

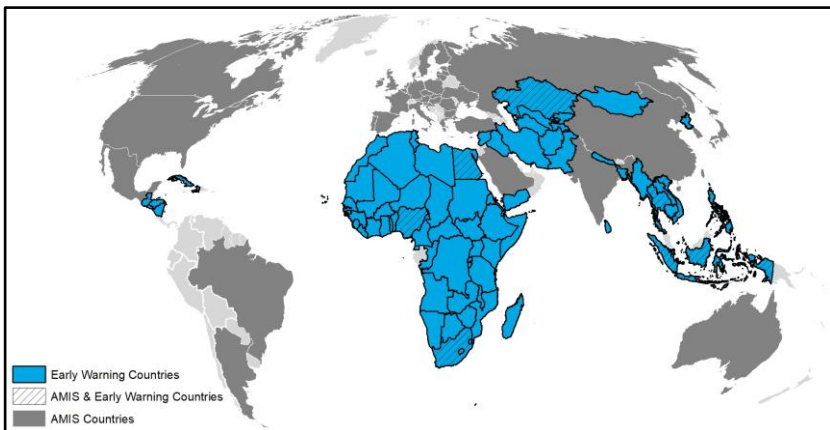


Crop Monitor

EARLY WARNING

Overview:

In northern **East Africa**, there is some concern for *Belg* crops in Ethiopia due to dry conditions. In the south, planting and development of main season *Long Rains* cereals is underway under generally favourable conditions except in parts of Kenya due to persistent below-average rainfall. In **West Africa**, planting of main season maize is underway in the south, and overall conditions are favourable. In the **Middle East and North Africa**, conditions for winter wheat crops are generally favourable with some concern due to dry conditions in Algeria, northern Morocco, and localized areas of northern Syria, Iraq, and Iran. In **Southern Africa**, harvesting of main season cereals is underway with favourable to exceptional conditions except in parts of Angola, Madagascar, and Namibia where crops are unlikely to recover from prolonged drought as well as in parts of Mozambique where there is concern due to recent dry conditions. Despite recent precipitation improvements in **Central and South Asia**, concern remains for winter wheat crops in parts of Tajikistan, Turkmenistan, Uzbekistan, and Afghanistan due to previous dry conditions. Land preparation is underway for spring wheat crops to be planted from April. In **Southeast Asia**, harvesting of dry-season rice crops is underway in the north, and harvesting of wet-season rice is underway in Indonesia. Crop conditions are generally favourable with some concern in parts of the Philippines and Indonesia due to recent flooding as well as in Myanmar and Thailand due to shortage of irrigation water. In **Central America and the Caribbean**, land preparation is underway for the start of the *Primera* season in April, and average rainfall is expected. Harvesting of *Apante* season bean crops finalized in Nicaragua and Haiti with average yields.



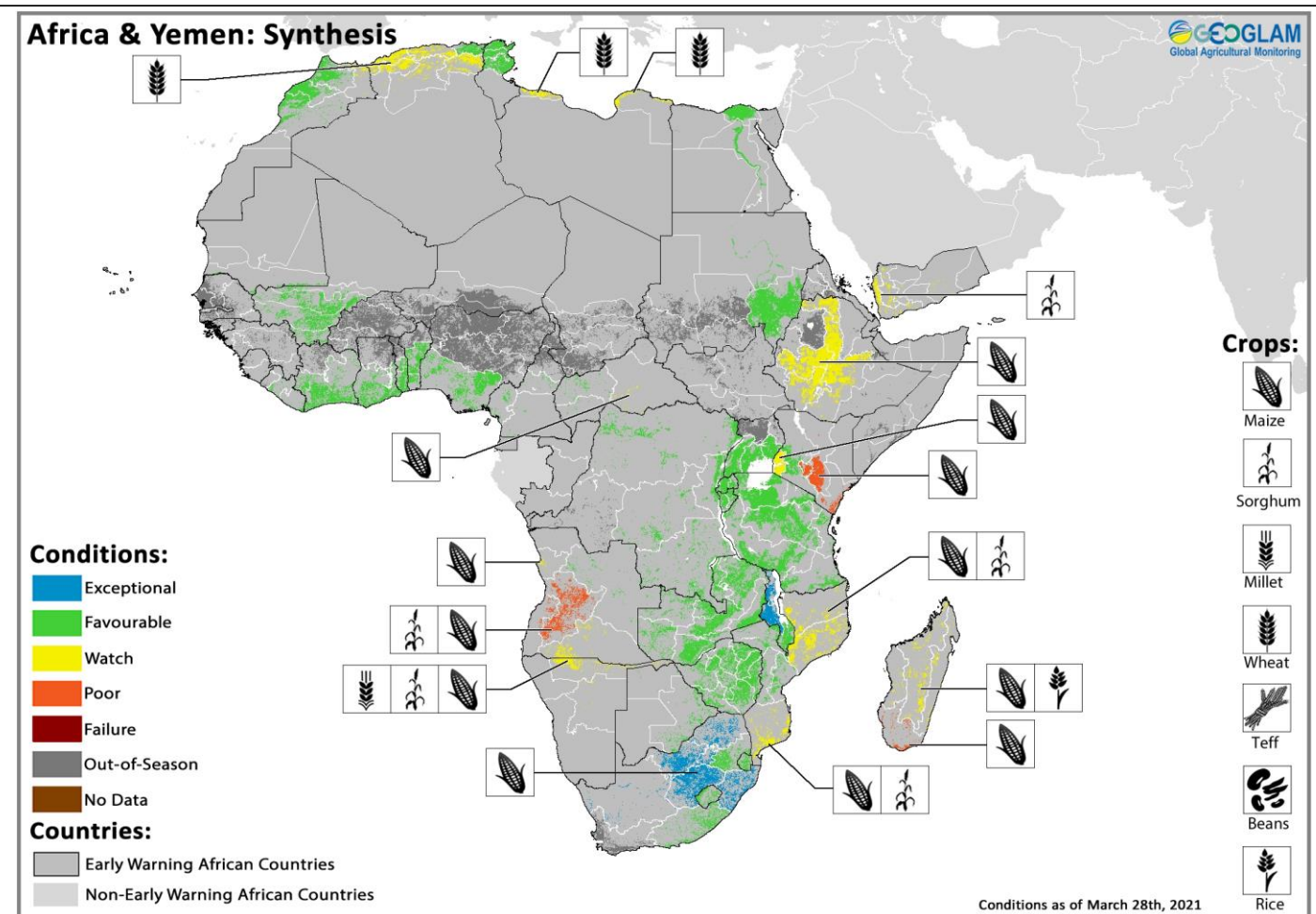
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GEOGLAM Crop Monitor for Early Warning

Crop Conditions at a Glance

based on best available information as of March 28th



Crop condition map synthesizing information for all Crop Monitor for Early Warning crops as of March 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, there is some concern for *Belg* crops in Ethiopia due to dry conditions, locust presence, and ongoing conflict in Tigray region. In the south, planting and development of main season *Long Rains* cereals is underway, and conditions are generally favourable except in Kenya where persistent dry conditions resulted in below-average *Short Rains* yields and are impacting *Long Rains* planting.

WEST AFRICA: Planting of main season maize crops is underway in the south for harvest in July while harvesting of second season rice crops is underway in the north, and overall conditions are favourable.

MIDDLE EAST & NORTH AFRICA: Conditions for winter wheat crop development are generally favourable; however, dry conditions and erratic rainfall are impacting crops in localized northern areas of Syria, Iraq, and Iran, and persistent drought is likely to result in below-average yields in parts of Algeria and northern Morocco. Conflict continues to disrupt agricultural activities in Syria while socio-economic challenges continue to impact agricultural activities in Libya.

SOUTHERN AFRICA: Harvesting of main season cereals is underway throughout the subregion, and overall production prospects are average to above-average except in parts of

Angola, Madagascar, and Namibia where crops are unlikely to recover from prolonged drought and in southern and northern Mozambique where dry conditions may impact yields.

CENTRAL & SOUTH ASIA: Despite recent rainfall improvements, concern remains for winter wheat crops in parts of Tajikistan, Turkmenistan, Uzbekistan, and Afghanistan due to previous dry conditions. April rainfall is forecast to be below-average for most areas (See Regional Outlook Pg. 15).

SOUTHEAST ASIA: In the north, harvesting of dry-season rice crops has begun in some areas, and crop conditions are generally favourable with some concern due to flooding from recent heavy rainfall in the Philippines as well as shortages of irrigation water in Myanmar and Thailand. In Indonesia, harvesting of wet-season rice is underway with some concern in South Kalimantan due to recent flooding.

CENTRAL AMERICA & CARIBBEAN: Land preparation for the *Primera* season is underway in Guatemala, Honduras, and El Salvador. Harvesting of *Apante* season bean crops finalized in Nicaragua and Haiti with average yields, and in Haiti, harvesting of second season rice crops finalized in March with average to below-average yields.

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 Colombia, Guyana, Suriname, northern Brazil, northern Tanzania, Thailand, southern Vietnam, the Philippines, and Papua New Guinea. There is also a likelihood of below-average rainfall across the south and east of the US, northeast and central and southern Brazil, northern Uruguay, central Ethiopia, Cameroon, Angola, central Namibia, Zambia, Mozambique, central South Africa, northern Pakistan, eastern India, Bhutan, eastern Bangladesh, northern Myanmar, southeast China, Indonesia, Malaysia, and southern Japan.

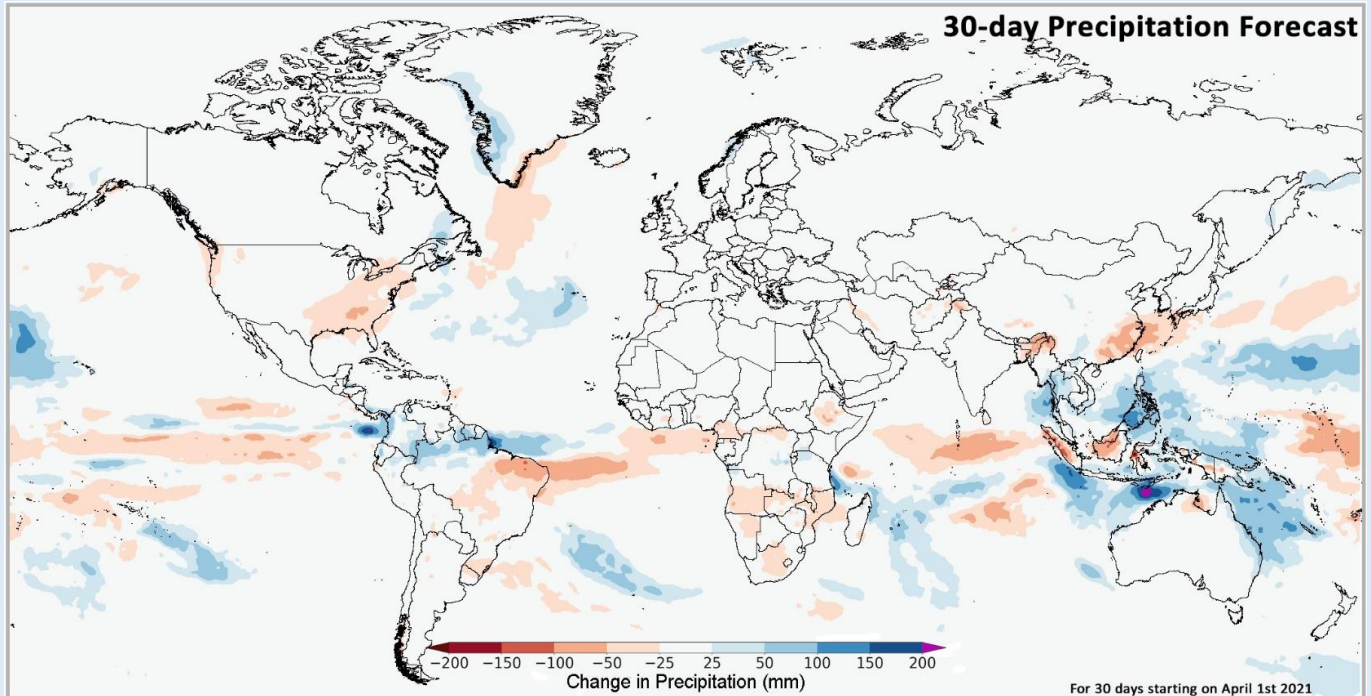


Figure 1. Forecast of areas with above or below-average precipitation over the next 30-days starting on April 1st, 2021. The image is the multimodel mean of precipitations anomaly from the Subseasonal Experiment ([SubX](#)) model forecasts for that day. The anomaly is based on the 1999 to 2016 model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

Source: UCSB Climate Hazards Center

Climate Influences: Transition to neutral ENSO is anticipated for Summer 2021

La Niña is present and is showing signs of weakening. There is a 62% chance of transitioning to El Niño-Southern Oscillation (ENSO) neutral conditions from April to June followed by a 52% chance of transitioning from July to September.

