CropWatch-ICP: CropWatch Innovative Cooperation Programme for Crop Monitoring

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Outline

- **Background**

- **CropWatch-ICP Introduction**

- **CropWatch: capacity building**

- **Outlook**

Issues for Food Security

- Food security is still a challenge issue over the world, in particular in Africa, south & southeast Asia. COVID-19, Desert Locust, drought, flooding, etc. further threaten food security.

- The paucity of adequate capacity in obtain and accessing up-to-date staple crop production information pose the danger of taking decisions based on delayed and on not easily verifiable information.
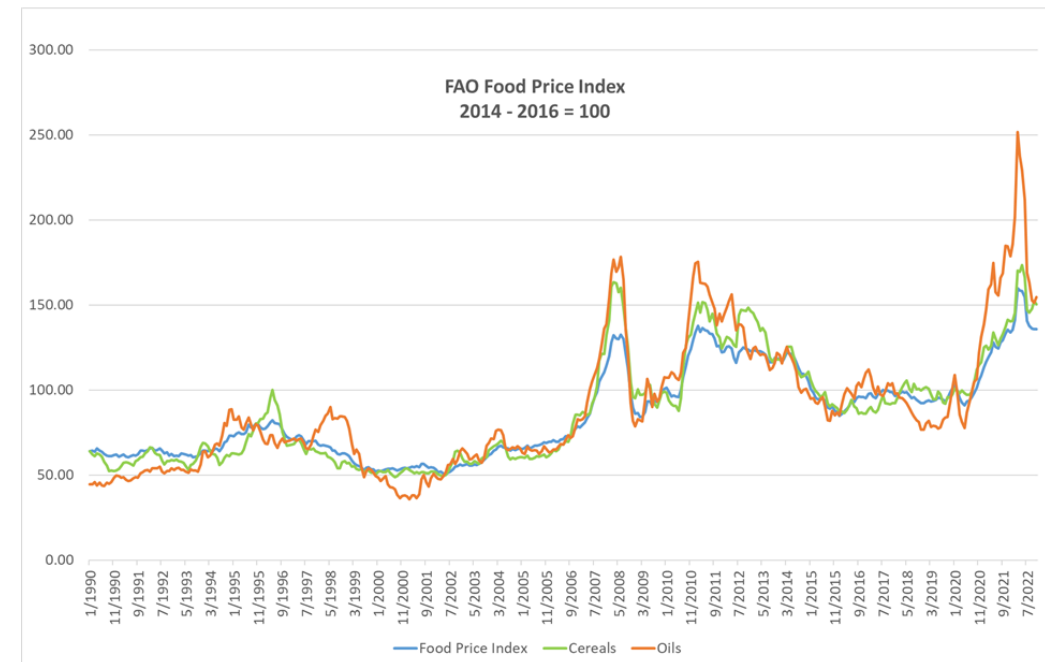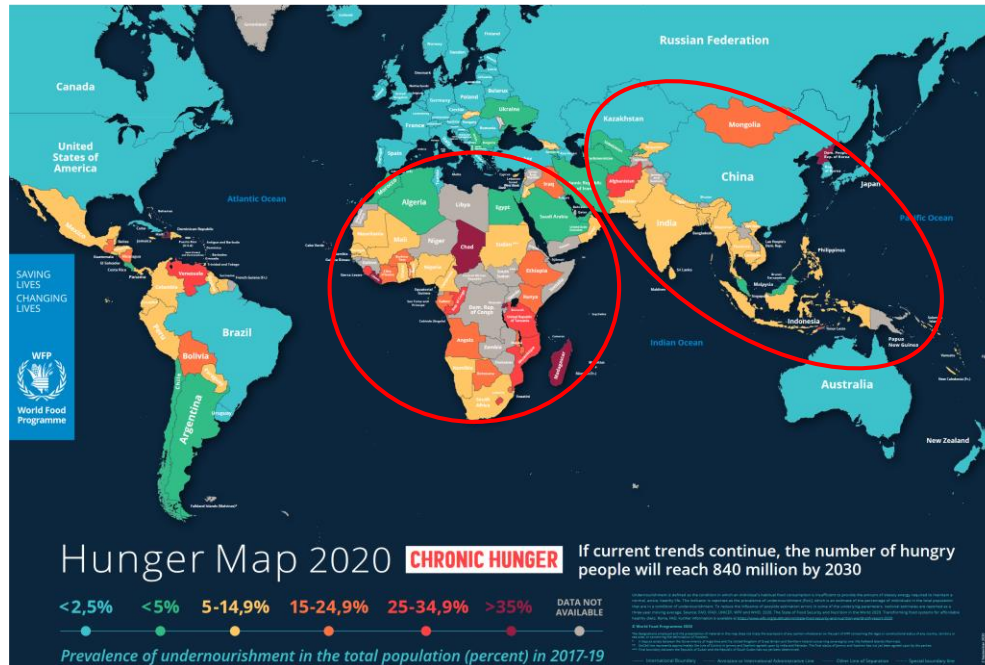
Constraints

- Many countries want to set up their own crop monitoring systems
- Initiative input and operational cost as well as adequate technical skills constrain many countries to set-up, operate, and maintain crop monitoring system, which make
  - most countries in the world do not have an operational crop monitoring system
- Combining of crops, phenology, location makes crop monitoring data streams very complex
  - Existing global systems have limited functions, mainly crop condition assessment
  - Most existing algorithms and methods are not implemented as operational activities

CropWatch Cloud

- Release quarterly and annually bulletin on global crop monitoring, covering 173 countries and regions down to provincial scales, with special focus on 43 key agricultural countries

- Components: CropWatch-Pro, CropWatch-Explore, CropWatch-Project and CropWatch-Bulletin

