UNITED REPUBLIC OF TAN
MINISTRY OF AGRICULTURE
NATIONAL FOOD SECURITY BULLETIN TANZANIA JUNE, 2019

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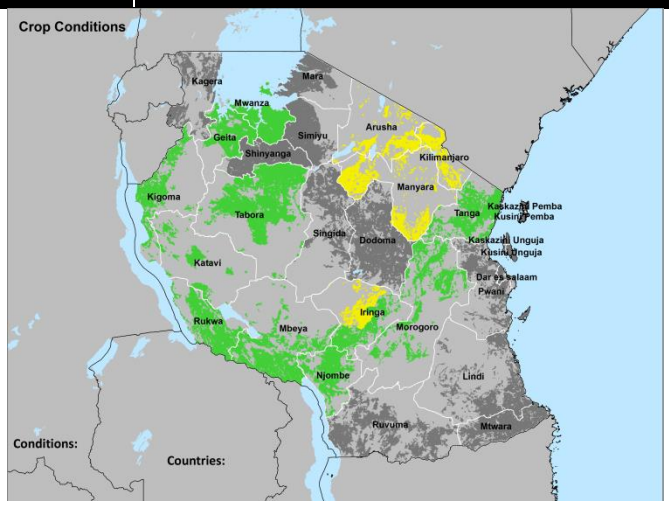

Figure 1: This Crop condition map syntheses information for all crops as of 30th June, 2019.

Crop conditions over the main growing areas based on combination of national and regional crop analysts inputs along with remote sensing data and rainfall data from Tanzania Meteorological Agency. Crop with conditions other than favorable are indicated on the map.

NATIONAL HIGHLIGHTS

- Harvesting activities are ongoing for all seasonal crops in the Unimodal regions while in Bimodal regions maize are at tasselling/grain filling stages
- Cassava continues to be in favorable conditions in most part of the country due to its ability to tolerate drought and harsh conditions

- Lindi, Arusha, Moshi and Songea had the highest prices of rice while Kigoma, Shinyanga and Iringa had lowest market prices.
- Moshi, Lindi, Kinondoni and Tanga had above average maize price while Iringa, Mbeya Songea and Njombe were all below average maize prices. However, the lowest maize prices were observed in the Njombe, Songea, Iringa and Mbeya market.

- Mbeya, Shinyanga, Ilala and Tanga markets had the highest prices for beans while Sumbawanga, Kigoma and Bukoba Markets had the lowest prices.

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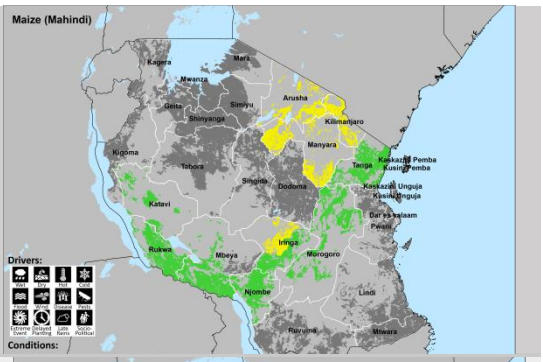
Crop Conditions for Major Food Crops

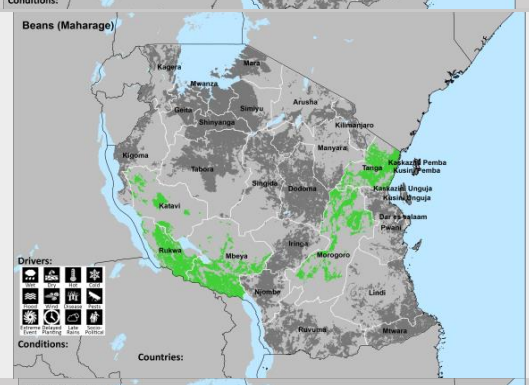
Maize

Maize is at a maturity stage in most parts of Unimodal regions and is in a favorable condition. However, harvesting of maize is ongoing in Unimodal regions while in bimodal regions maize is also at maturity stage in most parts and harvesting have also started in some parts. Watch condition was observed in North eastern parts of the country.



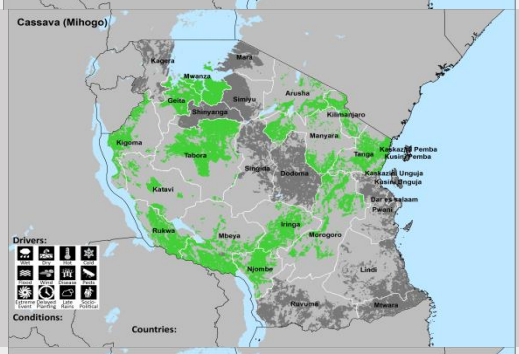
Beans

In most parts of the country harvesting activities are almost finished.



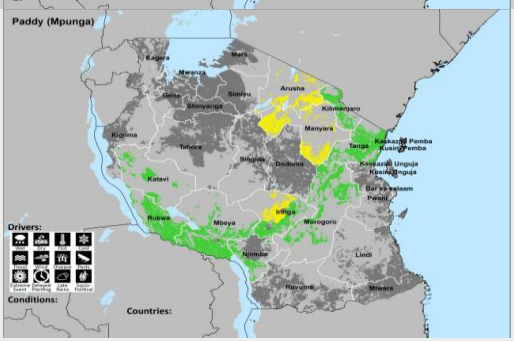
Cassava

Cassava continues to be in favorable conditions as this is a drought tolerant crop so it can perform well under harsh condition.



Paddy

The crop is in favorable conditions in most parts of Unimodal areas and is at maturity stages. Harvesting activities are on gong. Watch condition were observed in Arusha and Manyara due to poor rainfall performance. However, in irrigation schemes favorable conditions were observed eg Lower Moshi in Kilimanjaro regions.



NOTE: Other important crops grown in wide range and contribute in the food basket include banana, sorghum, millets, potatoes, wheat and other pulses.

