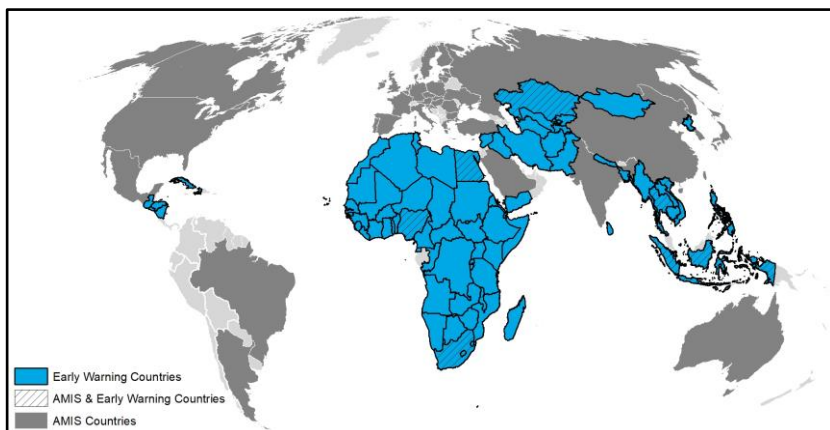**GEOGLAM** Global Agricultural Monitoring

Crop Monitor
EARLY WARNING

Overview:

In **East Africa**, harvesting of main season cereals continued in the north while planting and development of second season cereals is underway in south and central areas, and there is concern in some areas due to impacts from flooding, erratic rainfall and dry conditions, desert locusts, and ongoing socio-economic challenges and conflict. In **West Africa**, harvesting of main season cereals will finalize in December while planting and development of second season cereals is underway in the south, and conditions are favourable except in areas affected by continued conflict. In the **Middle East and North Africa**, planting of winter wheat crops continued in November, and there is concern in parts of North Africa due to insufficient precipitation and in conflict-affected areas of Syria and Libya. In **Southern Africa**, harvesting of winter wheat finalized in November under favourable conditions. Planting of main season cereals is underway, and conditions are favourable and likely to benefit from forecast near-average rainfall for the December to February period (See Regional Outlook pg. 13). In **Central and South Asia**, planting and development of winter wheat crops continued in November under favourable conditions except in Afghanistan due to erratic seasonal rainfall. In northern **Southeast Asia**, above-average rainfall is expected to benefit yields; however, there is concern in parts of the subregion where a series of tropical cyclones from October damaged crops, particularly in parts of Cambodia and the Philippines. In **Central America and the Caribbean**, *Postrera/Segunda* season bean and maize harvests are expected to be significantly below-average as two Category 4 hurricanes in November brought heavy rainfall and strong winds throughout the subregion, resulting in extensive crop damage (See Regional Alert pg. 21).
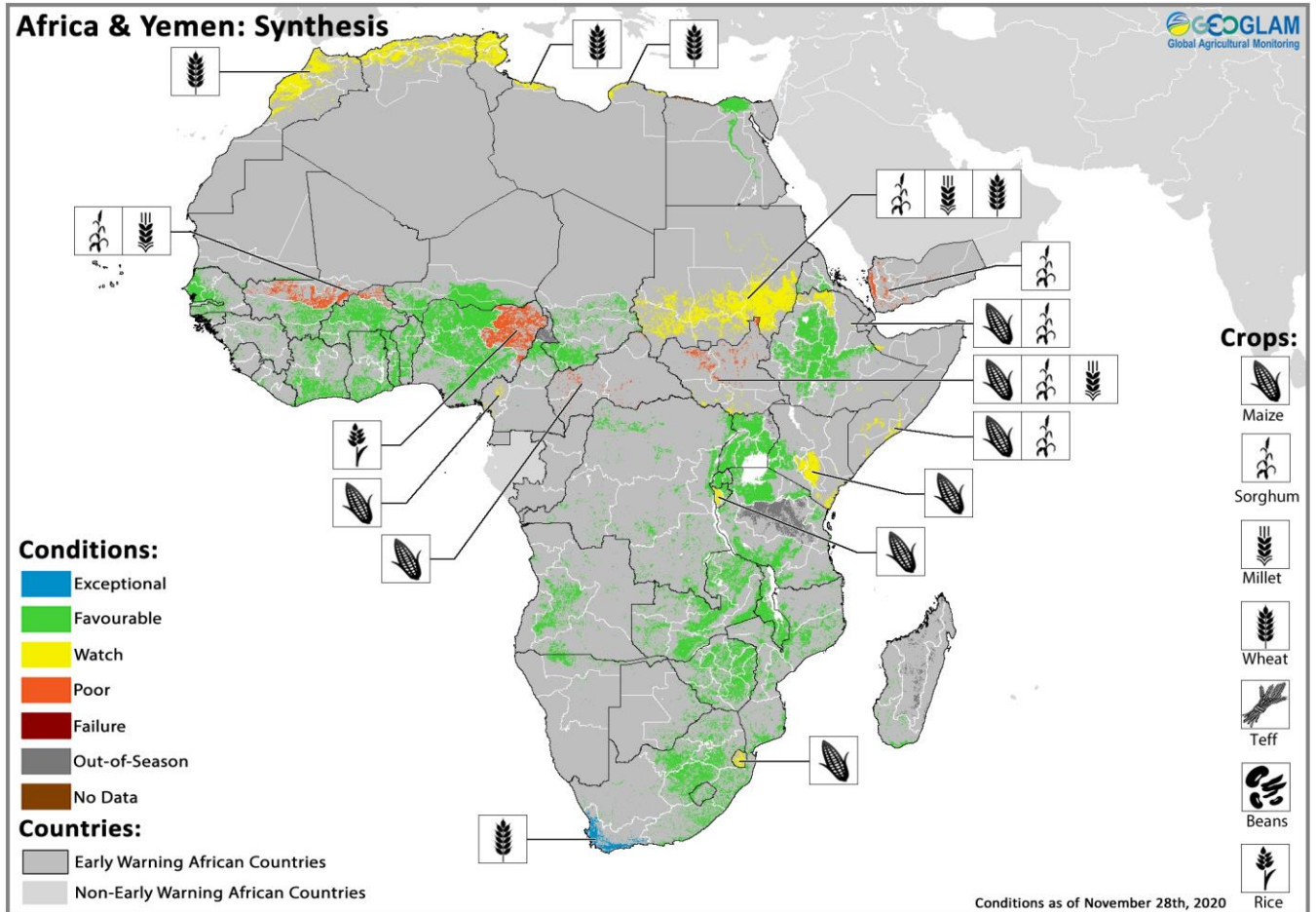
Contents:

Early Warning Countries
AMIS & Early Warning Countries
AMIS Countries

GEO GROUP ON EARTH OBSERVATIONS

The Crop Monitor is a part of GEOGLAM, a GEO global initiative.

GEOGLAM Crop Monitor for Early Warning

Crop Conditions at a Glance
based on best available information as of November 28ᵗʰ

*Crop condition map synthesizing information for all Crop Monitor for Early Warning crops as of November 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: In the north, harvesting of main season cereals continued in November to be finalized in January, and there is concern in areas impacted by flooding, desert locusts, and ongoing conflict and socio-economic challenges. In central and southern areas, planting and development of second season cereals is underway, and there is concern due to erratic rainfall received through the October to December (OND) rainfall period and impacts from desert locusts (See Desert Locust Alert pg. 4 & Regional Outlook pg. 8).

WEST AFRICA: Harvesting of main season cereals is complete in some areas and will complete across the Sahel in December, while planting of second season cereals is underway in the south. Crop prospects are generally favourable due to good seasonal rainfall, except in areas affected by ongoing conflict.

MIDDLE EAST & NORTH AFRICA: Planting of winter wheat crops continued in November, and there is concern in areas impacted by limited precipitation as well as in conflict-affected areas of Syria and Libya. In Egypt, harvesting of summer-planted maize and rice crops finalized under favourable conditions.

SOUTHERN AFRICA: Harvesting of winter wheat finalized in November under favourable conditions. Planting of main season cereals continued throughout the subregion under favourable conditions except in areas that experienced dry spells in November. Forecast near-average rainfall for the December 2020 to February 2021 period is likely to benefit crop development (See Regional Outlook pg. 13).

CENTRAL & SOUTH ASIA: Planting and development of winter wheat continued in November under generally favourable conditions except in Afghanistan where dry conditions and erratic rainfall delayed planting.

SOUTHEAST ASIA: In the north, harvesting of wet-season rice crops is nearing completion, and final yields are expected to be favourable except in areas where flooding from a series of tropical cyclones damaged crops, particularly in parts of Cambodia and the Philippines. Forecasts indicate above-average rains are expected to continue through February 2021 (See Regional Outlook pg. 18). In Indonesia, harvesting of dry-season rice is nearing completion with likely good yields, and sowing of wet-season rice is underway.

CENTRAL AMERICA & CARIBBEAN: Harvesting of *Postrera/Segunda* season maize and bean crops continued in November, and significantly below-average yields are expected due to damage from Hurricanes Eta and Iota in November which followed along similar paths, resulting in flooding, landslides, and extensive crop damage throughout the subregion (See Regional Alert pg. 21).

The Crop Monitor for Early Warning is a part of GEOGLAM, a GEO global initiative. www.cropmonitor.org

Global Climate Outlook: Global 30-day Subseasonal Rainfall Forecast Anomaly for December 2020

The 30-day Subseasonal (SubX) forecast indicates a likelihood of above-average rainfall for December 2020 over Costa Rica, Panama, Colombia, southern Venezuela, Ecuador, Northern Peru, northern Brazil, southern Brazil, northern Argentina, southern and eastern Spain, southwest Iran, coastal Morocco, Tanzania, southern DRC, eastern Angola, Zambia, central Mozambique, southern Zimbabwe, southern Botswana, southern India, central Vietnam, Philippines, southern and eastern Indonesia, Papua New Guinea, and northern and eastern Australia. There is also a likelihood of below-average December 2020 rainfall across the western and southeastern United States, Central Brazil, southern Peru, Bolivia, Gabon, the Central Republic of the Congo, Madagascar, southeastern China, southern Japan, and western Indonesia.

Monthly Precipitation Forecast

For 30 days starting on November 26th 2020
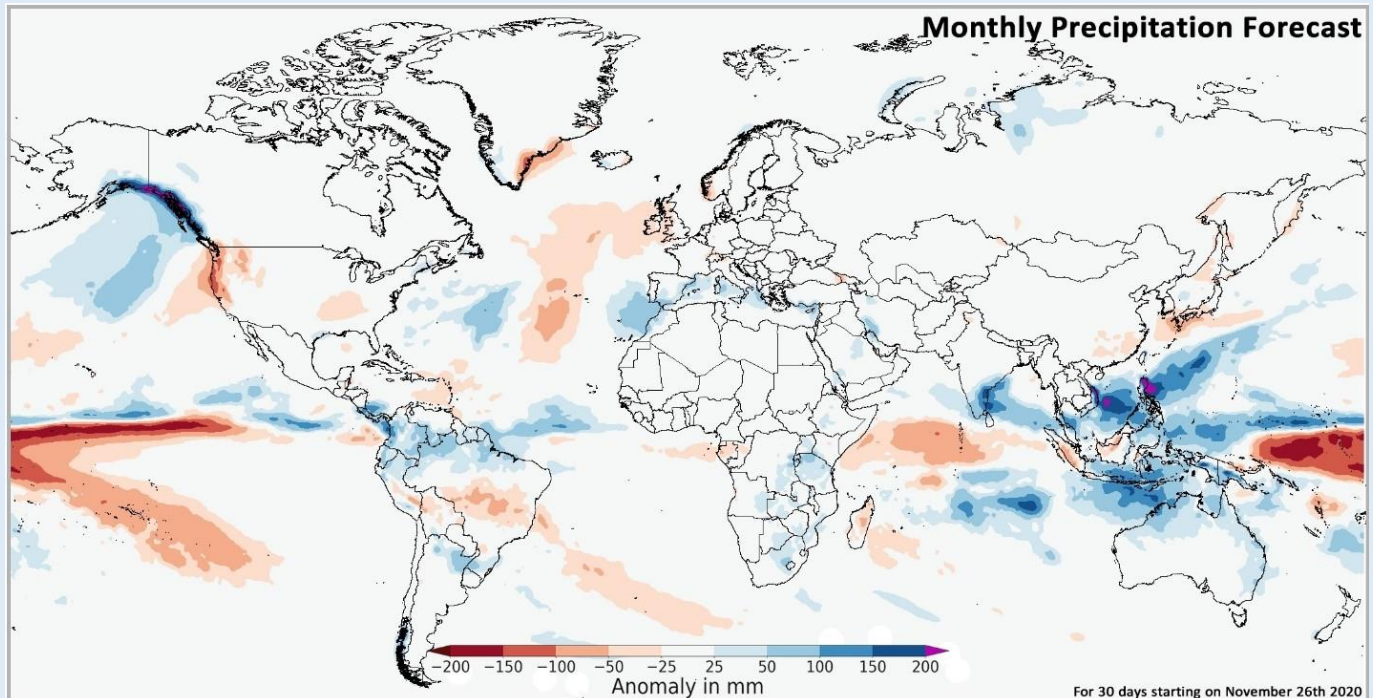
Multimodel mean subseasonal forecast of global rainfall anomaly for the 30-days starting from November 26th showing areas of above or below-average rainfall. The image shows the average of four Subseasonal Experiment (SubX) model forecasts from that day. The anomaly is based on the 1999 to 2016 model average. Skill assessments of SubX can be accessed here.
Source: UCSB Climate Hazards Center

Climate Influences: La Niña is present and expected to continue through early 2021

The El Niño-Southern Oscillation (ENSO) is currently in the La Niña phase, with very cool ocean conditions in the eastern equatorial Pacific. La Niña conditions are expected to continue during January to March 2021 (~95% chance) and potentially through March to May (~65% chance).