http://cloud.cropwatch.com.cn/

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

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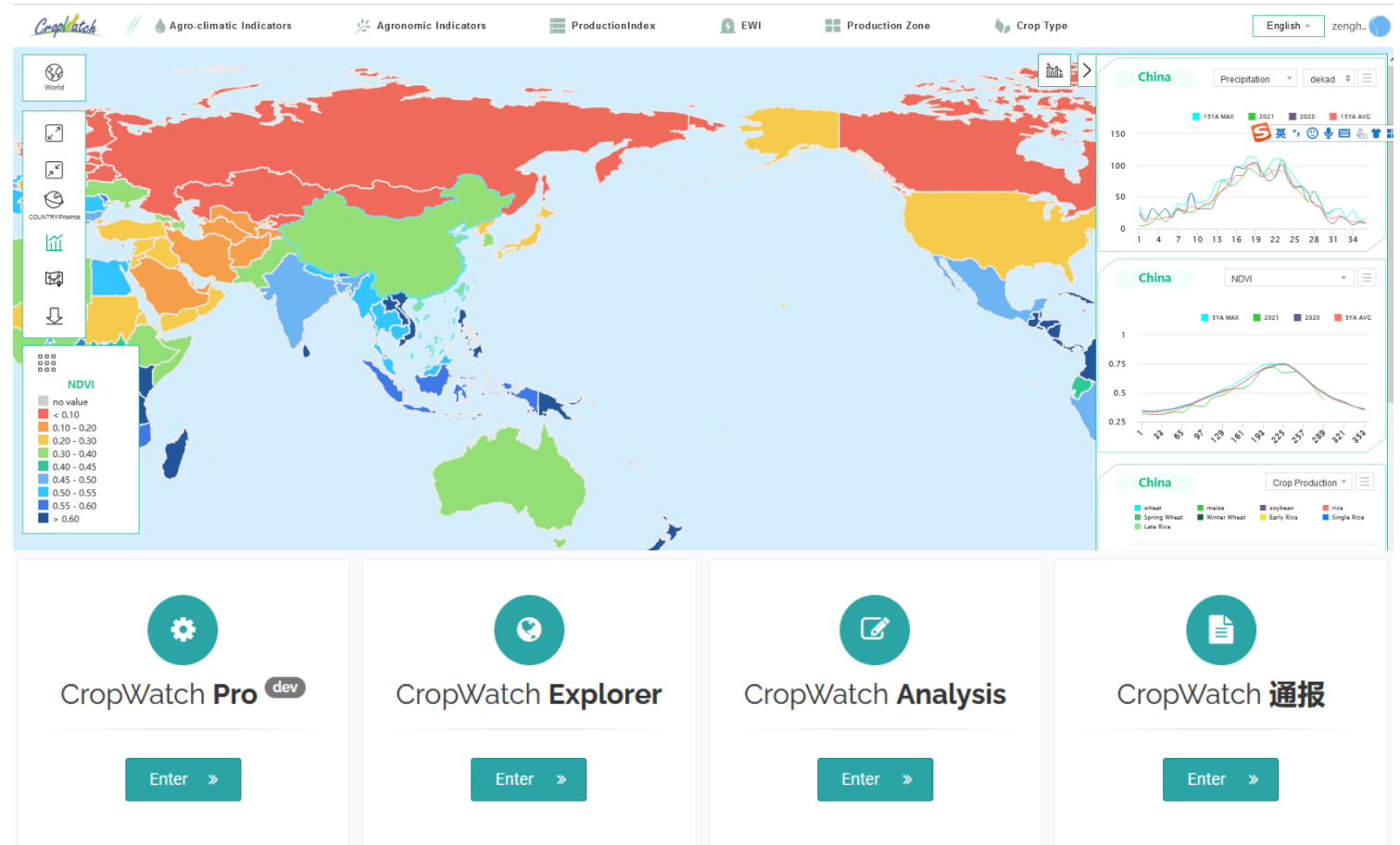- An online interface for people to explore and analysis all the crop information data easily.

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

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

Tools for ground truth data collection

- The field data collection prevents most systems have crop area and yield components

  - Cost, labor and time consuming

- Two tools developed for free use

  - GVG app for crop identification and Fieldwatch for yield measurement with image recognition
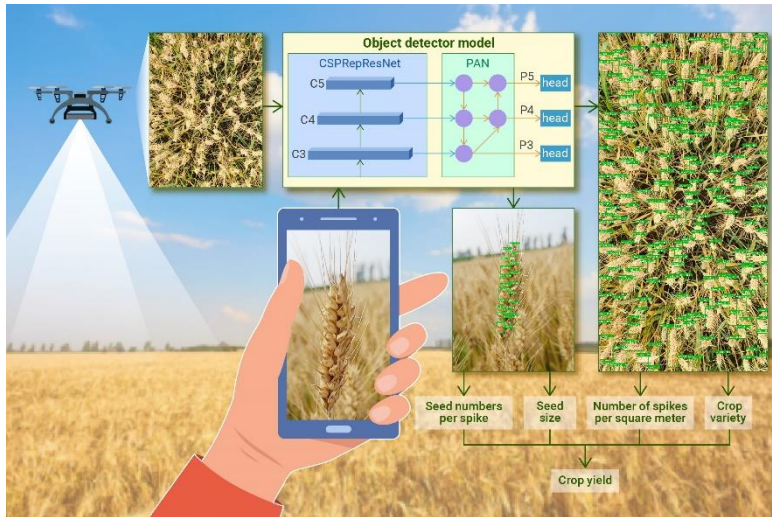
FieldWatch for yield data measurements
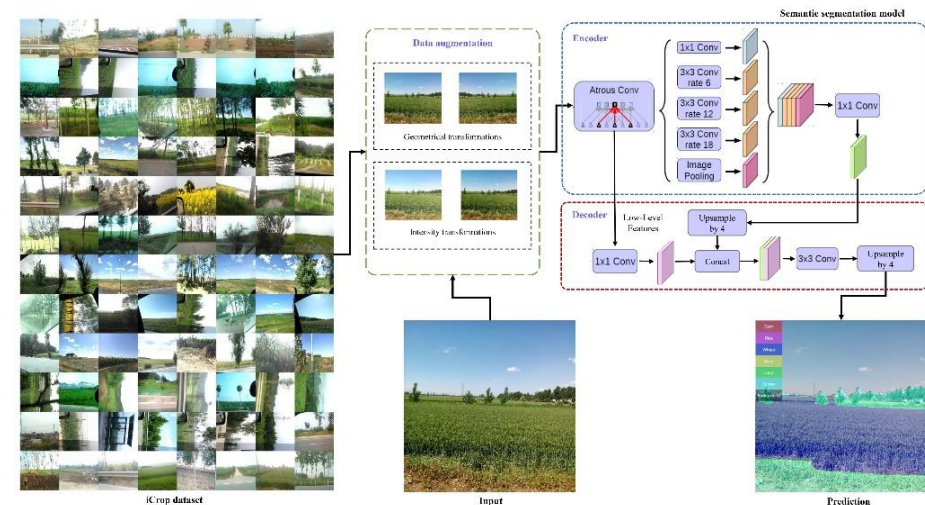
GVG Crop type identification from geo-tagged photos

CropWatch Cloud

- CropWatch is a satellite-based hierarchical method of crop monitoring, including 4 agro-climatic indicators and 13 agronomic indicators, area, yield and production at different scales

- CropWatch Cloud provided APIs access to all functions of crop monitoring indicators and thematic maps.