Long-range forecasts made during this time of year have a high level of uncertainty. However, IRI/CPC forecasts in March indicated about equal chances that another La Niña event might develop (48% chance) or ENSO neutral conditions will occur (42% chance) during September to November 2021.

Source: UCSB Climate Hazards Center

Desert Locust Alert: Drier than average weather reducing Desert Locust presence across the Horn of Africa

Throughout East Africa, the last few months have been drier compared to the previous year, and insects are fewer in number with smaller swarms due to the less favourable weather conditions. As of early March, the highest number of swarms had been reported in north and central **Ethiopia** and parts of **Kenya** and **Somalia**. While the onset of the March-May *Long Rains* season throughout East Africa would have provided beneficial conditions for locusts to lay their eggs at the same time planting begins, as of late March, delayed rains in the Horn of Africa have helped to keep the locust population down as swarms will not mature and breed without rainfall. Swarms in **Kenya**, **Ethiopia**, and **Somalia** continue to decline rapidly due to poor rains and ongoing control operations. The extent of spring breeding is likely to remain limited as no significant rainfall is predicted for northern **Kenya**, southern **Ethiopia**, or **Somalia** (See Regional Outlook Pg. 7). However, if April and May rains arrive, some breeding is possible in central and southwestern **Ethiopia** and northwestern **Kenya** which would cause swarms to mature and lay eggs. Contrarily, if poor spring rains are followed by poor summer rains in northeastern **Ethiopia**, the situation could return to normal.

East Africa Update

In **Kenya**, a few small immature swarms remain in Nakuru County in the central-west, and some locusts and swarms have been reported in Kajiado County in the southwest and Samburu county in the centre of the country. In **Ethiopia**, a few small immature swarms remain in the highlands of Arsi and East Harerghe district in the centre of the country, though the situation has improved in southern Oromia and SNNP Regions. In **Somalia**, a few hopper bands and immature swarms remain in Puntland in the northeast, and immature adults are present in Somaliland in the northwest. Most swarms are expected to remain on the northern plateau. In northern **United Republic of Tanzania**, hatching and limited breeding from previous mature swarms occurred in Arusha in the northeast, and small early instar hopper bands have formed. In **Sudan**, early instar hopper bands and scattered adults remain on the Red Sea coast, resulting in late hatching and hopper band formation. In **Eritrea**, adults and hopper groups were detected on the Red Sea coast; however, the situation is likely to decline as there is low soil moisture and no rainfall forecast for the breeding areas.

Arabian Peninsula Update

In **Saudi Arabia**, locust presence has declined on the northern Red Sea coast, though early instar hopper bands present in the interior from previous spring breeding resulted in widespread hatching and band formation. However, dry and hot conditions should reduce infestations. Strong winds also carried small immature swarms to **Kuwait** and southwest **Iran**, which could lead to hatching and band formation in southwest **Iran** in April and May.

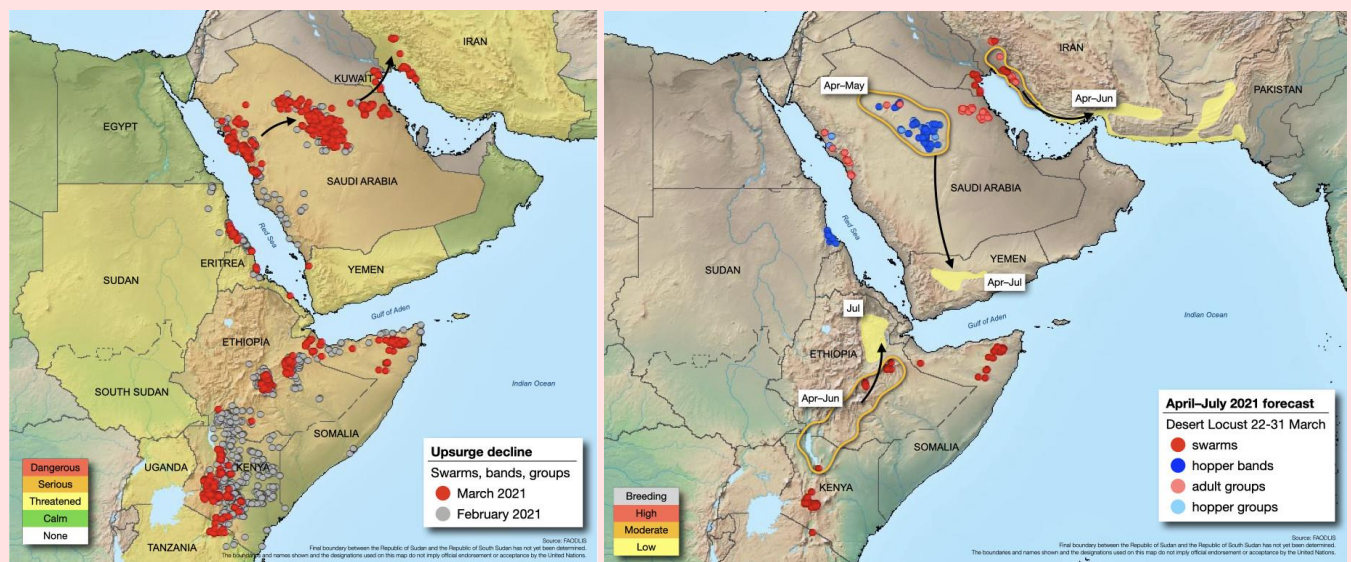
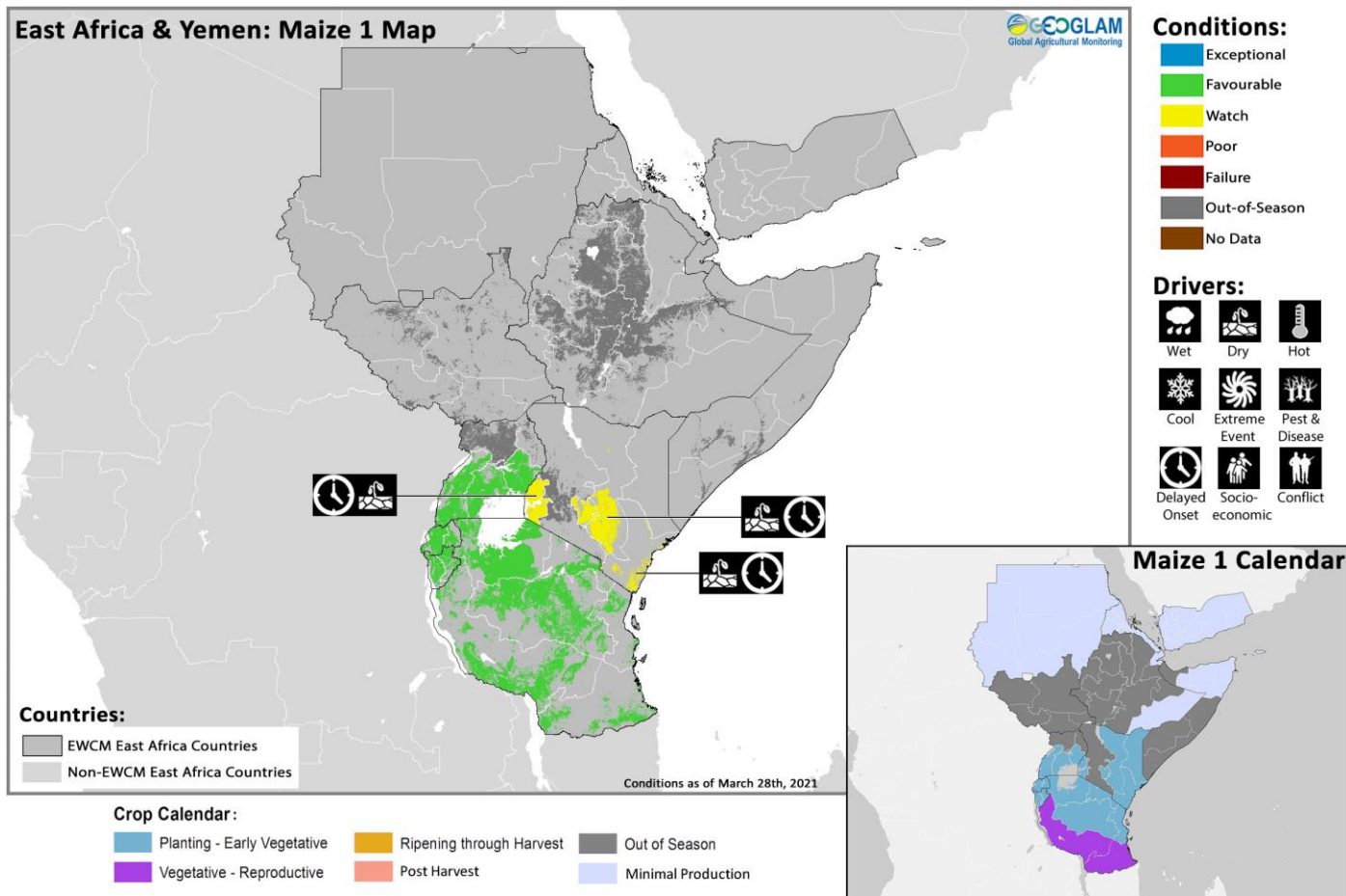


Figure 1. (Left) Desert Locust Current Situation, March 2021. (Right) Desert locust April- July 2021 forecast. Source: FAO DLIS

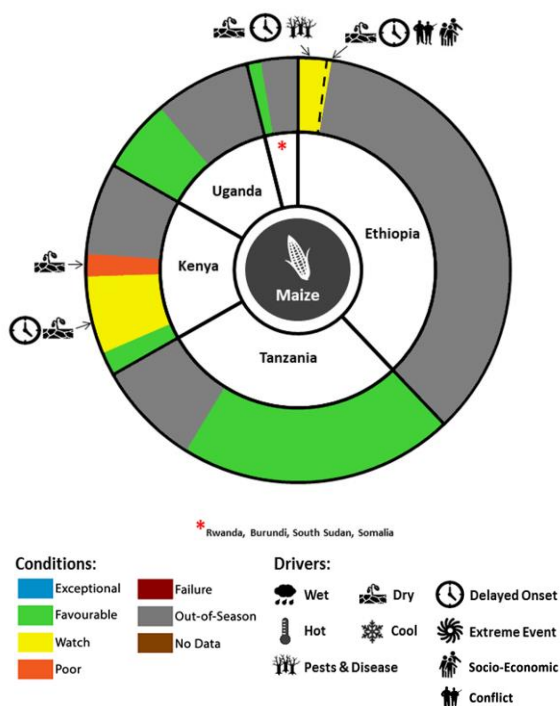
East Africa & Yemen



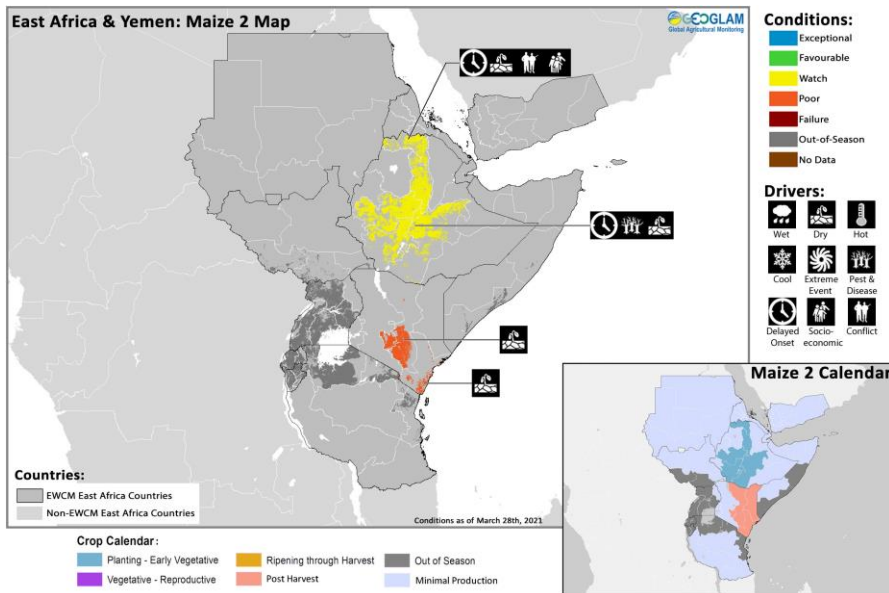
Crop condition map synthesizing crop conditions as of March 28th. Crop conditions over the main growing areas are based on a combination of inputs including remotely sensed data, ground observations, field reports, national, and regional experts. **Conditions that are other than favourable are labeled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

Across the north of the subregion, harvesting of winter wheat crops began in **Sudan** under favourable conditions. In **Ethiopia**, there is some concern for secondary *Belg* season crops due to delayed onset and erratic rains, desert locust presence (See Desert Locust Alert Pg. 4), and conflict in Tigray region. In **Yemen**, planting of main season sorghum crops has started under generally favourable conditions. Forecasts indicate drier-than-average conditions are likely to continue for the April to June period in north and eastern areas of the subregion (See Regional Outlook Pg. 7).