La Niña conditions typically reduce December to February/May rainfall in East Africa, the southern United States, the northern Middle East, southern Central Asia, Afghanistan, Pakistan, and India. Southern Brazil, northern Argentina, eastern China, the Korean Peninsula, and southern Japan typically see reduced rainfall into January. La Niña conditions typically increase December to February/May rainfall in Southeast Asia, Southern Africa, southern Central America, northern South America, and in southernmost India and Sri Lanka. Australia and Indonesia typically see increased rainfall into December.
Source: UCSB Climate Hazards Center

Desert Locust Alert: Northerly winds result in resurgence of locusts in Northeast and Eastern Kenya

The ongoing desert locust outbreak continues to cause concern across East Africa, particularly in eastern **Ethiopia** and central **Somalia** where desert locust breeding continues and hopper bands are present. In these areas, a new generation of immature swarms is expected to form by the end of November and will continue throughout December due to widespread hatching and band formation. The swarms are then expected to migrate to southern **Ethiopia**, southern **Somalia**, and northern **Kenya**. Also, heavy rainfall from Tropical Cyclone Gati in late November is likely to increase vegetation biomass and may allow immature swarms near Hargeisa and Jijiga areas of **Ethiopia** to rapidly mature and lay eggs. Strong winds from Gati may have also caused swarms to move southeast to the Ogaden where they would mature and lay eggs. Across the subregion, adult locusts are present in large numbers in **Sudan**, **Eritrea**, **Ethiopia**, and **Somalia**, and swarms have been reported in northeast, east, and coastal regions of **Kenya**, central, north, northeast, and eastern **Ethiopia**, northwest, northeast, and central **Somalia**, northeastern **Sudan**, and highland areas of **Eritrea**. There is growing concern in **Kenya** as strong northerly winds in November carried mature swarms and groups from southern **Somalia** to northeast and eastern **Kenya**. Some small swarms reached further south in **Kenya** near the border with northeast **United Republic of Tanzania**, and there is a possibility of swarms crossing the border. However, winds will shift by November 22nd, and locusts will no longer be expected to come from the north. Wind direction is forecast to favour south and west swarm movement in **Somalia** and north and northwest swarm movement in northern **Ethiopia**, **Eritrea**, and northern **Sudan**. Current ecological conditions and availability of green vegetation is most suitable in the northern subregion due to above-average rainfall received throughout the season, particularly in **Sudan**, northern **Ethiopia**, and northern **Somalia**.

East Africa Update

In **Kenya**, northerly winds have caused locusts to invade northern and eastern areas of Mandera, Garissa, Isiolo, Kitui, Tana River, and Taita Taveta counties, and hopper bands have begun forming in the northwest in Samburu County. Most swarms are nearing maturity and could begin egg-laying in the northeast where recent rains have fallen, and hatching and band formation could start in early December. Climatic conditions are suitable for locust development in east and coastal areas. In **Ethiopia**, adult locusts have been reported along Rift Valley and Ahmar mountains, and while conditions have improved in the north, breeding continues in the east where climatic conditions are suitable for further development. Control operations have been scaled back in Tigray as tensions escalate between the federal government and Tigray regional government forces. Locusts are projected to move from Doolo, Korahe, Shabelle, and Jarar to Nogob, Afder, and eastern Bale and from Deubawi, Mehakeleghaw, and Misraqawi to southern parts of Eritrea. In **Somalia**, Adult locusts have been reported in Woqooyi Galbeed, Togdheer, Sool, and Galguduud, and an increasing number of hopper bands are forming in central areas. Climatic conditions are suitable for locust development in south and central areas, and locusts are projected to move from Galguduud and Mugud to Hiiraan, Shabeelle, Jubba, and Bay regions. In **Eritrea**, adults are present in Debub region, and groups of hoppers and adults remain in winter breeding areas on the northern Red Sea coast. In **Sudan**, adult locusts are present along Northern Kordofan, Northern, River Nile, and Red Sea states, hopper bands and swarms are present in summer breeding areas east of the Nile Valley, and swarms are maturing in the winter breeding areas on the Red Sea coast. In the **United Republic of Tanzania**, a few swarms that reached Taita Taveta county in Kenya could reach northeastern regions of Kilimanjaro, Manyara, and Tanga.

Arabian Peninsula Update

In November, strong southerly winds caused immature swarms to move from the interior in **Yemen** to southwest and central **Saudi Arabia**, and some swarms may continue north towards **Iraq**. In **Yemen**, summer swarms remain, and several swarms moved from summer breeding areas of the interior to the Red Sea coast for winter breeding.
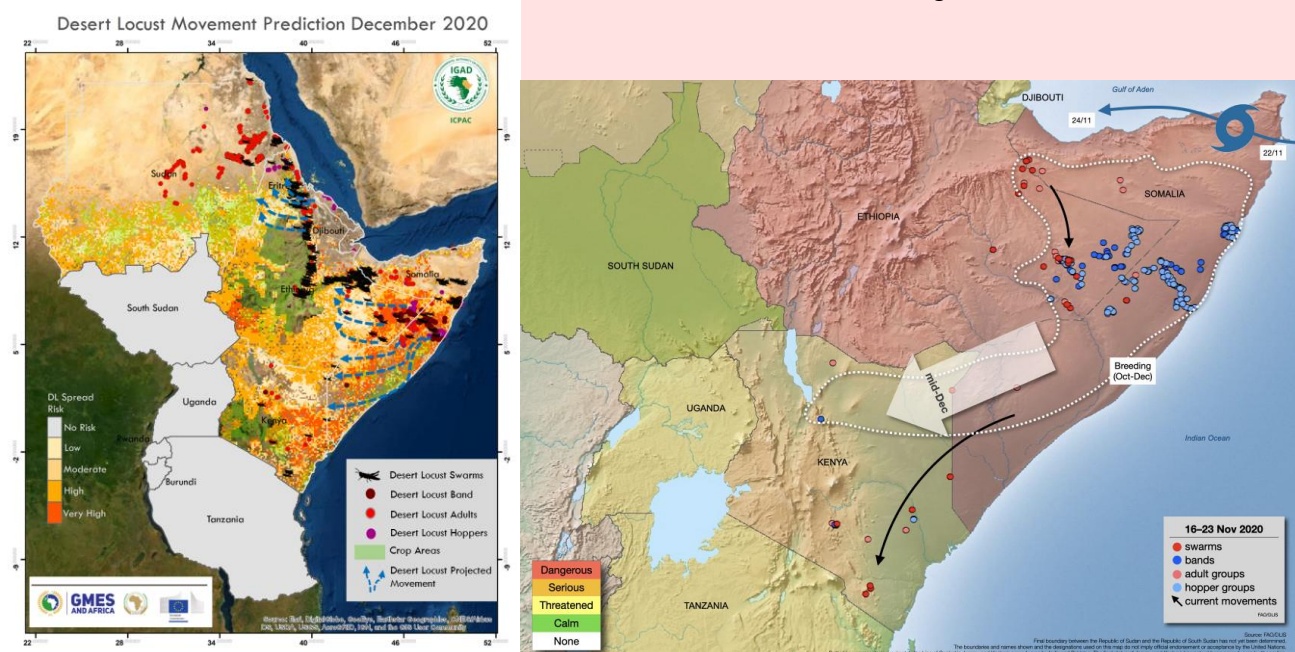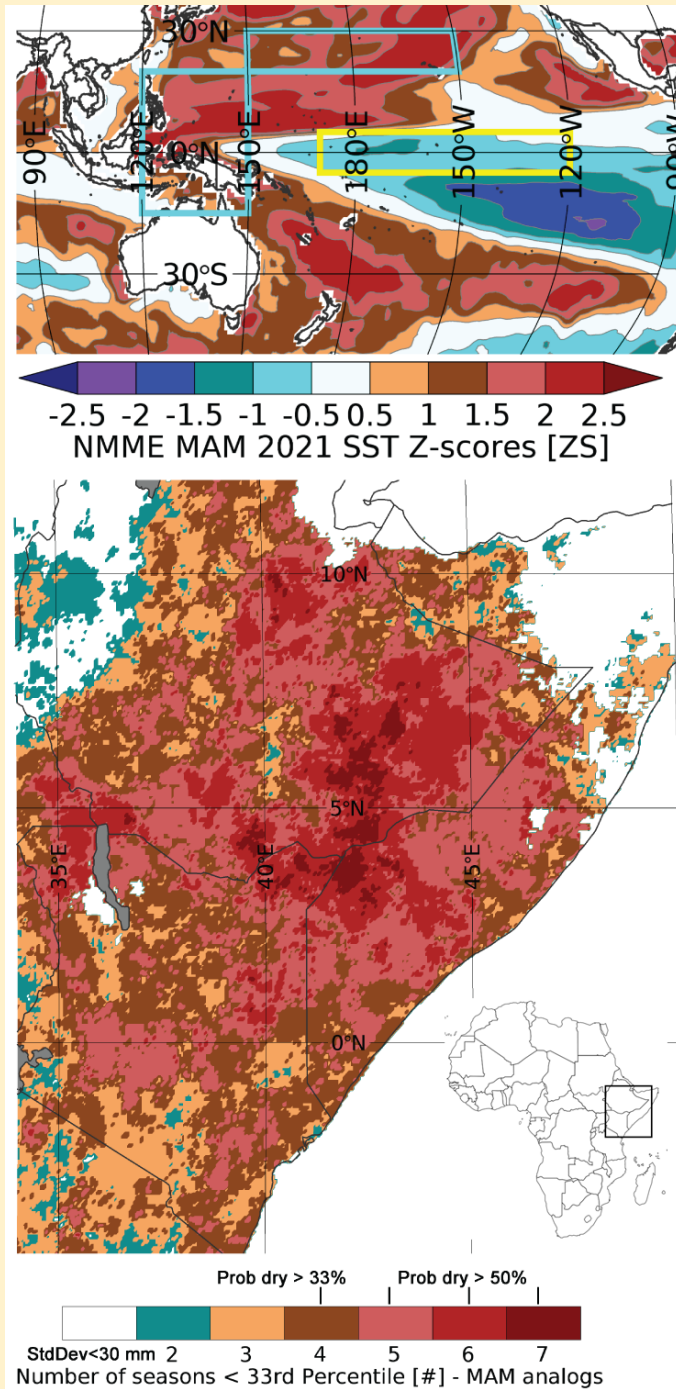

Figure 1. (Left) Desert Locust Movement Prediction December 2020. Source: IGAD ICPAC. (Right) Desert Locust Update November 16-23 2020. Source: FAO DLIS

Seasonal Forecast Alert: Below-average 2021 March-to-May rains are anticipated across parts of Eastern Africa

Current and forecast ocean and atmosphere conditions continue to raise concern about a below-average 2021 March-April-May (MAM) "long" rains season. A Pacific temperature configuration conducive to drier outcomes is currently present and is forecast to remain active for MAM 2021.

In recent years, Pacific Ocean sea surface temperatures have often provided early indications of below-average long rains in eastern East Africa. A much warmer-than-average western and subtropical Pacific, combined with cooler-than-average eastern Pacific temperatures, tends to produce a teleconnection that disrupts typical moisture patterns, leading to an increased chance of below-average "long" rains.

This long-range below-normal outlook for MAM 2021 in the eastern Horn is based on the forecast persistence of a moderate to strong La Niña into the spring of 2021 (65% chance for MAM 2021) accompanied by very warm (1 to 2+ standard deviations above-average) western and subtropical northern Pacific sea surface temperatures (Figure 1- top). Thus, heightened concern for MAM appears warranted. An examination of eight recent seasons with similar sea surface temperature forecasts reveals that seven out of eight experienced poor to very poor rainfall outcomes over the eastern Horn of Africa. However, weather anomalies can still generate very wet seasonal totals, as occurred during the outlier 2018, which was an extremely wet season. The bottom panel of Figure 1 shows how many of the eight analogs had below-normal observed rainfall. Regions with five or more below-normal outcomes can be considered as "likely" to have below-normal MAM rains, i.e., there is at least a 50% chance of below-normal rains. Therefore, the analogs indicate a substantial risk of a below-normal MAM season for eastern East Africa.

Figure 1. Forecast 2021 Indo-Pacific sea surface temperature configuration and the frequency of below-normal March-to-May (MAM) rainfall outcomes in past similar situations. The top panel shows the NMME November 2020 initial condition forecast MAM 2021 standardized sea surface temperature anomalies. In recent years, a combination of warm west Pacific Ocean conditions (blue boxes) and cool east Pacific conditions (yellow box), have tended to produce below-average eastern East African MAM rains. The bottom panel shows counts of analog seasons with below-normal rainfall. Eight analogs were used (1999, 2000, 2001, 2008, 2011, 2012, 2017, and 2018), so 5 or more below-normal seasons indicates a 50% or greater chance of low precipitation. Four below-normal seasons indicates a ~37.5% chance. "Below-normal" is defined as within the bottom 33% of the 1981-2019 rainfall distribution. Note that areas with very low rainfall were excluded from this analysis.
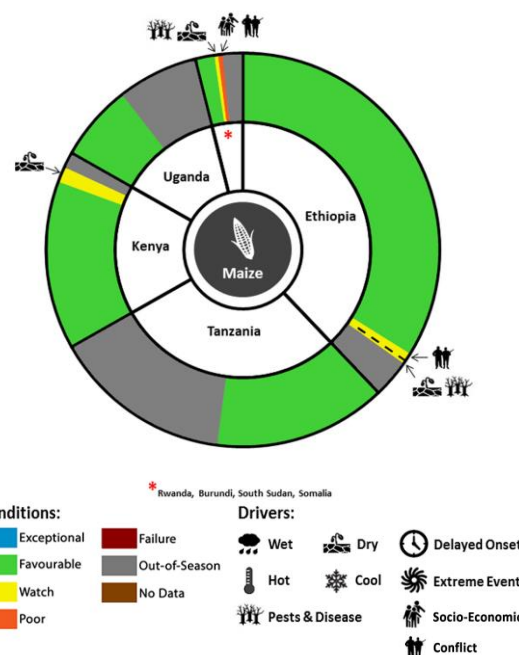*Source: UCSB Climate Hazards Center*

