EASTERN AFRICA

Climate Seasonal Outlook
March to May 2025
Released 6th March 2025

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HIGHLIGHTS

October to December (OND) Review

- There was mixed rainfall patterns over OND; deficits in central Somalia and northeastern Kenya; wetter than average in northern Uganda, southern S. Sudan, western Kenya and northern Tanzania. No major floods occurred
- La Nina (onset December 2024) brought drier conditions to some areas. By February, rain deficits and dry soil were reported in southwestern Uganda and western/southeastern Tanzania, raising the risk of floods with subsequent rains.
- Warmer-than-usual temperatures seen across of the region.

March April May (MAM) Outlook

- A high chance of drier-than-normal conditions (55%) is indicated for the borders-areas of Ethiopia-Kenya-Somalia, north-eastern Eritrea, and southwestern South Sudan.
- This is influences by La Nina conditions which are likely to persist into April (59% chance), followed by neutral conditions afterwards.
- Wetter than normal conditions are expected over parts of central and southern Tanzania, northeastern Uganda, eastern South Sudan and western Ethiopia.
- Temperatures are forecast to be above-average region wide.

OCTOBER TO DECEMBER (OND) CLIMATE REVIEW

- **Rainfall**: Mixed performance with substantial deficits in central Somalia and northeastern Kenya, as predicted. Wetter-than-usual conditions were observed in Rwanda, northern Uganda, southern South Sudan, western Kenya, and northern Tanzania. However, the seasonal rainfall was erratic, with dry spells and intense rainfall, particularly in northeast Kenya, negatively affecting crops and rangeland. Since Dec, the region has been generally dry. Latest updates (1st week Feb) indicate rain deficit with some areas experiencing dry soil (**Fig1**) in southwestern Uganda and western/southeastern Tanzania, making these areas more vulnerable to severe flooding if heavy rain occurs (see **Drought-Flood Cycle** below). No major flooding between Dec-Feb, as La Niña led to a drier conditions.
- **Temperature:** OND is not a strong heat season for most of the countries in the region. However**, warmer than usual conditions** were observed over the region (Copernicus) as predicted in the forecasts.
- **Food insecurity**: Poor cropping and vegetation condition were found across most of Somalia, eastern Ethiopia, Northern Kenya and northern Sudan. Surface water depletion was reported in northern Kenya and several points in 'watch' situation in South Sudan, Ethiopia and Somalia.

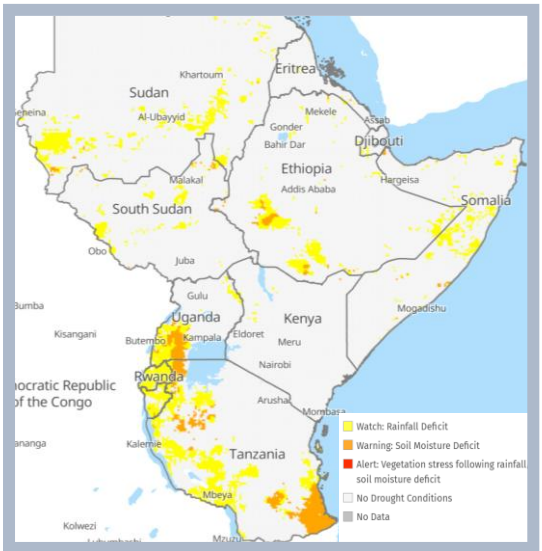

Fig 1. ICPAC Drought Watch, Feb Week #1.

