THE UNITED REPUBLIC OF TANZANIA
Ministry of Agriculture

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National Food Security Bulletin

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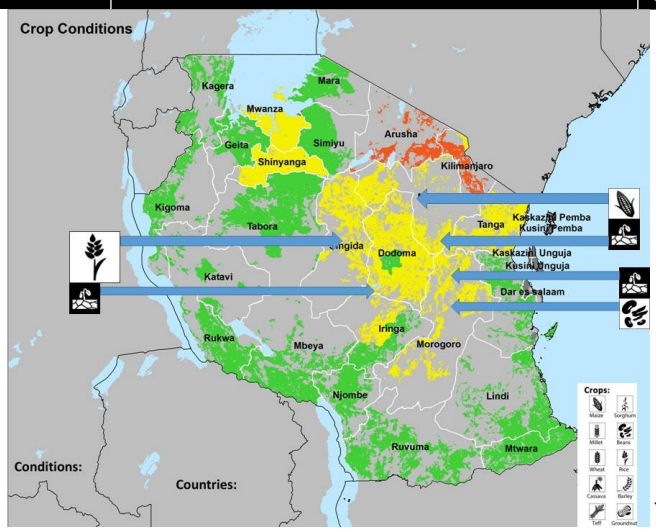

Figure 1: ***This Crop condition map syntheses information for all crops as of 31st May, 2019.***

Crop conditions over the main growing areas is based on combination of national and regional crop analyst inputs along with remote sensing data and rainfall data provided by Tanzania Meteorological Agency. Crop with conditions other than favorable is marked as indicated on the map.

NATIONAL HIGHLIGHTS

- Maize and paddy are at maturity stage and in favourable condition in most of Unimodal regions while in bimodal regions maize are at tasselling/grain filling stages except in northern regions specifically Arusha and Kilimanjaro where maize is at a vegetative stage due to late rainfall onset. Poor conditions were observed in Arusha region.
- Cassava continues to be in favorable conditions in most part of the country due to its ability to tolerate drought and harsh conditions. Watch conditions were observed in Shinyanga region.
- Arusha, Lindi, Ilala and Songea markets had the highest prices of rice while Kigoma, Geita and Sumbawanga had the lowest market prices.
- Moshi, Tanga, Kinondoni and Lindi markets had above average maize prices while Iringa, Mbeya and Songea had below average prices. The lowest maize price was observed in the Iringa, Mbeya and Songea markets.
- Highest bean prices were observed in Temeke and Mbeya markets while Sumbawanga, Babati and Kigoma Markets had the lowest prices.

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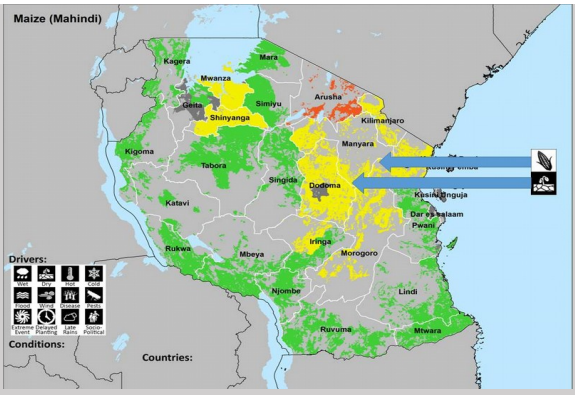
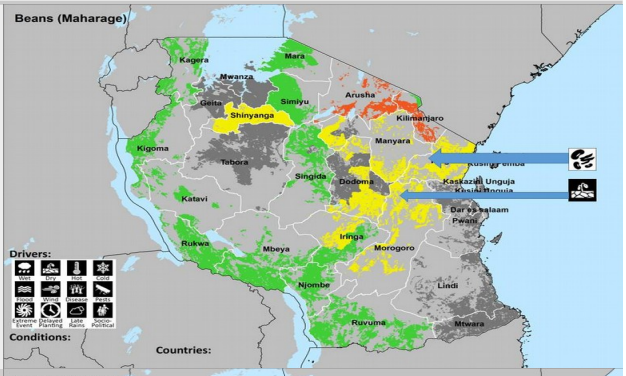
Crop Conditions for Major Food Crops

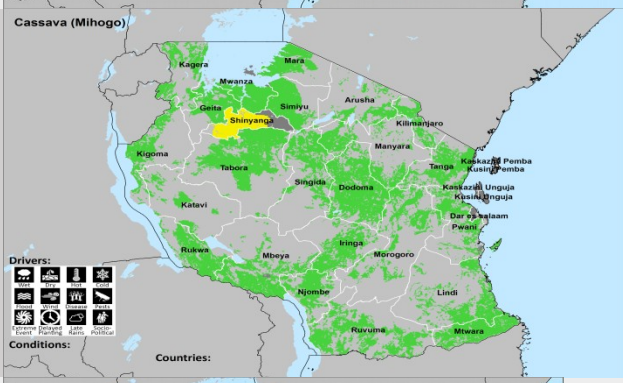
- **Maize**
  In most of Unimodal regions, maize is at maturity stage and in favourable condition. In bimodal regions, maize is at tasselling stages except in northern regions specifically Arusha and Kilimanjaro where maize is at vegetative stage due to late rainfall onset. Watch conditions were observed in parts of Central and Northern eastern of the country as well as in Shinyanga and Morogoro regions. Poor condition was also



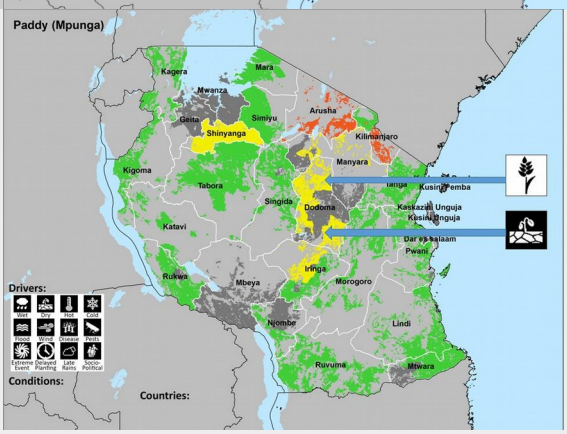
- **Beans**
  In most parts of Unimodal areas, harvesting activities of beans have finished. In bimodal areas, poor and watch conditions were observed in some parts due late rainfall onset particularly in the Central and North-eastern zone. Watch conditions were also observed in Shinyanga.