CropWatch acting data processing engine

■ CropWatch and AGRI-Map of Thailand develop data access portal through APIs to share the indicators and data to each other
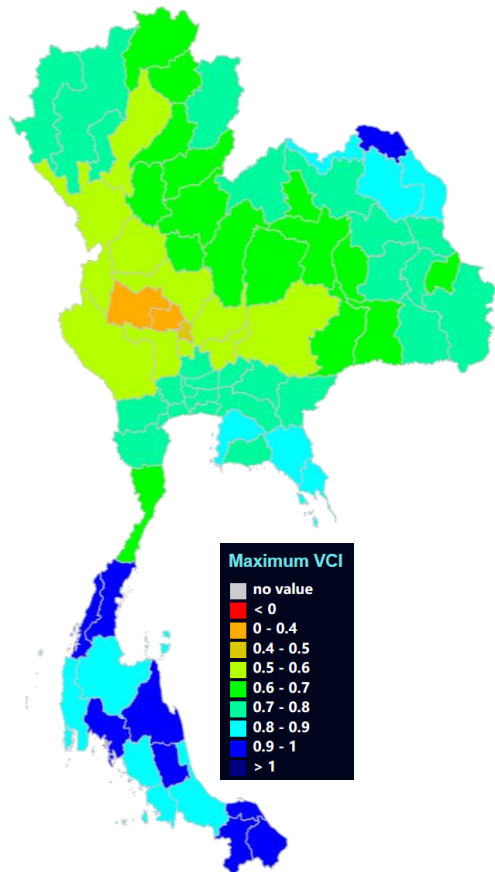
Provides Earth Observation-based Indicators through APIs:

– **Precipitation**
– **Temperature**
– **Radiation**
– **Biomass**
– **NDVI**
– **VCIx**
– **CALF**
– **VHI**
– **etc**

Maximum VCI
- no value
- < 0
- 0 - 0.4
- 0.4 - 0.5
- 0.5 - 0.6
- 0.6 - 0.7
- 0.7 - 0.8
- 0.8 - 0.9
- 0.9 - 1
- > 1

Sugar Cane Yield

Agri-Map
ยินดีต้อนรับเข้าสู่ระบบ Agri-Map Online

Dynamically updated with latest CropWatch EO indicators

EO-based indicators feeding into AI models

ton/rai
15.56
2.34

Ground station weather information

Supporting high resolution meteorological data producing and services
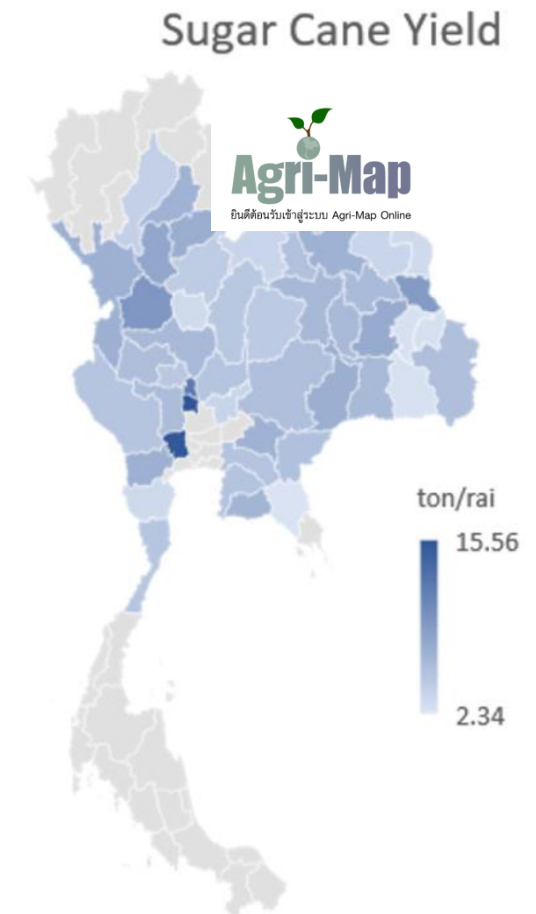
Capacity building activities across the globe

Russia:
Technical training; Joint field survey; Work plan ready for bilateral cooperation on crop monitoring;

Mongolia:
DroughtWatch Customization; Technical training; Joint research

Viet Nam:
Work plan ready for bilateral cooperation on crop monitoring; Technical training;

Sri Lanka:
DroughtWatch Customization; Technical training;

Cambodia:
DroughtWatch Customization; Technical training;

Myanmar:
Work plan ready for bilateral cooperation on crop monitoring; Technical training;

Zambia:
High resolution cropland mapping; Technical training; Joint research

Zimbabwe:
High resolution cropland mapping; Joint research

Mozambique:
CropWatch Cloud Customization; Technical training; Joint research

Thailand:
Real time communication between CropWatch and Agri-MAP; Technical training;

- Currently work closely with 10 countries, and will gradually include more countries at risk