- **Health:** There have been many protracted cholera outbreaks over recent months, ongoing from the region wide outbreaks of 2023/24, with >10K cases in South Sudan, >2K cases in Sudan and hundreds reported in Somalia and Uganda in January 2025 alone [WHO]. M-pox has continued to spread from DRC, Burundi and Uganda to South Sudan and there have been a small number of cases of Ebola (Sudan Virus) in Uganda and Marburg recently in Tanzania. Dengue cases have been reported in Sudan [AfricaCDC] and measles in Ethiopia and Kenya.
- **Conflicts and displacement:** During OND 2023, heavy rains and flooding displaced thousands across Burundi, Kenya, Rwanda, Somalia, Ethiopia and Tanzania [UN-IOM]. Over the 2024 OND season, hundreds of thousands of refugees from the Sudan conflict arrived in neighbouring countries, and internal displacement rose especially in South Sudan due to floods. In January, 24,885 people were displaced in Nasir County and Abyei Administrative Area, with 56% women and girls. Most displacements (21,385) were in Nasir County due to food insecurity and fires, while 3,500 people were displaced in Abyei AA by fires [IOM-DTM].

THE DROUGHTS - FLOOD CYCLE

The capacity of a region to buffer the impacts of a flood depend on the **soil, vegetation** and the **rivers/streams** response capacity. After droughts, soil becomes hard and hydrophobic, preventing water absorption. Weakened or dead vegetation increases runoff and erosion, while wildfires leave ash and charred soil, making it less permeable. Rivers and streams, collecting sediment during dry periods, struggle to handle large water flows. Rising global temperatures are intensifying droughts and fires, while extreme rainfall in short periods is becoming more frequent. Environmental degradation, including deforestation and land damage, worsens the region's ability to cope with extreme weather.

LAKE VICTORIA RAISING WATER

Water levels in Lake Victoria, Africa's largest freshwater lake, follow seasonal patterns closely linked to rainfall, peaking in May/Jun and dropping in Oct/Nov [NASA]. This causes seasonal floods and landslides in nearby areas in the peak season, and downstream flooding in South Sudan via the White Nile, usually with a 3-month delay between lake water levels peak and the peak floods. Since 2006, Lake Victoria water levels have risen, due to more extreme rainfall and droughts, worsened by urban development, land damage, and pollution (see **Drought-Flood Cycle**). The forecasted wetter conditions are likely to reinforce existing trends, rising flood and landslide risk in nearby areas and downstream.

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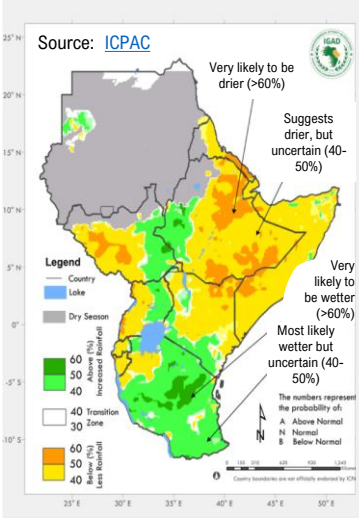
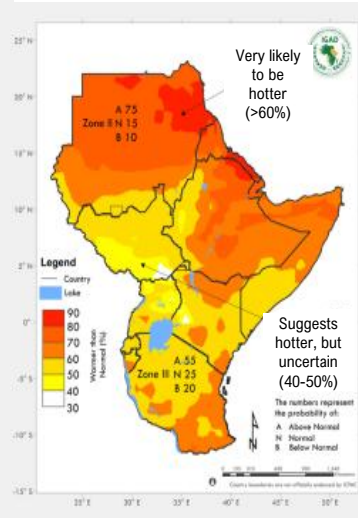
MARCH TO MAY (MAM) CLIMATE OUTLOOK

(A) Probabilistic Rainfall Forecast



(B) Probabilistic Temperature Forecast



- **Rainfall (Fig 2A):** High likelihood (>60%, orange) of **drier conditions** in eastern parts of the Greater Horn of Africa (GHA), including central and eastern Ethiopia, Eritrea, southeast Somalia, north Kenya and southwestern South Sudan.
- **High chances (>60%, dark green) of wetter conditions** expected near the South Sudan-Ethiopia border and central Tanzania.
- Lake Victoria levels are high, and whilst the eastern basin may receive less then average rainfall, the western side may receive above average rainfall, which may balance out over MAM.
- **Temperatures (Fig 2B):** High likelihood (>60%, dark orange to red) of hotter temperatures in Sudan, Ethiopia, northern Somalia, southern Tanzania, and northern Kenya (NOAA, ICPAC).
- **La Niña** conditions are expected to persist to ~April, with a transition to ENSO-neutral likely from May (60% chance). La Nina often brings reduced rainfall to eastern GHA].
- **Rainy season onset:** Early-to-normal onset of the rains is likely in northern Tanzania, central Uganda, and western Kenya; delays in central Kenya, southern Ethiopia, and central Somalia (ICPAC).

