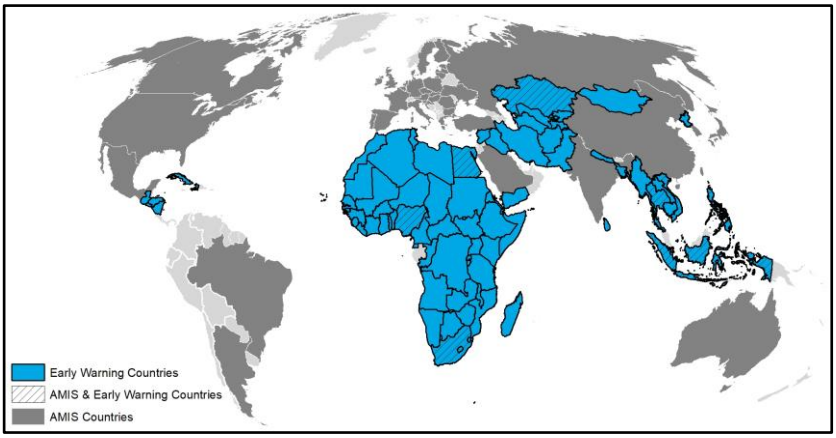
GEOGLAM Global Agricultural Monitoring

Crop Monitor EARLY WARNING

Overview:

In **East Africa**, planting and development of *Long Rains* cereals is underway in the south, and there is concern in areas impacted by ongoing socio-economic challenges, conflict, and persistent dry conditions. In **West Africa**, planting of main season maize is underway in the south while harvesting of second season rice crops continues in the north, and conditions are generally favourable. In the **Middle East and North Africa**, conditions for winter wheat crops are mixed due to persistent dryness and drought in some areas, particularly in Algeria where crops are unlikely to recover. In **Southern Africa**, harvesting of main season cereals is ongoing under generally favourable conditions. However, production is likely to be below-average in parts of Madagascar, Angola, and Namibia due to prolonged drought. In **Central and South Asia**, winter wheat crops are developing under mixed conditions due to persistent dryness in parts of the subregion while planting of spring wheat crops is ongoing under mostly favourable conditions. In northern **Southeast Asia**, harvesting of dry-season rice crops is underway with generally favourable production prospects. In Indonesia, harvesting of wet-season rice is underway with production prospects lower than the previous year due to impacts from flooding. In **Central America and the Caribbean**, early planting of *Primera* season cereals has started in some areas under generally favourable conditions.



Contents:

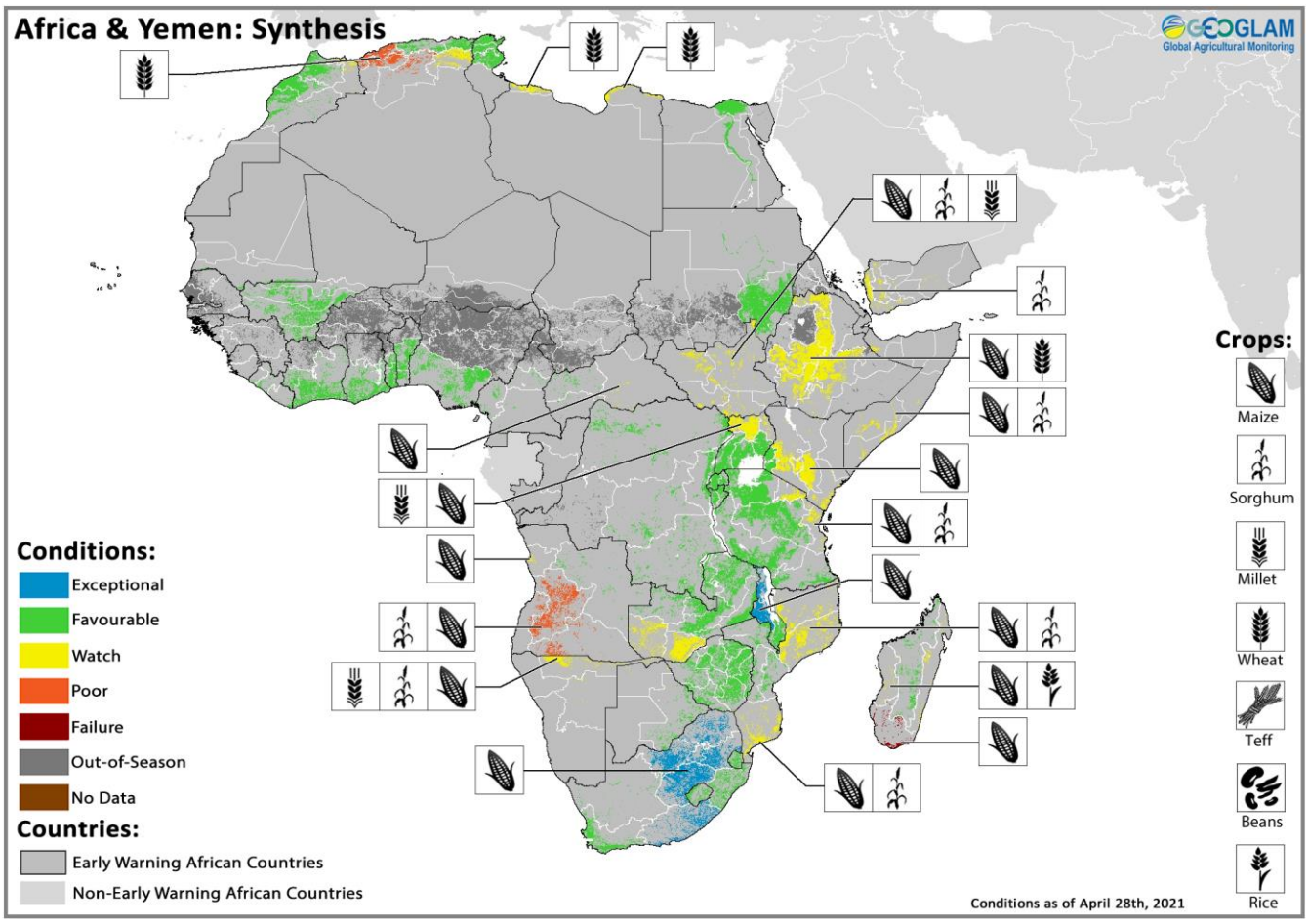
GEO GROUP ON EARTH OBSERVATIONS

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 April 28th



Crop condition map synthesizing information for all Crop Monitor for Early Warning crops as of April 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: Secondary *Belg* season crops in Ethiopia are in vegetative to reproductive stage for harvest from June, and there is concern due to delayed rainfall onset and persistent dryness, conflict, and desert locust presence. In the south, planting and development of *Long Rains* cereals is ongoing with concern in areas impacted by delayed rainfall onset and dry conditions which are forecast to continue through May (See Regional Outlook Pg. 7).

WEST AFRICA: Planting of main season maize is underway in the south under generally favourable conditions except in conflict affected regions.

MIDDLE EAST & NORTH AFRICA: Conditions are mixed for winter wheat crops due to persistent dryness in parts of Iraq, Iran, Syria, and Morocco as well as prolonged drought in Algeria where crops are unlikely to recover. There is continued concern in Syria and Libya due to ongoing conflict and socio-economic challenges.

SOUTHERN AFRICA: Harvesting of main season cereals is nearing completion under generally favourable conditions. However, prolonged drought has led to crop failure in southern Madagascar and is likely to lead to below-average production in parts of Madagascar, Angola, and Namibia. African Migratory Locust presence continues to pose a risk to production in other areas. Planting of winter wheat crops is ongoing under favourable conditions.

CENTRAL & SOUTH ASIA: Winter wheat crops are developing throughout the subregion with some concern in parts of Uzbekistan, Turkmenistan, Tajikistan, and Afghanistan due to persistent dry conditions while planting of spring wheat crops is underway under generally favourable conditions due to recent rainfall improvements benefiting water supply. Forecasts indicate below-average rainfall may be expected through June which could impact winter and spring wheat crops (See Regional Outlook Pg. 13).

SOUTHEAST ASIA: In the north, harvesting of dry-season rice is underway with generally favourable production prospects despite earlier concerns of limited irrigation water supply. In Indonesia, harvesting of wet-season rice is underway, and production is expected to be lower than the previous year due to earlier flooding in South Kalimantan.

CENTRAL AMERICA & CARIBBEAN: Early planting of main *Primera* season cereals is underway in Guatemala and parts of Honduras, and planting will begin across the rest of the region in May. Above-average precipitation in April benefitted soil moisture throughout Central America and will provide conducive conditions for the start of planting in May.

Global Climate Outlook: 30-day Forecast of Areas with Above or Below-Average Precipitation

The 30-day precipitation forecast indicates a likelihood of above-average rainfall over the Great Lakes and Northeast regions of the US, southern Mexico, Venezuela, Guyana, Suriname, French Guiana, northern and central Angola, southern and central DRC, Rwanda, southern Uganda, South Sudan, Ethiopia, northwest Somalia, southern and eastern India, western Indonesia, western Cambodia, southern Philippines, and Japan. There is also a likelihood of below-average rainfall in Cuba, Haiti, The Dominican Republic, El Salvador, southern Honduras, western Nicaragua, Costa Rica, eastern Paraguay, southern Chile, central Nigeria, the northern coast of Tanzania, coastal Kenya, southern Somalia, southeast China, northern Philippines, and Java Indonesia.

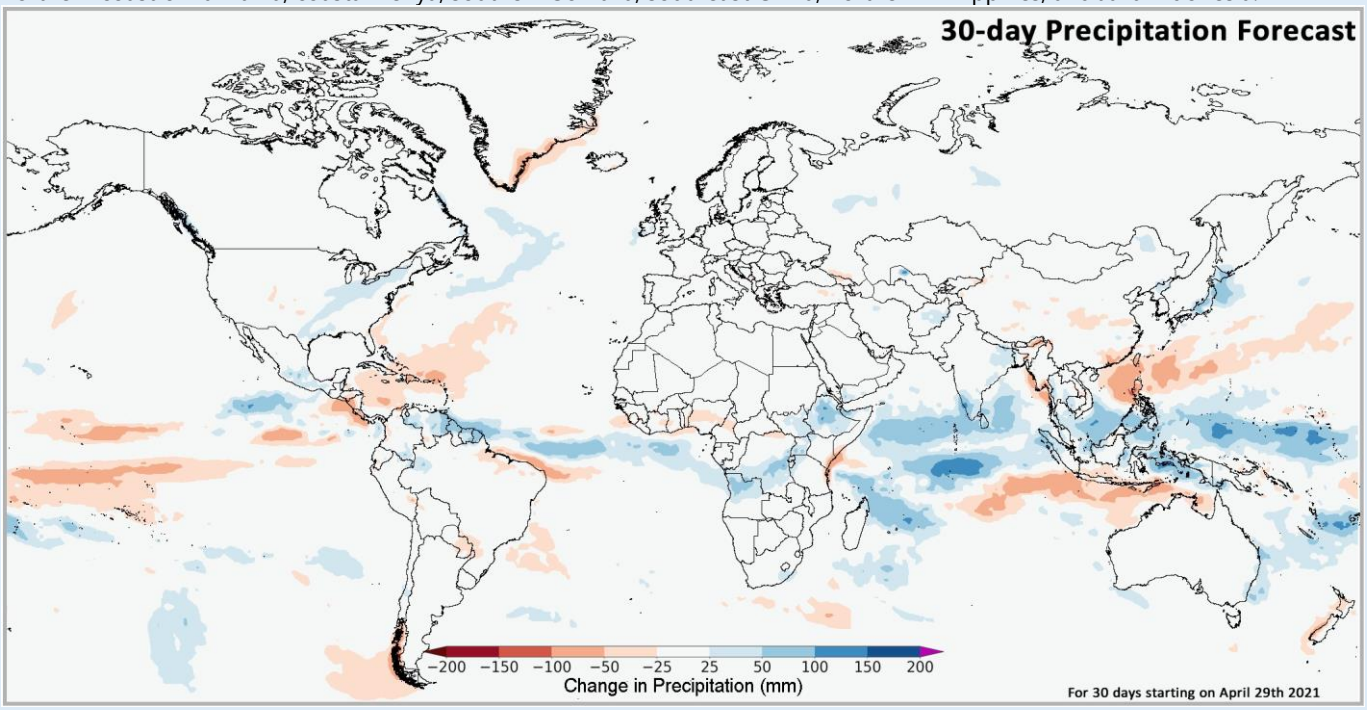


Figure 1. Forecast of areas with above or below-average precipitation over the next 30-days starting on April 29th, 2021. The image is the multimodel mean of precipitations anomaly from the Subseasonal Experiment (SubX) model forecasts for that day. The anomaly is based on the 1999 to 2016 model average. Skill assessments of SubX can be accessed here.
Source: UCSB Climate Hazards Center