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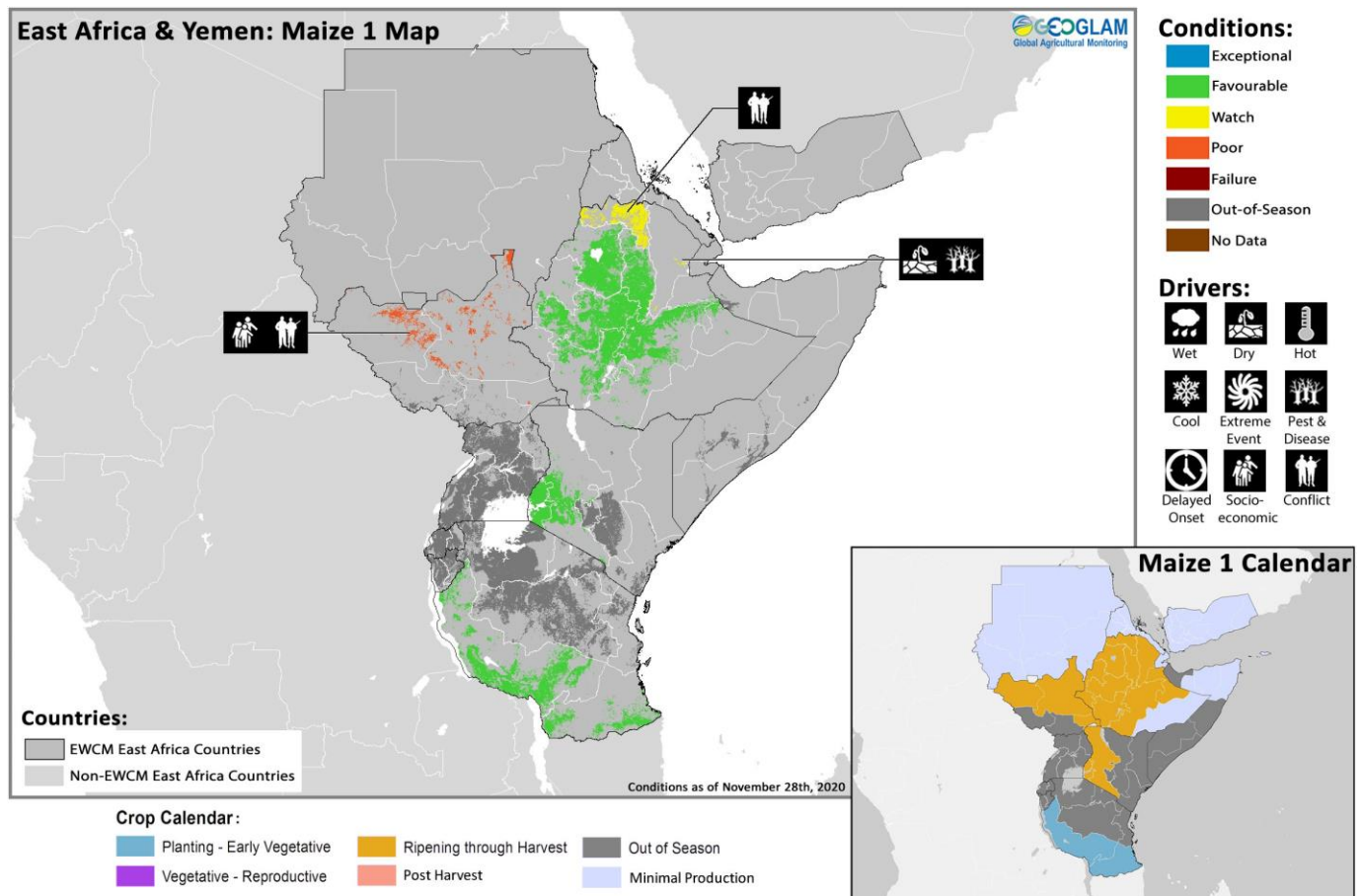
*Crop condition map synthesizing Maize 1 conditions as of November 28th. Crop conditions over the main growing areas are based on a combination of inputs including remotely sensed data, ground observations, field reports, national, and regional experts. **Conditions that are other than favourable are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

In northern parts of the subregion, harvesting of main season crops is underway in **Djibouti**, **Eritrea**, **Ethiopia**, **Sudan**, and **South Sudan** to be finalized in January. In central and southern parts of the subregion, harvesting of long rains cereal crops is nearing completion in main producing areas of West and Rift Valley **Kenya** with favourable production prospects while planting and development of second season maize and sorghum crops is underway in **Burundi**, **Kenya**, **Rwanda**, **Somalia**, **South Sudan**, **Uganda**, and the **United Republic of Tanzania.** Throughout the subregion, there is concern in areas impacted by flooding, dry conditions, desert locusts, and ongoing socio-economic challenges and conflict. Since June, close to 3.6 million people have been impacted by floods and landslides across the subregion, resulting in widespread population displacement, crop losses, and food security impacts. Conversely, following a poor start to the seasonal rains in October, moisture deficits are likely to impact development of second season cereals in eastern **Kenya** and parts of southern **Somalia**. Recent forecasts indicate mixed rainfall conditions are expected across most parts of the subregion for the remainder of the OND season and for the upcoming March April May (MAM) period which may affect crops in some areas if forecasts materialize (See Seasonal Forecast Alert pg. 5 and Regional Outlook pg. 8). The risks of below-average rainfall in some areas could compound the impacts that countries are still facing with desert locusts, flooding, and COVID-19 with little time to adapt between climate shocks.

Northern East Africa & Yemen

In **Ethiopia**, harvesting of *Meher* season (long rains) cereals continued in November, and there is concern in areas impacted by recent conflict, desert locust outbreaks, and dry conditions. In Tigray Region, conflict that erupted in early November has already resulted in massive internal displacements and movement of refugees into eastern Sudan, resulting in disruptions to ongoing harvesting activities. Also, in Afar and South Somali regions, dry conditions are impacting crop development, and presence of desert locusts is posing a risk to crops (See Desert Locust Alert pg. 4). On November 16th, the Government reported that desert locusts damaged crops on 365,015 hectares of land in Western and Eastern Hararghe Zones of Oromia Regional State as well as Oromo Special Zone, South Wollo, and North Wollo zones of Amhara Regional State. Planting of main season sorghum and teff is underway in South Somali region, and there is concern as dry conditions are impacting planting activities. In **Eritrea**, harvesting of winter wheat and main season sorghum crops began in November under favourable conditions to be finalized in January. In **Djibouti**, harvesting of main season millet and sorghum crops began in November under favourable conditions and will finalize in December. In **Sudan**, harvesting of main season millet and sorghum crops began in November while planting of winter wheat is underway in north and eastern parts of the country, and there is concern as heavy rainfall from mid-July through mid-September caused widespread flooding and

displacement, especially in riverine areas along the White Nile, Blue Nile, and Nile Rivers. While the above-average rainfall benefitted crop development in some areas, harvests are expected to be below-average, notably in Gadaref, Sennar, and the Blue Nile due to significant crop losses and delays in harvest from flooding and labour shortages. Also, a rapid increase in inflation rates, protracted economic crisis exacerbated by COVID-19 related restrictions, and fuel shortages continue to impact farmers and increase prices of agricultural inputs, further inflating production and transportation costs. In **South Sudan**, harvesting of main season cereals continued in November while second season maize and sorghum crops are in vegetative to reproductive stage to be harvested from December. There is concern due to impacts from flooding as well as ongoing conflict and socio-economic challenges. Flooding since June has affected 856,000 people with Jonglei state amongst the worst affected, and the floods have compounded the impacts of increased inter-communal violence since early 2020. From July to mid-November, abnormally heavy rainfall led to river overflows of the Nile, Pibor, Sobat, Lol, and other rivers as well as inland flooding, primarily in east and central areas. A total of 1,034,000 people have been affected by flooding with 418,000 displaced, and the flooding has destroyed harvests in the most affected areas. In **Yemen**, harvesting of main season sorghum crops finalized in November, and yields are estimated to be significantly below-average due to the combined impacts from ongoing conflict, socio-economic challenges that prevented farmers from accessing inputs, COVID-19 restrictions, flooding throughout the season, particularly on the western coast, as well as desert locust impacts.

*Rwanda, Burundi, South Sudan, Somalia

For detailed description of the pie chart please see description box on pg. 20.
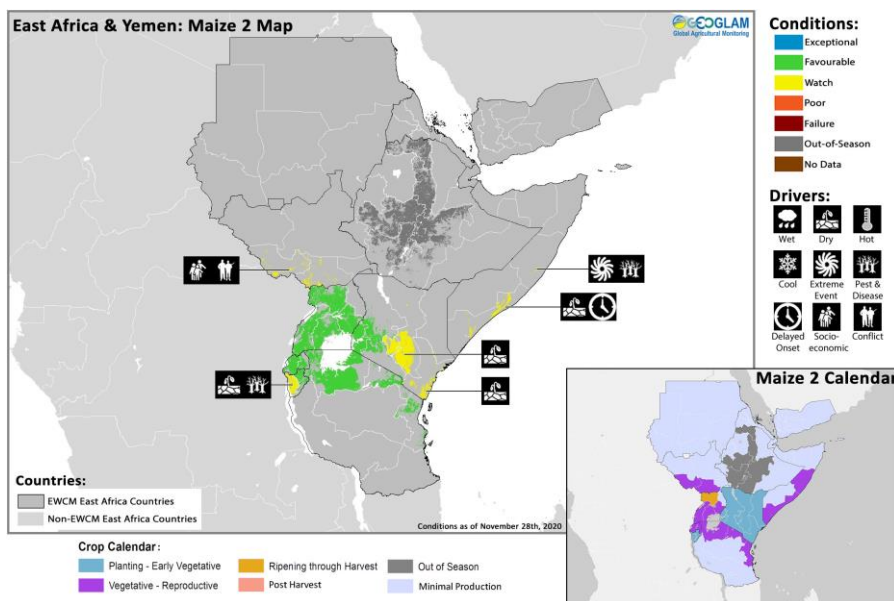
Crop condition map synthesizing Maize 2 conditions as of November 28th. Crop conditions over the main growing areas are based on a combination of inputs including remotely sensed data, ground observations, field reports, national, and regional experts. **Conditions that are other than favourable are labeled on the map with their driver.**

Southern East Africa

In **Somalia**, *Deyr* season maize and sorghum crops are in vegetative to reproductive stage to be harvested from December, and there is concern due to delayed onset rains and cumulative dry conditions in southern parts of the country as well as impacts from Tropical Cyclone Gati and desert locust presence in the northwest and central areas (See Desert Locust Alert pg. 4). The October to December *Deyr* season rains have performed better than previously forecast in central and southern areas and are likely to mitigate crop losses; however, cumulative rainfall in parts of the south remains below-average. Also, in south and central areas, intermittent heavy rains have led to flooding and affected farmlands in riverine areas. Heavy *Deyr* seasonal rainfall from mid-October has resulted in widespread flooding, displacing 108,000 people, particularly in South West, Jubaland, Hirshabelle, Galmudug, and Banadir regions.

In South West State, rising water levels of the Shabelle River has resulted in overflow and inundated farmland in six villages, and in Jubaland State, the overflow of the River Dawa has also inundated riverine cropping areas. Furthermore, on November 22nd, Tropical Cyclone Gati made landfall over northern Somalia in Puntland's Bari region before moving west along the coast of northern Somalia and weakening and heading into the Gulf of Aden. The storm brought heavy rains and strong winds, triggering flash floods along coastal and inland areas. Gati was the strongest tropical cyclone on record in the northern Indian Ocean and the first instance of a hurricane-strength system making landfall in the region. Northern Somalia typically receives four inches of rain per year, and Gati is estimated to have brought up to eight inches alone over two days. Bosaso reported 128 mm of rainfall in 24 hours, and extensive damage was reported in Bari region. Erratic *Deyr* rains are likely to be followed by drier than average conditions through January 2021 that could further impact the development of late planted and replanted *Deyr* season crops (See Seasonal Forecast Alert pg. 5 & Regional Outlook pg. 8). In **Uganda**, harvesting of second season maize crops is underway in the north while crops are still developing in other parts of the country, and overall conditions are favourable. However, sustained rainfall has caused water levels to rise in Lake Albert and Lake Kyoga, resulting in flooding in five districts. In **Kenya**, harvesting of winter wheat crops finalized in November under favourable conditions, and harvesting of *Long Rains* maize and rice crops continued in November under favourable conditions to be finalized in January. Planting of *Short Rains* maize crops continued in November, and there is concern in central areas as below-

average rainfall and dry conditions are causing delayed planting in some areas, and parts of the country are experiencing a resurgence of desert locusts (See Desert Locust Alert pg. 4). In **Burundi**, planting of *Season A* maize crops continued in November to be harvested from January, and there is some concern due to a delayed onset and erratic rainfall. Incidences of Fall Armyworm have been reported in some communes throughout the country and could pose a risk to crop development. In **Rwanda**, *Season A* maize crops are developing under favourable conditions to be harvested from January. In northern bimodal areas of the **United Republic of Tanzania**, *Vuli* season (short rains) maize crops are in vegetative to reproductive stage under favourable conditions to be harvested from mid-December, and *Vuli* season rains are expected to be average to below-average with prolonged periods of dry spells over most bimodal areas (See Seasonal Forecast Alert pg. 5 & Regional Outlook pg. 8). Planting of winter wheat crops is underway to be harvested from May, and conditions are favourable. In southern unimodal areas, planting of *Msimu* (long rains) maize crops is underway for harvest from April, and overall conditions are favourable. *Msimu* rains are expected to be normal to above-normal over central and southern parts of the country, while western areas are likely to experience normal to below-normal rains (See Seasonal Forecast Alert pg. 5 & Regional Outlook pg. 8).

Regional Outlook: Mixed rainfall received for the 2020 October to November period with drier than average conditions expected in December

November 2020 rainfall conditions were wetter than average in central and northern Tanzania, the Lake Victoria region, Rwanda, and Burundi. Elsewhere, November totals were more mixed. Central and eastern Kenya and southern Somalia experienced localized, heavy rainfall in early November followed by a two-week dry spell. Late November was atypically wet in parts of Ethiopia, Somalia, southern South Sudan, Uganda, western and southern Kenya, and northern Tanzania. On November 22nd, Somalia experienced its [strongest storm in at least the past 50 years](#). Cyclone Gati brought extreme storm conditions and more than two years' worth of rain to the northeast.