- 14 countries join online training in 2021 coordinated by UNCTAD
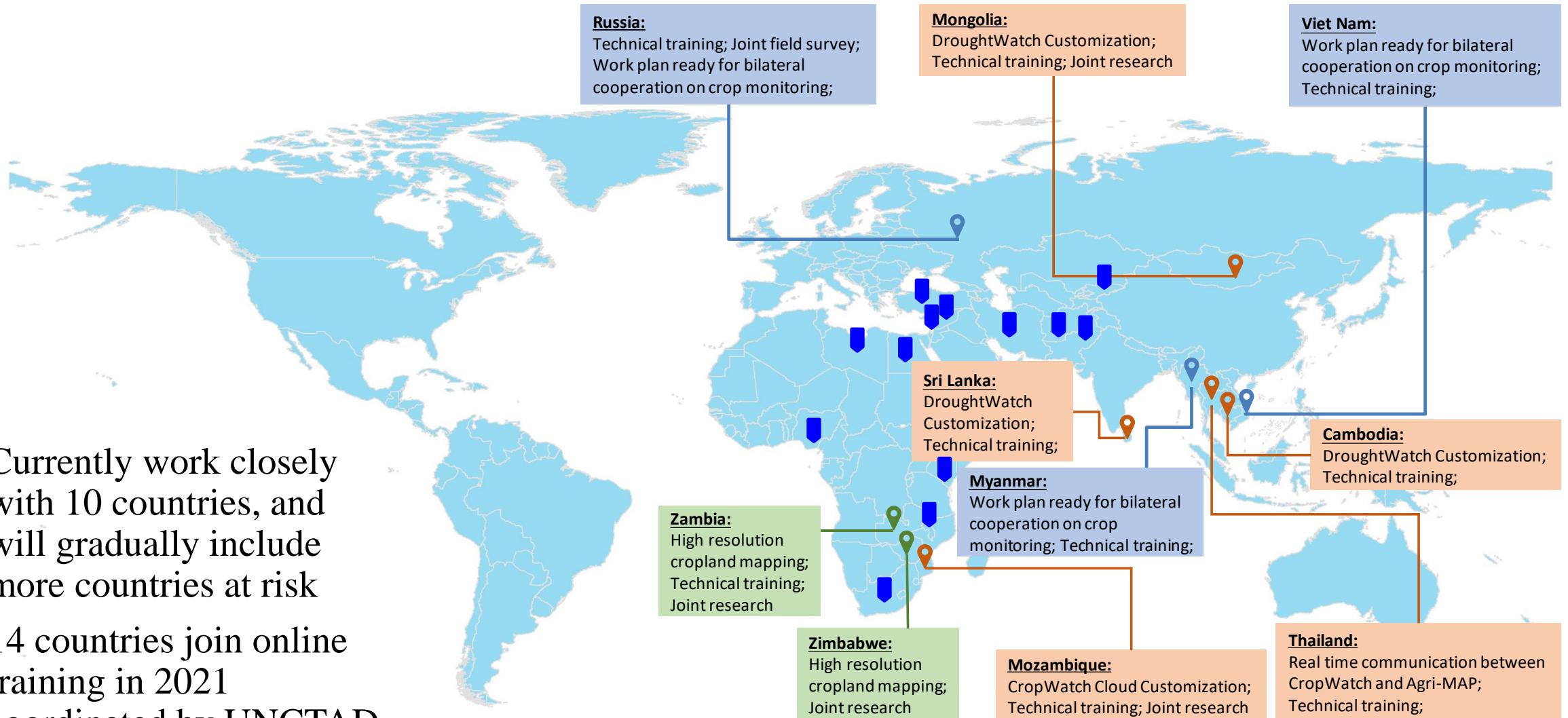
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- **CropWatch-ICP Introduciton**
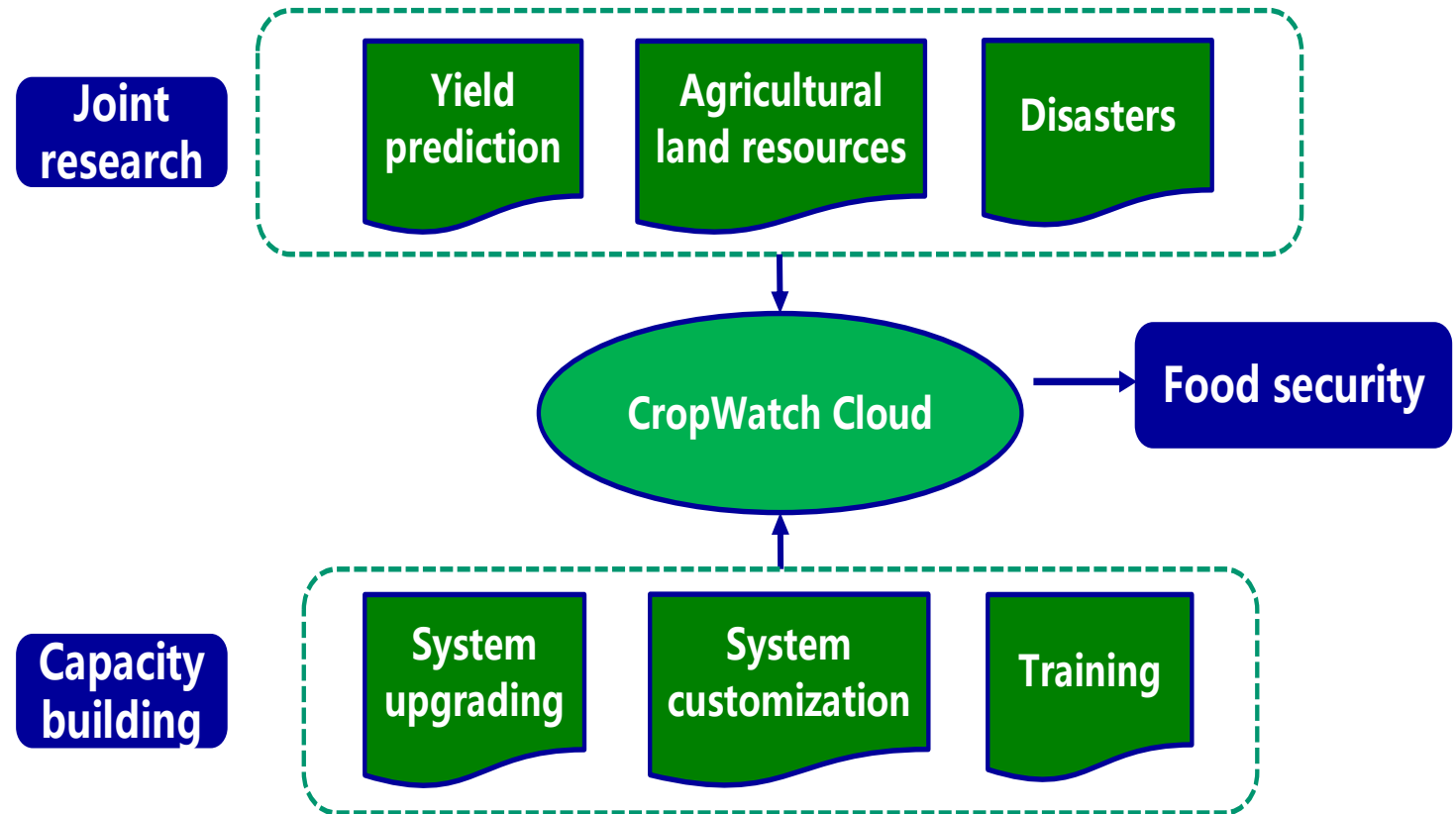
- **CropWatch: capacity building**

- **Outlook**

Project Objectives

Under coordination of UNCTAD, CropWatch Innovative Cooperation Programme for Crop Monitoring (CropWatch-ICP) is to facilitate and stimulate crop monitoring at developing countries for the advancement of the SDG goal of zero hunger through joint research and capacity building

- To enable pilot countries to do respective national or subnational crop monitoring on their own in real and near time
- To promote resilient agricultural practices by integrating geospatial information for crop monitoring

Key Actions on Capacity Building

- Training workshops
- On-job training in Beijing and in the field for verification
- CropWatch customization for Specific requirements
- Regional workshops on food security

Joint research

| Yield prediction | Agricultural land resources | Disasters |

CropWatch Cloud → **Food security**

Capacity building

| System upgrading | System customization | Training |

Expectations

- Trained staff of the participating country will have the capacity to use the cloud based crop monitoring system. And they can perform as trainers for sub-national officials to empower more technical staff for crop monitoring

- Participating country to produce regular bulletin with support of CropWatch cloud to inform policy-making at national and provincial levels on the food market, annual food import-export prospects and disaster relief.