- **Cassava**
  Cassava continues to be in favorable conditions due to its drought tolerant nature. Watch conditions were however observed in Shinyanga region.

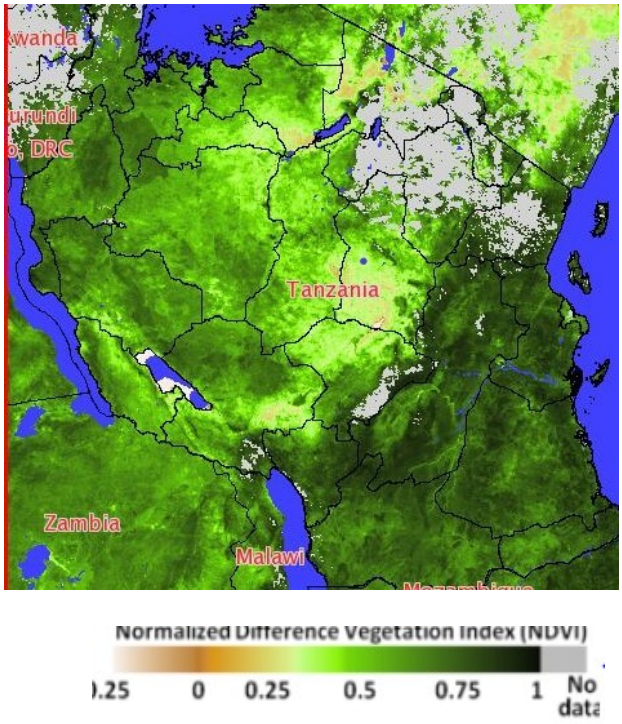


- **Paddy**
  The crop, in most parts of Unimodal area is in favourable conditions and at a maturity stage. The same is experienced in irrigated areas. Poor conditions were observed in Arusha and Kilimanjaro whereas watch conditions were observed in Shinyanga, Dodoma and some parts of Iringa region.



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



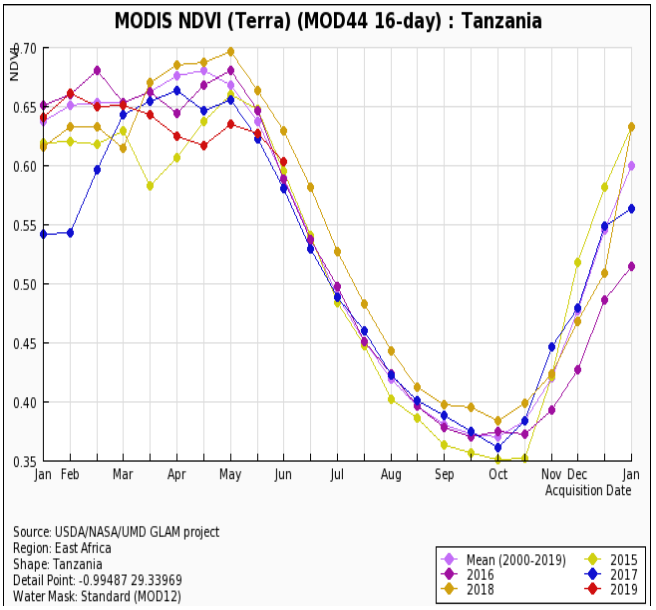
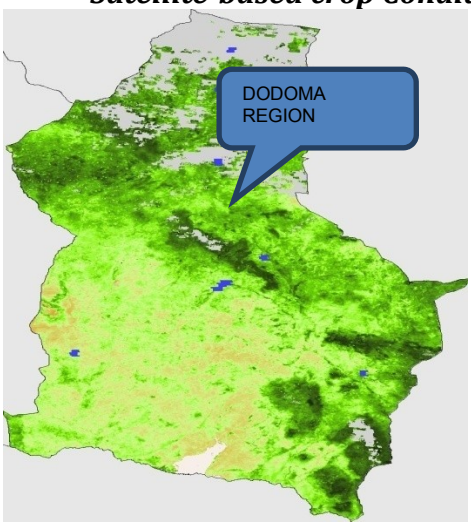


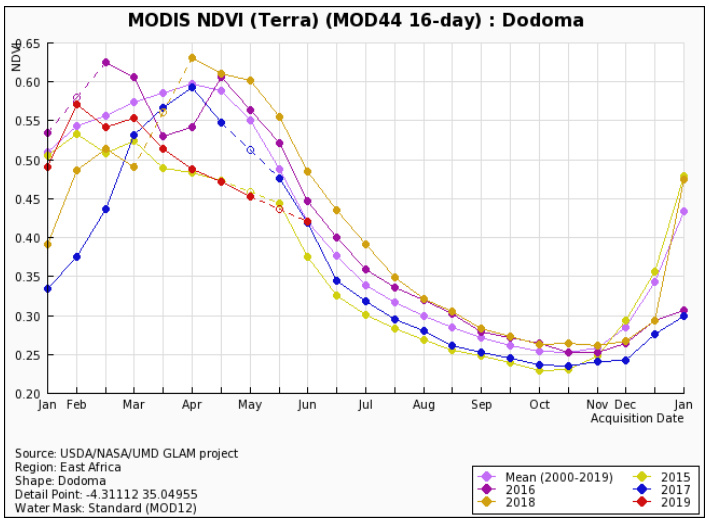
***Figure 6:** Normalized Difference Vegetation Index (NDVI) anomaly for 09-25 May, 2019*

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

Compared to the long term mean NDVI and the NDVI anomaly for 2015, 2016, 2017 and 2018, the NDVI for May, 2019 was lower than 2015, 2016, 2017, 2018 and the long-term mean **(Fig. 7).**

Satellite-based crop Conditions





- ***Figure 8:** Normalized Difference Vegetation Index (NDVI) for Dodoma anomaly for 09-25 May, 2019.*

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

During the month of May, 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 2015, 2016, 2017 and 2018, May 2019 NDVI for Dodoma is lower compares to May, 2015, 2016, 2017, 2018 and the long-term mean. **(Fig.9)**. Water and pasture for livestock was in favorable condition in most parts of the country.

