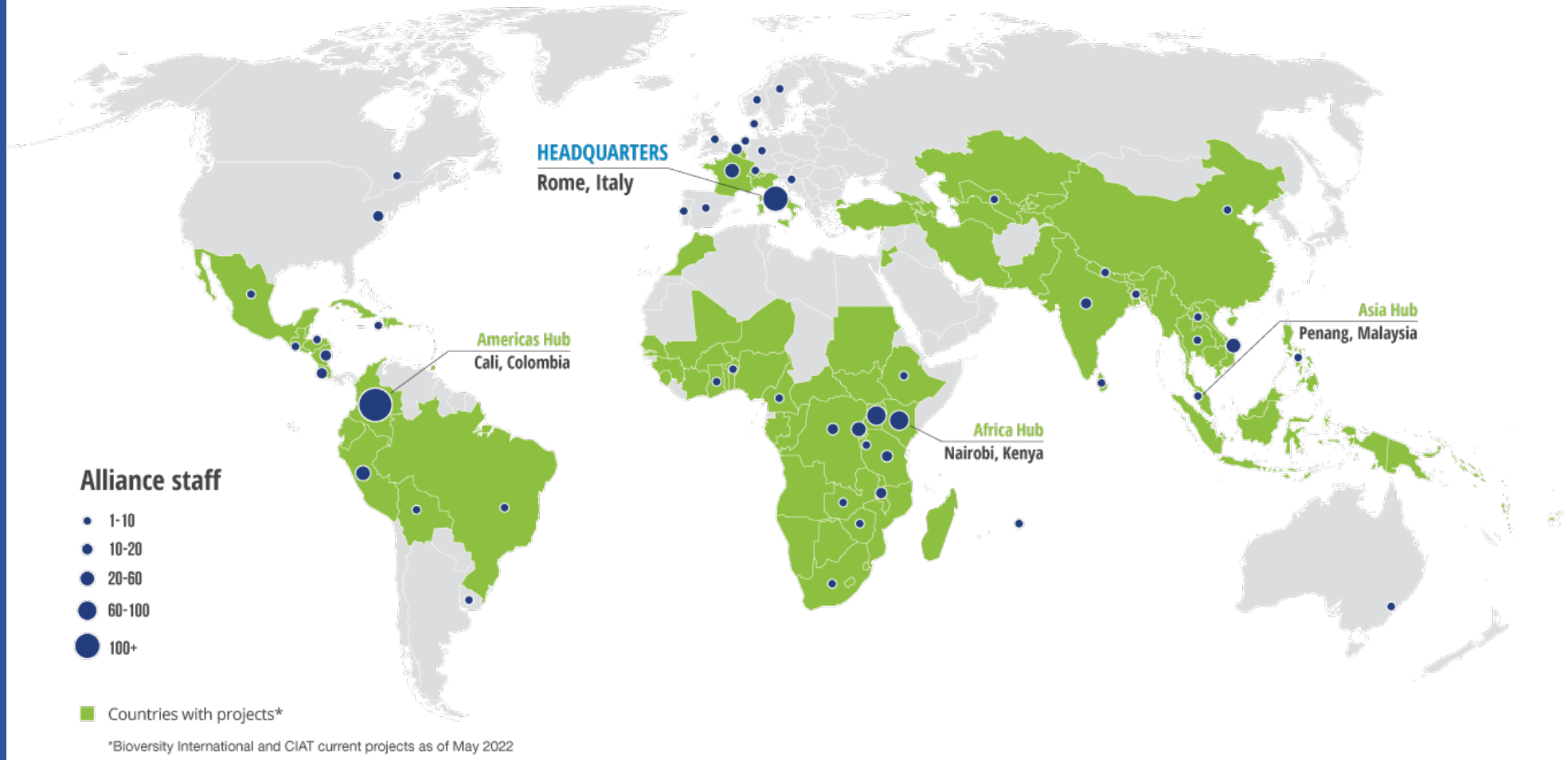
Crop Monitoring in Eastern & Southern Africa.

Anastasia Wahome,

EO4Africa Symposium,
Frascati, Italy.
24th September 2024.