Satellite-based crop Conditions

Figure.6: Normalized Difference Vegetation Index (NDVI) anomaly for 10-25 June, 2019

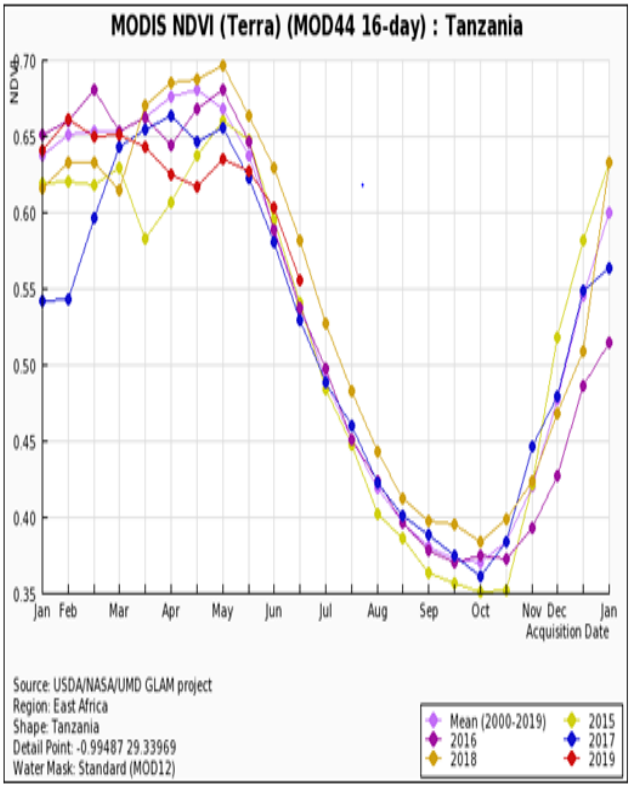
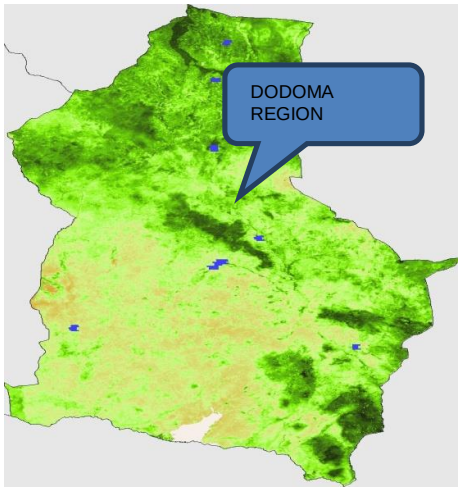


Figure 7: 16 days for June, 2019 as it compares to 2015,2016,2017,2018 and the long-term mean. Data shows NDVI values bordering average for the whole country.

Compared to the long term mean NDVI and the NDVI anomaly for 2015, 2016, 2017 and 2018, the NDVI for June, 2019 was higher than 2015, 2016, 2017 and the long-term mean but it was below as it is compared to 2018 **(Fig. 7).**

Satellite-based crop Conditions



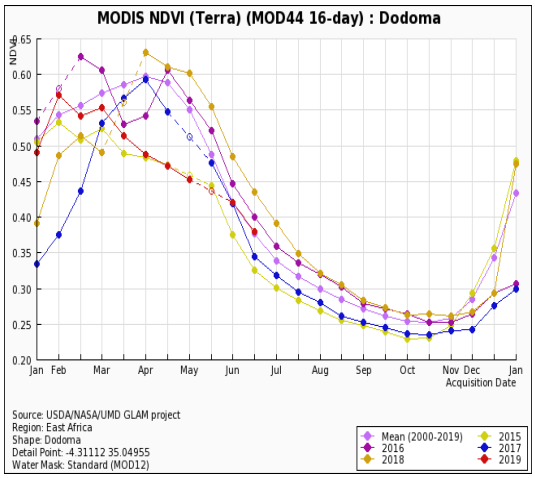


Figure 8: ***Normalized Difference Vegetation Index (NDVI) for Dodoma anomaly for 10-25 June, 2019.***

Figure 9: ***16 days NDVI for June, 2019 as it compares to 2015, 2016, 2017, 2018, and the long-term.***

During the month of June, the country was generally moist except few patches over Northern, Central and some parts of Western zone of the country particularly Arusha, Manyara, Kilimanjaro, Singida, Dodoma, Shinyanga and Tabora. Compared to the long term mean NDVI and the NDVI anomaly for Dodoma in 2015, 2016, 2017 and 2018 were higher than June 2019. NDVI for 2017, 2019 June and the long term mean almost were the same **(Fig.9)**. Water and pasture for livestock was in favorable condition in most parts of the country.

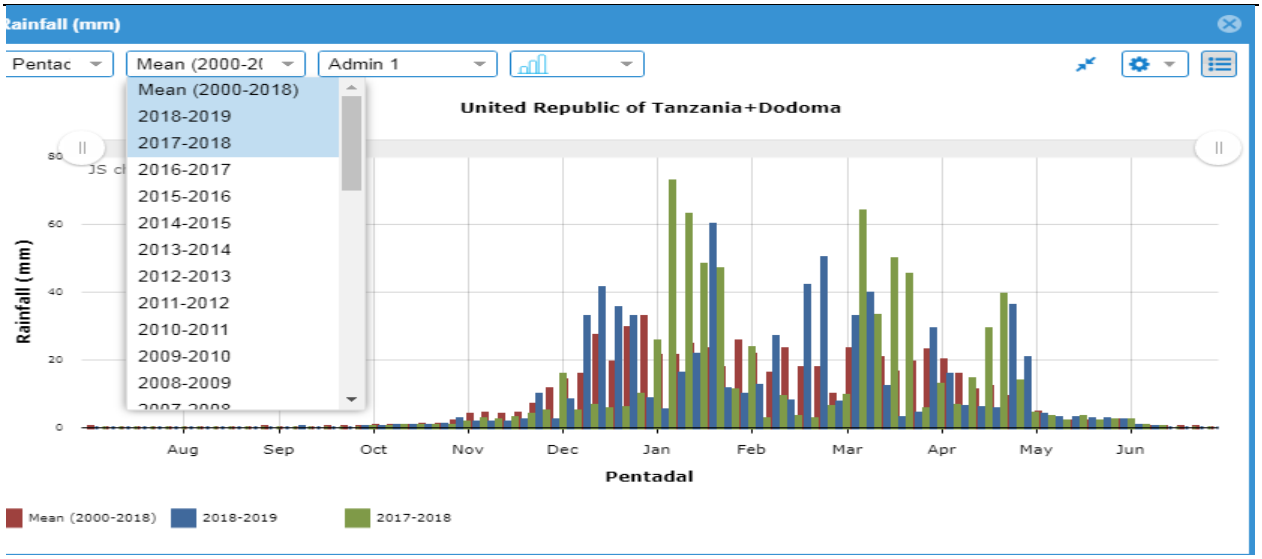


Fig 10 a Climatology of Dodoma

The above figure indicates how rainfall performs in 2018/2019 season as compared to 2017/2018 season for Dodoma Region.

