



**MINISTRY OF AGRICULTURE, LIVESTOCK,
FISHERIES AND COOPERATIVES**

**STATE DEPARTMENT FOR CROP DEVELOPMENT AND
AGRICULTURAL RESEARCH**

Kenya SDCD Experience

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STATE DEPARTMENT FOR CROP DEVELOPMENT AND AGRICULTURAL RESEARCH

Ministry of Agriculture Mandate/Goals

- ❑ Provision of enabling environment for agricultural development
- ❑ Increase agricultural productivity and outputs
- ❑ Increase farmers' incomes, market access and agro-processing



Food and nutrition security



Sustainable land management and conservation of the environment



Enhance farmers resilience and risk management



Use of Earth Observation for Agriculture and Food Security Monitoring

Crop conditions monitoring for Food Security management

Monitoring of pests and diseases (Locust invasion of 2020)

Climate/Weather monitoring; early warning on drought, floods, etc

Crop Insurance Program that uses GIS software to develop satellite maps, sample farms for data collection and loss assessment

Kenya Monthly Food and Nutrition Security Report

Kenya Monthly Food and Nutrition Security Report includes:

- Crop Conditions Maps for various crops summarized from the Kenya crop monitor
- Reports reflect a consensus on most recent crop conditions in the respective regions/counties
- Rainfall data at country and subnational administrative levels
- Fully integrated at County Level to ensure reliable, field-verified information on crop conditions
- Documents main cropping activities
- Inform and tracts different government interventions



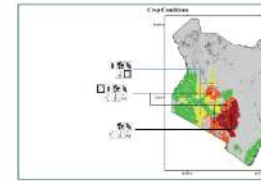
National Synthesis (Maize, Beans, Wheat)

Overview

- In the non-ASAL counties, performance of long rains 2022 predicts lower performance compared to 2021
- Most counties have received below normal rains, except for the counties in Western, Upper Nyandarua (Mogor, Kisii) and parts of North Rift Counties.
- The long rains admitted widespread infestation of the African Army worm, which has spread been contained due to intervention by the Plant Protection Unit at the State Department for Crop Development and Agricultural Research.
- Many farmers could not use optimal inputs due to increased prices.
- Due to the poor weather performance during the long rains of 2022, some parts of the Country especially North Eastern and Lower Eastern (Lanai and Igithia) have experienced complete crop failure.

In the Bulletin

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Regional Crop Conditions June 2022. The overall crop conditions in the country is as shown in the map above. The N of Agriculture are experiencing favorable crop conditions across the South Eastern current crop conditions are poor due to early cessation of rains. A few counties are growing dry spell conditions.

In the Bulletin

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Regional crop conditions June 2021. Map showing regional crop conditions information in Kenya for June 2021 and May 2022 for maize, beans, wheat, green grams, cowpeas, rice and sorghum. The crop monitor map is based on a combination of several variables including remotely sensed data, ground observations, field reports, national and regional reports. Crop with conditions that are other than favorable are indicated on the map with the aim to help the weakest condition. The situation in the country has deteriorated in the last month with most areas entering under watch due to lack of rains as compared to last reporting period.



Climatological Conditions Graphs

The following illustrates the climatological conditions for maize in Western region long rains; The blue line indicates 2022 long rains conditions.

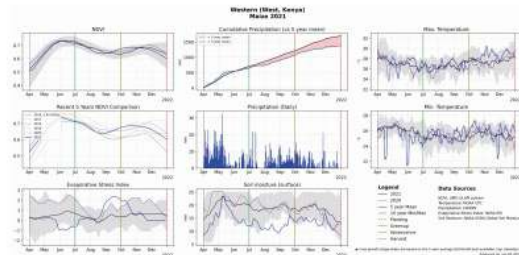


Figure 5: Maize maize crop in Khasioto Sub County, Kakamega



Nyanza Region

In Upper Nyanza region of Kisii and Nyamira Counties, maize which had suffered water stress picked up when some rainfall was received in the production season. African Army Worm infestation was wiped out by the rains and the spraying with chemicals received from National Government. In lower Nyanza comprising of Kisumu, Homabay, Migori, and Siaya Counties; the crop is favourable at vegetative to reproductive stage.

For the bean crop, in Upper Nyanza, the crop is at vegetative to harvesting stage. Crop performance low because of excessive wetness and associated diseases and rotting. Conditions for beans in Nyanza for long rains beans are normal in Migori Homabay Siaya Kisii and Nyamira but under watch in Kisumu due to dry condition The crop is from vegetative to harvesting stage. The expected production for beans in nyanza mainly grown as an intercrop with maize is near normal harvest. Some pure crop of beans in Migori County but a lower level. Rice production is under irrigation and therefore farmers are in production throughout the year, although there two seasons- long and short rains seasons which have very thin line of separation. In Kisumu County, harvesting of short rains season's crop continued during the period under review; total production from short rains crop 110,000 Bags paddy of 80kg of each. Available stocks are 1,000bags paddy of 80Kg each. Nursery and seed bed preparation were on-going for the next season There is minimal wheat production in the long rains in Nyamira County and its grown mainly in the short rains crop and for subsistence purposes.

