

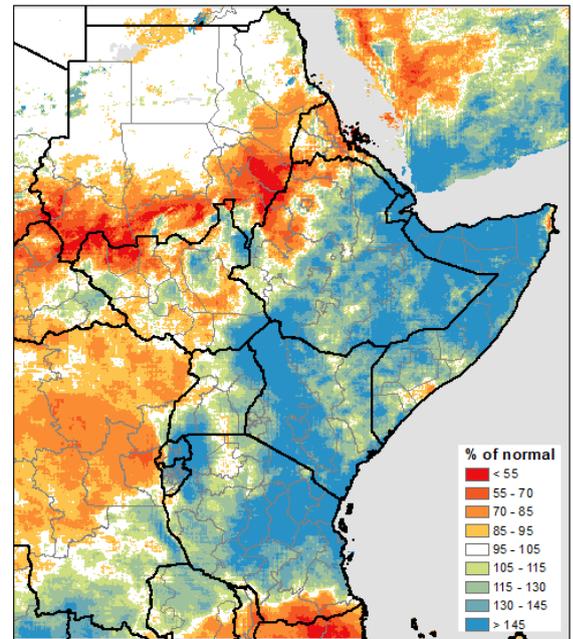
# East Africa 2020 flood impacts on agriculture

Updated May 19<sup>th</sup>, 2020

## Highlights

- The March to May (MAM) rainfall period was one of the wettest the region has seen since 1981 (Figure 1), following an already record wet 2019 October to December (OND) rainfall period.
- The early onset of rains and above-average rainfall since February promoted land preparation and planting activities for the MAM season across Somalia, Kenya, Tanzania, Uganda, Rwanda, and Burundi, along with the *Belg* season in Ethiopia.
- However, the abundant rains have also caused localized flooding, mudslides, flashfloods, and river overflows over the past months causing casualties, population displacement, infrastructure damage, and crop damage in parts of Kenya, Ethiopia, Somalia, Uganda, Tanzania, Rwanda, Burundi, and Yemen.
- Cropping conditions remain generally favourable as rains are expected to be beneficial to planting and crop development across much of the region; however, localized losses and crop damage are expected in areas worst affected by flooding (Figure 2).
- Abundant rains have also promoted the breeding and development of desert locusts and protracted the outbreak across the region, which continues to pose a significant threat to main season crops.
- Above-average rainfall is expected to continue across much of the region through May which will increase the flood risk across many areas and further protract the desert locust outbreak (See May Outlook Pg. 8).

Seasonal Rainfall Accumulation Percent of Normal by pentad  
2020 season Feb - May  
(Feb pentad 1 thru May pentad 1) / Avg (1981-2010) \* 100



Source: CHIRPS version 2.0 prelim  
Map produced by USGS/EROS

Figure 1. Seasonal rainfall accumulation anomaly for the Feb 1 - May 5 period over Eastern Africa (source: USGS/ EROS).

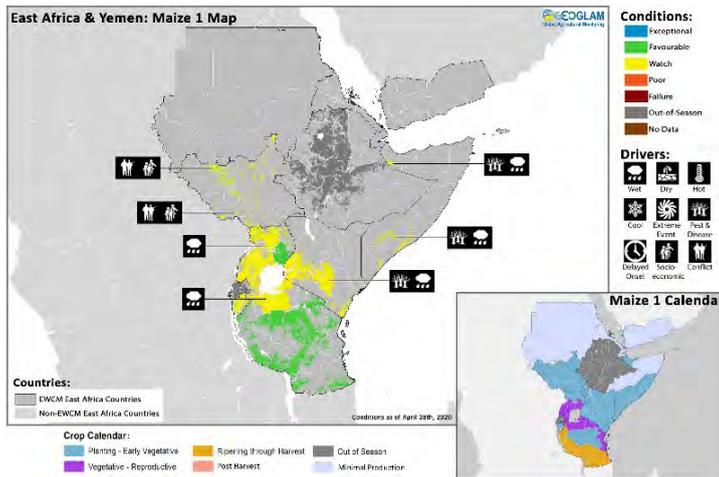


Figure 2. Crop condition map synthesizing conditions as of April 28th from the May CM4EW bulletin. (source: GEOGLAM CM4EW May Bulletin).

## Overview

The January to March rainfall period in East Africa, which marked an early start to the normal March to May (MAM) rains, was one of the wettest the region has seen since 1981. Since the beginning of the MAM season in March, UNOCHA has estimated that at least 1.3 million people have been affected by flooding, an estimated 481,000 people have been displaced, and 360 people have died following disastrous floods across the region.<sup>1</sup> This followed an already record 2019 October to December (OND) rainfall period where above-average rainfall led to widespread floods, resulting in the displacement of hundreds of thousands of people and causing crop and livestock losses in worst-affected areas.<sup>2</sup> The above-average rainfall in late 2019 was mostly a result of one of the strongest positive Indian Ocean Dipoles (IOD) in a 60-year history that brought enhanced rains to East Africa; however, the IOD is now in a neutral state and is forecast to remain neutral through June 2020.

While the early onset and above-average seasonal rains have had significant beneficial impacts for agricultural production, water resources recharge, and environmental and hydro-power regeneration across the region, they've also resulted in localized flooding, mudslides, flashfloods, and river overflows over the past months causing casualties, high levels of population displacement, infrastructure damage, and crop damage over worst affected areas. In many cases, the floods have affected the highly populous and agricultural productive regions of East Africa. Since late January, the worst affected areas of flooding include parts of **Somalia, Kenya,**

<sup>1</sup> "Eastern Africa Region: Floods and Locust Outbreak Snapshot (May 2020)." Reliefweb, May 11, 2020. <https://reliefweb.int/report/ethiopia/eastern-africa-region-floods-and-locust-outbreak-snapshot-may-2020>.

<sup>2</sup> "2019 Short Rains in East Africa Among the Wettest on Historical Record." Famine Early Warning systems Network (FEWS NET), January 29, 2020. <https://fewsn.net/east-africa/special-report/january-29-2020>.

**Ethiopia, Uganda, Tanzania, Rwanda, Burundi, and Yemen.** In many of these areas, the 2019 OND season ranked among the wettest on record (Figure 3-left), with no adequate recovery period due to above-average and, in some cases, record January to February off-season rainfall, followed by the current MAM season which from March 1 to May 10 has again ranked among the wettest on record (Figure 3-right). Forecasts indicate more heavy rains to come in the second half of May through early June across some of the worst affected areas (See May Outlook Pg. 8) and flood risk remains high. In addition, the above-average rains have also created a conducive environment for the breeding and development of desert locust and have protracted the outbreak, which remains a significant concern in **Somalia**, central and northern **Kenya**, southern **Ethiopia**, eastern **Uganda**, southern **South Sudan**, and **Yemen**.

