

## REVIEW OF GU 2023 RAINFALL PERFORMANCE, HAGAA OUTLOOK AND IMPLICATIONS ON LIVELIHOODS OVER SOMALIA

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### Key Highlights

Review of the 2023 March-April-May (MAM) seasonal rainfall has demonstrated three key points: First, there was an early transition into the Gu (April-May-June) long rains season in Somalia this year. Secondly, above Long Term Mean (LTM) rainfall was received over Puntland and Somaliland and below LTM over South and Central Somalia. Thirdly, the observed rainfall was more in agreement with the forecast over South and Central Somalia and less over Somaliland.

The early onset of the generally above-LTAM MAM rainfall led to substantial recharge of water sources, replenished water catchment levels, improved soil moisture conditions, creating favorable conditions for pasture regeneration, offering first line fodder for the livestock. It also favored land preparation and timely crop and fodder planting across the agro-pastoral livelihoods. However, the exceptionally heavy rains over both Shabelle and Juba River catchments in Ethiopian Highlands and the already-soaked soil conditions over the catchments within Somalia led to excessive overbank spillage resulting

to devastating floods at Belet Weyne from 9th May, at Bulo Burti from 25th May and at Jalalaqsi from 26th May 2023. Flash floods occasioned by localised rains also occurred in several places within Somalia like Bardheere from 23rd March 2023. The floods led to extensive damage to farmlands with earlier-grown crop and fodder and the grassland plains with devastating implications. Nonetheless, the MAM rains generally led to improved food security situation across the country particularly in the case of Somaliland where the observed rains were above LTM.

The wetter than average projected rainfall conditions are likely to at least slow the loss of soil moisture and support agricultural and livestock productivity over South and Central Somalia over which below LTM Gu rains were observed.

This bulletin presents both qualitative and quantitative review of the temporal and spatial variation of observed-, and verification of the forecast Gu rainfall season.

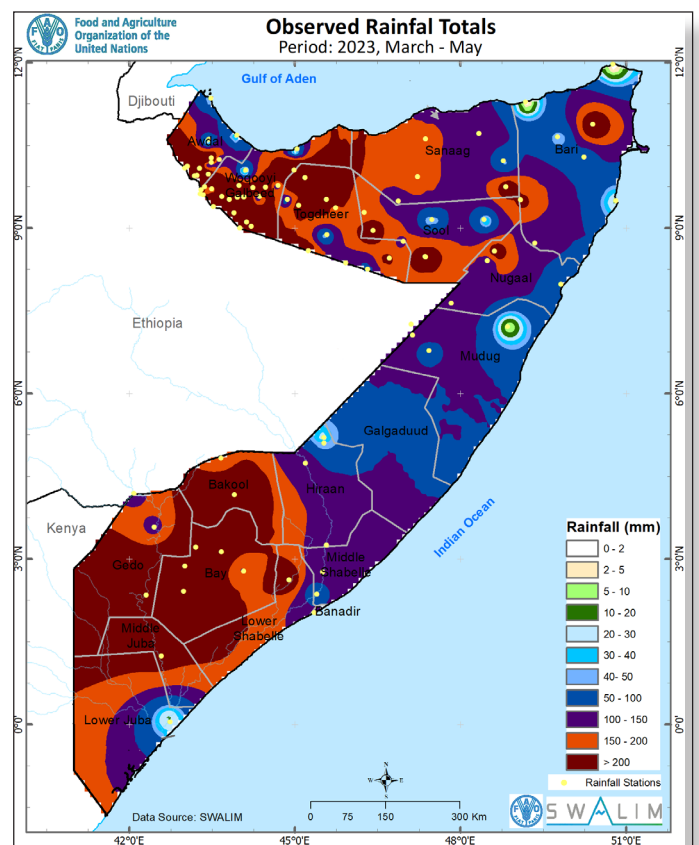
### Review of the Observed and Forecast Gu (March-April-May) Rainfall Season

#### Spatio-Temporal Variation of the Observed Rainfall

Heavy cumulative rainfall was observed over the southwestern and northwestern parts of the country with moderate cumulative rains over Galmudug region during the March-April-May season (Map 1). Based on descriptive statistics of both monthly and seasonal rainfall, the heaviest monthly and seasonal total rainfall of 311.0 mm and 612.0 mm were observed in May at Gumburaha station and at Taysa station (Figure 1), respectively, in Woqooyi Galbeed region (Map 1). Over Puntland and SC, the heaviest seasonal total rainfall of 270.7 mm (Figure 2) and 470.0 mm (Figure 3) were observed at Balli Dhiddin and Bardheere, respectively. Based on the weekly bulletins issued during the season, the highest number of stations observing rainy days (at least 1 mm of rain) was recorded between 25th April to 2nd May 2023 (Figure 4). On average, much rainfall (43.7 mm) was observed in MAM than in April-May-June (AMJ) demonstrating the earlier onset into the Gu season. The spatial variation of the cumulative rainfall amounts was as follows:

**Cumulative rainfall greater than 200 mm** was observed over most parts of Gedo, Bakool, and Bay regions, northern parts of Afmadow district in Lower Juba region, Buáale and Saakow districts in Middle Juba region, and over Sablaale and Wanla Weyne in Lower Shabelle region. In the north, such cumulative rains were observed in Woqooyi Galbeed region, Borama district and the southern parts of Awdal region,

Sheikh district and the northern parts of Togdheer region and isolated areas in Sool, Sanaag, Nugaal and Bari regions.