EXPECTED IMPACTS

Stagnant floodwater affects health in various ways in Eastern Africa. Despite this MAM season indicating below normal rainfall in the region, the most prevalent diseases expected are mainly malaria, cholera and other waterborne diseases (Reliefweb). In SSD, floods are also known to **spread pollution from oil, war debris and dead animals** across the region, affecting the health of communities, as well as the livelihoods and nutritional status of pastoralist communities, as cattle sicken, and agriculture is made more difficult. *Rec: Flood responses, WASH, vaccination, Malaria prevention, collaborative with VSF for active cattle RVF surveillance.*

Temperatures. The GHA is expected to experience above-average temperatures during the MAM season especially in Sudan, Ethiopia, Northern Somalia and parts of Tanzania (southeast) and Kenya (north). This will worsen already very hot conditions during this season in South Sudan, Sudan, Somalia, and northern Kenya, and bring some unexpected hotter days in countries where heat is usually less prominent during this season, such as Tanzania or Ethiopia. This is may reduce crop yields and increase heat stress among vulnerable communities (GHHIN) *Rec.: ICPAC weekly heat forecasts, ensure supply cold-chain, monitor vulnerable groups.*

Air pollution, particle matter (PM) and Wildfires. Air PM levels are above the WHO safety limit (15µg/m³) across the region, except for southern Somalia and Tanzania. Pollution is usually lower during the MAM season, except in Sudan and South Sudan, where it rises from Feb-May and peaks in March. March marks the end of the wildfire season, except for Tanzania which is the middle of the low season (Dec-May) and South Sudan, where the wildfire season extends to April/May. *Rec: Monitor IQAIR (real-time) or Windy (5-day forecast).*

Drought and drier than normal conditions are expected over the MAM season on the eastern part of the GHA. These conditions can contribute to famine, increased malnutrition cases, reduced water quality, and to dust storms and **meningitis outbreaks.** With some areas forecasted to see below average rains, risk may persist longer than usual (Jaca et al, AfricaCDC, WHO). *Rec.: monitor ICPAC Drought Watch*

La Niña is a phase of the El Nino Southern Oscillation (ENSO) characterized by a cooling of the tropical Pacific ocean. It impacts vulnerable communities with extreme weather events such as increased droughts, floods and storms on other regions. This phase is however expected to diminish by April, transitioning to neutral conditions afterwards (FAO). *Rec.: monitor ENSO forecast.*

Infectious diseases: With the USAID freeze leaving many people living with HIV unable to access antiretrovirals, opportunistic infections may increase over 2025. Mpox cases are reducing in Uganda with vaccinations ongoing [WHO] but cases have been reported in South Sudan. Malaria cases have been above average in parts of South Sudan and are projected to rise further in 2025 in some states [WHO]. Across "meningitis belt" countries, the peak season is ending, however due to dryer than usual conditions in the eastern GHA region, risk may remain above usual for MAM. *Rec: WHO Meningitis weekly bulletin and Dashboard, and the meningitis/dust alerts by ACMAD.*

Food insecurity: Food insecurity and malnutrition are expected to remain critical across the GHA, driven by conflict, economic pressure and climate shocks, especially in Sudan and South Sudan. Ongoing conflict in Sudan and the worsening crisis in South Sudan, including increased flooding, will worsen food security. Below-average rainfall during MAM season will worsen food insecurity in Somalia, eastern Kenya, and parts of Ethiopia. Uganda's refugee-hosting districts are also facing growing food insecurity, particularly in the west. Agriculture in Northeastern Kenya is at risk due to high temperatures and low rainfall. *As FEWSNET is down, please check IPC for forecasts.*