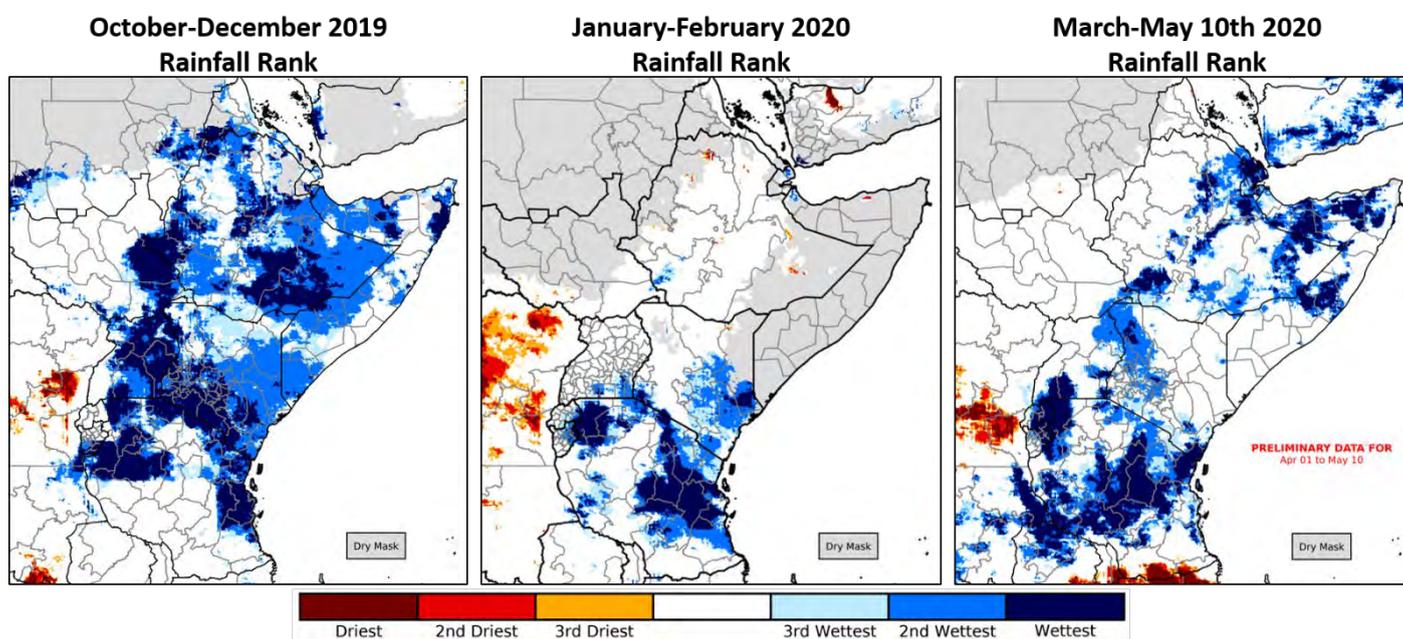


Figure 3. All three panels are CHIRPS Rank graphics, which indicate where rainfall totals for a given interval are ranked in the three wettest or three driest, relative to the CHIRPS historical record (1981-2019). The left panel shows the CHIRPS Rank for October to December, 2019. The middle panel shows the CHIRPS Rank for January to February, 2020. And the right panel shows the CHIRPS Rank for March to May 10th, 2020. Source: UCSB Climate Hazards Center

## Regional flood damage

Abundant rainfall in late January to early February marked an early start to the March to May (MAM) rains across the region. During this time period, equatorial and southern areas of East Africa experienced significant wet conditions, both in terms of rainfall amounts and number of days with rain. Affected areas were throughout **Tanzania**, western and southern **Kenya**, parts of **Uganda**, and in southwestern **Ethiopia**. In March, above-average rainfall conditions continued, further contributing to wetter-than-average conditions in southwestern **Ethiopia**, **Uganda**, western **Kenya**, **Rwanda**, **Burundi**, and throughout **Tanzania**. While the rains provided favourable growing conditions for the majority of these areas, sustained heavy rainfall resulted in flooding in parts of **Burundi**, **Rwanda**, and the Pwani (southeast) region of **Tanzania**. In April, above-average rainfall continued across much of the region resulting in flooding in **Kenya**, **Somalia**, **Ethiopia**, **Tanzania**, **Rwanda**, and **Burundi**. In early May, several parts of East Africa continued to receive heavy rain, resulting in riverine flooding and flash flooding in **Uganda**, **Burundi**, **Rwanda**, western and central **Kenya**, and **Somalia**. While **Sudan** and **South Sudan** were significantly affected by flooding in 2019, they were less affected by above-average 2020 MAM rains, except in parts of **South Sudan** where the rains have protracted the desert locust outbreak.

In **Kenya**, according to the latest official Government sources, more than 237 people have lost their lives due to recent heavy rains, floods, and landslides with at least 161,000 people displaced across the country and with the worst affected areas located in the Western, Rift Valley, and Central counties, which are some of the most agricultural productive areas of the country.<sup>3</sup> In late January to late February, rainfall was above-average in western and southern areas. In February, early planting of the *Long Rains* cereal crop started due to abundant rainfall received prior to the start of the MAM rains. Above-average rainfall continued through March, resulting in wetter-than average conditions in western Kenya and causing flooding and landslides in the southeastern and western counties, particularly Kisumu and Homa Bay. In late April and early May, heavy rains intensified, causing landslides and destruction in the Rift Valley, Central, and Coastal regions and resulting in the displacement of 100,000 people.<sup>4</sup> Across the main producing areas of West, Rift Valley, and Central Kenya, soil moisture is significantly above-average, and in Rift Valley and Central, soil moisture is the highest observed in 10 years (Figure 4).

<sup>3</sup> "Death and destruction as floods rain havoc across East Africa." Reliefweb, May 18, 2020. <https://reliefweb.int/report/kenya/death-and-destruction-floods-rain-havoc-across-east-africa>.

<sup>4</sup> "Kenya Floods Kill 194, People Evacuated from Risk Areas near Dams." Reliefweb, May 6, 2020. <https://reliefweb.int/report/kenya/kenya-floods-kill-194-people-evacuated-risk-areas-near-dams>.

