

Crop Monitor

EARLY WARNING

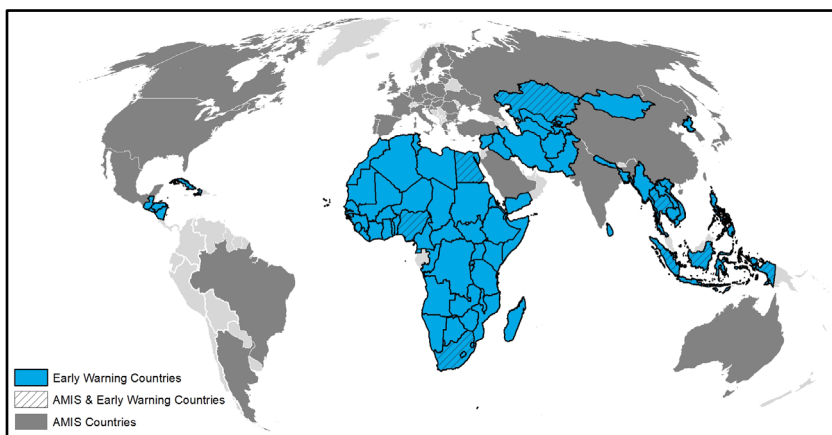
Overview:

In **East Africa**, planting of *Belg* season maize crops began in Ethiopia with concern due to ongoing impacts of dry conditions, conflict, and socio-economic challenges that were present in the previous season. In the south, poor and failure conditions resulted for secondary cereals due to a fifth consecutive poor rainfall season. Planting of 2023 main season cereals is underway, and dry conditions are expected to continue for the March to May 2023 rains which is likely to result in a sixth consecutive poor season and worsen already severe food insecurity in the region (See Seasonal Forecast Alert Pg. 4). In **West Africa**, planting of 2023 main season cereals will begin in March across the subregion. In the **Middle East and North Africa**, wheat crops continue to develop under mixed conditions due to ongoing dryness in Morocco, Algeria, Tunisia, northeastern Syria, northern Iraq, and parts of Iran. In **Southern Africa**, conditions remain mixed for main season cereals as persisting dry and hot weather continues to impact many parts of the subregion, and the passage of Intense Tropical Cyclone Freddy could further impact crops in east and central Madagascar as well as in southern Mozambique. In **Central and South Asia**, winter wheat continues to develop under mixed conditions due to persisting dryness. However, conditions in Pakistan have improved from previous concerns regarding the 2022 flooding and potential input supply constraints. In northern **Southeast Asia**, dry-season rice is in vegetative to harvesting stage under generally favourable conditions except in Laos and North Viet Nam due to limited water availability, inadequate sunlight, and cold weather. In Indonesia, sowing of wet-season rice continues under favourable conditions. In **Central America and the Caribbean**, conditions remain favourable for second season rice crops in Honduras and *Apante* season bean crops in Nicaragua. Conversely, below-average rainfall continues to impact crops in Haiti and Cuba. There are elevated chances for below-normal March to May rainfall across most areas and above-normal temperatures in northern areas (See Regional Outlook Pg. 15).



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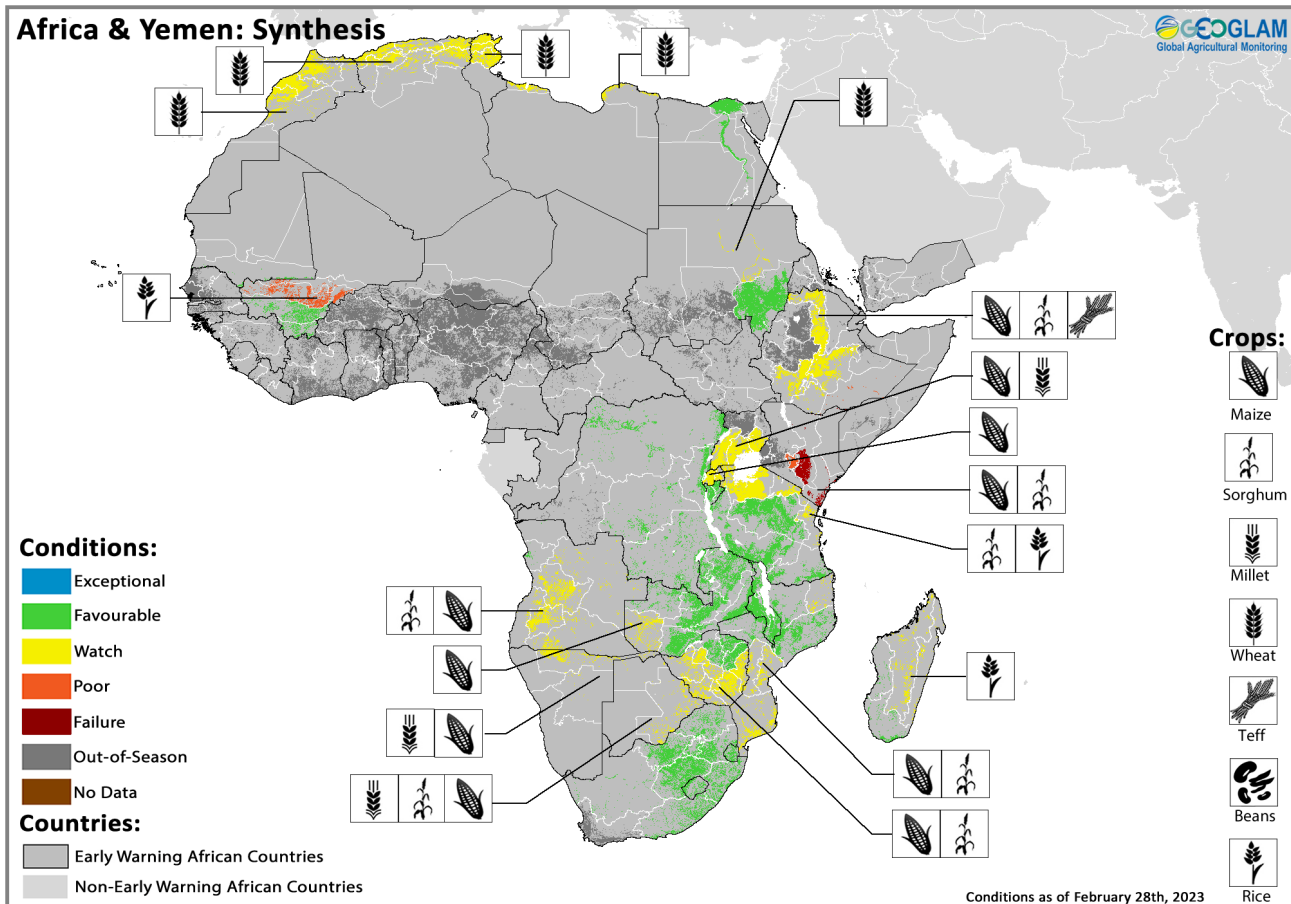
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GEOGLAM Crop Monitor for Early Warning

Crop Conditions at a Glance

based on best available information as of February 28th



Crop condition map synthesizing information for all Crop Monitor for Early Warning crops as of February 28th. Crop conditions over the main growing areas are based on a combination of inputs including remotely sensed data, ground observations, field reports, national, and regional experts. **Regions that are in other than favourable conditions are labeled on the map with a symbol representing the crop(s) affected.**

EAST AFRICA: Planting of *Belg* season cereals is now underway in Ethiopia with concerns due to ongoing impacts of dry conditions, conflict, and socio-economic challenges in affected areas. In the south of the subregion, poor and failure conditions resulted for second season cereals. Planting of 2023 main season cereals is now underway with concern due to dry conditions that are expected to continue across most parts of the Greater Horn of Africa over the next three months and result in a sixth consecutive poor season for parts of the subregion (See Seasonal Forecast Alert Pg. 4).

WEST AFRICA: Second season rice crops are in vegetative to harvesting stage in Mali and Mauritania under generally favourable conditions except in conflict-affected areas of central Mali. Land preparation is underway for 2023 main season cereals across the subregion, and planting will begin in March.

MIDDLE EAST & NORTH AFRICA: Wheat crops continue to develop under mixed conditions as drought is impacting crops in Morocco, Algeria, Tunisia, northeastern Syria, northern Iraq, and parts of northern Iran with substantial rainfall deficits present in many areas (See Regional Outlook Pg. 8). Conversely, yield forecasts are slightly above-average in Egypt.

SOUTHERN AFRICA: Main season cereals are in vegetative to harvesting stage under mixed conditions as persisting dry and hot weather continues to impact parts of Angola, Namibia,

Botswana, Zambia, Zimbabwe, Mozambique, and Madagascar. Additionally, the passage of Very Intense Tropical Cyclone Freddy poses a significant flood risk for Madagascar and southern Mozambique (See Regional Outlook Pg. 11).

CENTRAL & SOUTH ASIA: Planting and development of winter wheat continues under mixed conditions due to dryness in parts of Uzbekistan, Turkmenistan, Tajikistan, and Afghanistan. However, conditions in Pakistan have improved as the flood waters were able to recede in time for planting, and there are adequate input supplies available.

SOUTHEAST ASIA: Planting of dry-season rice is nearing completion, and the total rice planted area is expected to increase. Crops are in vegetative to harvesting stage under favourable conditions except in Laos where there are concerns related to limited water availability and sunlight and in North Viet Nam where there is prolonged cold weather. In Indonesia, sowing of wet-season rice continues under favourable conditions.

CENTRAL AMERICA & CARIBBEAN: Conditions remain favourable for second season rice crops in northern Honduras and *Apante* season bean crops in Nicaragua. In Haiti, below-average rainfall and high temperatures are expected to reduce yields for second season rice crops and *Hiver* season bean crops, and below-average rainfall is expected to continue through May in southern areas (See Regional Outlook Pg. 15).

Global Climate Outlook: Two-week Forecast of Areas with Above or Below-Average Precipitation

The two-week forecast (Figure 1) indicates a likelihood of above-average rainfall over the Mid-Atlantic of the US, central and eastern Brazil, Germany, Poland, Lithuania, Belarus, western and central Ukraine, eastern Slovakia, eastern Hungary, northwestern Romania, central Russian Federation, eastern Kazakhstan, western Iraq, southern Nigeria, Zambia, southern Malawi, northern Mozambique, central and western Madagascar, southern India, Sri Lanka, western Indonesia, and Malaysia.

There is also a likelihood of below-average rainfall over Quebec in Canada, the Pacific Northwest and the southern Plains in the US, Mexico, Guatemala, Honduras, Costa Rica, Panama, eastern Cuba, Haiti, the Dominican Republic, eastern Columbia, western Venezuela, northern and southern Brazil, Uruguay, central Argentina, Iceland, southern Norway, northern Sweden, central Morocco, eastern Algeria, southern Tunisia, western Libya, eastern and southern Ethiopia, southern Somalia, Kenya, southern Uganda, northern and central Tanzania, Rwanda, Burundi, northwestern Angola, eastern Namibia, central South Africa, southern and eastern Iran, Afghanistan, southern Kyrgyzstan, Tajikistan, Pakistan, northwest and eastern India, central and southeast China, Democratic People's Republic of Korea, Republic of Korea, Japan, the northern Philippines, northern Myanmar, Viet Nam, Laos, Cambodia, eastern Thailand, southern Indonesia, southern Papua New Guinea, and western and central Australia.

