



Gates Foundation



Crop Yield Forecast Estimates June 2025

Partnership for Inclusive Agricultural Transformation in Africa (PIATA)
The Regional Food Balance Sheet

Preface

Acknowledgments and Disclaimer

This publication was produced with support from the **UK Government's Foreign, Commonwealth, and Development Office (FCDO)**, **Gates Foundation (GF)** and **The Rockefeller Foundation**

The RFBS Initiative, anchored under the Common Market for Eastern and Southern Africa (COMESA), is supported by analytical and technology partners including: Xylem Lab-NASA Harvest/University of Maryland, Tetra Tech, Bureau for Food and Agricultural Policy, and Other key regional data providers.

This report was prepared by Xylem Lab, which leads the NASA Harvest Africa Initiatives at the University of Maryland.

Disclaimer

The opinions expressed in this report are those of the authors and do not necessarily reflect the official policy or position of AGRA, its employees, partners, or affiliates. While every effort has been made to ensure the accuracy and completeness of the information, we assume no responsibility for any errors, inaccuracies, omissions, or inconsistencies herein. The mention of specific companies, manufacturers, or their products, whether or not patented, does not imply endorsement, recommendation, or approval by AGRA, its employees, partners, or affiliates in preference to others of a similar nature not mentioned. The descriptions, charts, and maps used do not imply any opinion on the part of AGRA concerning any country's development, legal, or constitutional status.



Project Lead: Dr. Catherine Nakalembe
Xylem Lab/NASA Harvest-Africa Team
June 2025



Overview

This report summarizes yield, acreage, and total production estimates for maize, rice, and beans across six focus countries. The data is updated monthly in the RFBS Dashboard via a standard data file. Our model reports on the main growing season for countries with available historical yield data for model training. For detailed growing season imagery by country, please refer to the crop calendars in the various chapters for each country.

Data Limitations and Model Caveats

The data used in this report has limitations due to gaps in historical records and variations in data collection methods:

- Historical data accuracy and consistency vary by country.
- Our model reflects these data gaps, as it is trained on available information.
- We view these limitations as opportunities to improve data sharing and scaling methods with our country partners.

For detailed information about the model and data used in this report, please refer to Appendix A.

Data presented here this month focuses on maize, rice and bean systems in [Kenya](#), [Uganda](#), [Rwanda](#), and [Tanzania's Bimodal Region](#), which are currently in season. Additional information and context for the other priority countries can be found in the [Executive Summary](#). The complete report will include yield, acreage, and total production estimates for these crops for all six priority countries: **Kenya**, **Rwanda**, **Tanzania's Bimodal Region**, and **Uganda**. Satellite data in the current model runs are described in Appendix A.



Contents

Preface	ii
Dashboard Overview	iii
Nomenclature	v
List of Figures	vi
List of Tables	vii
1 Executive Summary	1
1.0.1 Production Forecast Summary	1
1.1 Regional Overview/Conditions	4
1.1.1 Eastern Africa	4
1.2 Country Summary	4
1.2.1 Uganda	4
1.2.2 Rwanda	4
1.2.3 Tanzania	4
1.2.4 Kenya	5
2 Uganda	6
2.1 Regional Crop Conditions and Yield Forecasts	6
2.1.1 Production Forecasts	8
3 Rwanda	11
3.1 Regional Crop Conditions and Yield Forecasts	11
3.1.1 Production Forecasts	13
4 Tanzania	15
4.0.1 Bimodal Regions	15
4.0.2 Production Forecasts	18
5 Kenya	21
5.1 Current Crop Conditions	21
5.1.1 Production Forecasts	24
References	27
A Model Description and Parameters	28
A.1 Crop Conditions Classes	28

Nomenclature

Abbreviations

Abbreviation	Definition
EO	Earth Observation
NDVI	Normalized Difference Vegetation Index
ESI	Evaporative Stress Index
NOAA	National Oceanic and Atmospheric Administration
NASA	National Aeronautics and Space Administration
SMOS	Soil Moisture and Ocean Salinity
GLAM	Global Agriculture Monitoring
CPC	Climate Prediction Center

Data	Source
NDVI	UMD GLAM system
ESI	NASA SERVIR Global
Precipitation	CHIRPS (historical)
NOAA precipitation	CPC (Areas outside of CHIRPS coverage)
Precipitation Forecast	CHIRPS-GEFS
Soil Moisture	NASA-USDA Global soil moisture, utilizing SMOS data
Temperature	NOAA CPC

List of Figures

1.1 Comparison of Yield Estimates from UMD, USDA, and FAO	2
2.1 Uganda agricultural calendar	6
2.2 Maize, bean, and rice conditions and estimated minimum and maximum production	7
2.3 Average Estimated Production with Min/Max Ranges in Uganda	8
2.4 Regional maize yield forecasts for Uganda	9
2.5 Regional bean yield forecasts for Uganda	9
2.6 Regional rice yield forecasts for Uganda	10
3.1 Rwanda agricultural calendar	11
3.2 Maize, bean, and rice conditions and estimated minimum and maximum production for Rwanda	12
3.3 Average Predicted Production with Min/Max Ranges in Rwanda	13
3.4 Regional maize yield forecasts for Rwanda	13
3.5 Regional bean yield forecasts for Rwanda	14
3.6 Regional rice yield forecasts for Rwanda	14
4.1 Tanzania Crop Calendar	15
4.2 Beans conditions and yield forecasts for the bimodal regions of Tanzania	16
4.3 Maize and rice conditions and estimated minimum and maximum production for the Bimodal regions of Tanzania	17
4.4 Mean Predicted Production with Min/Max Ranges in the Bimodal Regions	18
4.5 Maize yield forecasts for the Bimodal regions of Tanzania	19
4.6 Bean yield forecasts for the Bimodal regions of Tanzania	19
4.7 Rice yield forecasts for the Bimodal regions of Tanzania	20
5.1 Kenya agricultural calendar	21
5.2 Rice conditions and estimated minimum and maximum production for Kenya	22
5.3 Maize conditions and estimated minimum and maximum production for Kenya	23
5.4 Mean Predicted Production with Min/Max Ranges in Kenya	24
5.5 Beans conditions and estimated minimum and maximum production for Kenya	25
5.6 Regional maize yield forecasts for Kenya	26
5.7 Regional bean yield forecasts for Kenya	26
5.8 Regional rice yield forecasts for Kenya	27
A.1 Crop Conditions Classification	28

List of Tables

1.1 Historical and Forecast Maize, Bean, and rice Production	3
--	---

Chapter 1

Executive Summary

This report presents national forecasts for **June 2025**, focusing on **maize, rice, and bean production in Tanzania's Bimodal Region, Uganda, Kenya, and Rwanda**. These four countries are currently in their respective crop production seasons, with production underway. Our analysis leverages a yield estimation pipeline combining machine learning with Earth observation data to assess crop conditions at sub-national scales. The methodology integrates multiple satellite-derived indicators, including the Normalized Difference Vegetation Index (NDVI), Evaporative Stress Index, and Cumulative Rainfall (see Appendix A).

1.0.1 Production Forecast Summary

Current projections for June 2025 maize, beans and rice production in East Africa show varying forecasts between USDA, FAO and UMD models, as summarized in Table 1.1 and Figure 1.1.

Figure 1.1 compares national-level yield estimates (in million hectares) for maize, bean and rice across Tanzania's Bimodal Region, Uganda, Kenya, and Rwanda based on production data from the United States Department of Agriculture (USDA), Food and Agriculture Organization (FAO) and UMD production estimates. In June 2025, crop production estimates for maize, rice, and beans showed notable changes primarily due to the geographic scope of reporting, especially in Tanzania where only the bimodal region was considered, resulting in sharp declines compared to May (e.g., maize dropped from 4.6 - 7.2M MT to 1.9 - 2.6M MT; beans from 2.6 - 2.8M MT to 1.04 - 1.2M MT). In contrast, Kenya and Uganda saw slight increases in maize and rice production (e.g., Uganda's maize rose from 0.42 - 0.62M MT to 0.5 - 0.63M MT), while bean estimates remained relatively stable across all countries. USDA and FAO estimates remained mostly constant, highlighting UMD's responsiveness to seasonal and regional shifts. Overall, June data reflects ongoing post-harvest transitions and region-specific reporting adjustments, particularly in Tanzania.

Season Overview and Analysis

Our modeling integrates historical yield data with satellite observations covering the January-June growing period, including vegetation health, water stress, temperature extremes, and soil moisture. These assessments are designed to complement the Regional Food Balance Sheet by providing data-driven insights for agricultural policy and decision-making.

Figure 1.1: This figure compares national-level yield estimates (in million hectares) for maize, bean and rice across Tanzania's Bimodal Region, Uganda, Kenya, and Rwanda based on production data from the United States Department of Agriculture (USDA), Food and Agriculture Organization (FAO) and UMD production estimates. UMD estimates include a range represented by minimum and maximum values, with the average shown as a blue bar and capped error bars indicating variability.

USDA and FAO estimates are shown as single average values using green and yellow bars, respectively. Tanzania's prediction for this period only covers the bimodal region; hence, the sharp decline in production estimates compared to last month. *NB: Estimates from FAO are for 2023.*

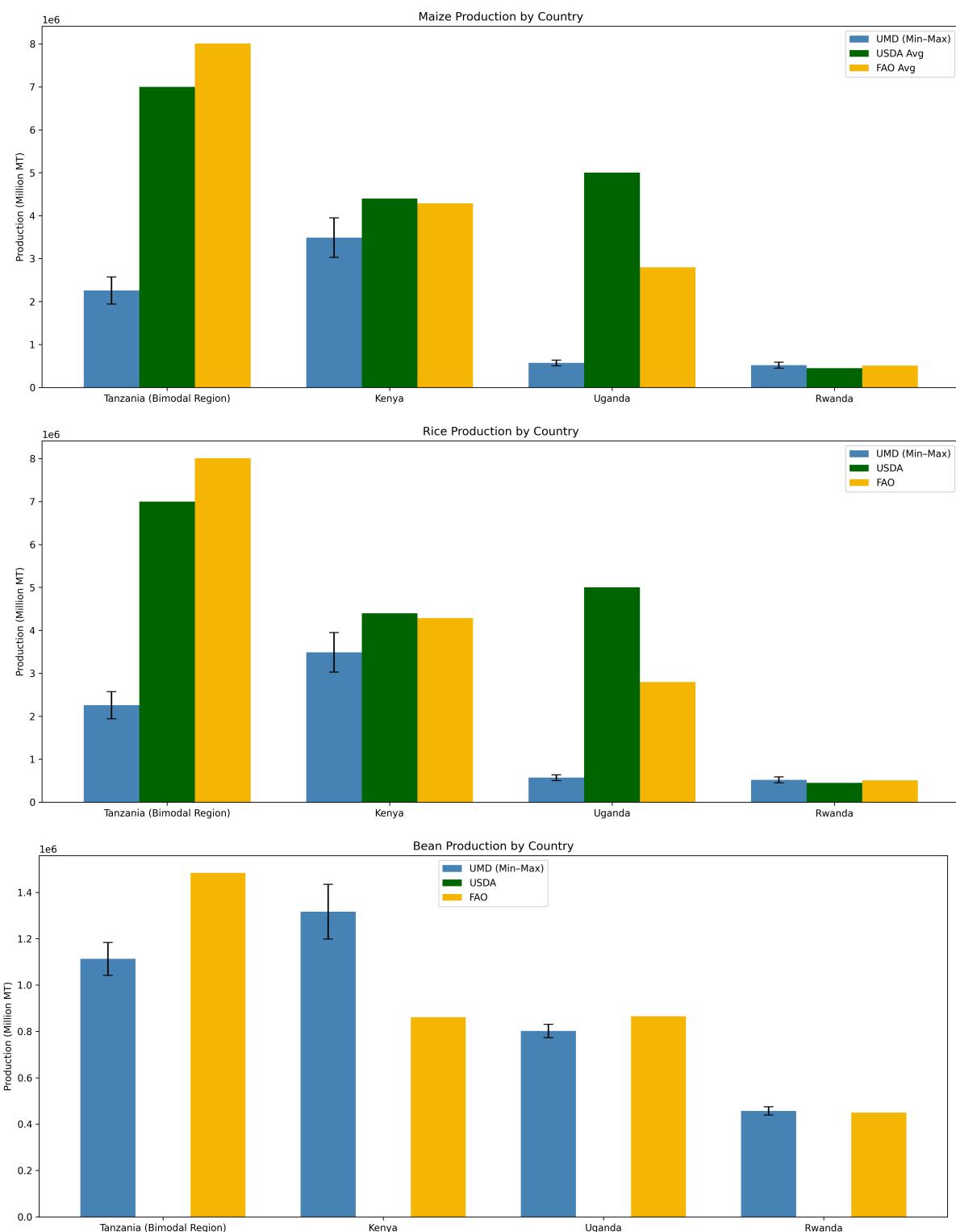


Table 1.1: This figure shows maize, rice and bean production estimates for 2025 from USDA and University of Maryland (UMD) models. Whereas estimates from FAO are from 2023. Tanzania's prediction for this period only covers the bimodal region(*)