Kenya 2020 Long Rains Cropping Season

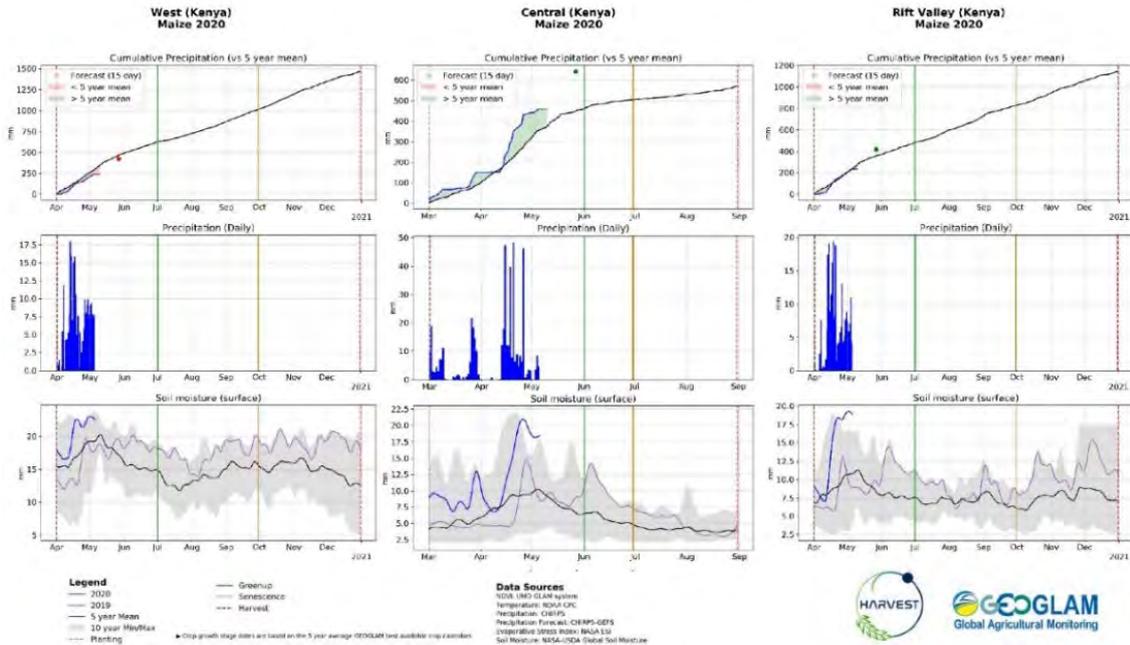


Figure 4. Agro-climatic indicators over the current 2020 season in West, Central, and Rift Valley Kenya (source: NASA Harvest)

Flooding resulted in Kisumu county in April (Figure 5-top right)<sup>5</sup>, and the overflow of the Nyando river in April along with the Nzoia and Tana river in early May (Figure 5-bottom right, left) caused destruction in western and central areas. According to the Kenya Red Cross Society, the overflow of both the Nzoia and Tana rivers has displaced as many as 40,000 people.<sup>6</sup>

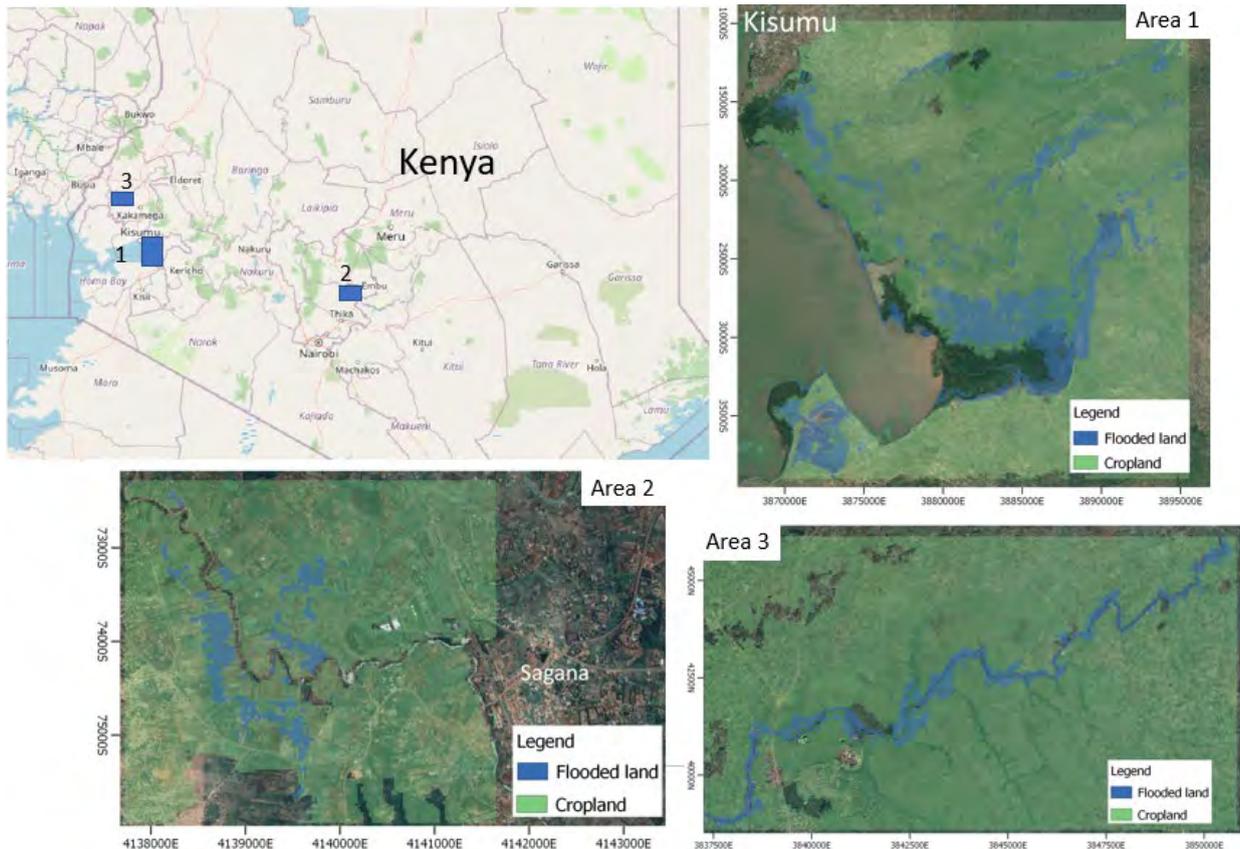


Figure 5. Flood water extent layer derived from Sentinel-2 images and cropland layer (source of cropland layer: GLOBE LAND 30) overlaid to a Google Satellite background layer for three areas of interest in Kenya highlighted by blue rectangles in the reference map (top left- source: Open Street maps). Area 1: Located close to Kisumu town, in Kisumu county from April 25th to May 4th 2020. Flooded land: 8,389 ha, flooded cropland: 6,399 ha. Area 2: Located in the border between Muranga and Kirinyaga county, along Tana river from May 1st to May 14th 2020. Flooded land: 71 ha, flooded cropland: 70 ha. Area 3: Located in Kakamega county, along Nzoia river from April 25th to May 4th 2020. Flooded land: 482 ha, flooded cropland: 332 ha. Source: JRC ASAP

<sup>5</sup> "Kenya – Thousands Displaced by Floods as Heavy Rain Continues." Floodlist, April 27, 2020. <http://floodlist.com/africa/kenya-siaya-homabay-kisumu-tanariver-april-2020>.

<sup>6</sup> "Heavy Floods Cause Loss of Life and Damage to Crops across East Africa." European Commission Joint Research Centre (JRC), n.d. [https://mars.jrc.ec.europa.eu/asap/files/special\\_focus\\_2020\\_05\\_floods.pdf](https://mars.jrc.ec.europa.eu/asap/files/special_focus_2020_05_floods.pdf).



Figure 6. Flooding of maize crops in Tana River County, Kenya, May 2020.

Since the beginning of May, the Tana River County districts of Tana Delta (Garsen), Tana North (Bura), and Tana River (Galole) have been affected by flooding (Figure 6). The floods have impeded farm inputs, delayed land preparation, and destroyed cropland, and the situation is expected to worsen food insecurity in affected areas. Additionally, the rising water levels of Lake Victoria is impacting Kisumu, Siaya, Busia, Migori, and Nyanza counties,<sup>7</sup> and additional flooding occurred in central and western areas.<sup>8</sup> Furthermore, the heavy rainfall is creating favourable conditions for the further spread of desert locusts as it provides suitable breeding conditions and promotes vegetation growth for feeding.