Where we work

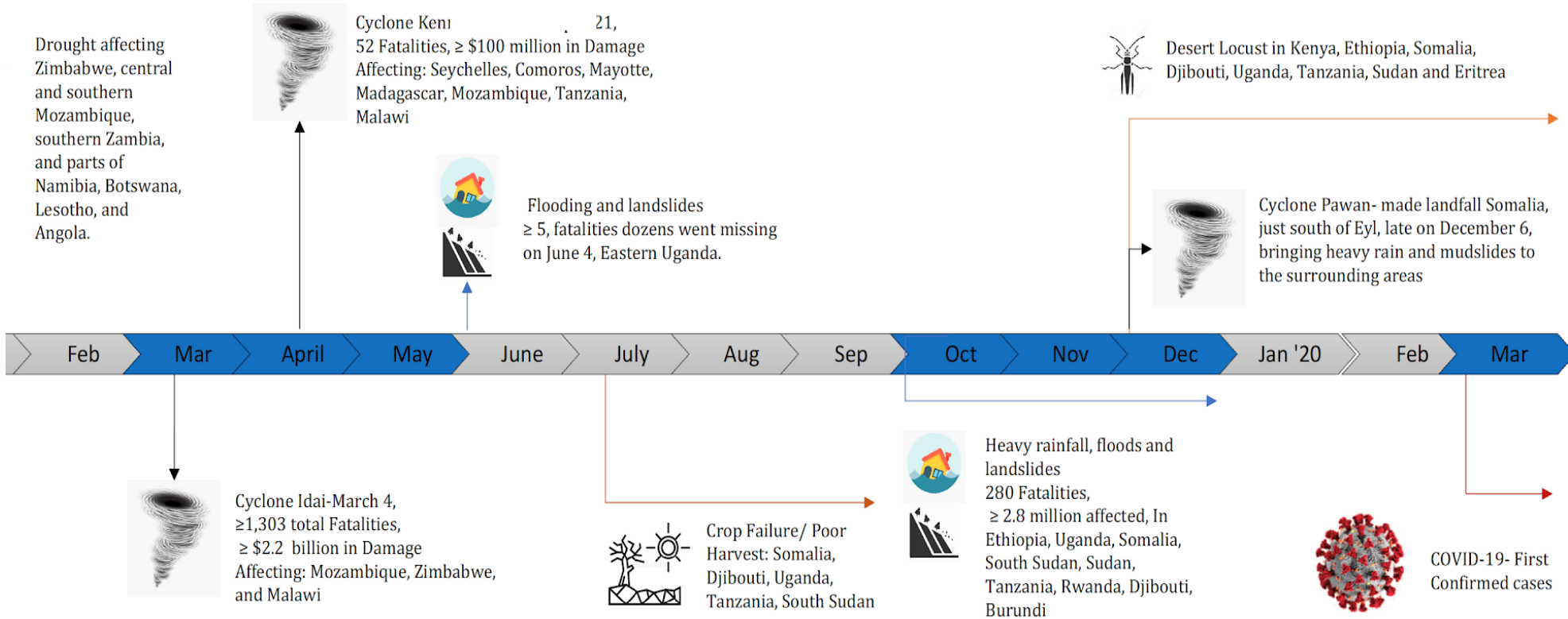


What we do

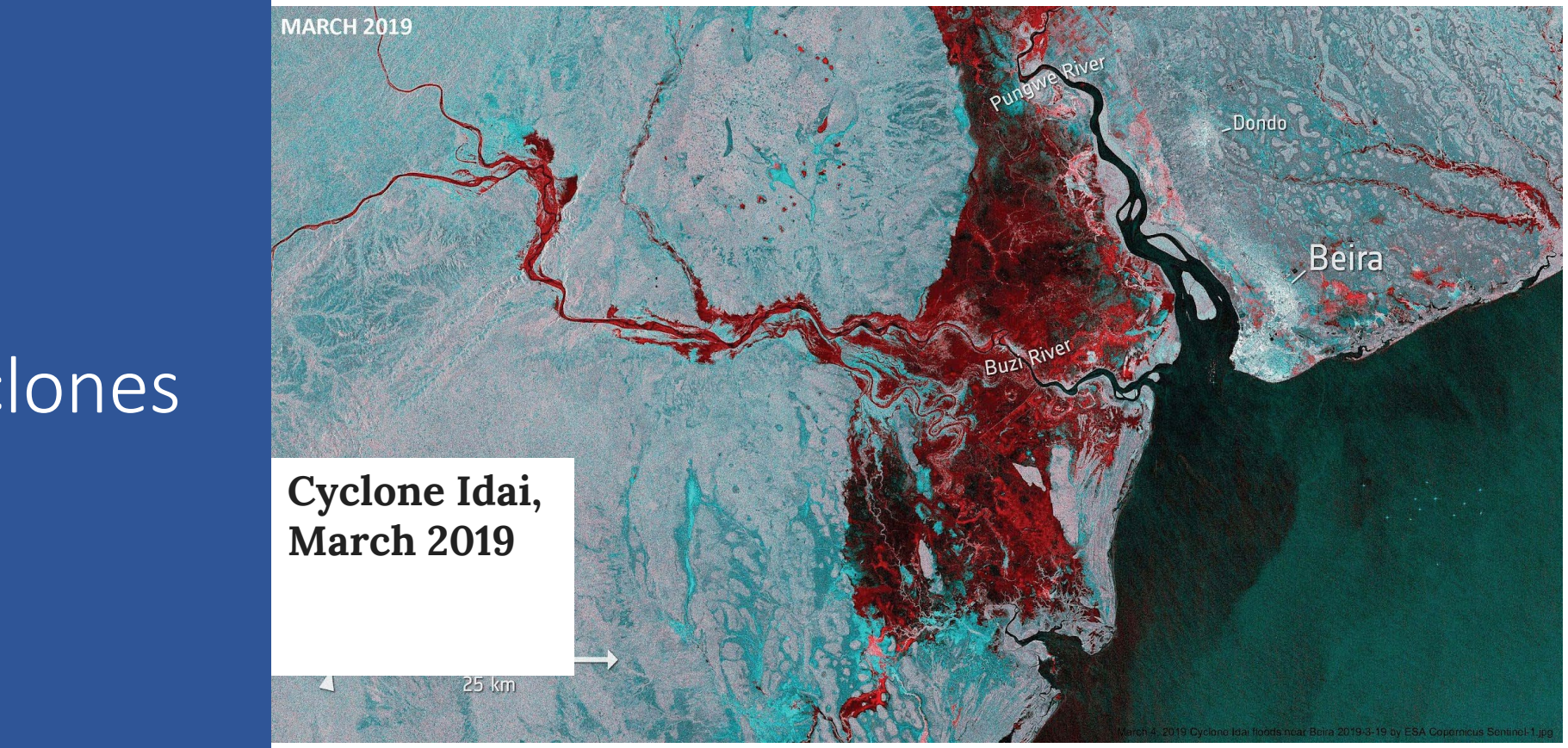
We strive to make food and agriculture systems more sustainable, efficient and inclusive, through sustainably funded science, research-based solutions and inclusive knowledge generation.

Footprint in Africa

Series of extreme events affecting crops



Cyclones

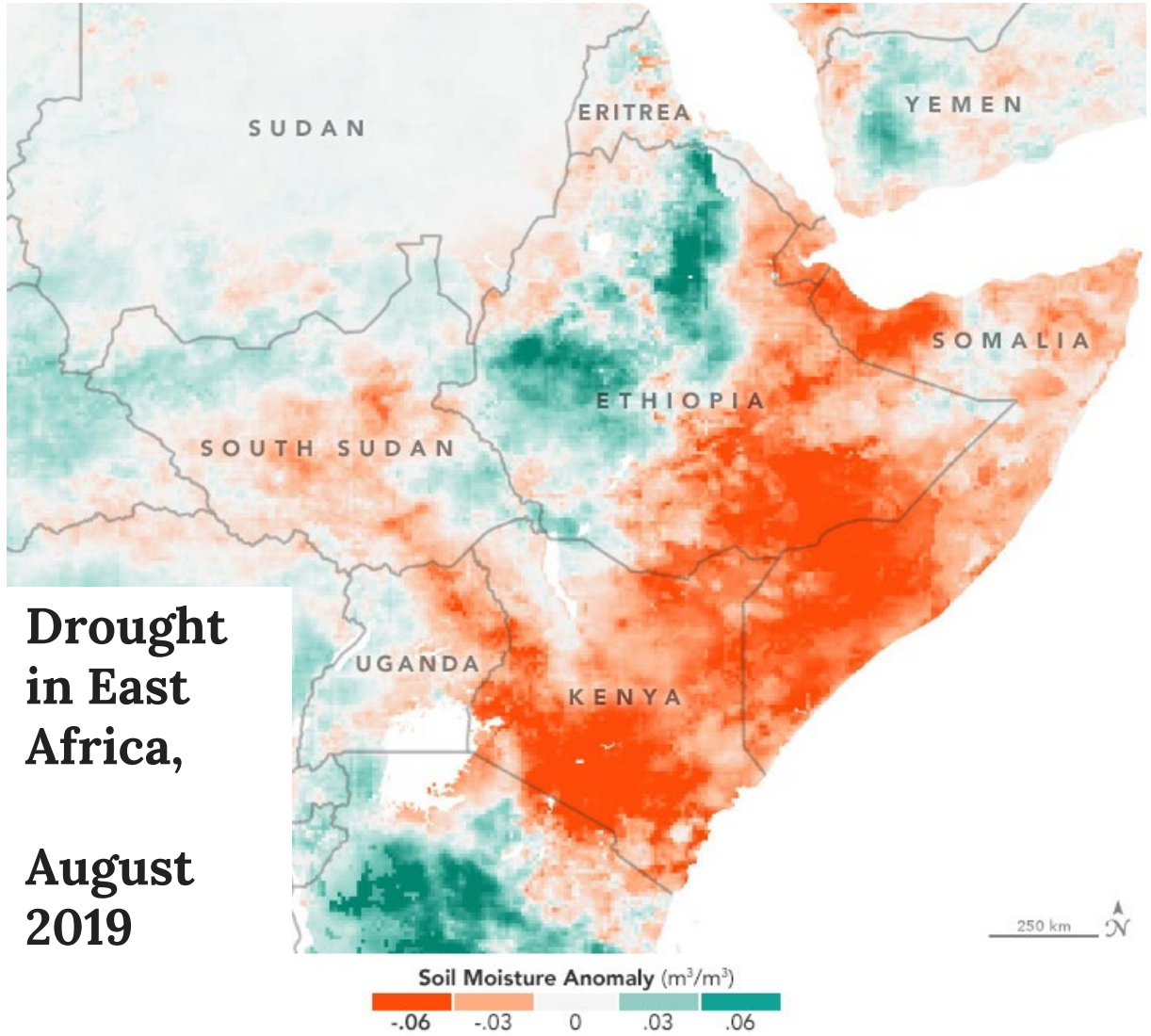


Cyclone Idai made landfall in Mozambique on March 15, 2019 causing severe damage in south-Eastern Africa, with catastrophic winds and flooding in several countries.