Across the south of the subregion, planting and development of main *Long Rains* season cereals is underway in parts of **Kenya, Uganda, Burundi, Rwanda,** and the **United Republic of Tanzania**. There is some concern due to delayed rainfall onset and dry conditions which are impacting planting activities. In March, below-average rainfall was received over much of the region, and moderate to large rainfall deficits occurred in **Uganda, southern Kenya,** and northern **United Republic of Tanzania**. Forecasts indicate a likelihood of above-normal rainfall for the April to June period in south and western areas of the subregion, which would benefit main season crop development (See Regional Outlook Pg. 7). In **Kenya**, the secondary *Short Rains* harvest was concluded in mid-March in southeastern and coastal marginal agriculture areas, and cereal production is estimated at well below-



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



Crop condition map synthesizing crop conditions as of March 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.**

transportation and production costs. In **Sudan**, harvesting of winter wheat crops is underway in the north and east under favourable conditions to be finalized in April. However, fuel shortages and high prices of agricultural inputs continue to inflate the already elevated production and transportation costs. In **South Sudan**, land preparation is underway in the southern equatorial areas, and planting will begin in April for main season cereal crops for harvest from mid-July. While current climatic conditions are favourable for the start of the season, ongoing socio-economic challenges are likely to impact agricultural activities. Seasonal rains are forecast to be above-average, beginning early in April and continuing late through November (See Regional Outlook Pg. 7). The lengthened rainy season may compound impacts from extreme flooding in 2020, particularly as three counties in Jonglei State remain flooded. It would also be the third consecutive season of severe flooding that could lead to crop damage and further livelihood disruption. In **Yemen**, planting of main season sorghum crops is underway for harvest from September, and there is concern for crop production due to ongoing conflict, socio-economic challenges, and desert locust presence in southern coastal areas (See Desert Locust Alert Pg. 4). Conflict is likely to persist on the existing frontlines with new escalations possible in other areas, further impacting agricultural production.

Southern East Africa

In **Uganda**, planting of first season maize and millet crops is underway in the south for harvest from June, and overall conditions are favourable. Planting of first season cereals in the north and northeast will begin in April. The increased probability for the transition to neutral El Niño Southern Oscillation and Indian Ocean Dipole for the April to June period is expected to bring rains in most parts of the country and benefit first season cereal production. (See Regional Outlook Pg. 7). In **Kenya**, the secondary *Short Rains* harvest was concluded in mid-March in southeastern and coastal marginal agriculture areas, and maize production is estimated at 25 and 45 percent below-average, respectively, due to poor rains. Planting of main *Long Rains* (March to May) maize crops is underway for harvest from July, and there is concern as delayed rainfall onset and dry conditions have delayed the start of the season. Forecasts indicate below-average rains are likely through June in eastern areas which may negatively impact crop production (See Regional Outlook Pg. 7). This is of particular concern given the poor performance and below-average production realized in the *Short Rains* cropping season. However, in the main producing and unimodal areas of the west and Rift Valley, land preparation of *Long Rains* (mid-February to mid-August) maize crops is underway for planting in April, and the forecasted above-average rains from April to June will likely benefit crop production (See Regional Outlook Pg. 7). In **Somalia**, land preparation is underway, and planting will begin in April for the main *Gu* season (April to June rains) maize and sorghum crops for harvest from July. There is some concern for the upcoming season as 2020 *Deyr* rains from October to December were lower than the historical average in the north and most of the south, and most of the country has been experiencing drier and hotter than normal conditions since January. The situation has resulted in water shortages in 34 districts, particularly in Somaliland, Puntland, Galmudug, Hirshabelle, and Jubaland, and in mid-March, pre-drought conditions were reported in these regions. The Juba and Shabelle river levels are low for this time of year, and the *Gu* rains are projected to be poor and below-average in south and northwestern areas (See Regional Outlook Pg. 7). Over 83,000 individuals have been displaced as of late March due to water shortages since November 2020. Additionally, desert locusts continue to threaten crop production for the *Gu* season (See Desert Locust Alert Pg. 4). In **Rwanda** and **Burundi**, conditions are favourable for the planting of main *Season B* maize and rice crops for harvest from June. However, some localized flooding could affect crop development in affected areas. In the main producing central and southern unimodal areas of the **United Republic of Tanzania**, main *Msimu* season (November to April rains) cereal crops are developing under favourable conditions for harvest from April. In northern bimodal areas, planting of main *Masika* season (March to May rains) cereals is underway for harvest from May, and overall

average levels due to poor rains. Across northern bimodal areas of the **United Republic of Tanzania**, planting of second season *Short Rains* maize and sorghum crops continued in March under favourable conditions for harvest from June.

Northern East Africa & Yemen

In **Ethiopia**, planting of *Belg* season maize crops continued in March for harvest from June, and there is ongoing concern due to delayed rainfall onset in the northeast, erratic rains in the southwest, forecast below-average seasonal rainfall for most areas for the March to May period (See Regional Outlook Pg. 7), and desert locust presence (See Desert Locust Alert Pg. 4). There is also concern in Tigray region as escalating conflict has significantly disrupted agricultural operations and resulted in the destruction of crops and farming equipment, particularly in Eastern and Central zones. Continuous depreciation of the country's currency has also resulted in increased

conditions are favourable. Planting of second season sorghum crops is also underway with favourable conditions for harvest from mid-June.

Regional Outlook: Below-average rainfall likely in early April across Ethiopia, Somalia, South Sudan, and eastern Kenya.

Below-average rainfall during March and starting in February in parts of Uganda and Ethiopia has resulted in moderate-to-large rainfall deficits in much of the region (Figure 1-left). March 1st to March 31st rainfall is around 25 mm to 50 mm below-average in southwestern to central-northeastern Ethiopia, western and southern Kenya, eastern and northeastern Tanzania, and parts of Uganda, Rwanda, and Burundi. Tanzania's eastern coastal region recorded large 50 mm to 100 mm deficits. March rainfall amounts correspond to less than 55% of the 1981 to 2010 average for much of Kenya and in parts of Ethiopia and eastern Tanzania. Ethiopia's drier-than-average conditions in March are confirmed by [improved rainfall estimates](#) that include many National Meteorological Agency station observations. Overall, there has been a [poor start to the March-to-May rainfall season](#) in Kenya and much of Ethiopia.

The rainfall deficits are likely to increase significantly over much of East Africa into mid-April, especially over the eastern Horn and *Belg* season dependent areas. April is a critically important month for these areas as it is the short period when the substantial rainfall amounts that are needed to support agriculture are received. According to NOAA CPC's week 1 and week 2 outlooks from April 6th, there are increased chances for below-average rainfall across central and eastern Ethiopia, eastern Kenya, and southern Somalia from April 7th to April 13th (Figure 1-middle) and in northeastern Kenya, southeastern Ethiopia, and southern Somalia from April 14th to April 20th. The outlooks indicate wetter-than-average conditions in Tanzania, Rwanda, Burundi, and Uganda. SubX forecasts from April 1st support the NOAA CPC outlook for early April. The probabilistic SubX forecast for April 10th to April 23rd indicates above-normal rainfall in some central areas of the region, from central Tanzania to southern Ethiopia, and below-normal rainfall in areas of the region to the south and to the north. Overall, the SubX models forecast below-average April rainfall totals across Ethiopia and in northeastern Somalia.

Longer range dynamical model forecasts from several international forecasting centers and from early March show increased chances for below-normal April-to-June rainfall in eastern Kenya, southwestern and northern Somalia, and central and eastern Ethiopia. These forecasts and the observed drier-than-average conditions in March are in agreement with the increased chances of below-average eastern East Africa March-to-May precipitation discussed in Crop Monitor for Early Warning seasonal forecast alerts in the August 2020 to March 2021 reports. According to the March dynamical model forecasts, northeastern Ethiopia is very likely to be warmer than normal. There are increased chances for above-normal precipitation in April to June in some southern and western areas of East Africa, including in central and northwestern Tanzania, western Kenya, eastern Uganda, and eastern South Sudan.