Country	Crop	Source	Area (Million ha)	Yield (MT/ha)	Min - Max Prod. (Million MT)
Tanzania *	Maize	USDA	4.0	1.75	7.0
		FAO	4.2	1.9	8.0
		UMD	1.3	1.6	1.9 - 2.6
	Rice	USDA	1.1	3.37	3.8
		FAO	1.2	3	3.58
		UMD	1.4	1.56	2.1 - 2.7
	Bean	FAO	1.1	1.37	1.5
		UMD	1.4	0.7	1.04 - 1.2
	Kenya	USDA	2.3	1.91	4.4
		FAO	2.4	1.76	4.28
		UMD	2.5	1.81	3.0 - 3.9
		USDA	0.06	5.18	0.21
	Rice	FAO	0.038	5.8	0.23
		UMD	0.4	2.1	0.82 - 0.94
		FAO	1.2	0.7	0.86
	Bean	UMD	1.3	0.56	0.59 - 0.73
		USDA	2.3	2.17	5.0
Uganda	Maize	FAO	1.1	2.5	2.8
		UMD	0.3	1.81	0.5 - 0.63
		USDA	0.23	1.59	0.24
	Rice	FAO	0.2	1.3	0.26
		UMD	1.0	1.32	1.2 - 1.4
		FAO	1.1	0.74	0.86
	Bean	UMD	1.03	0.77	0.77 - 0.83
		USDA	0.3	1.5	0.45
Rwanda	Maize	FAO	0.32	1.59	0.51
		UMD	0.31	1.7	0.45 - 0.59
		USDA	0.31	1.59	0.45 - 0.59
	Rice	FAO	0.032	4.1	0.13
		UMD	0.6	2.4	1.4 - 1.6
		FAO	0.62	0.72	0.45
	Bean	UMD	0.63	0.73	0.44 - 0.47
		USDA	0.3	1.5	0.45



1.1 Regional Overview/Conditions

1.1.1 Eastern Africa

In June 2025, climate conditions across Kenya, Uganda, Rwanda, and Tanzania reflected the seasonal transition into the dry period for much of the region. Western Kenya and eastern Uganda experienced above-normal rainfall, especially around Lake Victoria and parts of the highlands, while most of central and eastern Kenya remained generally dry. Uganda began its dry season, though localized heavy rains were recorded in the north and east. Rwanda entered its major dry season with minimal precipitation, particularly in the eastern lowlands. Tanzania also experienced dry conditions typical of its long dry season, with cooler temperatures in the highlands and warm, humid conditions along the coast.

1.2 Country Summary

1.2.1 Uganda

Crop conditions in Uganda showed **modest improvements** compared to May. Maize conditions improved in the Central and Northern regions, shifting from **poor to favorable and improving**, while Eastern and Western regions remained stable. Bean conditions remained mixed, with favorable status in Central and Western Uganda, but continued watch conditions in the North and East. Rice conditions **declined overall, especially in Central and Northern regions** where poor conditions persisted, but **Eastern Uganda improved significantly**, shifting from poor to favorable with a notable yield anomaly increase. Compared to May, the June outlook reflects gradual recovery in maize and rice in select regions, while beans remain mostly stable with localized improvement.

1.2.2 Rwanda

In June 2025, crop conditions in Rwanda remained largely stable compared to May. **Favorable conditions** for maize, beans, and rice continued in **Amajyepfo** and **Amajyaruguru**, with positive yield anomalies. **Iburengerazuba** also maintained favorable rice and maize performance. However, **Iburasirazuba** and **Umujiyi wa Kigali** continued to experience **poor rice and maize conditions**, similar to last month. Production forecast shows that **Iburasirazuba leads in average production for beans, maize, and rice**, particularly maize (**474,064–567,026 tons**), though with high prediction uncertainty. **Amajyepfo** and **Iburengerazuba** also report strong outputs with narrower ranges, while **Umujiyi wa Kigali** remains the **least productive province**, especially for rice. Overall, there were **no major shifts in regional crop conditions**, with improvement still needed in eastern.

1.2.3 Tanzania

Crop conditions in Tanzania's bimodal region showed overall improvement compared to May. **Maize conditions strengthened**, with most regions now under **favorable status**, though some coastal zones like **Dar es Salaam** and **Kusini Pemba** remain

poor. **Rice conditions** were mixed with poor conditions in several coastal and island regions, but **improving in highland areas** like **Manyara** and **Arusha**, where yields are now among the highest. **Beans remained mostly stable**, with favorable conditions holding steady in several western and lake regions. Overall, trends point to **gradual recovery**, especially for maize and rice in key inland zones.

1.2.4 Kenya

This month, Kenya's crop conditions showed regional contrasts. **Maize remained poor** in over half of counties, especially in the east and northeast, with anomalies as low as **-1.08 MgT/ha**. Western and Rift Valley regions reported **favorable to exceptional maize yields**, up to **2.94 MgT/ha**. **Rice was mixed**, with 15 counties showing favorable conditions, while others remained poor. **Beans performed well overall**, though some arid counties continued to face poor conditions. Kenya's production forecast shows that **maize remains the dominant crop**, with the highest outputs in **Turkana, Wajir, and Narok**, each exceeding **160,000 tons**, while **rice is notable in Kirinyaga** and **beans have the lowest production levels** across counties. However, **maize estimates show wide uncertainty ranges**, especially in the Rift Valley and northern regions, indicating variability in forecast confidence.

Chapter 2

Uganda

In bimodal areas, Uganda has two rainy seasons, the first from **March to July** and the second from **September to December**. In the unimodal areas found above 3° North altitude, there is one rainy season from **April to October**. Crop-growing regions are located throughout the country, but the eastern, central, and western regions are most intensely cultivated.

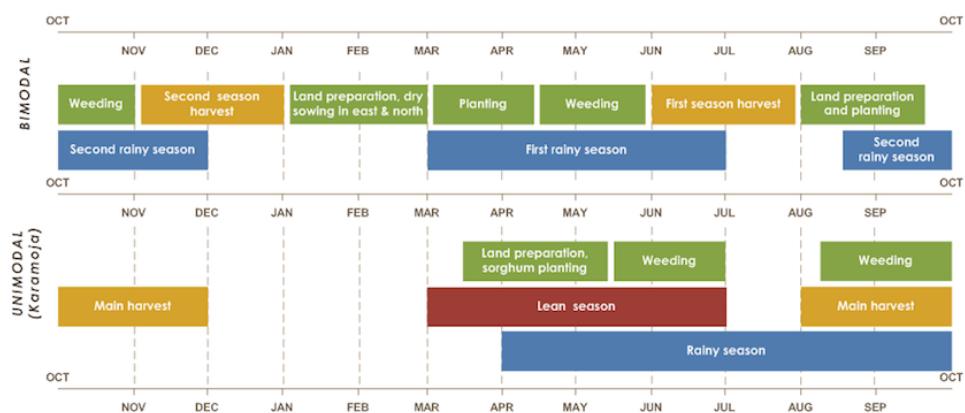


Figure 2.1: Uganda's agricultural calendar

2.1 Regional Crop Conditions and Yield Forecasts

This section provides a summary of crop conditions and yield forecasts for Uganda for June 2025. Overall, conditions vary by region and crop, with signs of improvement in some areas. Beans are performing **favorably** in the Central and Western regions, with yield anomalies slightly above average (up to +0.04 MgT/ha), while conditions remain under watch in the Northern and Eastern regions. Maize continues to show a regional divide: conditions are **favorable** in the Central and Eastern regions with positive yield anomalies (+0.11 MgT/ha), whereas Northern and Western Uganda still experience **poor** conditions, although an improving trend is observed in the North. Rice conditions remain **poor** in Central and Northern Uganda, with negative yield anomalies (down to -0.16 MgT/ha), but Eastern Uganda shows marked improvement to **favorable** status with a strong positive anomaly of +0.36 MgT/ha. Trends in most regions are stable, with signs of improvement where **favorable** conditions are emerging.

The table 2.2 below summarizes the notable updates for Uganda maize, beans and

rice. Only major changes in conditions or forecast yield are highlighted here.

Figure 2.2: Maize, bean, and rice conditions as of June 2025 and the estimated minimum and maximum production forecast for July 2025, showing regional variations in crop performance. This table not only shows predicted yield but also estimated crop production minimum and maximum ranges with their uncertainty across counties using standard deviation.

Crop Conditions and Yield Forecast for Uganda

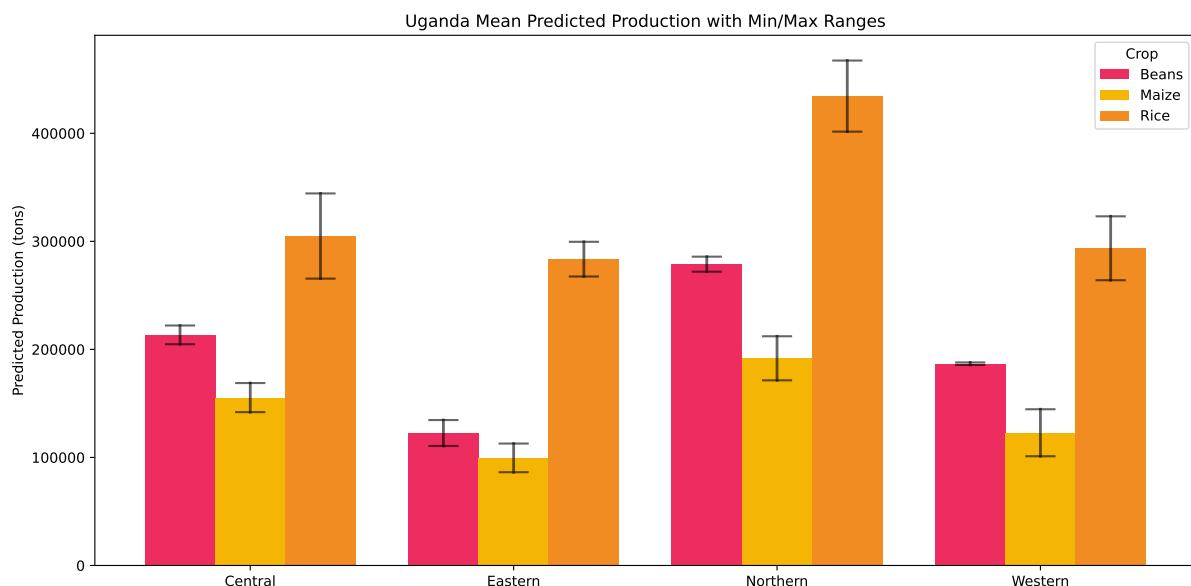
County	Area	Predicted Yield	Predicted Prod.	Yield Anomaly	Current Conditions	Trend
beans						
Eastern	168,996	0.73	110,601 - 134,598	-0.05	Watch	Stable
Northern	365,534	0.76	271,928 - 285,819	-0.01	Watch	Stable
Western	236,621	0.79	185,566 - 187,932	0.02	Favorable	Stable
Central	262,847	0.81	204,756 - 222,104	0.04	Favorable	Stable
maize						
Western	72,771	1.69	101,094 - 144,586	-0.12	Poor	Stable
Northern	112,417	1.71	171,367 - 212,136	-0.10	Poor	Improving
Eastern	51,973	1.92	86,306 - 112,837	0.11	Favorable	Stable
Central	80,837	1.92	141,926 - 168,840	0.11	Favorable	Improving
rice						
Central	262,847	1.16	265,482 - 344,337	-0.16	Poor	Stable
Northern	365,534	1.19	401,542 - 467,338	-0.13	Poor	Stable
Western	236,621	1.24	264,005 - 323,160	-0.08	Watch	Stable
Eastern	168,996	1.68	267,464 - 299,574	0.36	Favorable	Improving

Poor Watch Favorable Exceptional

Source: Satellite data analysis

2.1.1 Production Forecasts

Figure 2.3: This figure summarizes the June 2025 mean predicted production for **maize, beans, and rice** across Uganda's four regions. The **Northern region** leads in production for all three crops, especially rice (**401,542–467,338 tons**) and beans (**271,928–285,819 tons**), with rice showing the widest range, indicating higher forecast uncertainty. **Maize production** is also highest in the North (**171,367–212,136 tons**), followed closely by Central. In contrast, the **Eastern and Western regions** show relatively lower production levels for all crops, though their maize and rice forecasts exhibit narrower ranges, implying greater prediction confidence. **Beans** display the most consistent and stable forecast ranges across all regions. Refer to Table 2.2 for estimated production ranges. **NB:** *The vertical black lines and caps indicate the minimum and maximum estimated production range for each region.*



Further analysis of yield forecasts and anomalies is presented in Figures 2.4, 2.5, and 2.6 showing the spatial distribution of the projected maize, bean, and rice yield for Uganda's end of season.