Climate Influences: Transition to neutral ENSO is anticipated between May and July

The current La Niña is weakening. A transition to neutral El Niño-Southern Oscillation (ENSO) is expected in the next month (81% chance between May and July).

Long-range forecasts made at this time of year have a high level of uncertainty. However, IRI/CPC forecasts in April indicated about equal chances that another La Niña event might develop (46% chance), or neutral ENSO conditions will occur (41% chance) during October to December 2021.

Source: UCSB Climate Hazards Center

Desert Locust Alert: Delayed rains in East Africa are likely to reduce locust numbers in the region

Across the Horn of Africa, the upsurge continues to decline due to ongoing control operations. However, in April, good rains in northern **Kenya** and southern **Ethiopia** will allow swarms to mature and lay eggs and will give rise to hatching and hopper band formation in May, posing a risk to further locust development in **Kenya**. Immature swarms and groups are expected to move towards northern **Ethiopia** during the June to September period. However, egg-laying, hatching, and band formation is expected at a much smaller scale than the previous year, and there is an overall decreasing trend in swarms and hopper bands over **Ethiopia**, **Somalia**, and **Kenya**. Additionally, continued control operations as well as the forecast drier than normal upcoming rainy season is likely to further diminish overall locust numbers (See Regional Outlook Pg. 7). If poor rains continue during the summer in northeastern **Ethiopia** and **Somalia**, the upsurge in the Horn of Africa is likely to further decline. Elsewhere in East Africa, the situation remains unchanged.

East Africa Update

While delayed rains at the beginning of the planting season are likely to decline locust numbers in **Kenya**, the threat to cropland remains, particularly as some locust swarms were reported in the main producing Rift Valley. Also, remaining infestations in the north could result in breeding. In **Ethiopia**, immature swarms that persist east of the Rift Valley in Bale Mountains and Harar Highlands bred in areas that received rainfall. The eggs are expected to hatch in early May, giving rise to hopper bands. In northern **Somalia**, breeding is also expected in areas that received rainfall from late April.

Arabian Peninsula Update

In the Arabian Peninsula, extensive winter breeding along the northern Red Sea coastal plains in **Saudi Arabia** in combination with strong southerly winds in April has resulted in the spread of mature adults and small swarms to **Iraq**, **Jordan**, **Israel**, **Lebanon**, and **Syria**. Hatching and small swarm formation may occur in May. In **Saudi Arabia**, widespread hatching and hopper band formation is underway in the interior, and groups of immature adults began to form in late April. Small swarms could form and move to **Yemen**, **Jordan**, and **Iraq**.

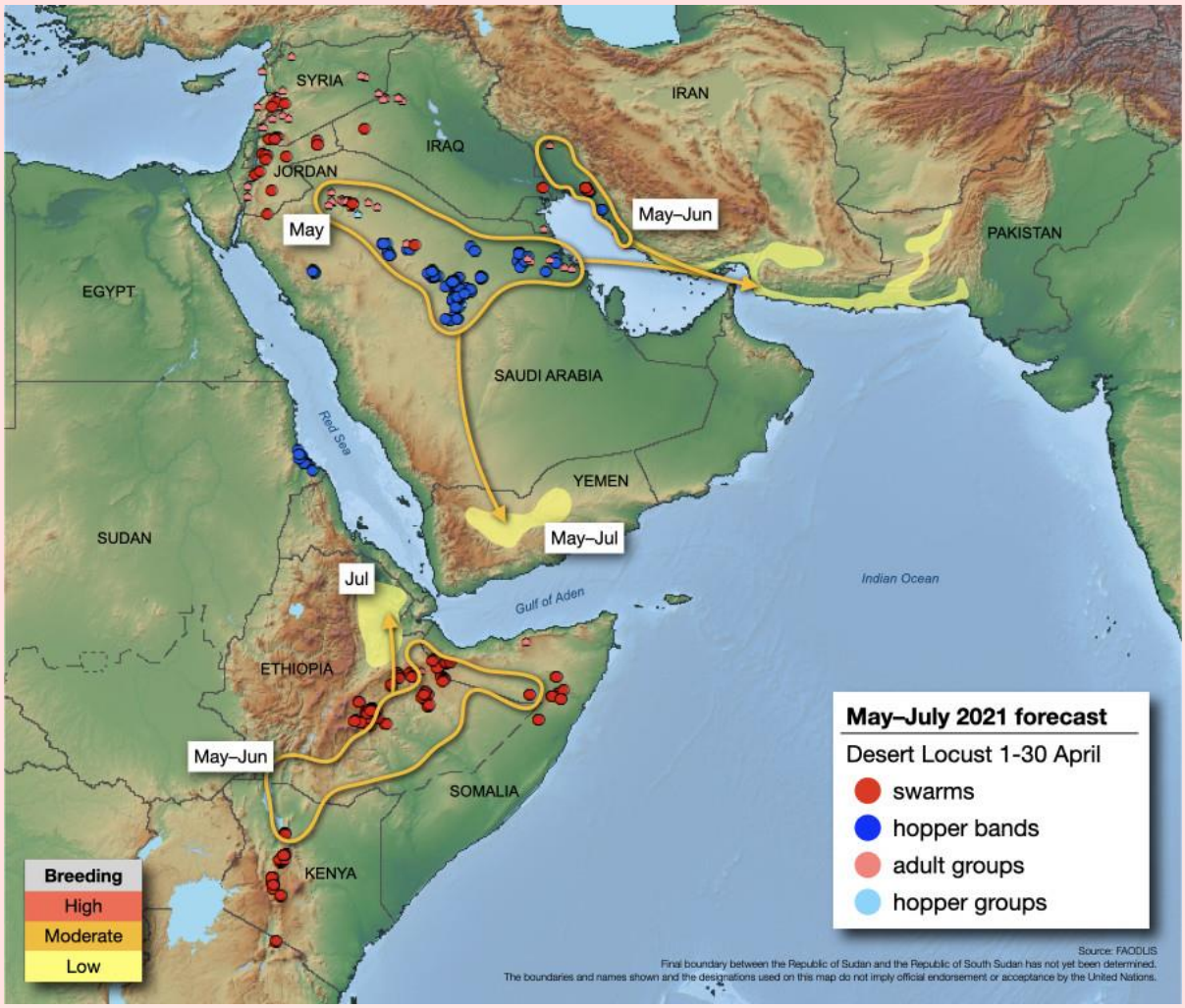
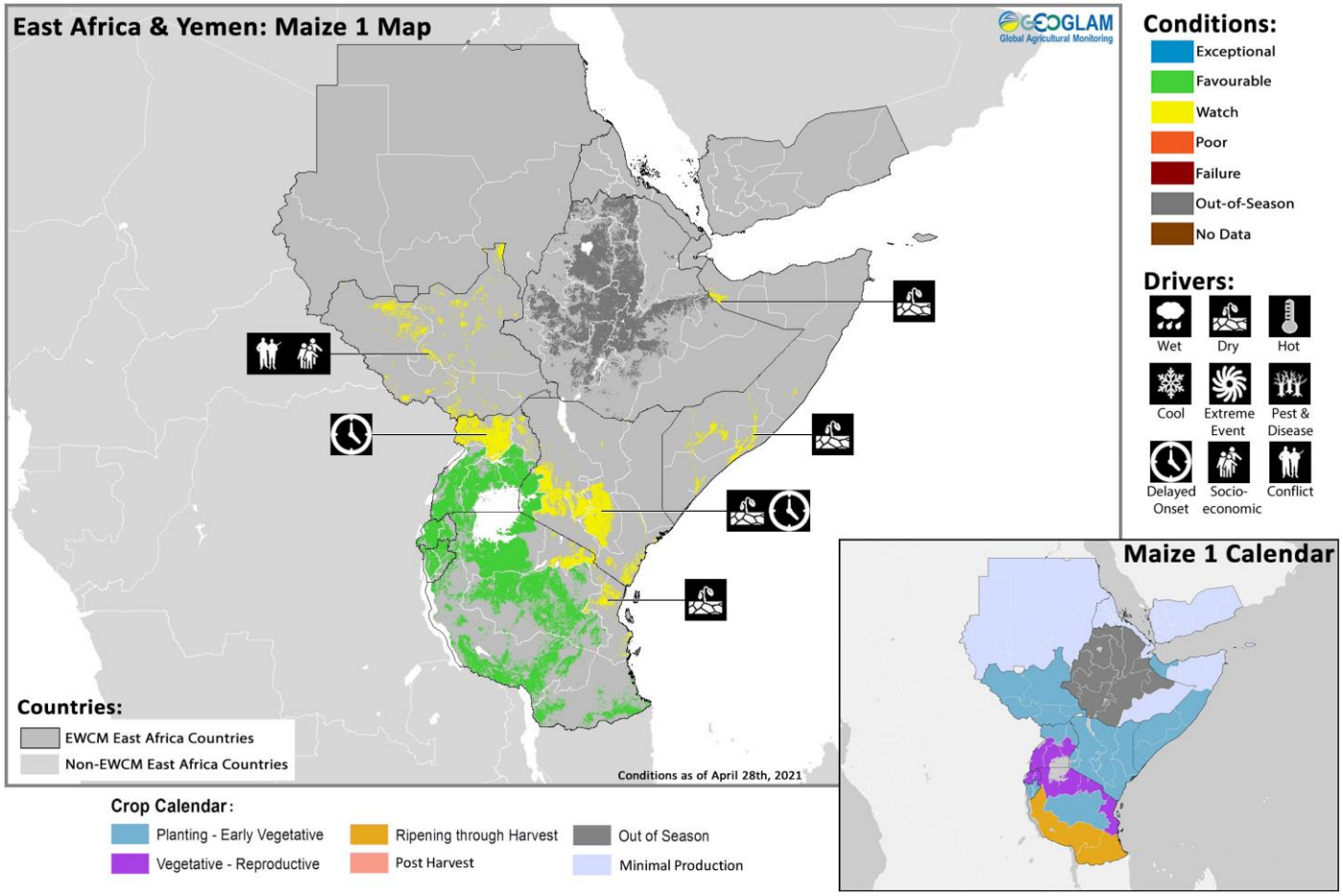