Rainfall totals for October to early December show below-average to near-average amounts in most of the eastern Horn, and above-average amounts in parts of central Somalia, the Gati-affected area, and southeastern Kenya (Figure 1-left). In central Kenya to southern Somalia and in Ethiopia, totals are less than 80 percent of average in some areas. Some of these areas as well as other near-average areas had poor and erratic rainfall distribution throughout October and November and delayed onset rains. Some western and southern areas of the region may see October to early December surpluses of 50 to 100+ mm. Based on forecasts from late November, areas with previously poor seasonal rainfall distribution in central and eastern Kenya and Somalia will see drier-than-average conditions in early December (Figure 1-right). During this period, southwestern Ethiopia may see above-average rainfall, otherwise, the northern sector is forecast to be drier-than-average. Above-average rainfall is likely in the southern sector, e.g. in Tanzania, the Lake Victoria region, Rwanda, Burundi, and parts of southern Kenya. Concentrations of rainfall in the southern sector and average to below-average amounts in the east are also shown in SubX forecasts for the next 30-day totals. An overall persistence of current regional climatic conditions from October to December 2020 into March to May 2021 is anticipated based on foreseen consistent climatic drivers.
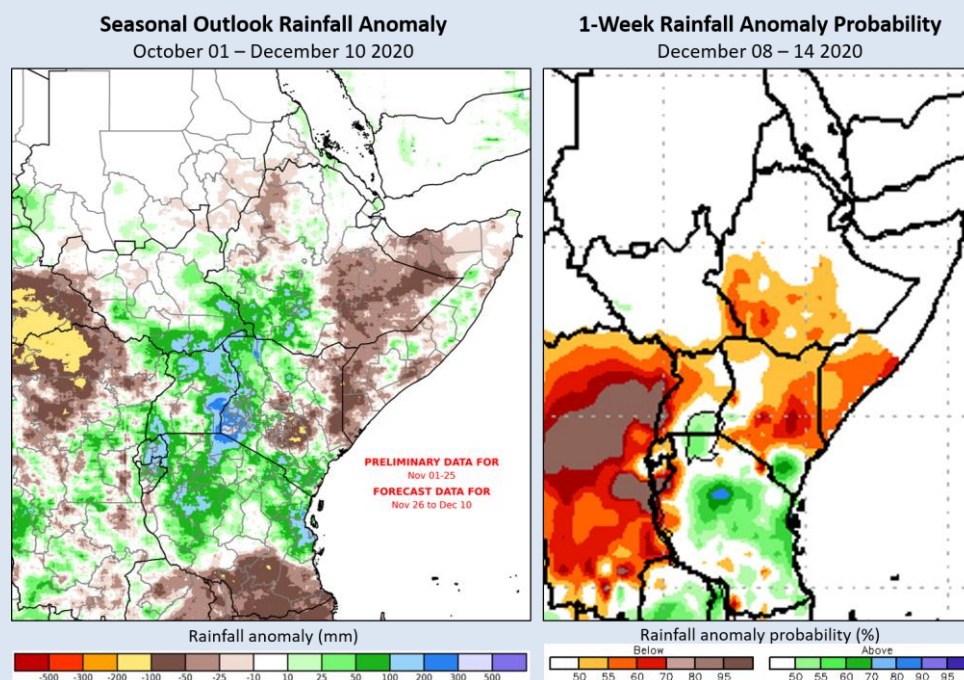

Figure 1. Estimated and forecasted rainfall for October 1st to December 10th, and a forecast for December 8th to 14th. On the left, a UCSB Climate Hazards Center Early Estimate, which compares 2020 rainfall amounts to the 1981-2019 CHIRPS average. The map shows the difference from average for October 1st to December 10th if the 15-day unbiased GEFS forecast from November 26th materializes. Note: The map may show too strong of a dry signal in southwestern Ethiopia, based on comparison with other CHIRPS-based data that includes more Ethiopia station reports for October 2020. On the right is the NOAA GEFS Week 2 probabilistic forecast for December 8th to 14th, from November 30th. GEFS image from https://www.cpc.ncep.noaa.gov/products/international/gefs_bc/afr_gefs_bc.shtml
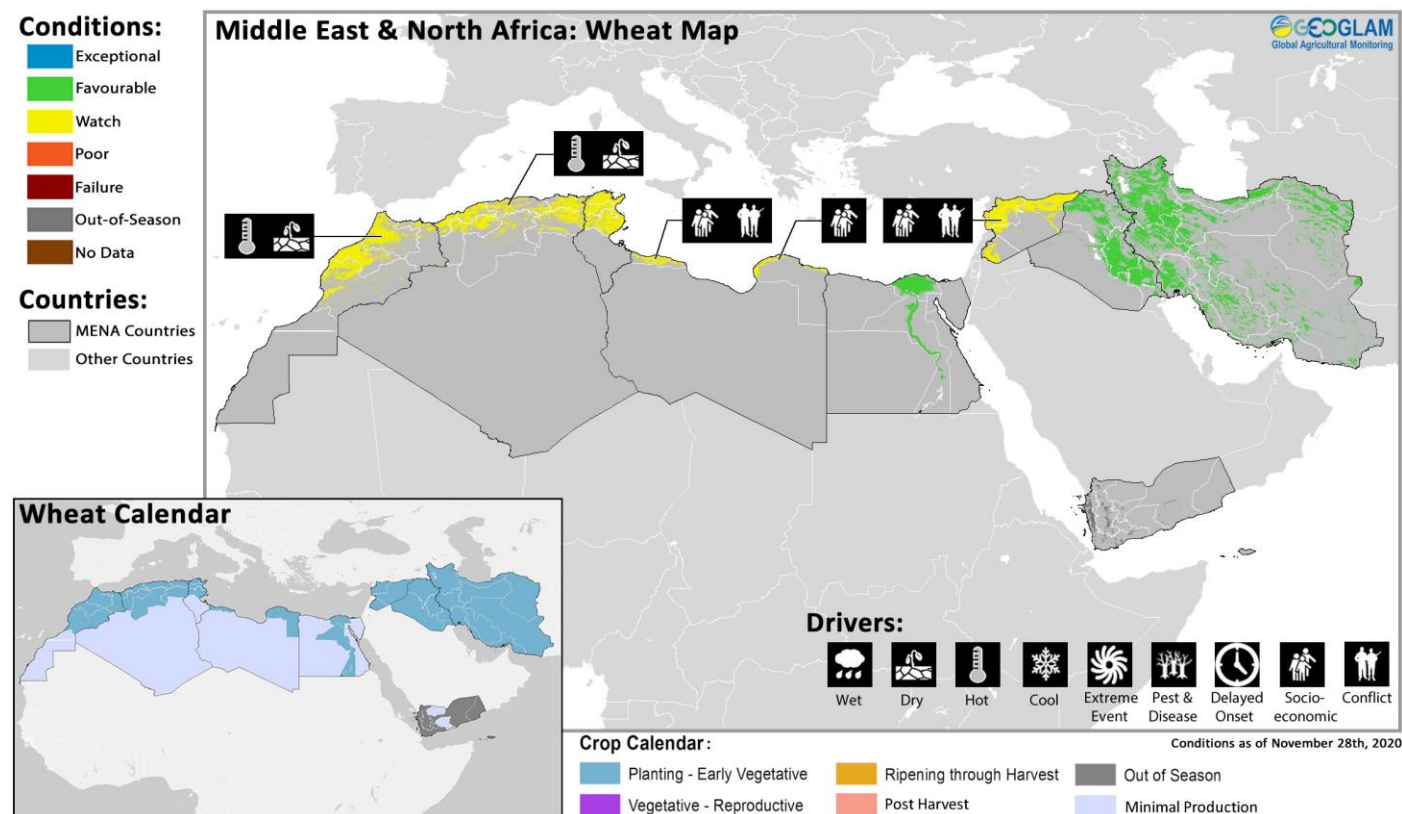Source: UCSB Climate Hazards Center.

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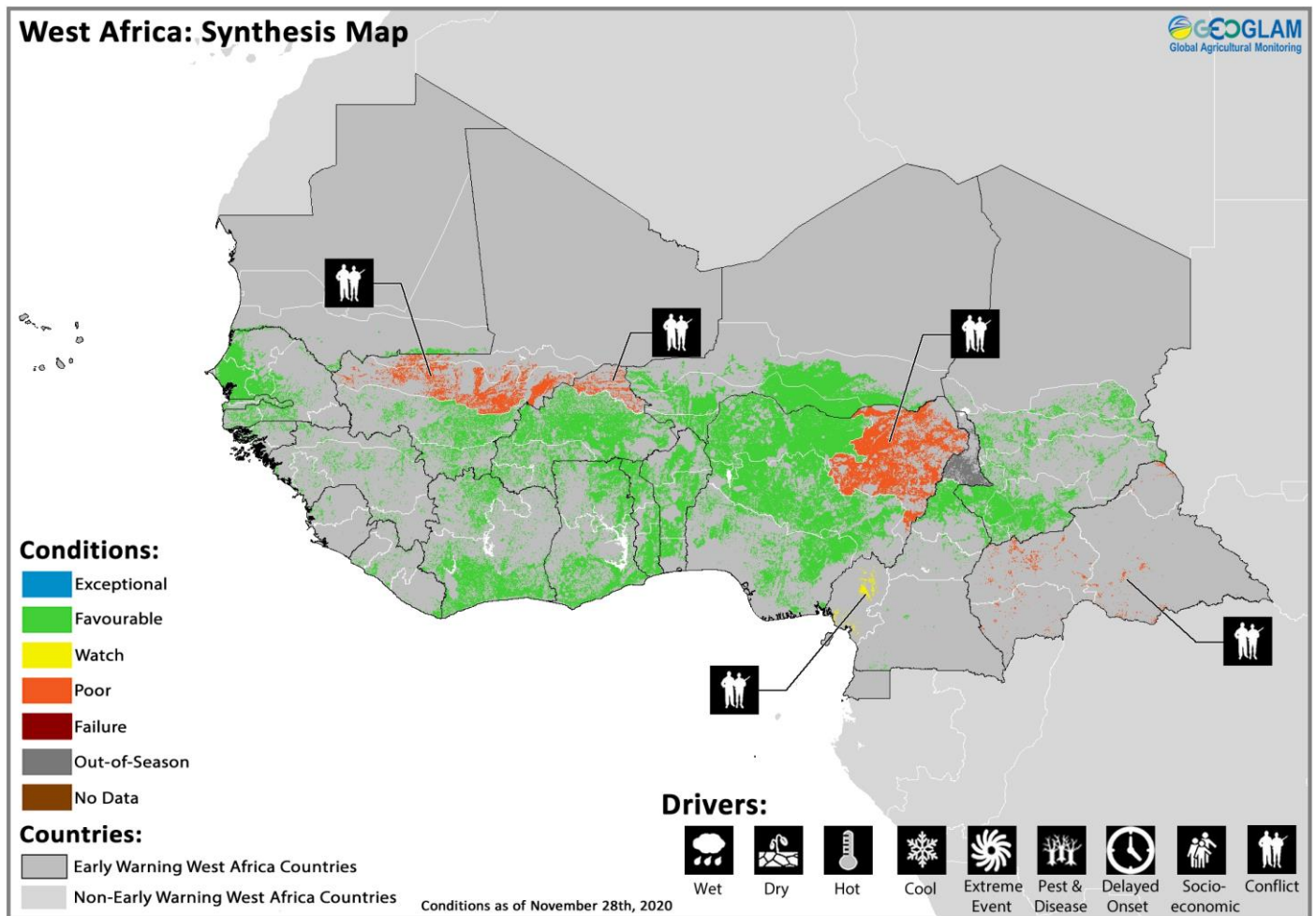
*Crop condition map synthesizing information as of November 28th. Crop conditions over the main growing areas are based on a combination of inputs including remotely sensed data, ground observations, field reports, national, and regional experts. **Crops that are in other than favourable conditions are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

In West Africa, harvesting of main season cereals finalized in northern **Cameroon**, **Gambia**, **Togo**, northern **Nigeria**, **Guinea-Bissau**, and north and central **Benin** while harvesting continued throughout most of the subregion and will complete in December. Harvesting of second season cereals finalized in central **Cameroon** while harvesting continued in **Nigeria**, and planting and development of crops is underway in southern **Cote d'Ivoire**, southern **Ghana**, southern **Togo**, southern **Benin**, southern **Mauritania**, and southern **Mali**. Overall crop conditions are favourable throughout the subregion except in areas where conflict continues to disrupt agricultural activities, including the Far North and southwest regions in **Cameroon**, Lac region in **Chad**, the **Central African Republic**, northeast **Burkina Faso**, northeast **Nigeria**, and north-central **Mali**. In the Central Sahel countries of **Burkina Faso**, **Mali**, and **Niger**, daily armed confrontations and attacks have resulted in forced displacements and limited access to agricultural fields and markets, and they are likely to have strong localized impacts on the 2020-2021 main season crop prospects. Late season floods also led to crop damage and livelihood losses across the three countries. Throughout the subregion, COVID-19 related restrictions have impacted farmers' ability to access markets and agricultural inputs. In **Chad**, 11,500 people have been displaced since late October as rising water levels led to the overflow of the Chari River and an embankment break in N'Djamena, Chad's capital city. In **Nigeria**, seasonal rainfall has been above-average from late-April, resulting in generally favourable agro-climatic conditions despite flooding in some areas, particularly along the major rivers Benue and Niger in late August to early December which resulted in localized crop damage. In **Sierra Leone**, agricultural activities have been affected by erratic and below-average rains, though current climatic conditions are favourable. In **Mauritania**, millet production is expected to increase 20 percent compared to the five-year average.
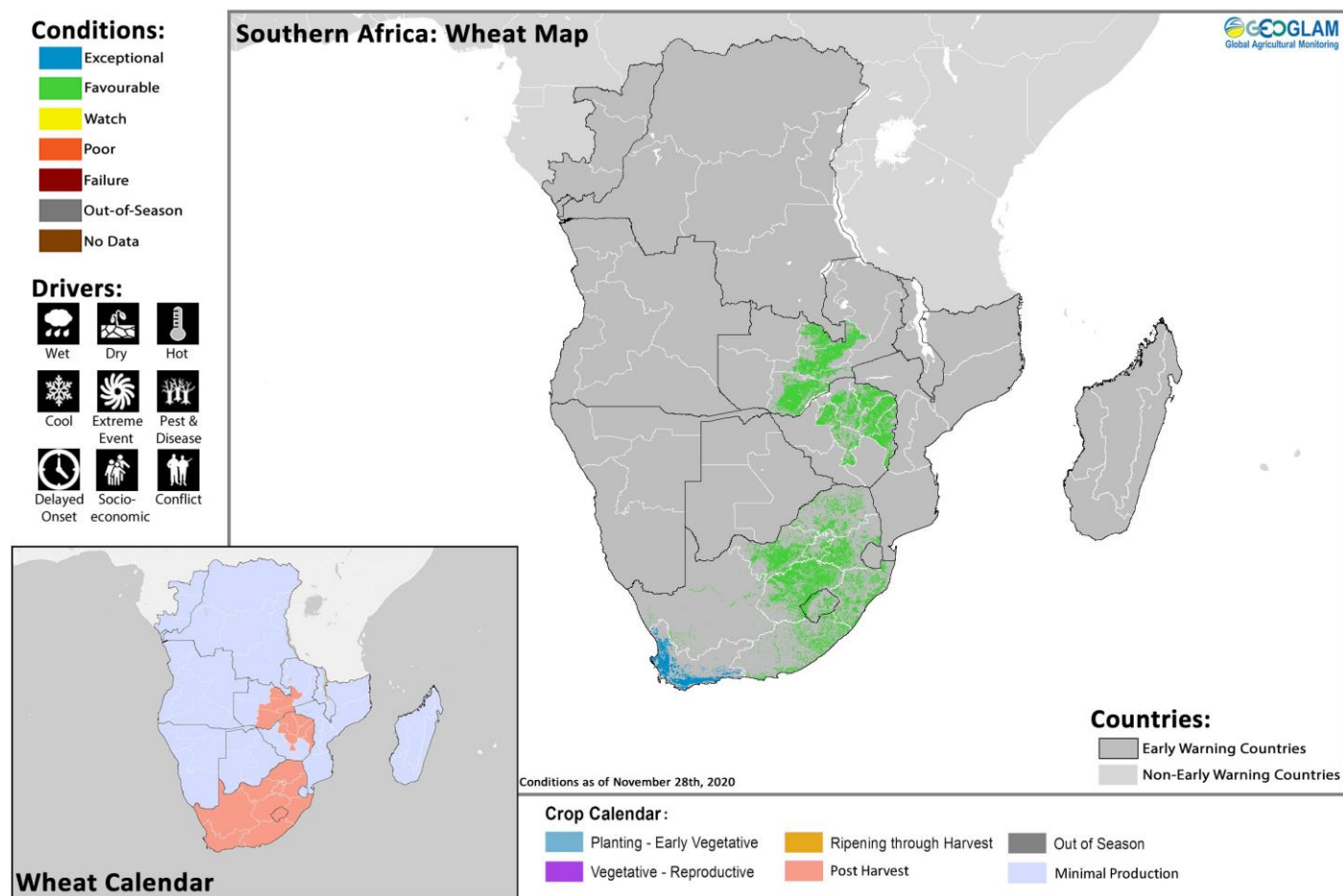
Middle East & North Africa