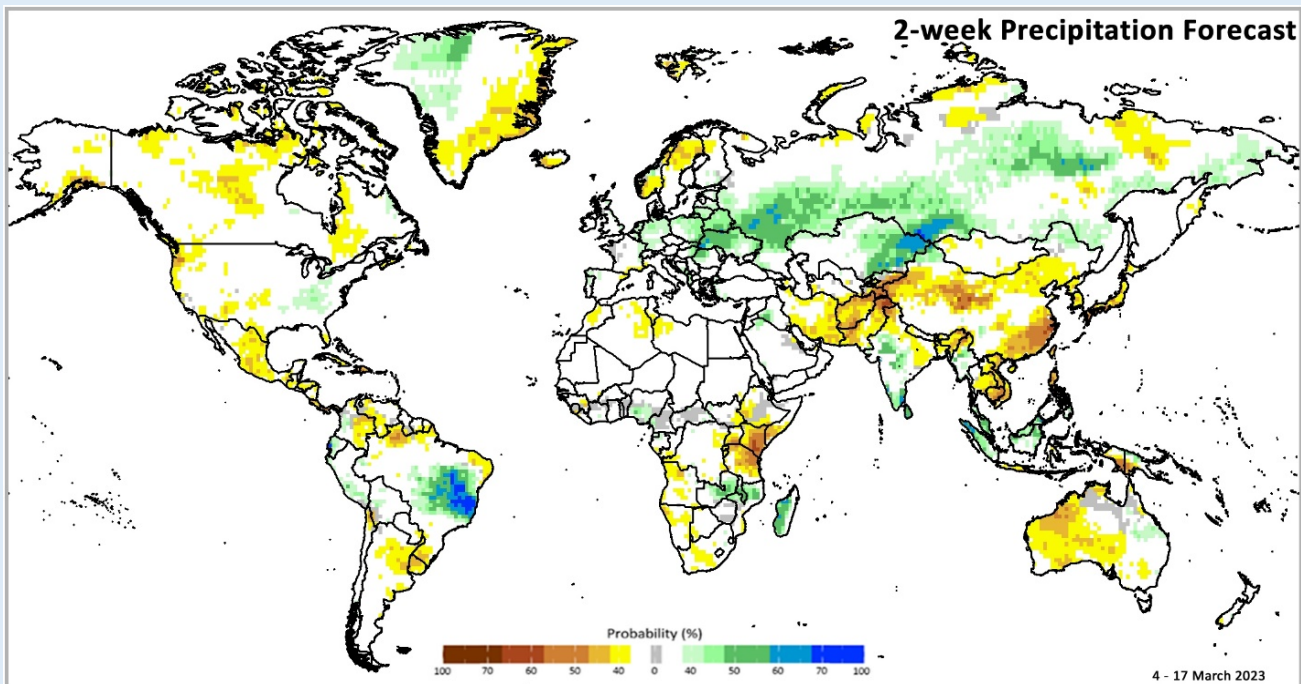


Figure 1: IRI SubX Precipitation Biweekly Probability Forecast for 4 – 17 March 2023, issued on 24 February 2023. The forecast is based on statistically calibrated tercile category forecasts from three SubX models. Source: [IRI Subseasonal Forecasts Maproom](https://www.iri.columbia.edu/our-work-and-services/forecasts/subseasonal-forecasts-maproom/)

Climate Influences: La Niña is present and transition to neutral ENSO is likely in March to May

The El Niño-Southern Oscillation (ENSO) is currently in the La Niña phase. A transition to a neutral ENSO state is likely, with a 94% chance of ENSO neutral conditions in March-April-May, according to the IRI/CPC forecast. ENSO neutral conditions are expected through July, after which El Niño conditions may develop, with a 60% chance of El Niño in August-September-October. While long-range forecasts made at this time of year can be unreliable, El Niño events can have widespread, global impacts. Seasonal forecasts indicate La Niña precipitation impacts may continue through the next several months. While a transition to ENSO-neutral is anticipated during this time, atmospheric responses to La Niña can linger. For [eastern East Africa](#), where multi-year drought continues to severely impact food security, yet [another below-normal rainy season](#) is likely, based on forecast La Niña-like sea surface temperature gradients during spring.

Source: UCSB Climate Hazards Center

Forecast Alert: Catastrophic sixth consecutive dry season forecast for eastern East Africa during MAM 2023 worsening an already severe food insecurity situation

The March-April-May (MAM) 2023 season will most likely be drier and warmer than normal across much of Kenya, Somalia, and Ethiopia, and in portions of Uganda, South Sudan, Rwanda, Burundi, and Tanzania. This outlook is supported by forecasts released in February from multiple international centers, including the IGAD Climate Predictions and Applications Center (ICPAC).

For eastern East Africa, the stakes are extremely high. This region has been reeling from the catastrophic humanitarian impacts of an already historic multi-year drought that started during October-November-December (OND) of 2020. It now faces a likely sixth season in a row with poor rainfall performance. According to the [Joint Alert from February 16th, 2023](#) "It is highly likely that the current humanitarian emergency in the Horn will persist until at least late 2023, requiring high assistance levels to prevent further deteriorations. Regardless of the performance of this year's major rainy seasons, the sheer scale, severity, and magnitude of suffering already observed means that the region will take many years to fully recover."

There have been concerns for the MAM 2023 season in eastern East Africa since mid-2022, based on a forecast La Niña-like SST pattern in the Pacific Ocean that is associated with below-average MAM season rainfall. Corresponding to the predicted negative Western V Gradient (WVG) and analog year MAM rainfall, the chance for below-normal rainfall in eastern East Africa is estimated at around 64% (Figure 1-top-right). Over the eastern Horn, the median rainfall values during analog years indicate moderate-intensity drought conditions (SPI value of -0.8). A strong negative WVG is often present during or directly following recent La Niña events. The latest WVG forecast for MAM 2023 indicates exceptionally warm western Pacific SSTs, reflecting influences from the active La Niña (NOAA CPC Feb 20th [ENSO update](#)) and a strong anthropogenic warming trend. Near-average Nino3.4 region SST are forecast, reflecting the expected return to neutral ENSO conditions. Additional details on NMME SST WVG forecasts are available from [Agrilinks](#) with an update [here](#); see also Crop Monitor for Early Warning reports from November 2022 and February 2023.

The Greater Horn of Africa Climate Outlook Forum (GHACOF63) [forecast](#) indicates below-normal MAM 2023 rainfall as the most likely tercile category across eastern areas (40-50% chances), mixed conditions in western and southern areas, and above-normal temperatures across the Greater Horn (50-70% chances) (Figure 1-bottom-left). GHACOF63 predicts the "moderate to severe multi-season drought conditions in the region, particularly over Kenya, Uganda, southern Somalia, southern and south-eastern Ethiopia, southern South Sudan, Burundi, and parts of eastern Tanzania." Insufficient seasonal rainfall amounts for MAM rains coupled with abnormally high temperatures and antecedent soil moisture deficits would produce suboptimal conditions for main season maize and other cereals over the eastern Horn.

The latest WMO and NMME MAM 2023 precipitation forecasts are also pessimistic. These forecast elevated chances of below-normal rainfall across many equatorial areas (Figure 1-bottom middle and right). Altogether, the forecasts raise concerns not just for MAM 2023 rainfall performance in eastern areas, but also across Kenya, Uganda, Rwanda, Burundi, and northern Tanzania. Drier-than-average conditions have been observed in recent weeks in western Kenya and in southwestern Ethiopia, and these may continue into early March, based on the February 23rd unbiased GEFS forecast. Longer-range probabilistic forecasts from IRI, based on SubX models, predict drier-than-normal conditions in central and eastern Kenya, southwestern Somalia, and northeastern Tanzania through March 24th.

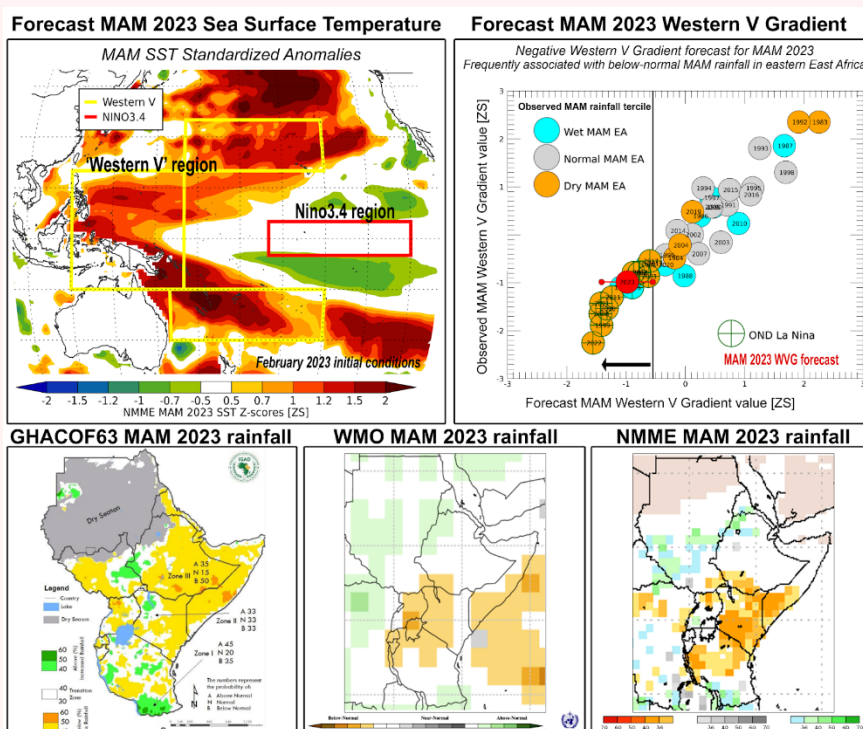
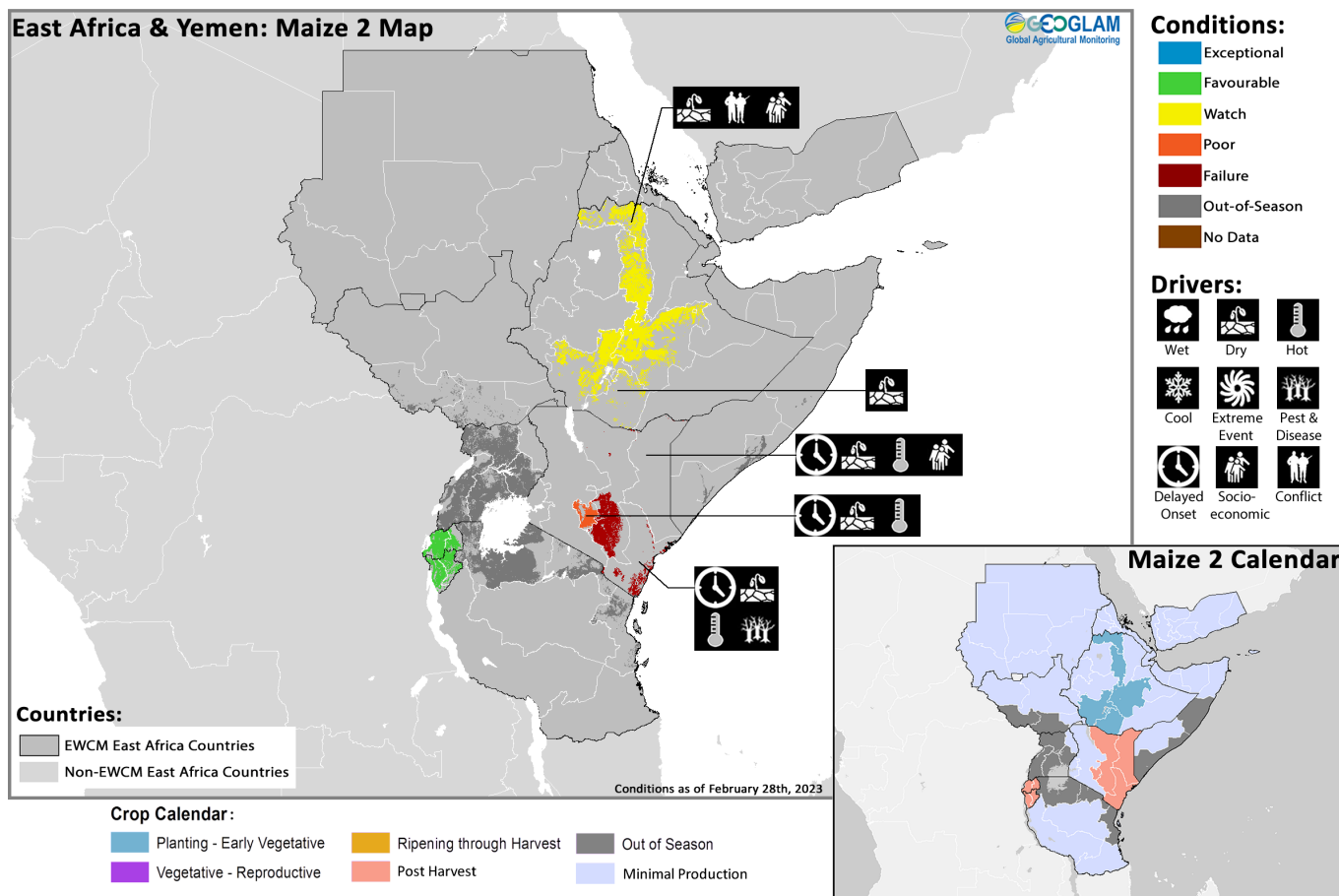


