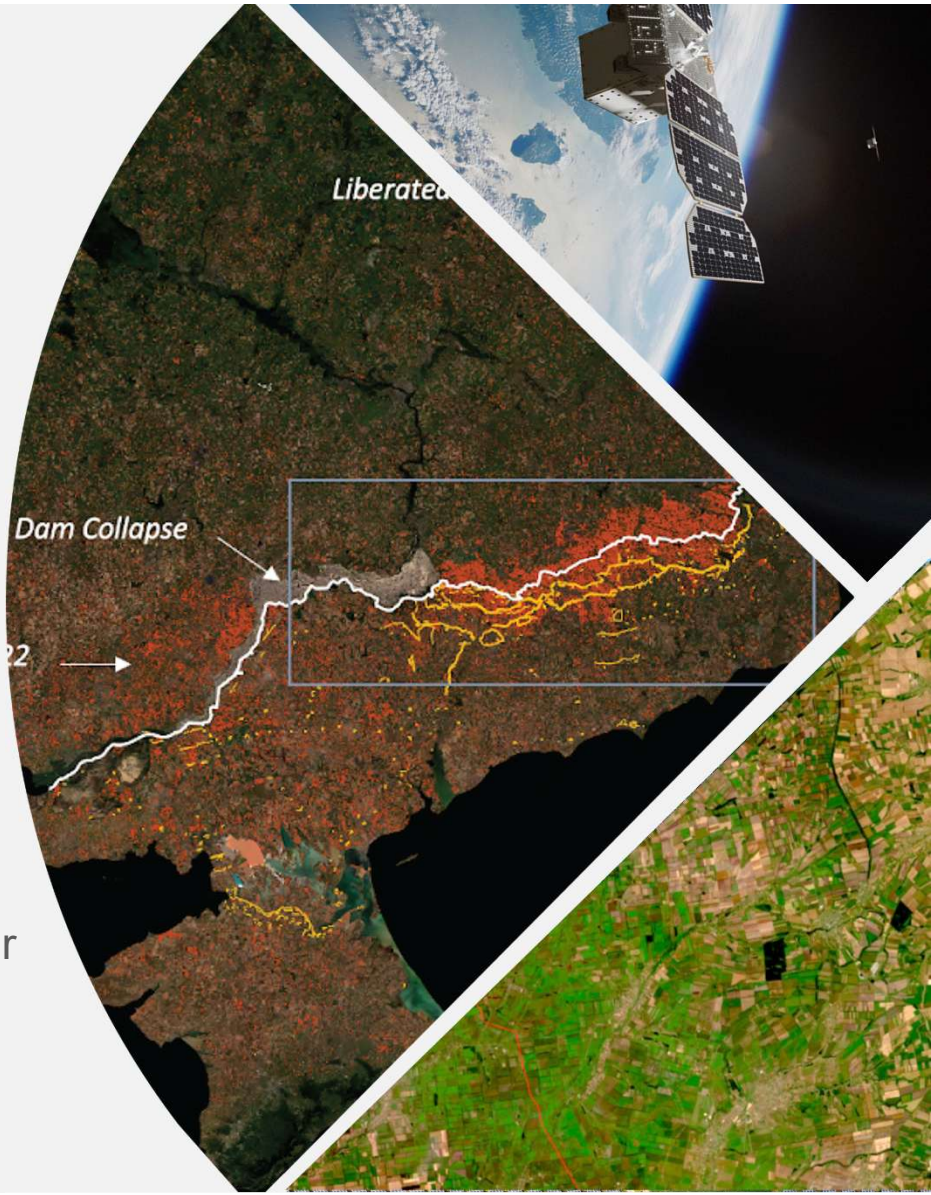
raapid

Rapid Agricultural Assessments
for Policy Impact and Decision-making



Applying AI in Agrifood Systems: RAAPID

Dr. Inbal Becker-Reshef, NASA Harvest/Microsoft AI For Good Lab
Simon Winter, RF Catalytic Capital
Rafael Swit, RAAPID/NASA Harvest

