Disaster & Food Security Early Warning System

Agromet Update

2024/2025 Agricultural Season

Issue 02 Month: January Season:2024-2025 15 January 2025

Highlights

- Cumulative rainfall from October to early January has varied, with large rainfall deficits in Madagascar, southern and northern Mozambique, Malawi, western South Africa, southern Tanzania, and parts of Zambia. Eastern Madagascar experienced its driest October-to-December on record, while areas like Botswana, northern Namibia, and southern Zimbabwe received above-average rainfall.
- Onset of rainfall in several areas, including eastern Madagascar, southern Mozambique, and southern Zambia, was delayed by at least 30 days. Dry spells and high temperatures in December stressed crops, with some regions, like Malawi, reporting crop wilting and replanting efforts.
- December saw above-average temperatures across much of the region, with heatwave alerts issued in Botswana, South Africa, Zambia, and Zimbabwe. High temperatures exacerbated soil moisture loss and crop stress, particularly in areas with low rainfall.
- Vegetation recovery remains slow in some areas affected by previous droughts, with poor grazing conditions persisting in Namibia, Botswana, and parts of South Africa. Livestock health is under strain, but recovery is possible with forecasted rainfall through March.
- Madagascar faces a high risk of locust infestations, threatening agriculture, while Fall Armyworm outbreaks in southern Malawi highlight the need for enhanced pest monitoring and management.
- Four named tropical storms/cyclones have been recorded so far this season, two of which caused significant damage in the region. Currently active Tropical Cyclone Dikeledi has impacted Madagascar and Mozambique, and damage assessments are still ongoing. Intense Tropical Cyclone Chido caused severe impacts in Mozambique, Malawi and Comoros, with over 130 reported fatalities and over 500,000 people affected in the three Member States.
- Normal to above-normal rainfall is forecast for the southern half of the region from January to March, providing opportunities for recovery in some areas. However, outcomes remain uncertain in regions with persistent rainfall deficits, where crop production and grazing conditions are at risk. The seasonal rainfall forecast will be updated at SARCOF, being held 28-30 January in Madagascar.
- Critically low water levels at Kariba Dam (3% capacity) and Cahora Bassa Dam (20% capacity) are severely impacting energy supply in the region. Zambia and Zimbabwe are already experiencing widespread load-shedding, disrupting agriculture, industry, and livelihoods. Cahora Bassa is a major contributor to the Southern African Power Pool, and the low dam levels pose a significant energy security risk to several SADC countries that import power from Mozambique.
- Climate-sensitive diseases remain a significant concern in the SADC region. Eight Member States experienced outbreaks of cholera between 2022 and 2024. Angola has reported new suspected cases in January 2025. The risk for cholera, malaria, diarrheal diseases, and heat-related illnesses, all of which are exacerbated by climatic conditions, emphasize the need for proactive health interventions.

Rainfall and Temperature Conditions to Date

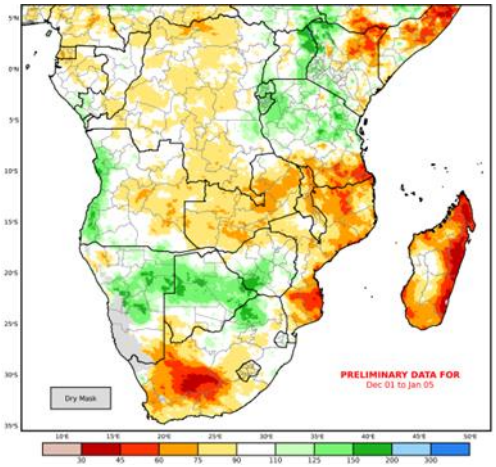

Figure 1. Rainfall for 1 October 2024 to 5 January 2025, expressed as a percent of average. The Rainfall estimates are based on CHIRPS/Prelim datasets Source: UCSB CHC/FEWS NET

Cumulative rainfall from October to early January has been varied across the region, based on CHIRPS/Prelim satellite estimates (Figure 1a). Over this period, seasonal total rainfall to date has been well below average in most of Madagascar, southern and northern Mozambique, much of Malawi, southern Tanzania, and parts of Zambia. Deficits were particularly severe in eastern Madagascar, where this has been the driest October-to-December on record, since at least 1981. Several other areas also received slightly below average cumulative rainfall, including eastern and central Angola, much of DRC, Lesotho, central South Africa, much of Zambia, and northern Zimbabwe. In contrast, a number of areas had above average season-to-date rainfall totals, including western Angola, much of Botswana, northern Namibia, northern South Africa, and northern Tanzania, and southern Zimbabwe.