Outline

- **Background**

- **CropWatch-ICP objectives**

- **CropWatch-ICP: activities**

- **Outlook**

CropWatch technical training for 14 countries

- Online Training Workshop of Earth Observation Applications for crop Monitoring, coordinated by CTAD, for three months over 23 March- 25 May, 2021

- Participating countries: Nigeria, Zambia, Malawi, Mozambique, Kenya, South Africa, Lebanon, Turkey, Syria, Afghanistan, Iran, Laos, Myanmar, Thailand,

- Theory, Methodology and Application: 12 courses from invited experts and 6 courses from CropWatch team

- Online practices: Participants from Algeria, Myanmar, Nigeria, Syria, Thailand and Mauritius finished the country analysis for May Bulletin 2021
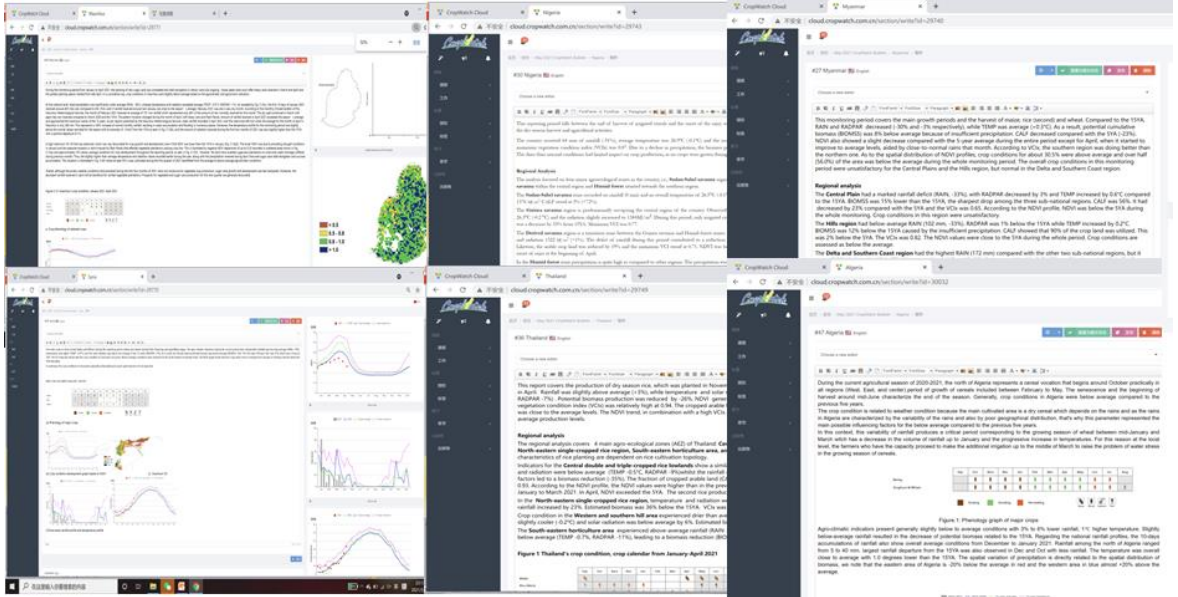
Technical support by country

- Work plan and requirement analysis

- Virtual field works and CropWatch data analysis training

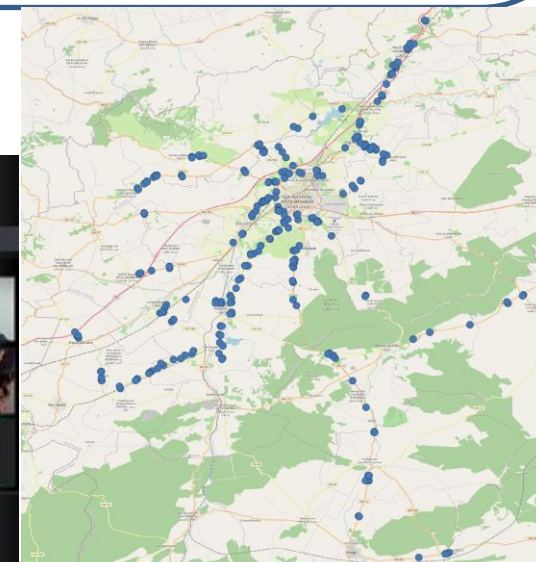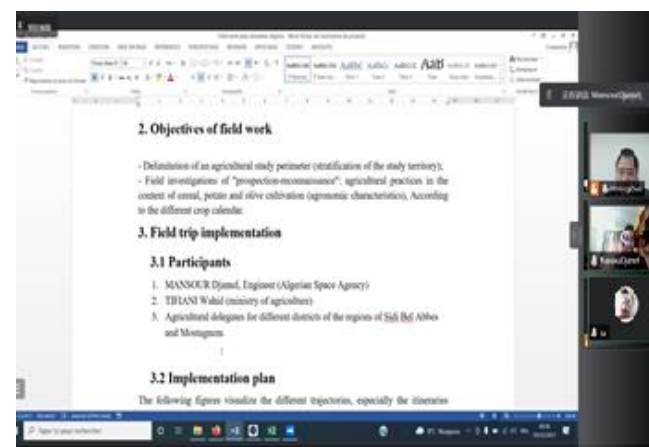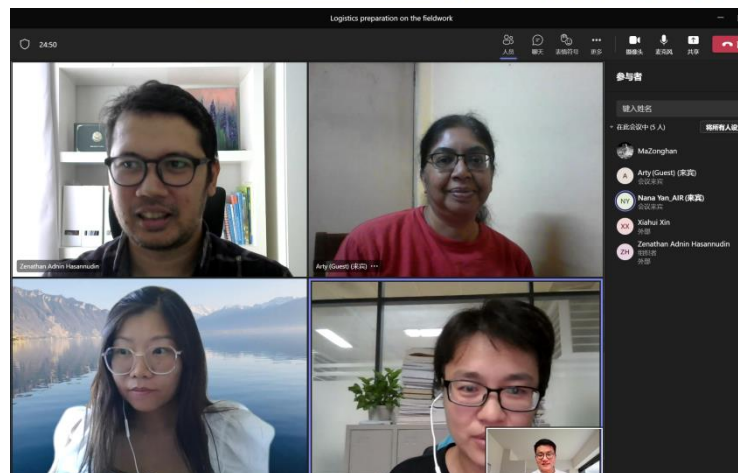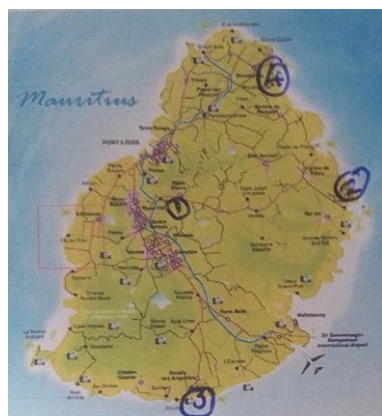# Virtual Joint Field works in Mauritius and Algeria