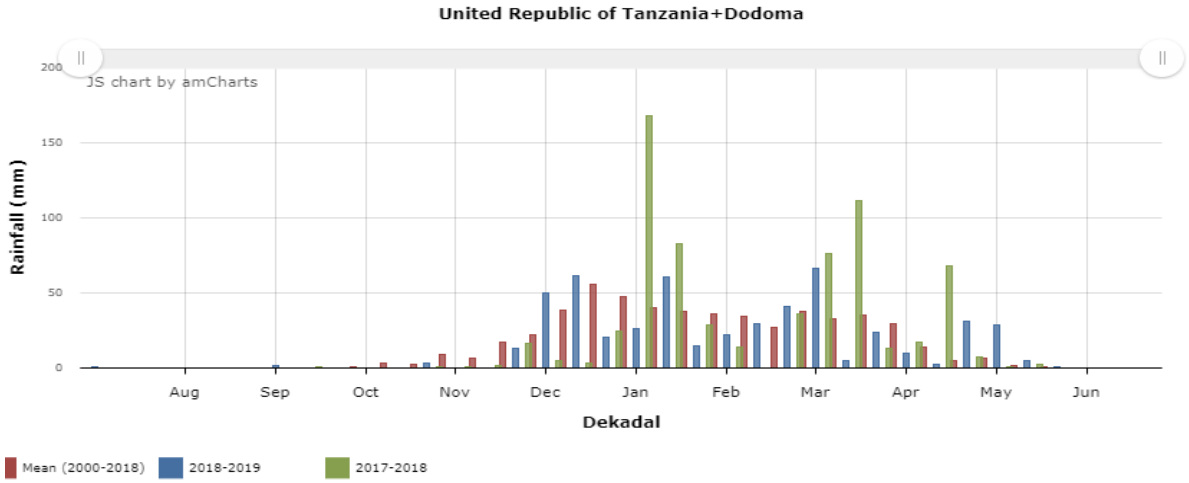


Figure 10a Climatology of Dodoma

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

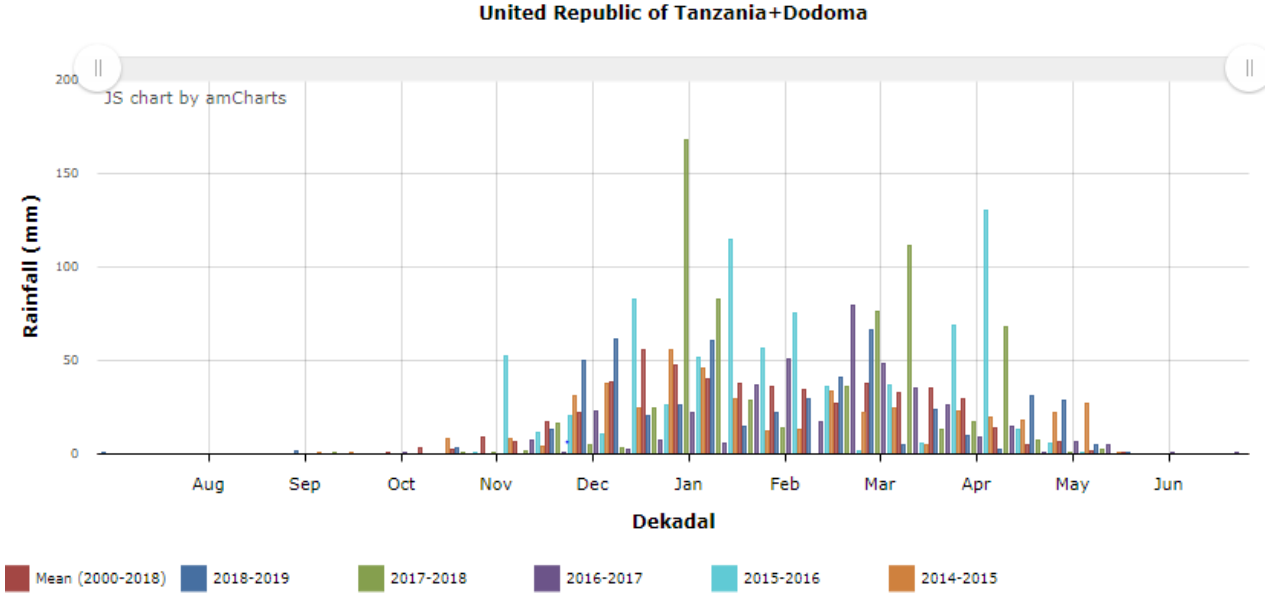


Figure 10b Climatology of Dodoma - Five years comparison

The above figure indicates rainfall performance in Dodoma for five consecutive years. The figure shows that rainfall performance in May 2019 was lower compared to previous years.

