



## AFRICA AGRICULTURE WATCH RATIONALE

Africa's food production systems are constantly battling numerous threats, including climate variabilities, plant diseases & pest outbreaks, further exacerbated by the COVID-19 pandemic, among other shocks. Furthermore, the disruptions engendered by such crises require accurate & timely data & predictions to inform agricultural policies for better preparedness. In response to this agricultural data gap, Africa Agriculture Watch (AAgWa), developed by AKADEMIYA2063's scientists & launched in 2021, is an open access web platform that employs cutting-edge machine learning techniques & satellite remotely sensed data to predict agricultural yields & production levels of several crops across Africa to support crisis management, monitoring & mitigation efforts in local communities.



## Africa Agriculture Watch (AAgWa) by AKADEMIYA2063 is contributing to sustainable agricultural productivity & resilient food production systems in Africa through:



Pixel & sub-national levels of food crop production & yield forecast



Off-the-shelf & pre-processed near real-time biophysical data



Biophysical anomaly charts & potential agricultural land mapping

## HOW ARE WE DOING THIS?



Remotely Sensed Biophysical Parameters



Historical Production Maps



Machine Learning Techniques



Crop Mask



Crop Prediction Calendars

## AFRICA AGRICULTURE WATCH SCOPE OF INTERVENTION

**47**  
AFRICAN  
COUNTRIES

**10**  
CROPS

The open-access AAgWa web platform harnesses cutting-edge predictive modeling technologies such as machine learning techniques to provide forecasts & reduce uncertainties in decision-making processes in African food production systems.



## THE AFRICA CROP PRODUCTION ( AfCP) MODEL

AAGWa's Africa Crop Production (AfCP) model forecasts crop production for beans, cassava, maize, millet, rice, sorghum, soybean, wheat, and yam across Africa. Though currently focused on ten crops, AAGWa is constantly collecting data to expand its scope of crop prediction. The estimations are based on a combination of remotely sensed biophysical parameters retrieved from satellite images, historical production maps, and machine learning techniques, comprising the following applied variables:



**Normalized Difference Vegetation Index (NDVI):** to measure healthiness or stress in plants.



**Land Surface Temperature (LST):** to detect climate change trends & reveal anomalies on cropland areas.



**Rainfall data:** 95% of Agriculture in Africa is rainfed.



**Evapotranspiration:** evaporation & transpiration data helps measure water stress of plants.



**Crop calendar:** selects/identifies crops for countries based on the FAO calendar.



**Machine Learning Techniques:** built out of an iterative process of making the computer learn the relationship between explanatory & response variables.

## TOP AAGWa FEATURES



### Granular & Seasonal Food Crop Production & Yield Forecast Maps

AAGWa harnesses cutting-edge predictive modeling technologies such as machine learning techniques to provide seasonal food crop production & yield forecasts at the granular community level. The platform's data helps reduce uncertainties in decision-making processes & supports the design of tailored policies & interventions in the African food production systems.



### Enriched Agricultural Statistics with Satellite Remote Sensing Data

AAGWa bridges the agricultural statistics gap in Africa by exploiting the data wealth from satellite remote sensing sources. Each layer of the satellite data provides key information about the dynamics of crop growth at different stages. AAGWa cleans, processes, extracts, uses & displays that information to contribute to bridging the agricultural statistics gap in Africa.



### Open Access & Ready-to-Use Data Visualization Features

AAGWa uses the latest web visualization technologies to display its outputs & make them interactive to facilitate interpretation & use. AAGWa is an open-access platform available from anywhere & at any time. Several data formats, such as images, tables & raster files, are available for download.