



SADC

Climate Services Centre (CSC)

Early Warning Bulletin Update of the 2018/19 Southern Africa Regional Rainfall Season

December 2018



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1. Executive summary

The SARCOF-22 Review and Update held in Maun, Botswana from 13-14 December 2018 confirms that many SADC Member States have recorded normal to below-normal rainfall during October-November 2018, as predicted by the 22nd Southern African Regional Climate Outlook Forum (SARCOF-22) which took place in Lusaka, Zambia. Due to the dynamic nature of the climate system, SADC CSC convened the Midterm review and Update. The updated climate outlook depicted the persistence of normal to below-normal rainfall conditions during January to May 2019 in most parts of the region with the exception of the northern and south-western part of the region, which are expected to be normal to above normal.

During SARCOF-22 Update meeting, the community of climate information users discussed and updated the mitigation measures for the sectors of Agriculture and Food Security; Water and Energy; Livestock; Disaster Risk Management, Health; and Early Warning and Conflict.

The updated forecast confirms a concern for agriculture. All the measures and recommendations proposed during SARCOF-22 remain valid. Amongst them are:

- Diversification of crop production with drought- and disease-tolerant crops; early maturing crops; and high-yield varieties;
- Making available the agricultural inputs to farmers before the onset of the rains;
- Employing water conservation and harvesting techniques for improved accessibility and availability;
- Adopting staggered planting dates for crops; and increase investment in irrigation; and
- Employing post-harvest techniques to avoid losses.

The sector(s) of Water and Energy have recommended the following mitigation measures due to the normal to below-normal rainfall conditions outlook impact on river flow for the period January to March 2019:

- Prioritize the charging of depleted reservoirs;
- Undertake a simulation exercise to test water allocation guidelines;
- Develop water management scenarios; and
- Continue with importation of power and expedite the completion of internal power projects.

Regarding Disaster risk reduction (DRR), the updated climate outlook depicts the shifting from

- normal to below normal to normal to above-normal rainfall – over northern and southwest part of the region
- normal to above-normal to normal to below normal –over central belt of the region

In the worse-case scenario there will be uneven rainfall with sudden heavy rains that can lead to flash flooding, displacement, destruction of property and infrastructure, and loss of life. In such a situation, access to basic social services could be disrupted, including to schools, health facilities and markets. Affected areas may also face outbreaks of water- and vector-borne diseases.

The key recommendation is to devise measures to cope with normal to above-normal conditions, which cover most of the remaining period of the season.

2. Introduction

This report updates the guidance provided during the SARCOF-22 held in Lusaka, Zambia August 2018 on how the region can best employ the analysis of SARCOF-22 Review and Update, held in Maun, Botswana, from 12 - 14 December 2018. Most specifically, how to use the January - May 2019 regional seasonal climate outlook in decision-making process.

SARCOF-22 Review and Update Forum was convened by SADC Secretariat through SADC Climate Services Centre. The support was provided by the Government of the Republic of Botswana through its Meteorological Services Department (BDMS). The meeting was also sponsored by 11th European Development Fund (EDF) through the management of African Development Bank (AfDB) under the ClimDev Special Fund (CDSF).

Climate scientists considered the current coupled conditions of oceanic and atmospheric factors that influence the climate of the SADC region. The official forecast favors the formation of a weak El Niño, with the expectation that the atmospheric circulation will eventually couple to the anomalous equatorial Pacific warmth during the remaining rainfall season (January to May 2019).

The user community that participated in SARCOF-22 Update meeting discussed the potential implications of the consensus climate outlook update for Agriculture, Food Security and Livestock; Water and Energy; Health; Disaster Risk Management; and Early Warning and Conflict. Users also recommended sector-specific mitigation measures.

The midterm review outputs of the starting 2018/19 rainfall season have shown that many SADC Member States recorded normal to below-normal rainfall during October-November, as predicted by the SADC Climate Services Centre (CSC) in August 2018 at SARCOF-22.

The key recommendations are that all the measures proposed during SARCOF-22 remain valid. The midterm review of the current rainfall season gives confidence on the anticipated updated normal to below-normal rainfall. This and other threats must be mitigated to alleviate the suffering of affected populations.