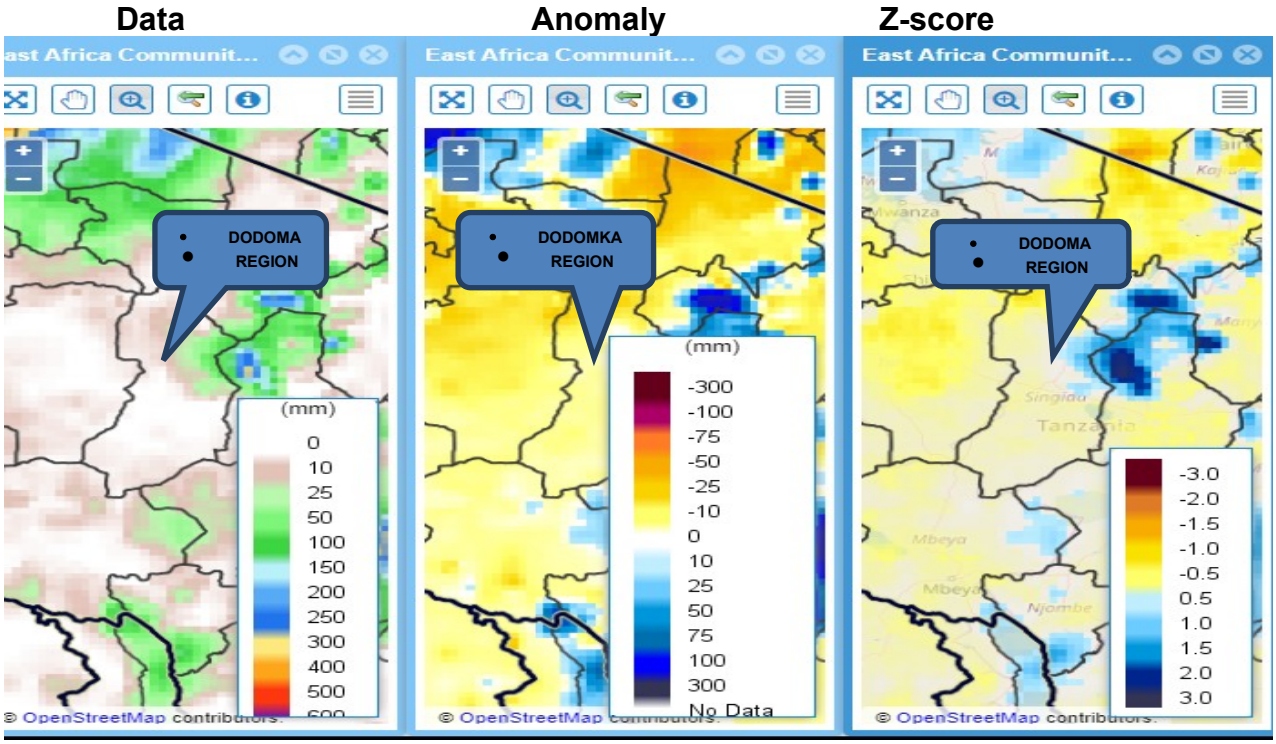


Figure 11 Significant reduction of rainfall during May over Dodoma as compared to Climatology of an area. A clear reduction was seen during the month.

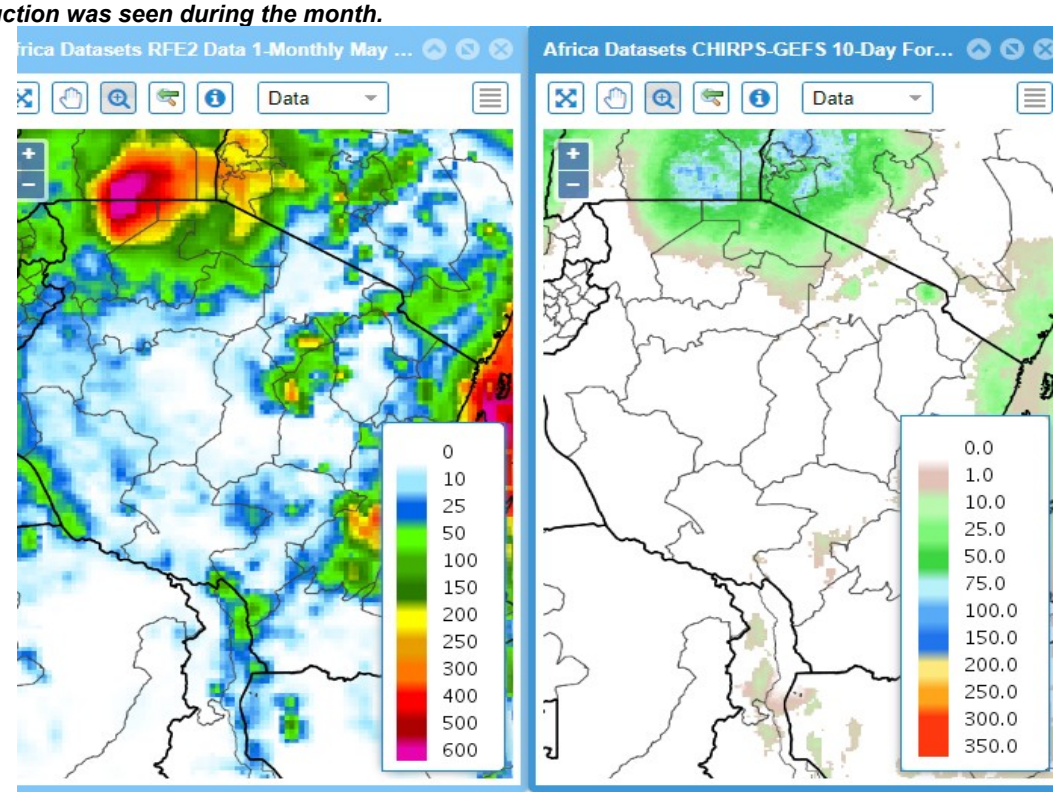


Fig 12: Data for May and June Forecast (Rainfall data in mm) **The above figure shows the rainfall data for May and Ten days forecast for June.**

Rainfall Performance during May, 2019:

During the month, the weather systems enhanced precipitation over some parts of both unimodal and bimodal areas. Significant rainfall of 150mm and above was observed towards the second half of May over entire Coast including Morogoro region (Fig. 13 left). This recorded rainfall is about 100mm above normal for the month of May (Fig. 13 right). Though rainfall recorded over Lake zone was 100mm and above, it performed below average especially over the western parts. The season has been extended over Unimodal regions such as Mtwara, Lindi and Southern parts of Morogoro, where it was expected to stop at the end of April. The remaining parts of the country such as Central, West, Southwestern Highland and Southern region remained relatively dry.