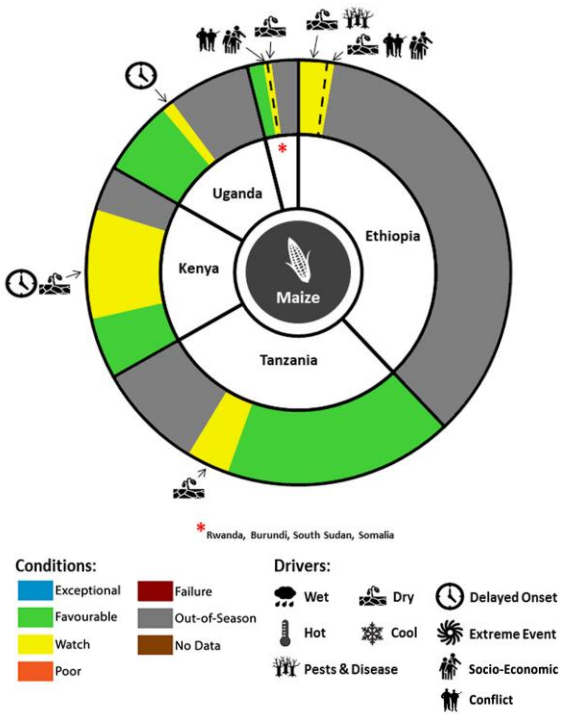
Figure 1. Desert Locust May- July 2021 forecast. Source: FAO DLIS

East Africa & Yemen



Crop condition map synthesizing Maize 1 crop conditions as of April 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.***

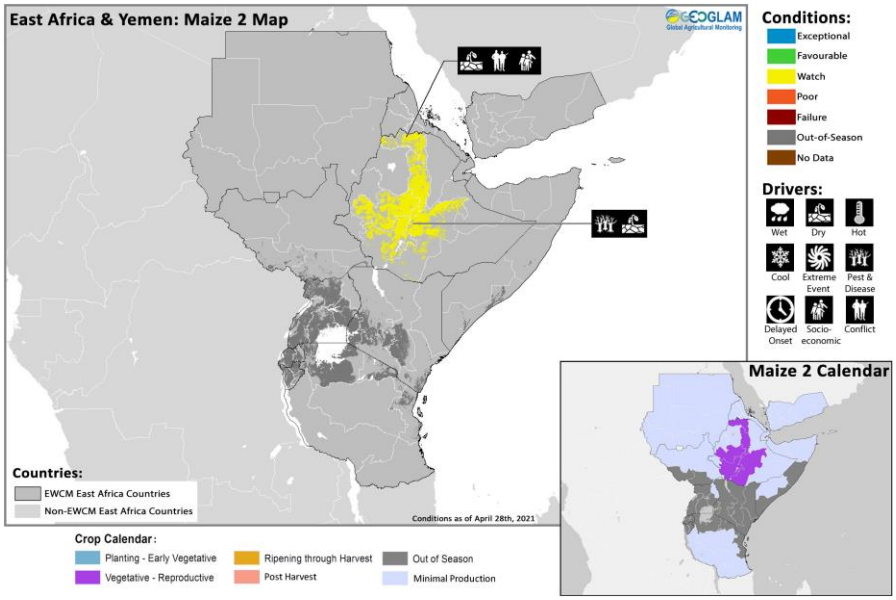
Across the north of the subregion, harvesting of winter wheat crops finalized in **Sudan** under favourable conditions. In **South Sudan** and **Yemen**, planting of main season cereals continued in April while secondary *Belg* season crops in **Ethiopia** are in vegetative to reproductive stage, and there is concern due to delayed rainfall onset and persistent dryness in parts of **Yemen** and **Ethiopia** as well as continued socio-economic challenges and conflict in affected areas. Across the south of the subregion, harvesting of main season cereals began in southern **United Republic of Tanzania** under favourable conditions. Planting and development of main season cereals continued throughout **Burundi**, **Kenya**, **Rwanda**, **Somalia**, **Uganda**, and the **United Republic of Tanzania**, and there is concern in areas impacted by delayed rainfall onset and persistent dry conditions since the beginning of the rainy season. A second consecutive season of below-normal rainfall is forecast through May in bimodal areas of southern and eastern **Ethiopia**, northern and eastern **Kenya**, and **Somalia** (See Regional Outlook Pg. 7). Below-average rains are likely to drive crop and livestock production losses in these areas.



For detailed description of the pie chart please see description box on Pg. 18.

Northern East Africa & Yemen

In **Ethiopia**, secondary *Belg* season maize crops, for harvest from June, are in vegetative to reproductive stage, and there is continued concern due to delayed and below-average rainfall in most *Belg* receiving areas as well as conflict in Tigray Region. February to May *Belg* rains have thus far been below-average and erratic, and vegetation conditions



Crop condition map synthesizing Maize 2 conditions as of April 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.***

remain poor in most regions as of late-April. The dry conditions throughout the country have resulted in delayed and reduced plantings and in widespread germination failures. However, recent rainfall has fallen over southern regions, and forecasts indicate potential precipitation improvement in May (See Regional Outlook Pg. 7). Also, the ongoing conflict in Tigray Region continues to disrupt agricultural activities. More than one million people have been displaced since the start of the conflict in November 2020 and can now not access their fields at a time when land preparation and planting should be underway for the upcoming *Meher* season. In **Sudan**, harvesting of winter wheat crops finalized in April under favourable conditions, and planting of main season millet and sorghum crops will begin in June. In southern bimodal areas of **South Sudan**, planting of first season cereals began in April, and there is concern due to below-average early-season rains. Additionally, escalating conflict has displaced farmers and significantly disrupted planting, especially in Central Equatoria state, and access to land for agricultural activities could be a significant challenge that may affect first season cultivation and limit local food production. In **Yemen**, planting of main season sorghum crops continued in April for harvest from September, and there is continued concern due to recent dryness, continued socio-economic challenges and conflict, and desert locust presence. Conversely, torrential rains from mid-April has resulted in flooding in Aden, Abyan, Al Dhale'e, Lahj, Hadramaut, Ma'rib, and Ta'iz governorates, and rains are forecast to persist in the coming days.

Southern East Africa

In **Uganda**, planting and development of first season cereals is underway for harvest from June. While climatic conditions are favourable in most regions, there is concern in the northwest as delayed rainfall onset and persistent dryness are impacting crop development. In **Kenya**, planting of *Long Rains* cereals is underway throughout the country. While conditions are favourable in the west, persisting dry conditions are a concern in the key producing Rift Valley region. There is also continued concern in the central region and the marginal producing southeastern and coastal regions as they have yet to receive adequate rainfall to sustain the development of crops that have already been germinated. Forecast below-average rains are expected to negatively impact crop production in these areas (See Regional Outlook Pg. 7). Conversely, heavy rainfall has impacted some areas from early April, leading to flooding in Tana River, Busia, Kisumu, Garissa, and Marsabit counties, displacing 26,958 people and damaging 1,308 hectares of cropland in Tana River basin. In **Somalia**, planting of *Gu* season maize and sorghum crops is underway across the country, and there is concern as April to June *Gu* rains have been delayed and below-average so far in most areas. In early and mid-April, most regions were experiencing critical water shortages, and more than 80 percent of the country was facing moderate drought conditions. Extreme water shortages have displaced over 116,000 people since October 2020 due to below-average 2020 *Deyr* (October-December) rainfall. The worst affected regions include Lower Juba, Middle Juba, Gedo, Mudug, Nuugal, Bari, Toghdheer, and Sool, which are all experiencing severe water shortages for agricultural production. While flooding was the primary driver of high displacements in 2020, drought will likely be the primary driver in 2021 due to poor seasonal rains. Conversely, from late April, most parts of the country experienced increased *Gu* rainfall with Somaliland and Puntland experiencing moderate to heavy rains, resulting in increasing water levels along the Shabelle and Juba rivers and localized flash floods. While forecasts indicate increased rainfall amounts in Somaliland and Puntland in early May, particularly in Awdal and Woqooyi Galbeed regions, it is uncertain whether there will be adequate moisture to support crops to full maturity (See Regional Outlook Pg. 7). Additionally, desert locusts remain a concern in the northwest where they are forecast to remain through June (See Desert Locust Alert Pg. 4). In **Rwanda**, main *Season B* maize crops are in vegetative to reproductive stage under favourable conditions as good rainfall from February has benefitted soil moisture and planting activities. However, heavy rains in early May caused severe flash flooding in the north, and additional heavy rains are forecast for the coming weeks (See Regional Outlook Pg. 7). In **Burundi**, planting of main *Season B* maize and rice crops continued in April for harvest from July, and conditions are favourable despite delayed rainfall onset in the northeast. Conversely, good rains were received in some localized areas along Lake Tanganyika in the southwest; however, increased rains and water inflows from neighbouring Democratic Republic of the Congo could lead to flooding and impact production. In the **United Republic of Tanzania**, harvesting of *Msimu* season maize and sorghum crops is underway in main producing central and southern unimodal areas, and overall conditions are favourable. In northern and northeastern bimodal areas, *Masika* season cereals are in vegetative to reproductive stage for harvest from May, and there is concern in some areas where dry conditions are impacting crop development. Below-average rainfall is forecast to continue through mid-May in the northeast (See Regional Outlook Pg. 7).

Regional Outlook: Below-average rainfall expected to continue into May across parts of Kenya, Somalia, and Tanzania

Poor rainfall performance since the start of the March to May rainfall season resulted in rainfall totals that are less than 80 percent of average from March 1st to April 25th in many areas. Severe deficits of less than 50 percent of average are found in portions of southeastern and northern Kenya, and in central and northeastern Ethiopia (Figure 1-left). In these areas of Ethiopia, seasonal totals up to April 25th rank among the lowest on the CHIRPS 40-year record. Up to April 25th, average or above-average rainfall occurred mainly in southern areas of the region, including Tanzania, Burundi, and far western Kenya, and in some northern areas, including western Ethiopia and northern South Sudan.

In the eastern Horn of Africa, the delayed season onset and erratic rainfall in March and April are of significant concern as substantial rainfall lasts around two months, and peak rains vary from April to mid-May. Rainfall in late April and the coming weeks provides the last chance for improved cropping or pastoral conditions.

Below-average rainfall is forecast from April 30th to May 13th across central and eastern Kenya, and in southeastern Somalia and northeastern Tanzania, according to the GEFS week 1 (Figure 1-middle) and week 2 outlooks from April 29th. SubX forecasts below-normal rainfall in these areas from May 15th to 28th, as well as in south-central and southeastern Ethiopia. This is convergent with the WMO May-to-July forecast for increased chances of below-normal rainfall (Figure 1-right).

Ethiopia is forecast to receive above-average rainfall and potentially very high localized amounts from April 30th to May 6th, according to the GEFS (Figure 1-middle). Wetter-than-average conditions may continue in parts of central and southwestern Ethiopia. Western Tanzania may also receive above-average rainfall into early May. WMO and NMME ensemble forecasts show increased chances for above-normal rainfall in western and northern areas from May to July (Figure 1-right).