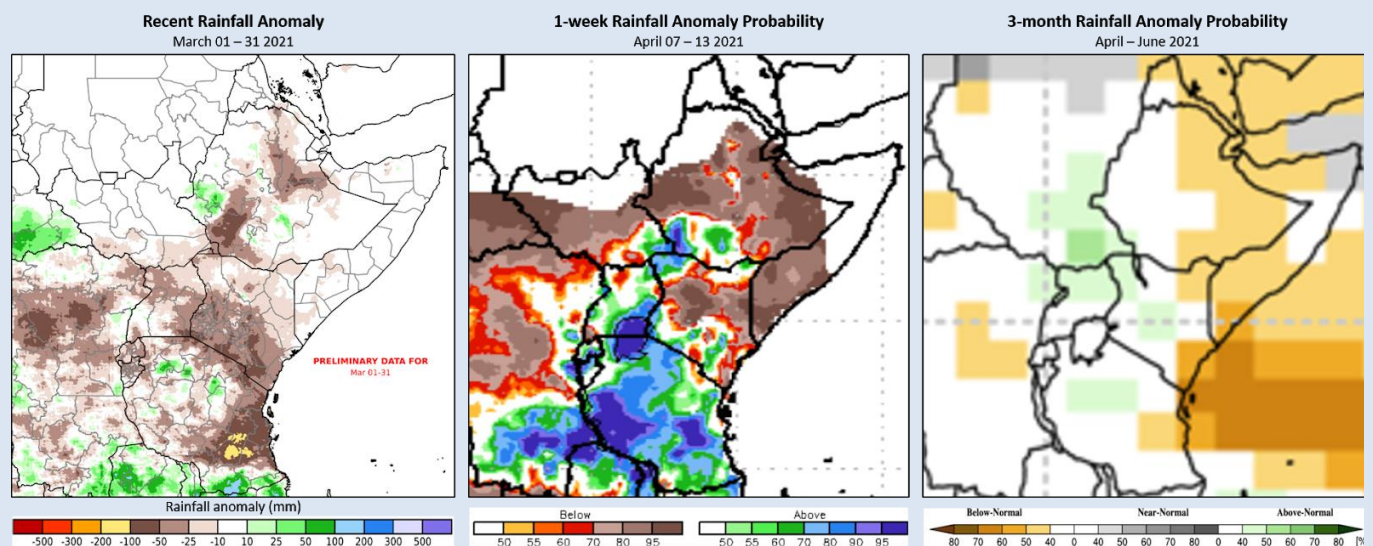
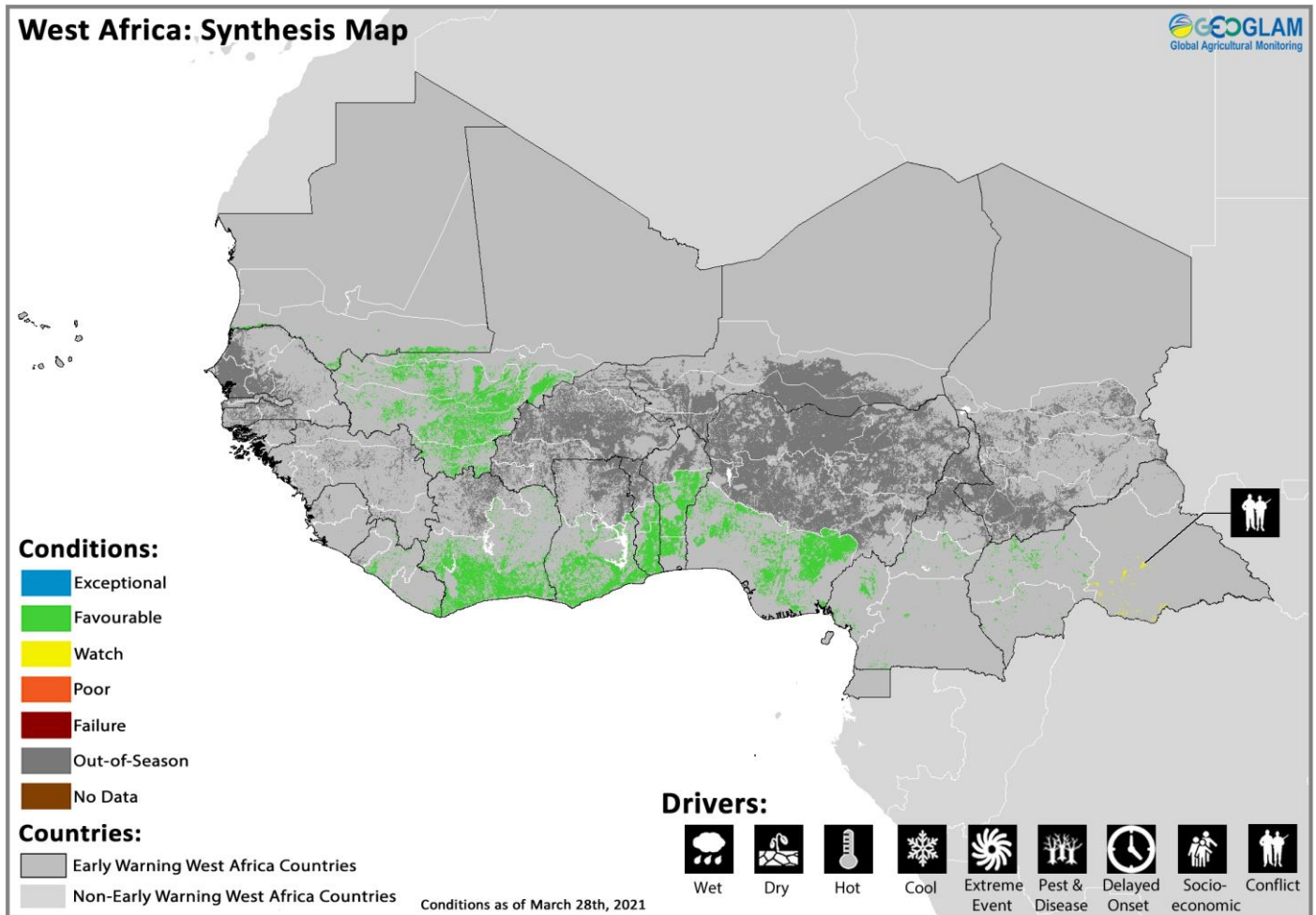


Figure 1. Recent rainfall anomaly for March 1st to March 31st, a 1-week probabilistic rainfall forecast, and a 3-month rainfall anomaly probability forecast. The left panel is a UCSB Climate Hazards Center Early Estimate for March 1st to March 31st, which compares 2021 rainfall amounts to the 1981-2020 CHIRPS average. The middle panel is the GEFS week 1 forecast for April 7th to April 13th, 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 April-May-June rainfall tercile from the [WMO Lead Centre for Long-Range Forecast Multi-Model Ensemble](#), March 2021. White color indicates that there is no dominant category across the model forecasts.

Source: UCSB Climate Hazards Center.

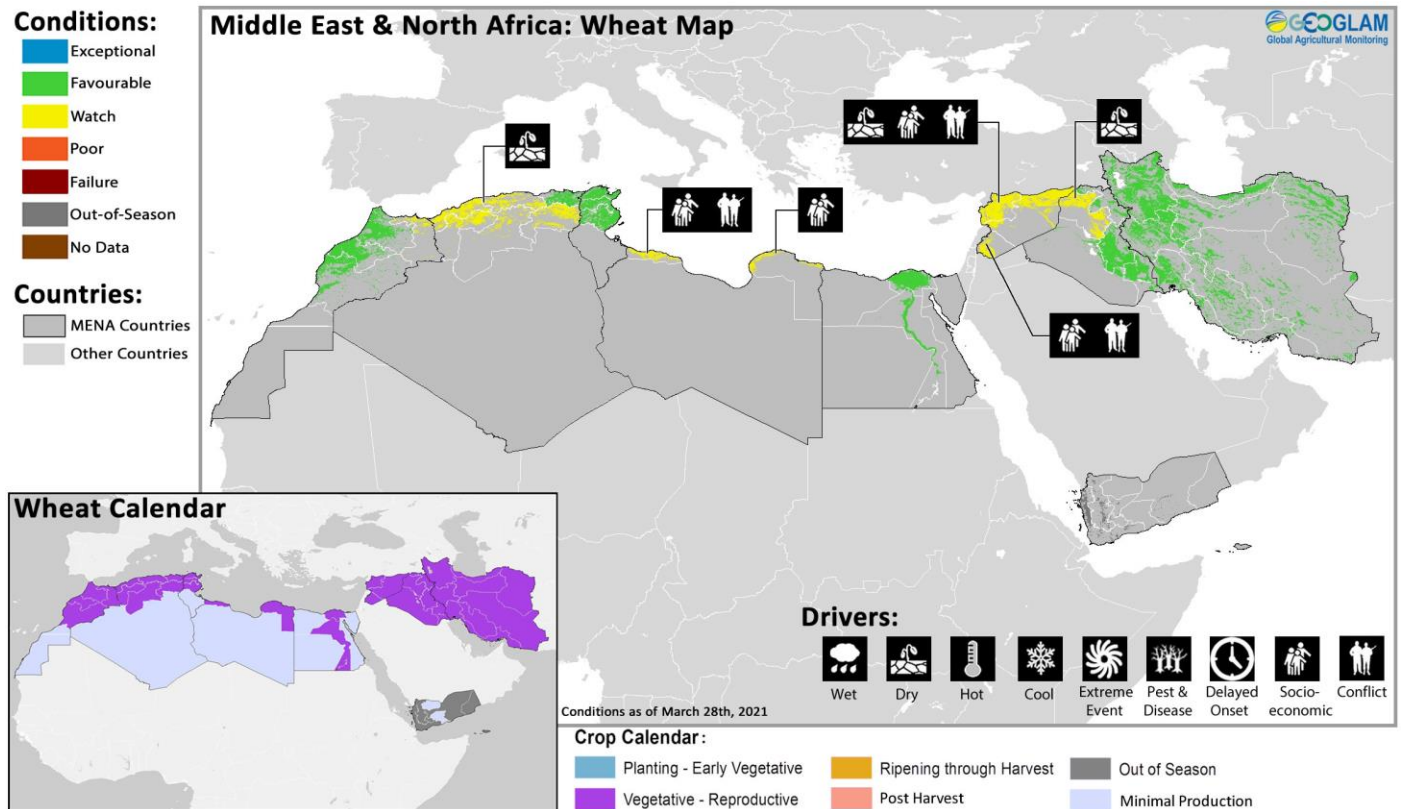
West Africa



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

In the south of the subregion, planting of main season maize is underway in southern **Benin**, the **Central African Republic**, southern **Cote d'Ivoire**, southern **Ghana**, **Liberia**, southern **Nigeria**, and southern **Togo** for harvest from July, and conditions are generally favourable. In the **Central African Republic**, a timely onset of seasonal rains in early March has been conducive for the start of planting; however, ongoing conflict continues to disrupt agricultural activities. In southern **Cameroon**, planting of second season maize crops is underway for harvest from August under favourable conditions. In the north of the subregion, harvesting of second season rice crops is underway in southern **Mali** and southern **Mauritania** under favourable conditions.

Middle East & North Africa



Crop condition map synthesizing information as of March 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 North Africa, harvesting of winter wheat crops will begin in April in parts of **Morocco** and **Tunisia** while crops continue to develop in **Algeria**, **Libya**, and **Egypt** for harvest from May. Conditions are favourable in south and central **Morocco**, **Tunisia**, and northeastern **Algeria** due to abundant rains and mild temperatures. However, in northeastern **Morocco** and northern **Algeria**, persistent drought since the beginning of the winter cropping season exacerbated by above-average temperatures in **Algeria** resulted in poor crop development and is likely to result in below-average yields. Drier than average conditions are forecast for early April in **Morocco** and northeastern **Algeria** which may signal an early end to the rainfall season (See Regional Outlook Pg. 10). In **Libya**, while climatic conditions are favourable for crop development, the socio-economic environment continues to disrupt agricultural activities. In **Egypt**, land preparation is underway for summer-planted rice crops for sowing from April.

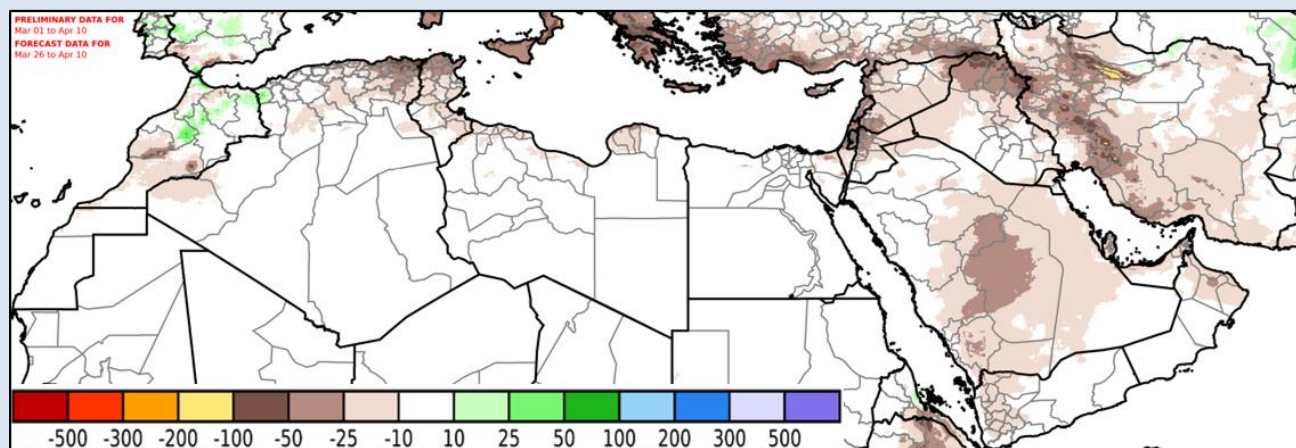
In the Middle East, winter wheat crops continue to develop for harvest from May, and growing conditions are generally favourable except in north and northeastern **Syria** and parts of northern **Iraq** where dry conditions impacted planting progress and in northeastern **Iran** where crop growth is delayed due to erratic rainfall. Hotter and drier than average conditions are forecast throughout the Middle East for the April to June period (See Regional Outlook Pg. 10). In north and northeastern **Syria**, winter wheat crop conditions are unfavourable, particularly in Hassakeh and parts of Idleb, Aleppo, and Raqqa Governorates due to dry conditions in combination with impacts from the ongoing conflict, its aftermath, and general economic conditions. While climatic conditions for the development of winter wheat are favourable in the southern half of the country, high prices of domestic and imported inputs resulting from currency depreciation and fuel shortages are hampering agricultural production throughout the country. In **Iraq**, conditions are generally favourable except in the major producing Ninewa Governorate in the northwest where previous dry conditions reduced planted area. Despite irregular rainfall from January in **Iran**, crop conditions are favourable with biomass near to above-average except in Golestan in the northeast where crop growth is delayed.