Map 1: Spatial variation of cumulative rainfall during the March-April-May (Gu) 2023 season over Somalia

**Cumulative rainfall of between 100 mm and 200 mm** was received over most parts of Lower Shabelle region and Hirshabelle state, Badhaadhe and Kismayo districts in Lower Juba region, Jilib district in Middle Juba region, Ceel Dheer district in Galgaduud region, central and western parts of Mudug region, and Burtinle and Garowe districts in Nugaal region. In the northern parts of the country, similar cumulative rains were observed in Sanaag and Sool regions, Qardho and Qandala districts in Bari region, central parts of Awdal region, Berbera district in Woqooyi Galbeed region, Buhoodle district and southern parts of Oodweyne and Burco districts in Togdheer region.

**Cumulative rainfall of less than 100 mm** was observed over most parts of Galgaduud region, Jamaame district in

Lower Juba region, Balcad district in Middle Shabelle region, Xarardheere and Jariiban districts in Mudug region, Eyl district in Nugaal region, BandarBeyla district, Bossaso district, Caluula district and central parts of Iskushuban district in Bari region, isolated areas in Xudur and Tallex district sin Sool region, and isolated areas in the northern parts of Woqooyi Galbeed, central parts and coastal areas of Awdal region.

**The least seasonal rainfall of less than 50 mm** was observed in Geerisa (20.5 mm), Lughaye (25.5 mm) and Zaila (42.0 mm) in Awdal region, Berbera (4.5 mm) in Sanaag region. The other stations that received less than 5 mm of rainfall include Bossaso and Callula in Bari region, and Bodale in Sanaag region.

### Analysis of the Observed Rainfall Anomaly

In this review, the long-term (1963- 1990) average (LTM) of rainfall during the Gu season over Somalia was used as the climatology. Based on this climatology, and averaging spatially, the rainfall received over Somaliland (Figure 5) and over Puntland (Figure 6) represent 87.0 mm and 43.7 mm above the LTM (excess), respectively, for the individual stations. The rains over the south and central regions of the country (Figure 8) represent a 21.9 mm below LTM (deficit). The largest positive anomaly (464.3 mm) was observed in Taysa (Figure 5) in Woqooyi Galbeed region implying that the received cumulative rainfall was as high as 414% of the LTM for

that station. The rainfall observed at Laas Dacawo (Figure 5) in the same region also showed comparatively large and positive anomaly (426.7 mm) representing more than four times (410.8%) of the station LTM. The largest negative anomaly (200.2 mm) was observed in Jamaame (Figure 7) in Lower Juba region with the station receiving just 8.5% of its LTM.

The rainfall observed at Bur Hakaba (Figure 7) also depicted similarly large and negative anomaly (190.8 mm) representing just half (43.9%) of the station's LTM.

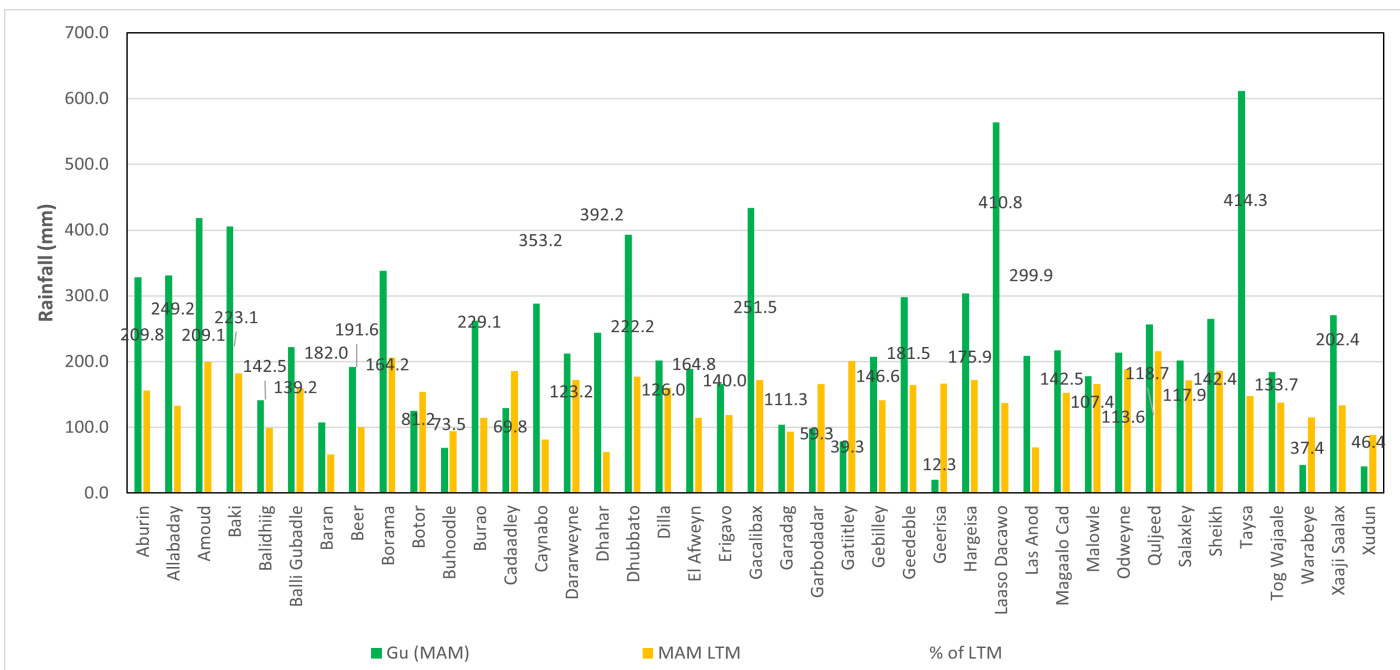


Figure 1: Spatial variation of cumulative rainfall during the March-April-May (Gu) 2023 season against LTM over Somaliland