Pests: Locust are expected to decline in the Red Sea but increase in northern Sudan and Southern Egypt, where breeding will start soon. In Somalia, no significant developments are likely. *Rec: monitor FAO monthly locust bulletins.*

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Key for Calendar Bars

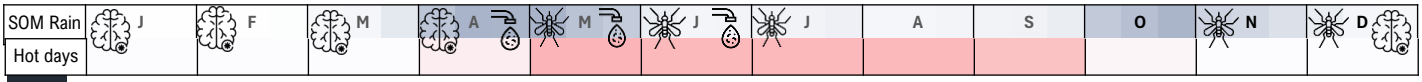
10	45	70
1	2	3+

Blue bars represent national average (1994-2013) rainfall, from 0-70mm per dekad (10 days) [WFP]. Red bars represent local (statewide) weeks per month (1, 2 or 3+ weeks/ month) with temperatures >35°C (health impacts) [CKP], this is the average from 1994-2014. We chose states with nearby MSF projects at high risk of heat-related morbidity (WG=Woqooyi Galbeed, Somalia. Kh=Khartoum, Sudan. Un=Union, S. Sudan. Af=Afar, Ethiopia). N.b. Many countries have highly variable local rainfall and heat index patterns, for more precise heat and humidity related historical data we would recommend reviewing [ERA5].

The mosquito symbol represents historical monthly malaria peaks [data from PMI, Noor et al, MSF and Elagali et al]. N.b. Malaria is endemic and outbreaks can occur outside of these periods, especially following atypical rainfall and temperature patterns impacting vectors, and migration affecting community immunity.

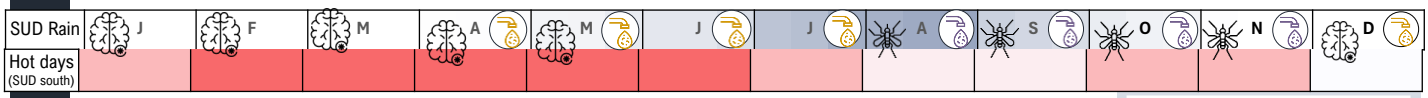
The tap with contaminated water symbol to the left signifies periods when cholera outbreak risk is historically highest [data from Perez-Saez et al]. This could potentially (with caution!) also be used as a proxy for the risk of other waterborne diseases, but many other environmental and social factors alter outbreak risk.

The meningitis symbol represents months where historical meningitis outbreak risk is high [from EMDAT and peer-reviewed literature]. This peaks in the dry season across the meningitis belt as 'Harmattan winds' bring Saharan dust, which damages the mucosal barrier and inhibits immune defences, facilitating bacterial invasion – but outbreaks can occur year-round. Check ACMAD for meningitis/dust storm warnings and forecasts but these are infrequently updated [methods here - Dione et al].



Somalia

Climate: During the Deyr season, most regions in Somalia experienced uneven rainfall distribution with areas such as Baki recording above-average seasonal rainfall while other regions like Jubaland, Galmadug, Hishabelle experiencing below normal rainfall. Higher temperatures are common between May-Sep, with more hot days (>35°C). Humid heat (temperature and humidity combined) is highest in April. Following the hot and dry Jilal season, the upcoming Gu season is forecasted to be drier and hotter than usual, undermining agriculture, water availability, displacement, food insecurity and additional health crises (SWALIM). **Health:** Given the anticipated reduced rainfall for MAM, malnutrition is expected to increase especially in children, water-borne diseases may rise due to unavailability of WASH, alongside heat-related illnesses (SWALIM). **Nutrition**: Malnutrition is likely to increase with the La Niña-induced drought conditions, high food prices, limited stocks, high shipping costs and ongoing conflict and insecurity in central, parts of northwest and southern Somalia (IPC). **Pests**: Minimal locust activity observed, and very low numbers of solitary adults may persist along the northwest coast and there is a low chance of forecasted swams/outbreaks for March-May. No significant developments expected [FAO].