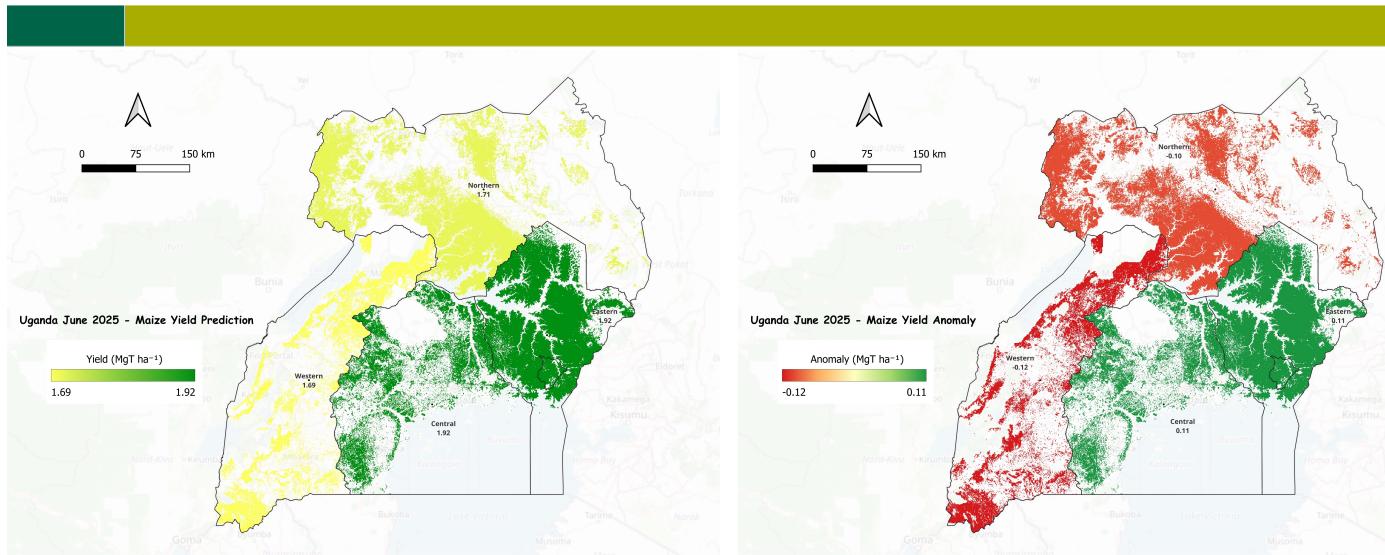


Figure 2.4: (a) End-of-season maize yield forecast for Uganda and (b) Yield anomaly projections based on satellite data and machine learning analysis. Predicted maize yield range from 1.69 to 1.92 MgT/ha, with the highest yields observed in Eastern (1.92 MgT/ha) and Central (1.92 MgT/ha) regions, while Western (1.69 MgT/ha) and Northern (1.71 MgT/ha) regions recorded lower values. Yield anomalies reveal positive deviations in Central and Eastern Uganda (up to +0.11 MgT/ha), whereas Northern and Western regions experienced negative anomalies as low as -0.12 MgT/ha, indicating subpar maize performance in those areas.

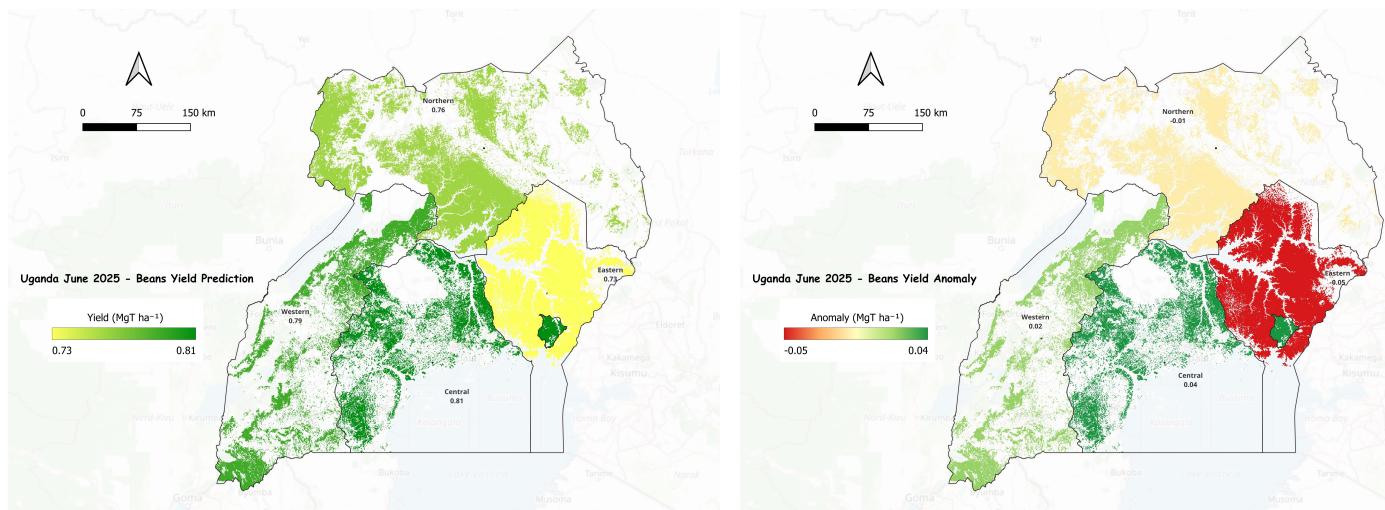


Figure 2.5: (a) End-of-season bean yield forecast for Uganda and (b) Yield anomaly projections based on satellite data and machine learning analysis. Predicted Bean yields range from 0.73 to 0.81 MgT/ha, with Central (0.81 MgT/ha, +0.04 anomaly) and Western (0.79 MgT/ha, +0.02 anomaly) regions performing best, while Eastern Uganda recorded the lowest yield (0.73 MgT/ha) and a negative anomaly of -0.05 MgT/ha, indicating below-average conditions there.

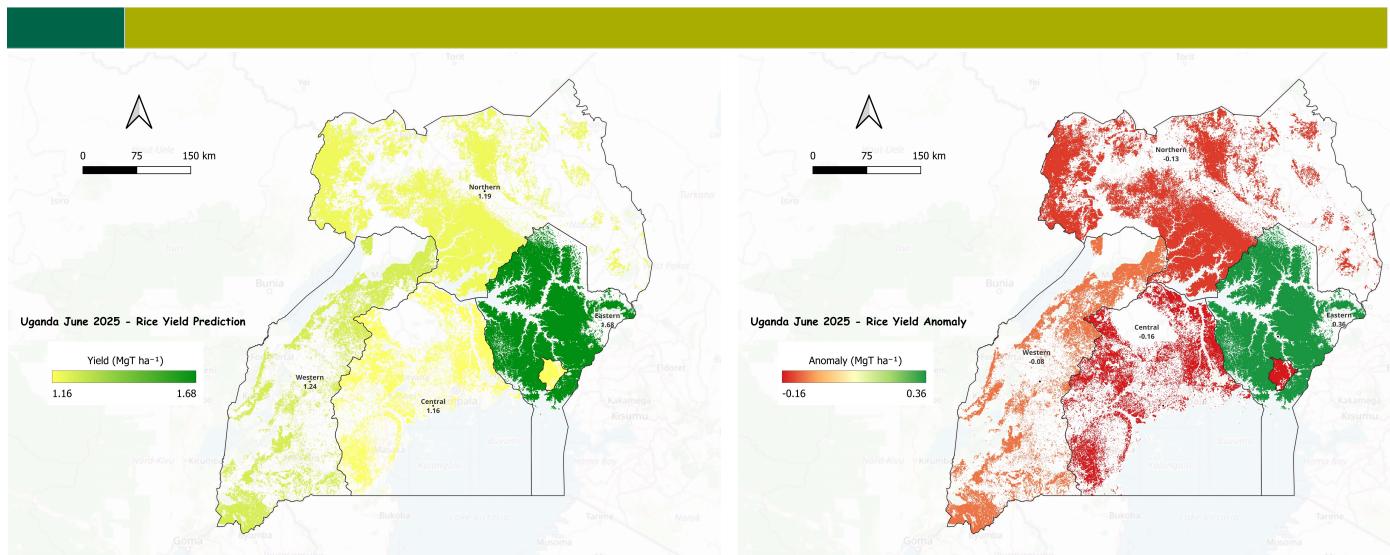


Figure 2.6: (a) End-of-season rice yield forecast for Uganda and (b) Yield anomaly projections based on satellite data and machine learning analysis. Uganda's predicted rice yields range from 1.16 to 1.68 MgT/ha , with Eastern Uganda performing best (1.68 MgT/ha , +0.36 anomaly), while Central (1.16 MgT/ha , -0.16 anomaly) and Northern (1.19 MgT/ha , -0.13 anomaly) regions showed below-average yields, indicating strong spatial disparities in rice performance.

Chapter 3

Rwanda

Rwanda has two rainy seasons with crop-growing regions throughout the country, largely concentrated in the East. The long rainy season lasts from **March to May** and the short rainy season lasts from **October to December**.

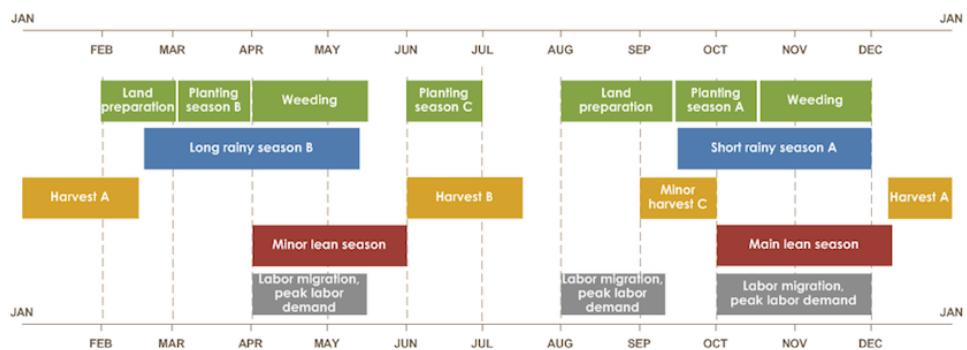


Figure 3.1: Rwanda's agricultural calendar

3.1 Regional Crop Conditions and Yield Forecasts

This section summarizes crop conditions and yield forecasts for Rwanda for June 2025 during the Long Rainy Season B. Crop conditions remained stable across all regions, with several areas continuing to experience **favorable** outlooks. Maize conditions are **favorable** in Amajyepfo and Amajyaruguru, with yield anomalies reaching up to +0.07 MgT/ha, while Iburasirazuba remains under **poor** conditions (-0.10 MgT/ha). Beans remain under watch in most regions, except in Amajyepfo, where conditions are **favorable** (+0.02 MgT/ha). Rice performance is strongest in Amajyepfo, Amajyaruguru, and Iburengerazuba, with **favorable** yield anomalies ranging from +0.10 to +0.15 MgT/ha, while Umujiyi wa Kigali and Iburasirazuba continue to face **poor** conditions with yield anomalies below -0.17 MgT/ha. Overall, **favorable** zones have remained consistent since May, while poorly performing areas have not shown improvement.

The table 3.2 below summarizes Rwanda's maize, beans and rice crop conditions and yield forecasts.

Figure 3.2: Maize, bean, and rice conditions for Rwanda as of June 2025 and the estimated minimum and maximum production forecast for June 2025, showing regional variations in crop performance. This table not only shows predicted yield but also estimated crop production minimum and maximum ranges with their uncertainty across provinces using standard deviation.