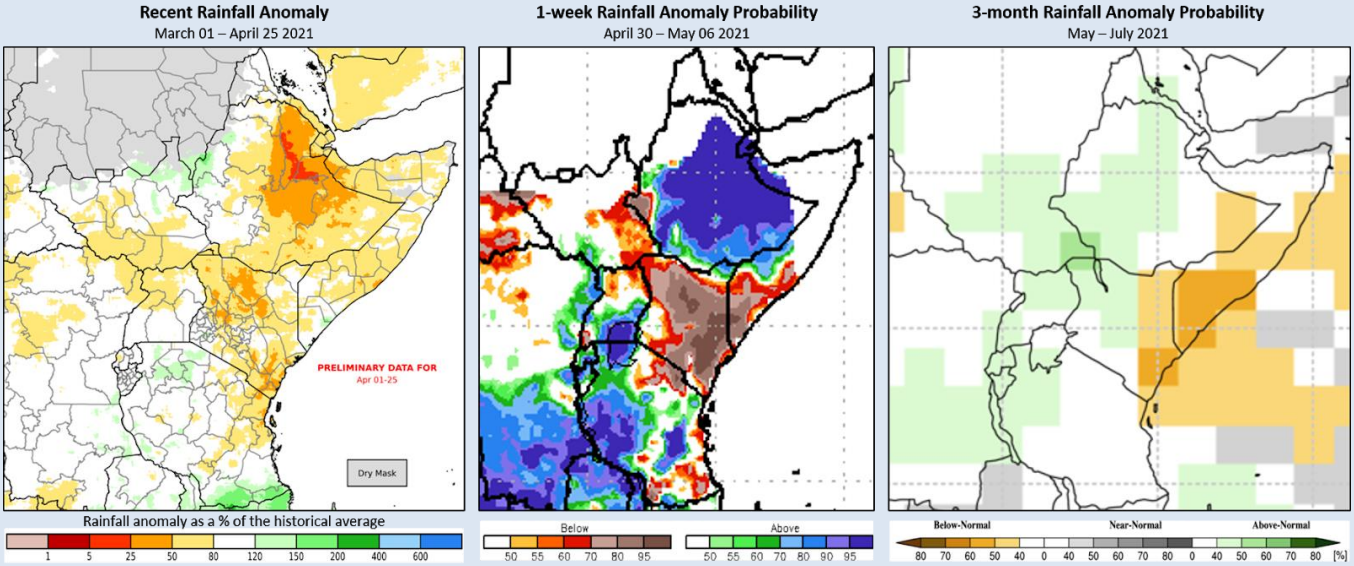
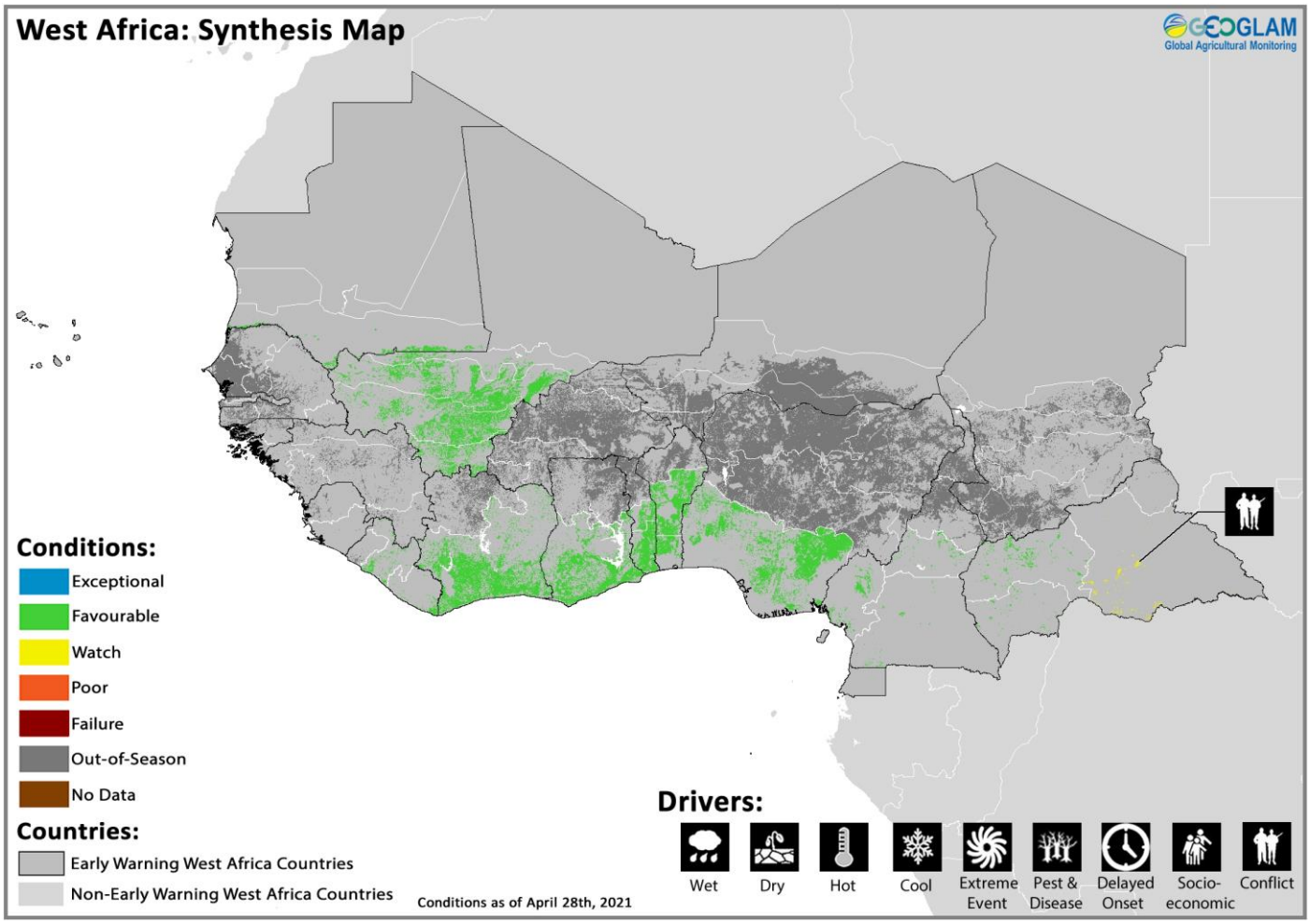


Figure 1. Recent rainfall anomaly for March 1st to April 25th, a 1-week probabilistic rainfall forecast, and a 3-month rainfall anomaly probability forecast. The left panel is a UCSB Climate Hazards Center Early Estimate for March 1st to April 25th, which compares 2021 rainfall amounts to the 1981-2020 CHIRPS average. The middle panel is the GEFS week 1 forecast for April 30th to May 6th, 2021, which shows the chances for above-normal (> 120% of average) and below-normal (< 80% of average) rainfall. The panel on the right is a probabilistic forecast for most-likely May-June-July rainfall tercile from the WMO Lead Centre for Long-Range Forecast Multi-Model Ensemble, April 2021. White color indicates that there is no dominant category across the model forecasts.
Source: UCSB Climate Hazards Center.

West Africa



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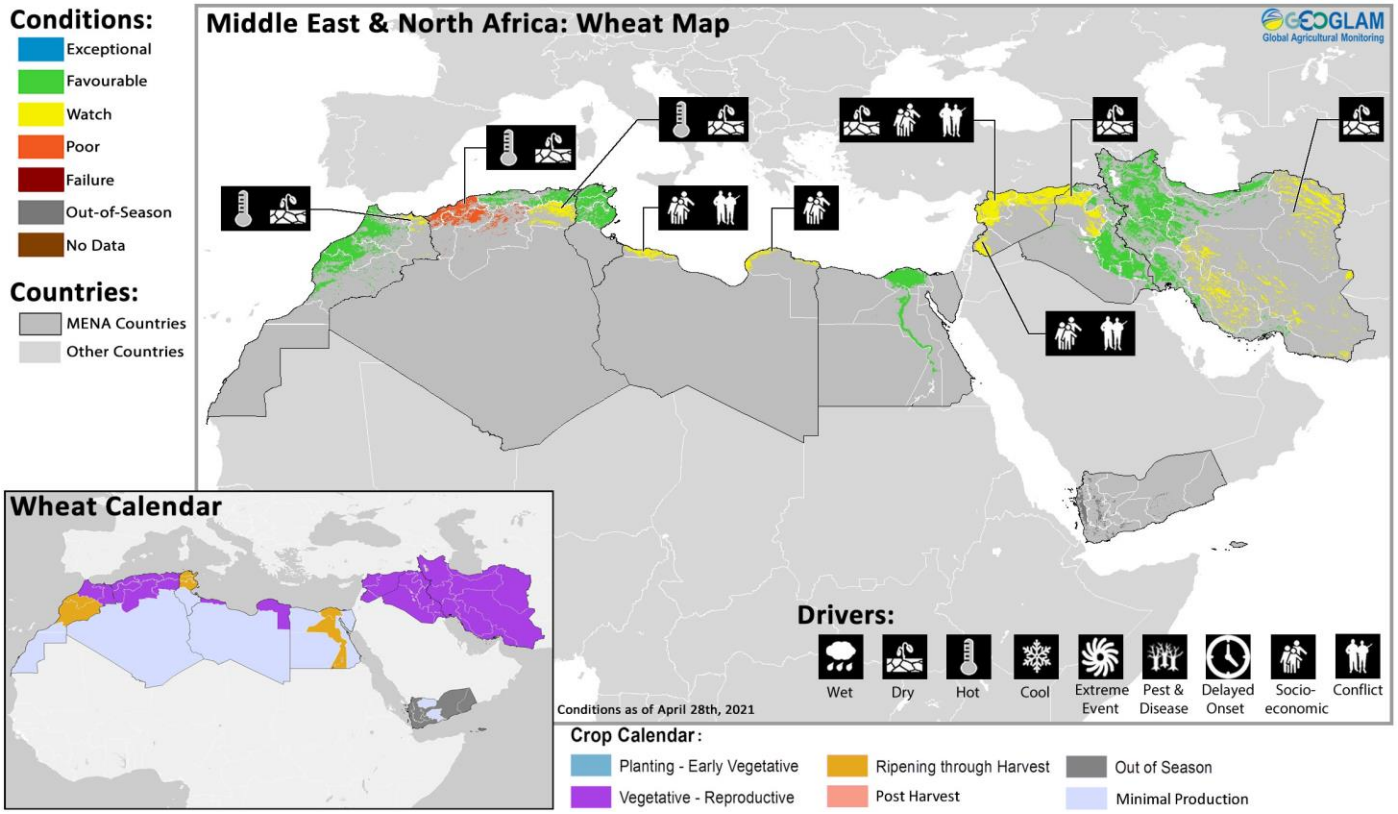
In West Africa, planting of main season maize is underway in the south of the subregion in **Liberia**, southern **Cote d'Ivoire**, southern **Ghana**, southern **Togo**, southern **Benin**, southern **Nigeria**, and the **Central African Republic** for harvest from July. Overall conditions are favourable except in parts of the **Central African Republic** impacted by conflict. Elsewhere, main season maize planting will begin in May. In southern **Cameroon**, planting of second season maize crops continued in April under favourable conditions for harvest from August. Planting of second season maize and rice crops will begin in central **Cameroon** and central **Nigeria** in May for harvest from October. Across the north of the subregion, harvesting of second season rice crops finalized in southern **Mali** while harvesting continued in southern **Mauritania**, and overall conditions are favourable. Forecasts indicate the possibility of below-normal rainfall in **Cameroon**, particularly in the southwest, for the June to September period that could impact main and second season crop development. Below-normal rainfall is also expected along the southern coast while a wetter-than-normal rainy season is expected in the Sahel from July to September, which could benefit crop development but lead to flooding in localized areas.