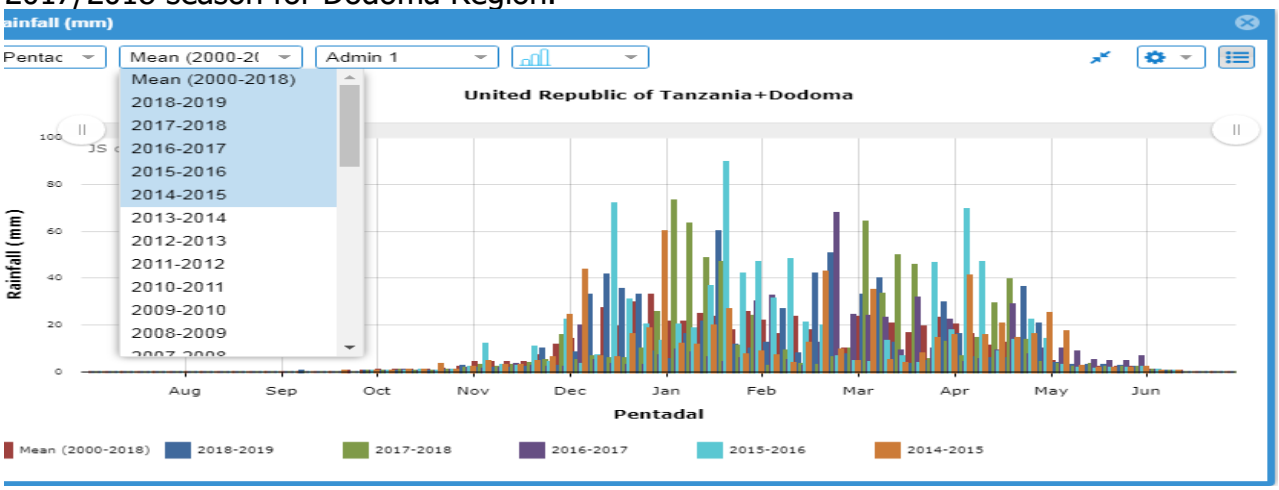


Figure 10 b Climatology of Dodoma for Five years

The above figure indicates the performance of rainfalls in Dodoma for the past five consecutive years. The figure shows that rainfall performance in June 2016/2017 was higher compared to previous years.

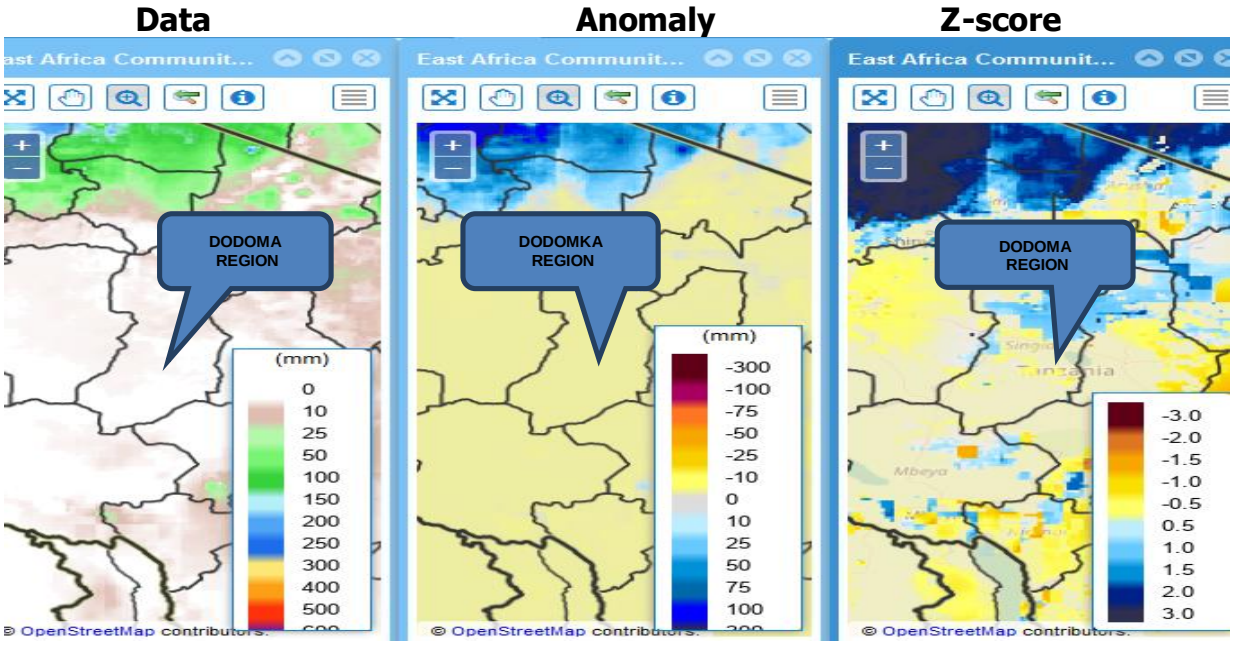


Figure 11 Significant reduction of rainfall during June over Dodoma as compared to Climatology of an area. A clear reduction was seen during the month.