Crop Conditions and Yield Forecast for Rwanda

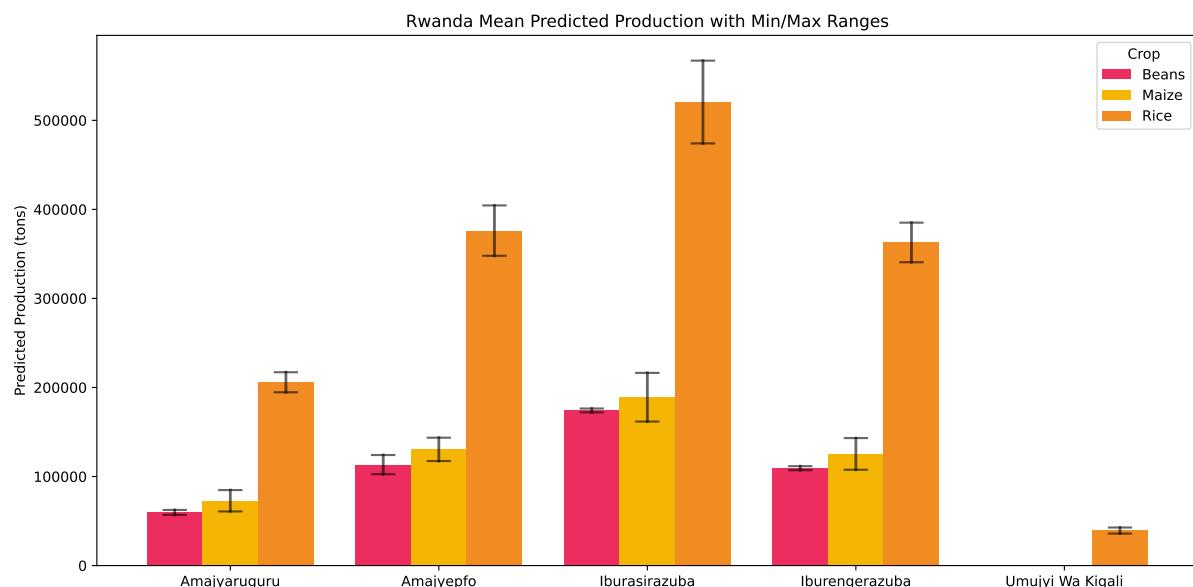
County	Area	Predicted Yield	Predicted Prod.	Yield Anomaly	Current Conditions	Trend
beans						
Amajyaruguru	83,305	0.72	56,978 - 62,476	-0.01	Watch	Stable
Iburasirazuba	240,507	0.72	172,050 - 176,379	-0.01	Watch	Stable
Iburengerazuba	149,599	0.73	107,112 - 111,600	0.00	Watch	Stable
Amajyepfo	151,633	0.75	102,618 - 124,150	0.02	Favorable	Stable
maize						
Iburasirazuba	118,755	1.59	161,747 - 216,390	-0.10	Poor	Stable
Iburengerazuba	74,903	1.67	107,627 - 143,162	-0.02	Watch	Stable
Amajyepfo	74,785	1.75	117,409 - 143,599	0.05	Favorable	Stable
Amajyaruguru	41,197	1.77	60,758 - 84,771	0.07	Favorable	Stable
rice						
Umujyi Wa Kigali	18,027	2.18	35,966 - 42,745	-0.22	Poor	Stable
Iburasirazuba	233,571	2.23	474,064 - 567,026	-0.17	Poor	Stable
Iburengerazuba	145,284	2.50	340,640 - 385,097	0.10	Favorable	Stable
Amajyaruguru	80,902	2.54	194,631 - 217,122	0.14	Favorable	Stable
Amajyepfo	147,259	2.55	347,880 - 404,428	0.15	Favorable	Stable

Poor Watch Favorable Exceptional

Source: Satellite data analysis

3.1.1 Production Forecasts

Figure 3.3: This chart presents the June 2025 mean predicted production for beans, maize, and rice across Rwanda's provinces. **Iburasirazuba** stands out with the **highest average production across all crops**, particularly maize (**474,064–567,026 tons**), but also shows the widest min–max range, indicating greater prediction uncertainty. **Amajyepfo** and **Iburengerazuba** follow with strong maize and rice outputs, both showing narrower confidence intervals than Iburasirazuba. In contrast, **Umujyi wa Kigali** records the **lowest rice production estimate**, ranging from **35,966 to 42,745 tons**, and is the least productive province overall. Beans exhibit relatively stable forecast ranges across all regions. Refer to Table 3.2 for estimated production ranges. **NB: The vertical black lines and caps indicate the minimum and maximum estimated production range for each province.**



Further analysis of yield forecasts and anomalies is presented in Figures 3.4, 3.5, and 3.6 reflecting on the projected maize, bean and rice yield for Rwanda's end of season.

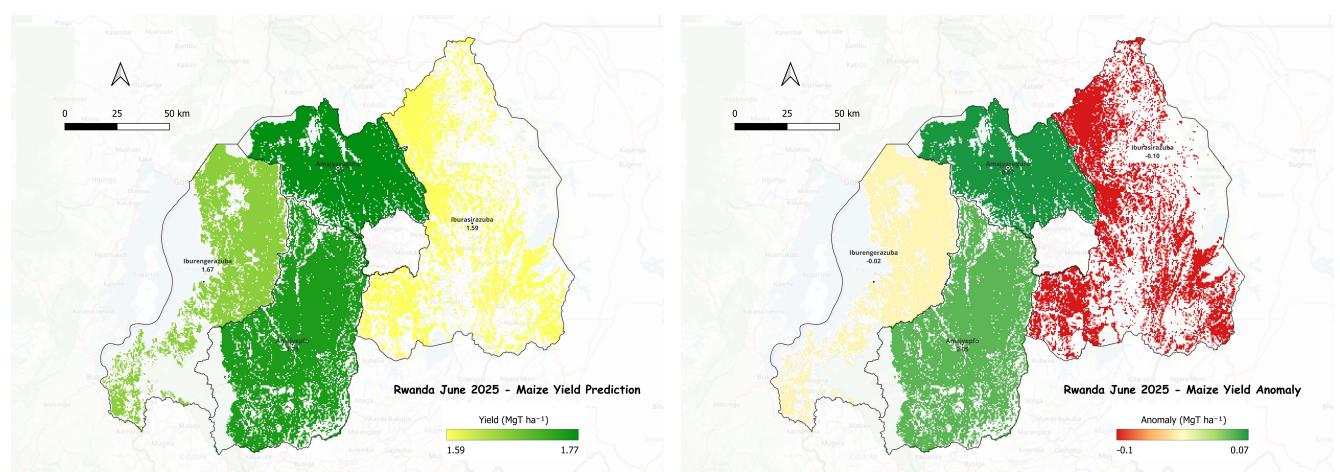


Figure 3.4: (a) End-of-season maize yield forecast for Rwanda and (b) Yield anomaly projections based on satellite data and machine learning analysis. This month, predicted maize yield for Rwanda ranges from 1.59 to 1.77 MgT/ha, with Amajyepfo performing best (1.77 MgT/ha, +0.06 anomaly), while Iburasirazuba had the lowest yield (1.59 MgT/ha) and a negative anomaly of -0.10 MgT/ha, indicating below-average performance in the eastern region.

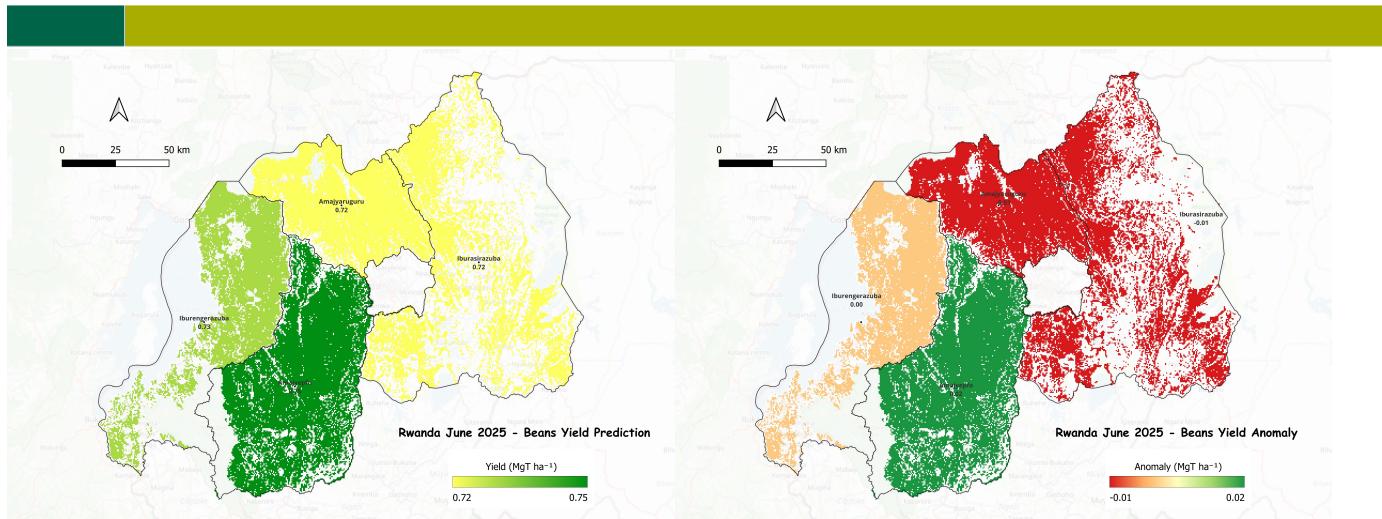


Figure 3.5: (a) End-of-season bean yield forecast for Rwanda and (b) Yield anomaly projections based on satellite data and machine learning analysis. Predicted Bean yields in Rwanda were uniformly low, ranging narrowly from 0.72 to 0.75 MgT/ha, with Amajyepfo slightly ahead at 0.75 MgT/ha, while Iburasirazuba and Amajyaruguru recorded the lowest yields (0.72 MgT/ha) alongside marginal negative anomalies (-0.01 MgT/ha and -0.01 MgT/ha, respectively), indicating overall stable yet modest productivity

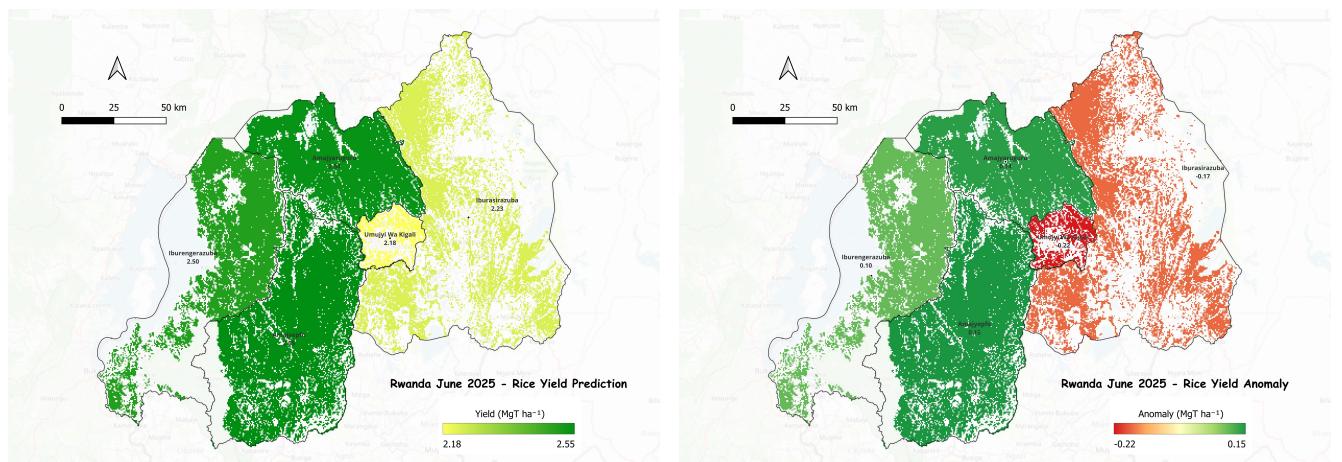


Figure 3.6: (a) End-of-season rice yield forecast for Rwanda and (b) Yield anomaly projections based on satellite data and machine learning analysis. Forecasted rice yields were highest in Amajyepfo (2.55 MgT/ha) and Iburengerazuba (2.50 MgT/ha) with corresponding positive anomalies of 0.15 and 0.10 MgT/ha, whereas Iburasirazuba and Umuyi Wa Kigali recorded the lowest yields at 2.23 and 2.18 MgT/ha, along with negative anomalies of -0.17 and -0.22 MgT/ha, indicating significant underperformance in eastern and central zones



Chapter 4

Tanzania

This chapter analyzes crop conditions and yield forecasts for the current season in Tanzania's Bimodal Region. Tanzania exhibits distinct bimodal (North) and unimodal (South) rainfall patterns.