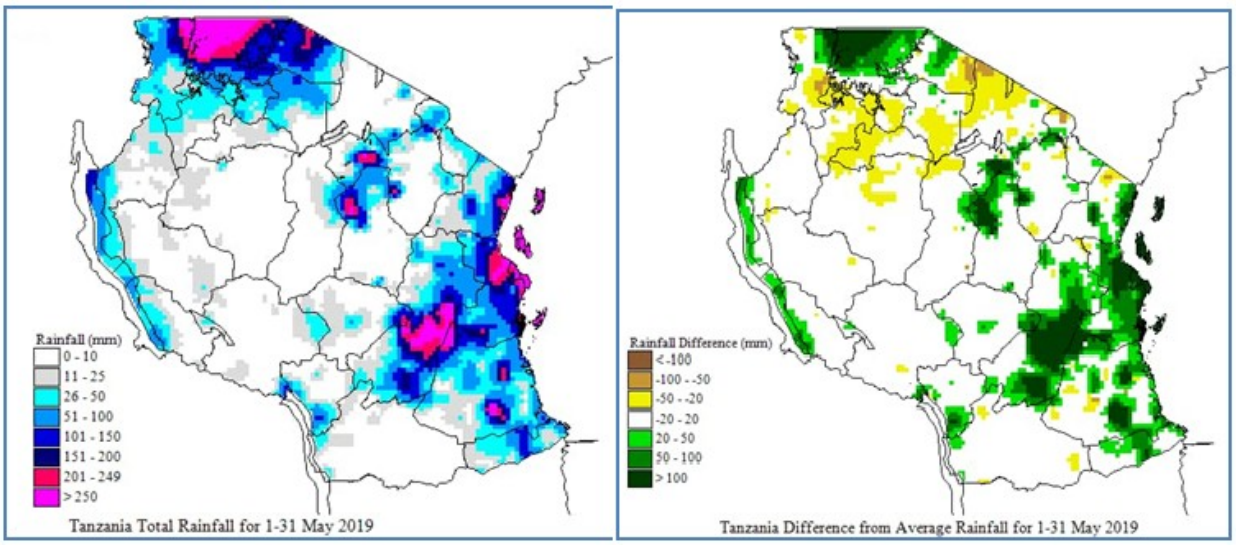


Figure 13: Tanzania Rainfall Distribution for the period 1st – 31st May, 2019; as total (left) and deviation from long term monthly average (right).

Agro meteorological impact during May, 2019:

Farmers in the unimodal areas were mostly engaged with maize harvesting, except in Njombe, Iringa and Mbeya were the maize crop is at full maturity stage and is in a good condition. However, poor conditions were reported in Dodoma, Singida and Tabora due to prolonged dry conditions. The bean crop has been reported to be in good condition and at the maturity stage in Mbeya, whereas wheat is between tillering and maturity stages over Iringa, Njombe and Mbeya regions. Harvesting activities of Paddy are ongoing in Tabora and Rukwa regions.

On the other hand, good rainfall received over some parts of bimodal areas enhances good soil moisture which favor crops development specifically over the Northern Coast and in some parts of Lake Victoria basin. Maize and bean crops in Kagera region are progressing well. Farmers over these areas continued with weeding and fertilizer application, while harvesting activities of beans have commenced for some of the fields. Over some parts of Shinyanga and Mwanza regions, farmers are proceeding with maize harvests which were grown during Masika rains, in 2019, and harvesting of Paddy is still ongoing in Mwanza, Tanga and Manyara regions. However, dry spells observed in some parts of bimodal areas, such as Moshi, Same and Kiteto affected crop development and growth. Water and pasture availability for livestock were in good conditions over most parts of the country except in Dodoma where there is a slight decrease.

Weather Outlook for June, 2019

Periods of light rainfall activities are expected over few areas especially coastal belts and Lake

Victoria basin during the first and second weeks of June, 2019 followed with mainly dry conditions during the last two weeks of June. However, normal to below normal temperatures are expected over much parts of the country during the month of June 2019. It should be noted that the cold conditions are expected mainly during the night and early in the morning. The details of monthly weather outlook during June, 2019 in the regions are given in the following table:

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 22°C to 26°C over most areas. However, high grounds of Tanga region especially over Lushoto and Bumbuli districts minimum temperatures are expected to be below 20°C at times.
2.	Kilimanjaro, Arusha and Manyara regions	Minimum temperatures ranging between 18°C and 24°C are expected over much of the region. However, minimum temperatures below 18°C 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 14°C and 18°C are expected over much of the regions. However, minimum temperatures below 14°C 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 14°C and 18°C are expected over much of the regions. Dry conditions are also expected.
5.	Dodoma and Singinda	Minimum temperatures ranging between 16°C and 24°C 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 16°C and 24°C are expected over much of the regions. Dry conditions are also expected.
7.	Mtwara and Lindi	Minimum temperatures ranging between 20°C and 24°C are expected over most areas. Dry conditions are expected to persist.
8.	Ruvuma	Minimum temperatures ranging between 20°C and 24°C are expected over most areas. On the other hand, below 20°C minimum temperature is likely over high ground areas. Dry conditions are expected to persist.

Agro-meteorological Outlook for June, 2019

The expected off season rains over few parts of bimodal rainfall regime, specifically over Lake Victoria basin will improve soil moisture, which will likely to favor late grown crops as season comes to end. However, they might increase a chance of damaging matured crops in the fields

and harvested ones at drying process. On the other hand, the forecasted dry condition over remaining parts of the country will be favourable for the crop at full maturity, harvesting and drying stages. Farmers and livestock keepers are advised to consult extension officers in their respectively areas for proper utilization of the forecasted weather during the month of June.