Food system shocks outpacing information systems

Compounding shocks
Conflict, climate extremes and market disruption

Decisions cannot wait
Agricultural assessments often arrive too late for urgent decisions

An intelligence gap
Limited ground access leaves critical gaps in understanding agricultural impacts

Coordination
Divergent assessments across actors make it harder to establish a shared basis for action

Governments & international organizations need rapid, trusted agricultural assessments to anticipate crises, respond effectively & build resilience



RAAPID: Turning Data into Action

A demand-driven initiative that grew out of NASA Harvest, built around decision-makers' priority questions and leveraging rapid advances in AI/Compute & EO

01 Deliver rapid insights

Combine satellite data, AI and agricultural expertise to assess impacts and inform timely action, including where ground access is limited.

02 Connect expertise

Bring national institutions, local experts and global partners together around shared questions to align assessments and reduce duplication.

03 Build lasting capacity

Co-develop tools and data systems with countries and local partners to strengthen monitoring, early warning and crisis response.

Shocks are inevitable.

Food crises are not.



What We Do

- Combine near-real-time satellite- and AI-driven insights with agricultural expertise
- Co-developed with decision-makers and shared as a public good to guide timely action, target assistance where it is most needed, and strengthen resilience to future food-system shocks
- Demand-driven initiative grew out of NASA Harvest

Key Focus Areas

01
Extreme weather events

02
Armed conflict & war

03
Market disruptions

04
National priorities



Prepare: Generate forecasts models, anticipatory analysis, and lead scenario planning for chronic and emerging risks.



Respond: Quick-turnaround assessments, delivered in days, not months. Produce actionable insights and projections.



Empower: Open datasets and global networks that build resilience, leverage expertise, and connect analysis with action.

RAAPID Initial Founding and Implementing Partners

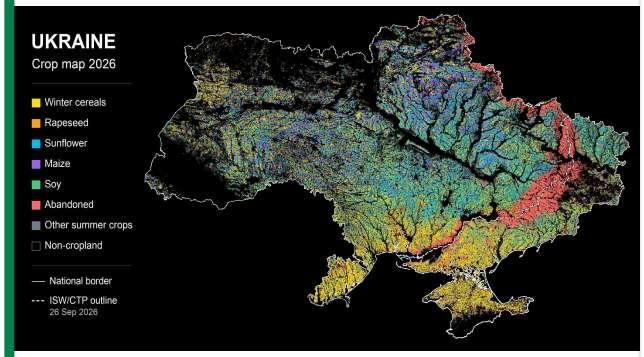
- *A growing community rapidly gaining moment with new partners*





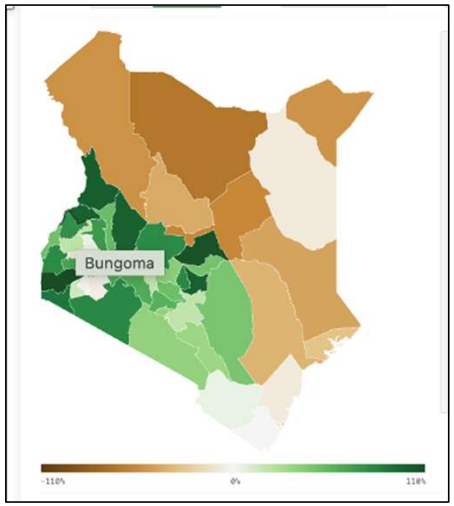
Shocks are compounding, budgets are thinner, effective decisions need real-time agriculture insights