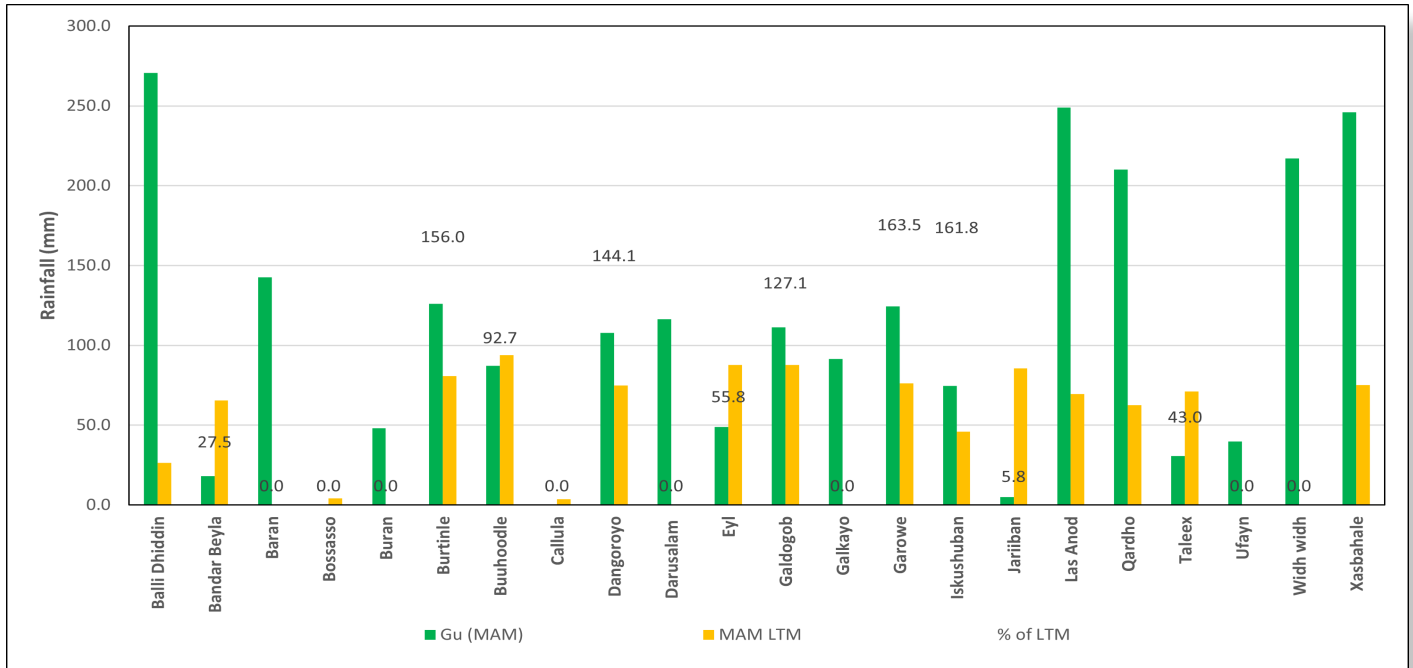


Figure 2: Spatial variation of cumulative rainfall during the March-April-May (Gu) 2023 season against LTM over Puntland

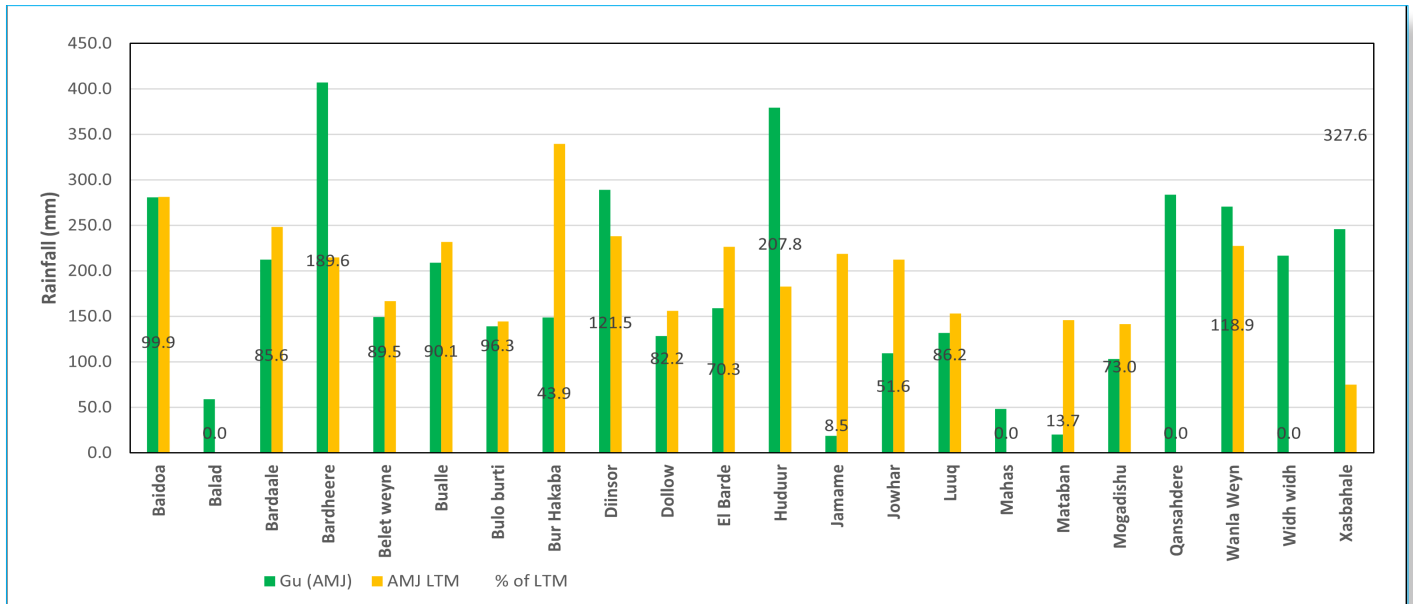


Figure 3: Spatial variation of cumulative rainfall during the March-April-May (Gu) 2023 season against LTM over South and Central Somalia