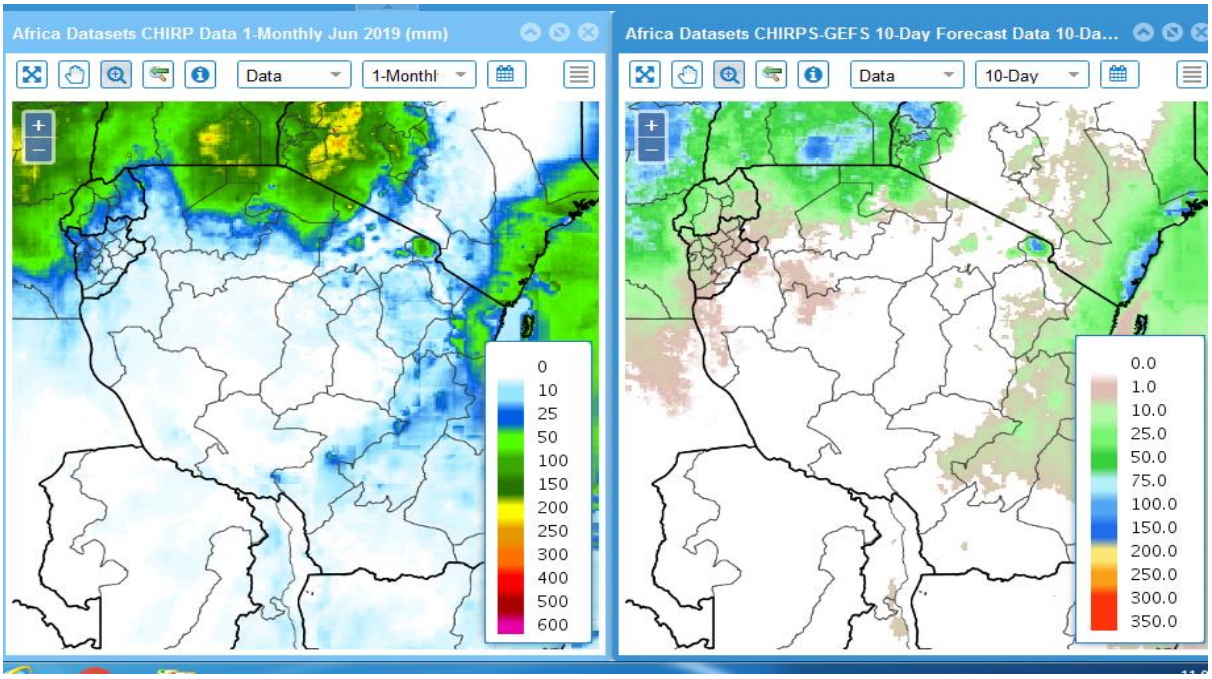


Fig 12: Data for June and July Forecast (Rainfall data in mm): The above figure shows the rainfall data for June and Ten days forecast for July.

Rainfall Performance during June, 2019

During the month, the country was generally dry except for some few areas in Lake Victoria basin where out of season rainfall performed. Significant amount of total rainfall between 100 – 150mm were received particularly in Mara region and Ngorongoro areas. This differs by 50mm from average rainfall of June as indicated in the figure 1.

Agrometeorological impact during June, 2019

During the period under review; in most parts of bimodal rainfall regime, maize crop was at maturity stage. However, over Northern coast, mainly in Tanga and Morogoro regions, soil moisture stress was dominant affecting late grown maize crop which was generally at early maturity stage whereas, in Simiyu, Kilimanjaro, Pwani and Mara regions maize harvesting activity was in progress. In most parts of the bimodal areas, paddy and potatoes were being harvested especially in Mwanza, Tanga, Pwani and Manyara regions. Finalization of paddy harvesting was carried in Simiyu and Shinyanga regions.

While maize harvesting activities were completed in most parts of unimodal areas, farmers were mostly engaging with drying of crops particularly in Mtwara, Tabora and Kigoma regions. Ruvuma, Mtwara, Dodoma and Rukwa, farmers were in final stages of maize harvesting activities. Wheat was at maturity to full maturity stages in Iringa, Njombe and Mbeya regions whilst the bean crop was reported in good condition and at full maturity stage in Mbeya. Otherwise, paddy harvesting is being winded up in Mbeya, Ruvuma, Tabora, Kigoma, Morogoro, Simiyu and Shinyanga regions.

The observed seasonal dry conditions that prevailed during the period were favorable for crop harvesting, drying and storage activities over both unimodal and bimodal areas, yet was also responsible for reduced pasture and water availability livestock and wildlife due to stressed soil moisture. It was generally reported to be average over much of the country but tense in Dodoma and Tabora where periods of dry spells persisted for long days.

Weather Outlook for July, 2019

Dry season is expected to prevail during the month of July, 2019. However, periods of off season light rainfall activities are expected over few areas especially over the coastal belts and Lake Victoria basin. However, mainly normal to above normal minimum temperatures are expected over much of the Coastal belt, North eastern highlands, the Lake Victoria Basin (LVB) areas as well as northern parts of Central and Western areas.

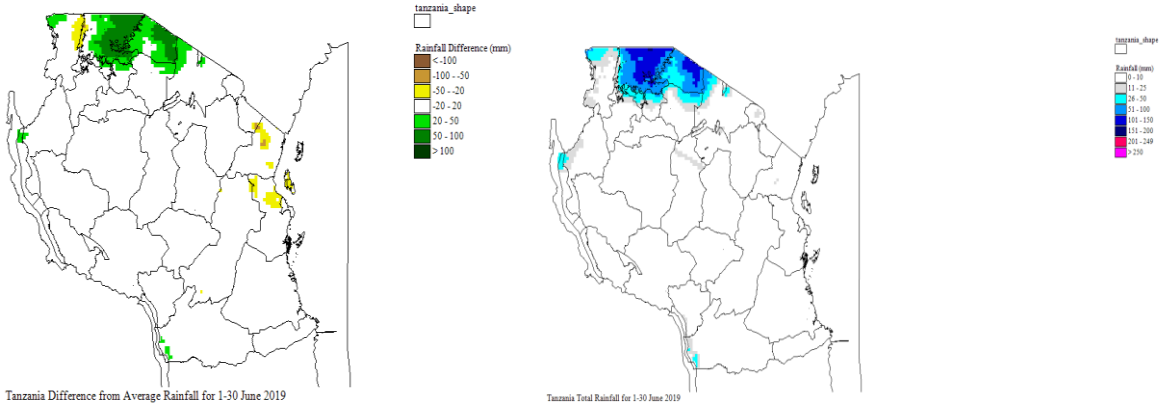
On the other hand, over the South Western highlands, Southern region and Southern parts of Central and Western areas below normal minimum temperature conditions are expected. High ground areas particularly those of North eastern highlands and Southwestern highlands are expected to have much colder nights.

Further Outlook for August, 2019

During the month of August, 2019 mainly dry conditions associated with cool condition are expected to persist.

Agro-meteorological Outlook for July, 2019

The expected dry conditions over Northeastern Highlands (Arusha, Manyara and Kilimanjaro regions), Western regions (Kigoma, Katavi and Tabora regions), and Southern coast (Mtwara and Lindi regions) is likely to favor crop drying, harvesting and storage activities. Light rain over northern coast will favor late grown crops that have been reported to be at early maturity stages. On the other hand, it is likely to affect drying, harvesting and storage management over Lake Victoria Basin. The expected dry condition may likely lead to further decline in pasture and water for livestock, therefore for optimal use of this forecast and advisory livestock keepers are advised to make proper use of available water and pasture resources in consultation with extension officers in their locality.



