Ghana Space Agency:
Building Crop Monitoring System for Ghana

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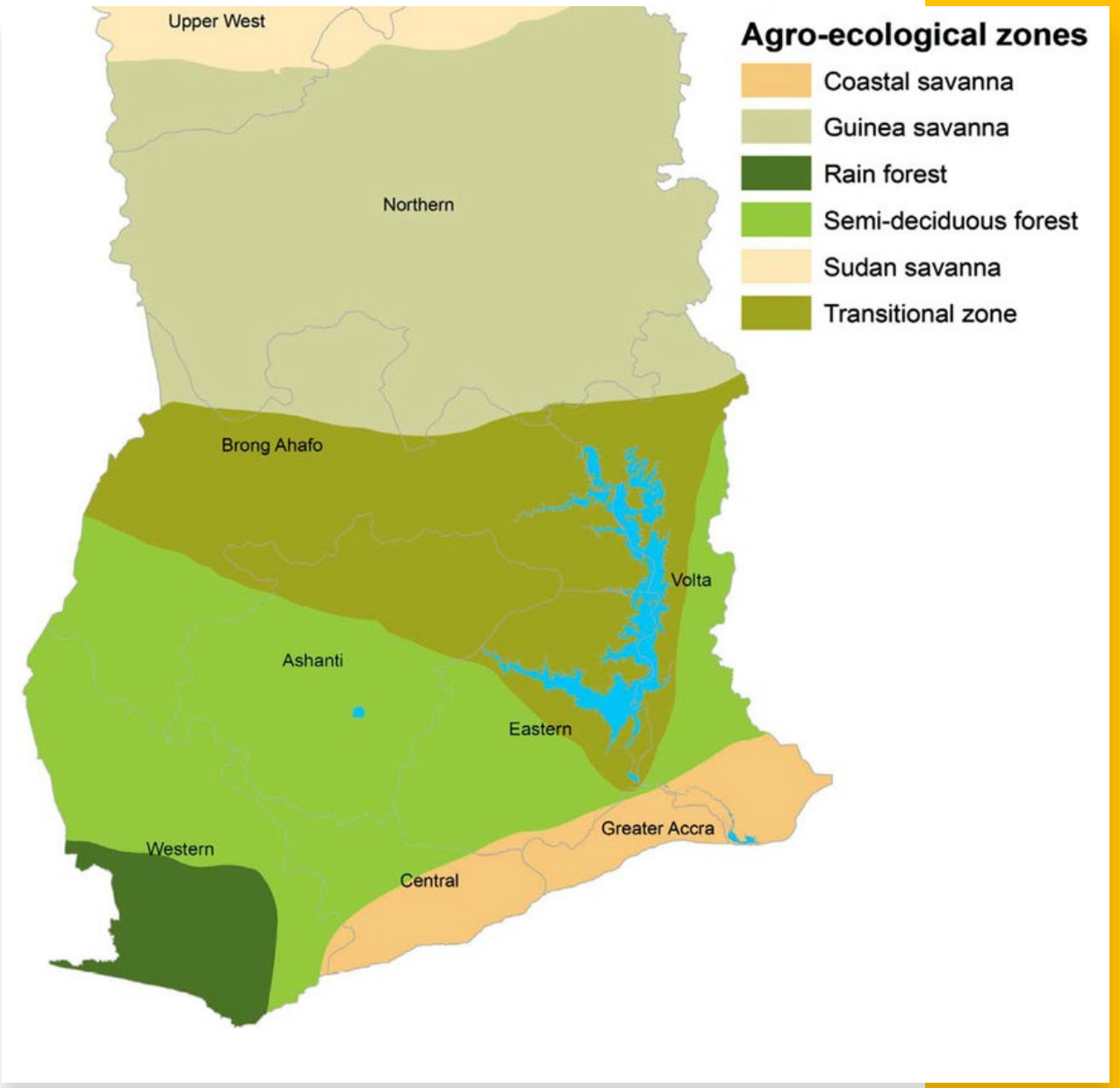
Agro - Ecological Zones

- Six agro-ecological zones in Ghana:
  - Sudan Savannah
  - Guinea Savannah
  - Coastal Savannah
  - Transitional
  - Deciduous Forest
  - Rain Forest

Rainfall Regime;

Bio modal - South

Unimodal - North



Agriculture in Ghana

Agriculture accounts - 28% of GDP
Employs – About 50% of labour force,
Irrigated lands - 0.2%
Cash crops:
- Cocoa,
- oil palm,
- rubber
- citrus