3. Performance of the 2018 October - November rainfall season

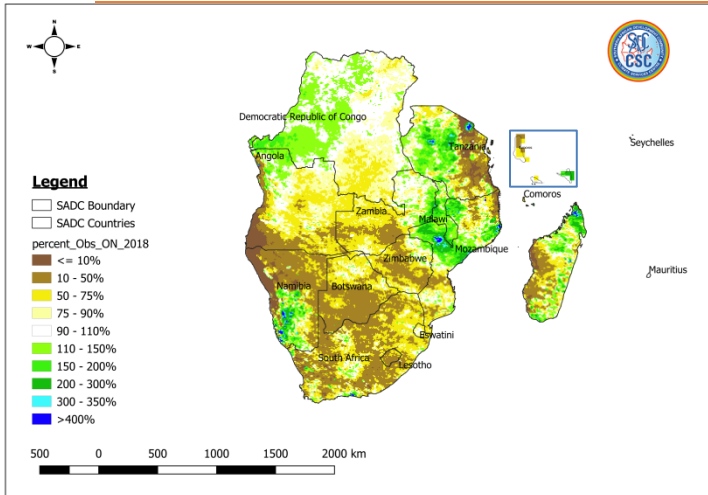


Figure 1: Percentage of average rainfall for the October - November 2018 period (Data source: ARC2 RFE)

During October and November 2018, the bulk of the central and south-eastern parts of the region had experienced normal to below normal rainfall condition. The northeast of Tanzania, northern part of Mozambique and the extreme west coastal area of Angola and Namibia experienced below normal conditions. Whereas some parts of the eastern, some south-western parts of the sub-region and eastern Madagascar and Comoros the rainfall received was normal to above normal in most areas of the north-western. Figure 1 depicts the spatial distribution of percentage of average rainfall during the first two months of the rainfall season.

This review of the first two months of the current 2018/19 rainfall season so far shows consistencies in various areas between the observed rainfall anomalies and the forecasted likelihood for OND 2018 rainfall outlook that was released at SARCOF-22 in August 2018.

The cyclone season over the South-West Indian Ocean started on time with two systems: Intense Tropical Cyclone ALCIDE and Severe Tropical Storm BOUCHRA. These tropical systems did not result in any fatalities or damage to property, as they dissipated without impacting on large land areas of the sub-region. Intense Tropical Cyclone ALCIDE only affected Agaléga islands of Mauritius and north-eastern tip of Madagascar, while Severe Tropical Storm BOUCHRA did not impact any land form within the region.

4. The 2019(JFM, FMA,MAM) regional seasonal climate forecast

JFM outlook update

The bulk of Southern African Development community (SADC) is likely to receive normal to below-normal rainfall for the period January to March (JFM) 2019, with the exception of central South Africa, south-western Botswana, south-eastern Namibia, northern Angola, Tanzania, Madagascar, a bulk of Democratic Republic of Congo (DRC), Mauritius, and Seychelles where normal to above-normal rainfall conditions are expected