Sudan

Climate: With December to February being a hot and dry season, the upcoming March to May period usually sees these conditions persist. The forecast MAM is for zero to minimal rainfall, whilst temperatures are highly likely to be above average, with high heat stress and heatwaves likely, especially in the north. Flooding in Rabak, White Nile displaced >8000 people in Dec/Jan [DTM] **Health:** With the ongoing war, a growing population in IDP camps has strained limited resources on WASH practices contributing to a new wave of cholera outbreaks which may persist over the oncoming season, made worse by water scarcity. Dengue and malaria cases have been reported in some areas. Heat related illnesses such as heat stroke are also expected to increase, being a dry season for the country (UNHCR). **Nutrition**: It is estimated that 90% of displaced households are unable to afford food now in Sudan [UN]. With the USAID freeze and food insecurity worsening, 80% of local food kitchens have been forced to close and famine is likely to spread. In besieged areas of Al Fasher and North Darfur, the possibility of IPC phase 5 is high and will likely persist in Zamzam and IDP camps, creating high chances of escalating starvation, acute malnutrition and mortality and displacement (FEWSNET). This dry and hot period is exacerbating malnutrition (FEWSNET). **Pests**: There were some large locust swarms in Sudan in Jan 2025 [FAO]. A new generation of breeding will continue along the Red Sea coast preparing for the breeding in the following months.

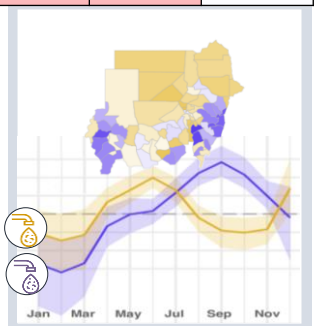


Fig 4. Sudan historical cholera outbreak risk

South Sudan

Climate: Recent heatwaves have led to school closures for the second year running as children are especially vulnerable to the impacts of heat on their health [EN]. Whilst staying at home can help them stay cool, this has negative impacts on their education, development and general wellbeing. Across December to February, the country experienced a very hot and dry period, which is likely to be followed mostly by above average rainfall over March to May, especially in the East. In 2024, seasonal flooding displaced hundreds of thousands of people and livestock and destroyed crops (IRC). Water levels have not receded as much as usual, and are unseasonally high for early March in many places. This increases the risk of more significant flooding in areas forecasted for heavy MAM rainfall (ICPAC, FEWSNET). **Health:** Cholera cases are still ongoing since the outbreak in late 2024, although in most areas cases are reducing. An m-pox outbreak was declared in Juba in February this year, and the Ministry of Health alongside WHO addressing it (WHO). With the expected above normal rainfall over the eastern parts of the country, we anticipate increased cases of cholera, malaria and measles, including extreme heat related cases (WHO, Humanitarian Action). The meningitis dry season is coming to an end. **Nutrition**: High levels of food insecurity over the past few months may increase acute malnutrition by 26% compared to 2024, primarily among children and pregnant and lactation women (Humanitarian Action). Floods spread pollution from oil, war debris, and dead animals, contaminating water and harming both human and cattle health. This affects livelihoods, particularly for pastoralist communities, and their nutrition[Rift Valley Institute]. **Pests**: No significant locust activity forecasted for Mar-May [FAO].

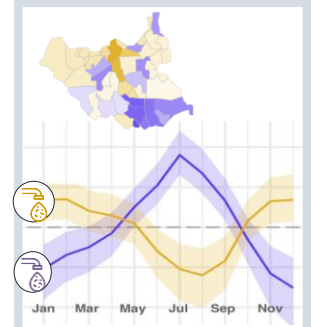


Fig 5. South Sudan historical cholera outbreak risk

Uganda

Climate: Following the hot season of December to February, we expect MAM to have above normal rainfall over the eastern half of the country, with below normal rainfall across the western half of the country. This may likely cause localized flooding on certain areas, with potential mudslides (ICPAC). **Health:** As of February, Ebola virus was declared an outbreak in the country and rising (CDC). Other expected diseases during the oncoming MAM season include malaria, and waterborne diseases due to poor WASH (AMREF). **Nutrition**: With the recently witnessed poor rainfall performance, prolonged dry spells, conflicts and diseases, a large number of children and breastfeeding women will likely face acute malnutrition, increasing from IPC phase 3 and above across the forecasted period (IPC). **Pests**: No significant locust activity is forecasted for March-May [FAO].