Alliance Bioversity & CIAT

CGIAR

Drought



Drought in East Africa,

August 2019

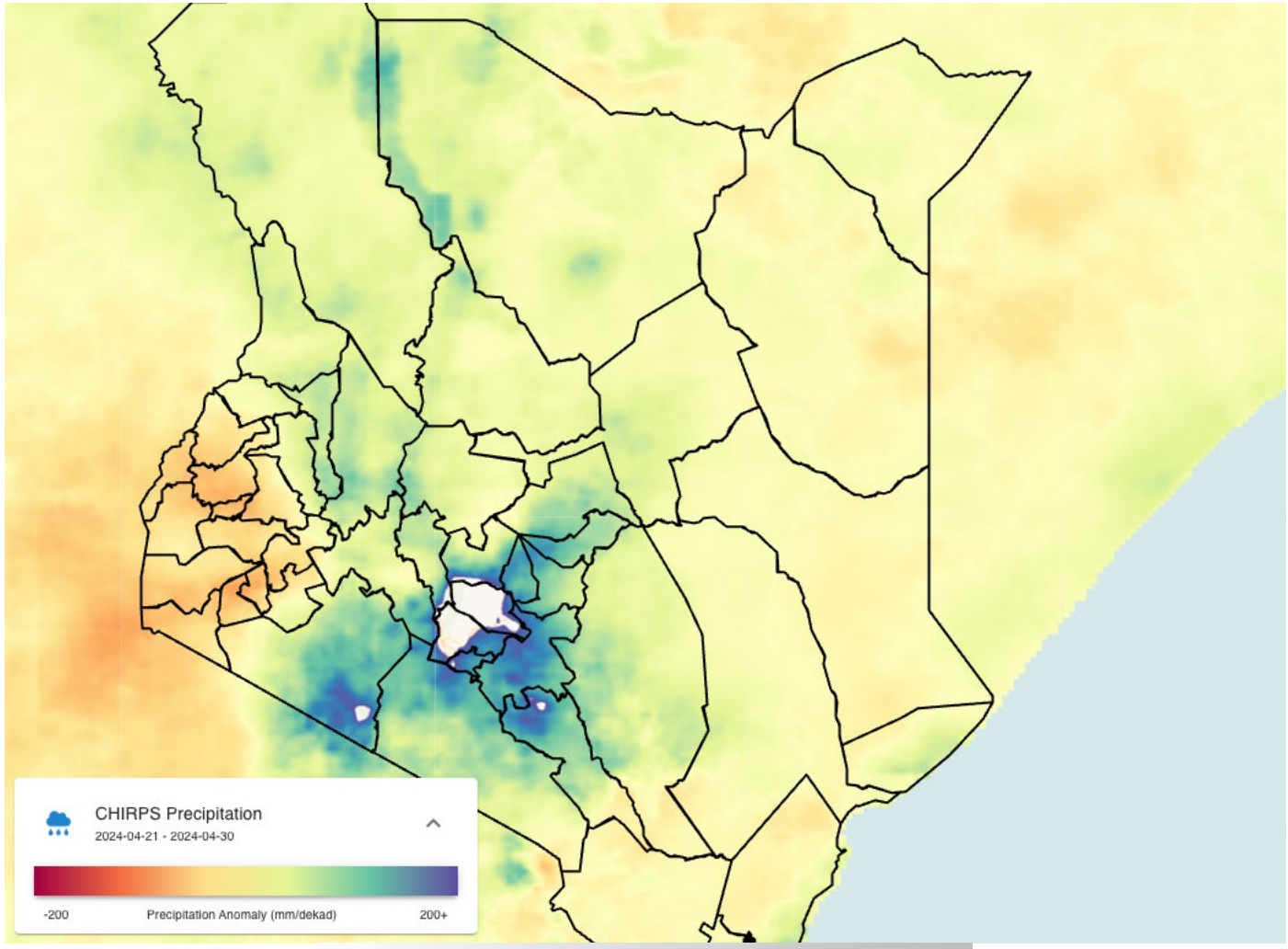
Rainfall deficits translated into depleted soil moisture, evident here as below-average levels (red) across Kenya and Somalia in April following poor rains.

This moisture deficit during critical crop stages caused widespread crop failure.

Alliance Bioversity & CIAT

CGIAR

Floods



Floods in East Africa, April 2024

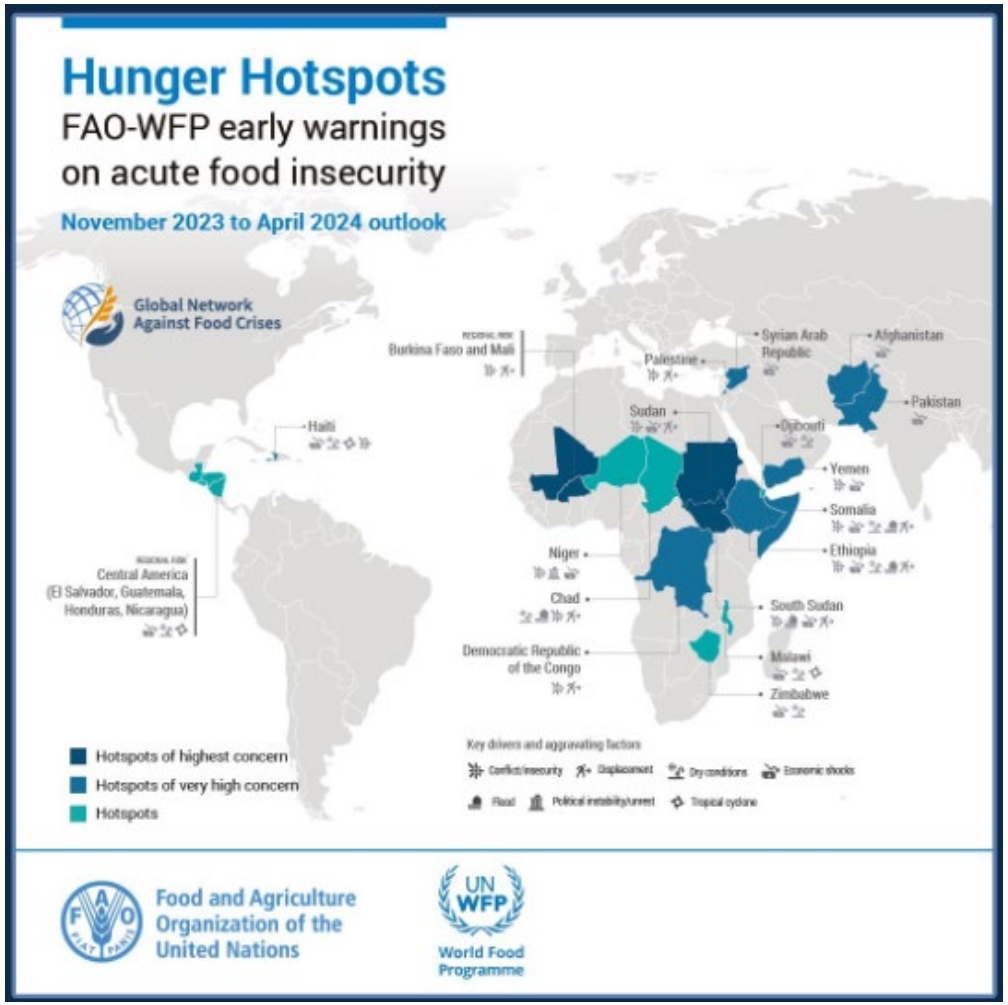
Kenya experienced severe flooding in March-May 2024.

Severe damage to croplands.

Flooding coincided with main planting season.