Mauritius
- Field work, 3days, October 4-14 2022
- Types : potato, tomato, pineapple
- Collected 320 samples

Algeria
- Field work, 3days, November 15-18 2022
- Types: potatoes, cauliflower, grains, olive and pomegranates
- Collected 279 samples

Technical training and national bulletin for Mozambique

- In-situ data collection training

- First CropWatch training for selected experts (3 persons)

- Extended CropWatch training (29 participants)

- CropWatch Cloud supports crop monitoring for food security in Mozambique – National Meteorological Bulletin powered by CropWatch

- CropWatch Cloud for Mozambique was included in Rural Solutions Portal by IFAD in 2020.

Activities	Outputs
Requirement analysis	Detailed Requirement report
Discussion and finalize the **implementation plan**	Detailed implementation plan
Discussion and **joint field trip** in Mozambique	In situ data in Maputo and Nampula
First **technical training** of CropWatch in Beijing	Agricultural monitoring report done by MOZ experts using CropWatch
Second technical training of CropWatch in MOZ	CropWatch based crop condition monitoring included in MOZ national meteorological bulletin
Training for national and provincial office	Mozambicans get some knowledge about crop monitoring on their own
Customize the CropWatch system for Mozambique	Provide system in Portuguese; Include all provinces for MOZ; Yield model calibrated
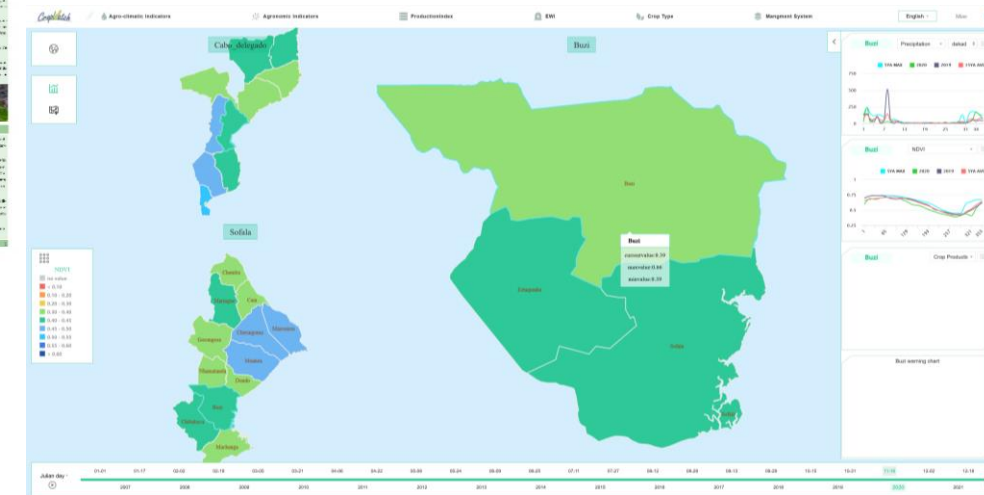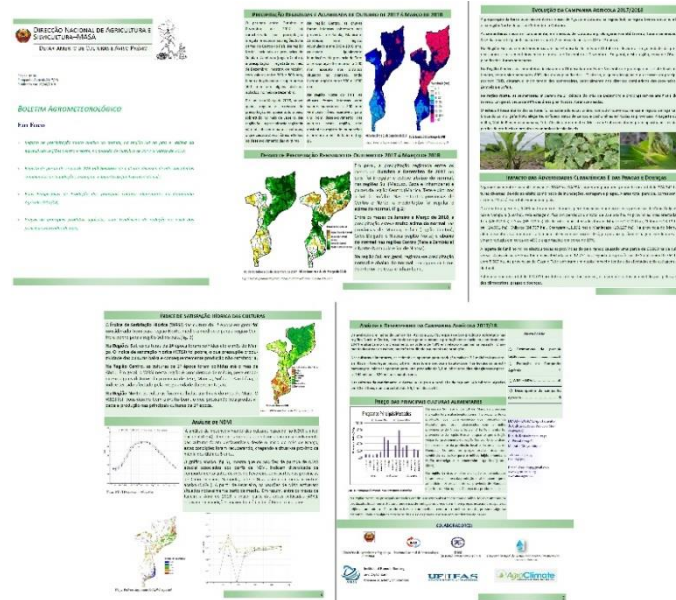
CropWatch for Mozambique

"We use CropWatch mainly for crop production forecast. Our team has been applying the tool to generate monthly agriculture bulletin during the rain season, which informs policy making at national and provincial-level agriculture departments."

Mr. Hilten, Department of Crops and Early Warning, Ministry of Agriculture and Rural Development, Mozambique

Collaborative **Crop conditions and Disaster's Updates** in **Portuguese language**

Powered by: *CropWatch*

In 2019, CropWatch Cloud for Mozambique was selected as one of the **best "rural solutions"** by the **International Fund for Agricultural Development (IFAD)** due to its contributions in improving the capacities of Mozambique to access domestic and global agricultural information.
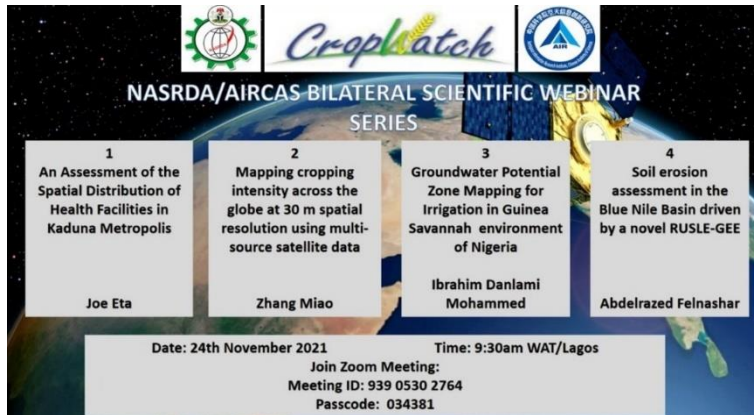
Activities in Nigeria NASRDA