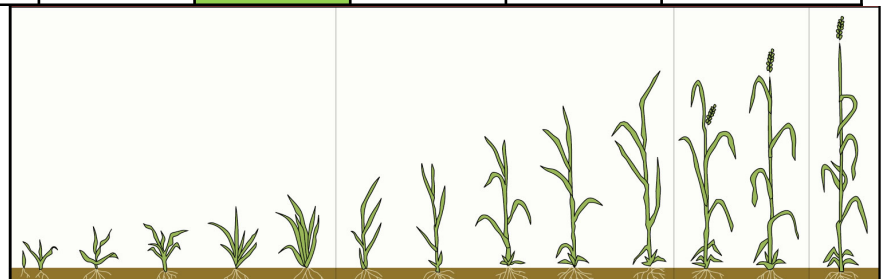
Major staples:
- maize,
- cassava,
- plantain,
- yam,
- rice,
- Sorghum
- millet

- Big **yield gap**
  - Low soil fertility
  - Low soil water retention capability
  - Little use of fertilizer (Below ECOWAS/AU average)

- Huge **variability** in smallholder farming
  - **Rainfed** agriculture
  - **Family-managed** farms
  - Low investment / Limited access to inputs
  - Not mechanizes

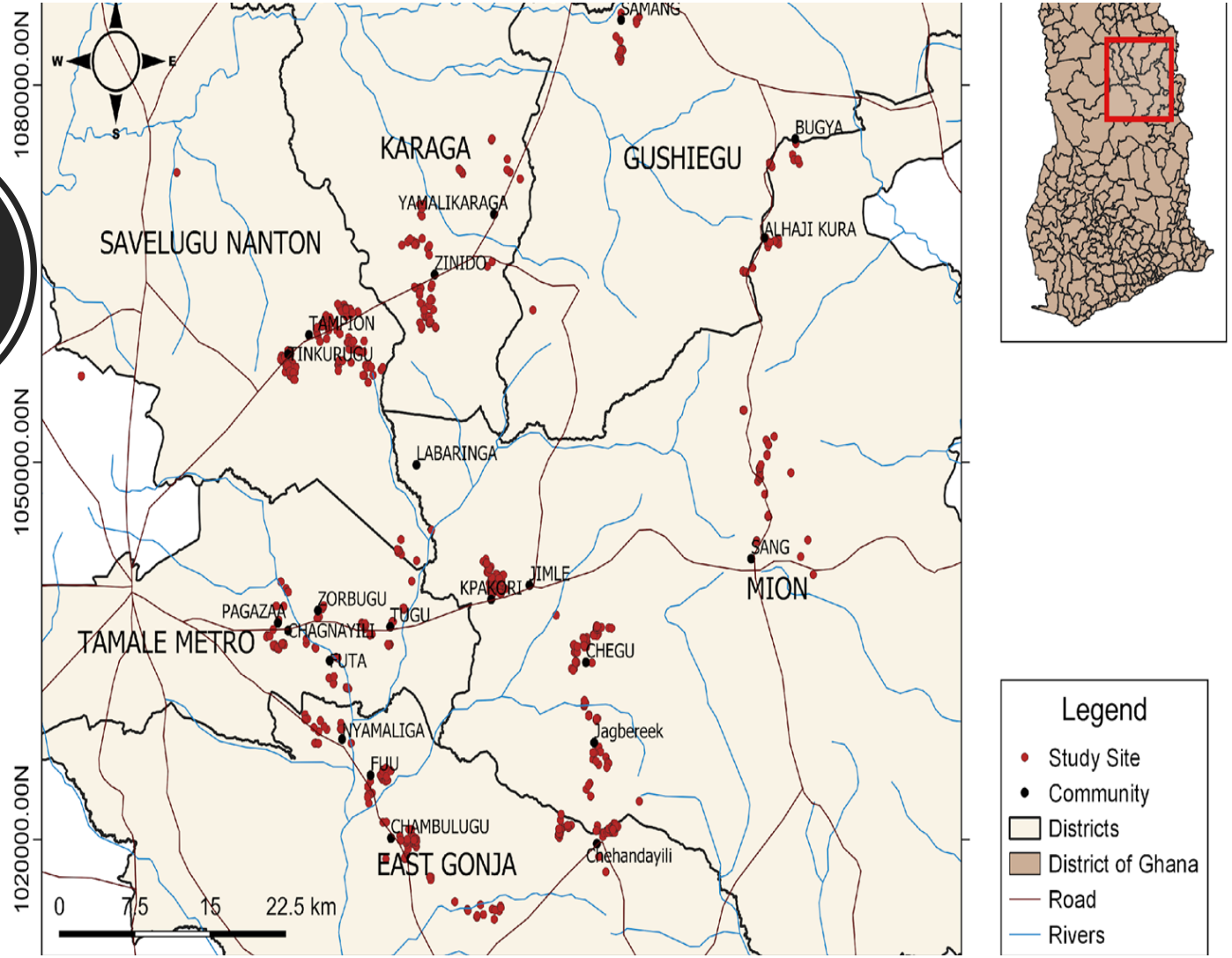
Growing Season – Maize – Northern Ghana

STAGE / ACTIVITY	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC	No. OF DAYS
Sowing													**0**
Emergence													**5**
Establishment													15-20
Vegetative													25-40
Flowering / tasseling													15-20
Yield formation / cobbing													35-45
Ripening / drying													10-15