Figure 1. Forecasts for the March-April-May (MAM) 2023 season. Top-left: NMME forecast of MAM 2023 Pacific Ocean sea surface temperatures (SST) standardized anomalies (Z scores) from February. **Top-right:** Predicted and observed MAM Western V Gradient (WVG) SST index values for 1982-2022, and the 2023 forecast, from February NMME. $WVG = Z(Niño3.4\ SST) - Z(Western\ V\ SST)$. Point labels: MAM year. Point colors: Red circles- MAM 2023 WVG forecast and 80% confidence interval. Orange, silver, and cyan circles - Below-normal, normal, and above-normal MAM rainfall, respectively. Crosses: Indicates if a La Niña event preceded MAM. **Bottom-left:** GHACOF63 consensus probabilistic forecast for MAM 2023 precipitation. GHACOF63 image from [ICPAC](#). **Bottom-middle:** WMO probabilistic forecast for MAM 2023 precipitation from February. From the [WMO Lead Centre Long-Range Forecast Multi-Model Ensemble](#). **Bottom-right:** NMME probabilistic forecast for MAM 2023 precipitation from February. From the [NOAA Climate Prediction Center](#). Source: UCSB Climate Hazards [Center](#)

East Africa

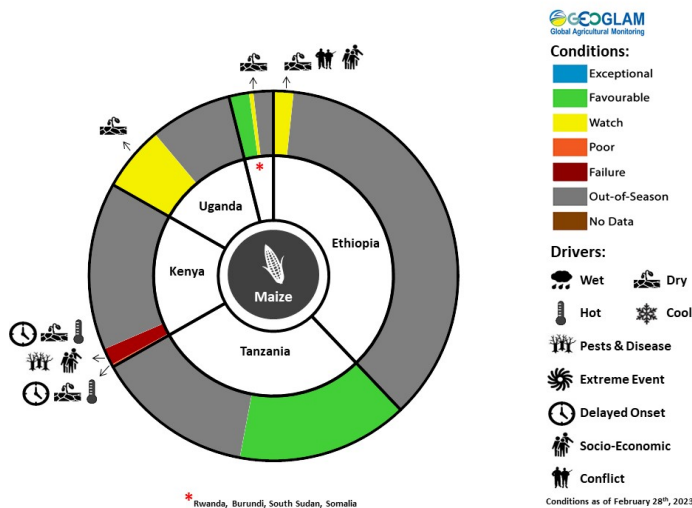


Crop condition map synthesizing Maize 2 crop conditions as of February 28th. Crop conditions over the main growing areas are based on a combination of inputs including remotely sensed data, ground observations, field reports, national, and regional experts. **Conditions that are other than favourable are labeled on the map with their driver.**

Across the north of the subregion, harvesting of main season cereals mostly finalized in February under mixed conditions due to impacts of flooding in **Sudan** and **South Sudan**, persistent dryness in southern **Ethiopia**, and conflict and related socio-economic challenges in affected areas of **South Sudan** and northern **Ethiopia**. In **Ethiopia**, planting of *Belg* season cereals is now underway, and there is concern due to ongoing impacts of dry conditions as well as residual pockets of conflict and related socio-economic challenges in the north.

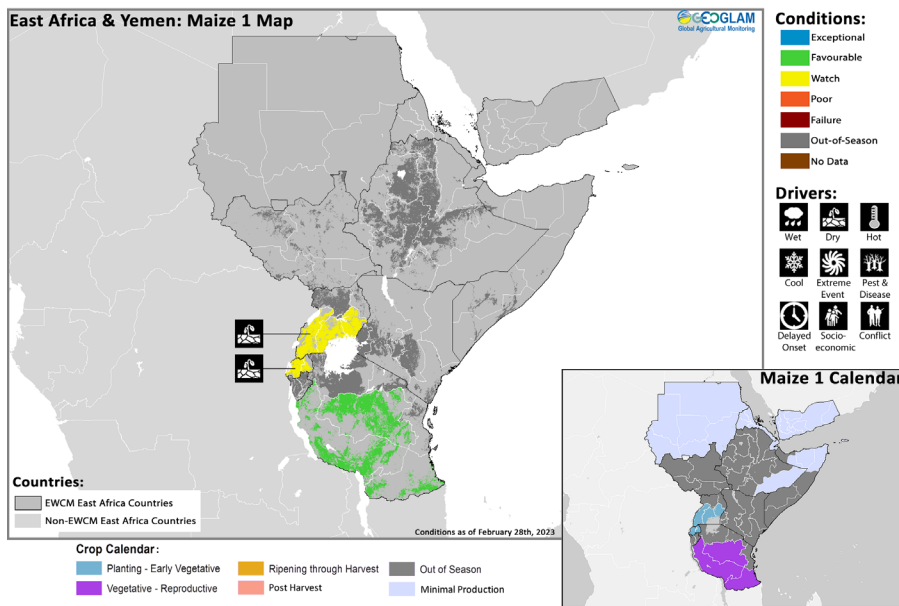
Across the south of the subregion, harvesting of second season cereals mostly finalized in February under mixed conditions as crops in **Somalia**, bimodal minor agricultural areas of **Kenya**, north-central and northwestern **Uganda**, and northern bimodal areas of the **United Republic of Tanzania** were unable to recover from the effects of drought and dry spells during October-November-December (OND) 2022 following several consecutive poor rainfall seasons since late 2020, resulting in poor to failure end of season conditions. Planting of main season cereals is now underway in bimodal minor agricultural areas of **Kenya** as well as in **Rwanda** and **Uganda** with concern due to continuing dry conditions.

Below-average rainfall and above-normal temperatures are expected in most parts of the Greater Horn of Africa during March-April-May (MAM) 2023, particularly across **Kenya**, **Somalia**, and **Ethiopia** and in portions of **Uganda**, **South Sudan**, **Rwanda**, **Burundi**, and the **United Republic of Tanzania**. This outlook is supported by forecasts released in February from multiple international centers, including the IGAD Climate Predictions and Applications Center (ICPAC). This is expected to result in a sixth consecutive poor rainfall season across parts of the subregion with critical food security impacts expected. Already, there are over 21 million highly food insecure people across **Ethiopia**, **Kenya**, and **Somalia** for the



For detailed description of the pie chart please see description box on Pg. 16.

January to March period, and this number is only expected to increase with another consecutive dry season expected and no relief on the horizon (See Seasonal Forecast Alert Pg. 4).



Crop condition map synthesizing Maize 1 conditions as of February 28th. Crop conditions over the main growing areas are based on a combination of inputs including remotely sensed data, ground observations, field reports, national, and regional experts. **Conditions that are other than favourable are labeled on the map with their driver.**

Southern East Africa

In **Uganda**, planting of first season maize and millet crops is now underway in bimodal rainfall areas, and there is concern due to continuing dry conditions. In bimodal minor agricultural areas of **Kenya**, well below-average yields have been realized for the Short Rains maize crops due to persistent dry conditions following several consecutive dry seasons across bimodal producing areas since late 2020. Additionally, the presence of Fall Armyworms in the southeast damaged 2,000 hectares of crops, and inter-communal natural resource based conflict affected marginal producing pastoral and agro-pastoral areas in the north and northeast. According to the government's 2022 Short Rains Season Assessment Report, overall crop production is estimated at 18 to 79 percent below the long-term average, driven mostly by below-average planted area resulting from the aforementioned factors. Land preparation and early planting is underway for Long Rains maize crops in marginal producing bimodal rainfall areas as well as in the central region. In **Rwanda**, harvesting of Season A maize crops finalized in February under favourable conditions with near-average yields expected. Planting of Season B maize crops is now underway, and there is concern due to current dry conditions that are forecast to continue through May (See Seasonal Forecast Alert Pg. 4). In **Burundi**, harvesting of Season A crops, which comprise 35 percent of total annual production, finalized in February under favourable conditions. Although pockets of northeastern areas experienced insufficient rainfall, yields are expected to be near-average as rains received in the last quarter of 2022 supported production. Harvesting of Season A crops will be completed up to two months later than usual, and crops are expected to occupy farmland until March. This will likely have negative implications for the narrow Season B planting window, which typically begins in March and ends prior to the start of the dry season in June. As a result, the cultivated area of Season B crops is expected to decrease by 15 percent, according to the January 2023 FEWS NET Key Message Update. In northern bimodal areas of the **United Republic of Tanzania**, *Masika* season rice and wheat crops are in vegetative to reproductive stage for harvest from May while planting of *Vuli* season sorghum crops is just beginning, and concern remains due to ongoing dry conditions. Land preparation is underway for *Masika* season maize crops, and planting will begin in March. In unimodal areas, *Masika* season cereals continue to develop under favourable conditions.