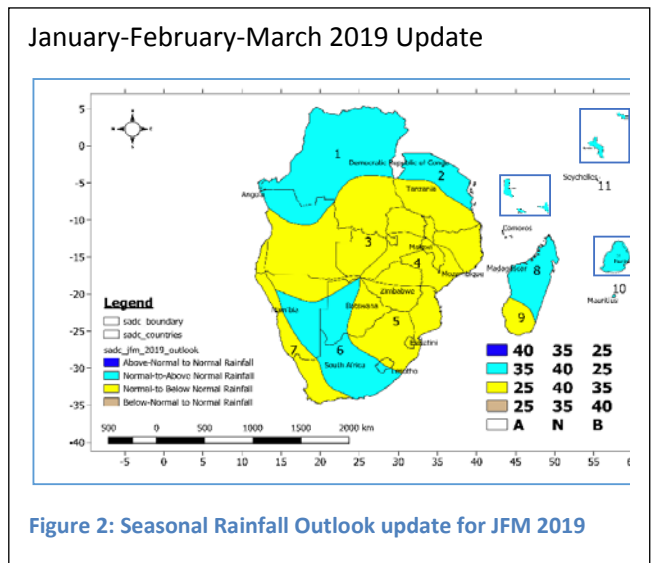
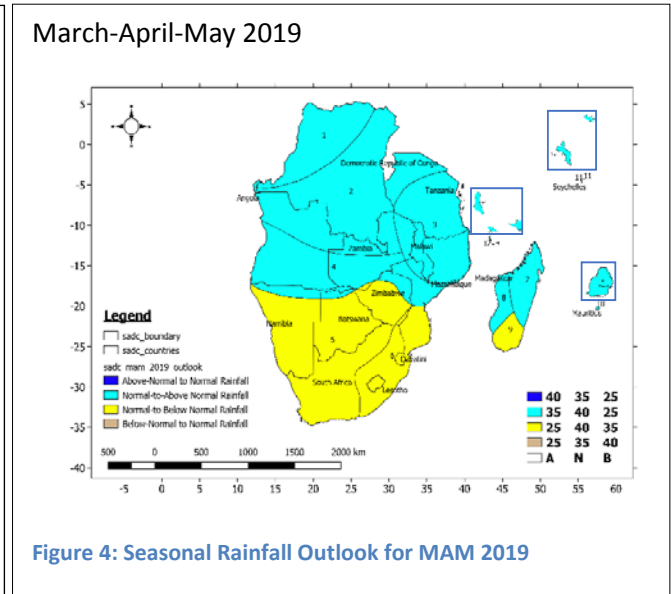
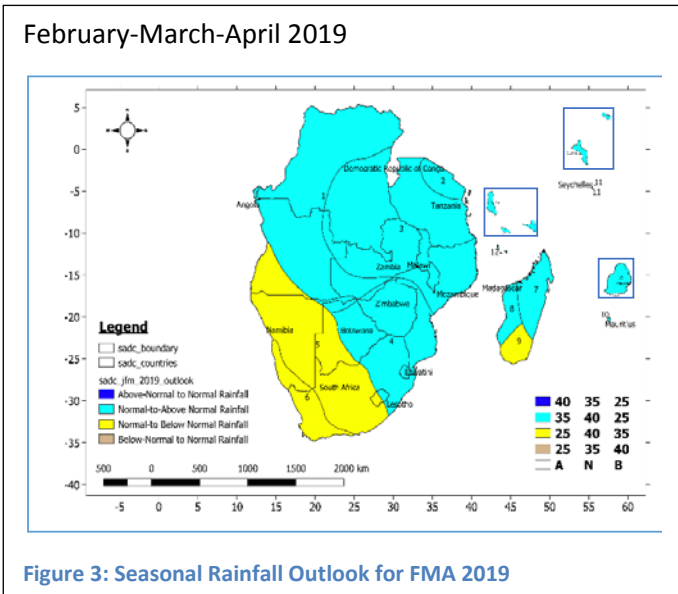


Figure 2: Seasonal Rainfall Outlook update for JFM 2019

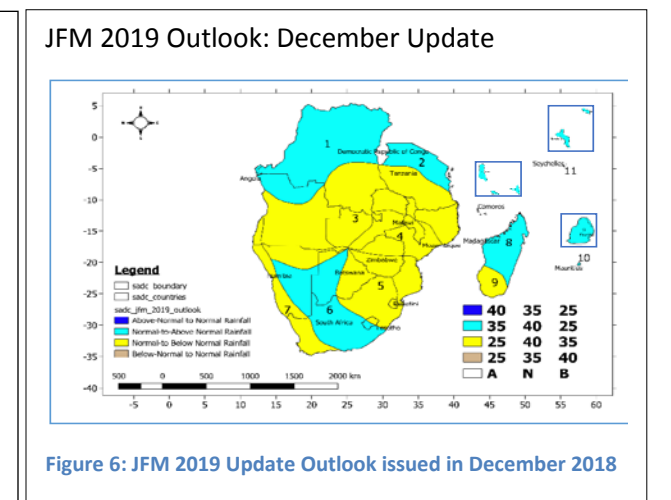
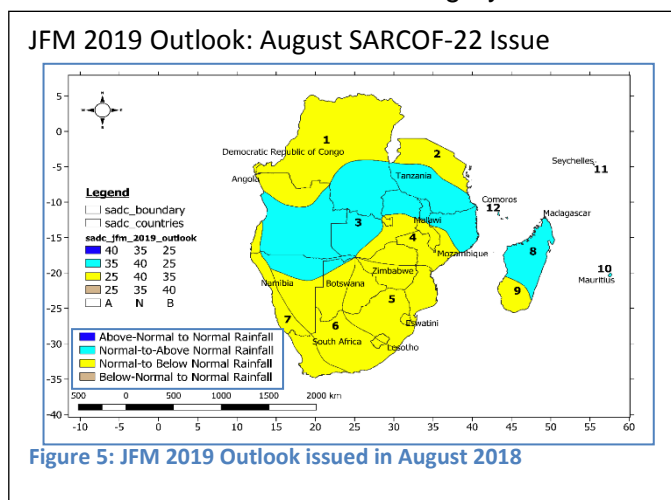
February to May 2019 outlook



For the period February to May 2019, the bulk of SADC is expected to receive normal to above-normal rainfall conditions with the exception of the south-western and most of the south part of the region where normal to below-normal rainfall conditions are expected.