2023 campaign in N Ghana

Study area



Surveyed 50 farms

- LAI
- Chlorophyll
- Crop yield

Ground data to build towards an agricultural monitoring system

Crop location

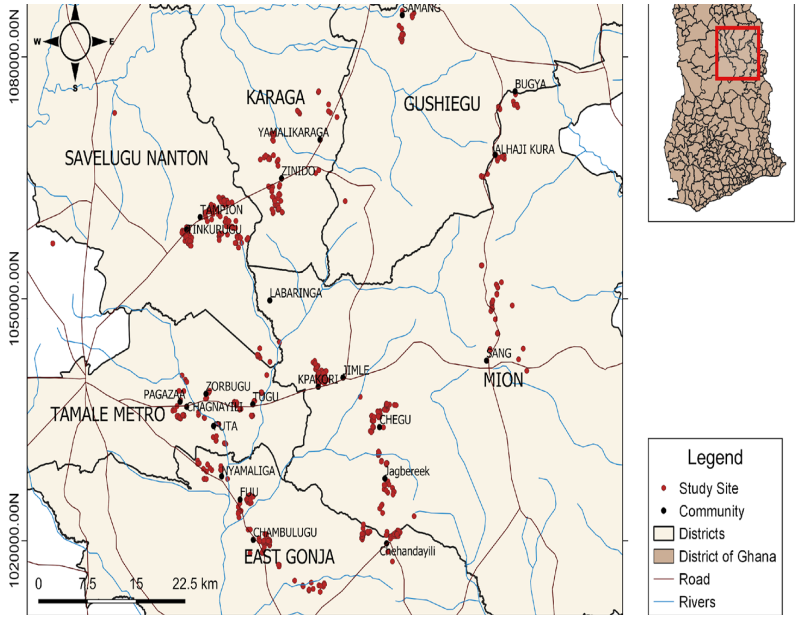
- Often poor information on **crop acreage**
- Very scarce information on **crop location**

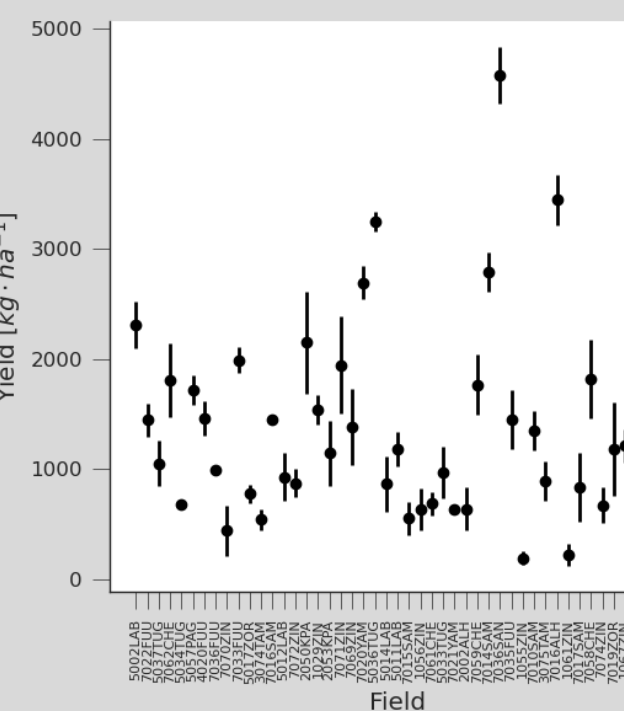
Biophysical variables (context: **Essential Ag Vars**)

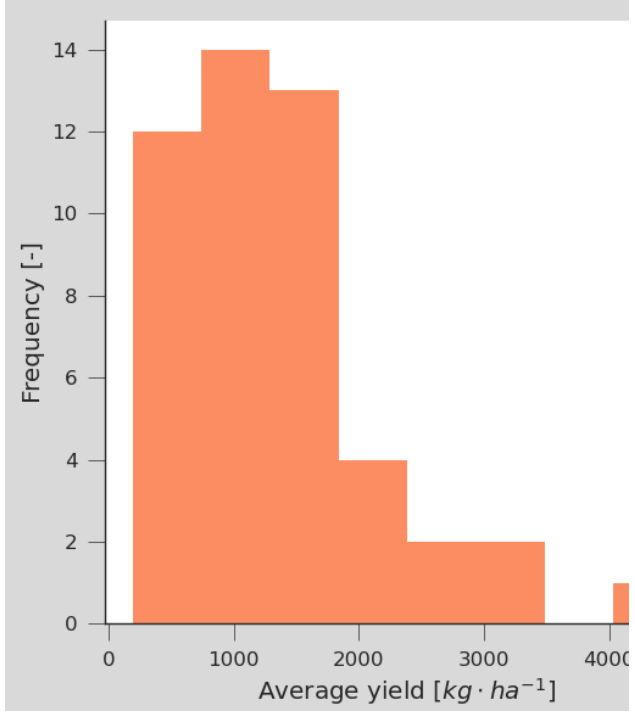
- Validate/**understand** limitations of **EO-derived estimates**.
- Includes: LAI, soil moisture

