NIGERIA CUSTOMIZED CROPWATCH PLATFORM
AGRICULTURE DEVELOPMENT AND CROP
MONITORING FOR FOOD SECURITY

BY

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Food Security is a priority for every Nation.

The importance of agriculture has received renewed impetus by the Nigerian administration as the government seeks to diversify the Nigerian economy.

As such, sustainable approaches towards effective monitoring of agricultural produce to optimise yield have become imperative.

Technologies and innovations are critical for boosting farm productivity.

Remote sensing technologies have been identified as a reliable proxy for providing accurate and up-to-date information on crop yield and phenology for farmers, agronomists, and research.
The EGRP and Agriculture

- The Federal Government of Nigeria (FGN) has made agriculture one of the major pillars of its strategic vision for growth and development through the Next level policy.
- The Next Level policy is operated through the Economic Growth and Recovery Plan (EGRP).

The government’s long-term interest to promote agricultural growth has been exemplified in different long term and medium-term plans implemented in the country. For instance,
- The National Accelerated Food Production Programme
- Green Revolution
- Nigerian Vision 20: 2020
- Agricultural Transformation Agenda,
- Agricultural Promotion Policy etc.


Under food security program of Nigeria:
- 200,000 metric tons of grains from the national reserve to be released
- 225,000 MT of fertilizers and seedlings to go to farmers
- N50bn to cultivate rice
- N50bn to cultivate casava and wheat
THE NIGERIAN SPACE PROGRAMME

National Space Research and Development Agency:

- NASRDA was established in 1999 with the clear mandate to:
  
  “vigorously pursue the attainment of space capabilities as an essential tool for the socio-economic development and the enhancement of the quality of life of Nigerians”.

- NASRDA is to achieve this mandate through:
  
  • research,
  • rigorous education,
  • engineering development,
  • design and manufacture of appropriate hardware and software in space technology.
NASRDA has Staff strength of over 5000 workers: with almost 3000 Technical Expertise (Engineering, Sciences, Social Sciences etc.).

Strategic Space Applications (SSA) department is located at NASRDA headquarter saddled with the responsibility of using Space derived data as a powerful planning tool to support Government Sustainable Programmes in environment, land use planning, agriculture, urban planning, water resources mapping, monitoring and management etc.
# NASRDA & AIRCAS Collaboration

## National Space Research And Development Agency (NASRDA)

- The National Space Research and Development Agency is mandated to vigorously pursue the attainment of space capabilities as an essential tool for its socio-economic development and the enhancement of the quality of life of its people.
- The Agency is to achieve this mandate through:
  - research
  - rigorous education
  - engineering development
  - design and manufacture of appropriate hardware and software in space technology.

## AIM:

Aimed at developing a “Nigerian customized CropWatch cloud service platform” to effectively monitor crops based on accurate, reliable, and timely availability of information for appropriate decision making to improve crop yield.

## Aerospace Information Research –Chinese Academy of Sciences (AIR-CAS)

### CROPWATCH

- The China CropWatch System (CCWS) has served as China’s leading crop monitoring system since 1998.
- The China CropWatch research team, part of the Institute of Remote Sensing and Digital Earth, Chinese Academy of Sciences, assesses national and global crop production and related information using remote sensing and ground-based indicators. Each quarter, the group’s findings are published in the CropWatch bulletin, which is issued in both English and Chinese.
**CropWatch Cloud**

**CropWatch-Pro**
- An online tool for people to produce crop monitoring products at any time and anywhere.

**CropWatch-Explore**
- An online interface for people to explore and analyze all the crop information data easily.

**CropWatch-Project**
- An online platform for people to create and write the crop bulletin.

**CropWatch-Bulletin**
- An webpage for people to read CropWatch bulletin.

- **Analysis-ready products**
  - 32 Indicators ready in CropWatch Cloud considering most indicators used in existing systems
  - Cloud-based system assessable from internet everywhere without much investment on computing infrastructure, storage, etc.
  - Customizable to improve and promote ownership
  - Indicators customizable, easy to include new national or regional specific indicators
  - CropWatch Cloud can be customized according to the specific demand for each country and work as a national/regional system
  - After customization and training, countries will strengthen the agricultural monitoring capacity on their own

- **Release CropWatch Bulletin**
  - Quarterly and annually
  - grain production outlook
  - covering 173 countries and regions down to provincial scales, with special focus on 43 key agricultural countries

To increase agricultural productivity in a sustainable manner to meet the growing demand both nationally and globally while adapting to a changing climate.

To provide access to a timely national food information system.

To facilitate and stimulate agricultural monitoring for the advancement of the SDG goal of zero hunger through a joint research and capacity building with NASRDA.

To customize CropWatch to meet specific needs of Nigeria and strengthen the capacity of relevant stakeholders to identify suitable climate resilient agricultural practices.

To improve crop production by integrating geospatial information for agricultural production.
The Status So far:

- **Invited by UNCTAD** to participant in Online Training 2021.

- **MoU (Memorandum of Understanding)**
  An MOU was signed between NASRDA and AIRCAS. The online ceremony was chaired by Dr. Jie Liu, Chief of International Cooperation Department, Aerospace Information Research Institute, Chinese Academy of Science (AIRCAS) supported by ANSO and UNCTAD. It was a successful event that marks the beginning of Customization of Nigeria CropWatch.

- **The 1st NASRDA held stakeholders meeting** and discussed the initiative which received a positive response: The meeting was well attended by representatives from various stakeholders. Among those that were in attendance are; NARSDA, AIRCAS (virtual), Federal Ministries (Agriculture and Rural Development, federal Water Resources, Environment, Nigerian Meteorological Agency, Nigeria Hydrological Services Agency, Nigeria Integrated Water Resources Management, Bureau of Statistics and SDG office. Some of the decisions taken at the meeting were: Type of crops to be monitored and the scope of the coverage area (National, State and Local level).