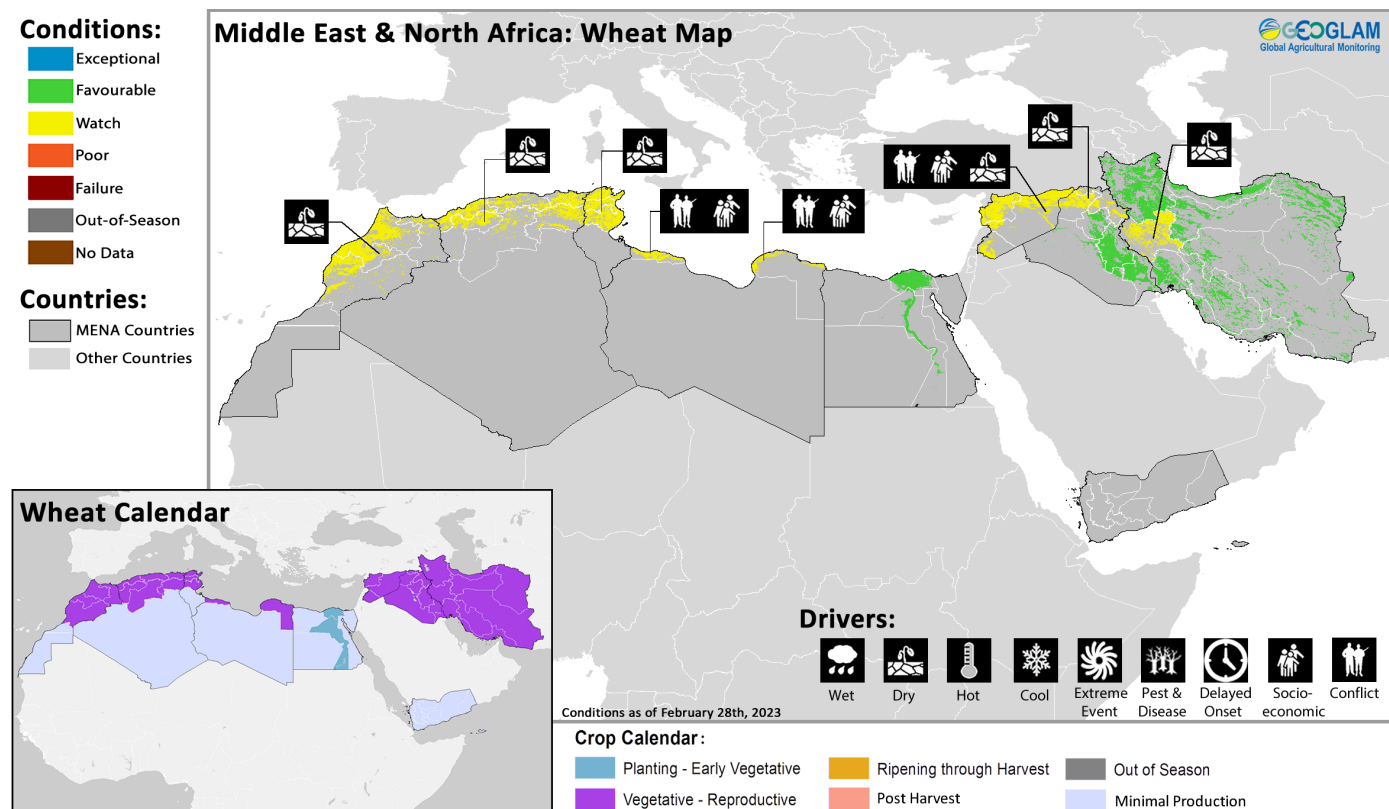
Northern East Africa & Yemen

In **Ethiopia**, planting of *Belg* season cereals is now underway for harvest from June, and there is concern as south and northeastern parts of the country continue to be impacted by several consecutive failed rainy seasons since late 2020, culminating in the worst drought in 40 years. A forecast continuation of below-average rains, particularly in the southwest, coupled with warmer than normal temperatures are likely to impact production (See Seasonal Forecast Alert Pg. 4). While the impact of active conflict on agricultural activities could decrease following the 2022 ceasefire, the resulting socio-economic challenges may continue to affect seasonal crop production in the areas that have been most heavily impacted. In **Sudan**, winter wheat crops continue to develop under mixed conditions due to residual flood impacts in the north. In **Yemen**, land preparation is underway for sorghum crops, and planting will begin in March.

West Africa

In West Africa, harvesting of main season cereals finalized in January under generally favourable conditions with near-average yields except in areas impacted by ongoing conflict. However, heavy rains and excess flows of major regional watersheds resulted in floods and localized crop losses in many regions. In **Guinea**, the 2022 paddy rice finalized in January under favourable conditions as good weather and government subsidies for agricultural inputs helped improve crop yields. However, localized crop losses occurred due to dry spells and floods. According to the February FAO GIEWS Country Brief Update, the aggregate cereal production for 2022 is estimated at 4.1 million tonnes, close to the previous year's level and slightly above-average. Harvesting of second season rice crops is now underway in **Mali** while crops continue to develop in **Mauritania**, and conditions are favourable except in central **Mali** where ongoing conflict continues to impact agricultural activities. Land preparation is underway for 2023 main season cereals across the subregion, and planting will begin in March.

Middle East & North Africa



Crop condition map synthesizing wheat conditions as of February 28th. Crop conditions over the main growing areas are based on a combination of inputs including remotely sensed data, ground observations, field reports, national, and regional experts. **Crops that are in other than favourable conditions are labeled on the map with their driver.**

In the **Middle East and North Africa**, wheat crops continue to develop under mixed conditions for harvest from April. Despite recent rainfall improvements in **Morocco**, west and coastal **Algeria**, and parts of the Middle East, substantial rainfall deficits remain in many areas due to drier than average seasonal rainfall (See Regional Outlook Pg. 8).

In **Morocco**, crops have been negatively affected by drought conditions and delayed sowing. While there was some recovery in the first half of December, inadequate rainfall in some regions has led to below-average yield prospects. Crops are now in advanced vegetative stages, and substantial rainfall is needed in the coming weeks to sustain the crops during the flowering and grain-filling periods and prevent negative seasonal outcomes. In **Algeria**, extended drought conditions are impacting wheat crops as the country experienced severe rainfall deficits at the start of the season, delaying sowing activities and crop establishment. Most northern areas have below-average November to mid-February rainfall totals, except in the northeastern region (See Regional Outlook Pg. 8), and rain is needed to avoid further crop damage. In **Tunisia**, severe drought conditions from December to February have led to soil moisture deficits and below-average biomass accumulation for wheat in most agricultural areas, particularly in the centre. Despite some rainfall improvement in January, seasonal totals remain well below-average (See Regional Outlook Pg. 8). Some main producing northern regions with widespread irrigation have accumulated average to above-average biomass, but water reserves are low, which may soon lead to water use restrictions. In **Libya**, despite above-average temperatures in addition to below-average rainfall in December, beneficial rains since mid-January have improved growing conditions. In the agricultural regions of Tripolitania, sowings were delayed due to dry weather, but crops recovered quickly and are progressing well. Similarly, the agricultural regions of Cyrenaica also experienced a dry start in December but benefited from frequent and evenly distributed rainfall in January. Yield expectations for

the country are expected to be near the five-year average but still below the pre-conflict average. In **Egypt**, rainfed regions of the north and Nile Delta outskirts benefitted from above-average rainfall. Elsewhere, cereal production is dependent on irrigated fields of the Nile Valley and Nile Delta regions, and there was a slight delay in sowing activities, likely due to a heatwave in late September. Growing conditions are generally favourable, and yield forecasts are 4 percent above the five-year average. In **Syria**, multiple earthquakes and aftershocks impacted several governorates in north, central, and coastal areas of the country after a 7.7 magnitude earthquake struck southern Türkiye near Syria's northern border on February 6. Aleppo was the most impacted with Lattakia, Tartous, Hama, and Idleb also considerably impacted. Additionally, rainfall in early February resulted in extensive flooding in the northwestern region following a dam collapse that resulted from the earthquakes. Conversely, dry conditions are impacting parts of Hassakeh governorate located in the northeast (See Regional Outlook Pg. 8). In Ninewa governorate located in the northwest of **Iraq**, less than 50 percent of average rainfall was received in December, resulting in low biomass. Elsewhere, wheat crops planted in December have received average rainfall, but more is needed in February and March to ensure adequate crop development. Additionally, the country is facing water scarcity due to erratic rainfall and decreased transboundary river flows, which limits water availability for irrigation. The Ministry of Water Resources approved an increase in wheat cultivation to 1 million hectares in 2023, including 625,000 hectares of irrigated lands, due to elevated international prices and concerns regarding limited supply in global markets. This increase in wheat area may be compensated by a decrease in the area planted with barley. In **Iran**, the country has received more snow compared to the previous year, and conditions are near-average in most areas except in the northwest, including Kermanshah and Hamedan, where dry conditions continue to cause concern. Additionally, in Golestan located in the northeast, December to January rainfall deficits resulted in below-average biomass.

Regional Outlook: Improvement unlikely across deficit rainfall areas due to average to below-average rainfall forecast through March

In recent weeks, from January 21st to February 20th, above-average rainfall occurred in Morocco, western and coastal Algeria, and portions of the Middle East. Drier-than-average conditions continued in Tunisia and western and eastern Libya (Figure 1-left). Rainfall was also mostly below-average in the northern Middle East, in Syria, northern Iraq, and northern and southeastern Iran.

Substantial rainfall deficits (<75% of average) are present in many of these areas, due to drier-than-average conditions during most of the rainfall season that were punctuated with some higher rainfall events. Despite the recent improvements in Algeria, most northern areas still have below-average November to mid-February totals. In Tunisia, rainfall in late January likely provided some relief; however, season-to-date rainfall totals are still far below-average (< 60%) and data indicate these as being [among the driest](#) on the 42 year CHIRPS record. Above-average rainfall in early February in northwestern Syria punctuated otherwise below-average rainfall conditions during the past two months; however, it also led to extensive flooding after a dam collapsed due to damage caused by the devastating February 6th earthquake.

Figure 1-right shows an outlook for November 1st to March 5th rainfall, based on preliminary data for February 1st to 20th and a two week forecast. Most of the areas with below-average season-to-date rainfall are unlikely to improve during this time, due to forecast average to below-average rainfall. There may be an expansion in locations with overall poor rainfall performance. Climate models forecast increased chances for warmer-than-normal temperatures through May, and overall low agreement and weak signals for rainfall during the next several months. There are slightly elevated chances of above-normal March-to-May rainfall in portions of the Middle East, including in Iraq and Syria, according to WMO, NMME, and C3S ensemble forecasts.