Tanzania Difference from Average rainfall 1- 30 June 2019 (left) and Total Rainfall 1-30 June 2019 (right)

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The monthly rainfall during June, 2019 in the regions is expected to feature as follows

No.	Regions	Likely Weather
1.	Tanga, Pwani, Dar es Salaam regions, northern sector of Morogoro region, Unguja and Pemba Islands:	Mainly dry conditions with occasional periods of off-seasonal rains are likely over Unguja and Pemba Islands during the first week of the month. Minimum temperatures are expected to be 22oC to 26oC over most areas. However, high grounds of Tanga region especially over Lushoto and Bumbuli districts minimum temperatures are expected to be below 20oC at times.
2.	Kilimanjaro, Arusha and Manyara regions	Minimum temperatures ranging between 18oC and 24oC are expected over much of the region. However, minimum temperatures below 18oC are expected over high ground of these areas. Mainly dry conditions are expected.
3.	Kagera, Geita, Shinyanga, Mwanza, Mara and Simiyu	Minimum temperatures ranging between 14oC and 18oC are expected over much of the regions. However, minimum temperatures below 14oC are likely over high grounds of Kagera and Geita regions. Mainly dry conditions with occasional periods of off-seasonal rains are likely over few areas during the first week of the month.
4.	Kigoma, Katavi, Tabora	Minimum temperatures ranging between 14oC and 18oC are expected over much of the regions. Dry conditions are also expected.
5.	Dodoma and Singida	Minimum temperatures ranging between 16oC and 24oC are expected over much of the regions. Dry conditions are also expected.
6.	Rukwa, Njombe, Iringa, Mbeya region and Southern sector of Morogoro	Minimum temperatures ranging between 16oC and 24oC are expected over much of the regions. Dry conditions are also expected.
7.	Mtwara and Lindi	Minimum temperatures ranging between 20oC and 24oC are expected over most areas. Dry conditions are expected to persist.
8.	Ruvuma	Minimum temperatures ranging between 20oC and 24oC are expected over most areas. On the other hand, below 20oC minimum temperature is likely over high ground areas. Dry conditions are expected to persist.

AVERAGE PRICES FOR JUNE, 2019

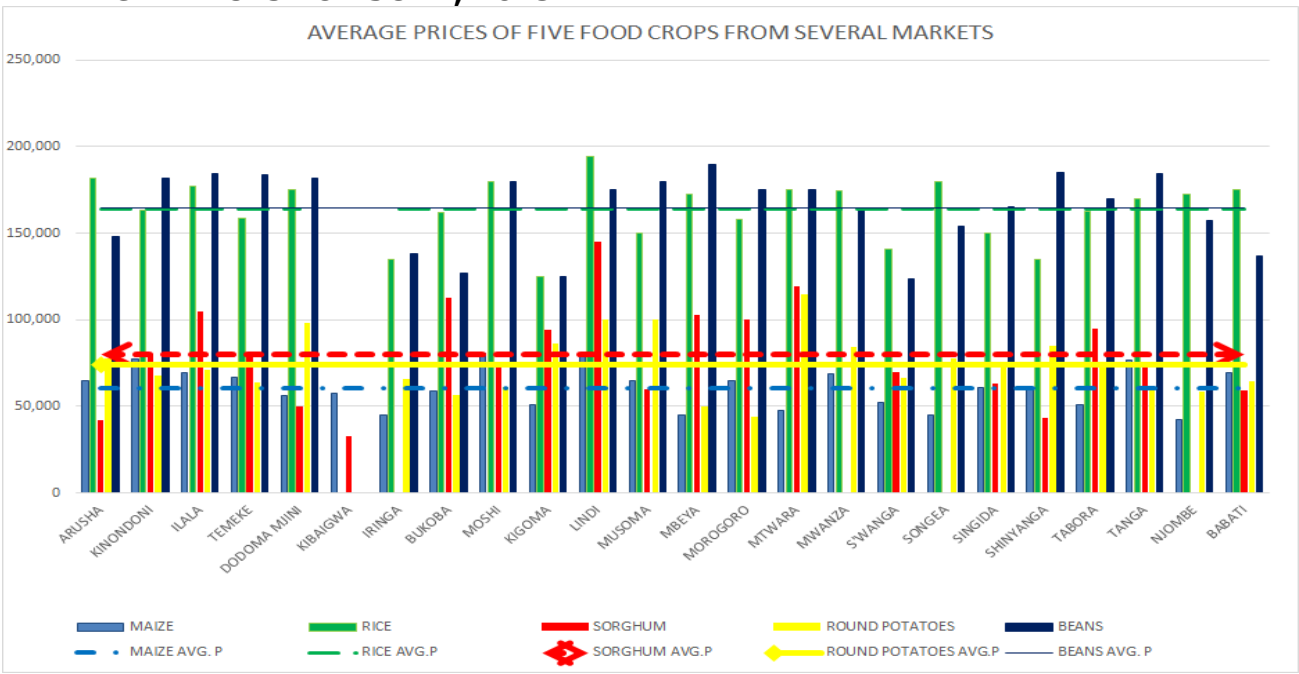

Figure 15: Major Food Prices at Selected Markets

The chart above depicts June, 2019 average market prices of major food crops in combination with National average price data for the selected markets. Lindi, Arusha, Moshi and Songea had the highest prices of rice ranging from Tshs.1, 800 to 1,944 per Kg while Kigoma, Shinyanga and Iringa had lowest market prices ranging from Tshs. 1,250 to 1,350 per kg. Moshi, Lindi, Kinondoni and Tanga had above average maize price while Iringa, Mbeya Songea and Njombe were all below average maize prices. However, the lowest maize price were observed in the Njombe market Tshs 420 per Kg, Songea market Tshs. 447 to 480 per Kg, Iringa market Tshs 450 per Kg and Mbeya market Tshs 450 per Kg.

Mbeya, Shinyanga, Ilala and Tanga markets had the highest prices for beans, ranging from Tshs1, 844 to 1,900 per kg while Sumbawanga, Kigoma and Bukoba Markets had the lowest prices of beans ranging from Tshs.1, 236 to Tshs 1,266 to 1,267 per kg. Lindi, Mtwara, and Bukoba had the highest prices of Sorghum, ranging from Tshs.1,127 to 1,450 per kg while Kibaigwa, Arusha, Shinyanga and Dodoma markets had the lowest prices ranging from Tshs.327 to 500 per kg. The prices of round potatoes also vary from one market to the other, Mtwara, Lindi, Musoma, Dodoma and Kigoma had the highest prices of round potatoes, ranging from Tshs 860 to 1,150 per kg while Morogoro, Mbeya, Bukoba and Njombe markets had the lowest prices ranging from Tshs.440 to 585 per kg.