In **Somalia**, excessive rainfall in October and November 2019 resulted in flash floods in Somaliland and Mogadishu along with widespread flooding and crop damage to the secondary *Deyr* season cereals in several areas along the Shabelle and Juba rivers. *Deyr* season flooding affected close to half a million people, disrupted livelihoods, and caused large-scale displacement of an estimated 370,000 people, according to UN OCHA.<sup>9</sup> At the end of April through the start of May torrential rains again caused river levels to increase considerably along the Shabelle and Juba, resulting in widespread riverine flooding. The rains also caused flash flooding across Bay, Bakool, and Puntland, causing damage and population displacement. According to UN OCHA, an estimated 918,000 people have been affected by ongoing flash and riverine flooding of which an estimated 412,000 have been displaced.<sup>10</sup> Belet Weyne district in Hiraan region has been one of the most affected districts following the flooding of the Shabelle river on May 12<sup>th</sup>, and 85 percent of Belet Weyne town and much of its' vicinity has been inundated.<sup>11,12</sup> Soil moisture in West, Shabelle and Juba, and Coastal areas is at or near the highest level in 10 years (Figure 7), and further rains could lead to further flood damage. Areas affected by the recent riverine flooding are the main maize producing regions, with lower Shabelle on average accounting for more than 60 percent of total maize output for the *Gu* season. Prior to the recent flooding, *Gu* season production was expected to be 15 to 25 percent below-average due to flooding and desert locust outputs.<sup>13</sup> With the recent increase in flooding, and notably over the major producing areas of the country, *Gu* production is likely to be significantly reduced.

**Somalia 2020 Gu Cropping Season**

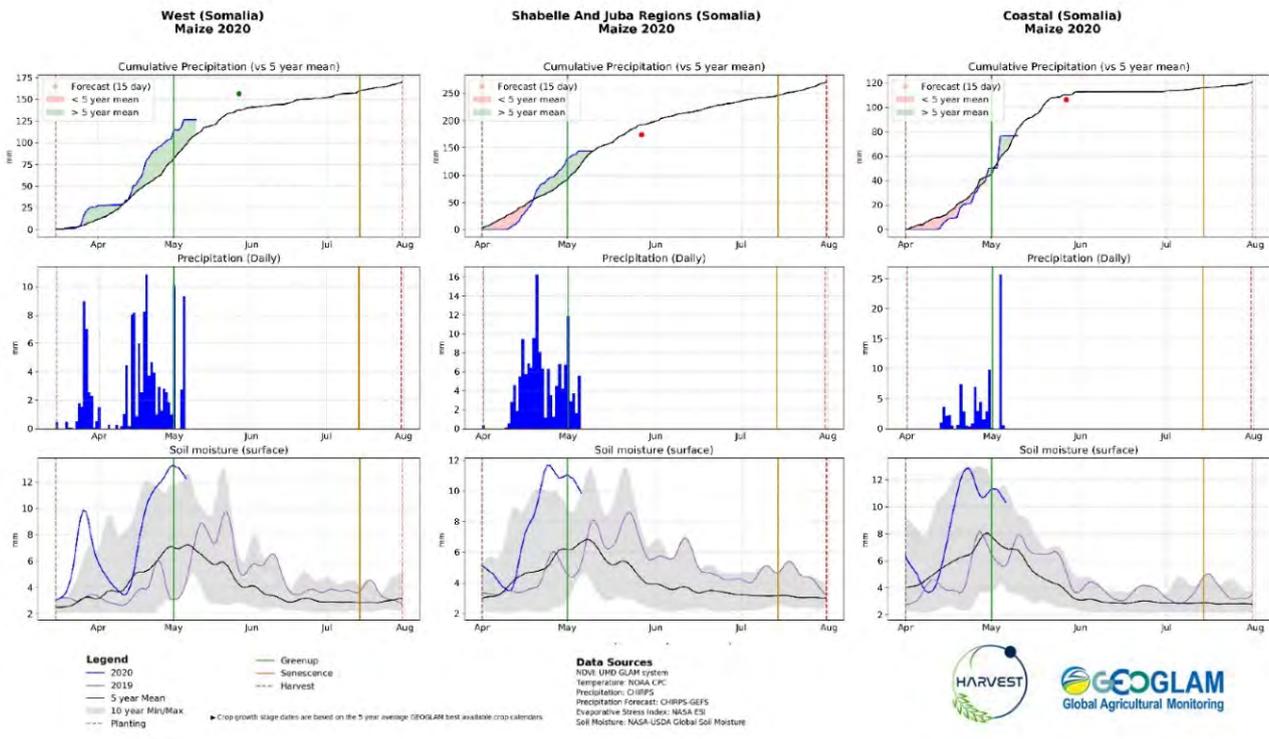


Figure 7. Agro-climatic indicators over the current 2020 Gu season in West, Shabelle & Juba, and Coastal Somalia (source: NASA Harvest)

In bimodal areas of **Uganda**, final yields for second season maize crops harvested in December were average due to normal rains received from October to December 2019; however, torrential rainfall caused localized crop damage in eastern areas due to flooding and landslides. Irregular, off-season rainfall in January and above-average rains since March have encouraged early field preparation

<sup>7</sup> "Kenya: Floods Flash Update No. 1 (7 May 2020)." Reliefweb, May 7, 2020. <https://reliefweb.int/report/kenya/kenya-floods-flash-update-no-1-7-may-2020>.  
<sup>8</sup> "Kenya – Floods Hit North and Central Regions as Death Toll Rises to 237." Floodlist, May 13, 2020. <http://floodlist.com/africa/kenya-floods-north-central-regions-may-2020>.  
<sup>9</sup> "Somalia – Government Appeals for Aid as 500,000 Affected by Floods." Floodlist, November 27, 2019. <http://floodlist.com/africa/somalia-floods-november-2019>.  
<sup>10</sup> "Somalia Flash Flooding Update #5". UN OCHA, May 16, 2020 <https://reliefweb.int/sites/reliefweb.int/files/resources/Flash%20Update%205%20-%20final%20for%20publication.pdf>.  
<sup>11</sup> Ibid.  
<sup>12</sup> "Satellite detected water & IDP distribution over Belet Weyne Town as of 13 May 2020." UNITAR-UNOSAT, May 13, 2020 [https://disasterscharter.org/image/journal/article.jpg?img\\_id=5760973&t=1589461803477](https://disasterscharter.org/image/journal/article.jpg?img_id=5760973&t=1589461803477).  
<sup>13</sup> "FSNAU Quarterly Brief – Focus on the 2020 Jilaal Impact and Gu Season Early Warning." FEWSNET, April, 2020 <https://fews.net/east-africa/somalia/food-security-outlook-update/april-2020>.

activities and planting for the MAM rainy season; however, the rains also established favourable breeding conditions for desert locusts and promoted further spread. In April through the beginning of May, heavy rains and severe flooding occurred over the western and northern regions (Figure 8), causing damage and population displacement.<sup>14</sup> In southeastern areas, due to persistent above-average rainfall, Lake Victoria water levels have risen to unprecedented levels in recent weeks and have flooded the surrounding areas, displacing local populations and resulting in regional electricity black-out. Average to above-average rainfall is likely to continue through May, notably in the south around Lake Victoria (See May Outlook Pg. 8) which could increase flood risk. In the Kasese district (southwestern Uganda), overflows of the Nyamwamba, Mubuku, Nyamughasana, and Lhubiriha rivers continue to cause flash floods and have displaced over 100,000 people.<sup>15</sup>



Figure 8. Photos of flooded maize crops in Karamoja region in northern, Uganda in April 2020.