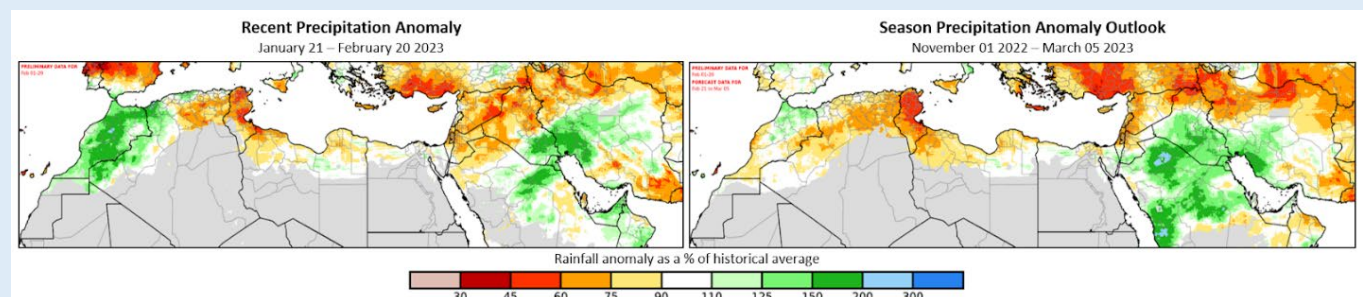
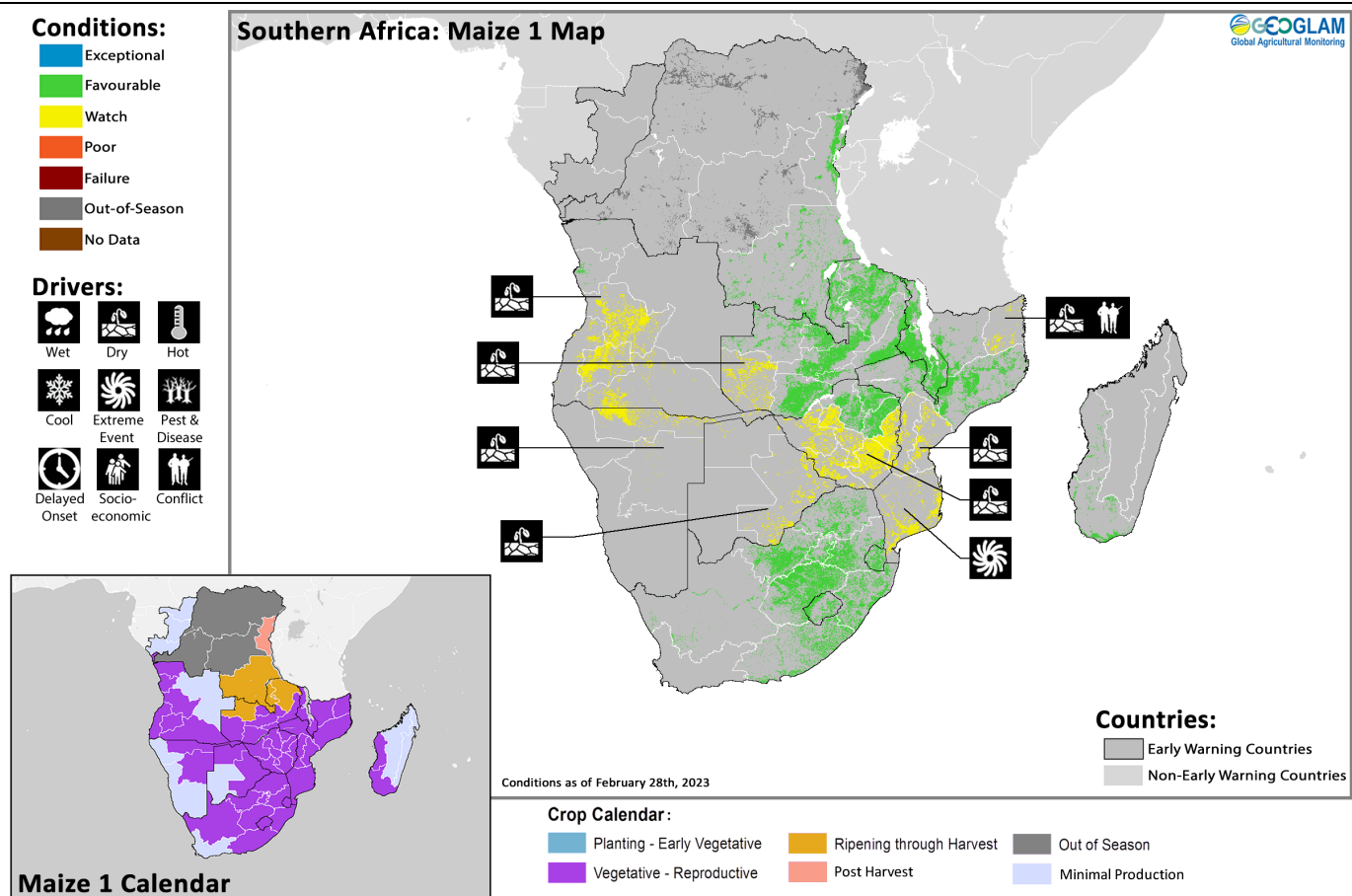


Figure 1. A recent rainfall anomaly and a seasonal rainfall anomaly outlook. Both panels are CHC Early Estimates, which compare current precipitation totals to the 1981-2021 CHIRPS average for respective accumulation periods. These show the percent of average precipitation for Jan. 21st to Feb. 20th 2023 (left), and for Nov. 1st 2022 to Mar. 5th 2023 (right). Both panels use CHIRPS Prelim for Feb. 1st to 20th 2023. The right panel also includes a CHIRPS-GEFS forecast for Feb. 21st - Mar. 5th 2023.

Source: UCSB Climate Hazards Center

Southern Africa



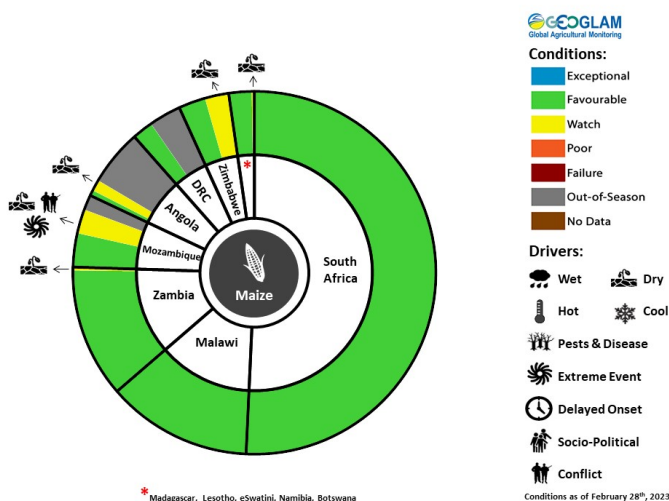
Crop condition map synthesizing Maize 1 conditions as of February 28th. Crop conditions over the main growing areas are based on a combination of inputs including remotely sensed data, ground observations, field reports, national, and regional experts. **Crops that are in other than favourable conditions are labeled on the map with their driver.**

In Southern Africa, harvesting of main season cereals is just beginning in **Angola** and **Zambia** while crops continue to develop across **Namibia, Botswana, Zimbabwe, South Africa, Lesotho, eSwatini, Mozambique, Malawi, and Madagascar** for harvest from March. Conditions remain mixed throughout the subregion due to dry conditions that have persisted through February, particularly in western areas (See Regional Outlook Pg. 11). The poor early season rainfall has caused a delay in planting in southern **Angola**, northern **Namibia, Botswana**, and southern **Zimbabwe**, which may lead to a reduction in planted area. Additionally, the dry spell in January resulted in severe moisture stress and permanent wilting across parts of **Botswana**, southern **Zimbabwe**, parts of southern **Mozambique**, and parts of central and eastern **South Africa**, leading to maize crop damage.

Conversely, the passage of Tropical Cyclone Cheneso in late January resulted in widespread flooding in **Madagascar, Mozambique, Malawi, South Africa**, and **eSwatini** as well as increased flows of the Maputo, Umbelizi, and Incomati rivers that could negatively affect cropping in some areas. Additionally, Very Intense Tropical Cyclone Freddy made landfall on the eastern coast of **Madagascar** on February 21, representing a significant flood risk for the island as the soils were already saturated from the impact of Tropical Cyclone Cheneso. The storm weakened overland but then re-strengthened as it passed through the Mozambique Channel and made landfall in southern **Mozambique** on February 24. Heavy rainfall resulting from the storm may also impact northern **South Africa, Zimbabwe**, and eastern **Botswana**. Furthermore, heavy January rains in southeastern **Angola** and northeastern **Namibia** caused flooding in Ondjiva, a city in southern **Angola** located in Cunene province, and surrounding areas. Floodwaters were observed along the Cuvelai lishanas, floodplains of the Cuvelai River system on the **Namibian** side, and water levels continue to rise in the main lishanas south of the **Angola/Namibia** border due to persistent rains. Elsewhere in the subregion, growing conditions remain favourable.

In **Angola**, the region has experienced below-average and erratic rainfall since the beginning of the season. Forecasts indicate dry conditions are likely to continue through the start of March across south and western areas of the country, but rains are likely to improve afterwards across much of the country through May (See Regional Outlook Pg. 11). According to the February FEWS NET Remote Monitoring Report, crop production expectations are better compared to the previous year due to forecast improved rains through April as well as the distribution of seeds that encouraged households in Huíla and Cunene to reseed crops. However, poor rainfall performance in Namibe is expected to result in low crop production for the province. In **Namibia**, the poor early season rainfall and the resulting delay in planting along with continuing dry conditions are an increasing concern in the main producing northern region and may significantly impact national production. In **Zambia**, heavy rains and storms have impacted wide areas of Kafue River region, including Southern, Central, Eastern, and Lusaka provinces since mid-January, resulting in severe flooding and river overflows.

However, rainfall performance has been below-average for much of the season, with dry conditions in February further impacting crops, particularly over southern areas. In **Botswana**, conditions have severely deteriorated due to persistent dry and hot weather. Despite some areas receiving recent rainfall in February, seasonal rainfall totals are below-average and some areas are experiencing record dryness (See Regional Outlook Pg. 11). In **Zimbabwe**, significant rainfall improvement during February led to improved rainfall totals in Manicaland. However, severe and extended dry spells over the past few months have negatively impacted crop development in Masvingo, and while there was above-average rainfall during February, the previous dryness may have an irreversible impact on overall production. In **South Africa**, overall conditions are favourable as above-normal rainfall from October through mid-February over most areas supported maize production (See Regional Outlook Pg. 11). In **Lesotho**, conditions remain favourable following above-average seasonal precipitation. However, heavy rains from November to December resulted in nutrient loss and impeded farming activities. According to the February FEWS NET Remote Monitoring Report, planted area is expected to be 30 percent below-normal due to high prices of seeds and fertilizers, and overall crop production is expected to be below-average. **Mozambique** has experienced mixed weather conditions since the start of the season, with below-average rainfall and dry conditions persisting from October through early February in the northeast while southern areas have received generally good rainfall (See Regional Outlook Pg. 11). However, heavy rains in early February resulted in widespread flooding in Maputo city and Maputo province located in the south of the country. Additional flooding is expected in Maputo province as flooded rivers in South Africa and eSwatini flow downstream, and the passage of Cyclone Freddy in late February brought additional heavy rainfall to the region. In **Malawi**, planting activities were delayed at the beginning of the season due to delayed rainfall onset and low precipitation amounts, though there was some rainfall improvement during November and December. As of late February, conditions have been mostly favourable despite erratic rainfall, but recent heavy precipitation has raised concerns regarding flooding and waterlogging in the south. Additional rainfall is expected in the coming months (See Regional Outlook Pg. 11). Furthermore, high prices of inputs may lead to reduced use of fertilizer and pesticides, resulting in lower yields, and some farmers may consequently switch to less input-intensive crops to minimize costs. In **Madagascar**, the passage of Tropical Cyclone Cheneso in mid-January resulted in flooding over northern regions of the country, and the passage of Very Intense Tropical Cyclone Freddy in late February brought additional heavy rainfall and strong winds to the east-central part of the country, posing significant risk for further flooding. In southern areas, ground conditions have improved due to good, albeit erratic, rainfall since the start of the season. In western areas, ground conditions are generally favourable and have improved from the previous month, but further improvement is needed. In the **Democratic Republic of the Congo**, harvesting of main season cereals is nearing completion in the east while crops continue to develop elsewhere, and overall conditions remain favourable despite previous heavy rainfall and flooding in South Kivu Province as well as along the Congo River and its tributaries. Land preparation is underway for main season sorghum crops in the north and second season maize crops in the east, and planting will begin in March.



For detailed description of the pie chart please see description box on Pg. 16.