- Project implementation team

- All indicators are tailored for three Levels of national, state and local units

- Stakeholder meeting including ministries of agriculture, environment and water resources
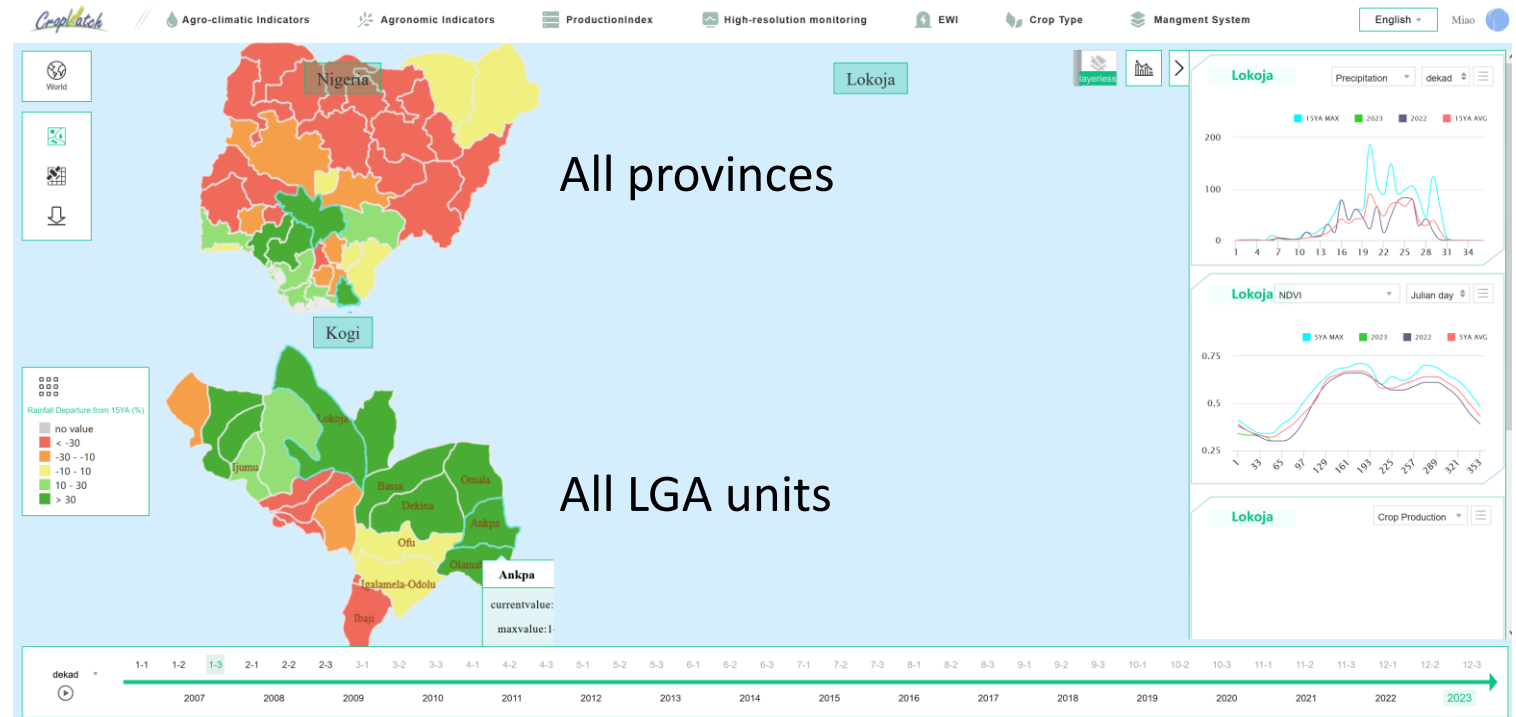
- Technical support to regional countries

Online scientific webinars

CropWatch customization for Nigeria

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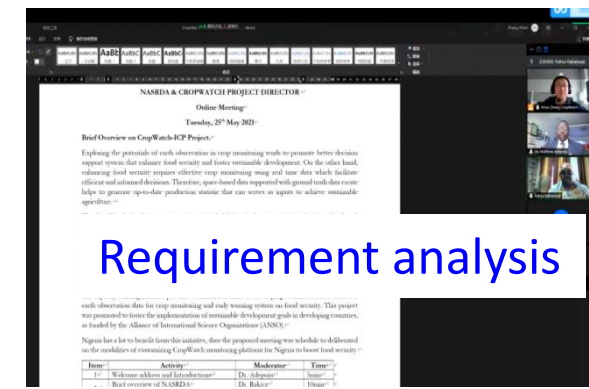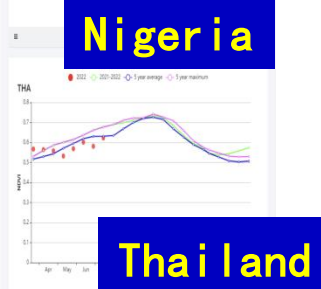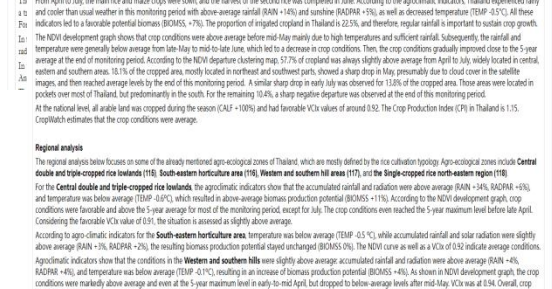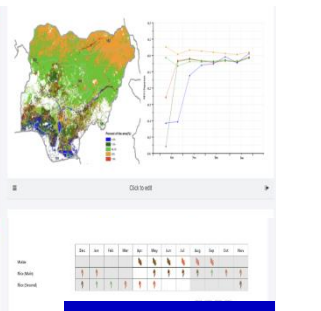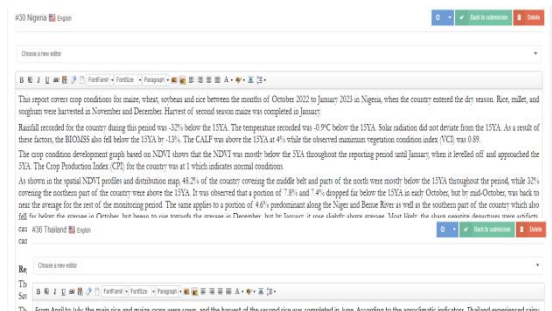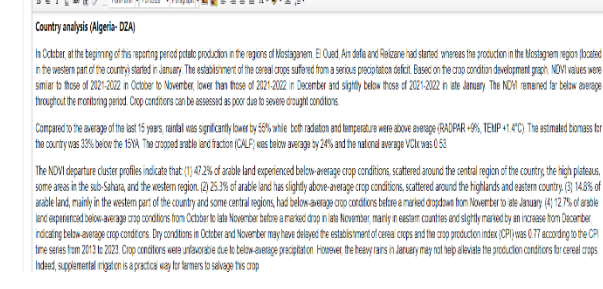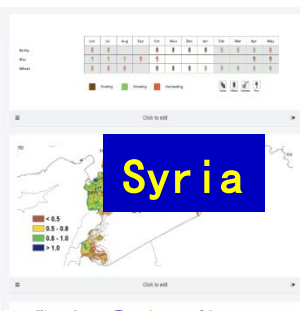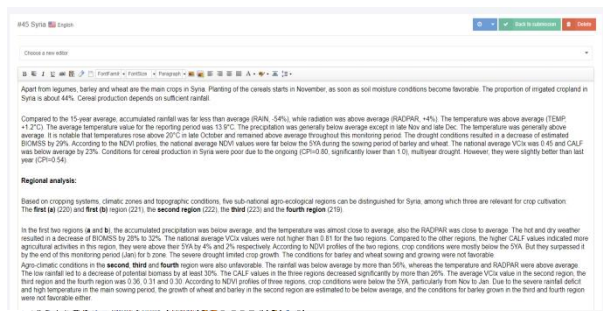
- **Outlook**