5. Changes from the previous outlook

The updated JFM climate outlook depicts the shifting of normal to above-normal over region 3 to normal to below-normal rainfall, while region 6 is predicted to have a shift from normal to below-normal to a normal to above-normal category.



This therefore, means that the bulk of Angola, Zambia, south-eastern DRC, southern half of Tanzania, Malawi, Mozambique, Eastern Botswana, Northern South Africa, Zimbabwe, south Madagascar and western coastal areas of South Africa, Namibia and Angola will have a probability of normal to below-normal rainfall conditions.

Region 1, 2 and region 6 also indicate a shift in the outlook for JFM 2019, as it is now expected to be in the normal to above-normal category instead of the normal to below-normal probability.

6. Recommended planning and mitigation measures

Below some sectoral guidance to regional stakeholders on coping and mitigation strategies related to the updated forecast.

6.1 Agriculture, Food Security and Livestock

6.1.1 Review of October to December 2018 climate outlook

Total rainfall amount from October to early December 2018 was below average in most parts of the region. This below-normal average rainfall condition was accompanied with a delay in onset. Most parts of the region typically start planting in November, unfortunately most of the rains came from late November to early December 2018 over central and eastern parts of the region. A prolonged onset delay is expected for a number of areas in the south-western parts of the region. The ongoing delay of the crop planting dates is likely to ground reductions in end-of-season crop harvests if it continues much longer. The significant delays in planting increase risk of reduced yields, and appropriate measures should be taken where possible.

Poor grazing conditions were observed which implies a reduction of pasture for livestock. A November national report from South Africa also noted poor veld and livestock conditions in most provinces, including some reports of drought-related livestock deaths. Livestock in poor condition due to the dry conditions and low pasture availability were further recently noted in parts of Botswana and Namibia. A heat wave in mid-November had negatively affected agricultural production in some countries.

Given the prevailing status of rainfall received to date, appropriate preparedness and contingency measures are required.

6.1.2 Use of current (JFM, FMA and MAM 2019) outlook

The January to March 2019 rainfall forecast shows a normal to below normal outlook in most parts of the region. Since the season has started late the situation will adversely impact on regional household food security and necessitate coping strategies as stated in the first advisory note released in August 2018. Therefore, monitoring measures are required since there is a likelihood of increases in illegal, unregulated and unreported fishing, deforestation and poaching.

To counter these risks, the following mitigation measures which were proposed in August 2018 remain valid: Stakeholders need to encourage crop diversification; incorporating drought tolerant and disease resistant varieties; facilitate timely availability of agricultural inputs to farmers; and advocate for appropriate and climate-smart agricultural practices. There is a need to intensify crop and livestock trans-boundary pest and disease surveillance and monitoring, as well as implement control and management strategies. To ensure sustainable livestock production, stakeholders need to support and encourage drought-related de-stocking mechanisms coupled with follow-up restocking measures. Investment in crops that also benefit animals (e.g., cowpeas) is encouraged. Supplementary feeding, especially to cover the period where poor rainfall is foreseen. These processes need to be linked to market access.

The 2018/19 season also presents a good opportunity to maximize agricultural production, particularly in areas that normally receive good rainfall. As said in August 2018, from a crop production perspective, farmers can comprehensively utilize the forecast by committing a portion of their cropland to medium-to-late maturing and high-yield varieties. Farmers are encouraged to stagger their planting dates in consultation with extension and meteorological services. Farmers are also encouraged to be ready to go beyond Government's stipulated ploughing season. Government intervention is required to prevent wildlife from damaging crops. The forecast also presents an opportunity for the Agro-Forestry sector, as the normal rains expected allow for tree planting and reforestation in relevant areas.