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Regional Outlook: Dry conditions expected to continue over some rainfall deficit areas while wetter than average conditions are forecast during March to May 2023

Below-average rainfall continued during recent weeks in some areas with prevailing dry conditions— in Angola, Namibia, western Botswana, northwestern Madagascar, and portions of central-eastern and northern Mozambique. Above-average February rainfall improved October-to-date totals in central and southern Zimbabwe, northeastern South Africa, and eastern Botswana, bringing these from less than 75% of average to near-average by late February. However, poor distribution of seasonal rains, with low December and January amounts in many central locations, negatively impacted planting activities and resulted in severe moisture stress. Recent rains were also above-average in other parts of Zimbabwe, central Zambia, southern Malawi, western and southern Mozambique, and central-western Madagascar.

An expansion of drier-than-average conditions in western areas is highlighted by the percent-of-average rainfall map for October 1st to February 20th (Figure 1-left). The short-term forecast indicates that drier-than-average conditions will continue into early March in some of these areas, including southern Angola, Namibia, Botswana, and western Zimbabwe (Figure 1-middle). Above-average rainfall is forecast for eastern areas during this time. Cyclone Freddy made landfall in eastern Madagascar, near Mananjary, on Feb. 21st. As of February 23rd, the storm is forecast to make a second landfall on Friday the 24th along the Mozambique coast between Inhambane and Beira, potentially as a strong tropical storm. Heavy rains and damaging winds are likely in central and southern portions of Mozambique, and high rainfall amounts are also forecast in northeastern South Africa and eastern Zimbabwe.

Wetter-than-normal conditions are anticipated during March-April-May 2023, based on WMO (Figure 1-right) and C3S forecasts, which show 40-50% chances of above-normal rainfall in most areas. Variability in actual outcomes is likely, and the NMME indicates higher uncertainty in forecast MAM rainfall for central and southern Zimbabwe, central and southern Mozambique, Botswana, and Madagascar. Temperatures in eastern and northern areas will likely be warmer than normal.

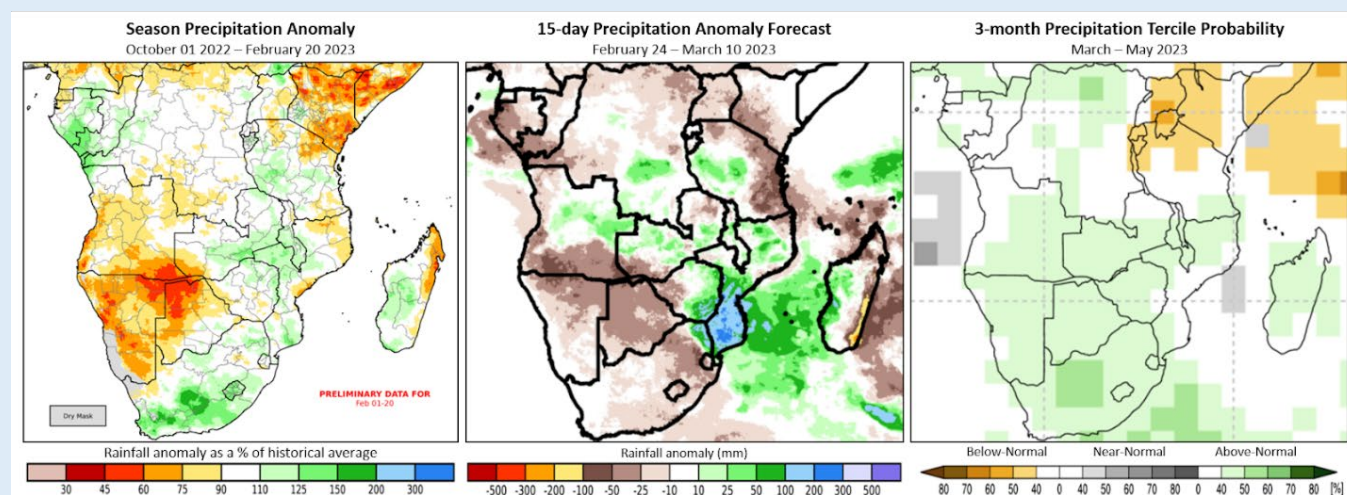
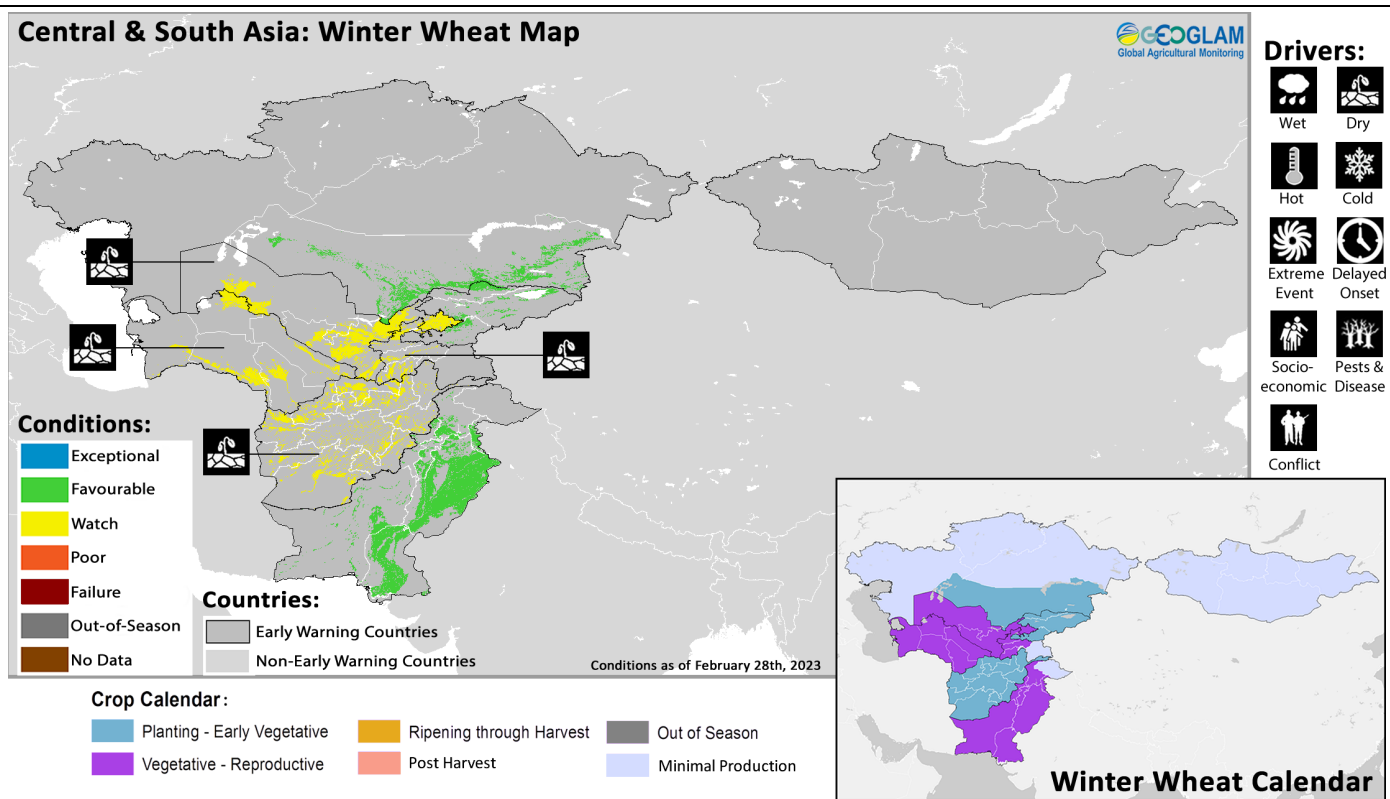


Figure 1. A seasonal rainfall anomaly, a 15-day rainfall anomaly forecast, and a 3-month rainfall probability forecast. The left panel shows the seasonal rainfall performance, represented as a percent of the 1981-2022 CHIRPS historical average, for Oct. 1st, 2022 to Feb 20th, 2023. The middle panel shows a 15-day CHIRPS-GEFS (unbiased GEFS) forecast from Feb 24th, with values indicating how the forecast compares to the CHIRPS average for this period. The right panel is a WMO probabilistic forecast for March to May 2023 precipitation, based on models initialized in February. From the [WMO Lead Centre Long-Range Forecast Multi-Model Ensemble](#).

Source: UCSB Climate Hazards Center

Central & South Asia

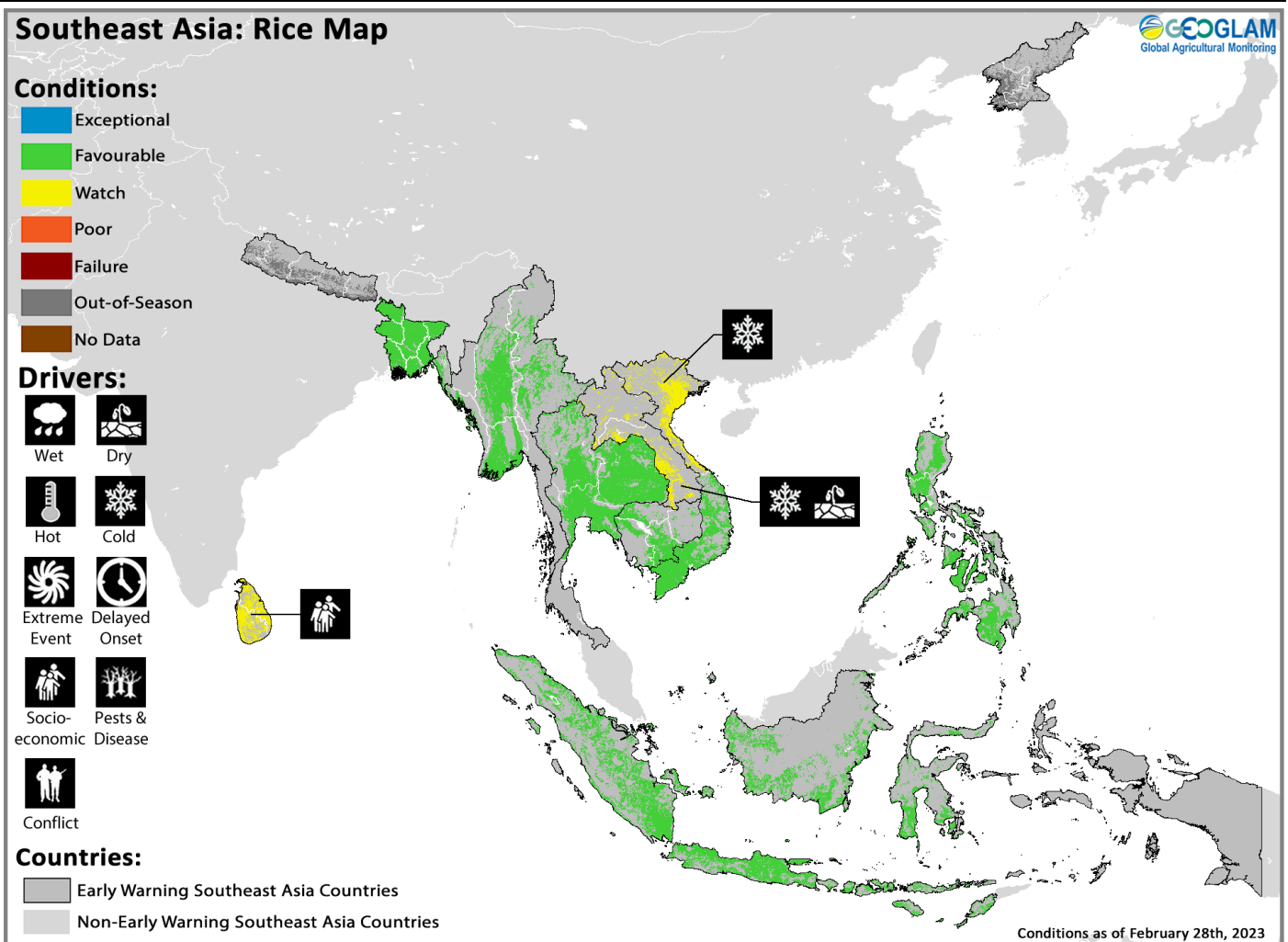


Crop condition map synthesizing Winter Wheat conditions as of February 28th. Crop conditions over the main growing areas are based on a combination of inputs including remotely sensed data, ground observations, field reports, national, and regional experts. **Crops that are in other than favourable conditions are labeled on the map with their driver.**

In Central and South Asia, winter wheat development continues in southern **Kazakhstan, Uzbekistan, Turkmenistan, Kyrgyzstan, Tajikistan, Afghanistan, and Pakistan** under mixed conditions as dry conditions continue to cause concern in **Uzbekistan, Turkmenistan, Tajikistan, and Afghanistan**. In addition, some crop damage may have resulted across **Turkmenistan and Tajikistan** due to a cold spell in mid-January that may have caused winter kill in areas not protected by snow cover. Conversely, conditions in **Pakistan** have improved from previous concerns regarding the 2022 flooding and potential input supply constraints. Additionally, land preparation is underway for spring wheat in **Afghanistan and Tajikistan**, and planting will begin in March.