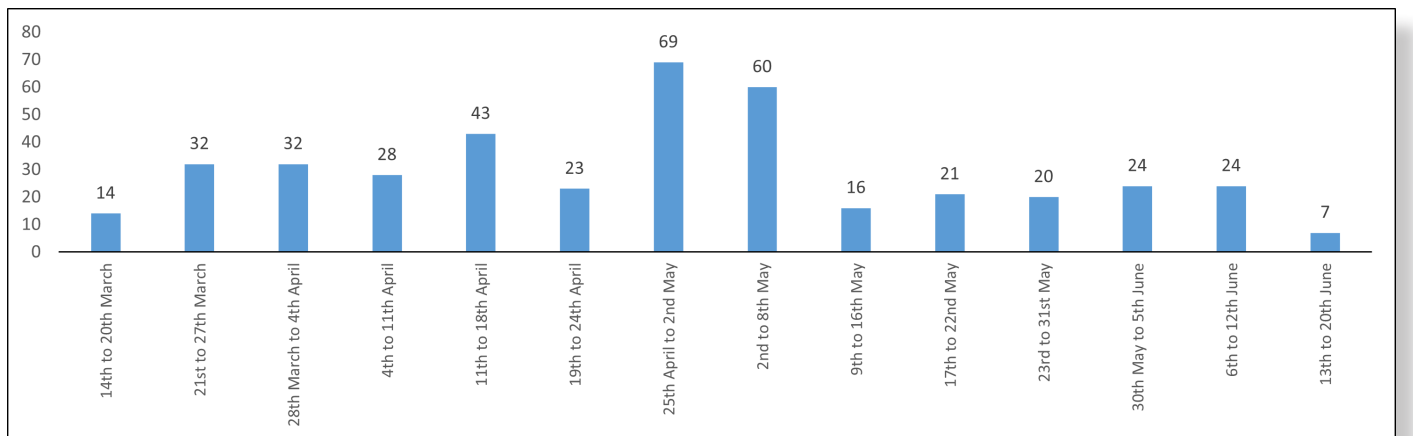


Figure 4: Weekly variation of the number of stations that recorded a rainy day (>1 mm of rainfall) during the forecast week