AVERAGE PRICES FOR MAY, 2019

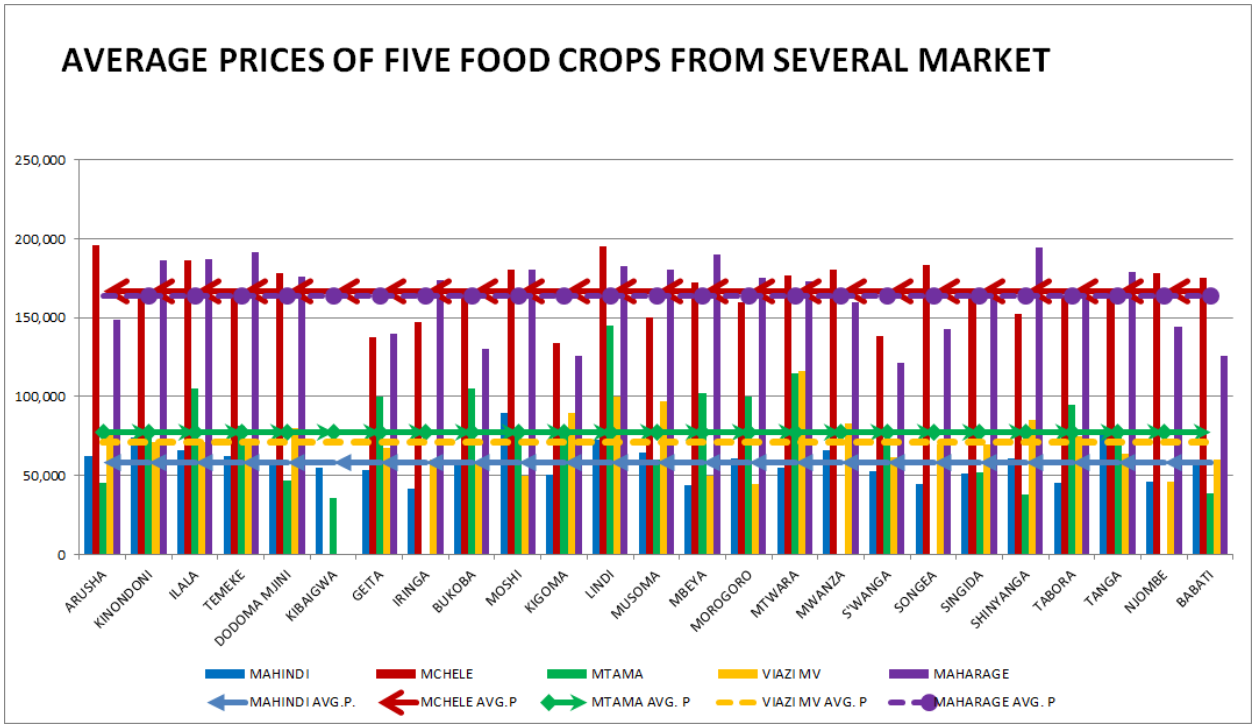


Figure 14: Major Food Prices at Selected Markets

The chart above shows May, 2019 average market prices of major food crops in combination with National average price data for the selected markets. Arusha, Lindi, Ilala and Songea had the highest prices for rice ranging from TZS 1,836 to 1,959 per Kg while Kigoma, Geita and Sumbawanga had lowest market prices ranging from TZS 1,341 to 1,382 per kg. Moshi, Tanga, Kinondoni and Lindi had above average maize price while Iringa, Mbeya and Songea were all below average. However the lowest maize price was observed in the Iringa TZS 4178 per Kg, Mbeya TZS 441 per Kg and Songea market TZS 447 per Kg.

Shinyanga, Temeke and Mbeya markets had the highest prices for beans, ranging from TZS 1,900 to TZS 1,940 per kg while Sumbawanga, Babati and Kigoma Markets had the lowest prices of beans ranging from TZS 1,214 to 1,261 per kg. Lindi, Mtwara, Ilala and Bukoba had the highest prices of Sorghum ranging from TZS 1,050 to 1,450 per kg while Kibaigwa, Shinyanga, Babati markets had the lowest prices ranging from TZS 355 to 390 per kg. The round potatoes price varied from one market to the other. Mtwara, Lindi, Musoma and Kigoma had the highest prices of Round potatoes ranging from TZS 900 to 1,164 per kg while Morogoro, Njombe, Mbeya and Moshi markets had the lowest prices ranging from TZS 449 to 500 per kg).

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 15,16 and 17) in relation to seasonal rainfall characteristics for either bimodal (figure 16) or unimodal (figure 17).

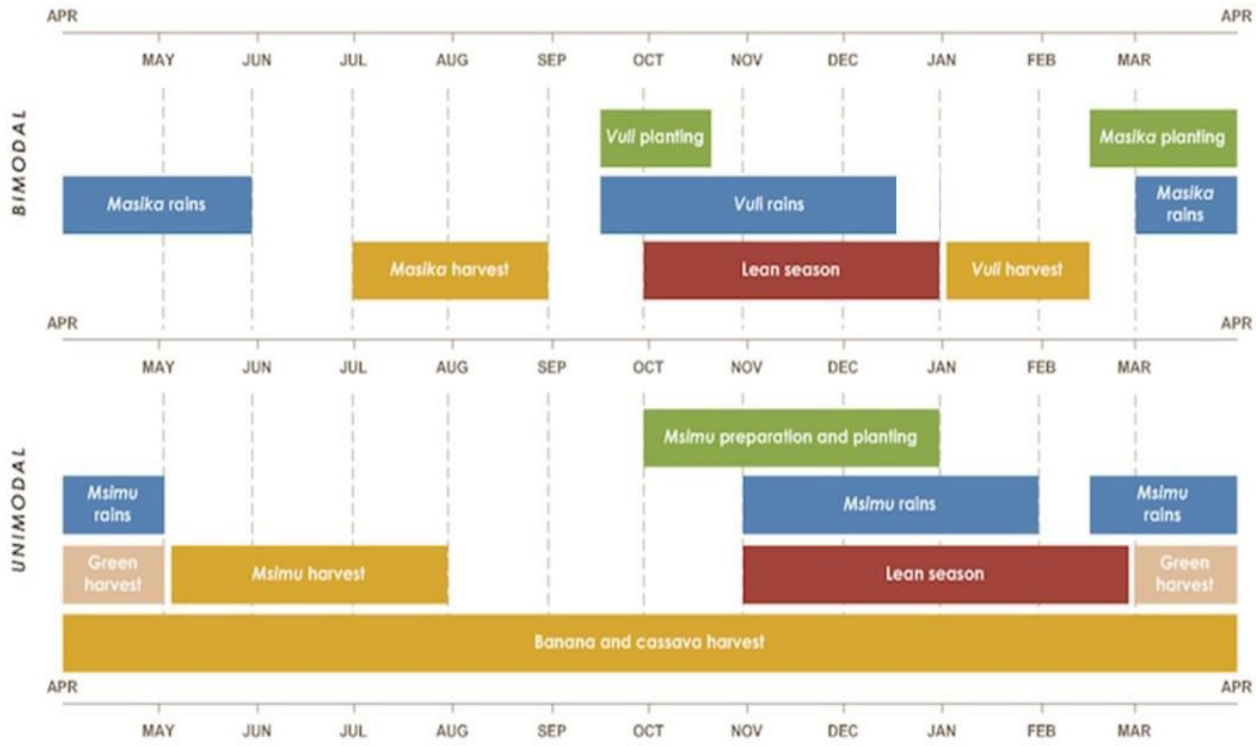


Figure 15: **An example of a generic agricultural production calendar for unimodal and bimodal areas in Tanzania (Source FEWSNET)**