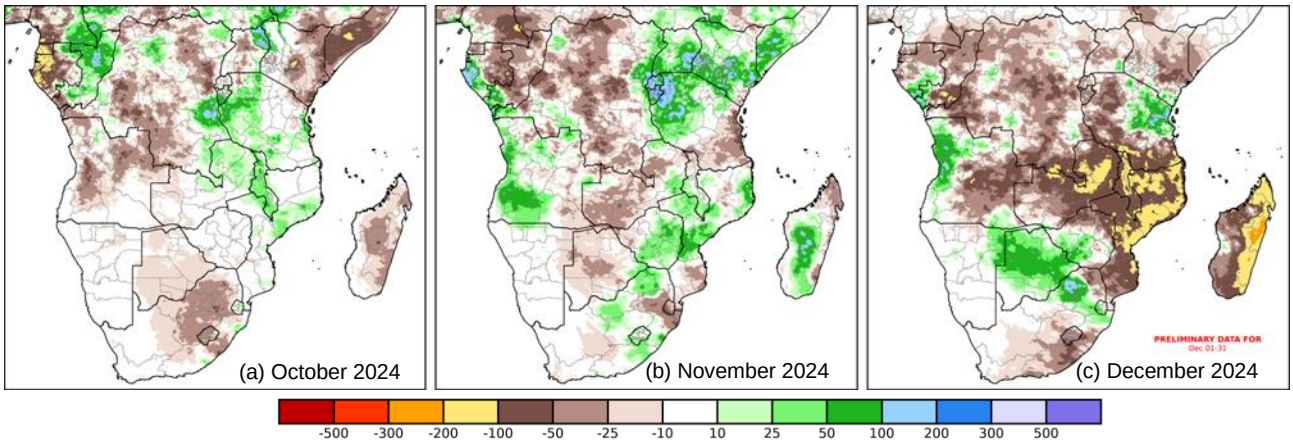

Figure 2. Rainfall for (a) October 2024, (b) November 2024, and (c) December 2024, expressed as a difference from average. The Rainfall estimate is based on CHIRPS/Prelim datasets Source: UCSB CHC/FEWS NET

A number of areas received significant rainfall in October and/or November, followed by very dry conditions (Figure 2). These areas include Malawi, northern/central Mozambique, eastern Zambia and northern Zimbabwe. The entire northern, central and eastern part of the region had very low rainfall in December (Figure 2c), including all of Madagascar and Mozambique, as well as Malawi, Zambia, eastern Angola, southern Tanzania, and DRC. This was mainly due to a slow southward migration of the Intertropical Convergence Zone (ITCZ). ITCZ is one of the main systems that brings rainfall to southern Africa. Botswana had significant rainfall in December after a relatively dry October and November, while western Angola, northern South Africa and southern Zimbabwe experienced a relatively wet November and December.

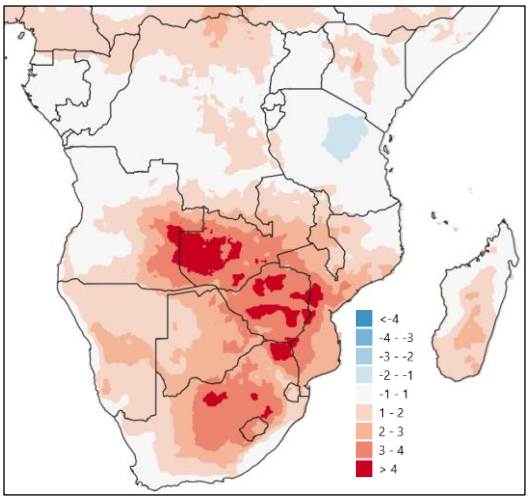

Figure 3. Temperature Estimate for 1-25 December as a difference from average. Temperature estimates are based on the CHIRTS-ERA5 Tmax dataset Source: UCSB CHC

Temperature was well above average during December in the southern half of the region (Figure 3), according to the *CHIRTS-ERA5 Tmax* daily maximum temperature estimates. During this time, several National Meteorological and Hydrological Services (NMHS) issued heatwave and extreme temperature alerts, including Botswana, Zambia, and Zimbabwe. The high temperatures were most pronounced during the first 20 days of December, while 21-31 December saw lower temperatures in the south-western half of the region, including Botswana, northern South Africa, Eswatini, parts of Namibia, Angola, and southern Zimbabwe. However, in northern and central parts of the region, higher temperatures were most pronounced in the second half of December. The high temperatures were associated with the low rainfall that was received, particularly in the central and north-eastern parts of the region. October and November temperatures were much closer to average, although November temperatures were slightly higher than average in some areas in the southern half of the region, particularly Madagascar, and parts of South Africa, Botswana, Namibia and Zimbabwe.