Middle East & North Africa



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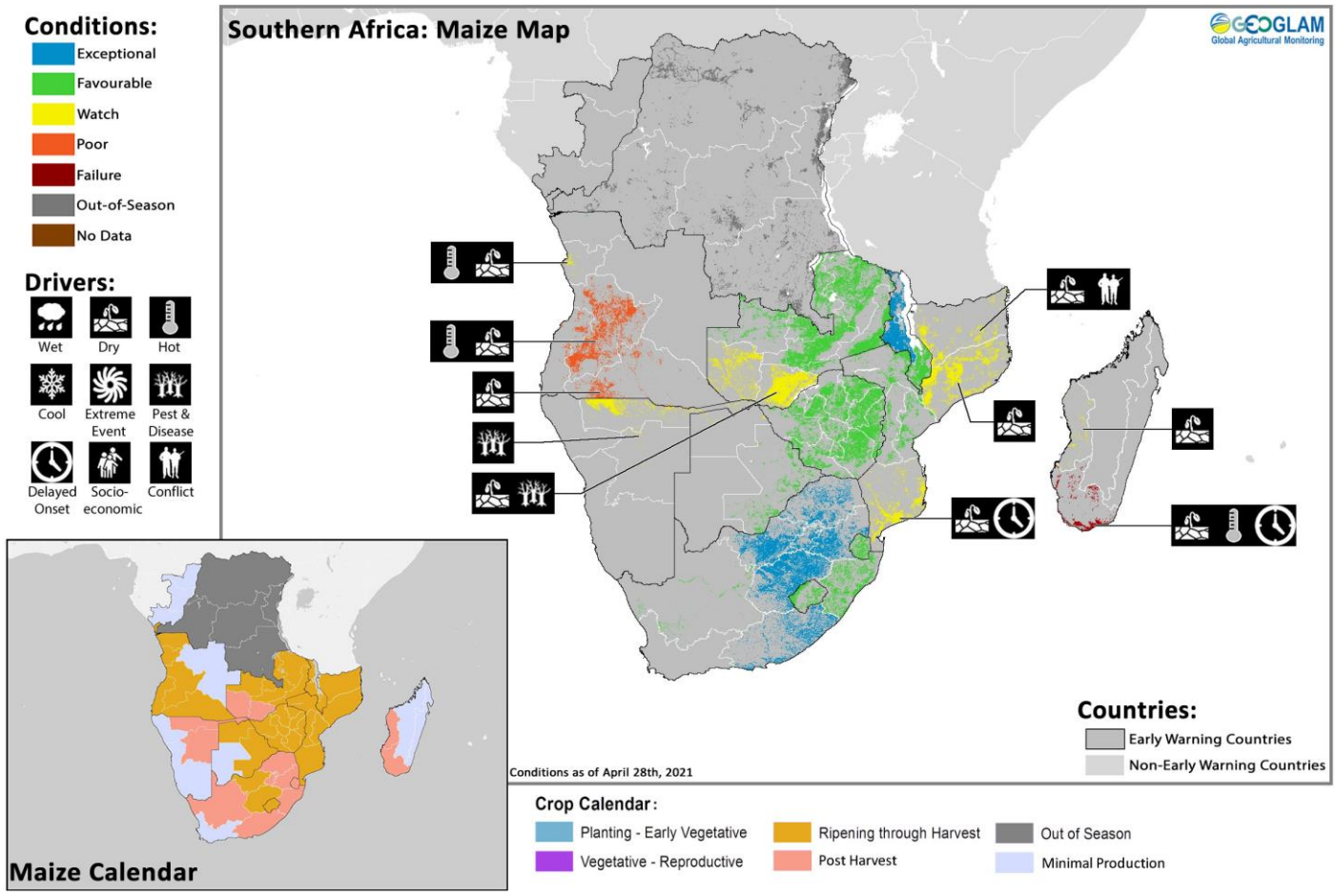
In the Middle East and North Africa, winter wheat crops are in vegetative to reproductive stage for harvest from May. In North Africa, conditions are favourable in parts of **Morocco**, northern **Tunisia**, **Egypt**, and northeastern **Algeria**; however, there is concern in parts of **Algeria** and northeastern **Morocco** due to persistent dryness as well as in **Libya** where socio-economic challenges continue to disrupt agricultural activities. In **Morocco**, conditions are average to slightly above-average in most areas due to favourable rainfall and temperatures throughout the season. Dry conditions in the northeast may impact harvest; however, overall national production is forecast to be well above the previous year's drought-affected output. In **Algeria**, prolonged drought since the beginning of the season is expected to result in below-average yields in central and western areas, and there is continued concern in the southeast due to persistent dryness. Conversely, crop conditions are favourable in the northeast, and yields are forecast at near-average levels. However, overall national yields are forecast to decline 20 percent compared to the five-year average. In **Tunisia**, crop conditions are favourable due to generally good weather conditions throughout the season and despite slightly below-average rainfall from mid-January to mid-February. In **Egypt**, sowing of summer-planted rice crops began in April for harvest from September under favourable conditions.

In the Middle East, conditions are favourable in south and central **Iraq** and western **Iran** while dry conditions are impacting crop development in northern **Iraq**, northeastern **Syria**, and south and northeastern **Iran**. In **Syria**, drought conditions have developed over Hassakeh in the northeast where sown crops appear to have failed. Parts of Raqqa, eastern Aleppo, and Deir zor in the northwest are also affected by dry conditions, resulting in poor biomass of rainfed crops. In the minor producing western part of the country along the Mediterranean, agro-climatic conditions are favourable for winter wheat crop development; however, conflict and socio-economic challenges continue to disrupt agricultural activities throughout the country. In **Iraq**, conditions are generally favourable throughout the country except in the north where dry conditions have resulted in below-average planted area. Sown crops appear to have failed in the northwestern Ninewah Province, and parts of northeastern Dahuk, Erbil, Sulaymaniyah, and Salah Al Din Provinces have also been affected by irregular rainfall. In western **Iran**, conditions are favourable for crop development. However, in the south, poor and irregular rainfall since January has impacted crops in Fars, Kerman, and Esfahan. In the northeast, crop growth is delayed in western Golestan and part of Khorasan, and planted area is below-average.

Southern Africa



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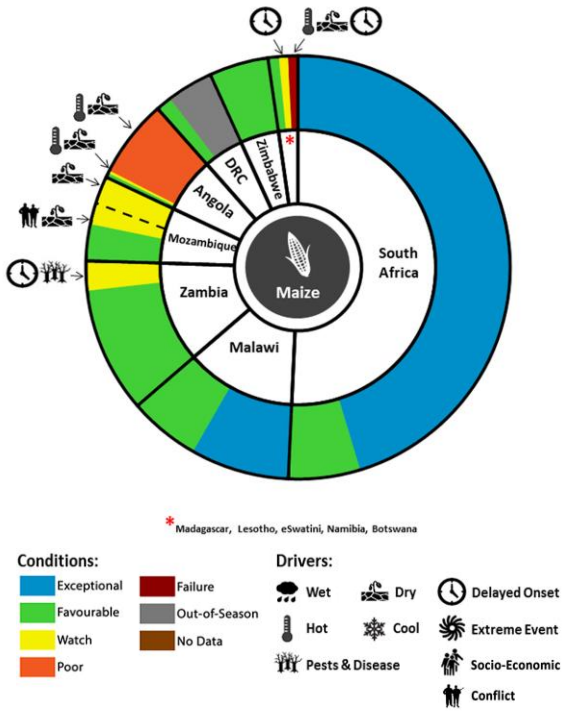
In Southern Africa, harvesting of main season cereals is underway throughout the subregion to be finalized in June. Crop conditions are favourable throughout most areas with exceptional production expected in parts of **South Africa**, **Malawi**, **Zambia**, **and Zimbabwe**. However, maize crop production is likely to be well below-average in southern **Madagascar**, and stressed crops in south and southwestern **Angola** and northwestern **Namibia** are unlikely to recover due to the impacts from prolonged drought. There is continued concern in parts of southern **Mozambique** impacted by storm damage earlier in the year as well as parts of northern **Mozambique**, northwestern **Angola**, and western **Madagascar** where delayed rainfall onset and dry conditions may impact production. African Migratory Locust (AML) presence continues to pose a risk to crops in northeastern and central **Namibia**, northwest and northeastern **Botswana**, southeastern **Angola**, and south and western **Zambia**.

In the **Democratic Republic of Congo**, harvesting of main season sorghum crops finalized in central areas while planting and development is underway in south and northern regions, and overall conditions are favourable. Harvesting of second season maize crops continued in central and southern regions while planting and development is underway in the east and north. Despite uneven rainfall distribution, crop conditions remain favourable. However, conflict continues to disrupt agricultural activities in affected regions. In **Angola**, harvesting of main season maize and sorghum crops is underway, and crops in the south and southwest are unlikely to recover from well below-average rainfall throughout the season and above-average temperatures. A favourable start to the rainy season with near-average rainfall in October and November 2020 was followed by persistent rainfall deficits and high temperatures in key producing southwestern and central provinces through February 2021. Despite rainfall improvements in March, cumulative seasonal rainfall is 30 percent below the long-term average, resulting in the worst drought conditions since 1981. The provinces most impacted include Namibe, Huila, Huambo, and Benguela in the southwest, which together produce close to half of the national maize output. Cunene Province in the southwest and, to a lesser extent, the northwest are also impacted. Rainfall deficits are less significant in the central provinces of Bie and Cuanza Sul which account for one-third of national maize production. African Migratory Locust (AML) presence is also a concern in Cuando Cubango Province in the southeast as they could cause further damage to already stressed cereals. Conversely, conditions remain favourable in the north and east as rainfall totals are near-average. Even so, national cereal production is likely to decline significantly. In **Zambia**, harvesting of main season maize crops is ongoing under generally favourable conditions. Increased planted area, above-average October through December rainfall, and favourable weather conditions throughout