Requests: Conflict, Extreme Weather, Supply Shocks, Market Uncertainty



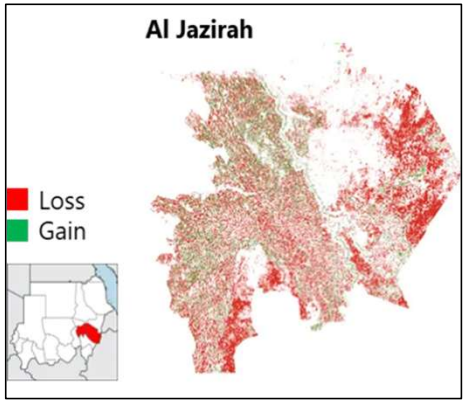
Ukraine, July 2026

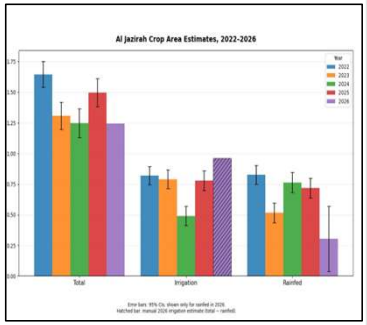
How much **of Ukraine's crop** production was harvested on Russian-held territory?



Kenya, June 2026

How much did **maize production decline** in Kenya due to the drought?