FOOD CROP PRODUCTION DATA AT NATIONAL LEVEL

From the analysis at national level, food crop production has reached **16,408,309** metric tons (Grain Equivalent) of which **9,007,909** metric tons are cereals and **7,400,400** metric tons are non-cereals. On the other hand, requirement for 2019/2020 is **13,842,536** metric tons of which **8,754,119** metric tons are cereals and **5,088,417** metric tons are non-cereals. Comparing these production figures with the requirement figures of **13,842,536** metric tons for 2019/2020 consumption year, it is evident that the country produced a surplus amounting **2,565,774** metric tons of total food crop production where **253,790** metric tons comprise cereals and **2,311,984** metric tons is non-cereals (Table 1).

Cereals	**Maize**	**Sorghum & Millets**	**Rice**	**Wheat**	**Cereals**
Production	5,817,508	1,117,839	2,009,174	63,388	9,007,909
Requirement	5,513,469	1,974,778	999,543	266,326	8,754,119
Gap (-) / Surplus (+)	304,040	-856,939	1,009,631	-202,942	254,790
SSR	**106**	**57**	**201**	**24**	**103**
Non-cereals	**Pulses**	**Banana**	**Cassava**	**Potatoes**	**Non-cereals**
Production	1,880,438	1,135,645	2,739,318	1,644,999	7,400,400
Requirement	816,659	936,359	2,337,839	997,559	5,088,417
Gap (-) / Surplus (+)	1,063,778	199,286	401,479	647,440	2,311,984
SSR	**230**	**121**	**117**	**165**	**145**
TOTAL	**Cereals**		**Non-cereals**		**TOTAL**
Production	9,007,909		7,400,400		16,408,309
Requirement	8,754,119		5,088,417		13,842,536
Gap (-) / Surplus (+)	254,790		2,311,984		2,565,774
SSR	**103**		**145**		**119**

Source: Tanzania Preliminary Food Crop Production Forecast for 2018/2019

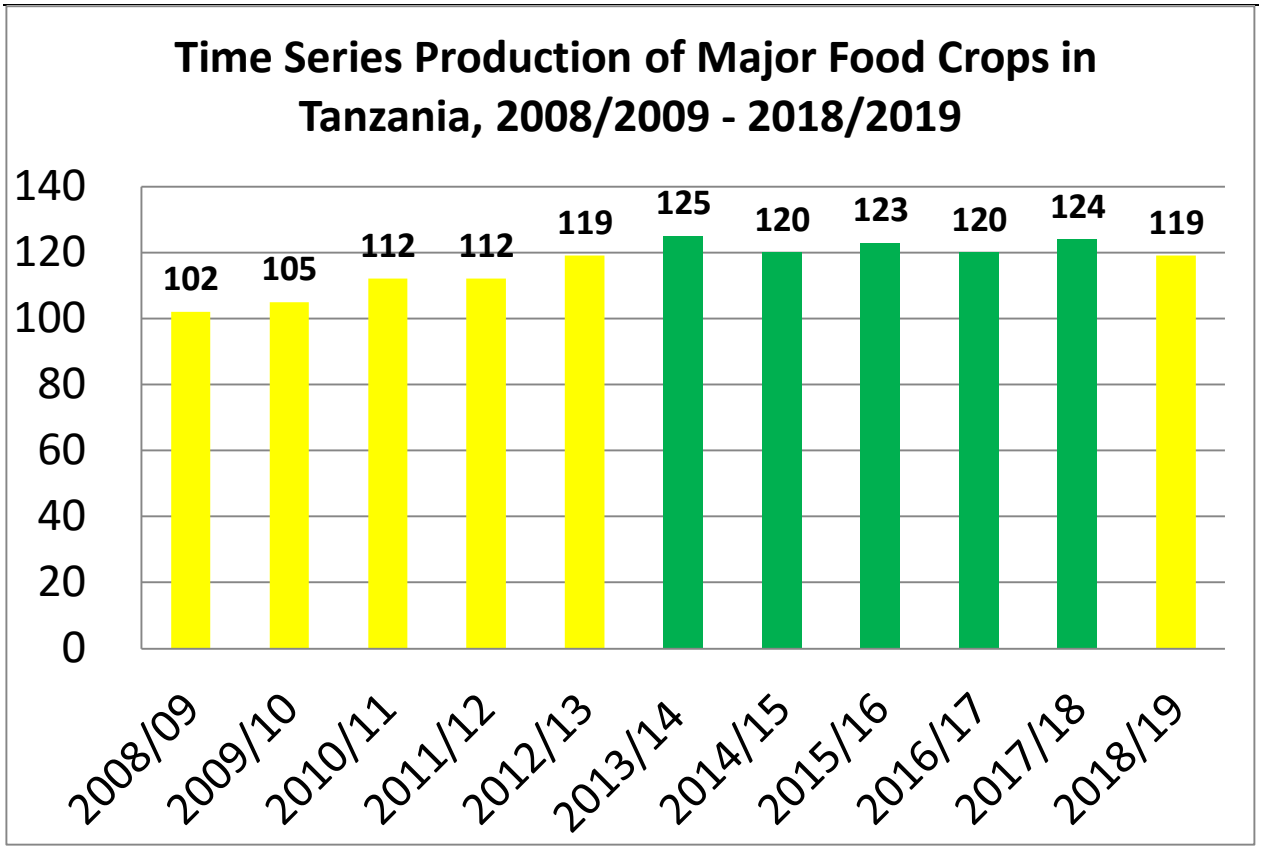

Figure 16: The Yellow and Green colors indicate years where the country had production levels at sufficient and surplus respectively.

TANZANIA AGRICULTURAL PRODUCTION CALENDAR

Farmers and extension officers need to know the agricultural production calendar of their areas in relation to climatological conditions, or else they need to develop one to guide on proper utilization of agrometeorological information and advisories. Agricultural production calendar usually starts with the beginning of the agricultural season. To most people and in many places, the start of the season is marked by the onset of the rains. However, scientifically the start of the season is confirmed if an area received rains for at least 20mm in four consecutive days with at least two days wet and not followed by a dry spell of more than ten days in the next 21 days. This also means that not every rain signifies the start of the season even if it has come during the times for the start of the season.