*Crop condition map synthesizing information as of November 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.***

Across the Middle East and North Africa, planting of winter wheat crops continued in November. Planting will finalize in December to early January, and crops will be harvested from May. In coastal parts of **Morocco**, **Algeria**, and **Tunisia**, there is concern as limited precipitation is impacting planting activities, particularly in **Morocco** where below-average rainfall since September limited recovery of soil moisture following drought conditions in the previous year. Current forecasts indicate that continued below-average rainfall is expected in main cereal producing coastal areas in December. In **Libya**, ongoing military operations and conflict continue to limit farmer's ability to purchase agricultural inputs, access fields, and plant crops. Slight rainfall deficits in **Syria** and **Iraq** in October were alleviated by sufficient rainfall in early November, and current climatic conditions are favourable for cereal planting in **Syria**, **Iraq**, and **Iran**. However, in **Syria**, ongoing socio-economic challenges and conflict continue to impact agricultural activities and increase input prices. In **Egypt**, harvesting of summer-planted maize and rice crops finalized in November under favourable conditions. *Nili* season (Nile Flood) rice crops are in vegetative to reproductive stage to be harvested from December, and climatic conditions are favourable for continued crop development.
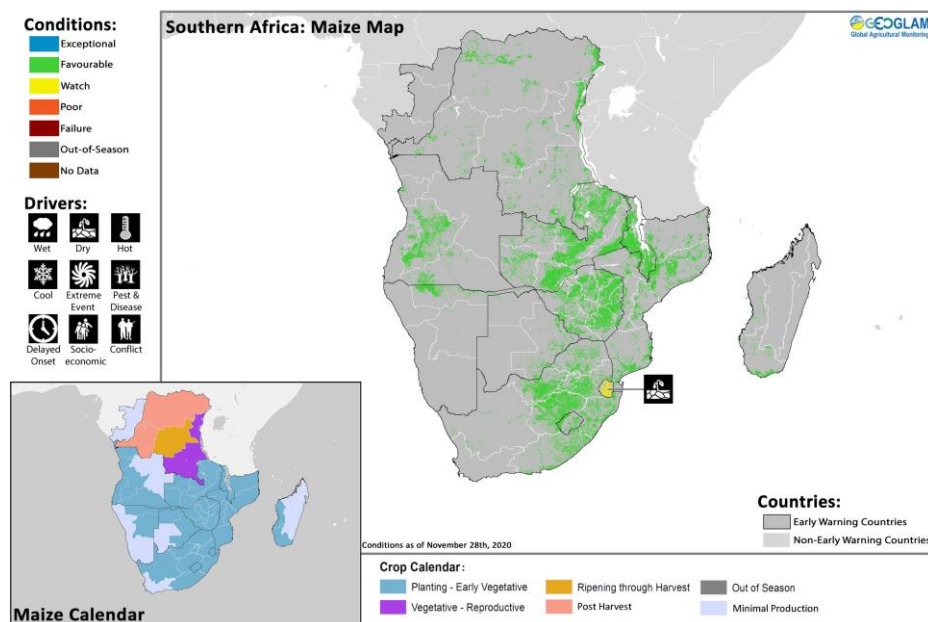
Southern Africa

*Crop condition map synthesizing information as of November 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 2020 winter wheat crops finalized in November in **South Africa**, **Zambia**, **Zimbabwe**, and **Lesotho** under favourable conditions despite concerns over low water source availability in **Zambia** and **Zimbabwe**. In **South Africa**, above-normal and well-distributed rainfall over the winter rainfall region supported well above-average winter wheat production, particularly in the main producing province of Western Cape, and resulted in the largest output since 2008. While favourable yields resulted in **Zambia**, low Kariba dam levels limited hydro electrical generation, resulting in load shedding and slightly reduced harvested area. In **Zimbabwe**, production of winter wheat is expected to be above-average. In **Lesotho**, crop prospects are generally favourable.

Planting of 2021 main season cereals continued throughout the subregion under generally favourable conditions. From September to early November, the rainfall season started with average to above-average precipitation in the southeast, resulting in flash flooding in northeastern **South Africa**, central **Mozambique**, and eastern **Zimbabwe** in early November. Early rains in many areas favoured early planting; however, parts of **eSwatini** experienced subsequent dry conditions that resulted in poor crop germination. Conversely, the rainfall season started with below-average rainfall in northern areas, including parts of **Angola**, parts of **Democratic Republic of Congo**, **eSwatini**, parts of **Mozambique**, parts of **Zambia**, and eastern and central **Madagascar** which delayed planting of 2021 crops. Above-average temperatures in the last few months also exacerbated moisture stress in central **Zambia**, central and southern **Mozambique**, parts of **Zimbabwe**, and southern **South Africa**. Forecasts indicate near-average rainfall is likely for the December 2020 to February 2021 period in most parts of the subregion which is expected to benefit crop development. However, forecast normal to above-normal tropical cyclone activity in the Southwest Indian Ocean could pose a risk to crops (See Regional Outlook pg. 13). African Migratory Locusts (AMLs) have been reported in southern **Angola**, north and central **Namibia**, and parts of **Botswana**, **Zambia**, and **Zimbabwe** and could pose a threat to main season production in these areas. In addition, COVID-19 related restrictions have delayed the arrival of chemicals necessary for controlling the outbreak. The pandemic has also adversely affected farmers' income and is likely to limit their ability to purchase agricultural inputs, though governments in several countries have implemented or expanded agricultural support programmes in response to potential adverse impacts.
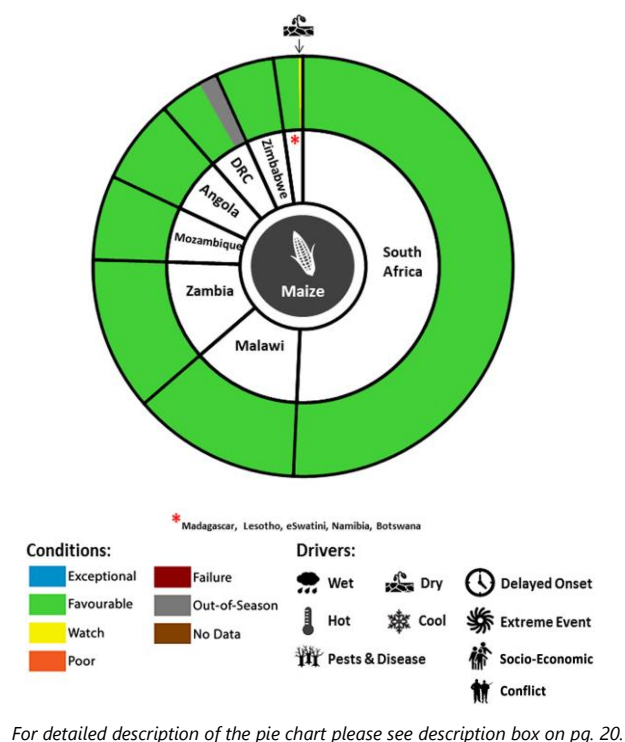
In **Zambia**, overall conditions are favourable as average to above-average October rainfall amounts increased soil moisture levels and benefitted maize crop germination in most areas despite below-average rainfall and high temperatures in some areas. Forecasts of

Crop condition map synthesizing information as of November 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.**

above-average rainfall for the November 2020 to January 2021 period are likely to benefit yields (See Regional Outlook pg. 13); however, there is some concern due to the current AML infestation. The outbreak has affected parts of Central, Southern, and Western Provinces, and the situation has become serious in Sesheke, Mwandi, and Sioma in Western Province and Kazungula in Southern Province. Some farmers are now reluctant to plant their crops as the outbreak has the potential to disrupt the start of the 2020/2021 agricultural season. The presence of AMLs in combination with the impact of two consecutive below-average cereal harvests on household incomes are likely to limit farmers' ability to take advantage of the forecast favourable rainy season. In **Malawi**, land preparation continued in November under favourable conditions. While heavy rainfall in October resulted in localized flooding, the rains

were beneficial to soil moisture levels and early crop development. However, forecasts indicate a possibility of reduced rainfall in central and southern districts for the November 2020 to January 2021 period, which tempers yield prospects (See Regional Outlook pg. 13). In **Mozambique**, planting continued in November under favourable conditions despite below-average rainfall and high temperatures in some areas, and the seasonal onset of rains in late November to early December is expected to benefit crop development. In **Namibia**, planting began in mid-November, and there is concern as the presence of AMLs could pose a risk to crop development. In **Botswana**, well above-average rainfall to date is benefitting planting activities. In **Zimbabwe**, planting began in November under favourable conditions despite high temperatures and moisture stress in some areas; however, a shortage of foreign currency is hindering the importation of agricultural inputs, and more than half of farmers are reported to be facing difficulties in accessing seeds. In **Madagascar**, while current conditions are favourable for planting of main season maize and rice crops, below-normal rainfall and above-average temperatures were recorded, particularly in the southern half of the country. Forecasts indicate below-average rainfall is likely for the November 2020 to January 2021 period throughout the country which could negatively impact crop development (See Regional Outlook pg. 13). Also, while recently lifted COVID-19 related restrictions improved farmers' access to inputs and fields, economic impacts of the pandemic will limit their ability to purchase fertilizers and hire labour. In **South Africa**, planting began in October in the east and November in the west, and conditions

For detailed description of the pie chart please see description box on pg. 20.

are generally favourable with widespread rain received during the planting window over the summer rainfall region, supporting timely cultivation. In **eSwatini**, there is some concern for main season maize crops as farmers that planted early with the good October rains reported poor germination due to a dry spell in November. While there is sufficient time for replanting, late onset rains are expected to delay the season. In **Lesotho**, conditions are favourable for the continued planting of main season cereals as good rains are supporting planting activities. In the **Democratic Republic of Congo**, harvesting of main season maize crops finalized in the north and west while harvesting of maize and rice crops began in central and northern areas, and planting and development of main season maize and sorghum crops continued in November. Overall conditions are favourable despite slightly below-normal seasonal rainfall in the east.

Regional Outlook: Mixed rainfall received during the start of the main cropping season with forecasts indicating average to above-average rains from December

To date, seasonal rainfall conditions have been mixed across the Southern Africa region. From October 1st to November 25th, northeastern and central areas generally received average to above-average rainfall, while eastern and western areas generally received average to below-average rainfall (Figure 1-left). As of November 25th, some of the more significantly dry areas were in southern Mozambique, southeast Zambia, throughout Zimbabwe, Madagascar, eSwatini, and eastern South Africa. Drier-than-average conditions prevailed in some of these areas since late October. Some of the wettest conditions, up to November 25th, were in western Zambia, Botswana, parts of central and eastern South Africa, and Lesotho.

Based on the November 29th probabilistic GEFS forecasts for November 30th to December 13th, previously wet areas in central and northern parts of the region are likely to see increasing rainfall surpluses, while deficits may develop in central to northern Mozambique, eSwatini, and throughout Madagascar. SubX model forecasts do not show a clear indication for mid to late-December rainfall conditions. Figure 1-middle shows a scenario for October 1st to December 10th rainfall based on preliminary and forecast rainfall for that period.

The latest available NMME forecast indicates that the DJF rainfall, a key period for crop establishment and development, is expected to be near-average across much of the region, with some areas where above-normal and below-normal rains may develop (Figure 1-right). Tropical cyclone activity in the Southwest Indian Ocean is forecast to be near-normal (50% chance) to above-normal (40% chance) with 5 to 7 tropical cyclones during the 2020-2021 season.
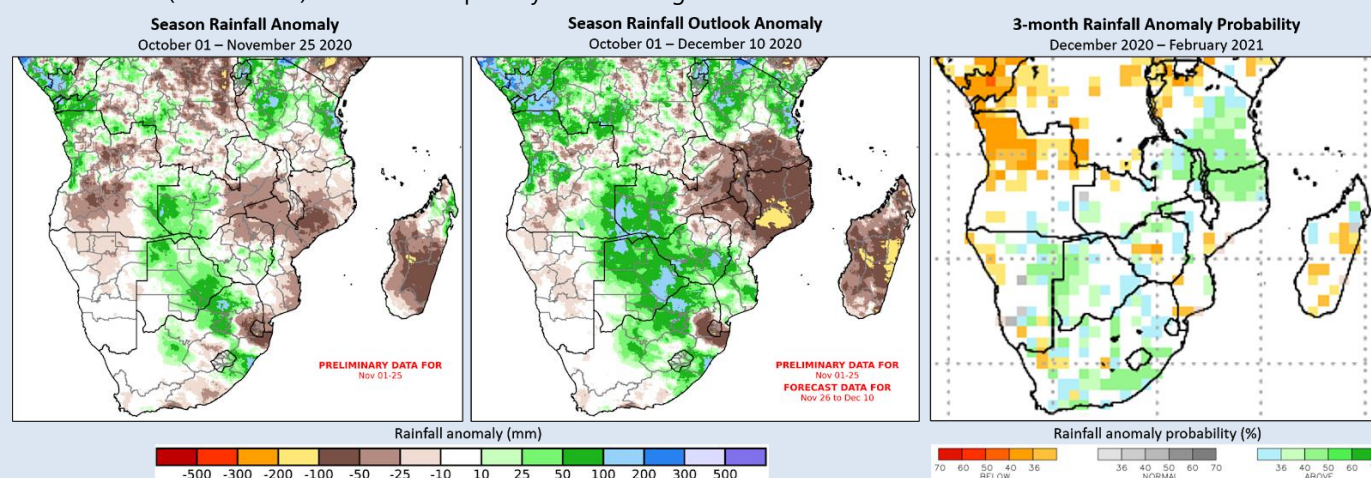

Figure 1. Estimated and forecasted rainfall since October 1st, and a 3-month probability forecast. The left and middle panels are UCSB Climate Hazards Center Early Estimates, which compare 2020 rainfall amounts to the 1981-2019 CHIRPS average. The left map shows the difference from average for October 1st to November 25th. The middle map shows the difference from average for October 1st to December 10th if the 15-day unbiased GEFS forecast from November 26th materializes. On the right is the 3-month NMME experimental probabilistic forecast for December 2020 to February 2021, based on November 2020 initial conditions. The forecast probability is calculated as the percentage of all 79 NMME ensemble members that fall in a given tercile (above/below/near-normal). White color indicates there is no dominant category across the model forecasts. NMME image from https://www.cpc.ncep.noaa.gov/products/international/nmme/nmme_seasonal.shtml
Source: UCSB Climate Hazards Center.