Start of Season and Early Dry Spells

Most areas had experienced an onset of rains by end of December 2024. While the onset was generally on time in most parts of the region, some areas received their first effective rains at least 30 days late. These include eastern Madagascar, southern and central Mozambique, southern Angola, northern Namibia, southern Zambia, and western Zimbabwe (Figure 4a). Although rains were on time in many areas, the early part of the season was also marred by a dry spell and high temperatures that in some cases came soon after the planting rains, leading to heightened soil moisture loss. In Malawi, excessive heat stress and wilting of crops were reported in parts of southern and central regions where hot dry conditions persisted in mid-December. Some farmers have managed to replant following improved rainfall from late December into early January. Preliminary

data suggests little improvements in rainfall for southern Zambia, central and southern Mozambique and Madagascar from late December through January. Anecdotal reports indicate that some farmers in parts of Zimbabwe experienced low germination rates as a result of the early dry conditions, and needed to replant. Madagascar was also likely impacted by the record dry conditions, with likely reduced planting and crop moisture stress. The impacts of the early dryness is seen in the soil water index (Figure 4b) which shows moisture stress conditions in many parts of the region by the end of December, at which time many crops should be in an emergence and establishment phase.

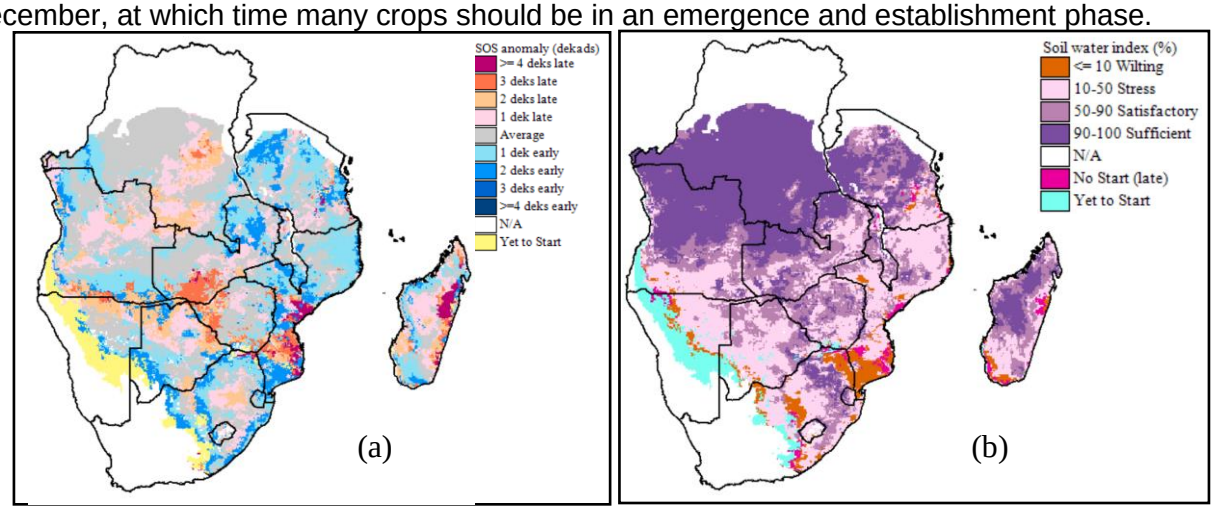

Figure 4. (a) Onset of rainfall anomaly as of 30 December 2024, and (b) Soil water index as of 31 December. Source: FEWS NET

Vegetation, Grazing & Livestock

As of late December 2024, vegetation conditions across Southern Africa remain varied, reflecting both ongoing recovery and persistent challenges from the 2023/2024 drought season. The latest satellite-derived Normalized Difference Vegetation Index (NDVI) data show that while some areas, particularly the northern half of the region, are experiencing near-average to above-average vegetation conditions due to improved rainfall, many areas in the west and south-central regions still show significantly below-average vegetation (Figure 5).