Table 7: Nyanza Region Maize Production Forecast

County	Target Area (Ha) LR	Target Production (90 Kg Bag) LR	LTA Achieved Area (Ha)	LTA Achieved Production	Achieved LR (Ha)	SR Targets (Ha)	SR Target production (90kg Bag)
Homabay	44,440	1,111,100	43,652	714,294	23,340	34,470	448,925
Kisumu	35,000	770,000	29,507	491,183	34,850	34,245	648,355
Migori	30,000	1,000,000	45,448	890,672	42,500	25,400	373,380
Siaya	45,000	864,000	46,817	748,062	45,000	25,500	518,000
Kisii	28,060	477,020	37,801	867,098	28,075	16,758	96,517
Nyamira	50,200	1,008,000	24,458	446,923	44,000	30,230	214,850
Total	252,700	4,129,392	227,683	4,158,232	109,237	157,603	2,148,847



Figure 4: Army worm damage in Legent, Viooi ward of Bongai sub county, Nakuru



Upper Eastern Region

The month of May was marked by increased rainfall in the central and upper parts Meru county while the marginal zones remained relatively dry. The crops in the county are generally under watch. In Tharaka Nithi, only the middle and upper zones of Maara chuka and Muthambi received light rains. Crop conditions in the fields is generally poor. Crop failure is likely to be experienced in most counties due to late onset of rains and early cessation. Maize crop is in the vegetative to reproductive stage in all the three counties. The crop condition is poor in Tharaka Nithi, Embu and Meru, as the crop is suffering from water stress. There is evidence of low fertilizer application in Tharaka Nithi, there is expected crop failure above 50%. The crop is likely to fail in Embu if rains are not received in the next one or two weeks. For beans the crop is in vegetative to reproductive stage in Embu and Tharaka Nithi counties and in early vegetative stage in Meru County. It is performing poorly in Tharaka Nithi county and under watch. The condition is likely to worsen if rains are not received soon. Beans condition is worsening in Embu County due to water stress while the condition is fair in Meru County. Sorghum which is grown in Tharaka Nithi, is at vegetative to reproductive stage and the crop is under watch and doing poorly due to late onset of rains and early cessation. Wheat which is grown in Meru county is in the early vegetative stage and under watch due to moisture stress.

Table 5: Upper Eastern Region Maize Production Forecast

County	Target Area (Ha) LR	Target Production (90 Kg Bag) LR	LTA Achieved Area (Ha)	LTA Achieved Production	Achieved LR (Ha)	SR Targets (Ha)	SR Target production (90kg Bag)
Embu	18,430	322,525	17,595	231,734	17,968	17,505	86,409
Garissa	85	147	73	674	70	148	1,400
Mandera	1,514	6,947	1,538	7,473	1,240	715	2,150
Meru	340	965	291	1,485	280	604	0
Meru	45,400	681,000	26,335	332,609	43,650	57,081	303,221
Tharaka Nithi	17,890	101,970	11,259	142,047	16,995	18,635	107,535
Wajir	120	240	300	3,097	80	90	0
Total	83,779	1,113,794	57,391	715,119	80,303	94,778	500,715



Figure 2: Harvesting beans Migori County



Figure 3: Bean harvesting in lower sub counties of Bungoma. The crop was affected by dry spell at flowering and pods formation



**Use of Crop
monitor in
Kenya
Monthly Food
and Nutrition
Security
Report**

The monthly Food and Nutrition Security Report in addition to other information includes maps showing Crop performance of various crops

This is collaborated with the data provided on achieved hectarages and expected production and photographs

The crop monitor report has enabled the unit to produce a much more informative food security report for decision making and can help identify hotspots early enough

Sample from July 2022 FNS Report

This July 2022 extract represents crop condition in Upper Eastern region, the data from field report and the crop conditions report for maize is from the portal

HQA/DCA/MONTHLY FSR/7/2022

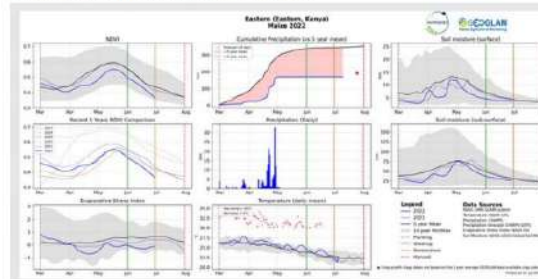
3.1.5 Upper Eastern Region

The month of July was marked by dry conditions in central and upper parts. Embu county is expecting approximately 20% of target production, maize is at milky stage. Kiambu are expecting approximately 45% of targeted produce. 25% of the maize crop has been harvested though cobs are very small and 45% of the crop in the county is in favourable condition. Beans have been harvested and harvests realised was approximately 20% with very small pods and not fully filled. Meru county reported beans as harvested is at milky stage with lower parts experiencing crop failure.