In the **United Republic of Tanzania**, planting operations for the secondary OND season started with heavy rains throughout October 2019 and a tropical cyclone that triggered flooding in the northeast. Final yields for second season maize crops harvested in January and February were average to above-average due to rains received from October to December; however, torrential rainfall caused localized crop damage in parts of Tanzania due to flooding and landslides. Planting started in December for main season crops and heavy rains and flooding in late January affected Iringa and Lindi Regions. In February, flooding continued and, in some cases, worsened, particularly in Mwanza, Morogoro, and Manyara. Heavy rains continued through March, creating particular concern in main producing regions of Morogoro (southeast Tanzania), Mbeya (southwest Tanzania) (Figure 9), and Manyara and causing flooding in Pwani Region<sup>16</sup> (Figure 10). Morogoro and Mbeya Regions together account for more than one third of the national rice output. At the end of April, flood incidences occurred over the north in Arusha and Kilimanjaro,<sup>17</sup> and there was waterlogging in Mara, Mwanza, and Simiyu from earlier floods. Additionally, heavy rainfall occurred in northern areas of Kagera, Katavi, Manyara, Kigoma, and Rukwa and flooding has been reported.<sup>18</sup> According to the official Government sources, at least 31,000 people have been affected by the current heavy rains and floods including 13,500 displaced. Above-average rainfall is expected across much of the southern highlands as well as around the Lake Victoria area through May (See May Outlook Pg. 8). The risk of desert locust swarms entering from bordering countries is low due to southerly winds.

<sup>14</sup> "Uganda – Floods Affect Thousands in Western and Northern Regions." Floodlist, May 4, 2020. <http://floodlist.com/africa/uganda-floods-western-northern-region-may-2020>.

<sup>15</sup> "Uganda - Landslides and Flash Floods (DG ECHO, NOAA-CPC, Media) (ECHO Daily Flash of 11 May 2020)." Reliefweb, May 11, 2020. <https://reliefweb.int/report/uganda/uganda-landslides-and-flash-floods-dg-echo-noaa-cpc-media-echo-daily-flash-11-may-2020>.

<sup>16</sup> "Tanzania – Homes Damaged After Floods in Pwani Region." Floodlist, March 18, 2020. <http://floodlist.com/africa/tanzania-floods-pwani-march-2020>.

<sup>17</sup> "Tanzania – Deadly Floods and Mudslides Hit Northern Regions." Floodlist, April 26, 2020. <http://floodlist.com/africa/tanzania-floods-arusha-kilimanjaro-april-2020>.

<sup>18</sup> "Tanzania: Floods - Apr 2020." Reliefweb, May 8, 2020. <https://reliefweb.int/disaster/fl-2020-000125-tza>.

United Republic of Tanzania 2020 Cropping Season

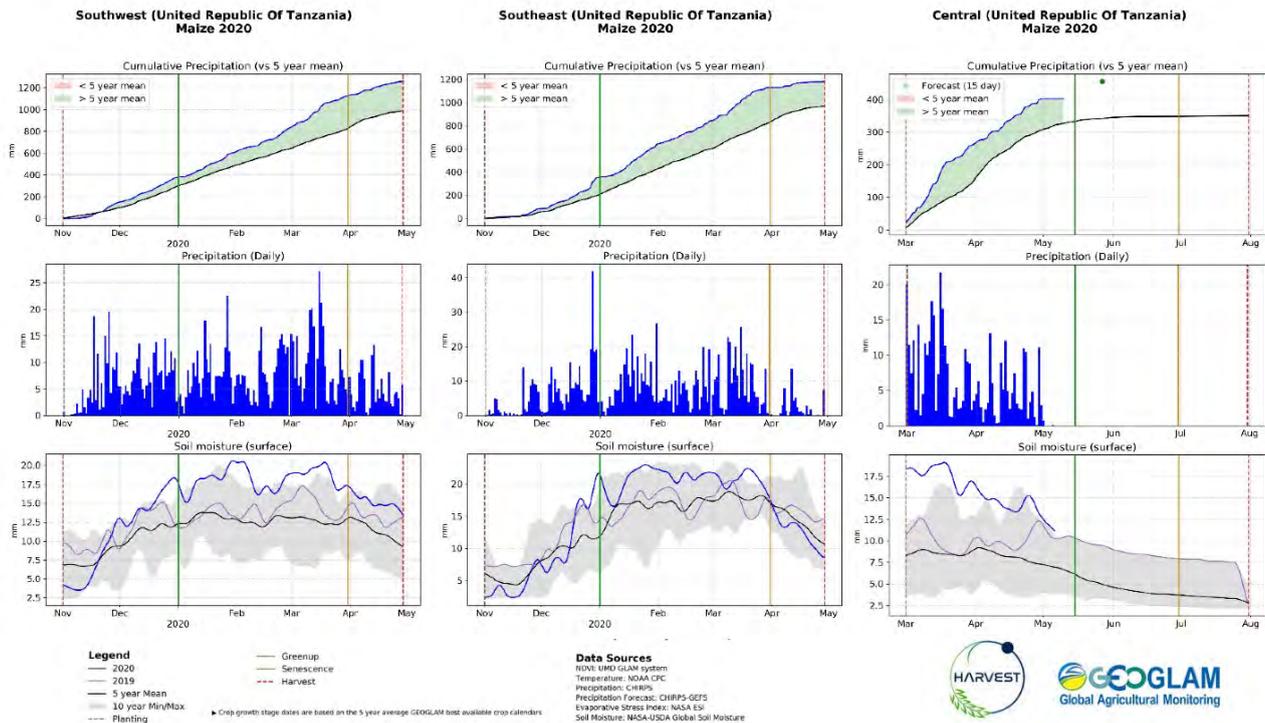


Figure 9. Agro-climatic indicators over the current 2020 Maize cropping season in Southwest, Southeast, and Central Tanzania (source: NASA Harvest)