Regional Outlook: Below-average rainfall likely through mid-April across much of the region

During February 26th to March 25th, the region had mixed precipitation performance. Areas in northeastern Morocco and northern Algeria where rainfall deficits were present received average to above-average precipitation. Eastern areas of the region received mainly average or below-average amounts. According to two-week precipitation forecasts from late March, mainly average to drier-than-average conditions are forecast through April 12th. Figure 1 shows an extended outlook for February 26th to April 10th that includes forecast amounts. Areas that may experience a drier-than-average early April include Morocco, northeastern Algeria, northeastern Syria, northeastern Iraq, and eastern and central Iran. According to the April 1st SubX next 30-day forecast, April totals may be below-average in eastern Iran. Near-average April precipitation totals are forecast in most other areas of the region. April to June is likely to be hotter than normal (Figure 1-right) and drier than normal in the Middle East, according to early March dynamical model seasonal forecasts from several international centers.

Rainfall Outlook Anomaly

February 26 – April 10 2021



3-month 2m Temperature Anomaly Probability

April – June 2021

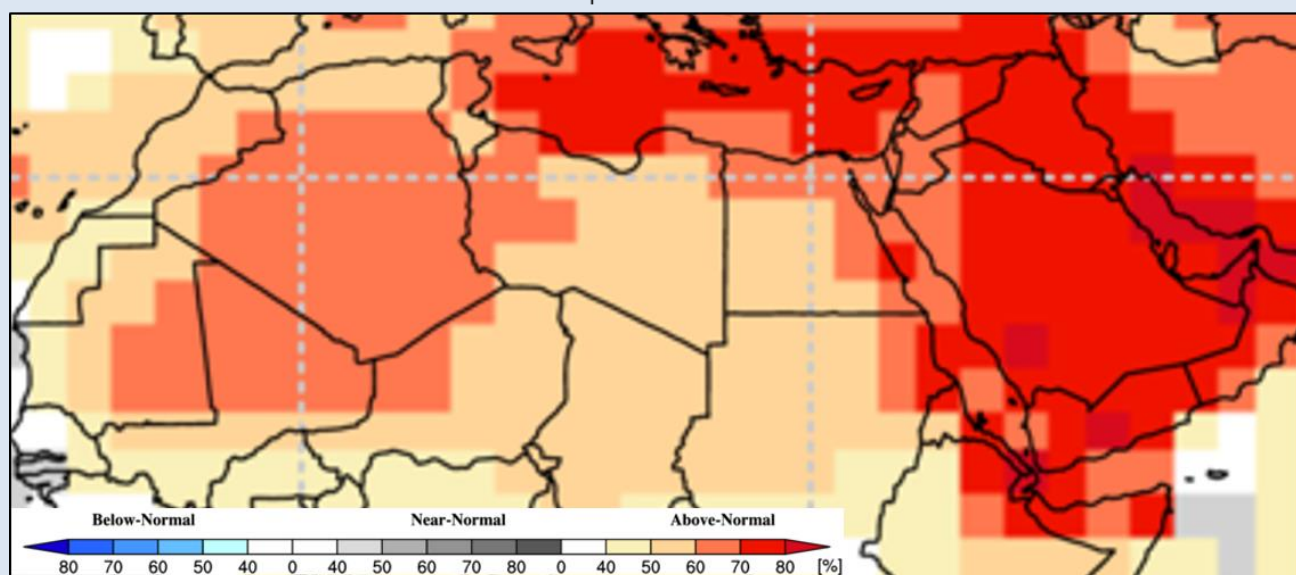
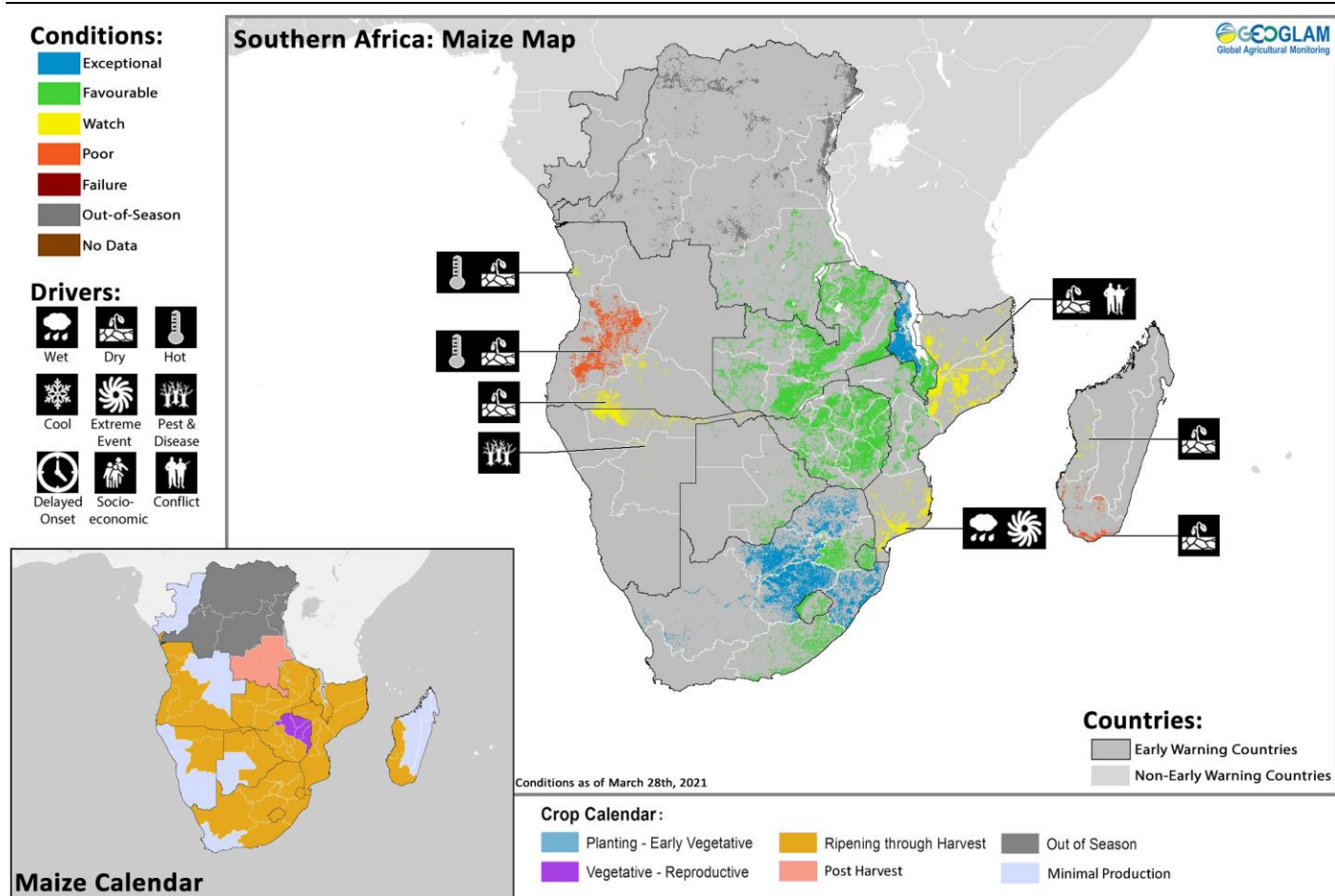


Figure 1. Rainfall anomaly outlook for February 26th to April 10th and a probabilistic forecast for 2-meter temperature for April to June. The top panel is a CHC Early Estimate for February 26th to April 10th, which compares 2021 rainfall amounts to the 1981-2020 CHIRPS average. The bottom panel is a probabilistic forecast for most-likely April-May-June 2-meter temperature tercile from the WMO Lead Centre for Long-Range Forecast Multi-Model Ensemble, March 2021. White color indicates that there is no dominant category across the model forecasts. Image from <https://www.wmolc.org/home>.

Source: UCSB Climate Hazards Center.

Southern Africa

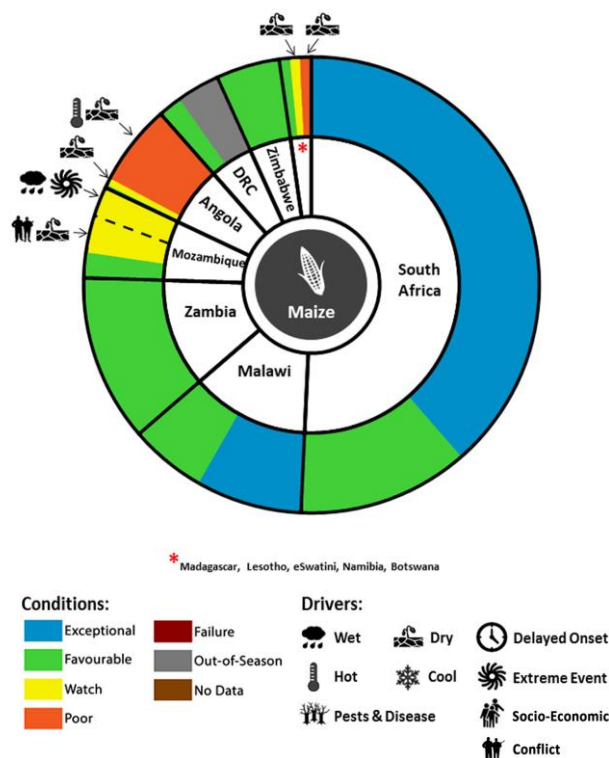


Crop condition map synthesizing information as of March 28th. Crop conditions over the main growing areas are based on a combination of inputs including remotely sensed data, ground observations, field reports, national, and regional experts. **Crops that are in other than favourable conditions are labeled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

Throughout Southern Africa, harvesting of main season cereals is underway in **Angola, Botswana, eSwatini, Madagascar, Malawi, Mozambique, Namibia, South Africa, Zambia, and Zimbabwe** to be finalized in June. Overall production prospects for 2021 cereal crops are mostly favourable to exceptional due to average to above-average rainfall for much of the season. However, stressed crops in southwestern **Angola**, southern **Madagascar**, and northwest **Namibia** are unlikely to recover due to impacts from prolonged drought. There is also concern in east, west, and central **Madagascar** and north and southern **Mozambique** where dry conditions are impacting crop development. Decreased rainfall in March is likely to affect late-planted crops and may lead to an early end to the rainfall season (See Regional Outlook Pg. 13).