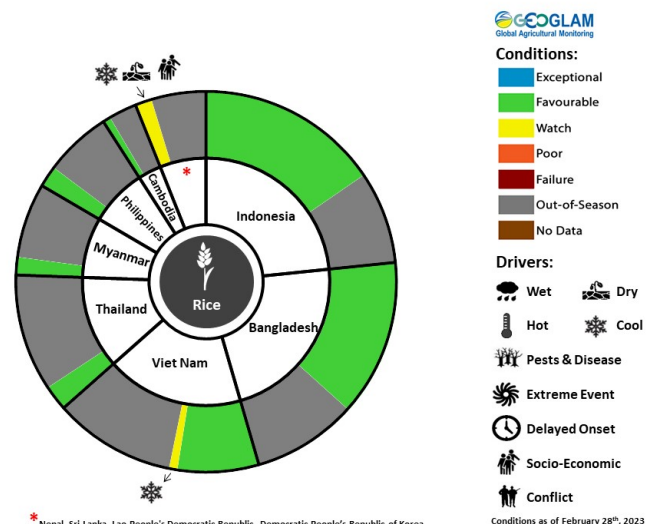
In the south and southeastern regions of **Kazakhstan** where winter crops are grown, precipitation and temperatures were above-normal during the first dekad of February. While growing conditions are currently favourable, the high temperatures may reduce the winter resistance of weakly developed crops. Conversely, a temperature decrease in the west could lead to freezing of weakly developed winter cereals if the snow is not evenly distributed or is absent. In **Afghanistan**, most of the country received below-average October to mid-February precipitation, while some parts of the southwest, central, and northeast received near-average precipitation. As of late February, snow water equivalent was below-normal over higher elevations in the northeast and central parts of the country, though conditions appear better than last year and overall water supply should be sufficient for the first crop cultivation. Land preparation for spring wheat crops is underway on the back of favourable distribution and frequency of precipitation in February. Additionally, the government ban on poppy cultivation as well as the distribution of seeds and fertilizers by humanitarian organizations is expected to benefit spring wheat plantings. Overall wheat area estimates for 2023 are expected to be slightly below to near-average, with the area of irrigated wheat expected to be below-average and the area of spring wheat expected to be near-average. In **Pakistan**, crop conditions are currently favourable and the area planted is officially estimated at a near-average level as standing waters from the 2022 record floods receded on time for plantings, and coordinated efforts of the government and donor community ensured an adequate supply of seeds and fertilizers.

Southeast Asia



Crop condition map synthesizing rice conditions as of February 28th. Crop conditions over the main growing areas are based on a combination of inputs including remotely sensed data, ground observations, field reports, national, and regional experts. **Crops that are in other than favourable conditions are labeled on the map with their driver.**

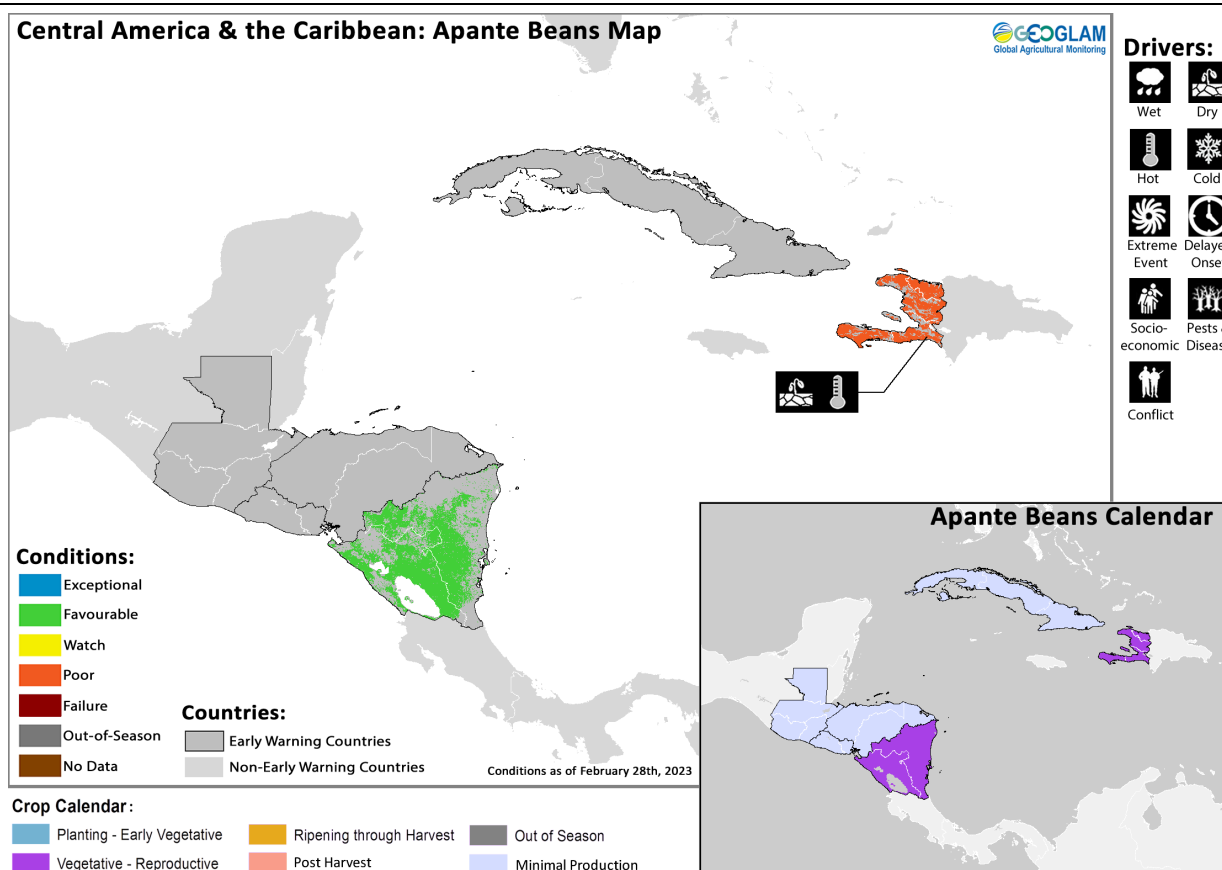
In northern Southeast Asia, planting of dry-season rice has almost completed in all countries and regions. This season, total rice planted area is expected to increase due to sufficient irrigation water availability. Crops are now in vegetative to harvesting stage under generally favourable weather conditions with high yields expected, except in **Laos** where limited agricultural water availability and sunlight may affect seasonal outcomes and in North **Viet Nam** where prolonged cold weather is impacting sowing activities. In **Indonesia**, sowing of wet-season rice continues into the fifth month with a total sown area of 6.2 million hectares, which is a 14.8 increase compared to last year due to plentiful rainfall and irrigation water supply, particularly in the northern area. Harvesting of earlier sown rice is continuing with good yields due to sufficient sunlight during the growing period. Harvested area has reached 1.6 million hectares and is progressing much faster than last year. In the **Philippines**, dry-season rice planted during the November to December period continues to develop under favourable conditions despite excessive rainfall in most parts of Luzon, Visayas, and western parts of Mindanao during the second half of January. In **Thailand**, dry-season rice is in the young panicle-forming to grain-filling stages under good water availability and weather conditions. Planted area reached up to 119 percent of the national plan as a result of higher irrigation water availability compared to the same period the previous year. However, the government is encouraging farmers to plant other high price and less water-intensive crops instead of rice. Yield and production are expected to



For detailed description of the pie chart please see description box on Pg. 16.

increase due to sufficient irrigation water availability and favourable weather conditions. In **Viet Nam**, sowing of dry-season rice (winter-spring rice) is continuing in the South with some provinces beginning to harvest, primarily in the Mekong River Delta. The current sown area is 1.82 million hectares. In the North, sowing of dry-season rice (winter-spring rice) is beginning with a slow start due to prolonged cold weather. The sown area so far is estimated at 107 thousand hectares, which is 89.9 percent of the same period last year. In **Laos**, dry-season rice is in the seeding and tillering stages. The planted area has reached 68 thousand hectares and 72 percent of the national production plan. The final planted area is estimated to be lower than the national production plan due to limited agricultural water availability and sunlight for cultivation. In **Myanmar**, over 772 thousand hectares of dry-season rice has been planted, accounting for 72 percent of the national plan of 1.06 million hectares, and the planting progress is similar to last year. However, the final planted area may be higher than last year due to the high availability of irrigation water with favourable weather conditions. Crops are mostly in tillering to panicle forming stages under favourable growing conditions. In **Cambodia**, planting of dry-season rice reached 666 thousand hectares, an increase of about 6 percent compared to last year. Around 25 percent of the cultivated area has now been harvested with an estimated yield of 4.50 tons per hectare. Growing conditions are generally favourable with a good final yield expected. In **Sri Lanka**, harvesting of *Maha* season maize and rice crops is now underway, and there is concern regarding the impact of lingering agricultural input constraints, including mainly fertilizer and pesticides, on cereal output. In **Nepal**, wheat crops continue to develop under favourable conditions as good weather since the beginning of October and ample supplies of irrigation water following the above-average May to September monsoon rains supported planting activities and benefitted crop germination. The area planted is estimated at an above-average level, driven by strong local demand. Planting of maize crops is now underway under favourable conditions. In **Bangladesh**, both *Boro* and *Aus* season rice crops are in vegetative to reproductive stage under favourable conditions, and production is estimated at an above-average level.