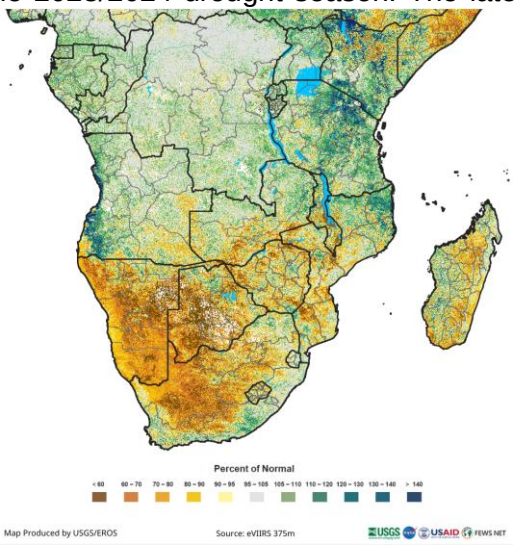

Figure 5. Vegetation Index (NDVI) expressed as percent of average for 21-31 December 2024. Source: USGS/FEWSNET

Since early November 2024, vegetation has shown gradual improvement in regions that received rainfall, particularly in Angola, northern Namibia, Zambia, and western Madagascar. However, in many other areas, including parts of southern Mozambique, central and western South Africa, and much of Namibia and Botswana, recovery has been slow. These regions continue to show well below average NDVI, with grazing conditions in these areas likely limited for livestock. Some areas are showing a highly variable NDVI, with spots of near average and below average values. These include much of Malawi, Mozambique, Zambia, and Zimbabwe. Poor grazing and water shortages in areas that were affected by drought during the 2023/24 season, and continue to experience poor rainfall this season, are expected to significantly affect livestock health. This has critical implications for smallholder farmers who rely on livestock for draught power, potentially delaying land preparation and planting activities. With the recent improvement in rainfall since late December, widespread improvements in vegetation conditions are expected over the next few weeks.

Crop Pest and Diseases

The SADC region faces multiple pest and disease threats, exacerbated by climate variability and environmental conditions. Notably, Madagascar faces a high risk of locust infestations during the November-to-April rainy season, with forecast normal to above-normal rainfall. These outbreaks

threaten agriculture and livelihoods, with locust migrations projected to impact food availability. By August 2024, over 667,000 acres of farmland were infested, and populations are estimated to have increased by 30% compared to 2023. FAO and Madagascar's Ministry of Agriculture and Livestock are responding through aerial interventions, agricultural assistance, and ongoing monitoring to mitigate the threat.

In southern Malawi, Fall Armyworm (FAW) has been reported, highlighting the importance of pest monitoring across the region. Low rainfall and high temperatures provide favorable conditions for FAW and other pests, increasing the risk to crops and food security.

Drought Impacts on Energy Sector

The 2023/24 El Niño-induced drought, coupled with consecutive low rainfall seasons in the Zambezi River Basin, has led to critically low water levels at Kariba Dam—the primary hydroelectric power source for Zambia and Zimbabwe. Monitoring bulletins from the Zambezi River Authority indicate that the reservoir level remains slightly above its minimum operating threshold, at 3% of its full supply capacity. This situation has resulted in widespread load-shedding in both countries, severely disrupting irrigation and other agricultural operations reliant on electricity. Industrial activities are also negatively impacted, amplifying economic challenges and reducing productivity across key sectors, and impacting households dependent on industrial labour for their livelihoods. Zambia's installed electricity generation capacity is 83% dependent on hydropower, while Zimbabwe, as of 10 January 2025, was obtaining about 20% of its currently available electricity supply from Kariba dam.

The Cahora Bassa Dam in Mozambique has also been adversely affected by the 2023/24 El Niño-induced drought. The National Directorate of Water Resources Management noted that dam levels dropped to approximately 20% of full capacity as of early January 2025, marking the lowest levels in at least thirty years. As the primary source of Mozambique's electricity generation, and a critical contributor to the Southern African Power Pool (SAPP), Cahora Bassa supports electricity exports to seven SADC Member States, namely Botswana, Eswatini, Lesotho, Malawi, South Africa, Zambia and Zimbabwe. These historically low water levels present a significant risk to regional energy security, with cascading impacts on agricultural activities, industrial productivity, and household livelihoods. The January-to-April 2025 rainfall, forecasted as normal to above normal, may partially improve reservoir levels. However, low confidence in global forecasts adds uncertainty regarding the extent of recharge. Historically, severely depleted dam levels have required at least two seasons to recover significantly.