Hunger Hotspots

- Climate change impacts are exacerbating existing vulnerabilities related to food security.
- In 2022, 278 million Africans faced chronic hunger while 139.95 (~140) million experienced acute food shortages across 35 nations
- Rising temperatures and worsening extreme weather disrupt harvests, cause crop failures, livestock losses, and intensify resource conflicts



Crop Monitors implementation Process

1.Needs assessment, stakeholder identification and mapping

2.Create a framework for coordination between stakeholders (data providers, developers, experts, and end-users)

3.Develop a technical framework using open-access resources for EO data, field data, analytics, IT, and monitoring

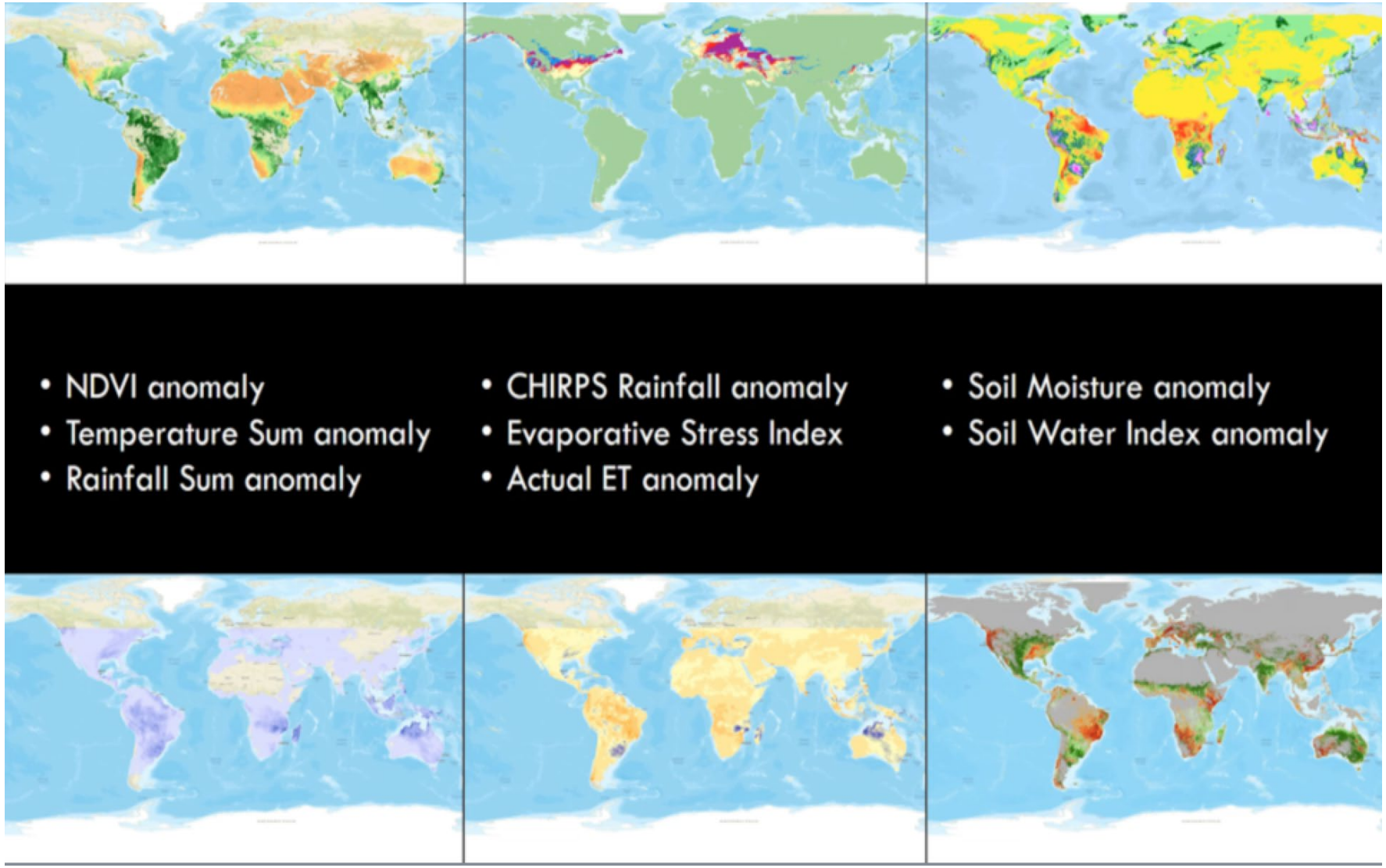
4.Assess capacity, train local staff, and partner with relevant stakeholders to transfer EO knowledge and skills

5.Technical support to the lead institution in developing the crop monitors.

6.Operationalization of the production of crop monitors.