Increased investment in irrigation is encouraged. Some water reservoirs and irrigation systems need to be rehabilitated to improve and maximize irrigation in farming activities. Likewise, the use of water harvesting technologies should be intensified to fully utilize rains and reduce the negative impacts of dry spells.

6.2 Water and Energy

6.2.1 Review of October to December 2018 climate forecast

The October to November 2018 recorded predominantly normal to below-normal rainfall conditions as predicted. Countries and their respective energy and river basin institutions responded to the forecasted situation according to anticipated impacts and conditions. In general, they planned for a difficult situation of below-normal rainfall conditions.

Contingency plans were developed by Member States, hydrological forecasts were carried out, and public awareness bulletins prepared and disseminated more frequently by some Member States, including Mozambique.

In the energy sector, decrease hydro-electricity generation is still expected. Energy utilities (such as ZESCO in Zambia) have above 50% water levels in their water reservoirs as a result of the January to March 2018 rainfall. Information was disseminated to all stakeholders about potential water scarcity downstream of the reservoirs. In the Zambezi River, for example, the Zambezi River Authority (ZRA) has not yet instituted water restrictions to system-dependent hydropower networks in 2018.

However, the ongoing dry spell experienced during October to November 2018 has a potential to trigger a panic in most regional water and energy institutions. Power utilities had to review downward-planned water releases from reservoirs.

6.2.2 Use of current (JFM, FMA and MAM 2019) outlook

The forecast warrants varying response measures. The outlook for FMA and MAM 2019 show that the river basin in the south and south-western part of the region will be overlapping with below-normal rainfall conditions during the remaining period. The implications and probable mitigation measures in the Water and Energy sector(s) for normal to below-normal rainfall include:

- Up-scaling the use of alternative sources of energy (e.g. coal, wind and solar) for the southern parts of the sub-region;
- Awareness and sensitization on efficient use of energy and water conservation measures;
- Provision of daily to weekly hydrological bulletins (flood alert);

SADC river basins



- Intensifying the frequency of water quality monitoring, as this is expected to deteriorate;
- Declaring water shortage areas with a view of reviewing water rights and consider ground water sources;
- Inter-basin water transfers; and
- Increasing the frequency of information exchange with upstream countries.

For the normal to above-normal rainfall scenario in the north-eastern part of the region, mitigation measures include:

- Improving control of settlements on or close to flood plains through either passing new laws or strengthening existing laws;
- Encouraging or enforcing improved standards of construction that are resilient in times of floods;
- Establishing social and financial safety nets as ‘insurance’ for flood events;
- Establishing effective contingency plans in case of floods, and carrying out simulation exercises;
- Establishing emergency national funds for preparing for, responding to and recovering from flood events;
- Planning for higher maintenance costs as change in known rainfall variability patterns may increase operation challenges such as siltation and maintenance cost of energy delivering systems.

Recommendations include:

- Diversify energy sources beyond hydro-power;
- Increase investments in hydro-meteorological monitoring and early warning systems;
- Increase investment in groundwater exploration and development;
- Increase inter-sectoral information sharing to address potential conflicts; and
- Promote rain water harvesting.

6.3 Health

6.3.1 Review of October to December 2018 climate forecast

Areas with above-normal rainfall experienced outbreaks of water- and vector-borne diseases. Diseases included cholera, plague, malaria, typhoid, Hepatitis E and other diarrheal illnesses like cryptosporidiosis, giardiasis and amoebiasis.

In areas with below-normal rainfall condition, cases of malnutrition and water-borne diseases were observed. Observations also indicate an increase of malnutrition, insect and reptile bites, asthmatic attack and heat strokes.

Governments provided alternative sources of clean water in affected areas, including through tankers, the distribution of chlorine, the removal of street vendors, and the provision of mosquito nets and indoor residual spray.

In addition, actions on ground included the following: enhanced public health inspection and community-based surveillance, training of health workers and communities on health, contingency plan updating and information sharing for awareness building.

6.3.2 Use of current (JFM, FMA and MAM 2019) outlook

Normal to below normal rainfalls conditions impacts will vary from one country to another. Interpreting the seasonal climate outlook and malaria trend suggests a prediction of low malaria transmission during the below normal and excessive rainfall conditions, yet warm temperature.