In the **Democratic Republic of Congo**, harvesting of main and second season maize and sorghum crops is underway in south and central provinces under favourable conditions, following generally adequate and well-distributed rainfall throughout the season except in some central areas that experienced erratic rainfall. Planting continued in north and eastern provinces under favourable weather conditions for harvest from June. In southwestern **Angola**, stressed crops in coastal and highland areas and in Cunene Province are unlikely to recover due to consistently well below-average rainfall and above-average temperatures since the start of the season, representing one of the worst droughts in 40 years (See Regional Outlook Pg. 13). While much of Cuando Cubango province in the southeast has experienced generally favourable weather conditions, initial reports indicate that African Migratory Locust (AML) swarms damaged crops and remain a threat to agriculture. There is also concern for main season maize crops in the northwest where rainfall has been erratic and temperatures were high in January and February. Elsewhere in the north and east, harvesting conditions are favourable with near-normal cumulative rainfall and generally favourable conditions throughout the season. In **Zambia**, harvesting of main season maize crops is underway with positive production prospects due to well-distributed rainfall throughout the season. However, AML presence in south and western areas remains a concern. In **Malawi**, main season maize crop conditions have been favourable throughout the season with overall average to above-average production prospects. However, combined incidences of Fall Armyworm infestations as well as reported water stress for maize at its critical cobbing to maturity stages, mostly over districts in the Blantyre, Machinga, and Shire Valley Agriculture Development Divisions in the south, may result in localized yield reductions. In

Mozambique, flooding from Tropical Cyclone Eloise on January 23rd followed by Tropical Storm Guambe on February 12th resulted in localized crop damage in Maputo, Gaza, Inhambane, Sofala, Manica, Tete, Zambézia, and Niassa Provinces, but total impact was limited, and overall national production is expected to be near normal. Conversely, while rainfall in southern provinces was conducive for crop growth in areas that did not experience crop losses from tropical cyclones, there is some concern as a late start to the season in combination with below-average rainfall in March may impact yields. There is also concern for crops in Cabo Delgado Province in the north as rainfall has been below-average, with most places having experienced the second driest December to February rainfall season in 40 years. Also, the escalation of conflict in northern coastal areas, particularly with the recent clashes between non-state armed groups reported in Palma district since March 24th, is expected to lead to increased displacement and damage to agricultural production. In **Namibia**, there is concern for main season cereal crops in the north due to below-average rainfall and AML presence. While weather conditions have been favourable for crop development in central areas, there is concern due to AML presence and potential impacts. In **Botswana**, harvesting of main season cereals is underway in north and eastern areas under favourable conditions, and yields are expected to be above-average due to adequate rainfall from November 2020. However, country reports indicated that infestations of AMLs increased between January and March in northwest and northeastern areas where rainfall has been conducive for breeding, and AML presence could pose a risk to 2021 production. In **Zimbabwe**, harvesting is underway for main season cereals, and conditions are favourable with above-average production prospects across many areas. However, localized flooding from Tropical Storm Chalane on December 30th and Tropical Cyclone Eloise on January 24th may have resulted in leaching and waterlogging that could slightly affect crop yields. Additionally, dry spells in February were reported in Rushinga, Mudzi, and Nyanga in the northeast, though crop impacts were minimal. In **Madagascar**, dry conditions in the south in combination with high temperatures has led to extremely poor vegetation conditions and is likely to result in the third consecutive year of poor yields and production declines for main season cereals with significant crop losses expected. Seasonal forecasts indicate a likelihood of below-average rainfall until the end of the season. There is also concern for main season maize and rice crops in east, west, and central regions where below-average and erratic rainfall has resulted in dry conditions in several areas. In **eSwatini**, conditions are favourable for the continued harvesting of maize crops. In **Lesotho**, favourable conditions for much of the season have been beneficial for maize and sorghum crop development, and production prospects are favourable. In **South Africa**, conditions are exceptional across most of the country as harvest begins for main season maize crops. Widespread and above-normal rainfall has supported crops for most of the season from early November through February, with further rains in the main producing southern region during March. Official production forecasts for the 2021 maize crop indicate that the maize harvest could be the second largest on record and above the 2020 level.



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

Land preparation is underway as planting of winter wheat crops will commence in April across **Lesotho, South Africa, and Zimbabwe**. However, AML swarms have recently increased over southeastern **Angola**, northwest and northeastern **Botswana**, northeastern **Namibia**, and south and western **Zambia**, and Brown locusts were reported in central **South Africa**, which could pose a risk to crops.

Regional Outlook: Forecast below-average rainfall in April likely indicative of an early end to the 2021 rainfall season in many areas

Current rainfall estimates indicate the 2020-21 October-to-March season was one of the driest on record, since at least 1981, in southwestern Angola, northwestern Namibia, northeastern Mozambique, and southern to east coast Madagascar (Figure 1-left). The December to February rainfall rank is similarly low. In contrast, large portions of eastern Botswana and northern central South Africa, parts of eastern Namibia, southern and central Zimbabwe, and localized areas of Mozambique recorded one of their wettest seasons of the CHIRPS data record. These areas had consistently above-average amounts mainly through February.

Below-average to average rainfall is forecast through the next several weeks for most of Southern Africa (Figure 1-right). In many areas, this indicates an early end to the 2020-2021 rainfall season. The outlook for below-average rainfall in early to mid-April in large areas of the region is supported by several forecast products. Some SubX models from April 1st indicate above-average rainfall in the next several weeks in northeastern Madagascar and parts of southeastern South Africa, but there is low confidence in that due to model disagreement.

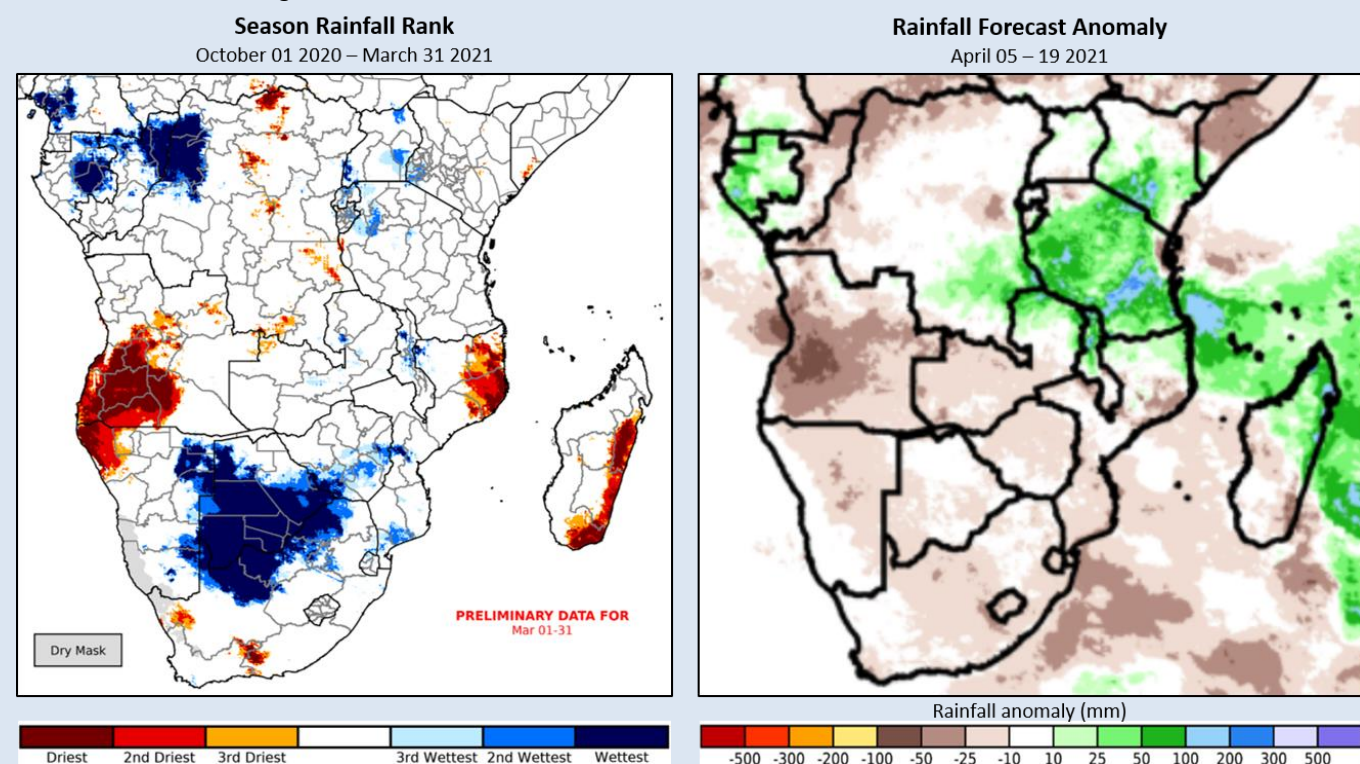
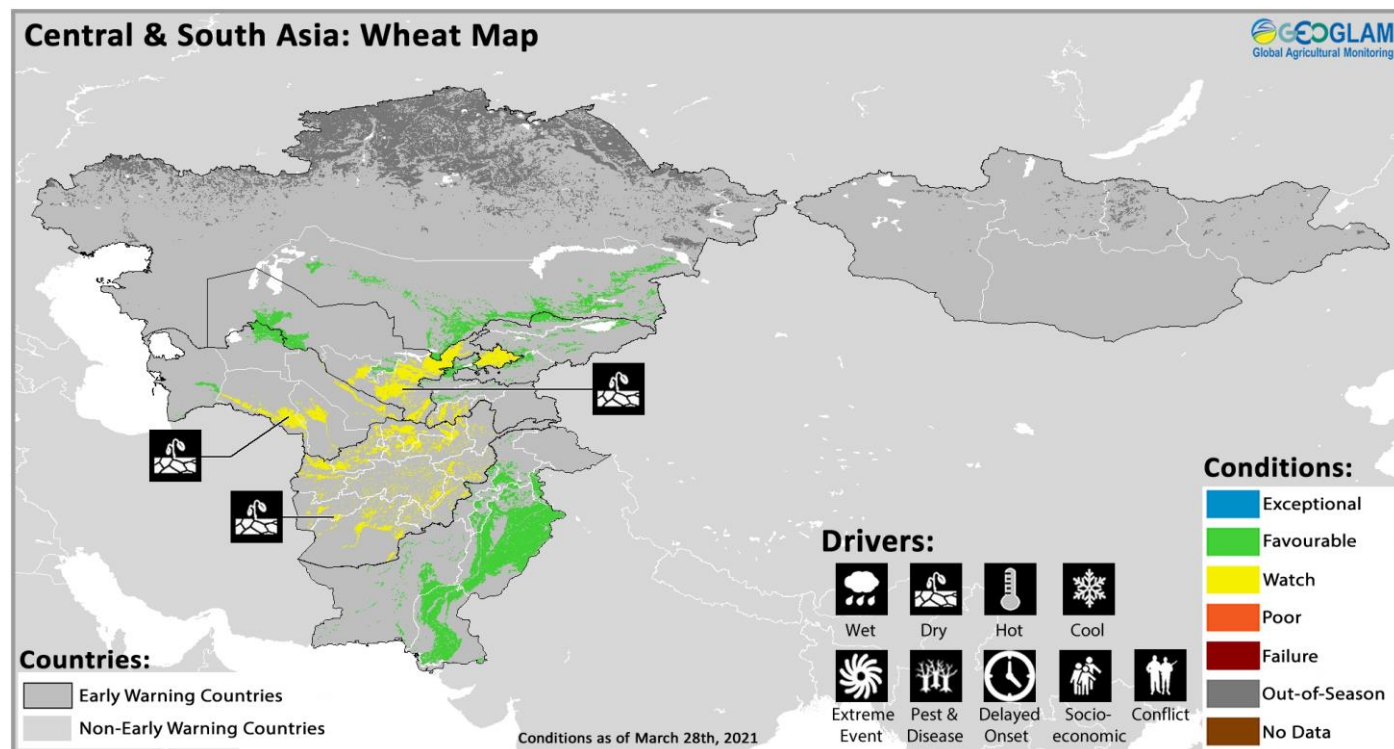


Figure 1. Historical rank of the 2020-2021 rainfall season and a 15-day rainfall forecast anomaly. (Left) UCSB Climate Hazards Center Early Estimate, which shows where October 1st 2020 to March 31st 2021 total rainfall ranks in the CHIRPS 40 year record (1981-2020). Data includes CHIRPS final for October to February, and CHIRPS preliminary for March. Red and blue colored areas indicate where the 2020-21 rainfall season ranks in the 1st, 2nd, or 3rd driest/wettest seasons. (Right) Unbiased GEFS 15-day forecast anomaly for April 5th to April 19th, 2021, from April 5th.

Source: UCSB Climate Hazards Center.