7.Explore and utilize sustainability options

Satellite Data Indicators for Crop Conditions

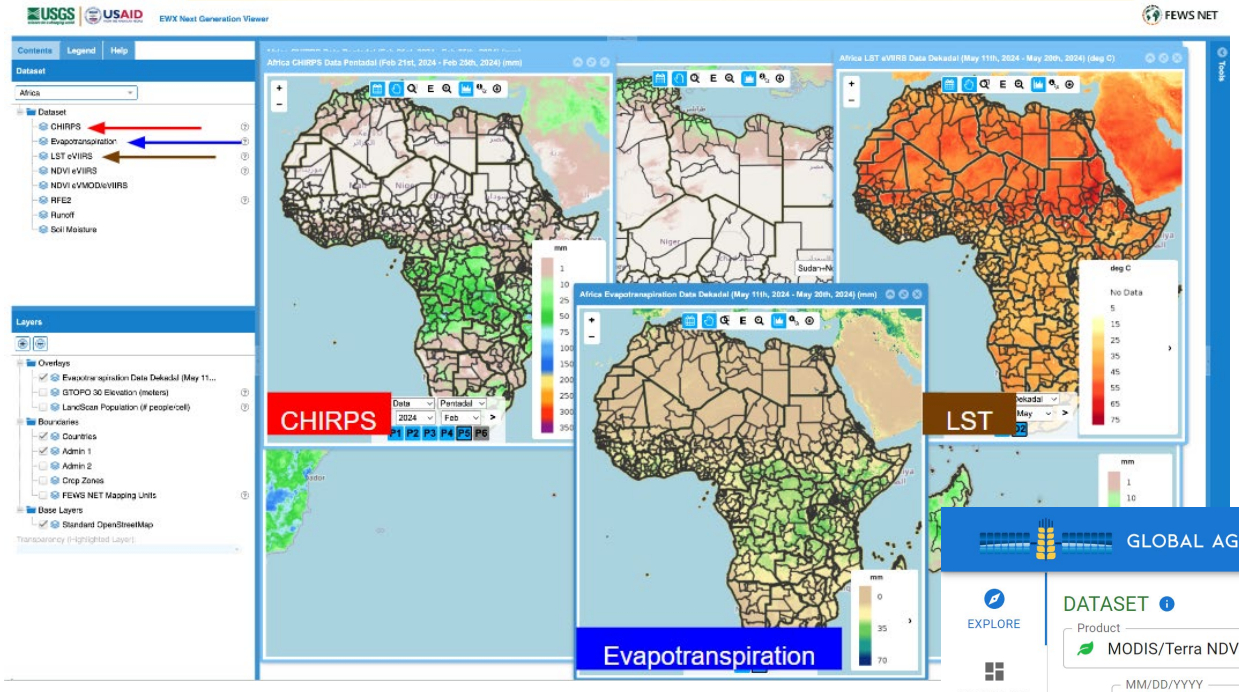


Alliance Bioversity & CIAT

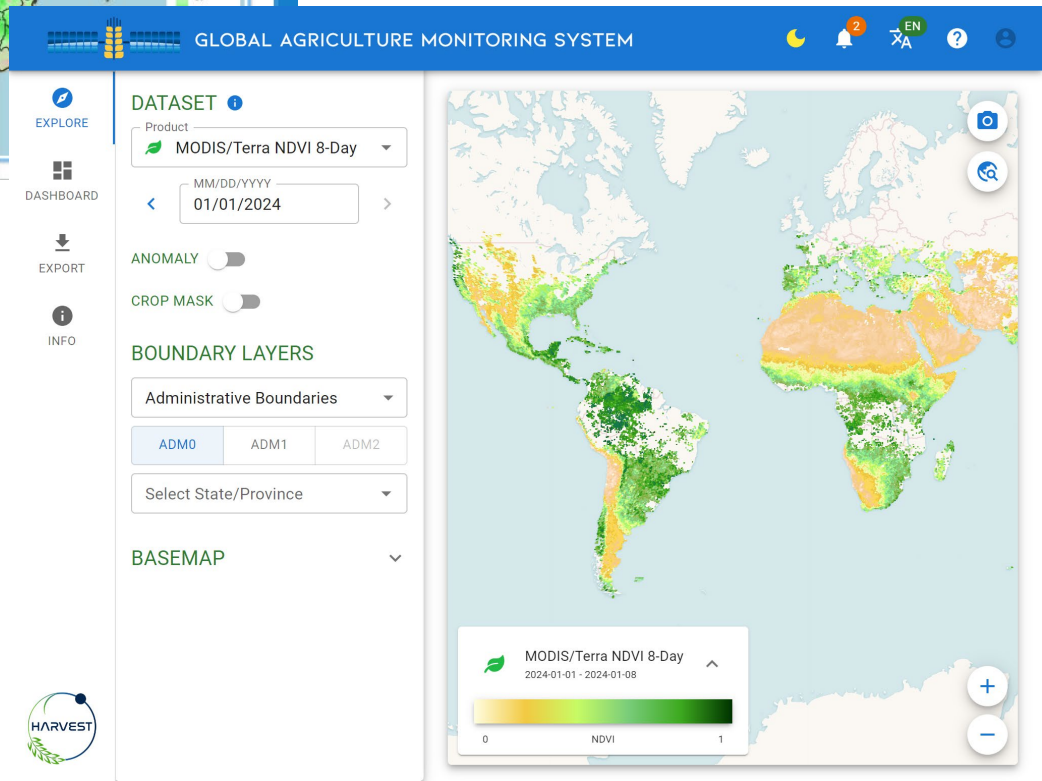
CGIAR

Decision Support Tools for Agriculture

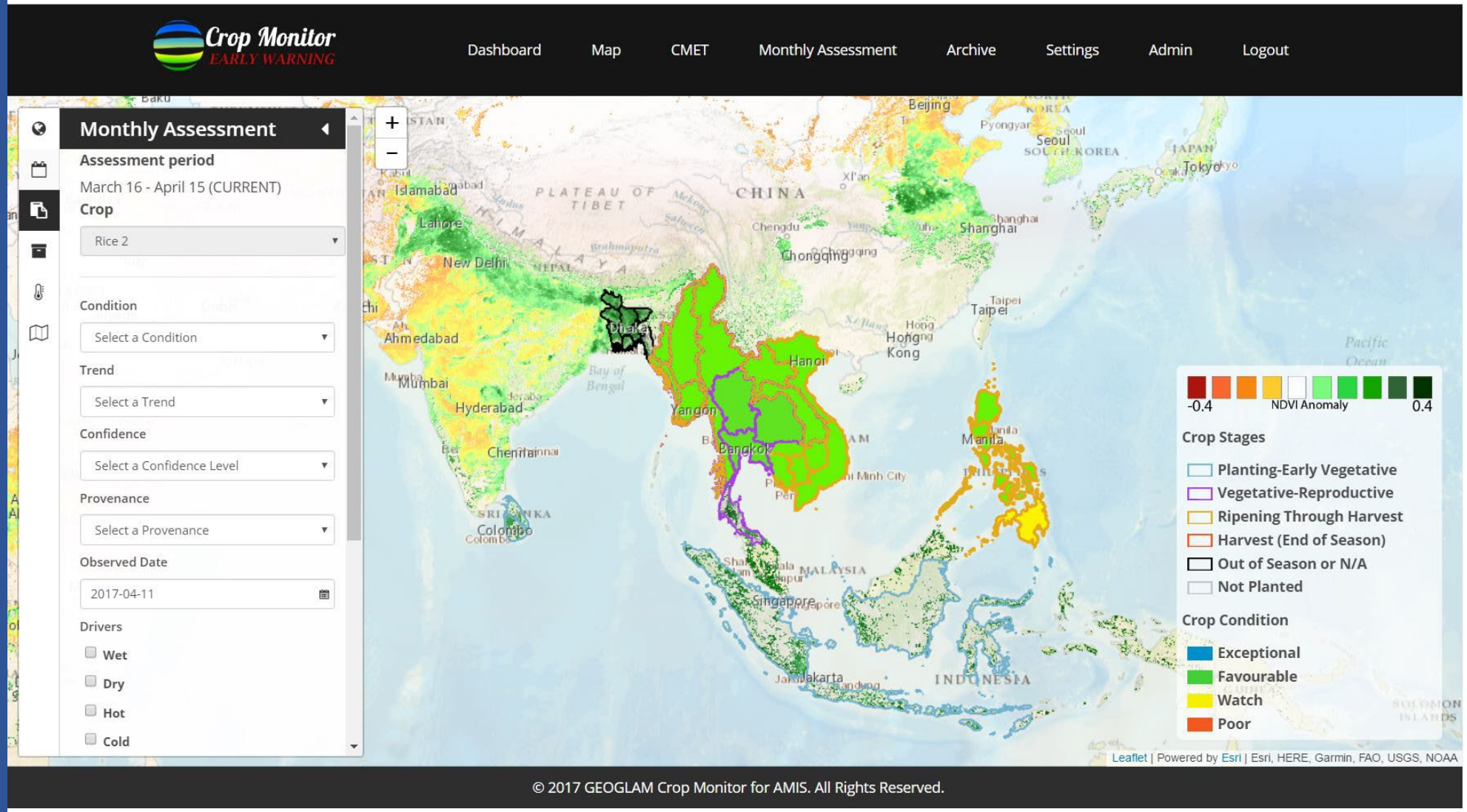
https://earlywarning.usgs.gov/fews/ewx/index.html