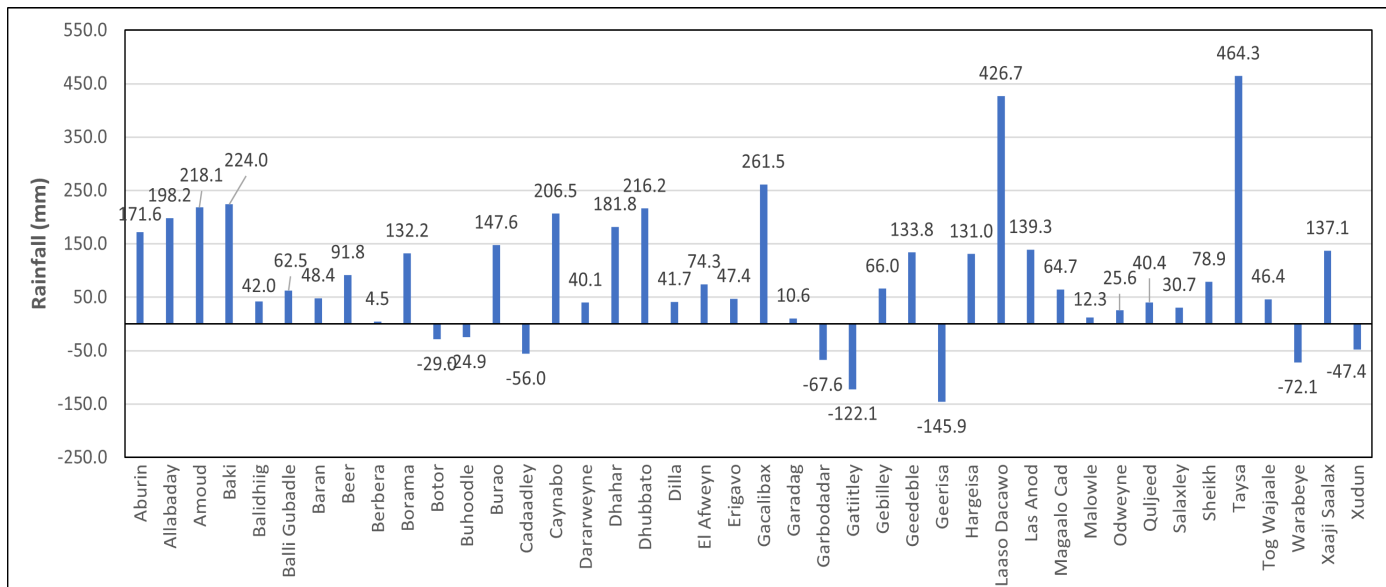


Figure 5: MAM rainfall anomalies over Somaliland

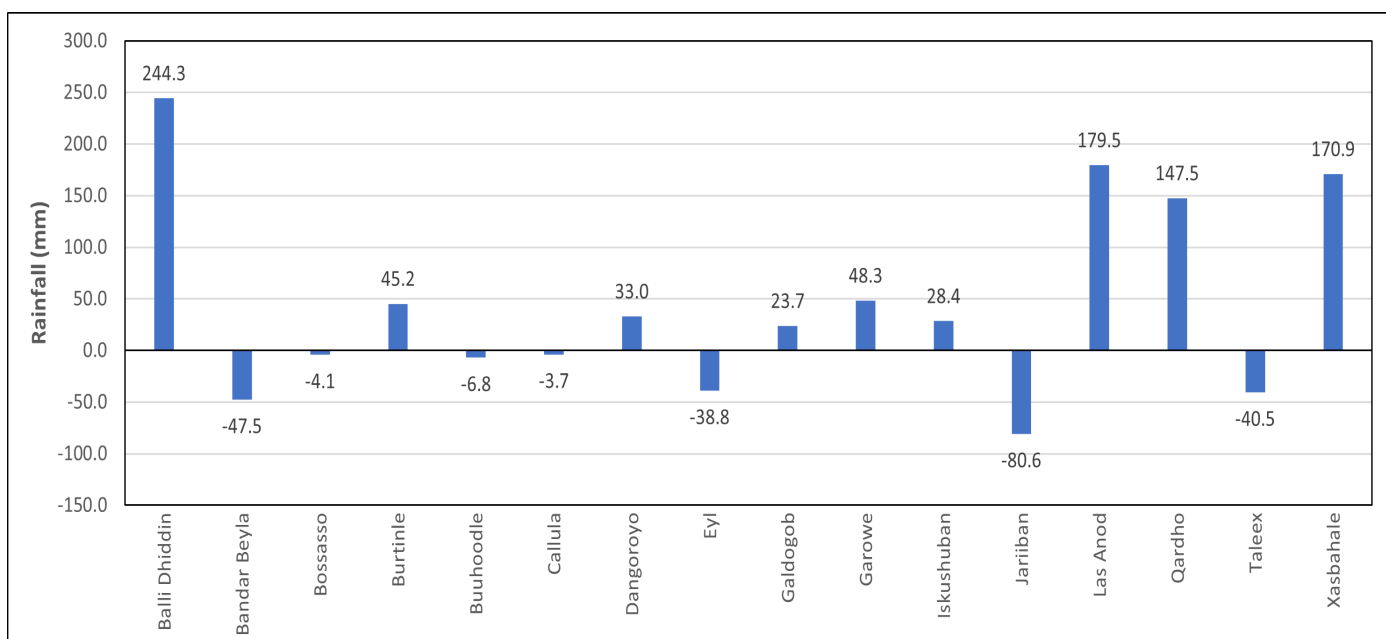


Figure 6: MAM Rainfall anomalies over Puntland, Somalia

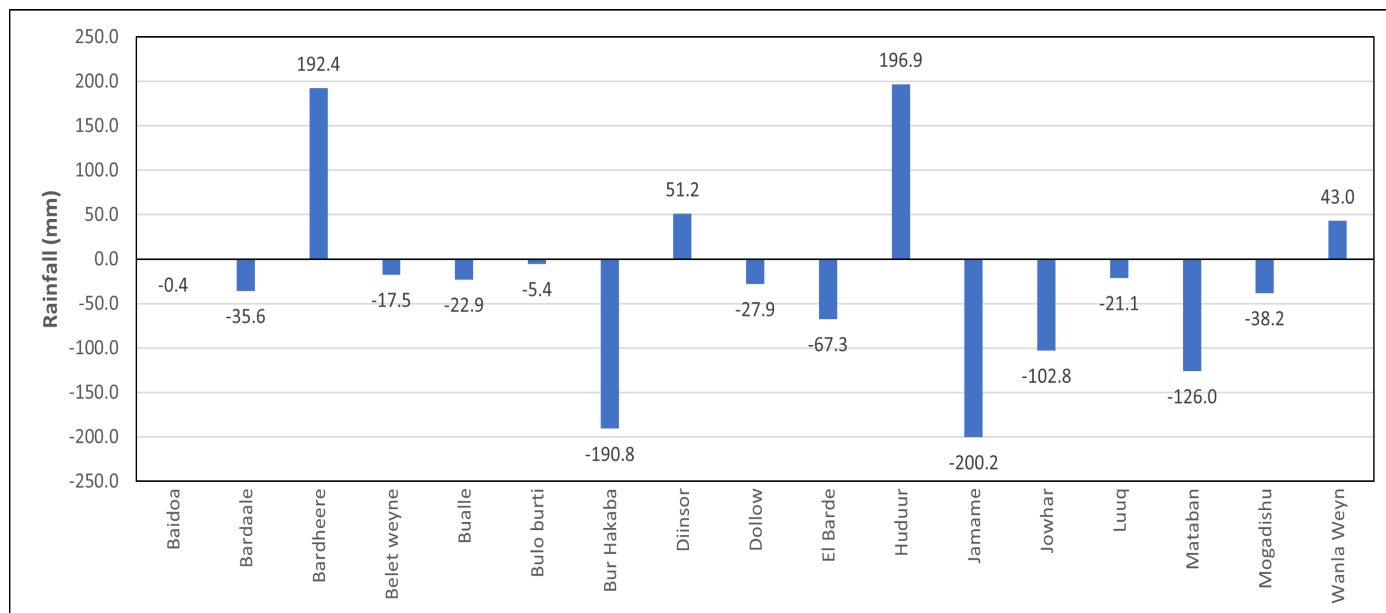


Figure 7: MAM Rainfall anomalies over South and Central Somalia

# Verification of the Rainfall Probabilistic Forecast

## MAM Rainfall Probabilistic Forecast

FAO-SWALIM's Gu probabilistic rainfall outlook was issued on 17th March 2023 based on IGAD's Climate Prediction and Applications Centre (ICPAC) regional forecast with 30-year period (1991-2020) as the LTM. The forecast depicted a 50% likelihood that below normal rainfall (drier than normal conditions) were to be observed over most parts of Somalia. The outlook also reported a greater likelihood (60%) of observing such dry conditions over the northern parts of Middle Shabelle region, southeastern parts of Hiran region and southern parts of Galgaduud region. Equal probabilities of below normal, normal and above normal rains were likely over most areas in the northeastern part of the country, southern parts of Togdheer region and Lower Juba region.