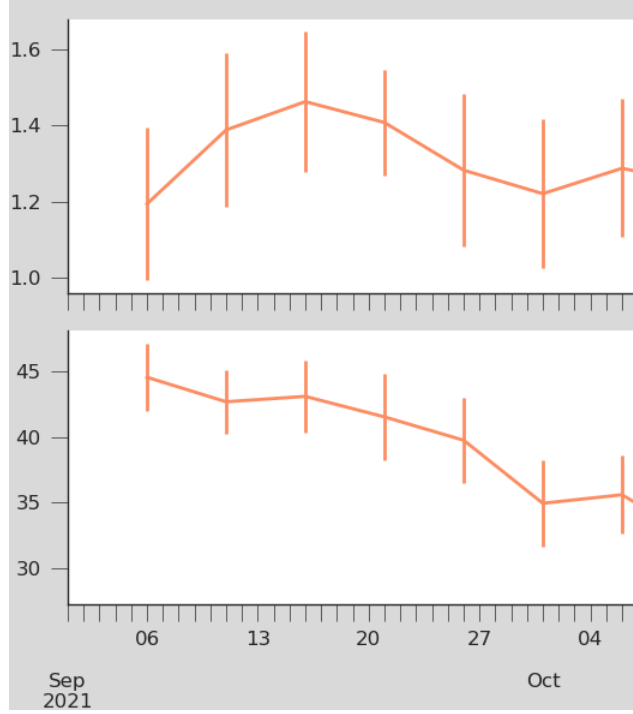
Understand **mapping from EO to agricultural variables**

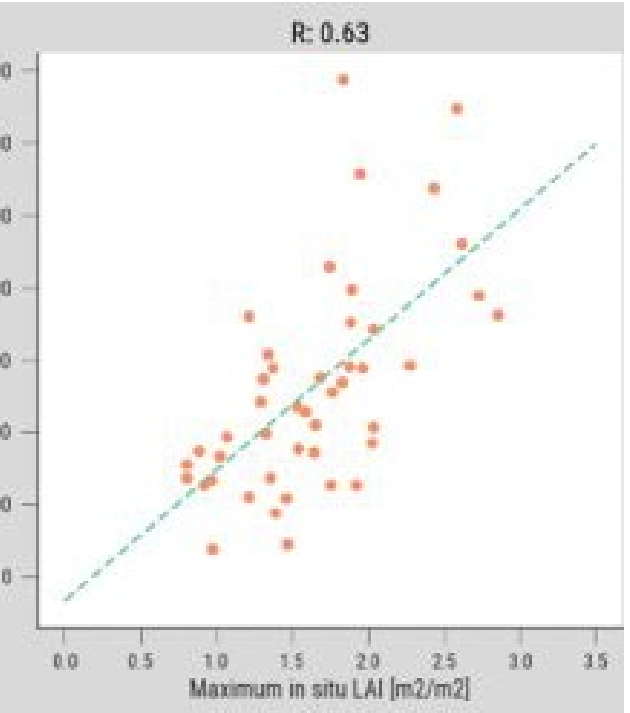
- Includes **yield**, above ground biomass, …











Field measurements

- LAI & Cab **dynamics visible**
- **Low LAI values** cf to temperate maize
- **Decay of chlorophyll** over time
- Large **spread** of **yields**
  - Spread of yields **within field!**

Challenges

- Access to high resolution satellite data
- Grounding data for validation

Expectations

- Build a robust crop monitoring system for Ghana
- Downscale and customize Cropwatch to Ghana
- Next steps in implementing Cropwatch in Ghana

Ghana Space Experience and Abilities

- Large area **crop type mapping** experience
- Agronomic monitoring:
  - Biophysical parameters (->EAVs) for satellite product validation/exploitation
  - Crop yield, management and condition
- Ability to liaise directly with farmers
- Good connections and interest from government and state organisations (e.g., MoFA, National Stats office)
- Combining crop models and EO data

Ghana Space is open to collaborate with partners

- Establish Jecam site in Ghana
- Expand our data collection and monitoring activities
- Build monitoring platform
- Share our data GEOGLAM

Thank you

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