- **2nd Stakeholders Meeting**: Nigeria CropWatch Project (Status & Update), 6th July, 2023
CropWatch Platform down scaling data to local Government level

The deliverables such as Biomass, NDVI, VCI, Temperature, Precipitation etc can be access and download from National, State and Local Government level. This a tremendous improvement for Nigeria.

Knowledge Building

✓ CropWatch-ICP Online Training: Video Conferencing, (22 March – 28 May 2021)
✓ Bilateral Research Exchange Workshops (August 2021 to January 2022):
✓ Consultative Meetings with NASRDA project implementation team
✓ CropWatch Bulletin Publications: 7 editions (from 2021 till date)
✓ Exchange of Data with AIRCAS:
✓ NASRDA Staff attended UNCTAD Geneva Meeting in March 2023
✓ NASRDA staff Attended the GEO Symposium and GEO Open Data and Open Knowledge Workshop as a young researcher representative from Africa

Second Stakeholders Briefing on the Update/use of the platform: July, 2023

Attended Training in Mauritius in August, 2023
Customize Nigeria CropWatch-ICP Project: Activities so far

- **Workshop and Field Data Collection Training** using the GVG App. As part of the CropWatch Innovation Cooperation Programme. GRID3 Lab, NASRDA, Abuja Nigeria 09 - 13 October, 2023

- **CropWatch quarterly bulletin**
  NASRDA has been participating in the publication of cropwatch bulletin quarterly report on global crop production including Nigeria (from last quarter of 2021- till date)

http://cloud.cropwatch.com.cn/site/bulletin
CropWatch Innovative Programme for Agricultural Monitoring (Crop-Watch) is to facilitate and stimulate agricultural monitoring of the developing countries for the advancement of the SDG goal of zero hunger through joint research and capacity building.
Customize Nigeria CropWatch-ICP Project Cont’D

CROPWATCH
Nigerian CropWatch Platform for Effective Crop Monitoring

SOME DELIVERABLES FROM THE CROPWATCH PROJECTS

PHENOLOGY: Tells the farmer when it’s time to start planting various crops for the year in different regions of the country.

2023 NDVI NATIONAL LEVEL

NORMALIZED DIFFERENTIAL VEGETATION INDEX: Helps quantify the greening of the farm, plant stress, healthiness of plants, economic drought, and productivity.

Arable CropLand: Information on the suitable land for cropping various crops.

Vegetation Condition Index: It focuses on the impact of drought on vegetation and can provide information on the onset, duration, and severity of drought.

In Nigeria, 70% of the of the populace are engaged in subsistence farming with little or no access to information. Leading to poor farm handling and poor yield.

SOLUTION
CropWatch is a system that uses satellite data to monitor crop conditions and integrates this with other climate-related data to produce accurate, reliable, and timely information for appropriate decision making to improve crop yield.

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The National Agricultural Development Fund (NADF) is a transformative institution dedicated to empowering and revolutionizing the Nigerian agricultural standards and secure its food future.

https://nadf.gov.ng
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NASRDA will continue to liaise with ECOWAS directorate of Agriculture for possible involvement of other ECOWAS countries in the CropWatch program.

NASRDA in Collaboration with FMAFS to Train the Agricultural Extension workers and frontliners on basic RS/GIS knowledge to enhance their ability to relate with geospatial data from the CropWatch platform and convey the uses to farmers and interested parties.

Sensitization, Encouragement and Engagement for the youth and policy makers embracing Space Technology in Agricultural Extension Services using the knowledge acquired from CropWatch to assist farmers.

Nigeria Customized Platform will be fully ready with other missing components very soon.

For sustainability NASRDA need to train young scientist in RS applications in Agriculture especially support in sending staff in scholar visit to AIRCAS facilities or acquire M.Sc/PhD
Capacity Building for NASRDA Staff
In conclusion, with the increasing population, estimated to reach 400 million by 2050, enhanced agriculture productivity through adaptation of new technologies and innovations is necessary. Support from all partners to the efforts by the federal and state governments is central for achieving the government goal in food security and SDG 2.

- Relevant stakeholders at the national and state levels to have the capacity and knowledge to use the customized cloud-based crop monitoring platform and the generated information on agro-climatic condition, agronomic and major production zone for the effective development of climate resilient agricultural practices in various crop production.
- For sustainability NASRDA need to train young scientists in RS applications in Agriculture especially support in sending staff in scholar visit to AIRCAS facilities or acquire M.Sc/PhD
- NASRDA Dedicated Equip Lab for CropWatch

Requirements and expectation
CROPWATCH PARTNERS

United Nations Conference on Trade and Development provides funding of CropWatch preprograms.

Alliance of International Science Organizations aids in catalyzing and implementing programs and initiatives in Science, Technology, Innovation and Capacity Building (STIC) for the promotion of shared development and the advancement of the UN SDGs.

Aerospace Information Research Institute, Chinese Academy of Science is the research institute that integrates both research and higher education and committed to training talented scientists. It is responsible for providing the technical manpower for the CropWatch programmes and publication of the quarterly bulletins.

The National Space Research and Development Agency is mandated to vigorously pursue the attainment of space capabilities as an essential tool for its socio-economic development and the enhancement of the quality of life of its people. NASRDA signed MoU with AIRCAS on the 4th of July 2022 to advance crop monitoring using the CropWatch platform.
Thanks for listening

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