Central America & Caribbean

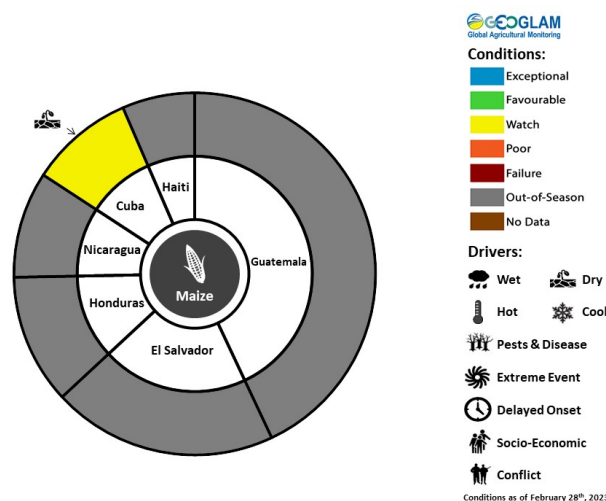


Crop condition map synthesizing Apante season bean conditions as of February 28th. Crop conditions over the main growing areas are based on a combination of inputs including remotely sensed data, ground observations, field reports, national, and regional experts. **Conditions that are other than favourable are labeled on the map with their driver.**

In Central America, harvesting of *Segunda/Postrema* season cereals is complete or nearing completion in **Nicaragua**, **El Salvador**, **Guatemala**, and **Honduras** under favourable conditions despite impacts of previous storm damage in **El Salvador** and **Guatemala**, below-average rains since 2022 in **Nicaragua** and **Guatemala**, and localized areas of dryness in **El Salvador**.

In **Nicaragua**, *Segunda/Postrema* maize and bean yields are expected to be near-average despite below-average precipitation since December, especially in the key bean-producing northern areas. *Apante* season bean crops are now in vegetative to reproductive stage for harvest from March. While below-average rainfall has been observed over much of the country since December, residual humidity of the soils due to rains received at the end of the *Postrema* season has resulted in average to slightly above-average soil

moisture across the country with positive effects on crop development. The Ministry of Agriculture forecasts near-normal crop outcomes for the *Apante* season as a result of timely rainfall distribution and residual soil moisture. In **Honduras**, crop conditions are near-average, including in the key bean-producing departments of El Paraíso, Olancho, and Comayagua. Despite near-average yields in **Guatemala**, subsistence households face lower than normal harvests as the high prices of agricultural inputs led to reduced plantings and fertilizer use. In **Haiti**, second season rice and *Hiver* season bean crops are in vegetative to reproductive stage for harvest from February, and crops are unlikely to recover from persistent dry conditions since the last quarter of 2022 as well as above-average temperatures that affected the availability of moisture in the soil. However, there are some areas of near-average vegetation in localized parts of the Ouest department. Dry conditions and high temperatures prior to the start of the *Printemps* season could have negative implications for planting and crop development in March. In **Cuba**, planting of 2023 main season maize and rice crops is underway with concern for developing dry conditions. Cumulative precipitation since October has been limited, especially in the central region, and has contributed to below-average conditions of germinating crops.



For detailed description of the pie chart please see description box on Pg. 19.

Regional Outlook: Elevated chances for below-normal MAM rainfall across most areas and above-normal temperatures in northern areas

There are elevated chances of below-normal March-April-May (MAM) 2023 rainfall across most of Central America (Figure 1-left), and elevated chances of above-normal temperatures in northern areas, including in Guatemala, Belize, Honduras, and Haiti (Figure 1-right). This pattern is a continuation of observed conditions since December 2022. This could potentially result in an irregular start to the Primera season with high probabilities of delayed sowing activities due to dry soil conditions. Negative impacts during moisture and/or heat-sensitive periods of crop development and from pests and disease are also a concern. Based on WMO and C3S seasonal forecasts, the chances of MAM rainfall being below-normal are around 40-60% across Central America. The NMME forecast is less confident; however, it shows some agreement in portions of Guatemala and Belize.

Below-normal MAM rainfall is also indicated in southern Haiti by the WMO. In addition, forecast above-normal temperatures could increase the chances of heat stress and accelerated losses of soil moisture under average rainfall conditions. There is less agreement from the other seasonal forecast ensembles regarding MAM rainfall, and additional uncertainty around spatial accuracy. Close monitoring of Haiti growing conditions are recommended, particularly due to poor performance in back-to-back growing seasons, and the observed below-average vegetation health in some areas.

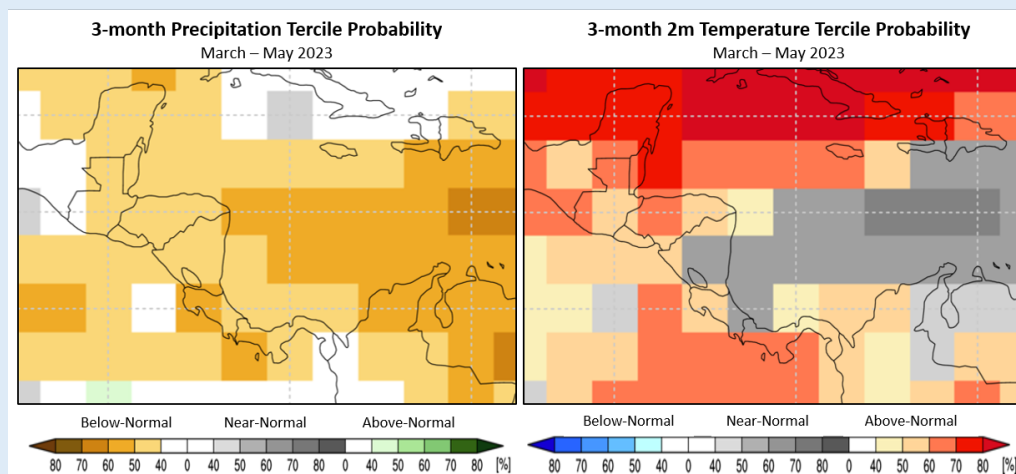


Figure 1. WMO probabilistic forecasts for March to May 2023. Right: MAM 2023 precipitation. Left: MAM 2023 2m temperatures. Forecasts are based on models initialized in February. Images are from the [WMO Lead Centre Long-Range Forecast Multi-Model Ensemble](#). Source: UCSB Climate Hazards Center

Pie Chart Description: Each slice represents a country's share of total regional production. The proportion within each national slice is colored according to the crop conditions within a specific growing area; grey indicates that the respective area is out of season. Sections within each slice are weighted by the sub-national production statistics (5-year average) of the respective country. The section within each national slice also accounts for multiple cropping seasons (i.e. spring and winter wheat) and are a result of combining totals from multiple seasons to represent the total yearly national production. When conditions are other than favourable icons are added that provide information on the key climatic drivers affecting conditions.

Information on crop conditions in the main production and export countries can be found in the Crop Monitor for AMIS, published March 2nd, 2023.

Appendix

Crop Conditions:

Exceptional: Conditions are much better than average* at time of reporting. This label is only used during the grain-filling through harvest stages.

Favourable: Conditions range from slightly lower to slightly better than average* at reporting time.

Watch: Conditions are not far from average* but there is a potential risk to final production. The crop can still recover to average or near-average conditions if the ground situation improves. This label is only used during the planting-early vegetative and the vegetative-reproductive stages.

Poor: Crop conditions are well below-average. Crop yields are likely to be 10-25% below-average. This is used when crops are stunted and are not likely to recover, and impact on production is likely.

Failure: Crop conditions are extremely poor. Crop yields are likely to be 25% or more below-average.

Out of Season: Crops are not currently planted or in development during this time.

No Data: No reliable source of data is available at this time.

"Average" refers to the average conditions over the past 5 years.

Note: In areas where conflict is a driver of crop condition, crop conditions are compared to the pre-conflict average rather than the average conditions over the past 5 years. In areas where conflict is protracted and based on expert analysis on a case by case basis, crop conditions will be compared to the average conditions over the past five years.

Drivers:

These represent the key climatic drivers that are having an impact on crop condition status. They result in production impacts and can act as either positive or negative drivers of crop conditions.

Wet: Higher than average wetness.

Dry: Drier than average.

Hot: Hotter than average.

Cool: Cooler than average or risk of frost damage.

Extreme Events: This is a catch-all for all other climate risks (i.e. hurricane, typhoon, frost, hail, winterkill, wind damage, etc.)

Delayed-Onset: Late start of the season.

Pest & Disease: Destructive insects, birds, animals, or plant disease.

Socio-economic: Social or economic factors that impact crop conditions (i.e. policy changes, agricultural subsidies, government intervention, etc.)

Conflict: Armed conflict or civil unrest that is preventing the planting, working, or harvesting of the fields by the farmers.



Crop Season Nomenclature:

In countries that contain multiple cropping seasons for the same crop, the following charts identifies the national season name associated with each crop season within the Crop Monitor for Early Warning.

MENA				
Country	Crop	Season 1 Name	Season 2 Name	Season 3 Name
Egypt	Rice	Summer-planted	Nili season (Nile Flood)	

East Africa				
Country	Crop	Season 1 Name	Season 2 Name	Season 3 Name
Burundi	Maize	Season B	Season A	
Ethiopia	Maize	Meher Season (long rains)	Belg Season (short rains)	
Kenya	Maize	Long Rains	Short Rains	
Somalia	Maize	Gu Season	Deyr Season	
Somalia	Sorghum	Gu Season	Deyr Season	
Uganda	Maize	First Season	Second Season	
United Republic of Tanzania	Maize	Long Rains	Short Rains	
United Republic of Tanzania	Sorghum	Long Rains	Short Rains	

West Africa				
Country	Crop	Season 1 Name	Season 2 Name	Season 3 Name
Benin	Maize	Main season	Second season	
Cameroon	Maize	Main season	Second season	
Cote d'Ivoire	Maize	Main season	Second season	
Ghana	Maize	Main season	Second season	
Mauritania	Rice	Main season	Off-season	
Nigeria	Maize	Main season	Short-season	
Nigeria	Rice	Main season	Off-season	
Togo	Maize	Main season	Second season	

Southern Africa				
Country	Crop	Season 1 Name	Season 2 Name	Season 3 Name
Democratic Republic of the Congo	Maize	Main season	Second season	
Mozambique	Maize	Main season	Second season	

Southeast Asia				
Country	Crop	Season 1 Name	Season 2 Name	Season 3 Name
Bangladesh	Rice	Boro	Aman	
Cambodia	Rice	Wet season	Dry season	
Indonesia	Rice	Main season	Second season	
Lao People's Democratic Republic	Rice	Wet season	Dry season	
Myanmar	Rice	Wet season	Dry season	
Philippines	Rice	Wet season	Dry season	
Sri Lanka	Rice	Maha	Yala	
Thailand	Rice	Wet season	Dry season	
Viet Nam	Rice	Wet season (Autumn)	Dry season (Winter/Spring)	

Central & South Asia				
Country	Crop	Season 1 Name	Season 2 Name	Season 3 Name
Afghanistan	Wheat	Winter-planted	Spring-planted	
Kazakhstan	Wheat	Winter-planted	Spring-planted	
Kyrgyzstan	Wheat	Winter-planted	Spring-planted	
Tajikistan	Wheat	Winter-planted	Spring-planted	

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In countries that contain multiple cropping seasons for the same crop, the following charts identifies the national season name associated with each crop season within the Crop Monitor for Early Warning.

Central America & Caribbean				
Country	Crop	Season 1 Name	Season 2 Name	Season 3 Name
Cuba	Rice	Main season	Second season	
El Salvador	Beans	Primera	Postrera	
El Salvador	Maize	Primera	Segunda	
Guatemala	Beans	Primera	Postrera	Apante
Guatemala	Maize	Primera	Segunda	
Haiti	Maize	Main season	Second season	
Honduras	Beans	Primera	Postrera	
Honduras	Maize	Primera	Segunda	
Nicaragua	Beans	Primera	Postrera	Apante



GEOGLAM

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Contributing partners



*EC contribution is provided by the Joint Research Centre of the European Commission