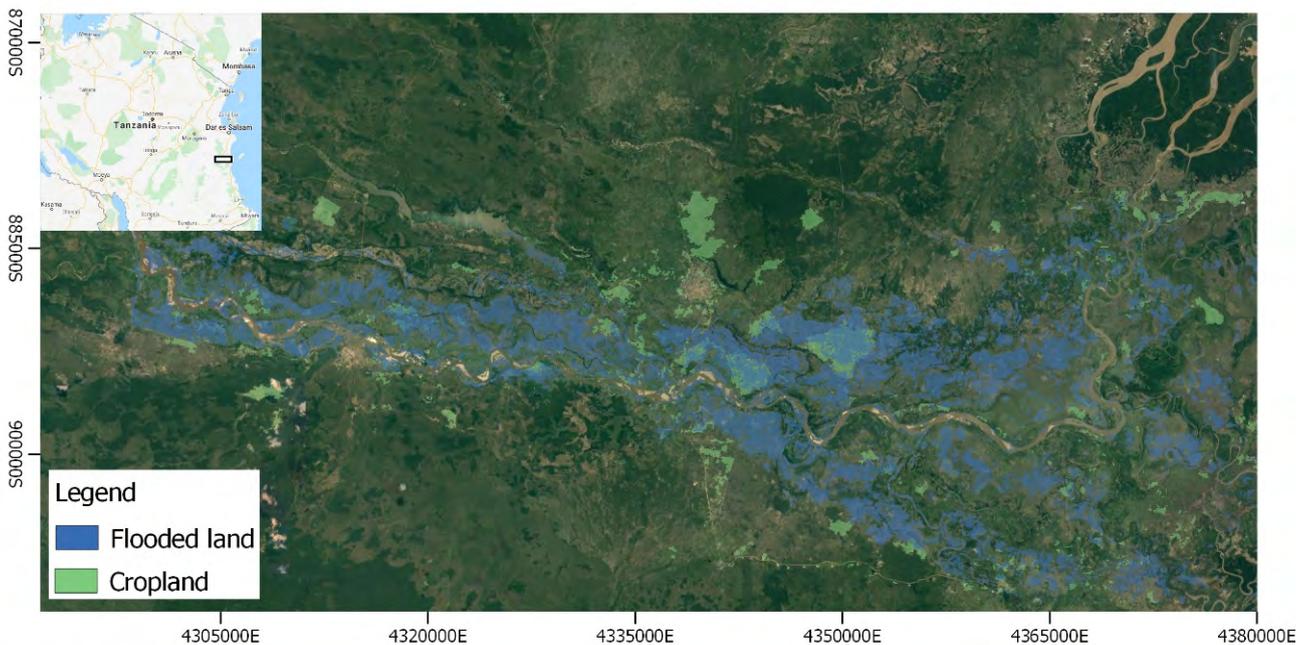


Figure 10. Flood water extent from 25th April-04th May 2020 (derived from Sentinel-2 images) and cropland layers (from Globe Land 30) overlaid to a Google Satellite background layer in Pwani county, along Rufiji river, Tanzania. Flooded land: 31,771 ha, flooded cropland: 2,508 ha. Source: JRC ASAP.

In **Ethiopia**, late January to late February was atypically wet in southwestern areas. While the continued above-average rains in March were beneficial to *Belg* crops, the rains also created favourable ecological conditions for desert locust breeding and promoted further development. In April, rainfall in eastern areas was average to above-average, resulting in flood incidences in Erer, Sitti, Nogob, and Korahe zones, Somali Region.<sup>19</sup> Additionally, heavy rainfall, flooding, and landslides have affected SNNPR since mid-April (Figure 11),<sup>20</sup> and further flooding in the east was reported along the Shabelle River in the Somali Region (Figure 12).<sup>21</sup> In May, the overflow of the River Dawa along the Kenya-Ethiopia border resulted in devastating floods in surrounding villages.<sup>22</sup> Flooding in areas of Somali, Afar, SNNP, Dire Dawa, and Harari has displaced 107,000 people.<sup>23</sup> Above-average rains are likely to continue across much of the *Belg* producing regions and the west through May; however, in eastern areas, rainfall is likely to be average to below-average (See May Outlook Pg. 8).

<sup>19</sup> "Ethiopia: Floods - Apr 2020." Reliefweb, May 6, 2020. <https://reliefweb.int/disaster/fl-2020-000126-eth>.  
<sup>20</sup> "Ethiopia – 12 Killed in Landslide Triggered by Heavy Rain." Floodlist, May 10, 2020. <http://floodlist.com/africa/ethiopia-landslide-snnpr-may-2020>.  
<sup>21</sup> "Ethiopia – Deadly Flash Floods in Dire Dawa." Floodlist, April 28, 2020. <http://floodlist.com/africa/ethiopia-flash-floods-diredawa-april-2020>.  
<sup>22</sup> "Heavy Rains on Ethiopian Highlands Flood Mendera." Reliefweb, May 10, 2020. <https://reliefweb.int/report/kenya/heavy-rains-ethiopian-highlands-flood-mendera>.  
<sup>23</sup> "Ethiopia – 12 Killed in Landslide Triggered by Heavy Rain." Floodlist, May 10, 2020. <http://floodlist.com/africa/ethiopia-landslide-snnpr-may-2020>.

Ethiopia 2020 Belg Cropping Season

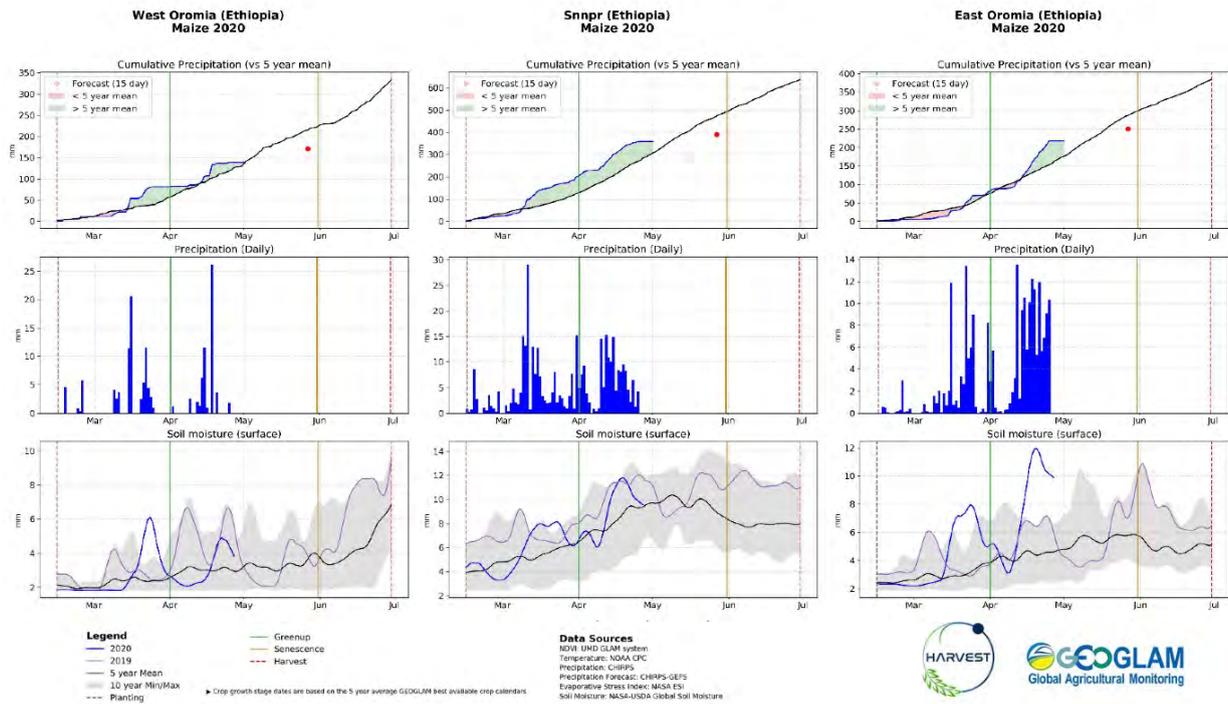


Figure 11. Agro-climatic indicators over the current 2020 Belg cropping season in West Oromia, SNNPR, and East Oromia Ethiopia (source: NASA Harvest)