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.***

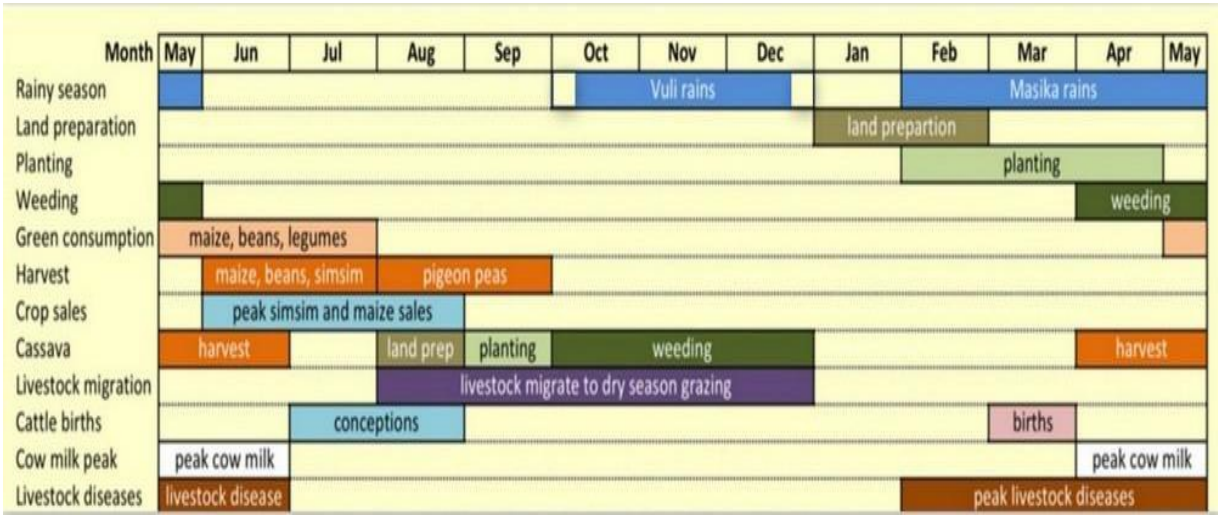


Figure 16: Agricultural calendar for Handeni - Pangani in Tanga region to represent bimodal areas, showing suitable agricultural activities at different times of the year (source www.kilimo.go.tz).

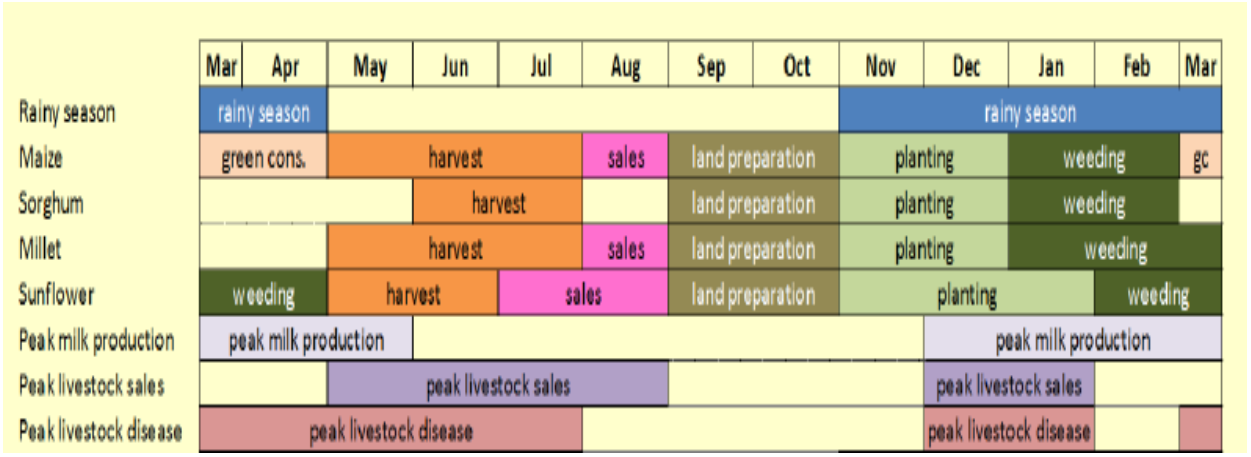


Figure 17: Agricultural calendar for Tabora and Singida regions to represent unimodal areas, showing various agricultural activities at different times of the year (source www.kilimo.go.tz).

PUBLIC AWARENESS

The National Early Warning System (CMEWS) has been instrumental in producing food crop production data and information from the regions and district councils in regular basis for decision making. Starting year 1992/1993, the Ministry of Agriculture through CMEWS has produced on annual basis, preliminary and final forecast reports and trigger vulnerability assessment that zoom into detected hotspots at district level towards household level. The system has also been contributing in preparing monthly food security updates and other ad hoc

reports in response to management needs. The other unique contribution is that of populating and updating national food balance sheets and sharing with the process of integrating regional food security situation w with East African Community (EAC) and Southern African Development Community (SADC) secretariats along regional food balance sheet approach.