Climate Impacts on Health Sector

The SADC region remains highly vulnerable to climate-related health risks, with cholera continuing to pose a significant public health challenge. Outbreaks were reported in at least eight Member States between 2022 and 2024, prompting the convening of an Extraordinary Summit on Cholera in February 2024. While progress has been made, including the declaration of the end of outbreaks in some countries, Angola has recently reported suspected cases as of early January 2025. Cholera's strong link to climatic conditions is well-documented, with heavy rainfall and flooding compromising sanitation systems, contaminating water supplies, and facilitating the spread of Vibrio cholerae. Conversely, prolonged droughts exacerbate the risk by reducing access to safe water sources. The forecast of normal to above-normal rainfall for much of the region during the January to March period highlights the potential for continued outbreaks.

Other climate-sensitive diseases, including malaria, schistosomiasis, diarrheal diseases, and heat-related illnesses, also remain of concern. Malaria prevalence increases with seasonal rains that promote mosquito breeding, while schistosomiasis thrives in stagnant waters. Diarrheal diseases often follow flooding or drought due to contaminated or insufficient water supplies, and heat-related illnesses are becoming more frequent with rising temperatures.

Short Term and Seasonal Forecasts

Short-term forecasts suggest that southern Africa may continue to experience the effects of the ITCZ, with above average rainfall forecasted in central parts of the region through late January, according to the ECMWF. The same forecast indicates that many other parts of the region are forecast to

receive below average rainfall in the week of 13-20 January. Temperatures are forecast to be above average in most areas during the same period, heightening concern of the impact of dry and hot spells on crop development in the coming weeks. It is recommended to stay updated with local forecasts from NMHSs, which are regularly updated based on the most recent weather systems.

The Southern African Regional Climate Outlook Forum (SARCOF) will be held in Madagascar from 28-30 January 2025, during which time an updated regional rainfall forecast will be issued. The earlier SARCOF forecast issued in August 2024 forecasted normal to above normal rainfall over the southern half of the region for the January-to-March 2025 period. The forecast will be updated providing guidance on expectations for the February-to-April 2025 period.

Tropical Cyclone Forecasts, Impacts & Flooding

The region to date has experienced four named storms with the 4th, Tropical Cyclone Dikeledi still active as of 15 January. While the first two Tropical Storms, Ancha and Bheki, had little to no impact on land, Intense Tropical Cyclone Chido, which occurred from 5-16 December 2024, had major impacts on land, causing significant flooding and damage to roads, houses, schools and health centres. Estimates indicate that over 500,000 people were affected in Mozambique, Malawi and Comoros, and additional impacts were also reported in Madagascar and Mauritius. In northern Mozambique, 120 fatalities were reported, with the province of Nampula most affected. In Malawi 13 fatalities were reported.

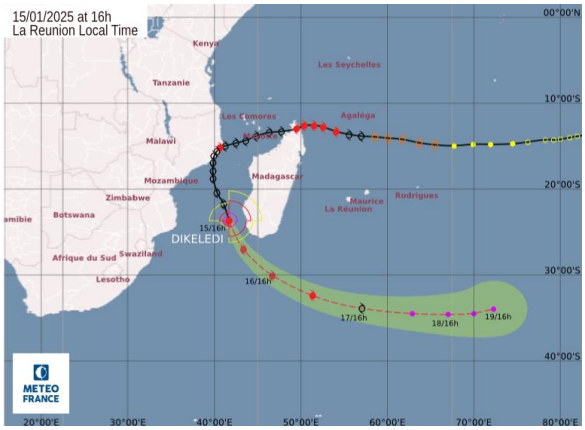

Figure 6. Tropical Cyclone Dikeledi Observed and Forecast Track, as of 15 January 2025. Source: Meteo-France La Reunion

Following the landfall of Tropical Cyclone Dikeledi over in northern Madagascar on 11 January, 3 fatalities were reported, with over 5,000 people affected. TC Dikeledi continued eastward and made landfall in Nampula Province, northern Mozambique on 13 January, where it brought heavy rainfall and strong winds, before curving southwards and re-entering the Mozambique Channel. Damage assessments in Mozambique are ongoing. As of 15 January 14:00 UTC, Tropical Cyclone Dikeledi was located east of southern Madagascar (Figure 6), and was expected to bring heavy rainfall and strong winds to parts of southern Madagascar. The Mozambique National Institute of Meteorology (INAM) issued warnings for Nampula and Zambezia provinces. The SADC Climate Services Centre and the SADC Humanitarian and Emergency Operations Centre (SHOC) have been closely monitoring the development of TC Dikeledi, issuing advisories, and encouraging users to consult the National Meteorological and Hydrological Services (NMHSs) in Member States for local warnings and alerts.