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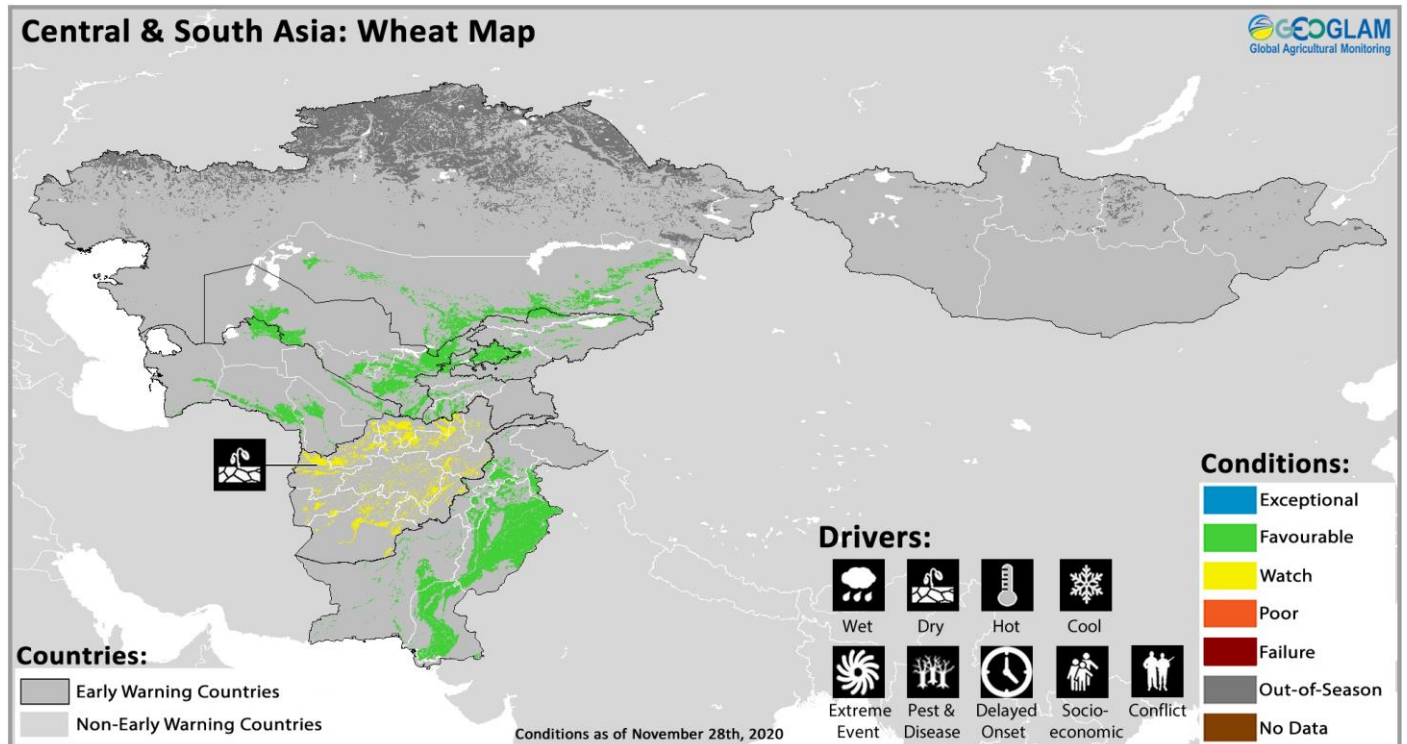
Crop condition map synthesizing information as of November 28th. Crop conditions over the main growing areas are based on a combination of inputs including remotely sensed data, ground observations, field reports, national, and regional experts. **Crops that are in other than favourable conditions are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

In Central and South Asia, harvesting of spring wheat and barley crops finalized in October under favourable conditions. Planting and development of winter wheat crops continued in November across **Afghanistan**, **Kazakhstan**, **Kyrgyzstan**, **Pakistan**, **Tajikistan**, **Turkmenistan**, and **Uzbekistan**, and overall conditions are favourable except in **Afghanistan** where dry conditions in October into early November have delayed land preparation and planting activities in some areas. Throughout the subregion, forecasts indicate a likelihood for below-average December to April 2021 rainfall along with above-average temperatures over **Afghanistan**, northern **Pakistan**, **Tajikistan**, **Uzbekistan**, and **Kyrgyzstan** which could impact snow pack and water availability for winter and spring cereals (See Regional Outlook pg. 15). In **Afghanistan**, while heavy precipitation from November 13th through November 18th eliminated much of the previous deficits and enabled farmers to begin planting, December rainfall will need to be sufficient to support planting and crop development. In **Uzbekistan** and **Turkmenistan**, increased precipitation amounts in November benefitted soil moisture, though cumulative rainfall is still slightly below the long-term average in some areas. In **Kazakhstan**, precipitation in early November increased soil moisture levels and benefitted planting and germination of winter wheat crops despite localized losses in the south and southeast due to low nightly temperatures. In **Pakistan**, planted area of winter wheat is forecast at an above-average level of 9.2 million hectares as a result of record domestic prices and official programmes promoting wheat production, such as minimum support prices for wheat crops as well as subsidized fertilizers and pesticides. While current planting conditions are favourable, forecast below-average precipitation through March/April 2021 in the important wheat-producing areas of Punjab could impact final production, and in the northern parts of the country, the forecast could reduce soil moisture availability for the spring month which normally comes from snow melting (See Regional Outlook pg. 15). Harvesting of main season rice crops continued in November to be finalized in January, and conditions are favourable.

Regional Outlook: Below-average rainfall expected across parts of the region for the December 2020 to February 2021 period

From October 1st to November 25th, most parts of Afghanistan, Pakistan, and Turkmenistan received average precipitation, while some areas to the north, including Tajikistan, Uzbekistan, and Kyrgyzstan received below-average precipitation.

The two-week forecast from November 26th indicates a trend toward above-average October 1st to December 10th precipitation in parts of northern Afghanistan, western Turkmenistan, and eastern Tajikistan (Figure 1-left). According to the SubX forecast from November 26th, precipitation is expected to be average to slightly below-average from late November to mid-December. Forecasts released in early November from NMME retain this outlook (Figure 1-right). These model ensembles predict below-average December and December to April precipitation totals for the region. The longer-term NMME and C3S outlooks indicate that below-normal December to April precipitation is likely in western and northeastern Iran, Afghanistan, northern Pakistan, Tajikistan, Uzbekistan, and Kyrgyzstan. The models also predict above-normal temperatures across the region. If these forecasts materialize, such a combination could have consequences for snowpack and water availability for winter and spring cereals and could pose flooding risks.

Season Rainfall Outlook Anomaly
October 2020 – December 10 2020

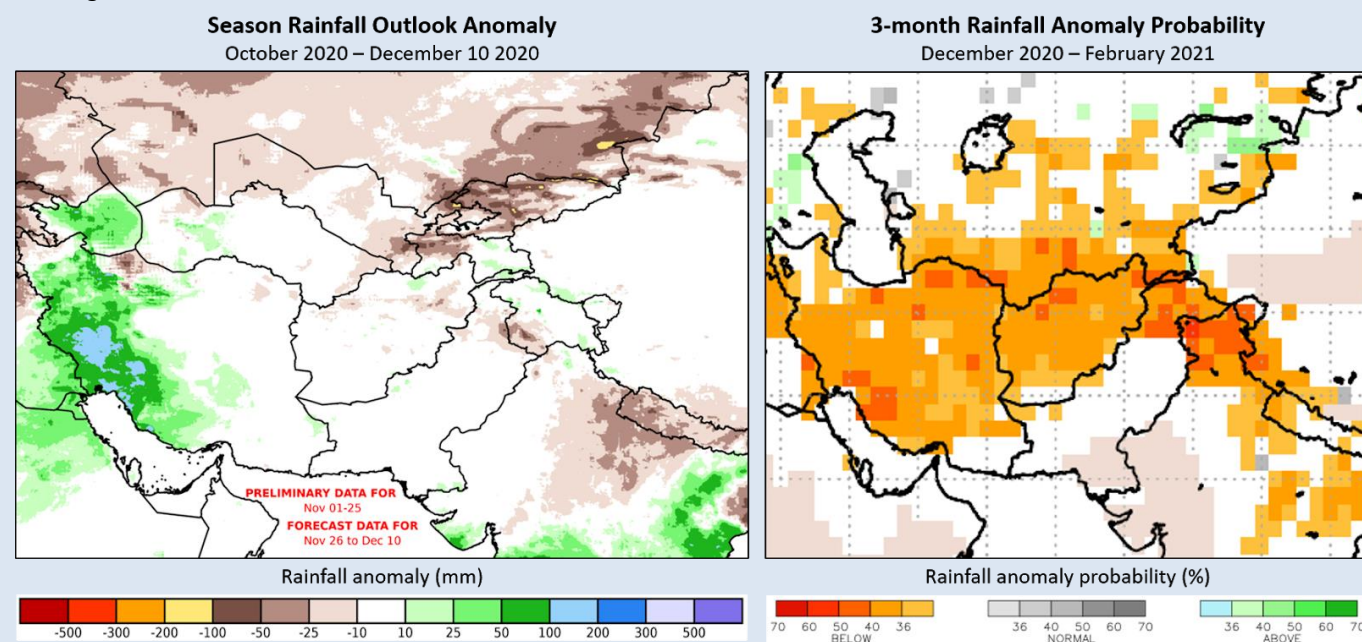**3-month Rainfall Anomaly Probability**
December 2020 – February 2021

Figure 1. Estimated and forecasted rainfall since October 1st, and a 3-month probability forecast. The left panel is a UCSB Climate Hazards Center Early Estimate, which compares 2020 rainfall amounts to the 1981-2019 CHIRPS average. The map shows the difference from average for October 1st to December 10th, if the 15-day unbiased GEFS forecast from November 26th materializes. On the right is the 3-month NMME experimental probabilistic forecast for December 2020 to February 2021, based on November 2020 initial conditions. The forecast probability is calculated as the percentage of all 79 NMME ensemble members that fall in a given tercile (above/below/near-normal). White color indicates there is no dominant category across the model forecasts. NMME image from https://www.cpc.ncep.noaa.gov/products/international/nmme/nmme_seasonal.shtml
Source: UCSB Climate Hazards Center.

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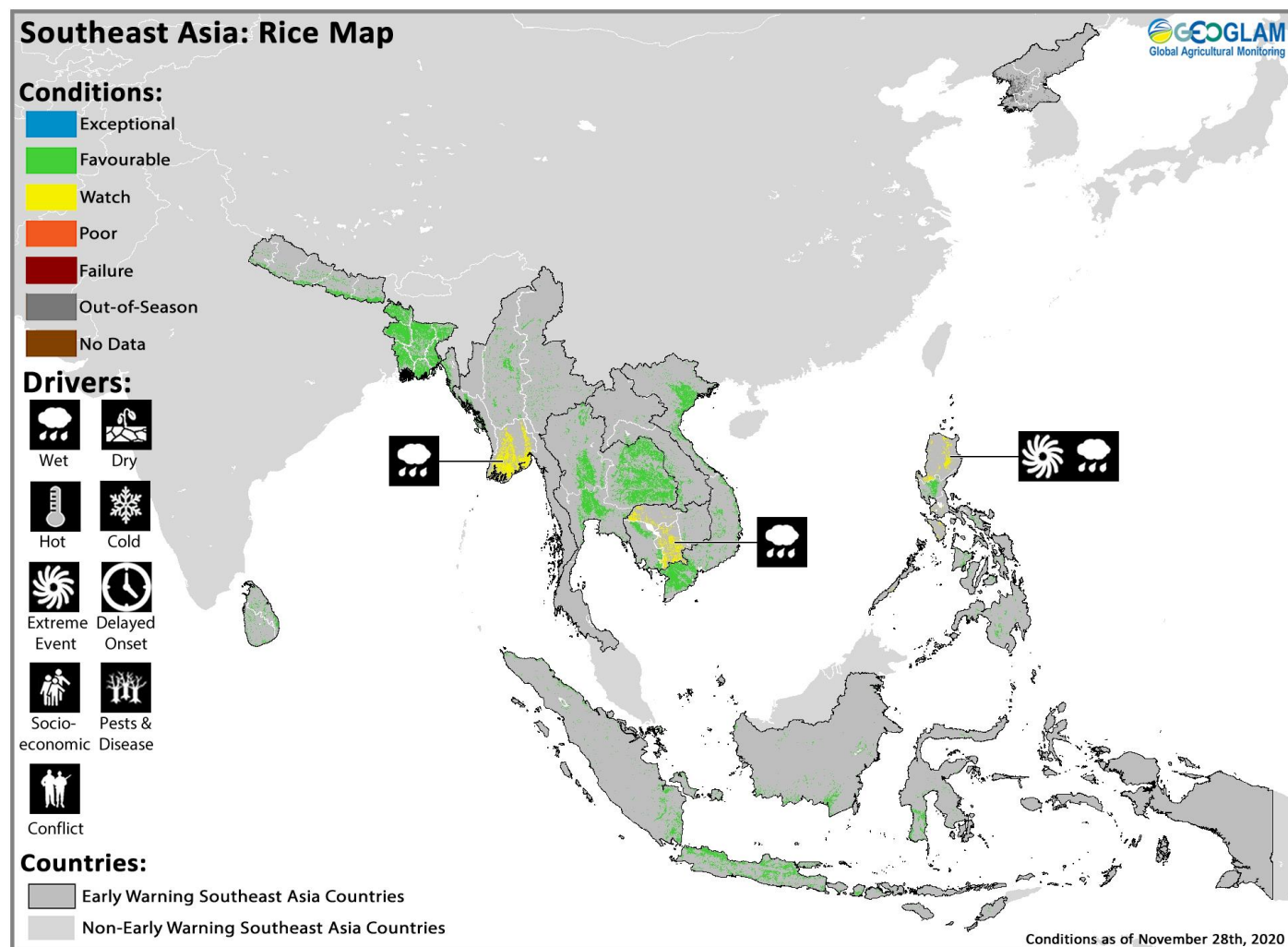
Crop condition map synthesizing rice conditions as of November 28th. Crop conditions over the main growing areas are based on a combination of inputs including remotely sensed data, ground observations, field reports, national, and regional experts. Crops that are in other than favourable conditions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