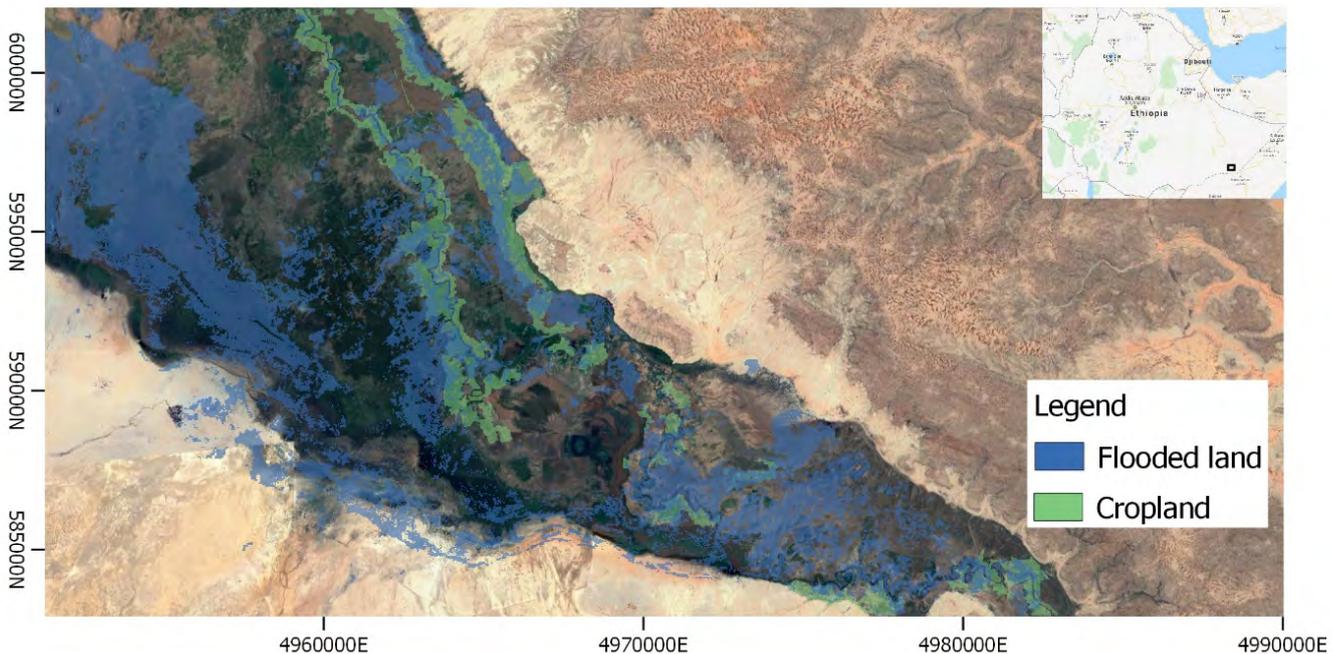


Figure 12. Flood water extent from 25th April-04th May 2020 (derived from Sentinel-2 images) and cropland layers (from Globe Land 30) overlaid to a Google Satellite background layer along the border between Shabelle and Afder counties in Ethiopia. Flooded land: 10,138 ha, flooded cropland: 988 ha. Source: JRC ASAP.

In **Burundi**, while the early onset of rains and above-average rainfall since February promoted land preparation and planting activities for *B* season cereals, the rains also caused an overflow of the Ruzizi River in April into six districts of Gatumba in Mutimbuzi Commune (Bujumbura Rural Province).<sup>24</sup> The flooding affected surrounding areas, displacing 34,905 people and inhibiting access to submerged food stocks and fields.<sup>25</sup> Over 400 hectares of crops were lost in the flooding.<sup>26</sup> From late April to early May, an additional 10,000 people were displaced as heavy rain and floods affected Muyinga Commune, Ruyigi Commune, Ruuyigi Province, Bugarama Commune, and Rumonge Province.<sup>27</sup>

<sup>24</sup> "Burundi: Floods and Landslides - Apr 2020." Reliefweb, May 1, 2020. <https://reliefweb.int/disaster/fl-2020-000054-bdi>.  
<sup>25</sup> "Burundi: Natural Disasters - Flash Update No. 2 - 28 April 2020." Reliefweb, April 28, 2020. <https://reliefweb.int/report/burundi/burundi-natural-disasters-flash-update-no-2-28-april-2020>.  
<sup>26</sup> "ACAPS Briefing Note: Burundi Floods (28 April 2020)." Reliefweb, April 29, 2020. <https://reliefweb.int/report/burundi/acaps-briefing-note-burundi-floods-28-april-2020>.  
<sup>27</sup> "Burundi – 10,000 Displaced by Floods Since Late April." Floodlist, May 14, 2020. <http://floodlist.com/africa/burundi-floods-late-april-may-2020>.



Figure 13. Flooded rice crops in Kirehe District, East Province, Rwanda. Source: Rwanda Crop Monitoring Network

In **Rwanda**, land preparation and planting activities for *B* season cereals, to be harvested in July, began in February under favourable conditions due to above-average rainfall. Heavy rainfall continued through March and April, further contributing to wetter-than-average conditions and resulting in localized flooding, landslides and flash floods, displaced populations, and localized crop damage. Heavy rain continued into May across much of the country and particularly the North, West, and Southern provinces, triggering floods and mudslides and resulting in casualties and severe damage.<sup>28</sup> Rice crops which are nearing maturity have been the most affected by the flooding as the impact has been largely over marshland areas and yield reductions are expected (Figure 13).

In **Yemen**, torrential rains caused flooding in April, particularly in the southern region including Lahj, Aden, Abyan, Taizz, Al Dale'e, Al Mahrah, and Hadramaut governates. According to UN OCHA, an estimated 150,000 people have been affected by flooding and heavy rains since mid-April.<sup>29</sup> The floods have damaged infrastructure and water networks, and in Al Sawm, Hajr, Mayfa, and Brom districts, crops were damaged and livestock was lost. The heavy rains are also expected to protract the desert locust outbreak.

## May Rainfall Outlook

Following a record-setting October-to-December (OND) *Short Rains* season, above-average off-season rains continued in January and February across Tanzania, Burundi, Rwanda, Uganda, and Kenya. This was followed by above-average rains in March and April, signaling an early start to the East Africa *Long Rains* season. The first ten days of May saw more localized heavy rainfall in northern Tanzania, Rwanda, Uganda, western Kenya, and central and coastal Somalia, while rainfall elsewhere in the region was average to below-average. Both short- and long-term (Figure 14-right) forecasts suggest rains are likely to remain above-average in the western half of the region (particularly Uganda, South Sudan, and western Ethiopia), and average to below-average in southern and eastern Tanzania, eastern Kenya, eastern Ethiopia, and Somalia, through the end of May and into June (contributing to the May anomaly map seen in Figure 14-left). Regardless of the reprieve in the east, the *Long Rains* seasonal rainfall total is expected to remain well above-average over the entire region, with March-through-May rainfall surpluses exceeding 100 mm (>150% of average) in Tanzania, Burundi, Rwanda, western Kenya, eastern Ethiopia, and southern Kenya (Figure 14-middle).