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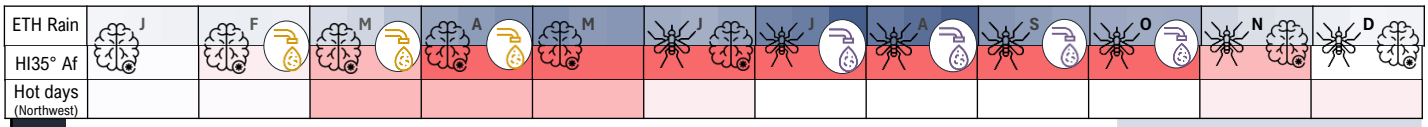


Ethiopia

Climate: Following the recent dry period of Dec-Feb, most of Ethiopia will likely experience below normal rainfall, with drier than usual conditions during the March – May *Belg* rainy season increasing the risk of drought. The Gu/Genna rains in eastern Ethiopia are likely to be below average. The western parts bordering South Sudan may experience wetter conditions, favouring agriculture and pastoralism. This may however be impacted by high temperatures which will increase evaporation rates and bring about heat stress (ICPAC). Most areas will have less than a week of temperatures above 35°C annually, except in the northwest and Afar, where temperatures will rise in MAM and exceed 35°C for over two weeks each month from April to October. **Health:** The ongoing conflict in the Amhara and Oromia regions is severely affecting public health, with increased violence and barriers to accessing health services, complicating the response to outbreaks like cholera, measles, and malaria. With at least 10 earthquakes recently reported in Ethiopia and signs of possible volcanic activity evacuations have begun for approximately 80K people in Afar, Oromia and Amhara. Access restrictions imposed by local militia prevent population's access to health and relief services. Flooding will likely affect areas such as Gambella, damaging healthcare facilities, affecting WASH infrastructure, increasing malaria cases and also affect crop and animal rearing in areas with poor rainfall patterns (ICPAC). **Nutrition**: In areas where there will be improved water supply - in the western parts of the country during March-May, livestock health may improve which will further enhance nutrition and income generation for pastoralists. However, in the central and east part of the country, crop failures, water and pasture shortages may lead to a decline in livestock productivity, reducing dairy production and limited nutritional intake, affecting children and pregnant women (ICPAC). Low crop production, high food prices, and lack of social pregnant women (ICPAC). Low crop production, high food prices, and lack of humanitarian and social protection support, have increased acute food insecurity recently. As we come out of the lean season in Somali region in April the lean season in Oromia will last until late May after the Belg rains finish **Pests**: No significant locust activity is forecasted for March-May [FAO].

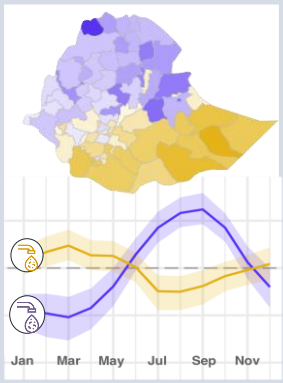
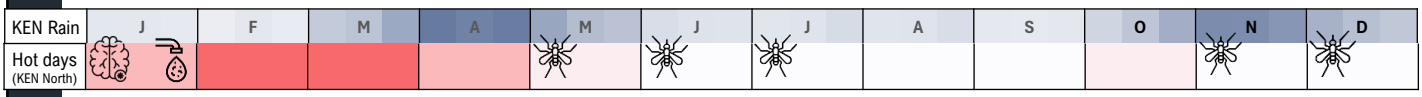