Maize

County	Target Area (Ha) LR	Target Production (90 Kg Bag) LR	LTA Achieved Area (Ha)	LTA Achieved Production	Achieved LR(Ha)	SR Targets (Ha)	SR Target production (90kg Bag)
Embu	18490	322525	17,595	231,734	17968	17,505	86,409
Garissa	85	147	73	674	70	148	1400
Mandera	1,514	6,947	1,538	7,473	1260	715	2,150
Meru	940	965	291	1,435	209	604	0
Tharaka Nithi	45400	681000	26,235	332,669	43550	57,081	303,221
Wajir	17890	101,970	11,259	142,847	15,905	18,635	107,535
Wajir	120	240	300	3,097	80	90	0
Total	83,779	1,143,794	57,391	719,119	80,303	94,778	500,715

The following illustrates the climatological conditions for maize in eastern region long rains; The blue line indicates 2022 long rains conditions.



HQA/DCA/MONTHLY FSR/7/2022

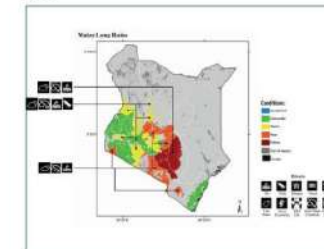
KENYA CROP CONDITIONS MAPS

Maize

The overall maize crop conditions in the country is as shown in the map. The north rift region, central, western and parts of Nyanza are experiencing favourable crop condition whereas the south eastern region is facing imminent crop failure as the current crop conditions are poor due to early cessation of rains. A few counties in Nyanza and central are on watch due to the prevailing dry spell conditions.

CROP CONDITIONS BY CROP

MAIZE



Maize crop is in favourable condition in central, north rift regions with exception of Samburu, Nyanza, and Kajiado counties where the crop is in poor condition due to the dry spell condition experienced in the month. Counties in the south eastern have had a crop failure due to the dry spell as well as the early cessation of the rains which was coupled with poor distribution in both space and time which necessitated replanting of the crop.

BEANS

Beans crop is in favourable condition in counties west of the rift but in watch in some counties in the north rift and central region but in eastern region and Kajiado the crop is a failure at vegetative and early reproductive stages due to early cessation of rains and poor rainfall distribution in the country.

Impact of crop monitor reports for early warning and food security monitoring



FAW attack



AAW on maize



AAW on grass

Since 2018, counties have continued to report on fall armyworm attack on acreage of maize affected and support given where necessary. The unit incorporated Crop Protection Services into the wall to pick issues and give direction on emergence of migratory pests and necessary support

In April 2022 reporting in crop monitor of incidences of outbreak of African Armyworm by 33 counties affecting approx. 542,000 acres enabled the National government to support all affected counties with chemicals and equipment which brought the pests under control. 25,365 litres of pesticides, 450 knapsacks, 115 motorized prayers, 262 handheld ULV sprayers and 595 PPE sets were distributed for control

Impact of crop monitor reports for early warning and food security monitoring



In 2021 and 2022 through the monitor, alerts on impending crop failure and hence effects on food security reported. The reports have enabled the government to intervene

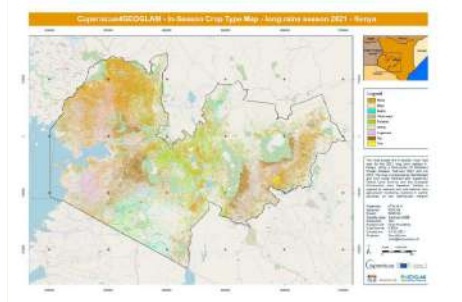
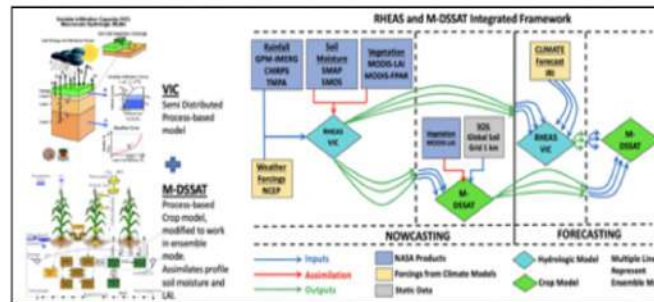
When the expected production is good, the monitor provides evidence



The crop monitor reports facilitates validation of the annual production data with evidence of crop performance

Other EO-Related Projects

- Helmets Labeling Crops for ground data collection (Top)
- GIS-Enabled Sampling in Crop Insurance Programme (Middle)
- Crop production forecasting with RHEAS (Bottom Left)
- Crop-type mapping (bottom right)



How EO Is Supporting Our Mandate

Enhanced
Management of Food
Security

Policy makers
evidence-based
decision-making

Enhanced farmers
awareness; Climate
change mitigation;
farmers' resilience

Enhanced farmers
information
sharing (Advisory
services)

CONCLUSION AND WAY FORWARD

- We are in the 3rd Industrial Revolution defined by Data and Digitization
- Kenya is open to work with partners to **continue to develop capacity** to improve forecasting, management of agricultural data and food security monitoring using EO tools-EO tools constantly evolving.
- There is huge and **growing potential in use of EO tools to improve decision making**, management of food security and farmers' incomes
- Partners: University of Maryland/NASA Harvest, Copernicus4GEOGLAM, NASA SERVIR, RCMRD among others