Central & South Asia



Crop condition map synthesizing information as of March 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 began in **Pakistan** while crops are still developing in **Afghanistan, Kazakhstan, Kyrgyzstan, Tajikistan, Turkmenistan, and Uzbekistan** for harvest from May, and overall conditions are mixed. While precipitation levels improved across parts of southwestern **Tajikistan**, east and central **Turkmenistan**, and eastern **Uzbekistan** in the second dekad of March (See Regional Outlook Pg. 15), vegetation conditions remain below-average due to previous dry conditions. Additional precipitation is necessary for southwestern **Tajikistan** to fully replenish soil moisture; however, below-average precipitation is forecast to continue for the April to May period (See Regional Outlook Pg. 15). In **Afghanistan**, below-average precipitation from December 2020 to February 2021 affected winter season snow accumulation that is critical for water supply for both winter and spring wheat crops. However, good precipitation from mid-February through March has partially improved water availability and rainfall deficits, and crop health is normal for most areas. Although existing snow water volumes remain below-normal, they may be sufficient to address the irrigated crop water requirements in northeast and central areas. As April is typically the last month for significant precipitation, forecast below-average April rainfall in central and southern areas is likely to impact rainfed crops (See Regional Outlook Pg. 15). Winter wheat conditions are favourable elsewhere in the subregion, and in **Kazakhstan**, snow cover was sufficient for normal wintering of crops until the second dekad of March in most croplands, and crops' dormancy stage finished in late March. In **Pakistan**, the season has progressed well overall, and national production is forecast to be 26.2 million tons, one million tons higher than the previous year.

Planting of spring wheat is underway in **Tajikistan** and **Turkmenistan** under favourable conditions due to improved precipitation in March that benefitted soil moisture levels. In southwestern **Afghanistan**, deficit precipitation is affecting planting activities. Elsewhere in the country, spring wheat planting is mostly delayed as farmers are waiting for soils to dry from recent rainfall. Land preparation is underway in **Kazakhstan, Kyrgyzstan, and Uzbekistan** for spring wheat planting in April.

Regional Outlook: Increased chances for below-average April to May precipitation across much of the region

Precipitation totals for October 1st to March 25th, plus forecast amounts through April 10th, show seasonal precipitation deficits in many areas of the region (Figure 1-left). Season-to-date totals are less than 80% of average in central, western, and southern Afghanistan, central and eastern Iran, western Pakistan, as well as in parts of Uzbekistan, Tajikistan, Kyrgyzstan, and Kazakhstan. Following severe February precipitation deficits, which ranged from less than 50% and 80% of average, March brought wetter conditions to many areas (Figure 1-middle). March precipitation was above-average in central and northern Afghanistan, northern Pakistan, Tajikistan, Kyrgyzstan, eastern areas of Turkmenistan and Uzbekistan, and southern Kazakhstan. April is typically the last month for high amounts of seasonal precipitation. Aside from some eastern areas influenced by the Indian summer monsoon, the region is mostly dry after May. According to SubX probabilistic forecasts from April 2nd, there are increased chances for below-normal April 10th to April 23rd precipitation in the region, with highest chances in central and southern Afghanistan, northern Tajikistan, and southern Kyrgyzstan. Several models are forecasting April precipitation totals to be more than 25 mm below-average in central and western Afghanistan, northeastern Pakistan, Tajikistan, and southern Kyrgyzstan.

Average to below-average precipitation forecast in the next several weeks for the region is generally in line with the increased chances for below-normal April-to-May precipitation forecast by dynamical models from international centers in early March and earlier in the season (Figure 1-right). Dynamical models forecast warmer-than-normal spring and summer temperatures across the region.

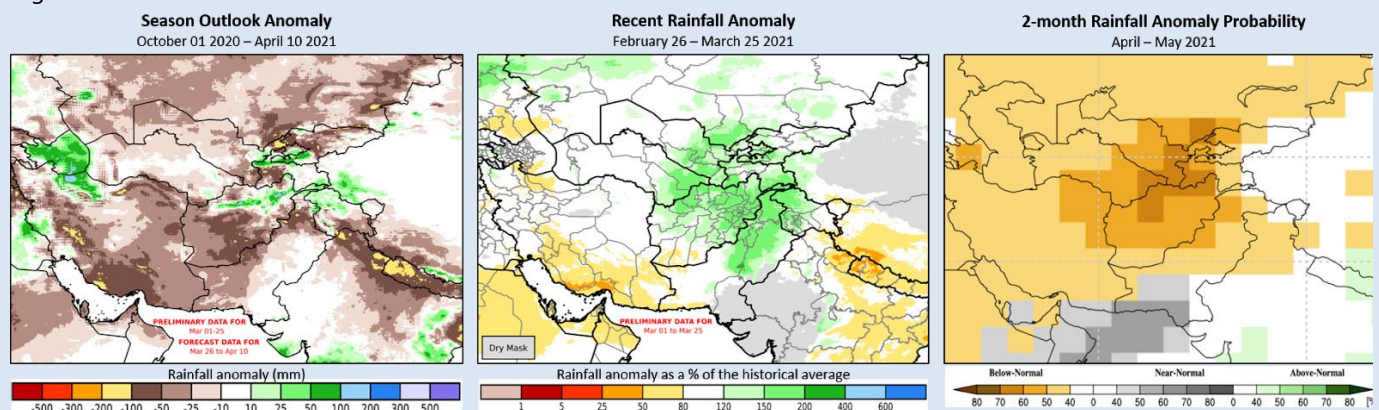
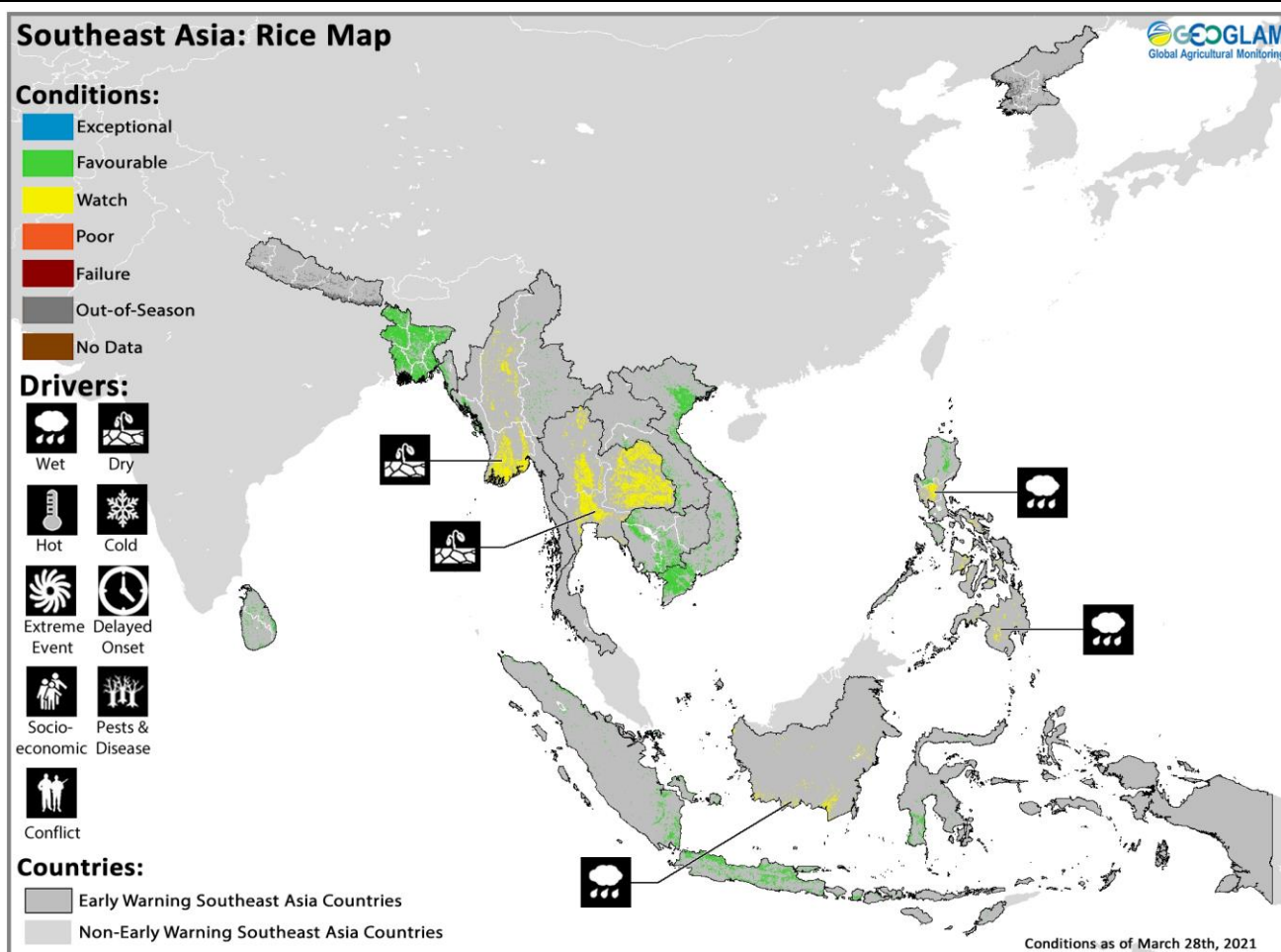


Figure 1. An October-to-May season rainfall anomaly outlook, recent rainfall percent of average, and a 2-month rainfall anomaly probability for April to May, 2021. The left and middle panels are CHC Early Estimates, which compare 2021 rainfall amounts to the 1981-2020 CHIRPS average. The panel on the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

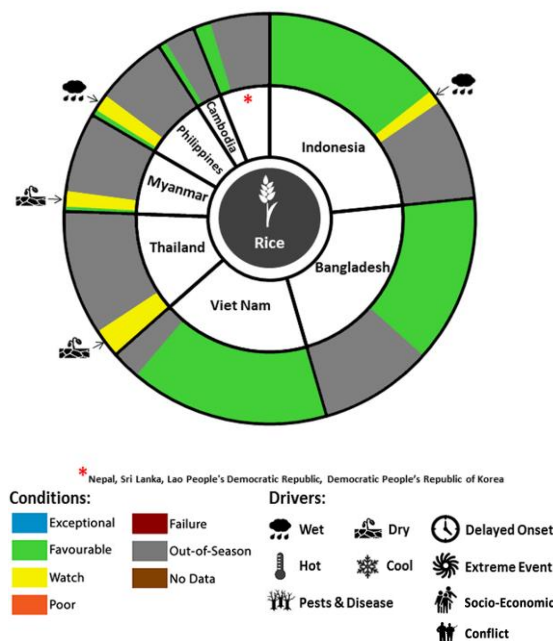
Source: UCSB Climate Hazards Center.

Southeast Asia



Crop condition map synthesizing rice conditions as of March 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 earlier sown dry-season rice crops is underway, and growing conditions are generally favourable with some concern in parts of the **Philippines** due to recent flooding as well as in western **Myanmar** and **Thailand** due to shortages of irrigation water. In southern **Viet Nam**, sowing of wet-season rice has started earlier than usual under favourable conditions, and in **Cambodia**, land preparation is underway for sowing of wet-season rice from mid-April. Forecasts indicate above-average rainfall for the April to June period in northern parts of the subregion (See Regional Outlook Pg. 17). In **Indonesia**, harvesting of wet-season rice is ongoing under generally favourable conditions. While harvested area in March reached 1.6 million hectares and is higher than the previous year’s level, yields are slightly lower due to overall drier conditions since November 2020. Also, earlier flooding in South Kalimantan resulted in damage to 56,700 hectares of crops, constituting 38 percent of planted area of wet-season rice in the region. Above-average rainfall is forecast for the south while central regions may experience below-average precipitation for the April to June period (See Regional Outlook Pg. 17). In the **Philippines**, harvesting has begun for earlier sown dry-season rice. Conditions are currently mixed as some provinces in Visayas and Mindanao have experienced damage from recent storm systems, including Tropical Storm Auring in the second half of February. However, production is likely to be normal as some areas were harvested prior to the storm impacts, and overall growing conditions are favourable in most regions. In **Thailand**, harvesting has begun for earlier sown dry-season rice crops under mixed conditions due to a lack of irrigation water during most of the season. However, total sown area has increased to above the previous year’s level due to high prices for rice in the market. In northern **Viet Nam**, conditions



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

are favourable for winter-spring (dry-season) rice crops in the early growing stage due to warm weather and sufficient irrigation water supply, and total sown area has reached 820,000 hectares. In the south, conditions are favourable for the winter-spring (dry-season) crop as harvesting continues in the Mekong River Delta. Harvested area has reached 270,000 hectares of 1.9 million hectares planted, and current yields are 6.39 tons per hectare. In the Mekong River Delta, sowing has begun early for the summer-autumn (wet-season) crop under favourable conditions. In **Laos**, dry-season rice is in tillering to young panicle forming stage under favourable conditions for harvest from April. Planted area is expected to remain slightly lower than last year at 83,000 hectares due to less rainfall received. In **Myanmar**, planting of dry-season rice is nearing completion and has reached 75.3 percent of the national plan of 1.08 million hectares, though the remaining area may not be planted due to limited irrigation water. While weather conditions are favourable for crop growth mostly in the reproductive stage, there is concern in western parts of the country due to limited irrigation water supply. In **Cambodia**, planting of dry-season rice reached 649,000 hectares, a nine percent increase compared to the previous year due to sufficient water supply and the high price of rice in the market. Harvesting is underway and has reached 61 percent of total planted area with an average yield of 4.36 tonnes per hectare, slightly higher than the previous year's level. In **Sri Lanka**, harvesting of *Maha* season maize and rice crops finalized in March under favourable conditions, and production was estimated to be above-average due to good agro-climatic conditions throughout the season. Land preparation is underway for planting of *Yala* season maize and rice crops from April. In **Bangladesh**, harvesting has begun early for the *Boro* season rice crop under favourable conditions, and the output is forecast at a bumper level, reflecting an increase in plantings supported by remunerative domestic prices. Yields are also expected to be above-average, reflecting favourable weather conditions and increased use of hybrid seeds. Planting is underway for the minor *Aus* crop, and farmers are expected to prefer rice cultivation due to strong domestic prices. In **Nepal**, planting of main season maize crops continued in March under generally favourable conditions despite below-average March rainfall in parts of the Far Western Region.