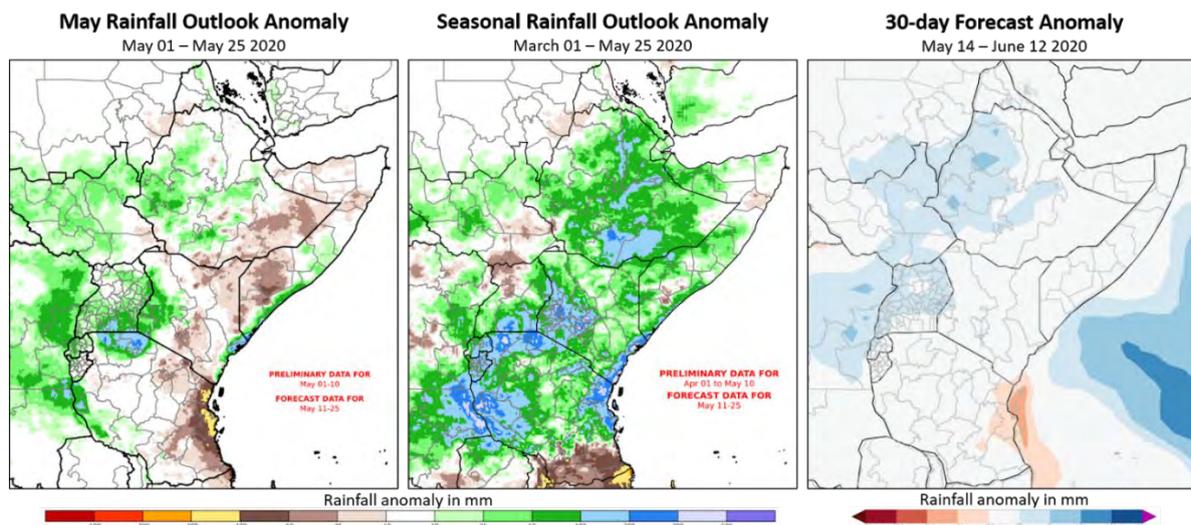


Figure 14. All three maps depict rainfall in terms of the difference from average. The left and middle panels are UCSB Climate Hazards Center Early Estimate extended outlooks of post-May 1<sup>st</sup> and post-March 1<sup>st</sup> rainfall, respectively. The left panel shows how the May rainfall anomaly to-date (May 1<sup>st</sup> to May 10<sup>th</sup>) would change if the 15-day unbiased GEFS forecast from May 11<sup>th</sup> materializes. Similarly, the middle panel shows how the March rainfall anomaly to-date (March 1<sup>st</sup> to May 10<sup>th</sup>) would change. These compare 2020 rainfall amounts to the 1981-2019 CHIRPS average. On the right is a 30-day forecast from May 14<sup>th</sup>. The image shows the average of four Experimental 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 at <http://cola.gmu.edu/kpegion/subx/index.html>. Source: UCSB Climate Hazards Center

<sup>28</sup> "Rwanda – Floods update". EC ECHO Daily Flash. May 13, 2020 <https://reliefweb.int/report/rwanda/rwanda-floods-update-un-ocha-meteorwanda-noaa-reliefweb-media-echo-daily-flash-13-may>.

<sup>29</sup> "Yemen – 150,000 Affected by Heavy Rain and Floods Since Mid-April". Floodlist. May 1, 2020. <http://floodlist.com/asia/yemen-floods-update-april-2020>.

Traditionally, above-average rainfall serves to recharge water reservoirs and provide favourable planting and crop-growing conditions for the start of the *Long Rains* season. However, excessive rains over the past seven months have saturated the regions' basins, resulting in flooding, mudslides, and infrastructure damage throughout the region, displacing many individuals and supporting continued spread of locust swarms.

## Food security outcomes and response

Key agricultural productive areas in the region are likely to be negatively affected by the prevailing and forecast agro-climatic conditions in the coming months. In the Shabelle Basin of Ethiopia and Somalia, there is an increased level of flood risk in the coming weeks as river levels are close to overflow, and rainfall is expected to continue. In the surrounding areas of Lake Victoria, the highest water levels on record is causing widespread flooding in nearby lowland areas. Continued impacts of flooding could prevent access to food stores and livelihoods, further increasing food insecurity in vulnerable areas. In addition, large scale displacement from flooding will impact agricultural activities and farmers' livelihoods in worst affected areas, and waterlogged and damaged crops will require replanting, putting further strain on farmers.

Despite adverse impacts of flooding, cropping conditions remain generally favourable as the above-average rains are beneficial to crop planting and development. However, climatic conditions also continue to promote breeding and development of second-generation hoppers across the Horn of Africa and Yemen. Heavy rains provide suitable soft soil for egg laying and promote vegetation development for locusts to feed on. Ongoing locust development and spread is threatening agricultural production most prominently in Ethiopia, Kenya, Somalia and to a lesser extent in Sudan, Eritrea, Djibouti, Uganda, and South Sudan; however, the impacts of the current swarms are yet to be fully assessed due to lack of comprehensive field assessment under current COVID-19 induced travel restrictions. Southerly winds are expected to impact swarm movement away from the main cropping areas in the south of the region and towards areas in the north and northeast, particularly towards northeastern South Sudan, central and eastern Ethiopia, and southern Eritrea.

Furthermore, the COVID-19 pandemic poses a critical threat to food security in vulnerable regions, and the widespread flooding and population displacement across parts of the region could exacerbate exposure to COVID-19. In East Africa, government measures to control its spread such as movement restrictions, border closures, and social distancing efforts have slowed down economic activity, inhibiting livelihood access and decreasing household income.<sup>30</sup> For instance, transport restrictions in Sudan could limit farmers' access to agricultural inputs and output markets.<sup>31</sup> Furthermore, in East Africa, potential labour shortages could impact household land preparation, planting, and other agricultural activities for main season cereals. Import dependent countries are especially vulnerable as control measures are hindering food logistics, impacting supply chains, and delaying food assistance imports. For example, movement restrictions in South Sudan have reduced maize imports from Uganda in March, causing significant price hikes for staple food products.<sup>32</sup> Additionally, restrictions could disrupt desert locust mitigation efforts; however, there are efforts underway to prevent slowdown in the supply of pesticides and motorized sprayers.

The GEOGLAM Crop Monitor team is monitoring the situation. Further information will be provided in the next Crop Monitor for Early Warning, to be released June 4<sup>th</sup>.

<sup>30</sup> "Acutely Food Insecure Population Rises Due to COVID-19 and Concurrent Shocks." Famine Early Warning Systems Network (FEWS NET), April 2020. <https://fews.net/east-africa>.

<sup>31</sup> "Sudan Situation Report." Reliefweb, April 17, 2020. [https://reliefweb.int/sites/reliefweb.int/files/resources/Situation%20Report%20-%20Sudan%20-%2017%20Apr%202020\\_0.pdf](https://reliefweb.int/sites/reliefweb.int/files/resources/Situation%20Report%20-%20Sudan%20-%2017%20Apr%202020_0.pdf).

<sup>32</sup> "East Africa South Sudan." Famine Early Warning Systems Network (FEWS Net), March 2020. <https://fews.net/east-africa/south-sudan/key-message-update/march-2020>.

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