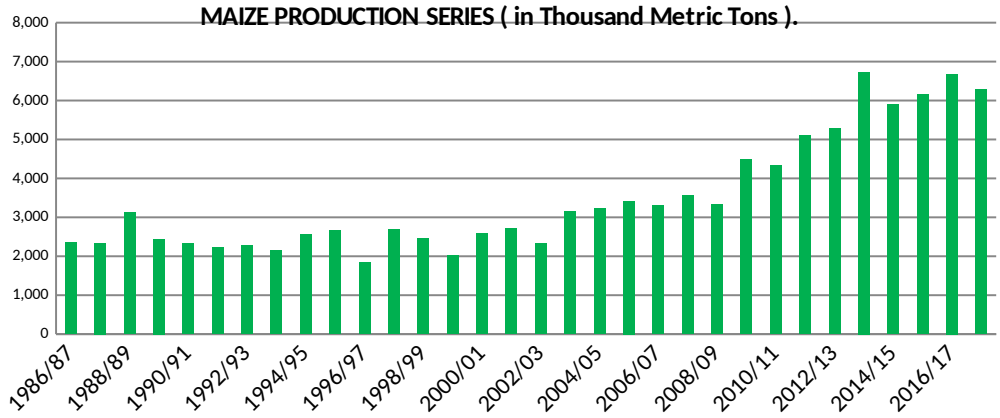
The forecasts have been using specially designed tools to capture data, initially at a seasonal frequency involving the use of a sample survey questionnaire (FSQ1) which address "Subjectivity" problems, later on at a weekly and a monthly frequency involving routine reporting forms (WRS1-5 and RRS1) to address early warning issues for food security and further TSA, Jed 6 and Jed 7 which are intended to get local authority and experts opinions on general aspects of agriculture as a whole, food security, prices and rainfall data on record as well as addressing urgency and ad hoc issues amidst stringent budgetary constraints. These tools have been constantly improved to capture data with reasonable statistical accuracy while opening doors of opportunities towards deeper insights of short-term to long-term food security interventions.

For effectiveness purposes, the tools are used to monitor food crop production in the field on weekly, bi-weekly, monthly and in the preliminary and final food crop production forecast surveys. These surveys are normally carried out at the beginning and at the middle of consumption year which runs from 1st June to 31st May of each year. The outcome of using these tools enables the analysis of food crop production, requirement and food security status both at national and sub-national levels and contributes to the output given by "AGSTATS for Food Security". Any Government needs accurate, reliable and timely information for planning purposes. Actions taken in sustaining food security acknowledge the need to involve key and relevant stakeholders in all different areas including, the dissemination of reports.

In this regards improvement of data reliability, accuracy and timeliness is very crucial in decision making and hence investment in data collection in terms of human and financial resources as well as Government commitment is very important. Furthermore, more capacity building on Remote Sensing, use and interpretation of Earth Observation Data (EO) is needed to support the field data collected for planning and take actions on time to reduce risks and save lives before the situation worsened (***i.e evidence based data information from the satellites*****).**

STATE OF FOOD SECURITY IN THE COUNTRY

The state of food security in the country continues to be stable at different levels of self-sufficiency. This improvement in production is due to among others, good weather (*Vuli, Masika a*nd *Msimu*), use of good agricultural practices, improve policies and other government interventions (inputs and extension services).


MAIZE PRODUCTION SERIES (in Thousand Metric Tons).
8,000
7,000
6,000
5,000
4,000
3,000
2,000
1,000
0
1986/87
1988/89
1990/91
1992/93
1994/95
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1998/99
2000/01
2002/03
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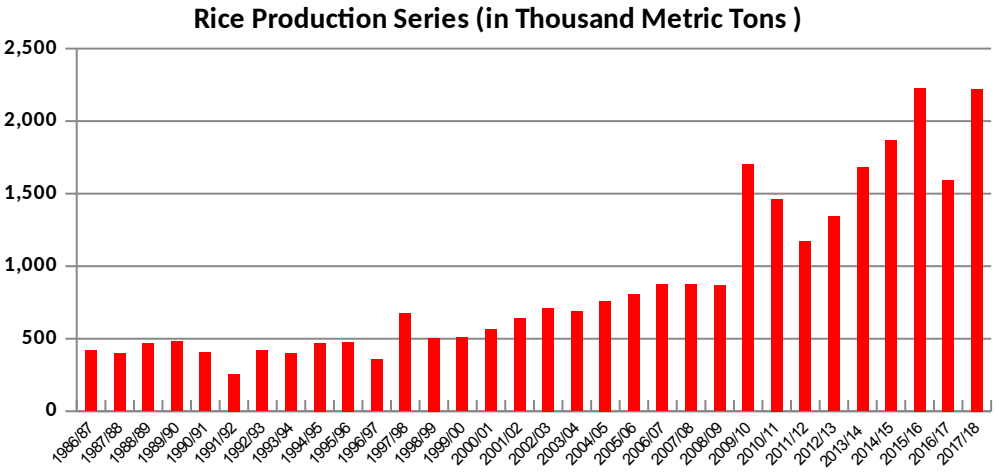
2006/07
2008/09
2010/11
2012/13
2014/15
2016/17


Rice Production Series (in Thousand Metric Tons)
2,500
2,000
1,500
1,000
500
0
1986/87
1987/88
1988/89
1989/90
1990/91
1991/92
1992/93
1993/94
1994/95
1995/96
1996/97
1997/98
1998/99
1999/00
2000/01
2001/02
2002/03
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2004/05
2005/06
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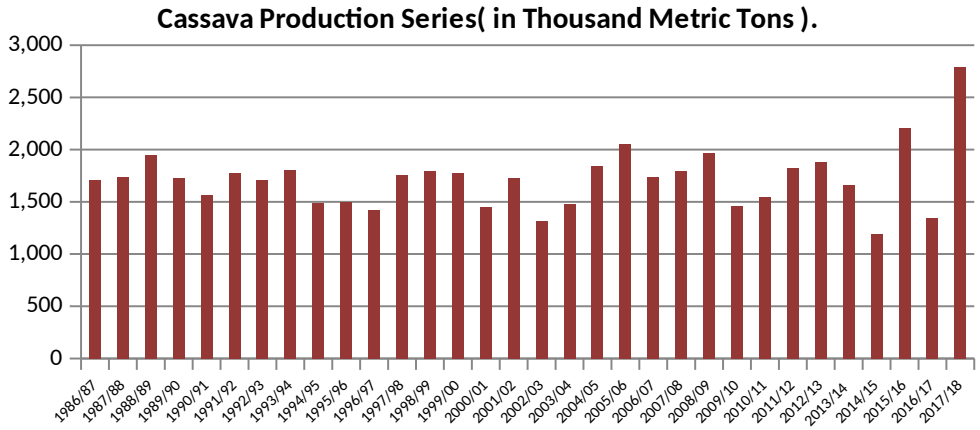
2015/16
2016/17
2017/18


Cassava Production Series(in Thousand Metric Tons).
3,000
2,500
2,000
1,500
1,000
500
0
1986/87
1987/88
1988/89
1989/90
1990/91
1991/92
1992/93
1993/94
1994/95
1995/96
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2017/18

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