Next steps

- Regional workshop in Mauritius (August) and Thailand (tbc)

- Food security session at ANSO conference (November, Beijing)

- Hand on training on the field in Cambodia, Thailand, Nigeria, Mauritius

- On-job training in Beijing for pilot countries from May to November

- CropWatch customization for technical transfer

- Upgrading the system to provide high resolution crop monitoring APIs to address the small holder farming systems

Ongoing system customization for pilot countries

- Specific requirements for function and models: Nigeria, Syria, Mauritius, Algeria, Thailand, Laos
- System languages documents: Vietnamese, Thai, Arabic
- Continuing participation on country analysis for CropWatch Bulletin: Nigeria, Syira, Thailand, Algeria


System Language

Syria

Algeria

Nigeria

Thailand

Requirement analysis

Outlook

- CropWatch is flexible to be tailored as their own crop monitoring system, it will enable developing countries have the capacity and ability to complete crop monitoring independently without additional investment on storage and computation.

- More countries are welcome to join us, please contact UNCTAD to express your interests
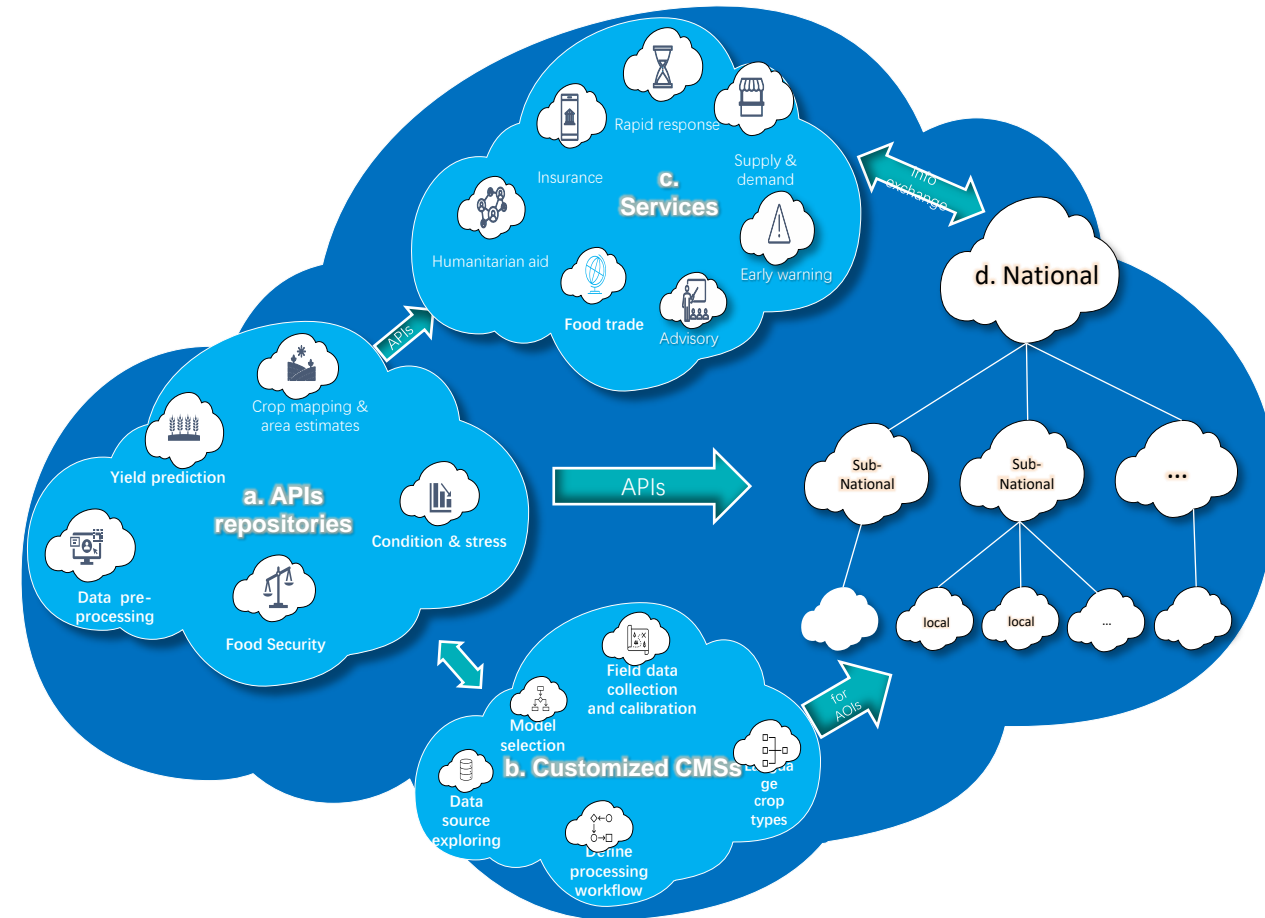
Thank you for your attention!

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