The rainfall onset forecast showed about 50% chance of

observing an early onset over south western part of the country (earlier than April 11). A normal onset timing was forecast over the other parts of the country including Bari region (*May 1*).

The observed rainfall was more in agreement with the forecast over South and Central Somalia and less over Somaliland. This was reflected in the updated MAM forecasts from ICPAC which pointed towards relatively better seasonal rainfall across most parts of Somalia than had previously been anticipated.

The earliest onset was observed over Borama in Awdal region (*Figure 8*) on 11th March 2023. Although the earliest rains received in second half of March were sporadically spread across the country, the analysis shows a general southeastward spread from Awdal region.

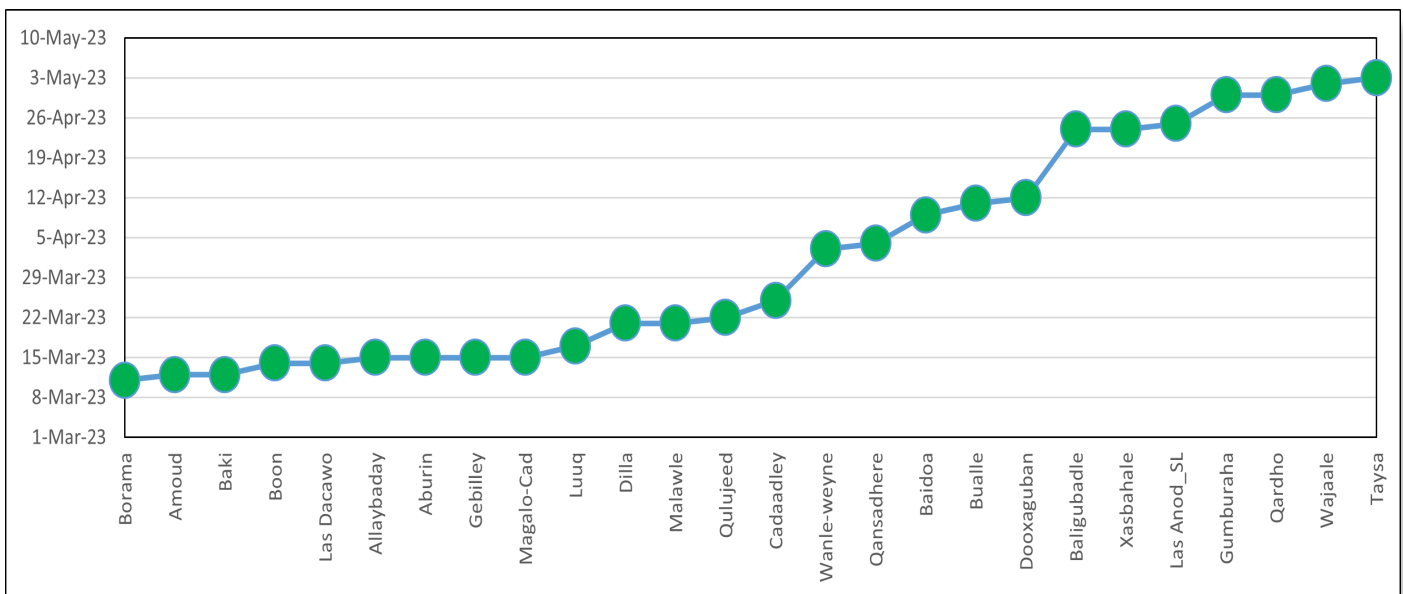


Figure 8: Gu 2023 Rainfall Season Onset Dates over Applicable Stations over Somalia

## Review of the Experienced (Gu) Weather and Impacts on Livelihoods

After five failed rain seasons in Somalia, the ensuing dry weather conditions caused food insecurity and loss of livelihoods. The early transition into the Gu (March-April-May) long rains season this year, and the fact that the earliest rains received in second half of March were sporadically spread across the country, sparked a ray of hope to the already vulnerable communities. The generally above-LTM MAM rainfall led to substantial recharge of water sources, replenished water catchment levels, improved soil moisture conditions, creating favorable conditions for pasture regeneration, offering first line fodder for the livestock. It also favored land preparation and timely crop and fodder planting across the agro-pastoral livelihoods (*Annex 1*).

The dry spells in between the season favoured farmland practices like weeding. The MAM rains therefore led to improved food security situation across the country particularly in the case of Somaliland where the observed rains were above LTM. Although above LTM rains were also received in Puntland, the length of the season might not have led to soil conditions conducive enough to sustain seasonal crops. This condition may be worse off over the South and Central Somalia where the Gu rains were generally below the LTM. Although rains were received in March over Jubaland particularly over Gedo region, the amounts and spread might not sustain seasonal crops.