Localized to significant flooding was also reported following heavy rains in various parts of the region including in parts of eastern Botswana, southern Mozambique, Seychelles, central and eastern South Africa, and northern and central Zimbabwe.

Agrometeorological Outlook: Seasonal Prospects

The 2024/25 agricultural season presents a mixed outlook for production across the SADC region. Areas with early-season rainfall deficits, such as eastern Madagascar, southern Mozambique, southern Zambia, and parts of Zimbabwe have already been impacted by delayed planting, poor germination, and reduced soil moisture. Seasonal outcomes in these areas will be significantly affected by whether farmers were not discouraged from planting by the late onsets, whether those who experienced early crop failure managed to replant, and by whether the season will extend for long enough for crops to reach maturity. Conversely, regions with above-average rainfall to date are better positioned for favorable production outcomes, especially for rain-fed crops, provided the rainfall remains consistent.

Livestock-dependent regions, particularly in Namibia, Botswana, and western South Africa, face challenges due to poor grazing and water shortages, leading to declining livestock productivity and

health. This impacts meat and milk production, with potential food security implications. However, recovery is possible with the forecasted normal to above-normal rainfall through March. Regions like southern Zimbabwe and northern Namibia, which recently received better rains, are more likely to see improvements, while areas with severe early deficits may recover more slowly. Sustained and well-distributed rainfall will be crucial, alongside timely support for livestock farmers.

The forecast for normal to above-normal rainfall in the southern half of the region for January-March provides some optimism for improved outcomes in parts of the region. However, uncertainties remain for areas with persistent rainfall deficits, where recovery is contingent on the timing and distribution of future rains. Regional production outcomes will likely be uneven, with better production in higher rainfall zones and continued challenges in areas facing cumulative deficits.

Recommendations

Given the ongoing variability in rainfall and temperature conditions and the challenges experienced so far in the 2024/25 agricultural season, regular updates to seasonal and sub-seasonal forecasts, including impact-based forecasts, remain critical. These updates should be widely disseminated to farmers and stakeholders to support planning and decision-making. Leveraging localized and downscaled national forecasts is essential to ensure that farmers receive timely and actionable information. Early warnings on potential dry spells, intense rainfall, heatwaves, and tropical cyclone activity should be emphasized to help communities adapt and prepare.

Water harvesting and improved irrigation infrastructure will play a vital role in areas where rainfall remains below average or erratic. Climate-smart agricultural practices such as use of drought-tolerant crop varieties, intercropping, and mulching should be promoted to optimize water use and enhance resilience. In areas expected to receive heavy rainfall, preparations to prevent waterlogging, including field drainage improvements, will be essential to minimize crop losses.

Livestock-dependent regions require urgent support as poor grazing conditions and water shortages persist in several areas. Supplementary feeding programs, expanded access to water points, and improved herd management strategies should be prioritized to protect livestock health and productivity. Regions expected to experience improved rainfall in the coming months should focus on fodder crop production and preservation to build reserves for future dry periods. Enhanced disease surveillance will also be critical in managing the increased risk of livestock diseases associated with high temperatures and changing rainfall patterns.

The situation with the Kariba and Cahora Bassa Dam underscores the urgent need for climate-resilient energy strategies and enhanced water resource management to safeguard regional energy and food security under increasing climate variability. Efforts to safeguard energy security should include diversifying energy sources and accelerating investments in renewable energy solutions, such as solar and wind power, to reduce reliance on hydropower.

Public health systems must also remain vigilant, particularly in areas affected by cholera outbreaks and other climate-sensitive diseases. Improved access to clean water, sanitation, and hygiene education will be vital in reducing disease spread, particularly in areas prone to flooding or experiencing water shortages. Given the forecast of normal to above-normal rainfall for much of the region during the January to March period, Member States are urged to prioritize robust public health interventions to mitigate climate-related health risks. These include strengthening climate-resilient Water, Sanitation, and Hygiene (WASH) infrastructure, enhancing disease surveillance systems, implementing synchronized cross-border cholera vaccination campaigns, and adopting multisectoral approaches to address the root causes of outbreaks. Proactive measures, particularly in high-risk areas, are essential to minimizing the health impacts associated with current and forecast climatic conditions.

Finally, sustained collaboration among regional and national institutions will be essential for effective disaster preparedness and resilience-building. Continuous monitoring of the season, coupled with impact-based advisories, will be key to guiding responsive and adaptive strategies for agriculture and livelihoods across the region.