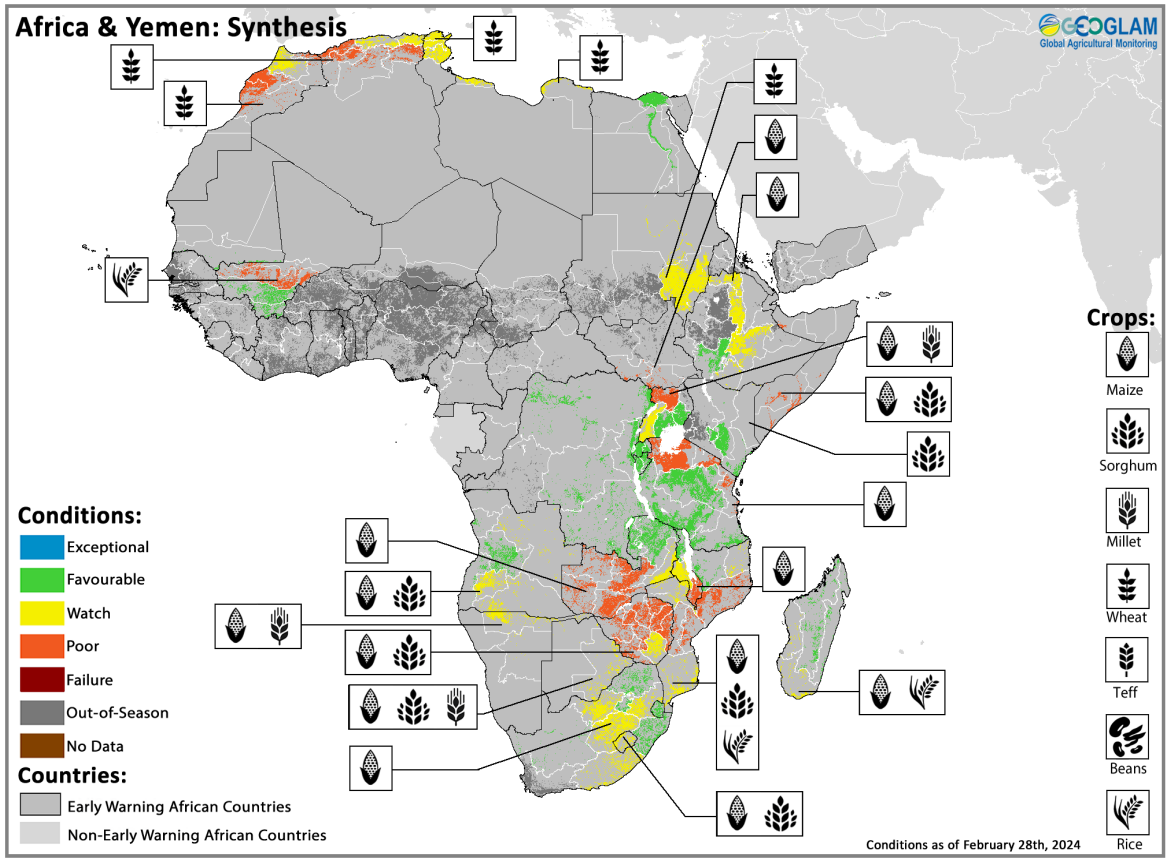
https://glam.nasaharvest.org/



Crop Condition Reporting Interface



Crop Monitor for Early Warning



Crop Condition Classes

	Condition	Definition
	Exceptional	Conditions are much better than average* at time of reporting. This label is used only during the grain-filling through harvest stages.
	Favourable	Conditions range from slightly below to slightly above average at reporting time.
	Watch	Conditions are not far from average but there is a potential risk to final yields. There is still time and possibility for the crop to recover to average conditions if the ground situation improves. This label is only used during the planting-early vegetative and the vegetative-reproductive stages.
	Poor	Crop conditions are well below average. Crop yields are likely to be 5% below average. This is only used when conditions are not likely to be able to recover, and impact on yields is likely.
	Out-of-Season	Crops are not currently planted or in development during this time.
	No data	No reliable source of data is available at this time.

** "Average" refers to the mean conditions over the most recent 5 years.*

Drivers of Crop Conditions

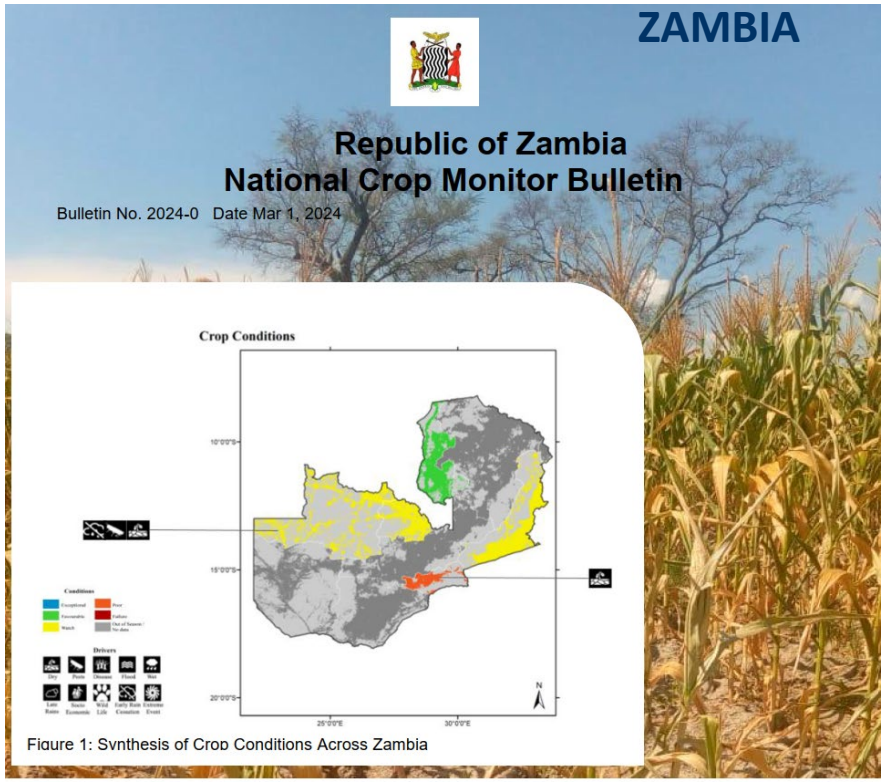
	Driver	Definition
	Wet	Wetter than average (*includes water logging and floods*).
	Dry	Drier than average.
	Hot	Hotter than average.
	Cold	Cooler than average or frost damage.
	Extreme Events	Catch-all for all other climate risks (i.e. hurricane, typhoon, frost, hail, winter kill, wind damage, etc.). When this category is used the analyst will also specify the type of extreme event in the text.
	Delayed Onset	A late enough start to the season that it may impact full crop development.
	Socio-economic	Social or economic factors that impact crop conditions (i.e. policy changes, agricultural subsidies, government intervention, etc.)
	Conflict	Armed conflict or civil unrest that is preventing the planting, working, or harvesting of the fields by the farmers.

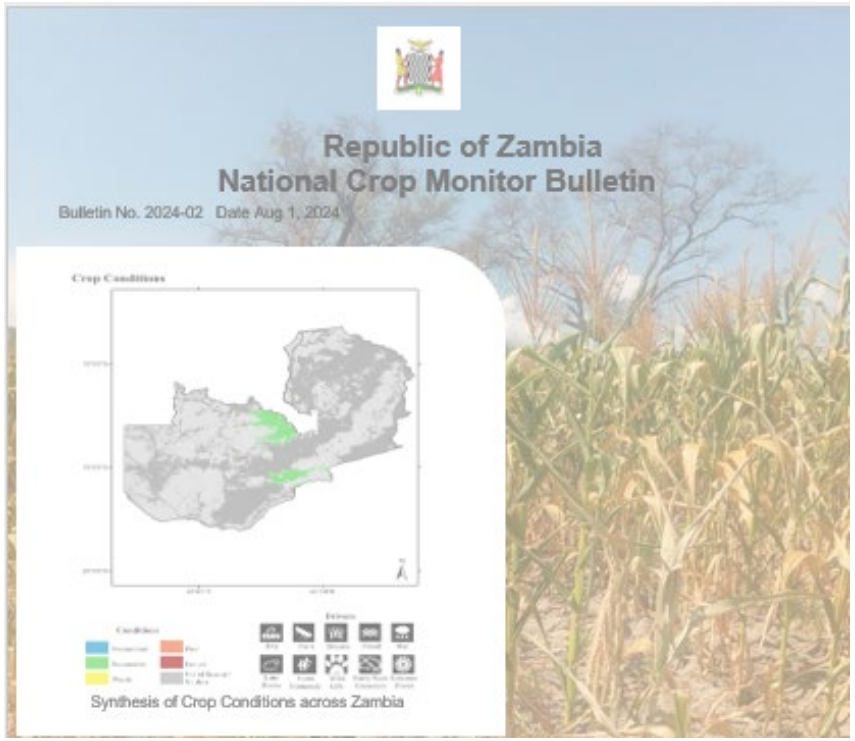
Crop Monitor for Early Warning Classification System

Alliance Bioversity & CIAT

CGIAR

Zambia Monthly Crop Monitor Bulletins





Lead agency: Ministry of Agriculture
Product: Zambia Crop Monitor Bulletin

- National synthesis maps with a sumary of the crop conditions
- Improved reporting and communication of crop conditons to government and other food security stakeholders.