Additionally, the exceptionally heavy rains over both Shabelle and Juba River catchments in Ethiopian Highlands and the already-soaked soil conditions over the catchments within Somalia led to excessive overbank spillage resulting to devastating floods at Belet Weyne from 9th May, at Bulo Burti from 25th May and at Jalalaqsi from 26th May 2023. Flash floods occasioned by localised rains also occurred in several places within Somalia like Bardheere from 23rd March 2023. The floods led to extensive damage to farmlands

with earlier-grown crop and fodder and the grassland plains with devastating implications. The ensuing population displacement triggered other social challenges including, unavailability of shelter, food, and clean water for use, increase in water borne diseases, and family disconnection among others. At Bulo Burte and Jalalaqsi the floods led to hindrance of access in and out of Bulo Burte and Jalalaqsi towns after the bridges were overtopped by flood waters.

## Projected (Hagaa) and Likely Impacts on Livelihoods

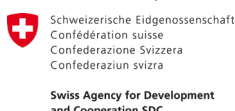
The weather forecast for the present month of July depicts wetter than usual conditions in parts of Borama and Baki districts in Awdal region, and Gebilley and Hargeisa districts in Woqooyi Galbeed region. Similarly wetter than usual conditions are expected in the south and central parts of the country including Middle Juba, Bay, Lower Shabelle and Middle Shabelle and the coastal parts of Lower Juba. The rest of the country is expected to be generally dry in July. In the longer July-August-September (JAS) season, the same conditions are expected to prevail over the south and central parts of the country. In the north however, above average rainfall conditions are expected over parts of Hargeisa in Woqooyi Galbeed, parts of Togdheer region, parts of Sool region, most of Sanaag region, and parts of Bari region. The chance of above normal rains are particularly high over Caynabo, Xudun and Taleex districts in Sool region and Qardho district in Bari region.

Average conditions are expected over northwestern areas of the country with below normal rains likely over southern parts of Awdal region. NOAA/CPC projects up to 96 % chance of El Niño occurring during the Deyr season. The impacts of these projected rainfall conditions will depend on the performance of the past Gu rains and the present weather conditions and will therefore vary from region to region (Annex 1). There are risks and opportunities associated with the anticipated El Niño driven above normal rainfall conditions particularly in the south and central parts of the country. Climatologically, El Niño does not lead to enhanced rains over the northern parts of the Greater Horn of Africa (GHA) which includes northern parts of Somalia.

SWALIM is a multi-donor project managed by FAO and currently funded by The European Union, SDC, Government of France and USAID



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## Annex 1: Experienced impacts of Gu and projected Hagea seasonal rainfall on livelihoods over Somalia

Region (Livelihoods within the Zone)	Impact of Gu Rains	Impact of JJAS Rainfall Outlook
<b>Awdal (pastoral and agropastoral)</b>	Recharge of water sources, improved soil moisture conditions, supporting grassland regeneration, offering fodder for the livestock and timely planting and other agricultural activities	Wetter conditions over southern parts of both Borama and Baki districts in July will sustain the rangeland and fodder conditions. The negative effect of the below normal moisture conditions will be felt later in the season.
<b>Woqooyi Galbeed (pastoral and agropastoral)</b>	Recharge of water sources, improved soil moisture conditions, supporting grassland regeneration, offering fodder for the livestock and timely planting and other agricultural activities	The moisture conditions over Gebiley and Hargeisa districts in July will sustain the rangeland conditions /grasslands and livestock fodder. The projected JJAS moisture conditions will ensure the continuous availability of the fodder over southeastern parts of Hargeisa district
<b>Sanaag (Goats, Sheep, Frankincense and Fishing)</b>	Recharge of water sources, improved soil moisture conditions, supporting grassland regeneration, offering fodder for goats and sheep. The moisture conditions favor the development of the Frankincense bark.	Although the grassland/fodder will be slightly impacted by the dry conditions over most parts of Sanaag region in July, the moisture conditions will improve in the later part of the JJAS season. As the August-January harvest season of Frankincense ( <i>Boswellia carterii</i> ) begins, the dry and hot conditions in July will favor the drying and hardening up of its cutout resin surfaces. The SE monsoon winds in JJAS are likely to aid coastal upwelling at Sanaag region's shores leading to upward transport of cold, nutrient-rich waters to the ocean surface thereby favoring fish abundance
<b>Togdheer (pastoral and agropastoral)</b>	Recharge of water sources, improved soil moisture conditions, supporting grassland regeneration, offering fodder for the livestock and early planting activities	Although the grassland/fodder will slightly be impacted by the dry conditions over most parts of Togdheer in July, the moisture conditions will improve over the central parts of the region in the later part of the JJAS season
<b>Nugaal (Goats, Sheep, and other pastoral)</b>	Recharge of water sources, improved soil moisture conditions, supporting grassland regeneration, offering fodder for goats, sheep and other pastoral activities	The grasslands and fodder will be negatively impacted by the dry conditions in the entire JJAS season over most parts of the region
<b>Sool (Goats, Sheep, and other pastoral)</b>	Recharge of water sources, improved soil moisture conditions, supporting grassland regeneration, offering fodder for goats, sheep and other pastoral activities	Although the grassland/fodder will slightly be impacted by the dry conditions over most parts of Sool in July, the moisture conditions will improve over the northern parts of the region in the later part of the JJAS season particularly over Caynabo, Xudun and Taleex districts
<b>Bari (Goats, Sheep, Frankincense and Fishing)</b>	Recharge of water sources, improved soil moisture conditions, supporting grassland regeneration, offering fodder for goats and sheep, The moisture conditions favor the development of the Frankincense bark	Although the grassland/fodder will slightly be impacted by the dry conditions over most parts of Bari in July, the moisture conditions will improve over the western and northwestern parts of Bari particularly over Qardho in the later part of the JJAS season. As the August-January harvest season of Frankincense ( <i>Boswellia carterii</i> ) begins, the dry and hot conditions in July will favor the drying and hardening up of its cut-out resin surfaces. The SE monsoon winds in JJAS are likely to aid coastal upwelling at Bari region's shores leading to upward transport of cold, nutrient-rich waters to the ocean surface thereby favoring fish abundance
<b>Mudug (pastoral, cowpea belt agropastoral and fishing)</b>	Recharge of water sources, improved soil moisture conditions, timely planting of cowpeas, supporting grassland regeneration, offering fodder that supports pastoral livelihoods.	The dry conditions are likely to lead to depressed grassland/fodder during JJAS in most parts of Mudug region. The SE monsoon winds in JJAS are likely to aid coastal upwelling at Mudug region's shores leading to upward transport of cold, nutrient-rich waters to the ocean surface thereby favoring fish abundance
<b>Galgaduud (pastoral, cowpea belt agropastoral and fishing)</b>	Recharge of water sources, improved soil moisture conditions, timely planting of cowpeas, supporting grassland regeneration, offering fodder that supports pastoral livelihoods.	The dry conditions are likely to lead to depressed grassland/fodder during JJAS in most parts of Galgaduud. The SE monsoon winds in JJAS are likely to aid coastal upwelling at Galgaduud region's shores leading to upward transport of cold, nutrient-rich waters to the ocean surface thereby favoring fish abundance