In northern Southeast Asia, wet-season rice is in grain filling to harvesting stage, and harvest is nearing completion in **Cambodia** and northern **Viet Nam**. From early October, a series of tropical cyclones caused flooding across parts of the **Philippines**, **Viet Nam**, **Cambodia**, **Myanmar**, and **Thailand**. However, the overall growing conditions are favourable, and final yields are expected to be average except in areas where monsoon flooding damaged crops. **Cambodia** and the **Philippines** are of particular concern as the damage may decrease final production. Forecasts indicate above-average rainfall is expected to continue in December which could increase the risk of flooding and landslides throughout northern parts of the subregion (See Regional Outlook pg. 18). Planting of dry-season rice has started in **Cambodia** and **Viet Nam** under favourable conditions. In **Indonesia**, harvesting of dry-season rice is wrapping up under favourable conditions with a total harvested area of 4.5 million hectares, 11.3 percent higher than last year. Sowing of wet-season rice continued in November under favourable conditions, albeit slowly due to uneven rainfall. Rainfall in late October and mid-November benefitted water shortages in the west but resulted in flooding in several areas of Sumatra and West Java, though there was no significant damage to planted rice crops. In the **Philippines**, harvesting of wet-season rice is under way with mixed conditions as three tropical cyclones brought flood damage to parts of Northern and Southern Luzon. On November 1st, Typhoon Goni crossed the northern Philippines island of Luzon, affecting 95,000 hectares of agricultural land across eight regions with damage to rice crops, particularly in Catanduanes and Albay
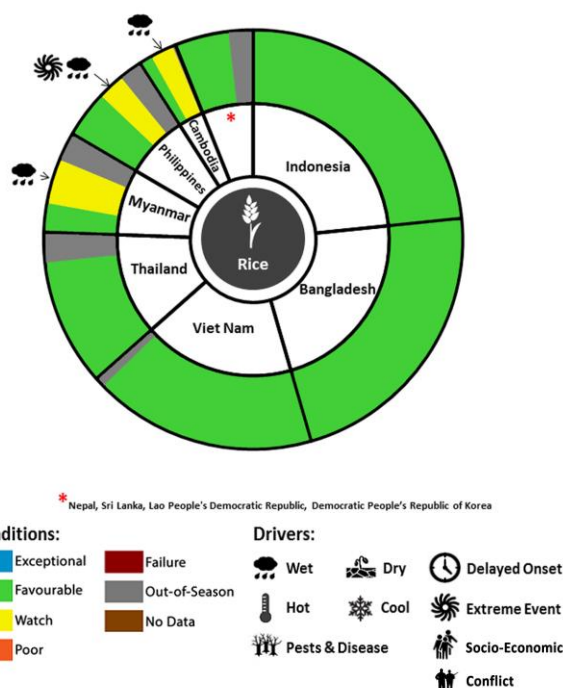
For detailed description of the pie chart please see description box on pg. 20.

which account for more than half of the overall damage to agriculture. On November 11th, Typhoon Vamco made landfall over Polillo Island, northern Calabarzon, and eastern Central Luzon Regions before continuing west over Central Luzon, bringing heavy rainfall, strong wind, and storm surges over central and northern areas and exacerbating impacts across Goni-affected provinces. In **Thailand**, wet-season rice is in the grain filling stage under favourable conditions with an increase in total sown area compared to last year despite damages in the northeastern region from heavy rainfall and flooding in October. Land preparation for dry-season rice is underway in the Central region. In **Viet Nam**, harvesting of wet-season rice in the north is wrapping up under favourable conditions, and yield is estimated at 5.26 tonnes per hectare, slightly lower than last year due to impacts from storms and flooding. On November 15th, Typhoon Vamco made landfall over the central provinces of Ha Thinh, Quang Binh, Quang Tri, and Thua Thien Hue before moving northwest towards the Laos border, exacerbating the impacts of multiple storms that have inundated the central region since October 6th and resulting in severe flooding and landslides. In the south, conditions are favourable as the harvesting of the summer-autumn (wet-season) crop is wrapping up with estimated yields of 5.76 tonnes per hectare, 3.6 percent higher than last year due to good growing conditions, and the harvesting of the autumn-winter (wet-season) crop continues under favourable conditions with yield forecasts higher than last year. Sowing of the winter-spring (dry-season) crop in the south has begun under favourable conditions. In **Laos**, harvesting of wet-season rice finalized in November. In lowland areas, harvested area is estimated at 717,000 hectares, slightly lower than last year due to a decline in planted area. However, yield is expected to reach 4.35 tonnes per hectare due to favourable weather conditions, and final production is expected to be greater than last year at 3.1 million tonnes. In upland areas, final production is estimated at 212,000 tonnes. Land preparation for dry-season rice is underway with a national planned planted area of 98,000 hectares. In **Myanmar**, planting of wet-season rice is complete, and planted area is estimated at 6.04 million hectares, slightly lower than last year due to inadequate rainfall and irrigation water supply. Crops are now in panicle forming to maturity stage, and there is concern in Delta areas as heavy rainfall from monsoon rains and tropical cyclones resulted in flooding and affected 60,000 hectares of rice crops, of which 37,000 hectares were damaged, though 12,000 hectares have been replanted. Elsewhere, overall growing conditions are favourable. In **Cambodia**, final planted area of wet-season rice reached 2.79 million hectares, and harvesting is underway. In October, flooding from heavy monsoon rains and tropical cyclones affected 288,000 hectares of crops in northwestern to lowland areas of the Mekong basin, of which 84,000 hectares were damaged. Flooding is expected to decrease yields from last year to 3.6 tonnes per hectare. Planting of dry-season rice began in November under favourable conditions. In **Sri Lanka**, harvesting of secondary *Yala* season maize and rice crops finalized last month under favourable conditions. Planting of main *Maha* season maize and rice crops continued in November under favourable conditions to be harvested from February. In **Bangladesh**, harvesting of *Aman* season rice crops began in November under favourable conditions and will finalize in January. While excessive precipitation in March and April resulted in localized yield losses and was followed by Tropical Cyclone Amphan in May and further heavy rainfall and severe flooding in July and August, overall conditions are favourable, and yields are likely to remain above-average. Planting of *Boro* season rice crops began in November under favourable conditions, and planted area is forecast at an above-average level as a result of current high prices and government support for paddy production, including subsidized seed prices. In **Nepal**, harvesting of main season rice crops began in November under favourable conditions to be finalized in January, and production is forecast at an above-average level. In the **Democratic People's Republic of Korea**, harvesting of main season rice finalized in October, and final conditions were mixed due to severe flooding and reduced yields in localized areas.

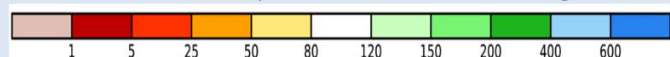### Regional Outlook: Above-average rainfall expected to continue through February 2021 across parts of Southeast Asia

Cumulative rainfall from October 1st to November 25th in southern mainland Southeast Asia and the Philippines is above-average. In eastern Thailand and Cambodia, totals range from 100 mm to 200 mm above-average. Wetter extremes, from 200 mm to 500 mm above-average, are in areas of southern Laos, Vietnam, and the northern Philippines. The surpluses amount to 150 to 200 percent of the average for this period. Most of the surpluses in mainland areas are due to a very wet October, with the exception of some areas in Laos and Vietnam that received periodic above-average rainfall in November. Rainfall across mainland Southeast Asia was average to below-average in early to mid-November, while in the northern Philippines, intense storm conditions and torrential rain from Typhoon Goni followed by Tropical Storms Atsani and Typhoon Vamco caused widespread flooding and damage over affected areas. In Indonesia, November rainfall was more mixed, with some areas registering drier-than-average conditions and parts of Java and Sumatra reporting flooding and landslides from heavy rains.

Figure 1-left shows a scenario for October 1st to December 10th rainfall, based on preliminary and forecast rainfall for that period. According to the 15-day GEFS forecasts from November 29th, early December may be wetter-than-average in coastal Vietnam, the northern Philippines, and southern Indonesia. Below-average rainfall is forecast for Indonesia's Sumatra and Kalimantan islands and in southern Malaysia. SubX forecasts agree with the GEFS for this period, and show this regional pattern persisting into late December. The NMME indicates that this pattern may last for several months. For December 2020 to February 2021, the NMME forecasts increased chances of wetter-than-normal conditions in the Philippines, northern Malaysia, and parts of southern Thailand, eastern Vietnam, and eastern Indonesia (Figure 1-right). The NMME forecasts increased chances of a drier-than-normal December to February in Indonesia's central Sumatra and western Kalimantan.
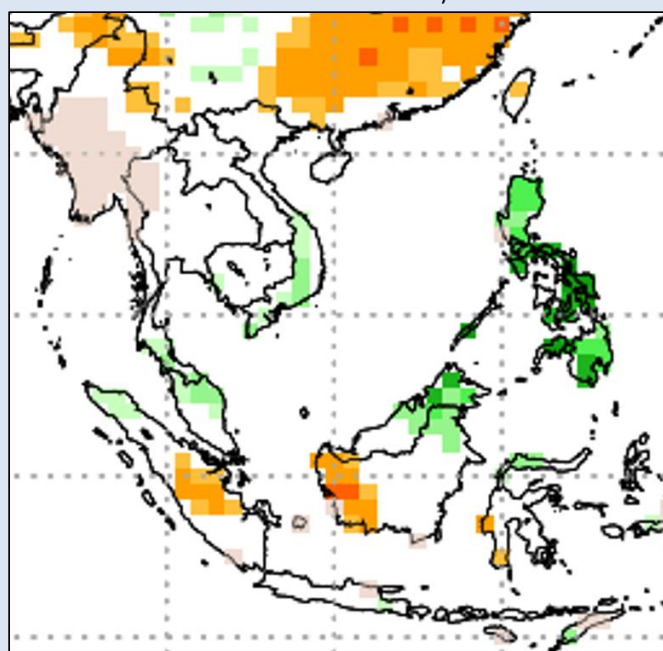
Season Rainfall Outlook Anomaly	3-month Rainfall Anomaly Probability
October 01 – December 10 2020	December 2020 – February 2021
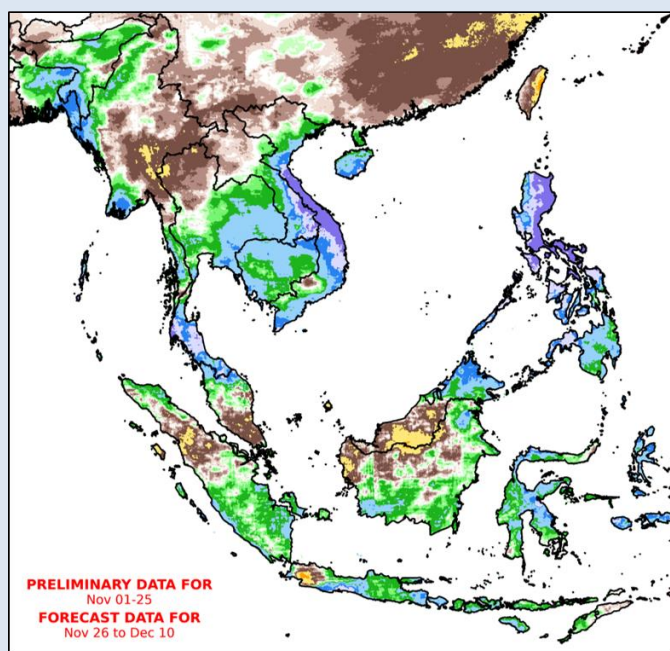
Rainfall anomaly as a % of the historical average
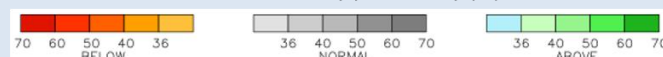
Rainfall anomaly probability (%)

Figure 1. Estimated and forecasted rainfall since October 1st, and a 3-month probability forecast. The left panel is a UCSB Climate Hazards Center Early Estimate, which compares 2020 rainfall amounts to the 1981-2019 CHIRPS average. The map shows the difference from average for October 1st to December 10th if the 15-day unbiased GEFS forecast from November 26th materializes. On the right is the 3-month NMME experimental probabilistic forecast for December 2020 to February 2021, based on November 2020 initial conditions. The forecast probability is calculated as the percentage of all 79 NMME ensemble members that fall in a given tercile (above/below/near-normal). White color indicates there is no dominant category across the model forecasts. NMME image from https://www.cpc.ncep.noaa.gov/products/international/nmme/nmme_seasonal.shtml
Source: UCSB Climate Hazards Center.