Collaborative effort

NASA Harvest is NASA's Global Food Security and Agriculture Consortium, led by University of Maryland

Goal: Enable and advance the adoption of satellite data in decision making related to food security and agricultural resilience worldwide.

Alliance Bioversity and CIAT has partnered with the University of Maryland to lead the adoption of these satellite technology, more so for agriculture and food security in East and Southern Africa.

Harvest is NASA’s contribution to GEOGLAM.

Copernicus4GEOGLAM crop-type mapping service
https://earthobservations.org/geoglam.php

Crop monitoring in East & Southern Africa Region

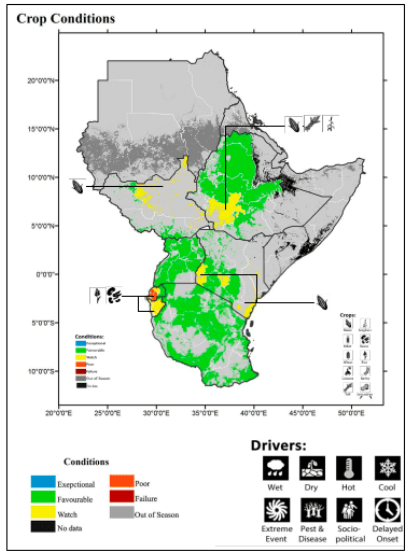
ISSUE NO 1 MAY 2018 WWW.ICPAC.NET

ICPAC

EASTERN AFRICA CROP MONITOR BULLETIN

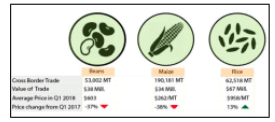
Overview

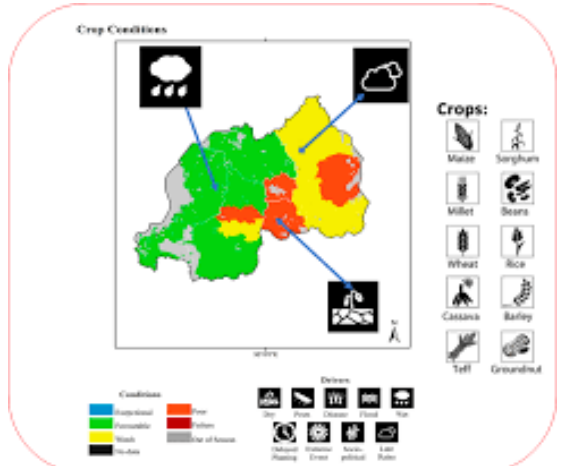
- Eastern Africa has been experiencing average to above average rainfall resulting in overall favorable crop conditions.
- Watch conditions prevailed in Rwanda, Burundi for rice and beans and in Kenya for main season maize mostly due to water logging and flooding
- Poor conditions have been reported in Rwanda due to extensive damage to rice and beans.
- Prices of grain staples in the region were below the 5-year average for quarter-1 as a result of adequate stocks. With inbound stocks from Tanzania and Uganda regional prices are expected to decrease towards the end of quarter-2 of 2018.