Recommendations

For the period January to April 2019, the meeting recommended to national programmes to continue with preparedness plans for as predictions point to an increase likelihood of normal to above normal which might imply in increased malaria cases around the time. The transmission patterns will be associated with the high risk of floods, especially for the countries that will remain under normal to above normal rainfall condition for the whole season such as Mozambique, Tanzania, DRC, Malawi, Zambia and eastern Madagascar which after subsiding, vector breeding and subsequent transmission is anticipated.

Depending on the current baseline, a particular country may turn to higher prevalence rate of epidemic outbreak. Border health posts will also have present a high positivity rate. Prepositioning of supplies such as the update of regional stock levels of malaria commodities by country; border district surveillance; training of health workforce; risk communication and hygiene promotion are advised to enhance preparedness of populations and health systems in the event of outbreaks. Planning for alternative sources of water provision to hospitals and schools should shortages occur to curb the spread of outbreaks. The sector recommends the following actions for following specific epidemia:

Malaria

- Distribute:
 - Mosquito nets (ITNs);
 - Malaria prevention medication;
 - Indoor Residue Spray (IRS);
- Risk communication & environmental management;
- Develop or update contingency plan for malaria,
- Education and awareness campaigns on precautions before the rain and dry season.

Cholera

- Water treatment & distribution;
- Risk communication;
- Community engagement & hygiene promotion;
- Stockpiling of medical supplies;
- Develop or update contingency plan for cholera;
- Public-private partnerships (PPP);
- Downscaling of reports to national level;
- Inter-sectorial collaboration;
- Conduct disease trend analysis for SADC;
- Develop disease database;
- Education and awareness campaigns on precautions.

The meeting further recommended to the awareness campaigns regarding prevention and prophylaxis, downscaling the report to national level, Inter-sectorial collaboration, developing disease trend analysis for SADC.

6.4 Disaster risk reduction and management

6.4.1 Review of October to December 2018 climate forecast

Based on the seasonal performance so far within the October to November period there are key observations, impacts, interventions and challenges related to disaster risk reduction. The situation reveals Member States are already experiencing negative impacts associated with the climate projection. These are summarised in the table below.

Table1: Impact and Intervention as of October - November 2018 rainfall review

| OBSERVATIONS | IMPACT | INTERVENTIONS | GAPS/CHALLENGES |
|--|---|---|--|
| Delayed onset of rains | Reduced Food Security | Safety net distribution | Food insecurity cumulative from past season |
| Water shortages | Water borne disease outbreaks | Emergency public health response and water distribution | Cost water distribution very high |
| | Increased livestock losses (reduced household income) | Sinking boreholes | Awareness of farmers related to stock management |
| High Temperatures | Increased diseases, heat stress, deaths | Media awareness | Social media creates confusion in terms of jurisdiction of forecast. |
| Hail storms, strong winds and Flash Floods | Property destruction | Support for affected households | Limited insurance coverage, poor drainage systems for cities, poor housing structures. |

6.4.2 Use of current (JFM, FMA and MAM 2019) outlook

For the period January to March 2019 the forecast suggests a likelihood of normal to below-normal rains, which has the potential to lead to incidences of drought and dry spells. In the worse-case scenario, drought/dry spells may lead to food insecurity and displacement of people and wildlife.

For the rest of the season, some areas are expected to experience normal to above normal rainfall. In some localities, destruction of properties and infrastructure, and interrupted access to basic social services such as schools, health facilities and markets, may occur as a result of extreme weather events (flooding, heatwaves, hailstorms and wildfire outbreaks). Affected areas may also face outbreaks of water- and vector-borne diseases.

After downscaling of the seasonal rainfall forecast, Member States will, as usual, use the forecast for the following risk mitigation activities:

- Identify possible hazards based on the seasonal rainfall forecast;
- Update contingency plans based on updated national forecasts specific to the hazards identified. The plans should entail activities that needed to be done before and after emergency phase, directing available resources;
- Determine areas likely to be affected and the sizes of populations likely to be affected;
- Resource mobilization for preparedness and response activities, for example disaster loss and needs assessments;

- Planning of appropriate simulation exercises;
- Determination of the appropriate relief stocks and their acquisition and prepositioning;
- Upgrade monitoring systems to provide updates on the forecast development daily, providing reliable warning service. Monitor during the onset of the disaster whether other phenomena may develop during the disaster; and
- Building of response capability of the communities.