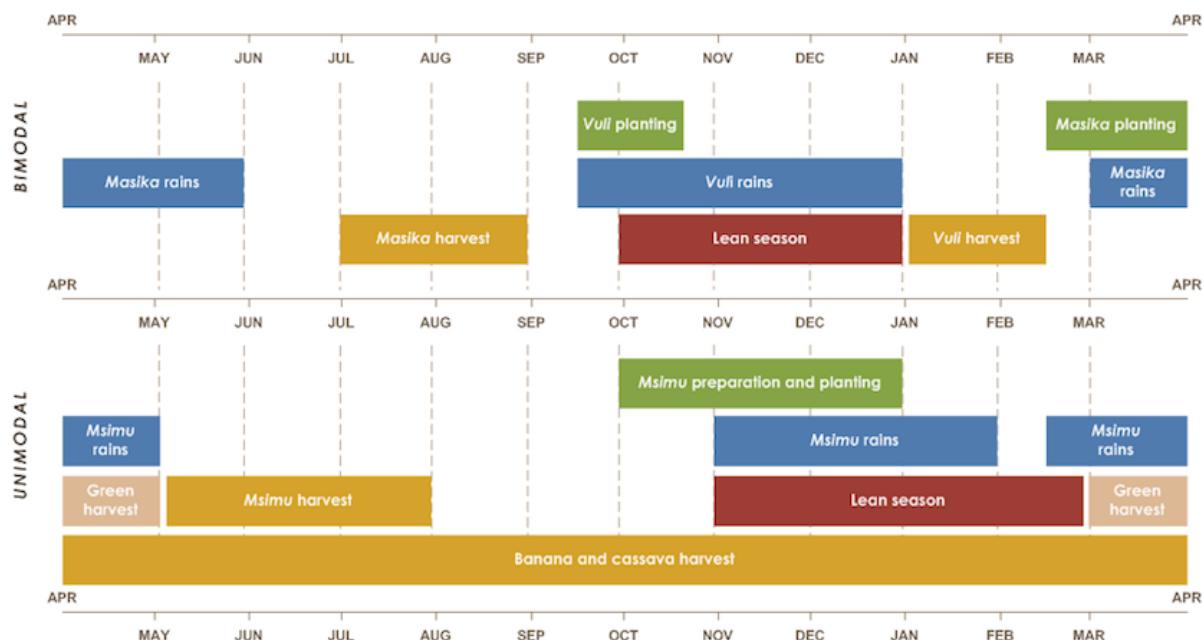


Figure 4.1: Tanzania's agricultural cycles follow two rainfall patterns: bimodal in the north (November-December and March-May) and unimodal in the south (November-April).

4.0.1 Bimodal Regions

Current Crop Condition

In the bimodal region of Tanzania, June 2025 crop conditions show mixed performance across commodities. Maize conditions have improved significantly, with 9 out of 17 regions now experiencing **favorable** conditions, including Kilimanjaro, Arusha, Mwanza, Mara, and Kagera. Yield anomalies range from **-0.43 to +0.50 MgT/ha**, with the highest anomalies in Kilimanjaro and Mara. However, poor conditions persist in Dar es Salaam, Shinyanga, Tanga, and Kusini Pemba. Rice remains largely under **poor** conditions in coastal and island regions like Pwani, Kusini Pemba, and Dar es Salaam, with negative yield anomalies as low as **-0.80 MgT/ha**. In contrast, 10



regions including Manyara, Arusha, and Songwe are under **favorable** conditions, with yield anomalies reaching up to **+0.54 MgT/ha**, and trends improving in Manyara and Arusha. Bean production remains generally **stable**, with most regions in watch conditions, but 8 regions, including Mwanza, Kagera, and Simiyu, reporting **favorable conditions** and yield anomalies ranging from **+0.01 to +0.08 MgT/ha**.

Tables 4.2 and 4.3 present maize, beans and rice conditions and yield forecasts for Tanzania's bimodal regions, integrating satellite data and machine learning predictions. Figures 4.5, 4.6, and 4.7 show spatial regional crop condition summaries.

Figure 4.2: Beans conditions for the bimodal regions of Tanzania as of June 2025, and yield forecasts for July 2025 harvest season based on satellite observations

Beans Conditions and Yield Forecast for Bimodal Regions of Tanzania

County	Area	Predicted Yield	Predicted Prod.	Yield Anomaly	Current Conditions	Trend
beans						
Kusini Pemba	2,114	0.63	927 - 1,748	-0.12	Poor	Stable
Kaskazini Pemba	2,206	0.69	1,125 - 1,937	-0.06	Watch	Stable
Mjini Magharibi	976	0.70	590 - 772	-0.05	Watch	Stable
Arusha	161,581	0.71	107,382 - 122,248	-0.04	Watch	Stable
Kilimanjaro	55,806	0.71	39,378 - 40,383	-0.04	Watch	Stable
Kaskazini Unguja	1,971	0.72	1,217 - 1,615	-0.03	Watch	Stable
Dar Es Salaam	6,871	0.72	4,082 - 5,841	-0.03	Watch	Stable
Pwani	136,504	0.74	99,013 - 101,743	-0.02	Watch	Stable
Manyara	195,153	0.75	139,395 - 152,665	0.00	Watch	Stable
Kusini Unguja	3,769	0.76	2,639 - 3,061	0.00	Watch	Stable
Tanga	122,714	0.77	88,701 - 99,745	0.01	Favorable	Stable
Simiyu	102,982	0.79	72,485 - 89,375	0.03	Favorable	Stable
Shinyanga	70,095	0.80	55,661 - 55,941	0.04	Favorable	Stable
Mara	131,550	0.80	89,911 - 120,957	0.05	Favorable	Stable
Songwe	91,491	0.81	70,206 - 77,526	0.05	Favorable	Stable
Geita	89,451	0.81	70,684 - 74,262	0.06	Favorable	Stable
Kagera	156,822	0.82	114,966 - 142,566	0.07	Favorable	Stable
Mwanza	105,006	0.83	83,816 - 90,746	0.08	Favorable	Stable

Poor Watch Favorable Exceptional

Source: Satellite data analysis

Figure 4.3: Maize and rice conditions for the Bimodal regions of Tanzania as of June 2025 and the estimated minimum and maximum production forecast for July 2025, showing regional variations in crop performance. This table not only shows predicted yield but also estimated crop production levels with their uncertainty across counties using standard deviation.

Crop Conditions and Yield Forecast for Bimodal Regions of Tanzania

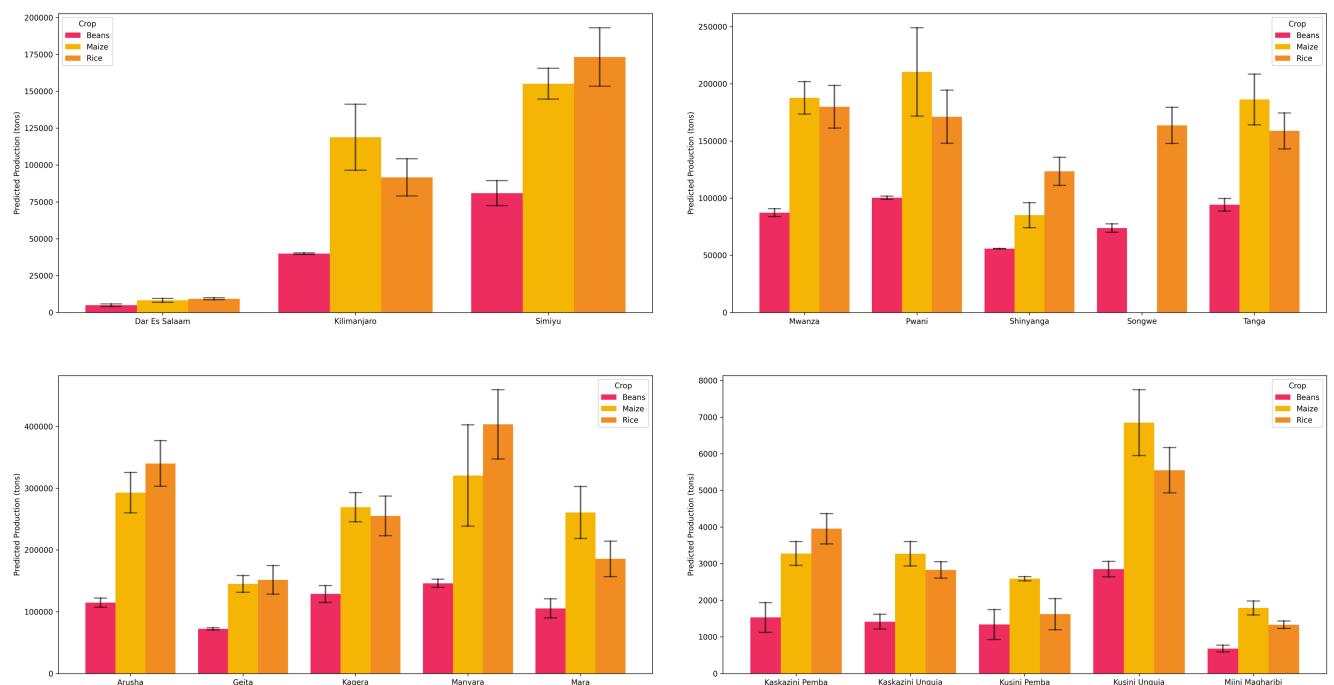
County	Area	Predicted Yield	Predicted Prod.	Yield Anomaly	Current Conditions	Trend
maize						
Dar Es Salaam	6,871	1.20	6,948 - 9,534	-0.43	Poor	Stable
Shinyanga	70,095	1.21	74,197 - 95,984	-0.42	Poor	Improving
Kusini Pemba	2,115	1.22	2,529 - 2,647	-0.41	Poor	Stable
Kaskazini Pemba	2,207	1.48	2,951 - 3,601	-0.14	Poor	Improving
Simiyu	102,983	1.51	144,663 - 165,653	-0.12	Poor	Improving
Tanga	122,715	1.52	164,087 - 208,446	-0.11	Poor	Stable
Pwani	136,503	1.54	171,783 - 249,008	-0.09	Poor	Improving
Geita	89,451	1.62	131,602 - 158,576	-0.01	Watch	Improving
Manyara	195,151	1.64	238,548 - 402,594	0.01	Favorable	Stable
Kaskazini Unguja	1,971	1.66	2,937 - 3,603	0.03	Favorable	Improving
Kagera	156,823	1.72	245,697 - 292,840	0.09	Favorable	Improving
Mwanza	105,007	1.79	173,602 - 201,931	0.16	Favorable	Improving
Arusha	161,579	1.81	260,212 - 325,443	0.18	Favorable	Stable
Kusini Unguja	3,767	1.82	5,951 - 7,747	0.19	Favorable	Improving
Mjini Magharibi	975	1.83	1,599 - 1,982	0.21	Favorable	Improving
Mara	131,551	1.98	218,648 - 302,891	0.35	Favorable	Improving
Kilimanjaro	55,807	2.13	96,527 - 141,263	0.50	Favorable	Stable
rice						
Kusini Pemba	2,114	0.77	1,195 - 2,045	-0.80	Poor	Declining
Pwani	136,504	1.25	147,985 - 194,397	-0.31	Poor	Declining
Tanga	122,714	1.29	143,158 - 174,573	-0.27	Poor	Declining
Dar Es Salaam	6,871	1.35	8,663 - 9,941	-0.21	Poor	Stable
Mjini Magharibi	976	1.36	1,230 - 1,433	-0.20	Poor	Stable
Mara	131,550	1.41	156,906 - 214,262	-0.16	Poor	Stable
Kaskazini Unguja	1,971	1.44	2,604 - 3,054	-0.13	Poor	Stable
Kusini Unguja	3,769	1.47	4,932 - 6,168	-0.10	Poor	Stable
Kagera	156,822	1.63	223,068 - 287,365	0.06	Favorable	Stable
Kilimanjaro	55,806	1.64	79,086 - 104,310	0.07	Favorable	Stable
Simiyu	102,982	1.68	153,536 - 193,082	0.11	Favorable	Stable
Geita	89,451	1.70	128,505 - 174,841	0.13	Favorable	Stable
Mwanza	105,006	1.71	161,265 - 198,647	0.15	Favorable	Stable
Shinyanga	70,095	1.76	111,212 - 135,746	0.19	Favorable	Stable
Songwe	91,491	1.79	147,856 - 179,512	0.22	Favorable	Stable
Kaskazini Pemba	2,206	1.79	3,538 - 4,368	0.22	Favorable	Stable
Manyara	195,153	2.07	347,449 - 459,467	0.50	Favorable	Improving
Arusha	161,581	2.10	303,058 - 377,063	0.54	Favorable	Improving

Poor Watch Favorable Exceptional

Source: Satellite data analysis

4.0.2 Production Forecasts

Figure 4.4: The June 2025 production forecast for Tanzania's **bimodal region** shows that **rice continues to dominate total crop output**, followed by maize, while beans consistently record the lowest production volumes. Leading production zones include **Manyara**, and **Arusha**, each surpassing **300,000 tons** in maize or rice output. In contrast, **Mjini Magharibi** and **Kusini Pemba** produce the least across all three crops. While production levels are high in several areas, **prediction uncertainty is notable**, especially for maize and rice in **Pwani**, **Simiyu**, and **Manyara**, as shown by wide error bars. These regional differences highlight the spatial variability in output across the bimodal zone. Refer to tables 4.3 and 4.2 for estimated production ranges. **NB: The vertical black lines and caps indicate the minimum and maximum estimated production range for each county.**