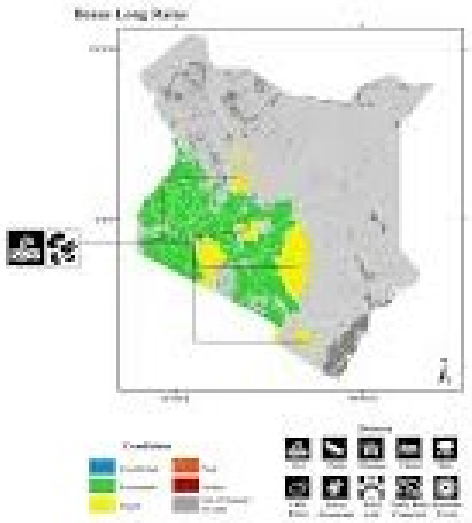


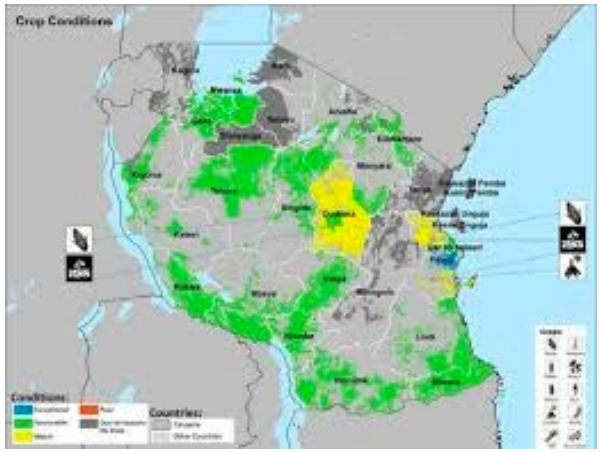
Contents

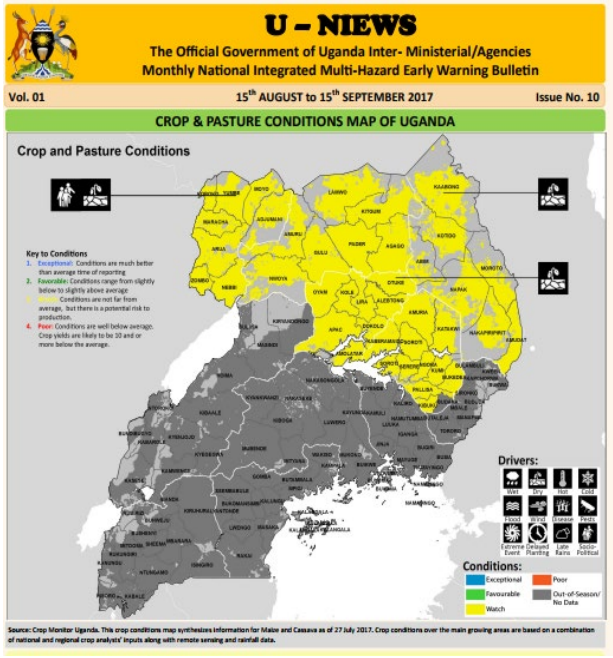
Market Information Grain Trade Q1

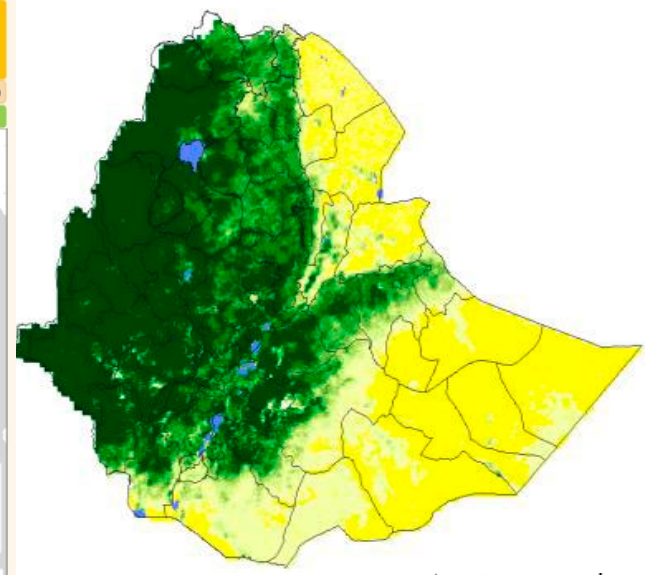












Alliance Bioversity & CIAT

CGIAR

Opportunities and Challenges

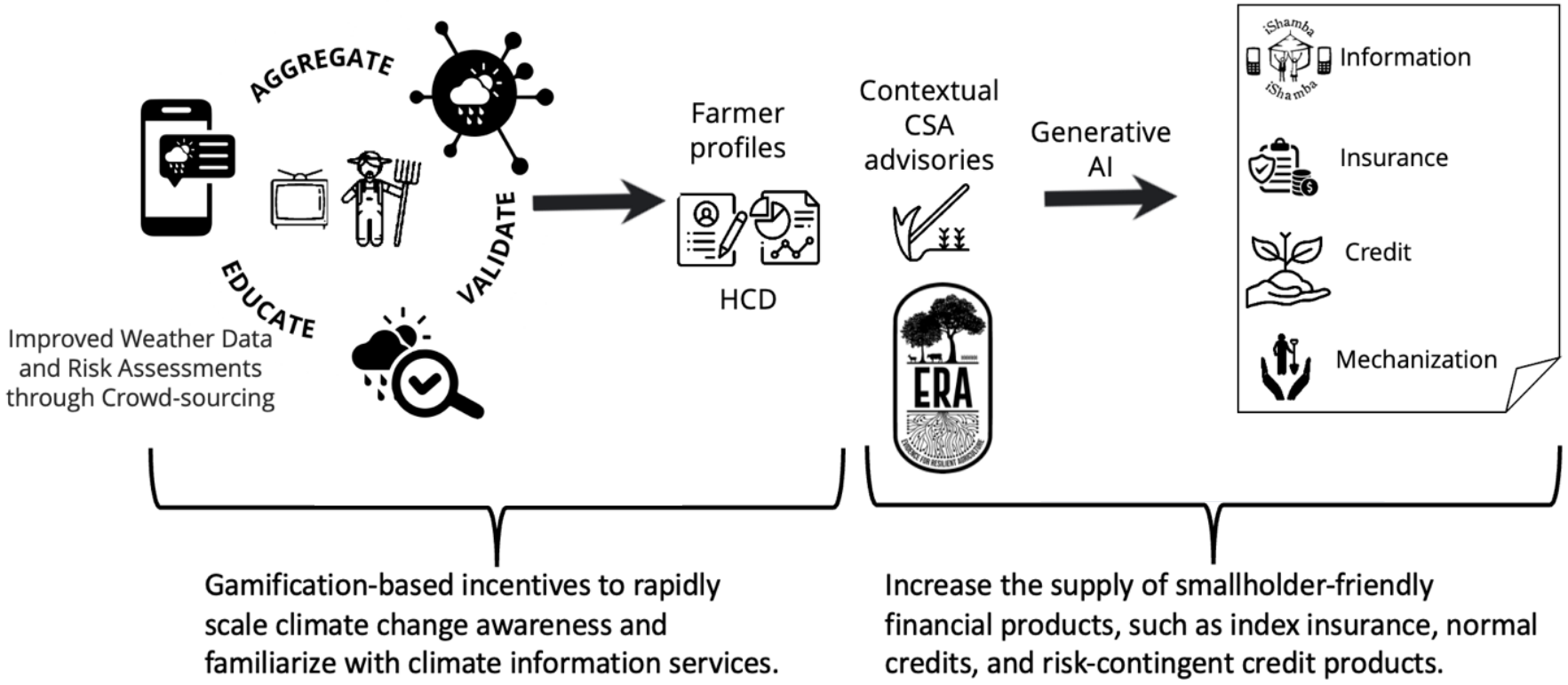
Opportunities

- Scaling up the crop monitoring work to Southern Africa Countries – Malawi
- Field data collection – for crop monitoring and reference data for other applications

Challenges

- Capacity retention due to staff turnover
- Financial resources

Activities supporting East & Southern Africa Region: Bundled Service Delivery Model



Farmer-facing Services

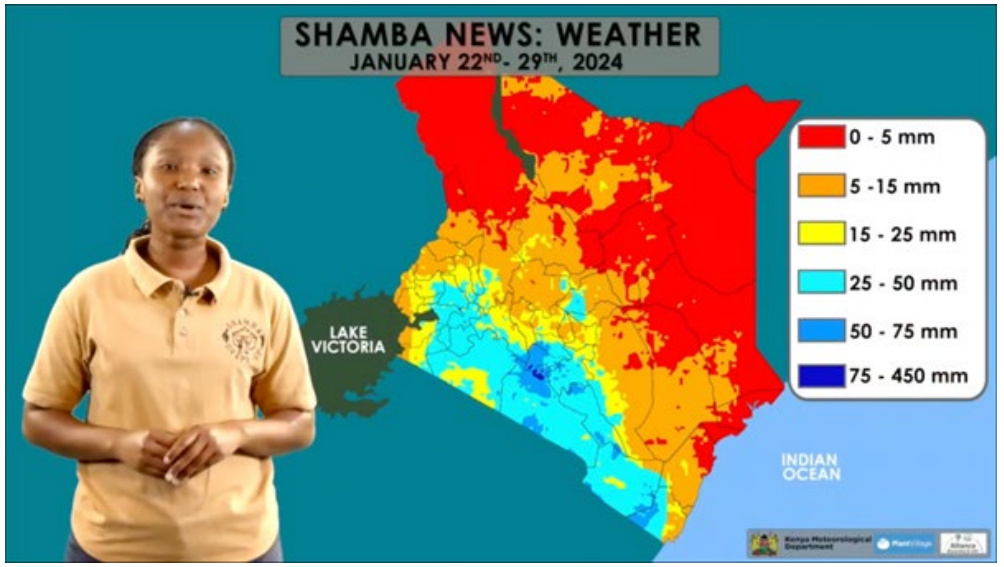
- Climate information services
  - PSP - Kenya
  - E-Extension - Zambia
  - PiCSA & e-PiCSA – Zambia & Malawi
  - Shamba Shape-Up/MMO – Kenya & Zambia
- Microfinance - Zambia
- Insurance - Zambia

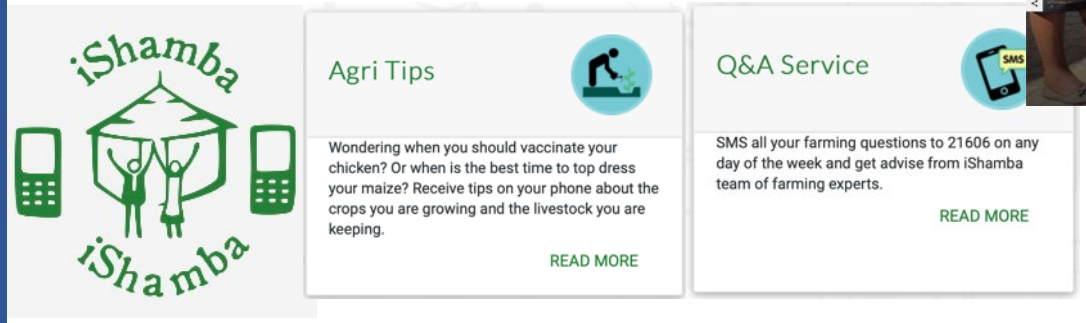
Bundles

Climate-informed credit
Climate-smart seed systems
Climate-smart mechanization

Activities supporting East & Southern Africa Region: Climate Information Services in Kenya

Shamba Shape Up has an audience of 6.8m adults, 96% learn something new, and 66% of those who implement changes perceive yield gains





Kenya Meteorological Department

Climate Hazards Center UC SANTA BARBARA

IGAD ICPAC IGAD Climate Prediction and Applications Centre

Thank you.