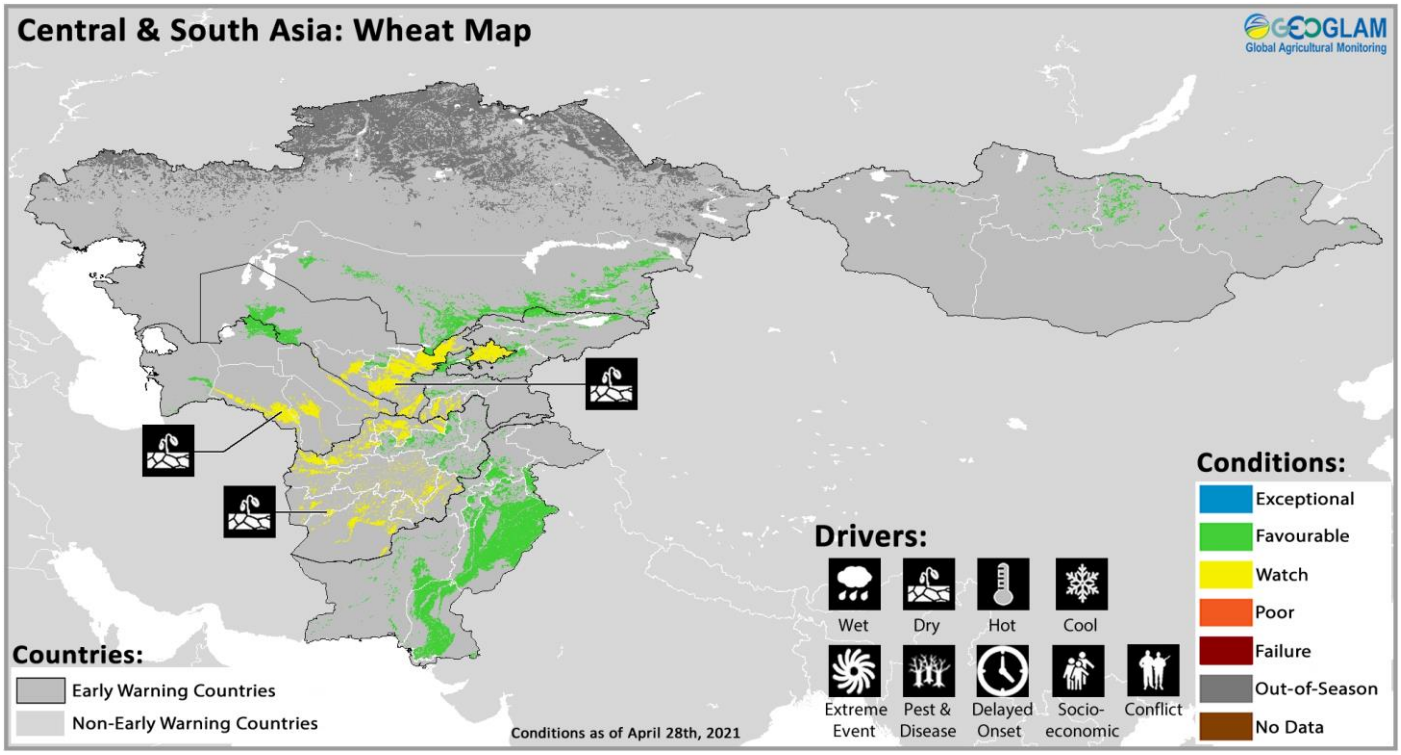


For detailed description of the pie chart please see description box on Pg. 18.

the season are likely to benefit 2021 production and yields. Maize production is forecast to reach a bumper level of 3.5 million tonnes, slightly above the 2020 output and 20 percent above the five-year average. However, abundant rainfall has led to an increase in AML infestations between January and March 2021. AML presence and late-season dryness in key southern and western cropping areas could pose a risk to 2021 crops. In **Malawi**, harvesting of main season maize crops is ongoing under favourable to exceptional conditions as rainfall has been adequate and well-distributed from the start of the cropping season. Excessive rainfall in parts of Central and Northern regions as well as dry spells in parts of the Southern Region could limit yields; however, increased planted area due to good weather conditions and subsidized seed and fertilizer inputs as well as generally favourable weather conditions throughout the season are likely to contribute to average to above-average yields at the national level. Maize production is forecast to reach 4 million tonnes in 2021, an increase compared to 3.7 million tonnes harvested in 2020. In **Mozambique**, harvesting of main season cereals is ongoing with concern in north and southern regions due to impacts from previous storms and recent drought conditions. In southern areas, recent rainfall reductions are likely to compound localized crop losses resulting from cyclone activity and flooding in February. In Sofala Province, conditions are favourable despite localized crop losses to lowland areas resulting from cyclone activity earlier in the year. In northern areas, well below-average rainfall and above-average temperatures from December to February have resulted in residual moisture stress despite rainfall improvements in March. Elsewhere, conditions are favourable. In **Namibia**, harvesting of main season maize crops continued in April while millet crops continue to develop for harvest from May, and there is concern due to poor distribution and below-average rainfall in the northwest as well as AML presence throughout the country which remains a threat to production. Kavango Region in the northeast is reported to be one of the worst affected areas for AML infestations. In **Botswana**, harvesting of main season cereals continued in April under favourable conditions. Overall good seasonal performance and increased planted area are likely to benefit production. However, AML infestations and late-season dry conditions may impact final yields in northwest and northeastern areas. In **Zimbabwe**, harvesting of main season sorghum and maize crops is underway, and overall conditions are favourable. Maize production is estimated at 2.5 million tonnes with the highest yield in 20 years. While national cereal output is expected to be above-average, waterlogging may lead to localized losses in parts of Masvingo in the southeast. Also, while Fall Armyworm presence was reported in all provinces, damage is minimal. In **Madagascar**, harvesting of main season maize and rice crops is underway in the south and west while crops are still developing in central and eastern areas, and vegetation conditions are generally below-average. In the south, rainfall was delayed up to three months in some regions, resulting in reduced planted area. Despite some rainfall improvements in March, many areas received less than 75 percent of average rainfall for the October through March period. Prolonged drought throughout the season has resulted in highly stressed vegetation conditions and crop losses, and maize output is expected to be well below-average. Elsewhere, rainfall has been average to below-average and unevenly distributed, and there is continued concern for rice crops in the east and maize crops in the west due to persistent dryness. Conversely, rice crops in central and western areas are developing under favourable conditions, and national production is expected to be below the 2020 level but above the five-year average. In **eSwatini**, harvesting of main season maize crops finalized in April. Production prospects are good owing to favourable growing conditions and despite a decrease in planted area. In **Lesotho**, harvesting of main season maize crops continued in April while sorghum crops are in vegetative to reproductive stage for harvest from May, and overall conditions are favourable with near-average production expected. In **South Africa**, harvesting of main season maize crops is ongoing under favourable to exceptional conditions as good weather throughout the summer followed by drier conditions in April have resulted in a positive production outlook.

Planting of winter wheat crops is underway in **Lesotho**, **South Africa**, and **Zimbabwe** and will begin in **Zambia** in May, and overall conditions are favourable. In **South Africa**, forecast precipitation over the winter rainfall region will support planting activities.

Central & South Asia



Crop condition map synthesizing information as of April 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 winter wheat crops is ongoing in **Pakistan** while crops are still developing in **Afghanistan**, **Kazakhstan**, **Kyrgyzstan**, **Tajikistan**, **Turkmenistan**, and **Uzbekistan** for harvest from May, and overall conditions are mixed due to continued dryness. Forecasts of drier than normal conditions throughout much of the subregion through June is likely to further impact winter and spring wheat crop development (See Regional Outlook Pg. 13). In **Tajikistan** and **Uzbekistan**, crop conditions improved in most areas due to abundant rainfall in March and despite below-average precipitation amounts in April. However, concern remains in parts of central and southeastern provinces in **Uzbekistan** as well as in some areas of the main producing Khatlon province in southwestern **Tajikistan** where vegetation conditions were slightly below-average in April. In **Kyrgyzstan**, near-average precipitation amounts in most cropping areas since the beginning of the season have resulted in adequate soil moisture and are likely to benefit winter wheat production prospects. In **Turkmenistan**, there is continued concern in the southeast where insufficient precipitation amounts have impacted crop development. In **Afghanistan**, below-average seasonal precipitation during January through mid-February has affected the winter season snow accumulation that is critical for water availability for the winter and spring crop cultivation. Crop conditions have improved in parts of the central and northeast due to good precipitation in March and April; however, persistent rainfall deficits, particularly in southern, southwestern, and western parts of the country, have led to lower-than-normal harvest prospects of the first crop. In **Pakistan**, planted area and yields are above-average, reflecting remunerative prices and Government support, favourable weather throughout the season, and adequate supply of agricultural inputs and irrigation water. Overall 2021 wheat production is estimated at 26.2 million tonnes.

Planting of spring wheat continued in April in **Afghanistan**, **Kazakhstan**, **Kyrgyzstan**, **Mongolia**, **Tajikistan**, and **Turkmenistan** for harvest from July, and conditions are generally favourable. In **Afghanistan**, recent precipitation improved soil moisture over northeastern areas; however, concern remains elsewhere in the country due to persistent dry conditions, particularly in the northwest. In **Mongolia**, planted area is expected at an above-average level due to strong demand and official programmes promoting wheat production.

Regional Outlook: Increased chances for below-normal precipitation and above-normal temperatures during May and June in parts of Central Asia

Drier-than-average conditions prevailed for most of the October-to-May season, including in recent weeks (Figure 1-left). October-to-May precipitation totals are on track to be less than 80 percent of average in most areas. Closer to average or slightly above-average seasonal totals are expected in parts of central and western Afghanistan, western Pakistan, and western Tajikistan. In some areas, such as southern central and eastern Afghanistan, the 2020-2021 season may be one of the driest in the past 40 years, according to CHIRPS data.

From March 26th to April 25th, regional precipitation was mainly below-average, except in western Pakistan, western Tajikistan, and parts of Kyrgyzstan, where rainfall was average (Figure 1-middle). According to the GEFS forecast from April 28th, central and western Afghanistan, northern Pakistan, northern India, and parts of Tajikistan and Kyrgyzstan are likely to see substantial precipitation in the first two weeks of May. Elsewhere in the region, lower than 25 mm or dry conditions are forecast.

There are increased chances for below-normal precipitation and above-normal temperatures during May and June, from central Afghanistan to central Kazakhstan, according to the WMO multi-model ensemble forecast. There are increased chances for above-normal precipitation in monsoon-affected areas of Pakistan during those months (Figure 1-right).