Fig 6. Ethiopia historical cholera outbreak Risk



Kenya

Climate: Following the below-average rainfall in most parts of the country on the previous season, MAM forecast indicates a higher likelihood of above average rainfall over western and southern parts of Kenya, exceeding 200mm across the season, with below average rainfall across central and coastal parts (ICPAC). The northern and eastern parts of the country are expected to have below average rainfall (KMD). In northern Kenya, peak temperatures and hot days occur from January to May, with humid heat highest from March to April. Heat stress is expected to increase due to above-average temperatures forecasted for MAM. Southeastern and coastal Kenya will experience lower temperatures and fewer hot days, with conditions forecasted to remain normal. **Health:** With expected floods and stagnating water over localized areas during the MAM season, we expect waterborne and vector borne diseases to increase slightly mainly due to poor water and sanitation facilities. Heat stress on the other hand may be prominent in below average areas of northern and eastern parts, with increased respiratory infections (KMD). **Nutrition**: Even though the country has made progress in reducing malnutrition, it remains a concern in arid and semi-arid counties common with recurrent drought, less rainfall and limited access to healthcare, mostly affecting children under 5, pregnant and lactating women (KMD, MOH). **Pests**: Whereas MAM rainfall may provide benefits for some regions, certain areas affected by reduced/increased rainfall and moisture content will encourage internal and external parasites and Transboundary Animal Diseases amidst conflict for pasture and water among human, wildlife and livestock (ICPAC). No significant locust activity is forecasted for March-May [FAO].

Tanzania

Climate: Tanzania experienced above average rainfall across December to January, with ranges from 200 – 500mm being observed in the central and southern parts, which is favourable for agriculture. This upcoming MAM season will be characterized with moderate to above rainfall across most parts of the country, except for areas around the northwest which will likely experience normal to below average conditions. Chances of flooding and flash floods are high (ICPAC). **Health:** Cases of the Marburg Virus Disease have been reported since January 2025, with a high fatality rate across the Kagera region (WHO). Other anticipated diseases during this rainy season include vector-borne such as yellow fever, dengue, Zika, all of which are transmitted by mosquitoes. Neglected tropical diseases such as schistosomiasis are also prevalent and expected in certain regions (Smart Traveller). **Nutrition**: Despite progress in nutrition cases, 34% of children under 5 suffer from chronic malnutrition and 58% from anaemia, affecting both rural and urban areas (USAID). Whereas agriculture is expected to thrive in the country during this season, malnutrition cases are still expected. **Pests**: For areas forecasted to experience dry conditions, fall army worm is expected to increase, whereas wetter conditions are likely to encourage the emergence of plants and diseases such as fungal diseases. All these have dire effects mostly in rural areas with limited infrastructure and increased soil erosion. No significant locust activity is forecasted for March-May [FAO].

Rwanda

Climate: OND rainfall patterns in Rwanda were characterized by a delayed onset with moderate rainfall experienced over most parts of the country, affecting agriculture. This year's MAM season is expected to have below normal rainfall across most parts of the country, with exceptions of above normal rainfall over few hilly and mountainous areas. Chances of landslides are quite high in hilly areas over this season, affecting further agriculture and subsequently food insecurity (ICPAC, ReliefWeb). **Health**: During rainy seasons, the country experiences a hike in malaria cases compared to dry seasons (Rubuga *et al*). However, geographical disparities and poor infrastructure reduces the interventions of health services across affected areas, hindering quality healthcare in vector-borne diseases (USAID). **Nutrition**: NCDs remain a huge challenge in the country, affecting specifically children on malnutrition and stunted growth increasing neonatal mortality. Increased cases of rift valley fever during rainy seasons have an impact on mental health issues through its effects on nutrition (USAID, ICPAC). **Pests**: Fall armyworms are expected over this season, damaging crops especially maize, causing significant yield loss (REMA).

DISCLAIMER: While climate forecasts can offer insights on health outcomes, many other drivers (e.g. conflict, displacement, migration, socio-economics, politics, immunity and vaccination) modulate disease transmission and should be considered possible. Furthermore, the impact of weather conditions may peak well after shifts in weather.

The Humanitarian Action for Climate and Environment is an MSF-Canada choice initiative established in 2020 **to support Climate Change Adaptation within the movement.**

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