlooks for the rainfall season during the March to June 2022 period are below average is expected over Morocco, southern Guinea Gulf, Cameroon, Mozambique and Madagascar, southernmost of Ethiopia, much of Guinea Equatorial and Gabon, northernmost of Kenya and the central part of Somalia
- ✚ Normal to above precipitation is very likely over Algeria, Tunisia, northern Guinea, western Burkina Faso, southern-western and easternmost of DRC, southern-west of Angola, much of Rwanda, Burundi, Tanzania, Malawi, northern Mozambique and Madagascar.
- ✚ Above average Temperature is very likely over northern Morocco and Algeria from March to June 2022
- ✚ Near to above average temperature is very likely over central and southern Morocco, much of Algeria, Libya, north and central Mauritania, northern Mali, south-eastern Angola, south-western Zambia. Most parts of Botswana and south-western Zimbabwe

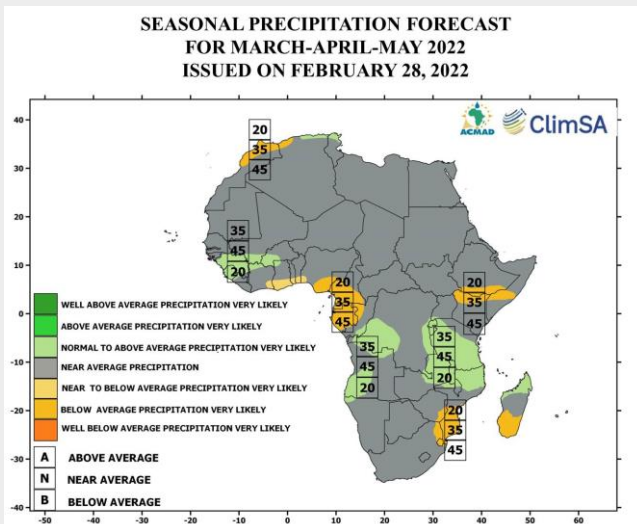


Figure 7: Seasonal precipitation forecast for March-April-May 2022

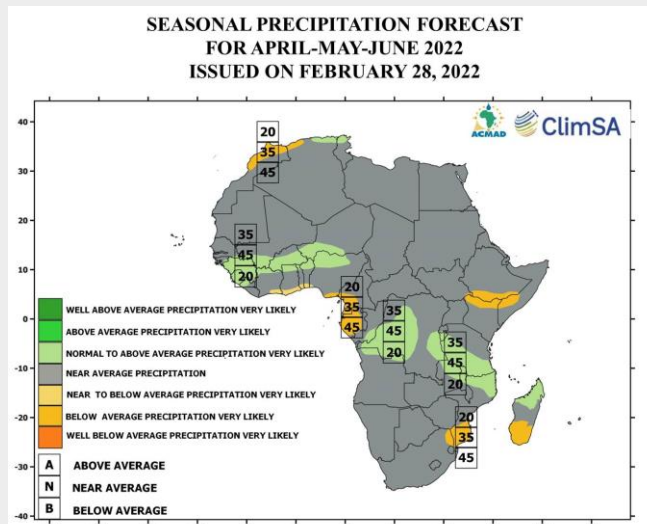


Figure 8: Seasonal precipitation forecast for April-May-June 2022

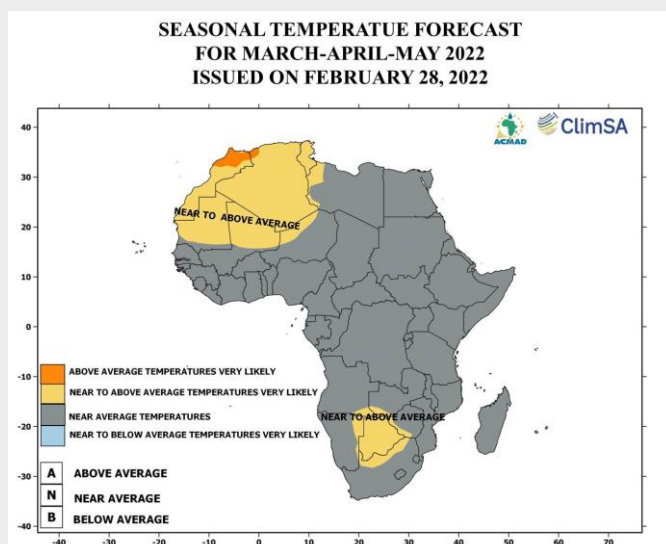


Figure 9: Seasonal Temperature forecast for March-April-May 2022

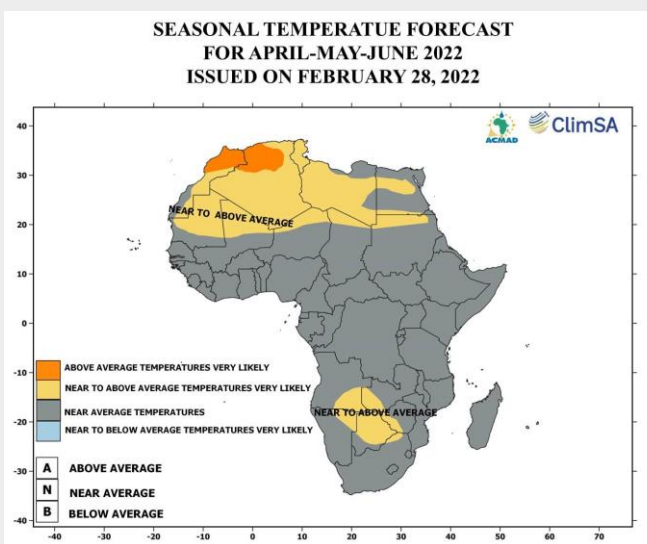


Figure 10: Seasonal Temperature forecast for April-May-June 2022

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 average is expected over Morocco, southern Guinea Gulf, Cameroon, Mozambique and Madagascar, southernmost of Ethiopia, much of Guinea Equatorial and Gabon, northernmost of Kenya and central part of Somalia.
- ✚ Normal to above precipitation is very likely over Algeria, Tunisia, northern Guinea, western Burkina Faso, southern-western and easternmost of DRC, southern-west of Angola, much of Rwanda, Burundi, Tanzania, Malawi, northern Mozambique and Madagascar.
- ✚ Above average Temperature is very likely over northern Morocco and Algeria from March to June 2022.
- ✚ Near to above average temperature is very likely over central and southern Morocco, much of Algeria, Libya, north and central Mauritania, northern Mali, south-eastern Angola, south-western Zambia. Most parts of Botswana and south-western 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

- ✓ Normal to above precipitation is very likely over Algeria, Tunisia, northern Guinea, western Burkina Faso, southern-western and easternmost of DRC, southern-west of

Angola, much of Rwanda, Burundi, Tanzania, Malawi, northern Mozambique and Madagascar

- ✓ Above average Temperature is very likely over northern Morocco and Algeria from March to June 2022 and near to above average temperature is very likely over central and southern Morocco, much of Algeria, Libya, north and central Mauritania, northern Mali, south-eastern Angola, south-western Zambia. Most parts of Botswana and south-western 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 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 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> 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).