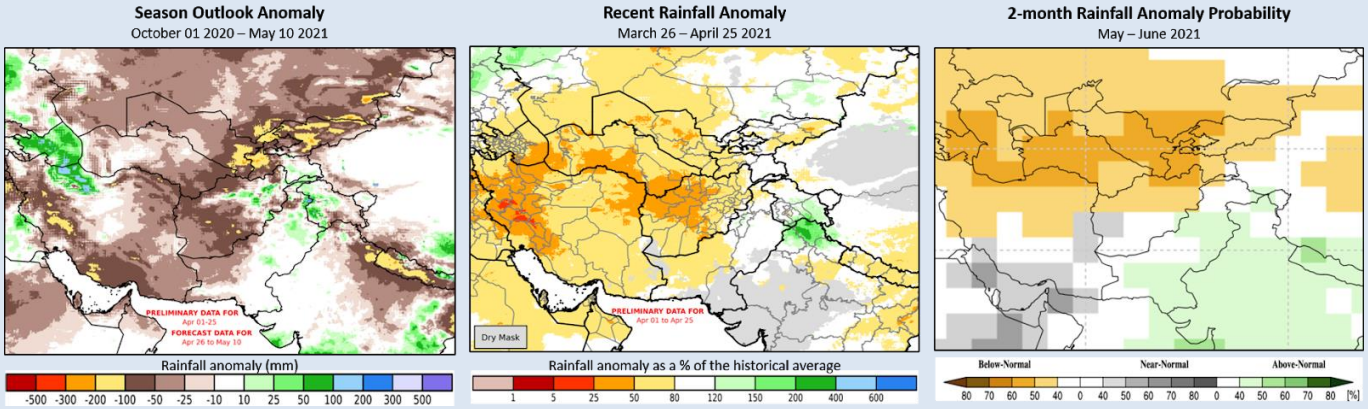
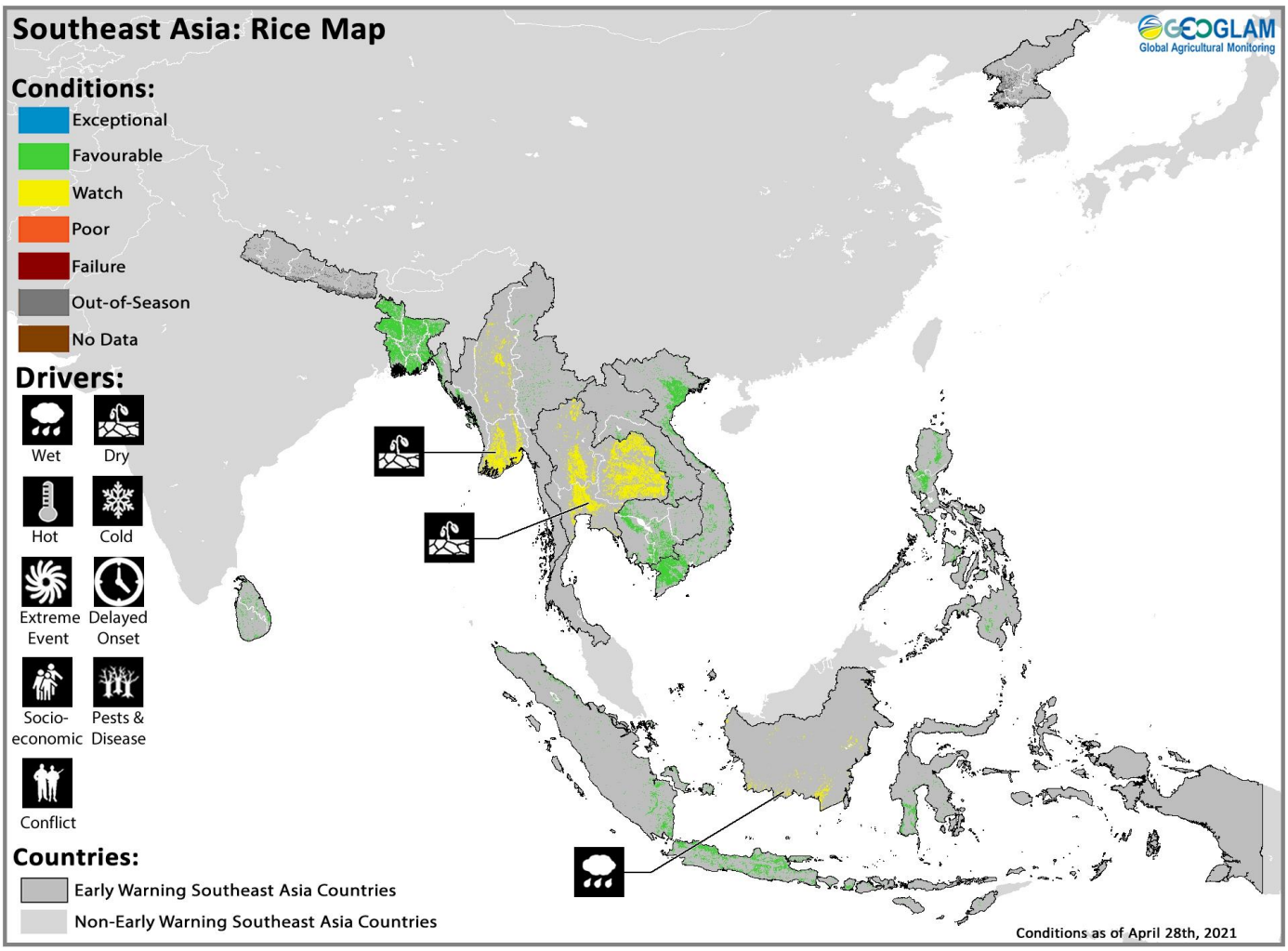


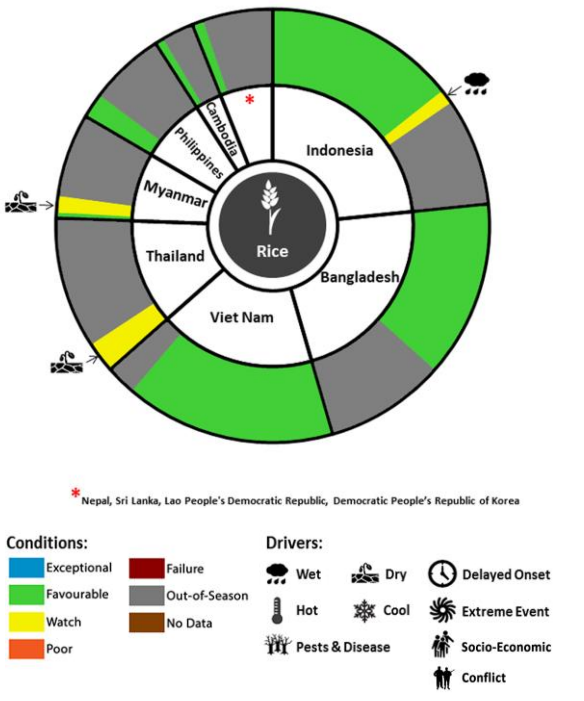
Figure 1. An October-to-May season rainfall anomaly outlook, recent rainfall percent of average, and a 2-month rainfall anomaly probability for May to June 2021. The left and middle panels are CHC Early Estimates, which compare 2021 rainfall amounts to the 1981-2020 CHIRPS average. The panel on the left indicates what the October to May season-to-date rainfall anomaly would be if the 15-day unbiased GEFS forecast from April 26th to May 10th materializes. The middle panel indicates how rainfall from March 26th to April 25th, 2021, compares to the historical average (represented as a percent of average). The panel on the right is a probabilistic forecast for most-likely May to June rainfall tercile from the WMO Lead Centre for Long-Range Forecast Multi-Model Ensemble, April 2021. White color indicates that there is no dominant category across the model forecasts.
Source: UCSB Climate Hazards Center.

Southeast Asia



Crop condition map synthesizing rice conditions as of April 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.***

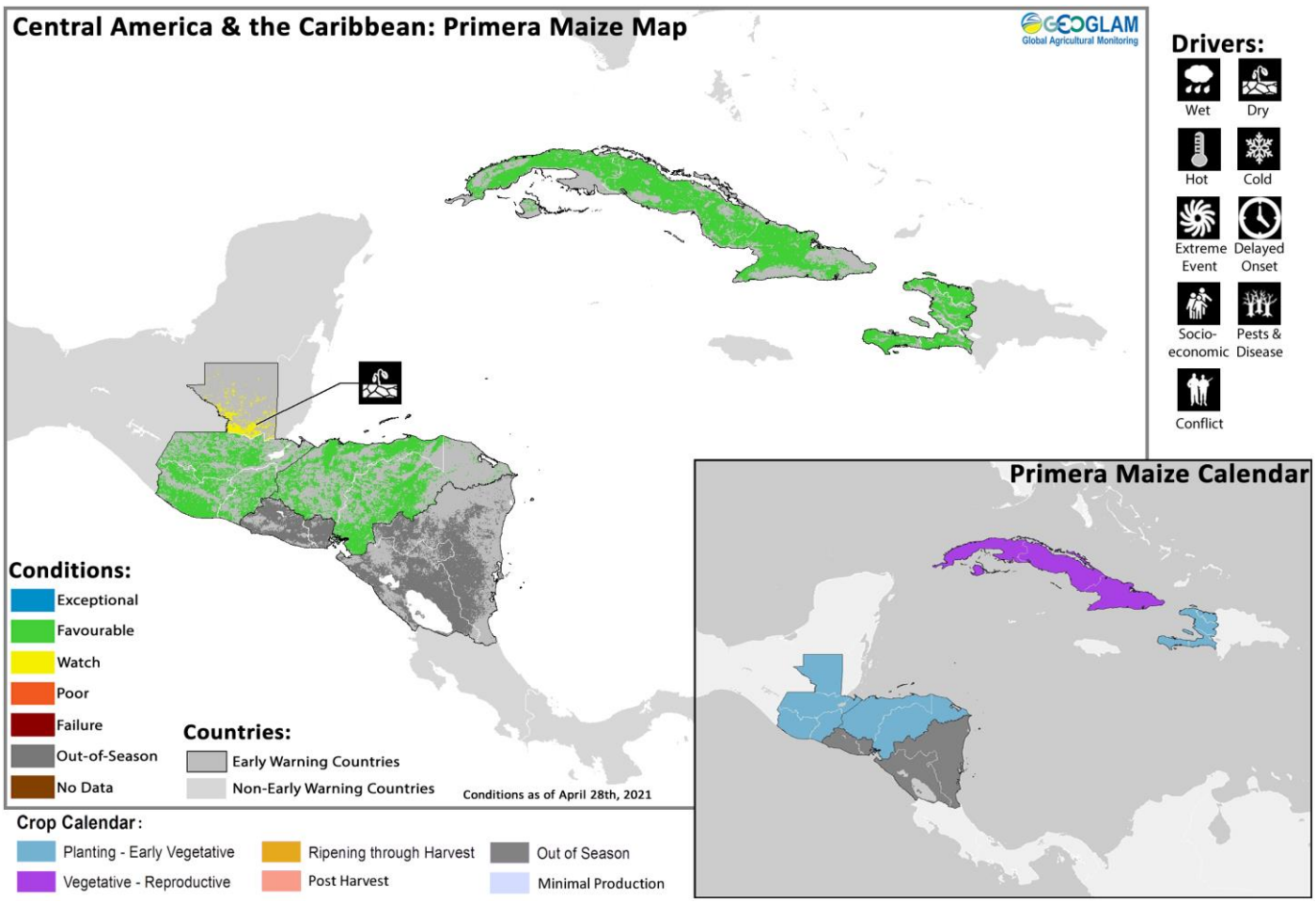
In northern Southeast Asia, harvesting of dry-season rice is underway with generally favourable production prospects. Despite earlier concerns of limited irrigation water supply, harvested area and yields are expected to be similar to the previous year. Sowing of wet-season rice has begun early in South **Viet Nam**, and land preparation is underway in **Cambodia**. In **Indonesia**, harvesting of wet-season rice is entering the fourth month under generally favourable conditions owing to good rainfall and sunlight during the critical flowering stage. While yield is expected to be near-average, harvested area is forecast at 1.3 million hectares, 18.3 percent lower than the previous year. Additionally, on April 4th, Tropical Cyclone Seroja formed over the Suva sea, bringing heavy rainfall, flash floods, and landslides to eastern Indonesia that could further limit production. Planting of mostly irrigated dry-season rice crops is underway, and irrigation water availability is adequate. In the **Philippines**, harvesting of dry-season rice is ongoing under favourable conditions as high October to May precipitation and sufficient irrigation water supply benefitted planting and crop development. Crops in some provinces of Visayas and Mindanao have recovered from earlier storm damage. However, between April 12th and April 16th, a Low-Pressure Area east of Mindanao intensified into Typhoon Bising, locally named Surigae, moving west-northwestward over the Philippine sea and impacting eastern coastal and northern areas of the country. Heavy rainfall may result in flooding and landslides. In **Thailand**, harvesting is ongoing for



For detailed description of the pie chart please see description box on Pg. 18.