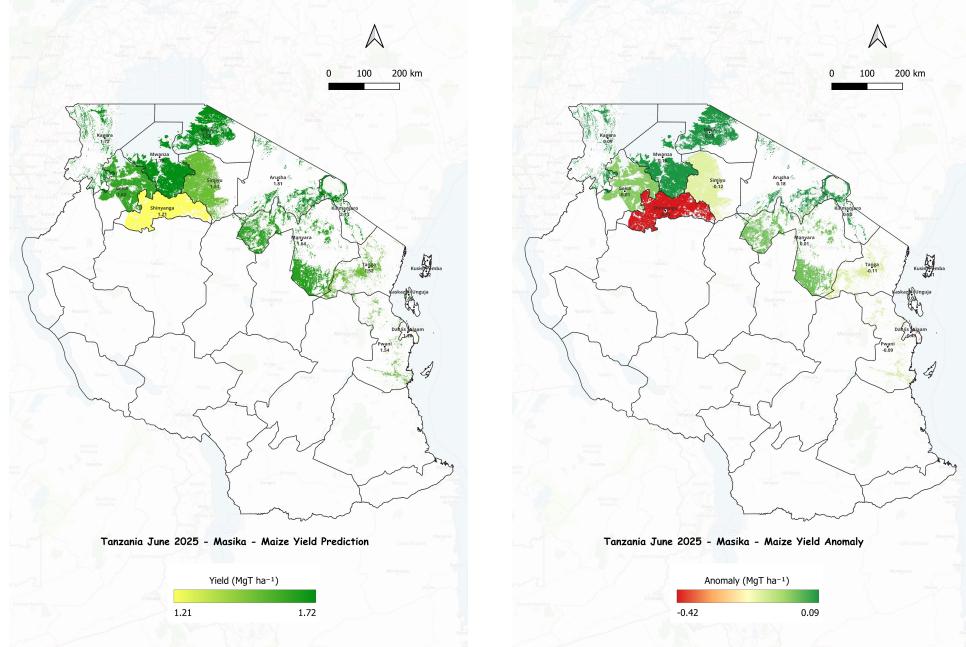


Figure 4.5: (a) End-of-season maize yield forecast for the bimodal regions of Tanzania and (b) Yield anomaly projections based on satellite data and machine learning analysis. This month, the Tanzania bimodal region recorded relatively strong maize yields in areas like Geita (1.72 MgT/ha) and Mara (1.70 MgT/ha), while Shinyanga had the lowest yield at 1.21 MgT/ha and also experienced the most negative yield anomaly at -0.42 MgT/ha, indicating significant production stress

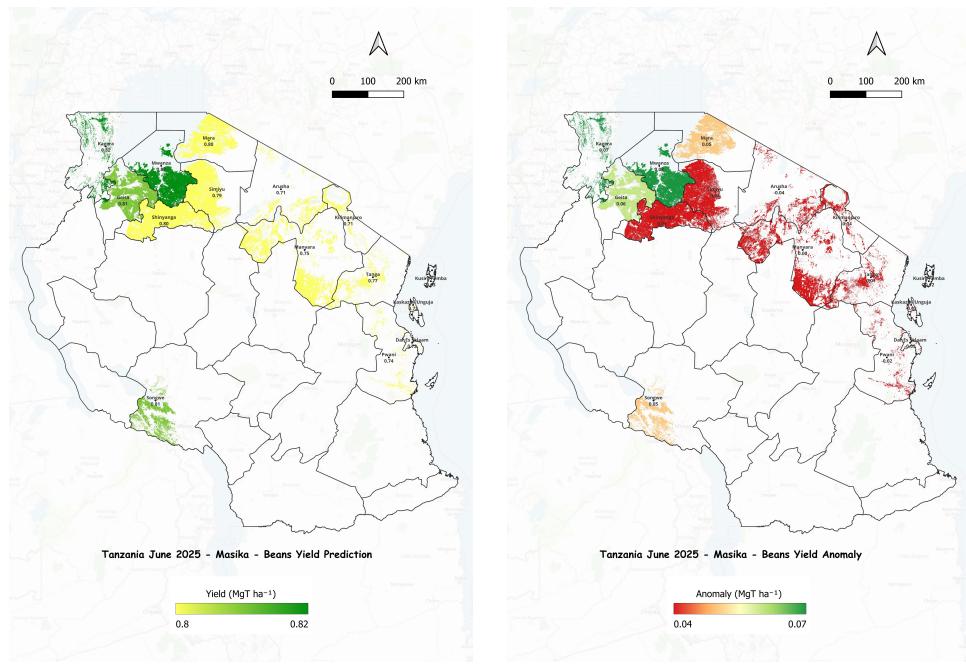


Figure 4.6: (a) End-of-season bean yield forecast for the bimodal regions of Tanzania and (b) Yield anomaly projections based on satellite data and machine learning analysis. Beans yield predictions were modest across the region, with Shinyanga showing the highest yield (0.82 MgT/ha) and Singida the lowest (0.71 MgT/ha), but widespread negative anomalies—particularly in Manyara (-0.07 MgT/ha) and Tanga (-0.07 MgT/ha)—signal below-average performance across most bean-producing zones.

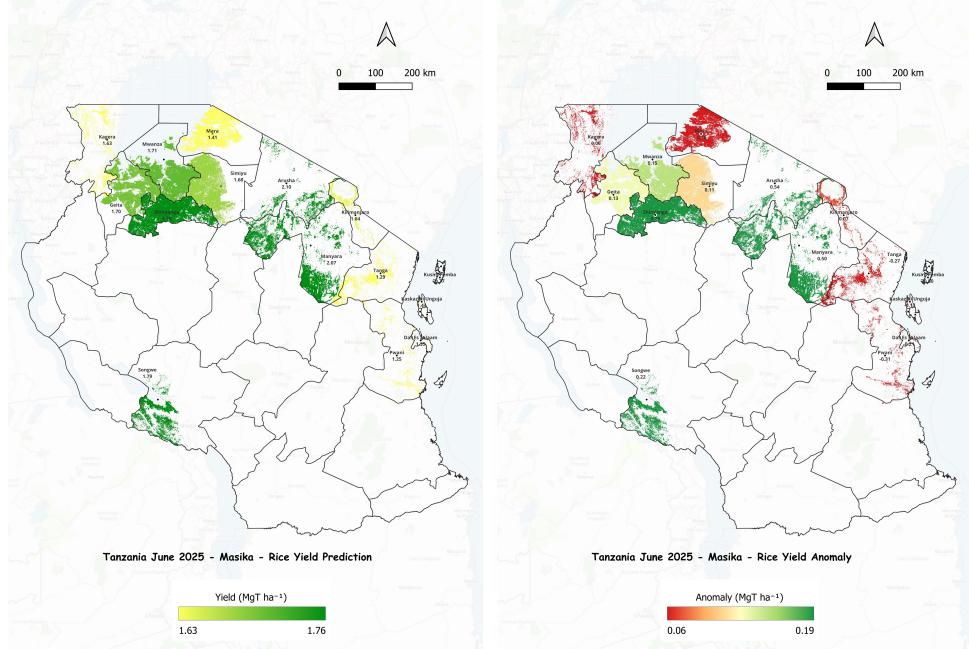


Figure 4.7: (a) End-of-season rice yield forecast for the bimodal regions of Tanzania and (b) Yield anomaly projections based on satellite data and machine learning analysis. Rice showed favorable outcomes in regions like Songwe (1.77 MgT/ha) and Manyara (2.07 MgT/ha), supported by positive anomalies (e.g., Songwe at $+0.19 \text{ MgT/ha}$ and Manyara at $+0.09 \text{ MgT/ha}$), while Tanga (1.53 MgT/ha) and Pwani (1.55 MgT/ha) saw yield declines with anomalies of -0.23 MgT/ha and -0.22 MgT/ha respectively.

Chapter 5

Kenya

Kenya's agricultural patterns are characterized by distinct growing regions with different rainfall patterns:

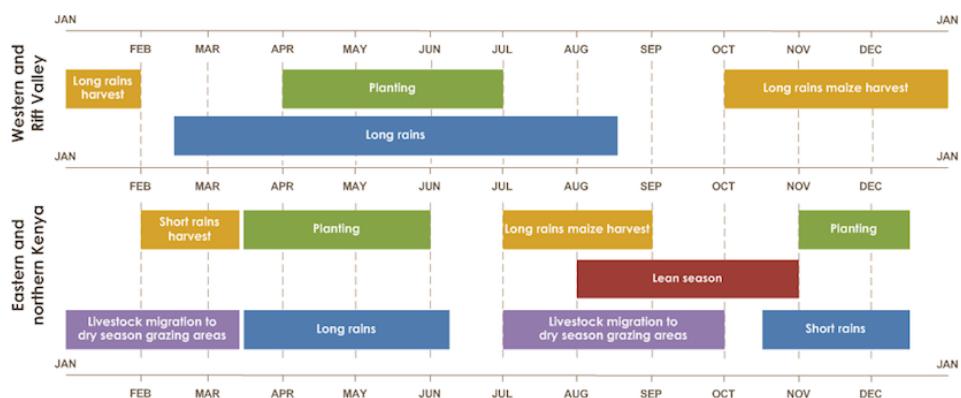


Figure 5.1: Kenya's agricultural calendar shows distinct regional patterns: the Rift Valley and Western regions follow a unimodal pattern with long rains (February-August), planting (April-June), and harvest (October-December), while the Eastern and Northern regions exhibit a bimodal pattern with two seasons - long rains (March-June planting, July-August harvest) and short rains (October-December planting, February-March harvest).

5.1 Current Crop Conditions

This month marks the peak of the planting season in Kenya, with crop conditions showing clear regional contrasts. **Maize remains in poor condition in 23 out of 47 counties**, particularly in eastern and northeastern regions such as Makueni, Wajir, Kitui, and Garissa. These areas show significant yield deficits, with anomalies ranging from **-0.44 to -1.08 MgT/ha**. However, western and Rift Valley counties like Nakuru, Bomet, and Elgeyo-Marakwet report **favorable to exceptional conditions**, with predicted yields between **1.72 and 2.94 MgT/ha**, exceeding seasonal norms. **Rice conditions remain mixed**, with continued **poor** performance in parts of central and coastal Kenya, including Nyandarua, Nakuru, Kilifi, and Lamu. Meanwhile, favorable conditions are seen in **13 counties**, including Kakamega, Siaya, Bungoma, and Kirinyaga, with positive yield anomalies up to **+0.35 MgT/ha**. **Beans continue to perform well**, with most counties under favorable or watch status. However, **poor conditions persist** in arid and semi-arid counties such as Marsabit, Garissa, Wajir,

Kitui, and Tana River. Overall, crop prospects are stable to improving in high-potential zones, while stress remains in traditionally drier areas.

The table 5.3, 5.2 and 5.5 below summarize Kenya's maize, beans and rice crop conditions and yield forecasts.

Figure 5.2: Rice conditions for Kenya as of June 2025 and the estimated minimum and maximum production forecast for August 2025, showing regional variations in crop performance. This table not only shows predicted yield but also estimated crop production levels with their uncertainty across counties using standard deviation.