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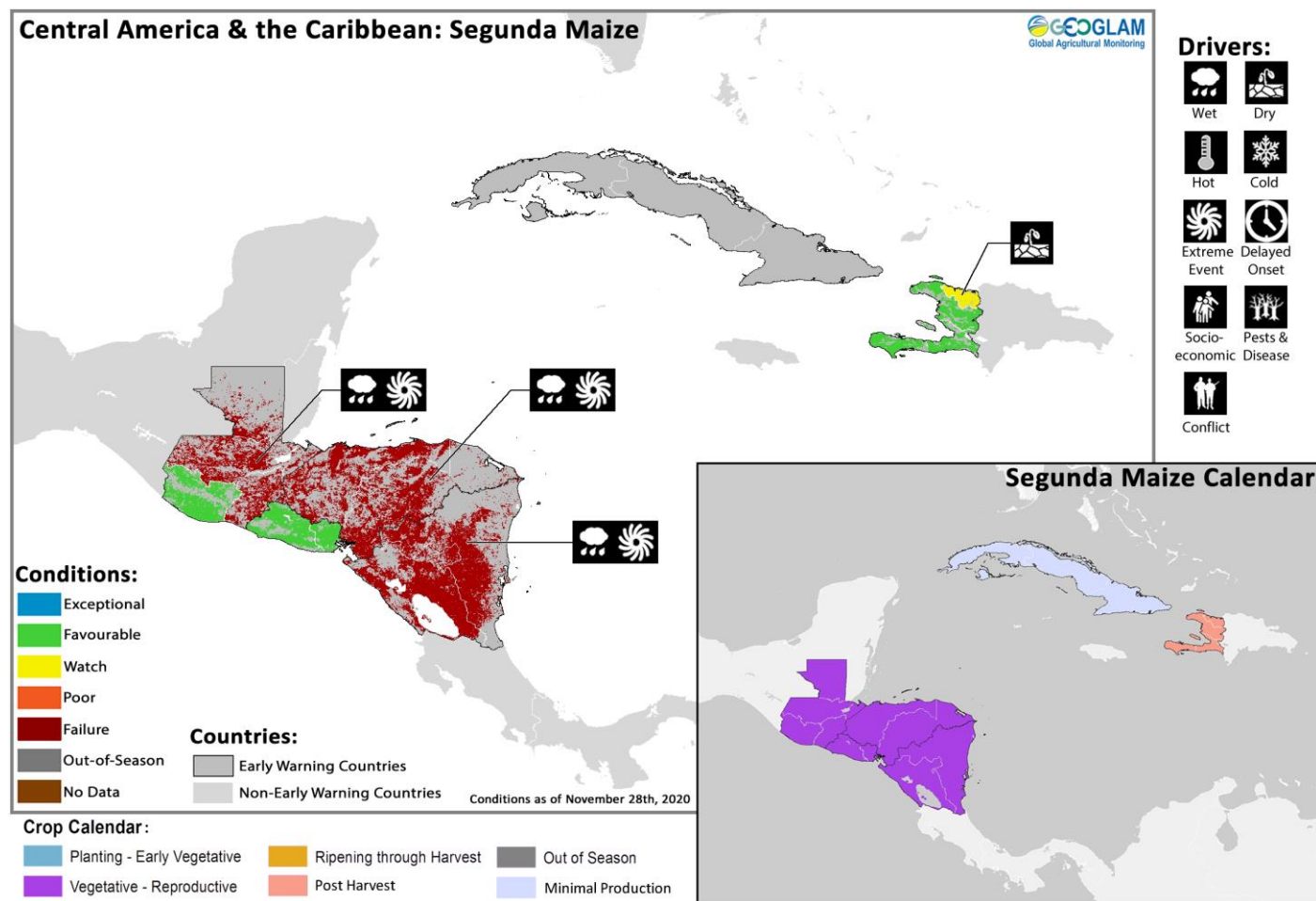
*Crop condition map synthesizing information as of November 28th. Crop conditions over the main growing areas are based on a combination of inputs including remotely sensed data, ground observations, field reports, national, and regional experts. **Conditions that are other than favourable are labeled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

In Central America and the Caribbean, harvesting of *Postrera/Segunda* season maize and bean crops continued in **Haiti**, **El Salvador**, and **Nicaragua** while crops are still developing in **Guatemala** and **Honduras**. Crop conditions have deteriorated across parts of the region impacted by the passing of two Category 4 hurricanes in November. The 2020 Atlantic hurricane season has been the busiest ever reported and the only season with two major hurricanes in November, resulting in one of the wettest October to November periods since 1981 across hurricane affected areas, causing excessive flooding and considerable crop damage. In early November, Hurricane Eta affected much of Central America as persistent rains and heavy winds resulted in flooding, landslides, and crop damage across **Nicaragua**, **Honduras**, **El Salvador**, and **Guatemala**. Two weeks later, Hurricane Iota continued along a similar path, bringing additional rains and winds and resulting in significant crop damages in northern **Guatemala**, **Honduras**, and **Nicaragua** (See Regional Alert pg. 21). However, impacts and damage were minimal for crops in southern **Guatemala**, **El Salvador**, **Haiti**, and **Cuba** and for bean crops in southern **Nicaragua** that had already been harvested.

In **Guatemala**, losses of *Postrera* season bean crops were significant as production concentrated in eastern areas was heavily affected by Eta and Iota. Conversely, impacts were minimal for bean and maize crops in the marginal producing south where conditions remain favourable. Despite high losses of *Segunda* season maize crops, domestic supplies will likely not be diminished due to good harvests gathered in the *Primera* season. In **Honduras**, losses of *Postrera/Segunda* season crops were significant throughout the country due to the impacts from Eta and Iota. According to
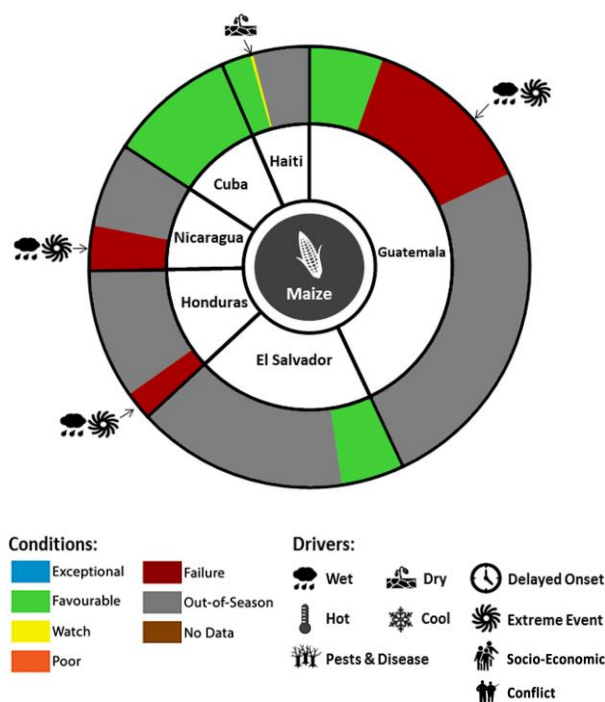
For detailed description of the pie chart please see description box on pg. 20.

the country's Ministry of Agriculture and Livestock, 8,200 hectares of maize and 12,850 hectares of beans were lost in Atlántida, Colón, Comayagua, Copán, El Paraíso, Francisco Morazán, Intibucá, Lempira, Olancho, and Yoro departments as of November 12th; however, the ministry assures there will be sufficient production and supply despite crop losses. In **Nicaragua**, *Postrera* season bean harvests were favourable in the south as they were harvested prior to the impacts of Iota. However, bean losses in the north were significant as they remained in the field and were impacted by the storms. To compensate for crop losses, farmers may increase plantings for *Apante* season beans to be planted from December. There was also a significant loss of second season maize as crops were in vegetative to reproductive stage when Eta and Iota hit the country. In **Haiti**, increased rainfall is expected to improve production prospects for second season maize and beans from the preceding main season which was affected by dry conditions. However, localized floods have been observed in some areas, while the Nord-Est region continues to experience poor rainfall performance which is impacting crop development. In addition, yields are likely to be reduced due to high production costs and shortage of agricultural inputs. In **Cuba**, harvesting of main season rice and maize crops continued in November to be finalized in January, and despite increased precipitation from Hurricane Eta, overall conditions are favourable.

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 slide 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 December 3rd, 2020.

Regional Alert: Two unprecedented major Hurricanes in November inundate Central America, causing widespread flooding and impacting Postrera/Segunda season crops

Since the start of planting in August, the *Postrera/Segunda* agricultural season in Central America had been generally favourable with above-average rainfall resulting in good vegetation health and yields. However, the 2020 Atlantic hurricane season has been the busiest ever reported and the only season with two major hurricanes in November, resulting in one of the wettest October to November periods since 1981 across hurricane affected areas and causing excessive flooding and considerable crop damage. On November 3rd, Hurricane Eta made landfall in northeastern **Nicaragua** on the coast of southern Puerto Cabezas as a Category 4 hurricane before weakening to a tropical storm, entering eastern **Honduras** and affecting **El Salvador** with rains on November 4th, heading northwest into northeastern **Guatemala** through November 5th, and finally weakening to a tropical depression and turning into the Caribbean Sea on November 6th. The storm affected an estimated 2.5 million people across much of Central America as persistent rains and heavy winds resulted in flooding, landslides, and crop damage across **Nicaragua**, **Honduras**, **El Salvador**, and **Guatemala**. Then on November 17th, Hurricane Iota made landfall over northern **Nicaragua** as a Category 4 hurricane, the strongest Atlantic hurricane this year, and extended along virtually the same path as Hurricane Eta. While Iota quickly degraded to a tropical depression, persistent rains and high winds exacerbated previous damage from Eta across **Nicaragua**, **Honduras**, and **Guatemala**. Overall, 6.5 million people have been affected by Eta and Iota across Central America and the Caribbean with **Guatemala**, **Honduras**, and **Nicaragua** being the most affected.

In **Guatemala**, Hurricane Eta has affected 900,500 people, and there is concern over potential extensive damages to crops and livelihoods. Reports indicate an estimated 120,000 hectares of land had been affected as of November 17th with Santa Rosa (southeast) and Alta Verapaz (central north) departments having the largest affected areas. Hurricane Iota then inundated nearly all departments with the previously affected north and eastern departments amongst the most affected, particularly Alta Verapaz and Izabal, and the number of affected people increased to 1.7 million. In **Honduras**, heavy rainfall and strong winds from Hurricane Eta affected 3.4 million people and caused catastrophic damage across nearly all 18 departments, particularly in the northern departments of Atlántida, Cortés, Yoro, the Sula Valley where banana and African palm are the primary crops, and Santa Bárbara where coffee is produced. Hurricane Iota increased the number of affected people to 4 million, and many areas in the Cortés department experienced further flooding. The storm also inundated mountainous southern central departments that present significant landslide risks. In **Nicaragua**, Hurricane Eta affected 130,000 people throughout the country, followed by Hurricane Iota which caused further flooding in the North, Central Pacific, and Caribbean regions. In **Cuba**, Hurricane Eta affected the region between November 8th and 9th, impacting the provinces of Granma, Ciego de Avila, and Sancti Spíritus and resulting in floods and river overflows. **El Salvador** was largely unaffected by Eta and Iota, though some regions were affected by high winds and minor landslides.
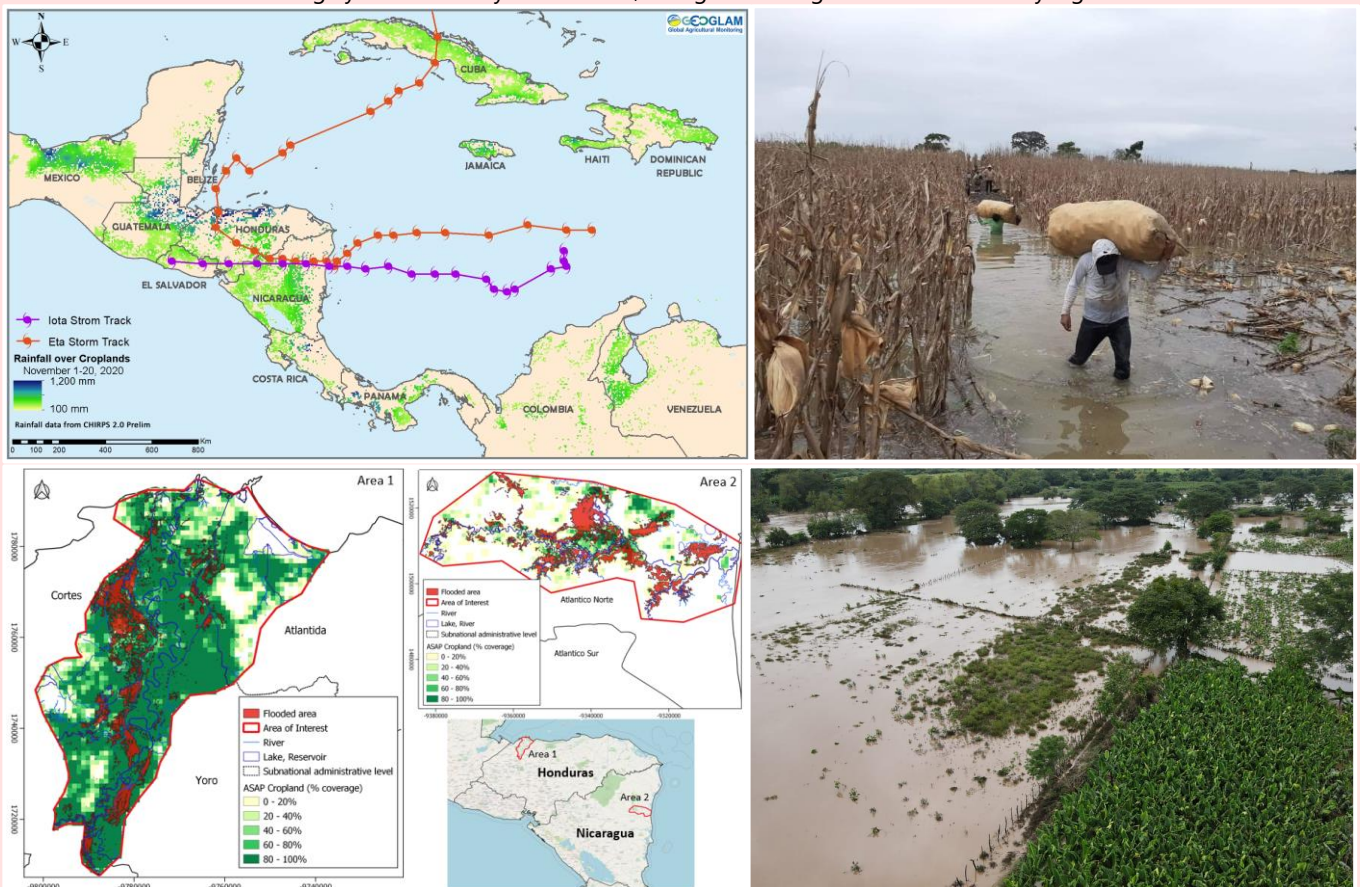
Figure 1. (Top-Left) Hurricane Eta and Iota storm tracks and rainfall received over cropland areas in Central America and the Caribbean. Source: GEOGLAM. (Top-Right) Flood affected maize fields in El Paraíso Honduras. Source: Secretaria de Agricultura y Ganadaria (SAG), Honduras. (Bottom-Right) Flood affected maize crops in Valle Honduras following heavy rains from Hurricane Eta. Source: SAG, Honduras. (Bottom-Left) Flood water extent layer from the Copernicus Emergency Management Service – Mapping for Tropical Cyclones Eta and Tropical Cyclone Iota overlaid to ASAP crop mask. Area 1 is located in Ulua Basin in Honduras and Area 2 in Prinzapolka in Nicaragua. Source: EC JRC.

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	

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.

Central America & Carribean				
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
Global Agricultural Monitoring

www.cropmonitor.org
@GeoCropMonitor

Prepared by members of the GEOGLAM Community of Practice, coordinated by the University of Maryland Center for Global Agricultural Research and funded through NASA Harvest.

The Crop Monitor is a part of GEOGLAM, a GEO global initiative.

Cover Photo by Catherine Nakalembe

Contributing partners