Impact mitigation activities include:

- Verification and rapid assessment followed by a comprehensive assessment. Based on the assessment findings there may be a need to develop technical papers for policy makers to incline them to declare a state of emergency (in a worst-case scenario);
- Strengthened regional appeal mechanism based on the development of the situation across the region.
- Areas which will experience normal to above-normal rainfall, require adequate preparedness for Flood Risk Management (FRM) and some may need special assistance either for the institutional capacity building or humanitarian prepositioning support.

Recommendations include:

- Some Member States need support to operate their coordination/emergency operations centres.
- SADC and RIASCO should be on standby to support country emergency and humanitarian responses;
- Review and update MOU's between Member States;
- Implement the SADC disaster preparedness and response strategy, the SADC Disaster Preparedness and Response Fund, and positioning of SADC Standby Force;
- Increase the footprint of community-based DRR (capacity-building at local level)
- Technical and financial support for climate scientist and relevant stakeholders to undertake research
- Technical capacity building of DRR experts to utilize meteorological products and services;

6.5 Early warning and conflict

6.5.1 Review of October to December 2018 climate forecast

There were no experiences shared on the use of the August outlook for OND 2018 by the sector.

6.5.2 Use of current (JFM, FMA and MAM 2019) outlook

As suggested in August 2018, more effective early warning systems and community-based early action without any control measures may trigger higher levels of displacement as a necessary survival measure. However, it is important to discuss the implication of the SARCOF outputs on the risk of displacement and triggered conflicts related on the use of limited resources.

Normal to below-normal rainfall has the potential to cause the following conflicts and competitions:

- Competition for resources between pastoralists and farmers may increase the risk of conflict and violence and with it, displacement;
- Competition for water resources resulting in conflict between upstream and downstream farmers;
- Conflict between wildlife and people, where one may encroach into the area of the other;

- Conflict between authorities and people moving with their livestock into national parks in search of greener pastures;
- Conflict due to unfair pricing: low yields may result in inflation of prices of grains and cereals by some farmers, while on the other hand livestock farmers may reduce prices to destock;
- Conflicts and violence also increases the vulnerability of communities whose livelihood and survival depends on timely and adequate rainfall.

Where the forecast is normal to above-normal rainfall, there is a likelihood of flooding that may result in displacement of communities and wildlife, with a potential for abrupt evacuations. It is however important to note that evacuations, like all forms of displacement, carries risks associated with the mass movement of people under pressure over short periods of time and the potential of conflict.

The risk of conflict associated with above-normal forecast may be triggered by:

- increase of competition for land and resources;
- densely populated river basins prone to flooding;
- displacement and unauthorized re-settlement;
- extended and prolonged relocation time after a disaster occurrence;
- lack of reconstruction, rehabilitation and recovery contingency plan

To address the risk of conflict related to SARCOF outputs, the establishment of effective early warning systems that allow early actions is required. Given that flooding accounts for most of the displacement associated with natural disasters, the use of forecasts and other early warnings available are recommended to better preparedness.

The meeting recommended for more details study on social conflict and migration triggered by the natural disasters to be undertaken in SADC region.

7. Conclusions

This report provided guidance on the way forward, drawn from users' discussions during SARCOF-22 Review and Update held on 13-14 December 2018 in Maun, Botswana. A detailed plan of action for each Member State will be drawn up during national climate outlook forums. The anticipated rainfall presents opportunities to take mitigation measures to alleviate the sufferings of affected populations. It is crucial that early planning and mitigation programmes be put in place so that communities, businesses and countries likely can prepare as quickly as possible to face the potential threat of the extreme weather and climate events.

The SADC DRR Unit has hosted a seasonal contingency planning workshop, which aimed to develop a disaster preparedness and response strategy for the impacts of extreme climate-induced disasters. In order to effectively anticipate, respond to, and recover from the impacts of likely, imminent or current hazard events or conditions, resource allocations, replenishment and pre-positioning of stocks for emergency response are critical.

Sectoral monitoring for agricultural impact assessment and crop production will be provided by the Agromet Bulletin issued by SADC Secretariat (specifically the Food, Agriculture and Natural Resources (FANR) Directorate) in collaboration with FEWSNET.

The SADC CSC is expected to continue with the provision of regional updates on a regular basis, while the national meteorological and hydrological services (NMHSs) will provide detailed national and sub-national updates for action.

The key recommendation is that "prevention is better than cure". It also contributes to resilience-building. Planning for extreme events is an essential way forward for all SADC Member States to implement mitigation and adaptation measures.

END