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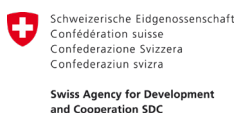
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<b>Hiraan</b> (Camels, goats, sheep, cattle and sorghum and pump irrigation)	Recharge of water sources, improved soil moisture conditions, favored planting of rain fed sorghum to ease pump irrigation, supporting grassland regeneration, offering fodder that supports livestock. Flooding at BW and at BB and Jalalaqi led to farmland and property damage.	The dry conditions are likely to lead to depressed grassland/fodder during JJAS in most parts of Hiran region. The SE monsoon winds in JJAS are likely to aid coastal upwelling at Sanaag region's shores leading to upward transport of cold, nutrient-rich waters to the ocean surface thereby favoring fish abundance
<b>Bakool</b> (Camels, goats, sheep, cattle and sorghum and Bay-Bakool low potential agropastoral)	Recharge of water sources, improved soil moisture conditions, favored timely planting of sorghum and supported grassland regeneration, offering fodder that supports livestock and improved the low potential agropastoral activities in the southern parts of Bakool	The dry conditions are likely to lead to depressed grassland/fodder during JJAS in most parts of Bakool region
<b>Middle Shabelle</b> (camels, goats, sheep, cattle, and cowpea belt, high potential sorghum, riverine gravity irrigation and fishing)	Recharge of water sources, improved soil moisture conditions, favored timely planting of cowpeas and enhanced high potential sorghum production in the riverine irrigation zone, supported grassland regeneration, offering fodder that supports livestock.	The wet conditions are likely to sustain the grassland/fodder during JJAS in most parts of Middle Shabelle region. The SE monsoon winds in JJAS are likely to aid coastal upwelling at Middle Shabelle region's shores leading to upward transport of cold, nutrient-rich waters to the ocean surface thereby favoring fish abundance
<b>Bay</b> (camels, goats, sheep, cattle, and high potential sorghum, and Bay-Bakool low potential agropastoral)	Recharge of water sources, improved soil moisture conditions, favored high potential production of sorghum and supported grassland regeneration, offering fodder that supports livestock. It also improved the low potential agropastoral activities in the northern parts of Bay	The wet conditions are likely to sustain the grassland/fodder during JJAS in most parts of Bay region
<b>Lower Shabelle</b> (camels, goats, sheep, cattle, rain fed maize, and high potential sorghum, riverine gravity irrigation)	Recharge of water sources, improved soil moisture conditions, timely planting of rain fed maize and favored high potential production of sorghum supplementing riverine gravity irrigation and supported grassland regeneration, offering fodder that supports livestock.	The wet conditions are likely to sustain the grassland/fodder during JJAS in most parts of Lower Shabelle region
<b>Gedo</b> (camels, goats, sheep, cattle, and high potential sorghum, riverine gravity irrigation)	Initial rains led to flooding at Baardheere Recharge of water sources, improved soil moisture conditions, favored high potential production of sorghum supplanting riverine gravity irrigation and supported grassland regeneration, offering fodder that supports livestock. Flooding at Bardheere led to farmland and property damage.	The dry conditions are likely to lead to depressed grassland/fodder during JJAS in most parts of Gedo region
<b>Middle Juba</b> (camels, goats, sheep, cattle, rain fed, maize, and high potential sorghum, riverine gravity irrigation)	Recharge of water sources, improved soil moisture conditions, timely planting of rain fed maize and favored high potential production of sorghum supplementing riverine gravity irrigation and supported grassland regeneration, offering fodder that supports livestock.	The wet conditions are likely to sustain the grassland/fodder during JJAS in most parts of Middle Juba region
<b>Lower Juba</b> (camels, goats, sheep, cattle, sorghum and rain fed maize, riverine gravity irrigation)	Recharge of water sources, improved soil moisture conditions, timely planting of rain fed maize and sorghum supplementing riverine gravity irrigation and supported grassland regeneration, offering fodder that supports livestock.	The wet conditions are likely to sustain the grassland/fodder during JJAS in the southern parts of Lower Juba region
<b>Banadir/Mogadishu</b> (urban)	Recharge of water sources, improved soil moisture conditions, improving the vegetative cover over highly urbanized areas and mitigating against windblown natural dust and urban particulates, support day time breeze in improving thermal comfort, reducing AC power demand	The normal wet conditions are likely to lead to improved thermal comfort over the urbanized areas in Banadir/Mogadishu region

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