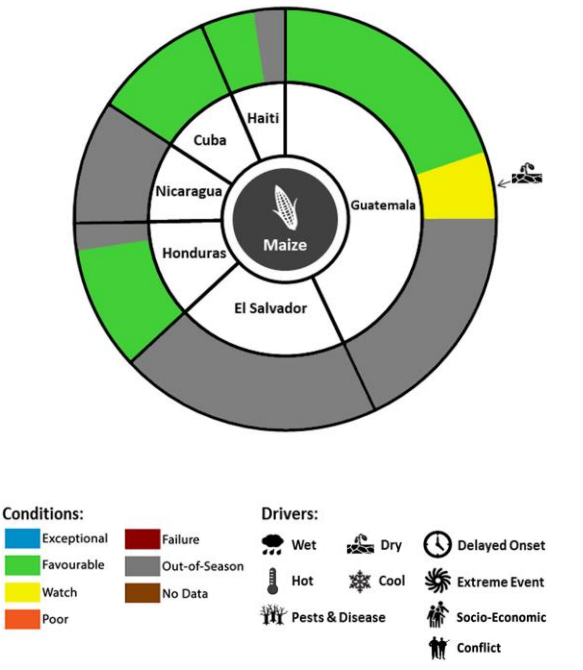
dry-season rice under mixed conditions across the country due to a lack of irrigation water during most of the season followed by recent moisture damage from an April storm in the north to central regions. Production is forecast to increase from the previous year due to increased planted area; however, yields are expected to decrease. In **Viet Nam**, conditions are favourable across the country for the winter-spring (dry-season) crop as harvesting continues in the Mekong River Delta. In the South, harvested area has reached 0.76 million hectares of 1.92 million hectares planted, and yield is 7.01 tons per hectare. Sowing of the summer-autumn (wet-season) crop in the Mekong River Delta is progressing at a good pace under favourable conditions. In **Laos**, dry-season rice crops are in young panicle forming to harvesting stage under favourable conditions as adequate irrigation water supply throughout the season has benefitted crop development. Final planted area reached 88,000 hectares, 96 percent of the national production plan, and harvested area has reached 8,000 hectares. In **Myanmar**, harvesting of dry-season rice crops is wrapping up under favourable conditions with some remaining concern in the west due to limited irrigation water supply earlier in the season. Harvested area has closed 81.3 percent of the national plan of 1.08 million hectares, and yields are slightly lower than the previous year. In **Cambodia**, harvesting of dry-season rice is wrapping up under favourable conditions, and yield is estimated to be slightly higher than the previous year at 4.5 tons per hectare. Land preparation is underway for planting of wet-season rice. In **Sri Lanka**, harvesting of *Maha* season maize and rice crops finalized in March under favourable conditions. Final rice production was above the five-year average at 3.1 million tonnes, and maize production was well above the five-year average, reflecting high planted area and above-average yields. Planting of *Yala* season maize and rice crops began in April under favourable conditions for harvest from August, and planted area is expected to surpass the five-year average due to Government support to increase local production. In **Bangladesh**, harvesting of *Boro* season rice crops is underway to be finalized in June, and conditions are favourable. Output is forecast to be 20.5 million tonnes, above the previous year's level and above the five-year average due to an increase in planted area supported by remunerative prices, favourable weather throughout the season, and adequate irrigation water supply. Planting of the minor *Aus* season rice crop continued in April under favourable conditions for harvest from June, and remunerative prices are expected to increase planted area. In **Nepal**, harvesting of winter wheat crops is ongoing under favourable conditions to be finalized in June. Planting of main season maize crops continued in April under favourable conditions for harvest from August. Despite below-average rains in parts of Far Western and Mid-Western Regions, planted area could still reach last year's above-average level as planting operations can continue through the end of May. In the **Democratic People's Republic of Korea**, land preparation and planting of main season maize crops began in April under favourable conditions for harvest from August.

Central America & Caribbean



Crop condition map synthesizing information as of April 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, main *Primera* season planting continued in **Haiti** and began in **Guatemala** under generally favourable conditions for harvest from June and August respectively. Early planting of *Primera* season maize crops began in eastern areas of **Honduras** under favourable conditions and will begin next month in **El Salvador** and **Nicaragua** for harvest from August. Above-average precipitation in April benefitted soil moisture throughout Central America and will provide conducive conditions for the start of planting in May. There is some concern in northern **Guatemala** where below-average rainfall was received in March; however, average to above-average April rainfall has helped to reduce the deficit and improve soil moisture levels, particularly in the Eastern region as well as the key producing Petén Department in the north. In **Haiti**, precipitation from March to early April was near-normal throughout most of the country except in northern regions where heavy rains resulted in flooding in North West, North East, and North Departments. From the second dekad of April, rainfall was slightly below-average, and forecasts indicate below-average rains are expected to continue through May, along with a likelihood for below-normal rainfall during the May to July period which could be a concern for developing crops (See Regional Outlook Pg. 17). However, current conditions remain favourable for the continued planting and development of main season cereals throughout the country. In **Cuba**, harvesting of main season cereals began in April. Despite below-average April precipitation, conditions are favourable for main season maize and rice crops, and forecast average rainfall for May and June



For detailed description of the pie chart please see description box on Pg. 18.

are likely to benefit crop development at flowering stages, particularly in the central region (See Regional Outlook Pg. 17). Second season rice crops are in vegetative to reproductive stage in the main producing northern coast of **Honduras** under favourable conditions as slightly above-average precipitation since March benefitted soil moisture levels. In **Cuba**, planting of second season rice crops began in April under favourable conditions for harvest from September.

Regional Outlook: May-to-July rainfall is likely to be near-average with potential for surplus and deficits in some areas

Most Central America areas are on track for average to above-average rainfall totals for April 1st to May 10th, while April deficits are forecast to increase in the Caribbean, according to preliminary data and the two-week unbiased GEFS forecast from April 26th (Figure 1 top-left). Some likely surplus areas include central-northern Guatemala and western-central Honduras. Possible deficits for April 1st to May 10th in Haiti range from 25 mm to 100 mm below-average, and up to 200 mm below-average in the Dominican Republic.

The SubX 30-day forecast from April 29th (Figure 1 top-right) indicates average to drier-than-average conditions across the region. Probabilities for below-normal rainfall during mid-May are highest in areas near the Pacific coast, from southern Guatemala to Costa Rica, and in the eastern Caribbean in Haiti and the Dominican Republic.

May-to-July rainfall is likely to be mainly average with potential for surplus and deficits in some areas, according to the Central America Climate Forum (Figure 1 bottom-left) and the Caribbean Climate Outlook Forum (Figure 1 bottom-right). These outlooks from regional meteorological and hydrological agencies show increased chances for above-normal rainfall in portions of Guatemala and northern Honduras, and in the northern Caribbean. Areas in Belize, Haiti, and the Dominican Republic show increased chances for below-normal May to July rainfall.

International dynamical model ensembles from WMO and NMME show increased chances for below-normal June-to-August rainfall and above-normal temperatures across the region. Due to those pessimistic forecasts, as well as the latest SubX and recent Caribbean deficits, close monitoring of rainfall conditions is recommended. In addition, several forecasting centers anticipate a more active than normal Atlantic hurricane season.

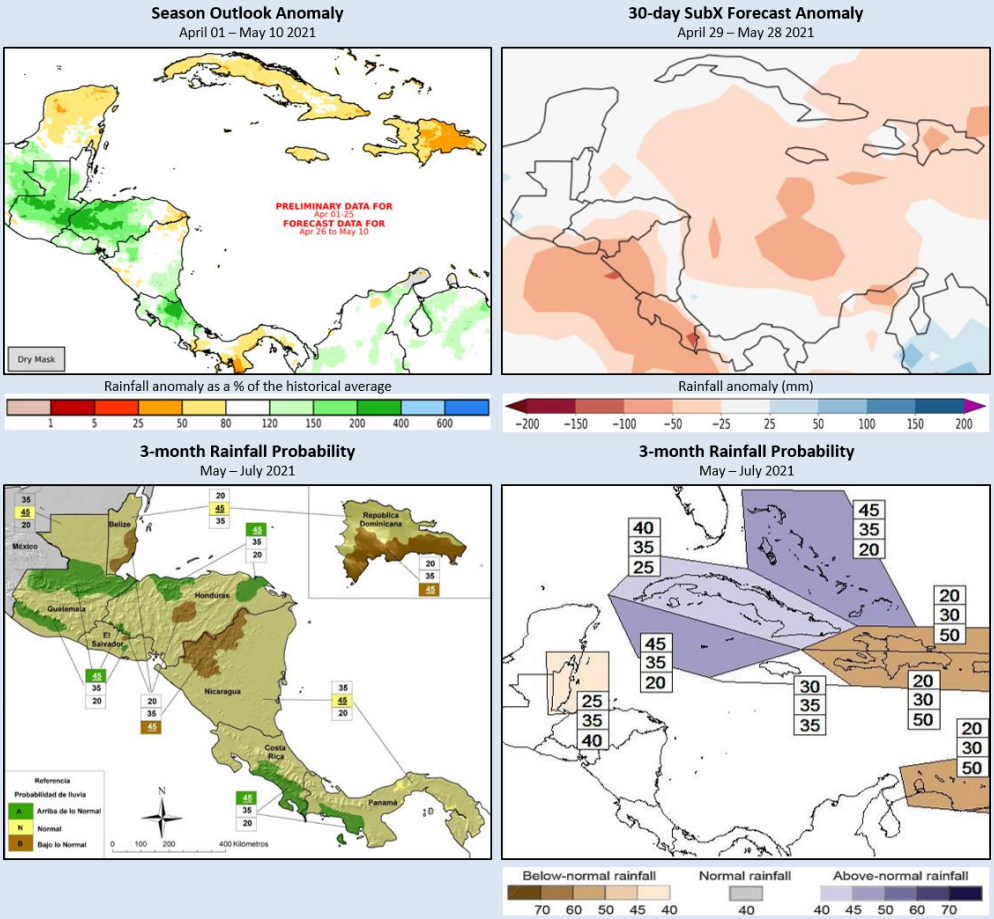


Figure 1. An April-to-present season rainfall anomaly outlook, forecast 30-day rainfall anomaly, and regional outlooks for May to July rainfall. Top-left: A CHC Early Estimate, which compares 2021 rainfall amounts to the 1981-2020 CHIRPS average. The map indicates how April 1st to May 10th rainfall would compare to the historical average (represented as a percent of average) if the 15-day unbiased GEFS forecast from April 26th to May 10th materializes. Top-right: A 30-day forecast from April 29th. 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. Bottom-left: The "LXIV Perspectiva del Clima de América Central y República Dominicana" rainfall outlook for May to July 2021 in Central America and the Dominican Republic, from the Central American Climate Forum (FCAC) coordinated by the Regional Committee for Hydraulic Resources of the Central American Integration System (CRRH-SICA). Bottom-right: The Caribbean Climate Outlook Forum (CariCOF) rainfall outlook for May to July 2021 in the Caribbean. In the bottom maps, colors and numbers indicate forecast probabilities for above-normal, normal, and below-normal rainfall categories. Probabilities higher than 33% indicate increased chances for that category. 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 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 May 6th, 2021.

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

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Contributing partners

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