Rice Conditions and Yield Forecast for Kenya

County	Area	Predicted Yield	Predicted Prod.	Yield Anomaly	Current Conditions	Trend
rice						
Nyandarua	7,196	1.75	12,259 - 12,965	-0.33	Poor	Declining
Nakuru	16,621	1.82	28,733 - 31,891	-0.26	Poor	Declining
Kilifi	27,964	1.88	46,998 - 57,904	-0.21	Poor	Stable
Lamu	13,911	1.88	23,619 - 28,628	-0.21	Poor	Stable
Meru	15,530	1.88	26,878 - 31,599	-0.20	Poor	Stable
Kwale	18,341	1.89	31,106 - 38,185	-0.20	Poor	Stable
Kiambu	5,640	1.91	10,087 - 11,429	-0.18	Poor	Stable
Tana River	85,241	1.91	150,214 - 175,104	-0.18	Poor	Stable
Garissa	99,248	1.92	178,262 - 202,677	-0.17	Poor	Stable
Nyeri	7,400	1.97	13,938 - 15,270	-0.11	Poor	Stable
Baringo	24,342	1.99	45,380 - 51,417	-0.10	Poor	Stable
Taita Taveta	37,886	2.00	72,946 - 78,478	-0.09	Poor	Stable
West Pokot	20,334	2.06	39,224 - 44,715	-0.02	Watch	Stable
Embu	6,249	2.12	12,302 - 14,164	0.03	Favorable	Stable
Tharaka-Nithi	5,903	2.13	11,917 - 13,181	0.04	Favorable	Stable
Murang'A	5,674	2.14	11,491 - 12,819	0.06	Favorable	Stable
Elgeyo-Marakwet	6,719	2.18	13,591 - 15,661	0.09	Favorable	Stable
Busia	3,757	2.18	7,447 - 8,920	0.09	Favorable	Stable
Kakamega	6,693	2.29	14,543 - 16,096	0.20	Favorable	Stable
Homa Bay	6,996	2.29	15,150 - 16,955	0.21	Favorable	Stable
Siaya	5,611	2.31	12,046 - 13,831	0.22	Favorable	Stable
Migori	5,758	2.31	12,626 - 13,928	0.22	Favorable	Stable
Vihiga	1,177	2.31	2,603 - 2,831	0.22	Favorable	Stable
Kisumu	4,625	2.32	10,146 - 11,302	0.23	Favorable	Stable
Bungoma	6,724	2.33	14,971 - 16,424	0.25	Favorable	Stable
Kirinyaga	3,280	2.44	7,509 - 8,486	0.35	Favorable	Improving

Poor Watch Favorable Exceptional

Source: Satellite data analysis

Maize Conditions and Yield Forecast for Kenya

County	Area	Predicted Yield	Predicted Prod.	Yield Anomaly	Current Conditions	Trend
maize						
Makueni	35,855	0.74	21,741 - 31,151	-1.08	Poor	Declining
Wajir	249,020	0.76	139,306 - 238,481	-1.06	Poor	Stable
Kitui	133,577	0.83	88,887 - 132,072	-0.99	Poor	Declining
Isiolo	111,387	0.87	79,251 - 115,585	-0.94	Poor	Declining
Marsabit	333,877	0.89	236,056 - 357,935	-0.93	Poor	Stable
Garissa	191,365	0.93	157,021 - 197,621	-0.89	Poor	Stable
Mandera	114,223	0.93	78,000 - 134,536	-0.89	Poor	Stable
Mombasa	1,026	1.11	971 - 1,302	-0.71	Poor	Stable
Taita Taveta	75,240	1.13	72,845 - 97,309	-0.69	Poor	Stable
Kilifi	55,255	1.14	53,641 - 71,933	-0.68	Poor	Stable
Kwale	36,325	1.18	36,375 - 49,039	-0.64	Poor	Stable
Machakos	26,530	1.22	30,406 - 34,495	-0.59	Poor	Stable
Embu	12,371	1.25	14,187 - 16,745	-0.57	Poor	Stable
Tharaka-Nithi	11,327	1.32	13,556 - 16,240	-0.50	Poor	Stable
Tana River	171,888	1.38	211,538 - 261,168	-0.44	Poor	Stable
Murang'A	11,074	1.53	15,742 - 18,105	-0.29	Poor	Stable
Lamu	26,606	1.53	37,942 - 43,539	-0.29	Poor	Stable
Turkana	264,820	1.57	396,389 - 435,761	-0.25	Poor	Stable
Meru	30,673	1.62	45,808 - 53,651	-0.20	Poor	Stable
Kajiado	96,066	1.64	130,889 - 184,237	-0.18	Poor	Stable
Kiambu	11,158	1.66	16,787 - 20,183	-0.16	Poor	Stable
Busia	7,763	1.66	12,167 - 13,644	-0.16	Poor	Stable
Kirinyaga	8,469	1.69	9,415 - 12,452	-0.13	Poor	Stable
Siaya	15,412	1.74	25,416 - 28,298	-0.08	Watch	Stable
Nyeri	14,628	1.79	24,220 - 28,215	-0.03	Watch	Stable
Homa Bay	20,607	1.86	35,921 - 40,736	0.04	Favorable	Stable
Samburu	92,183	1.94	144,909 - 213,162	0.12	Favorable	Stable
Kisumu	11,689	1.96	22,104 - 23,792	0.15	Favorable	Stable
Migori	13,839	2.03	24,760 - 31,551	0.22	Favorable	Stable
Vihiga	2,458	2.14	5,248 - 5,257	0.32	Favorable	Stable
Nairobi	3,096	2.19	6,102 - 7,475	0.37	Favorable	Stable
West Pokot	40,612	2.23	82,486 - 98,939	0.42	Favorable	Stable
Kakamega	13,196	2.26	27,365 - 32,410	0.45	Favorable	Stable
Nyandarua	14,324	2.39	30,178 - 38,291	0.57	Favorable	Stable
Laikipia	41,824	2.41	89,324 - 112,181	0.59	Favorable	Stable
Bungoma	13,206	2.45	31,240 - 33,425	0.63	Favorable	Stable
Trans Nzoia	10,839	2.48	22,959 - 30,865	0.66	Favorable	Stable
Nyamira	3,934	2.56	9,368 - 10,751	0.74	Favorable	Stable
Narok	78,561	2.61	183,087 - 227,604	0.80	Favorable	Stable
Bomet	10,694	2.62	25,778 - 30,208	0.80	Favorable	Improving
Baringo	47,755	2.63	111,014 - 139,985	0.81	Favorable	Improving
Kisii	5,764	2.64	14,525 - 15,920	0.82	Favorable	Stable
Nandi	12,437	2.67	30,935 - 35,412	0.85	Favorable	Stable
Uasin Gishu	14,893	2.74	35,516 - 46,059	0.92	Favorable	Stable
Kericho	11,026	2.77	28,897 - 32,227	0.95	Favorable	Stable
Elgeyo-Marakwet	13,201	2.82	34,328 - 40,030	1.00	Exceptional	Stable
Nakuru	32,835	2.94	85,792 - 107,153	1.12	Exceptional	Improving

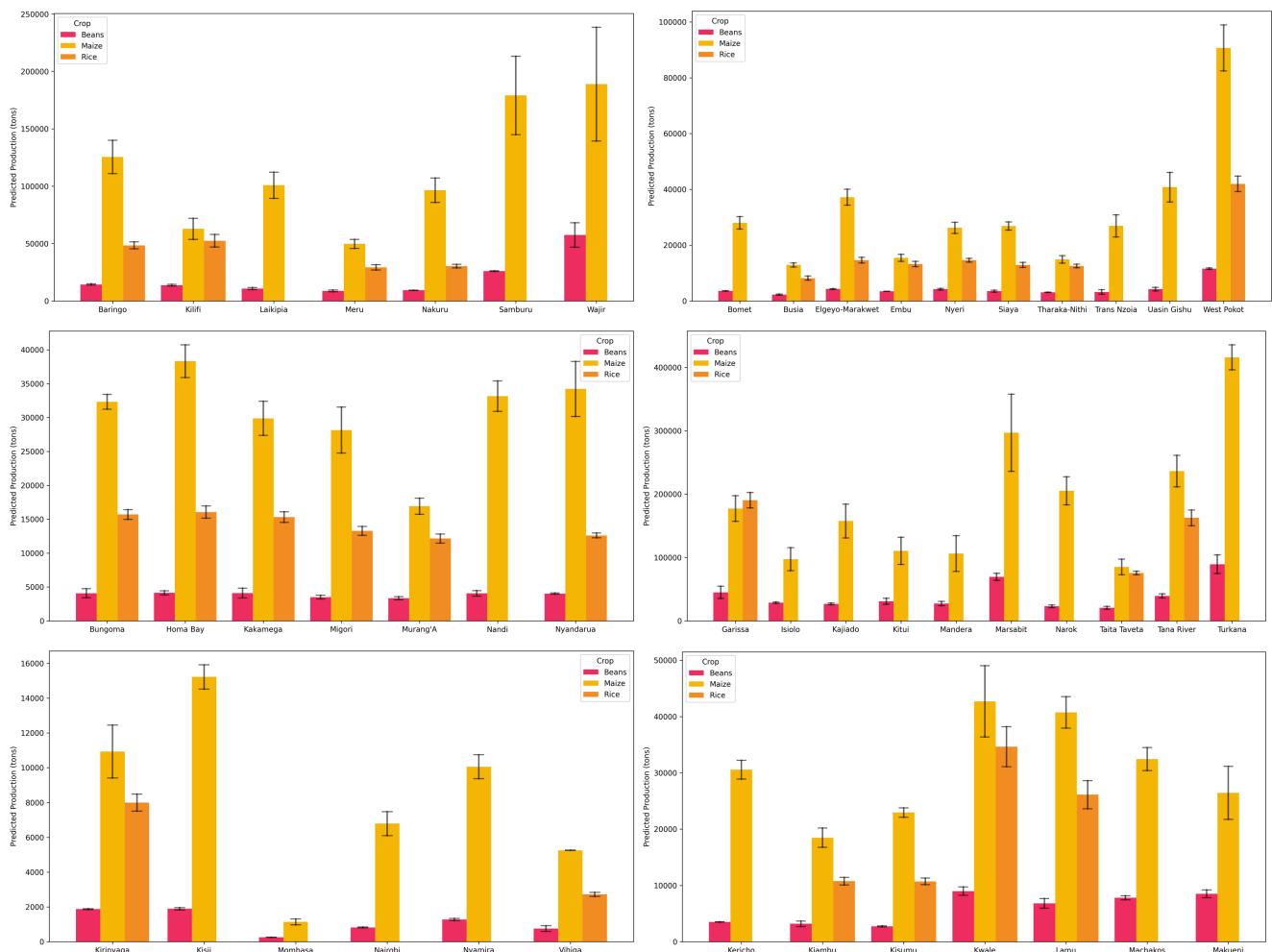
Poor
Watch
Favorable
Exceptional

Source: Satellite data analysis

Figure 5.3: Maize conditions for Kenya as of June 2025 and the estimated minimum and maximum production forecast for August 2025, showing regional variations in crop performance. **This table not only shows predicted yield but also estimated crop production levels with their uncertainty across counties using standard deviation.**

5.1.1 Production Forecasts

Figure 5.4: In June 2025, Kenya's production forecast reveals that **maize** is the leading crop across most counties, with top production recorded in Turkana (381,056–465,432 tons), Wajir (165,430–272,970 tons), and Narok (162,141–212,356 tons). While rice contributes less to total volumes, it remains notable in specific counties such as Kirinyaga (7,509–8,486 tons) which leads in rice production. Beans continue to show the lowest production levels nationally, though outputs are stable across counties. The wide uncertainty ranges in maize estimates, particularly in the Rift Valley and northern regions, highlight variability in production forecasts. Refer to tables 5.3, 5.2 and 5.5 for estimated production ranges. **NB: The vertical black lines and caps indicate the minimum and maximum estimated production range for each county.**



Beans Conditions and Yield Forecast for Kenya

County	Area	Predicted Yield	Predicted Prod.	Yield Anomaly	Current Conditions	Trend
beans						
Marsabit	157,370	0.44	63,949 - 74,965	-0.12	Poor	Stable
Garissa	99,248	0.45	35,320 - 54,574	-0.11	Poor	Stable
Wajir	125,712	0.46	46,762 - 68,133	-0.10	Poor	Stable
Kitui	67,483	0.46	26,075 - 35,658	-0.10	Poor	Stable
Tana River	85,241	0.46	36,134 - 42,783	-0.10	Poor	Stable
Mandera	57,526	0.48	24,033 - 30,706	-0.08	Watch	Stable
Makueni	17,818	0.48	7,810 - 9,200	-0.08	Watch	Stable
Kwale	18,341	0.49	8,257 - 9,724	-0.07	Watch	Stable
Lamu	13,911	0.49	5,972 - 7,669	-0.07	Watch	Stable
Kilifi	27,964	0.49	13,040 - 14,438	-0.07	Watch	Stable
isiolo	56,187	0.51	27,567 - 29,814	-0.05	Watch	Stable
Laikipia	20,983	0.51	9,826 - 11,714	-0.05	Watch	Stable
Mombasa	485	0.52	248 - 252	-0.04	Watch	Stable
Tharaka-Nithi	5,903	0.53	3,011 - 3,188	-0.03	Watch	Stable
Nairobi	1,543	0.53	792 - 844	-0.03	Watch	Stable
Taita Taveta	37,886	0.54	18,332 - 22,878	-0.02	Watch	Stable
Kajiado	48,569	0.55	25,307 - 28,124	-0.01	Watch	Stable
Samburu	46,620	0.56	25,733 - 26,386	0.00	Watch	Stable
Nyandarua	7,196	0.56	3,925 - 4,126	0.00	Watch	Stable
Nakuru	16,621	0.56	9,253 - 9,353	0.00	Watch	Stable
Embu	6,249	0.56	3,492 - 3,504	0.00	Watch	Stable
Kiambu	5,640	0.56	2,694 - 3,675	0.01	Favorable	Stable
Nyeri	7,400	0.57	3,950 - 4,512	0.01	Favorable	Stable
Uasin Gishu	7,418	0.57	3,618 - 4,864	0.01	Favorable	Stable
Kirinyaga	3,280	0.57	1,846 - 1,898	0.01	Favorable	Stable
Machakos	13,767	0.57	7,456 - 8,172	0.01	Favorable	Stable
Meru	15,530	0.57	7,993 - 9,577	0.01	Favorable	Stable
West Pokot	20,334	0.57	11,330 - 11,859	0.01	Favorable	Stable
Narok	39,770	0.58	20,843 - 25,138	0.02	Favorable	Stable
Trans Nzoia	5,534	0.58	2,393 - 4,065	0.02	Favorable	Stable
Turkana	152,312	0.59	74,648 - 104,196	0.03	Favorable	Stable
Kisumu	4,625	0.59	2,636 - 2,812	0.03	Favorable	Stable
Murang'a	5,674	0.59	3,130 - 3,561	0.03	Favorable	Stable
Baringo	24,342	0.59	13,827 - 14,898	0.03	Favorable	Stable
Homa Bay	6,996	0.59	3,842 - 4,430	0.03	Favorable	Stable
Bungoma	6,724	0.61	3,415 - 4,733	0.05	Favorable	Stable
Kakamega	6,693	0.61	3,383 - 4,816	0.05	Favorable	Stable
Busia	3,757	0.61	2,083 - 2,466	0.05	Favorable	Stable
Migori	5,758	0.61	3,229 - 3,770	0.05	Favorable	Stable
Siaya	5,611	0.63	3,155 - 3,862	0.07	Favorable	Stable
Nandi	6,396	0.63	3,657 - 4,463	0.08	Favorable	Stable
Nyamira	1,994	0.64	1,217 - 1,337	0.08	Favorable	Stable
Elgeyo-Marakwet	6,719	0.64	4,124 - 4,420	0.08	Favorable	Stable
Kericho	5,497	0.64	3,486 - 3,541	0.08	Favorable	Stable
Vihiga	1,177	0.64	591 - 916	0.08	Favorable	Stable
Kisii	2,921	0.65	1,829 - 1,958	0.09	Favorable	Stable
Bomet	5,464	0.66	3,561 - 3,648	0.10	Favorable	Stable