Regional Outlook: Wetter than normal conditions likely during April to June across much of mainland Southeast Asia and Indonesia

December 1st and March 25th rainfall totals are less than 80% of average in northern and southernmost Myanmar, in parts of southern and central mainland Thailand, and in western and central Cambodia. Parts of central Indonesia have also been drier than average. Rainfall totals are above-average in parts of southern Vietnam, peninsular Thailand, and most maritime areas, while eastern maritime areas have seasonal totals that are 120% to higher than 200% of average.

For the first half of April, the unbiased GEFS forecast from March 31st shows above-average rainfall in Thailand, southern Myanmar, northern Laos, and the southern Philippines. Below-average rainfall is forecast for northern Myanmar, which would increase and expand current deficits. Below-average rainfall is also forecast in Indonesia, in West Sumatra, West Kalimantan, and in some southeastern areas. The extended outlook for December 1st to April 10th rainfall anomaly (Figure 1-left) includes an earlier, but similar, unbiased GEFS forecast.

According to the SubX forecast from April 2nd, parts of southern Thailand, Cambodia, southern Vietnam, and the Philippines are likely to receive above-normal rainfall between April 10th and April 23rd, while drier-than-normal conditions are likely in rainfall deficit areas of central Indonesia (Figure 1-middle). SubX forecasts for April rainfall totals show a similar pattern.

Dynamical model forecasts from early March from several international centers show slightly higher-than-normal chances for wetter-than-normal conditions during April to June in mainland countries and in southern Indonesia, and higher chances for wet conditions in the Philippines (Figure 1-right). Parts of central Indonesia may see below-normal April to June rainfall. Warmer-than-normal conditions are forecast for maritime areas.

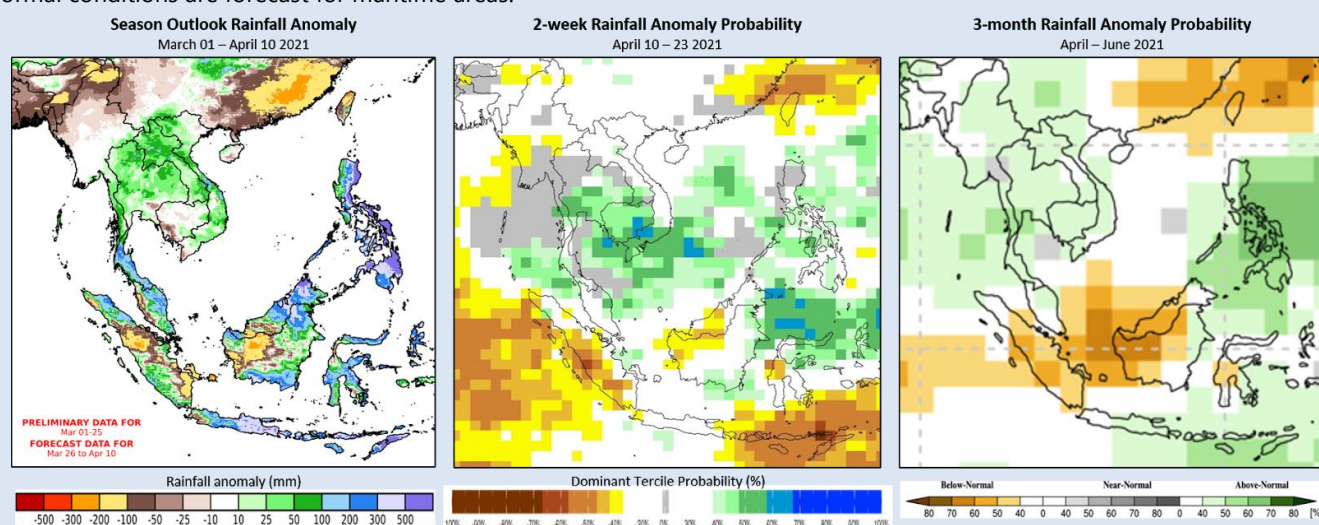
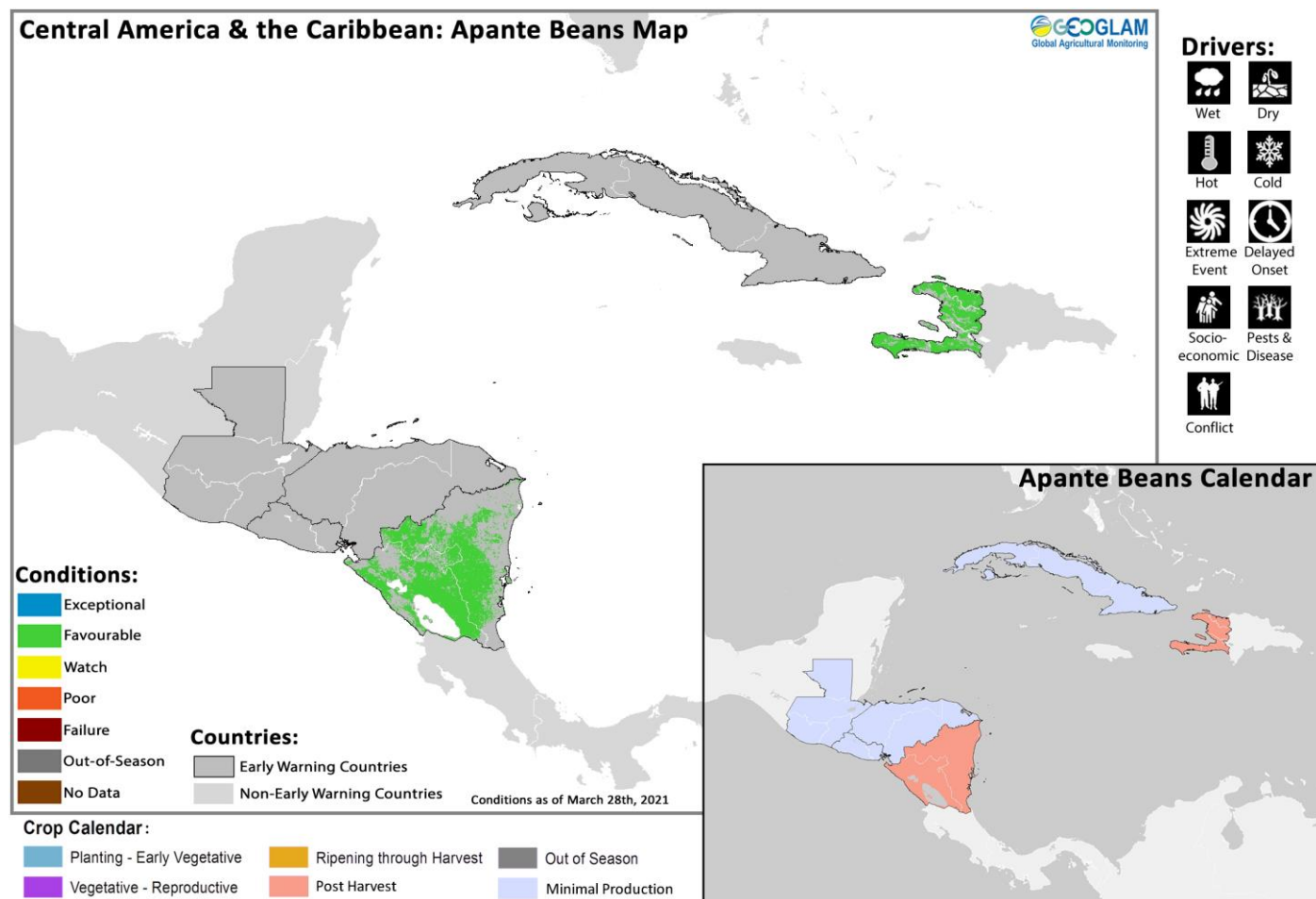


Figure 1. A March 1st to April 10th seasonal outlook, a 2-week rainfall anomaly probability forecast, and a 3-month rainfall anomaly probability forecast. (Left) CHC Early Estimate for March 1st to April 10th, which combines the 2021 rainfall amounts with the 15-day unbiased GEFS forecast, and compares the total to the 1981–2020 CHIRPS average. (Center) Probabilistic forecast for April 10–23, 2021, obtained from the statistical calibration of three models (NCEP CFSv2, NCEP GEFS, and NOAA/ESRL FIM HYCOM) from the SubX database. (Right) Probabilistic forecast for most-likely April–May–June 2021 rainfall tercile from the [WMO Lead Centre for Long-Range Forecast Multi-Model Ensemble](#), based on early March conditions. White color indicates that there is no dominant category across the model forecasts.

Source: UCSB Climate Hazards Center.

Central America & Caribbean



Crop condition map synthesizing information as of March 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, second season rice crops are in vegetative to reproductive stage in the main producing northern coast of **Honduras** under favourable conditions, and harvesting of *Apante* season bean crops in **Nicaragua** finalized in late February to early March with average to above-average yields despite flooding at the beginning of the season. Land preparation is underway across **Guatemala, Honduras, and El Salvador** for the start of the *Primera* season in April and May, though in **Guatemala**, some farmers in Sololá, Quetzaltenango, and Chimaltengo Departments in the southwest have begun early sowing activities due to beneficial rainfall and soil moisture conditions. A normal start to the *Primera* season is expected, and based on March initial conditions, dynamic models forecast mainly average cumulative rainfall during April to June.

In the Caribbean, planting and development of main season cereals is underway in **Haiti** and **Cuba** under favourable conditions to be harvested from April. In **Haiti**, recent rainfall performance has reduced previous deficits and resulted in normal main season maize crop development. Harvesting of second season rice crops finalized in March with average to slightly below-average yields, particularly in the main producing department of Artibonite, primarily due to reduced sown area. Harvesting of *Apante* season bean crops also finalized in March with average yields. In **Cuba**, planting of second season rice crops will begin in April for harvest from September.

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

Information on crop conditions in the main production and export countries can be found in the *Crop Monitor for AMIS*, published April 8th, 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 & Caribbean				
Country	Crop	Season 1 Name	Season 2 Name	Season 3 Name
Cuba	Rice	Main season	Second season	
El Salvador	Beans	Primera	Postrera	
El Salvador	Maize	Primera	Segunda	
Guatemala	Beans	Primera	Postrera	Apante
Guatemala	Maize	Primera	Segunda	
Haiti	Maize	Main season	Second season	
Honduras	Beans	Primera	Postrera	
Honduras	Maize	Primera	Segunda	
Nicaragua	Beans	Primera	Postrera	Apante



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Contributing partners



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