Key features of the production calendar include identification of times for land preparation, selection of crop or seeds for planting, sowing, vegetative plant growth phase, weeding, fertilizing, flowering period, maturity, and harvesting. In the preparation of seasonal agricultural crop calendar, farmers' needs to identify times when key features mentioned above are likely to

happen in their respective areas based on climatological information or seasonal weather forecast. The timing of the event usually correlates with optimal weather conditions suitable for optimal output such as adequate soil moisture for land preparation and sowing. In most cases, the calendar is drawn as a chart, which includes time in terms of month or week, type of crops or agricultural produce and key activities (See Figure 16,17 and 18) in relation to seasonal rainfall characteristics for either bimodal (figure 17) or unimodal (figure 18).

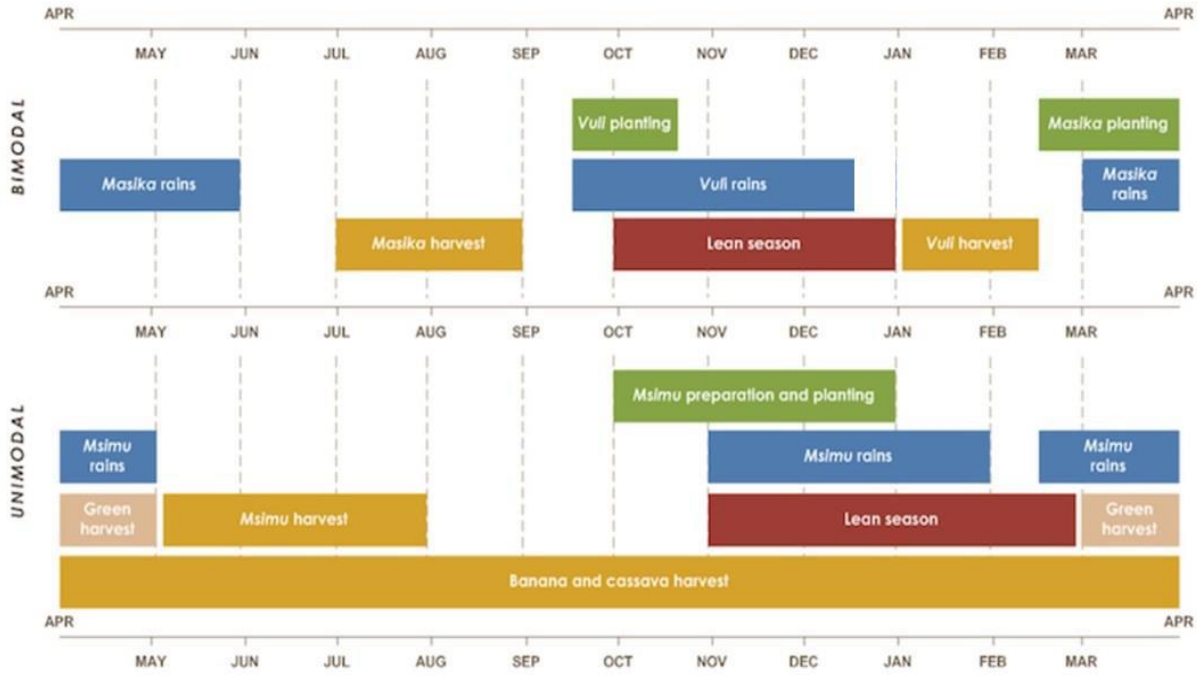

Figure 17: **An example of a generic agricultural production calendar for Unimodal and bimodal areas in Tanzania (Source FEWSNET)**

Using climatological information, it is possible to develop agricultural production calendar of an area and identify suitable agricultural practices and technologies. Farmers have been using indigenous knowledge in deciding for type of crop varieties, planting time, weeding and harvesting. However, because of climate variability and change, use of knowledge alone has become less reliable because of the disappearance of some the indicators. Hence, there is a need to use indigenous knowledge along with more reliable climatic and weather information based on scientific analysis in decision-making. Agricultural production calendar for different agro-ecological zones in the country can be downloaded on the Ministry of Agriculture website by clicking on the link below (http://www.kilimo.go.tz/index.php/en/resources/category/tanzania-livelihood-baseline-profiles). An example of an agricultural production calendar for bimodal areas is shown in Figure 16 and for unimodal in figure 17.

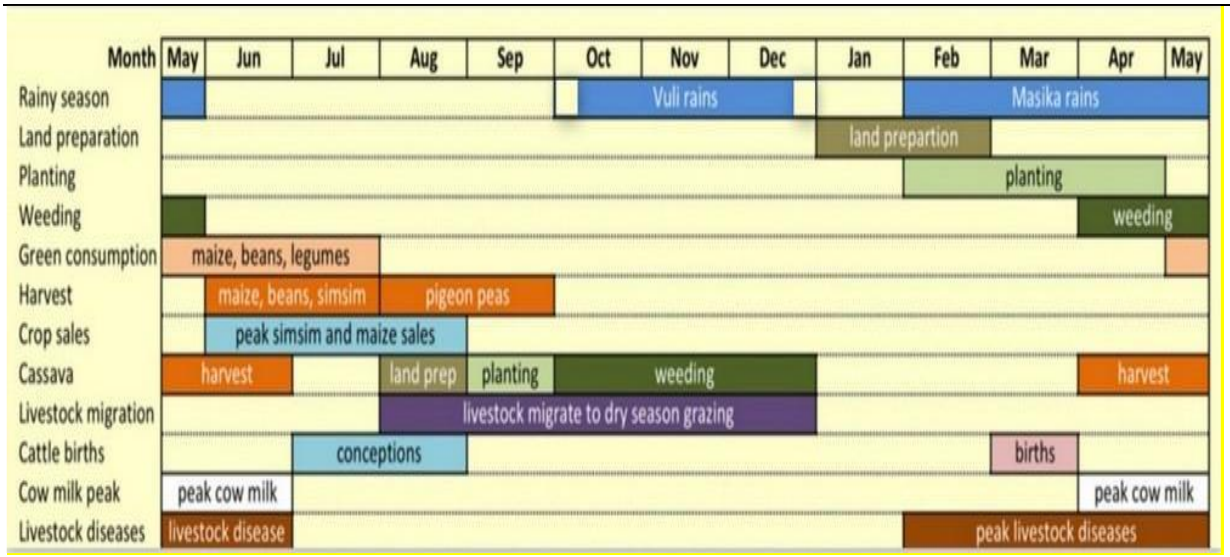

Figure 18: Agricultural calendar for Handeni - Pangani in Tanga region to represent bimodal areas, showing suitable agricultural activities at different times of the year (source www.kilimo.go.tz).