Poor
Watch
Favorable
Exceptional

Source: Satellite data analysis

Figure 5.5: Bean conditions for Kenya as of June 2025 and the estimated minimum and maximum production forecast for June 2025, showing regional variations in crop performance. This table not only shows predicted yield but also estimated crop production levels with their uncertainty across counties using standard deviation.

Further analysis of yield forecasts and anomalies is presented in Figure 5.6, reflecting on the projected maize, bean and rice yield for Kenya's end of season.

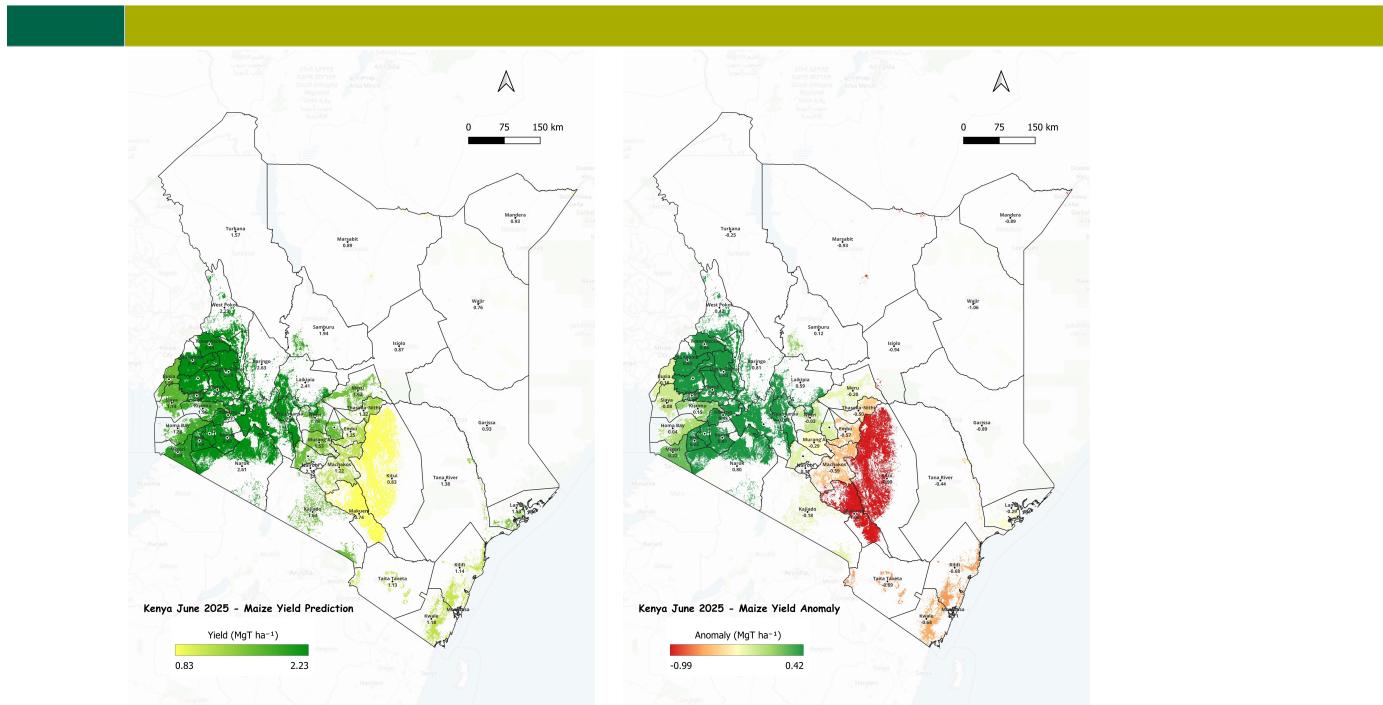


Figure 5.6: (a) End-of-season maize yield forecast for Kenya and (b) Yield anomaly projections based on satellite data and machine learning analysis. Forecasted maize yields are highest in the western region (Bungoma and Trans Nzoia with up to 2.23 MgT/ha), but significant negative anomalies (up to -0.99 MgT/ha) are observed in central counties like Bomet and Kericho, indicating under-performance despite relatively high yields.

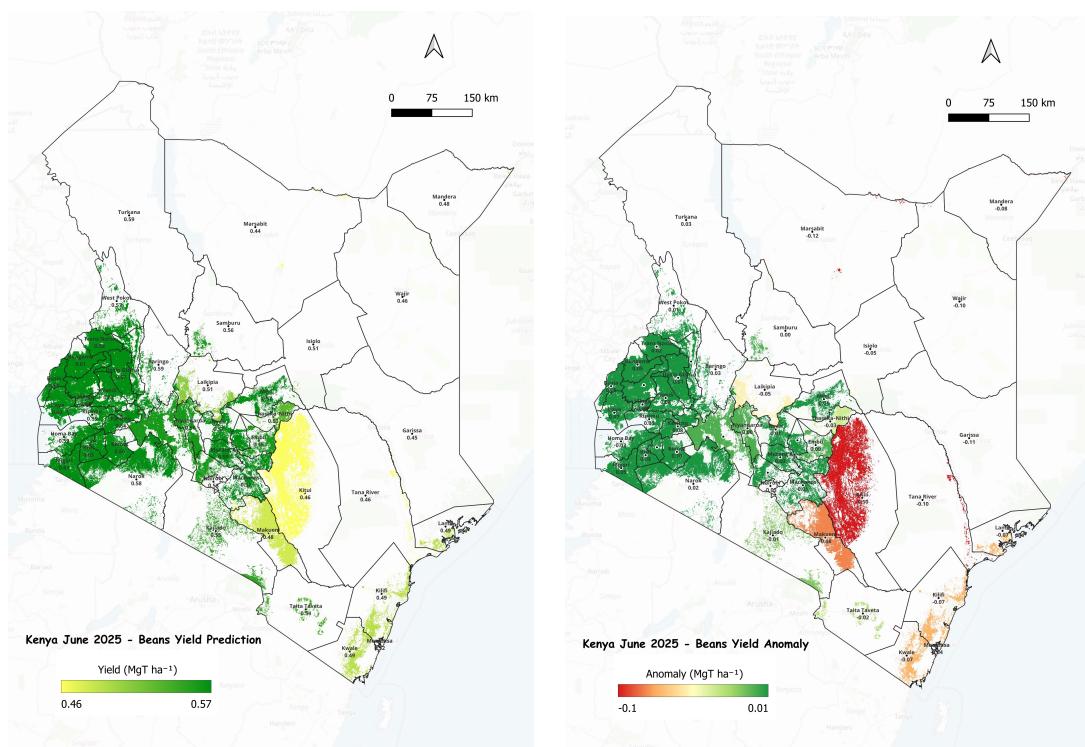


Figure 5.7: (a) End-of-season bean yield forecast for Kenya and (b) Yield anomaly projections based on satellite data and machine learning analysis. Beans show relatively low but consistent predicted yields across much of western Kenya, with values between 0.46 and 0.57 MgT/ha, though notable negative anomalies reaching -0.1 MgT/ha in central counties like Kericho suggest slight declines from typical performance.

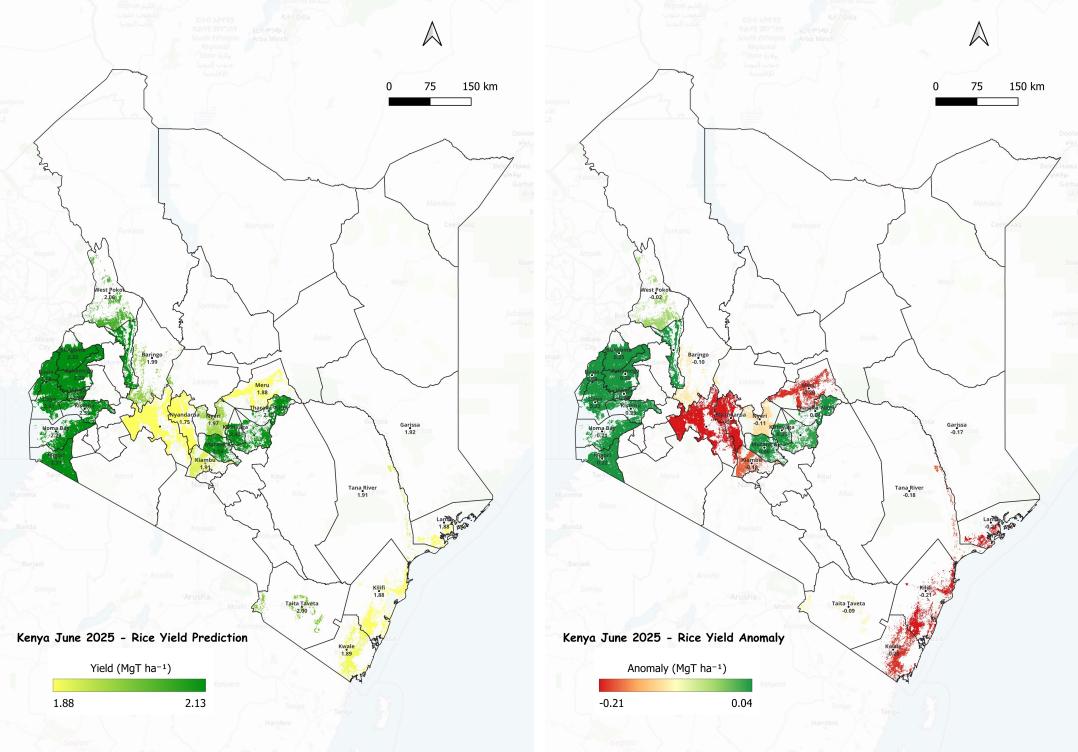


Figure 5.8: (a) End-of-season rice yield forecast for Kenya and (b) Yield anomaly projections based on satellite data and machine learning analysis. Predicted rice yields are moderate across major producing regions (Kisumu and Kirinyaga at 2.13 MgT/ha), but negative anomalies especially in Taita Taveta (-0.21 MgT/ha) and parts of central Kenya point to below-average performance despite good yield levels.



Appendix A

Model Description and Parameters

A.1 Crop Conditions Classes

Crop conditions classes (Figure A.1) are based on a combination of inputs, including earth observations, ground observations, reported impacts, and meteorological data, following the [Crop Monitor for Early Warning Classification system](#). The assessment considers crop phenology, climatic conditions, and agronomic information.

Class	Color	Definition
Exceptional		Conditions are much better than average* at the time of reporting. This label is used only during the grain-filling through harvest stages.
Favourable		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 final yields. There is still time and possibility for the crop to recover to average conditions if the ground situation improves. This label is only used during the planting-early vegetative and the vegetative-reproductive stages.
Poor		Crop conditions are well below average*. Crop yields are likely to be 10-25% below-average*. This is used when crops are not likely to recover, and impact on yields is likely.
Failure		Crop conditions are extremely poor. Crop yields are likely to be 25% or more below-average*.
Out-of-Season		Crops are not currently planted or in development during this time.
No data		No reliable source of data is available at this time.

* Average refers to the average conditions for that time of year in that area.

Crop conditions are based on a combination of inputs including earth observations, ground observations,

Figure A.1: Crop Conditions Classification

