Africa Agriculture Watch
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AFRICA AGRICULTURE WATCH RATIONALE

Africa's food production systems are constantly battling numerous threats, including climate variabilities, plant diseases, and pest outbreaks, leaving the continent vulnerable to diverse shocks such as the Russia-Ukraine war and COVID-19. These disruptions require accurate and timely data and predictions to inform agricultural policies for better preparedness. In response to this agricultural data gap, Africa Agriculture Watch (AAgWa) employs cutting-edge machine learning techniques and satellite remote sensing data to predict agricultural production for 10 crops across nearly 50 African countries. The web-based platform's interventions support decision-making, monitoring, crisis management, and effective intervention planning at country level.

Africa Agriculture Watch (AAgWa) was developed by AKADEMIYA2063 to contribute to sustainable agricultural productivity & resilient food production systems in Africa through:

- **Pixel and sub-national levels of food crop production and yield forecasts**
- **Off-the-shelf and pre-processed near real-time biophysical data**
- **Biophysical anomaly charts and potential agricultural land mapping**

HOW ARE WE DOING THIS?

Remotely Sensed Biophysical Parameters
Remotely sensed biophysical parameters retrieved from satellite images.

Historical Production Maps
Historical values of input variables used in a random forest model to predict values for the forthcoming season.

Crop Mask
Identifying where specific crops are being grown on the ground and at pixel level.

Machine Learning Techniques
The AAgWa model is built using the machine learning artificial neural network (ANN) technique.

Crop Prediction Calendars
Specific computations performed during crop sowing and growing stages to provide production and yield forecasts before harvesting.

AFRICA AGRICULTURE WATCH SCOPE OF INTERVENTION

47 AFRICAN COUNTRIES

10 CROPS

The open-access AAgWa web platform harnesses cutting-edge predictive modeling technologies, including machine learning and remote sensing data, to provide forecasts with the aim of reducing 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, groundnut, 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 to cover key staples across all 55 African Union Member States. The predictions 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 and reveal anomalies on cropland areas.

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

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

Supporting Climate Action

AAgWa is leveraging AI and remote sensing to enhance the tracking and measurement of greenhouse gas (GHG) emissions, methane concentration and other geo-biophysical parameters to support mitigation and adaptation policies in Africa.

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 and yield forecasts at the granular community level. The platform's data helps reduce uncertainties in decision-making processes and supports the design of tailored policies and 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 and 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 and make them interactive to facilitate interpretation and use. AAgWa is an open-access platform available from anywhere & at any time. Several data formats, such as images, tables, and raster files, are available for download.