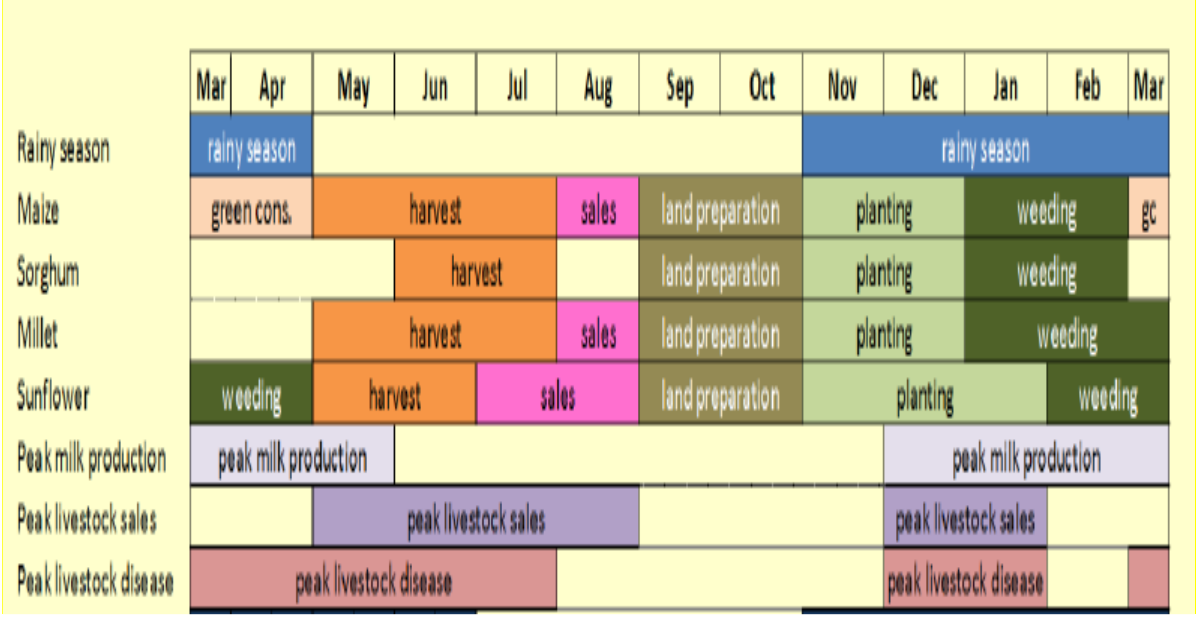

Figure 19: Agricultural calendar for Tabora and Singida regions to represent unimodal areas, showing various agricultural activities at different times of the year (source www.kilimo.go.tz).

PUBLIC AWARENESS

APPROVED CROP VARIETIES RELEASED IN 2019

The National Seed Committee (NSC) has approved the use of 13 new crop varieties recommended by the National Variety Release Committee (NVRC) for utilization and adoption. of which 9 varieties are maize, 3 soybeans and 1 type of tobacco. The crop varieties have been released and approved after extensive research with superior characteristics such as high yield, disease and insect pest resistance, early maturity and farmers' preference.

In addition, these seeds have been researched by public and private research centers in the country with the aim of increasing production and productivity of the respective crops while improving food security and increasing farmers' income. However, the Agricultural Seed Agency (ASA) and other seed companies will start the production of hybrid seeds in the 2019/2020 season. The analysis of the crop variety and Research Institutions / Companies participated in the research is as follow:

INSTITUTION/ COMPANY	CROP	TYPE OF SEED
ILONGA RESEARCH INSTITUTE	MAIZE	• WE 5141 • WE 7133 • WE 7118 • WE 7118
EAST AFRICAN SEED COMPANY	MAIZE	• EA S5019
ALSSEM SEED COMPANY	MAIZE	• AMH500 • AMH501
SYGENTA COMPANY	MAIZE	• SY 6444 • SY 5344
SEEDCo (T) LTD	SOY BEAN	• SC Semeki • SC Signal • SC Saxon
TOBACCO REASEACH INSTITUTE TANZANIA (TORITA)	TOBACCO	• TDR 17

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Terms and Definitions		
MOA	Ministry of Agriculture	
NFSD	National Food Security Division	
TMA	Tanzania Metrological Agency	
RAS	Regional Administrative Secretary	
NDVI	Normalized Difference Vegetative Index. The NDVI is used to measure and monitor plant growth, vegetative cover, and biomass production.	
MODIS	Moderate resolution Imaging Spectro-radiometer	
BIMODAL	Areas receiving rains twice a year. This means that the majority of precipitation falls in two distinct seasons a year i.e short rains Vuli-September to December, Long rains Masika - March to June.	
UNIMODAL	Areas receiving rains once a year Msimu rains i.e. from November to April	
Conditions	Exceptional	Conditions are much better than average at time of reporting
	Favorable	Conditions range from slightly below to slightly above average at reporting time
	Watch	Conditions are not far from average but there is a potential risk to production
	Poor	Crop conditions are well below average. Crop yields are likely to be 10% or more below
	Average	This is only used when conditions are not likely to be able to recover, and impact on production is likely
Drivers	Wet: Flooding	Wetter than Average due to flooding
	Wet: Water Logging	Wetter than Average due to water logging
	Dry	Dryer than Average
	Hot	Hotter than Average
	Cold	Cooler than average or risk of frost damage
	Extreme Event	This is a catch-all for all other climate risks (i.e. hurricane, typhoon, frost, hail, winterkill, wind damage, etc.)
	Delayed Planting	Postponement to the start of season
	Pests	Destructive insects or animals
	Disease	Impairment of the crop that causes abnormal functioning
	Wind Damage	Damage caused by high winds
	Flood	An excessive amount of water located beyond its normal boundaries
	Socio-political	Social or political factors that impact crop conditions (i.e. policy changes, agricultural subsidies, government intervention, etc.)
	Late Rains	Delayed onset of rainy season
Trends	Improving	Crop conditions are improving
	Stable	Crop conditions are stable
	Worsening	Crop conditions are worsening