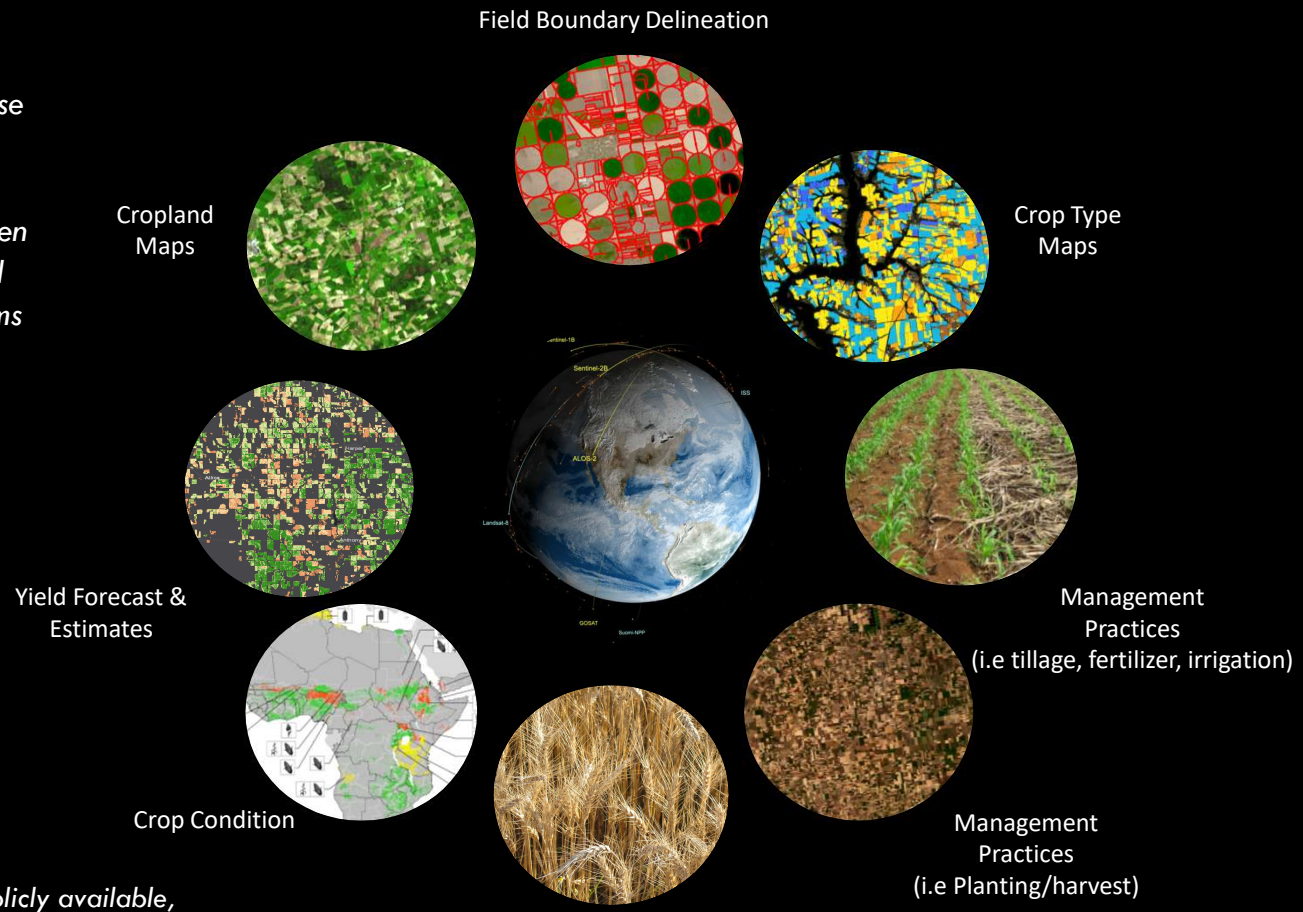
Sudan, 2026

How much cropland has been abandoned due to the war in Sudan?

Foundational Agricultural Products Pipelines

All applications build on these products.

To be impactful must be driven by end users/co-developed within multi-disciplinary teams



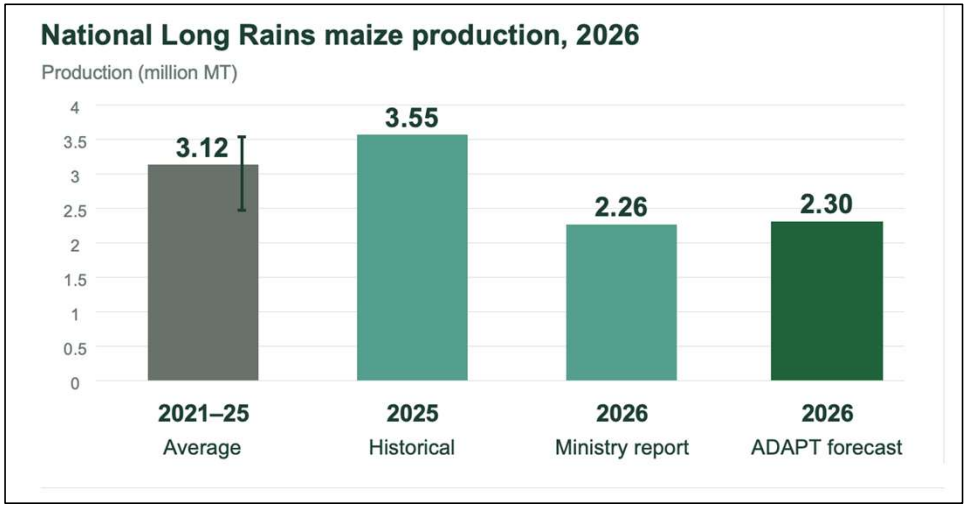
In most countries, these are not publicly available, could be groundbreaking- enable large suite of both public and private sector applications

Estimate 30–35% maize decrease

In the 2026 long rains, due to El Niño
Assessment led by MoLD with ADAPT Initiative

1.25 MT **forecasted production deficit** compared to 2025

35% decrease from 2025





Peter Owoko
AGRICULTURE SECRETARY
GOVERNMENT ACKNOWLEDGMENT

Ministry of Agriculture
and Livestock Development
4 August 2026





MINISTRY OF AGRICULTURE AND LIVESTOCK DEVELOPMENT
STATE DEPARTMENT FOR Agriculture
Office of the Agriculture Secretary

KILIMO HOUSE
CATHEDRAL ROAD
P. O. BOX 30028 NAIROBI

Ref: MOALF&I/AGRIC/16/268

4th August, 2026

Dr Girmaw Abebe Tadesse
Technical Co-Lead, ADAPT-Kenya Initiative
Microsoft Kenya Office
Dunhill Towers, Westlands,
P.O. Box 64736-00620
NAIROBI

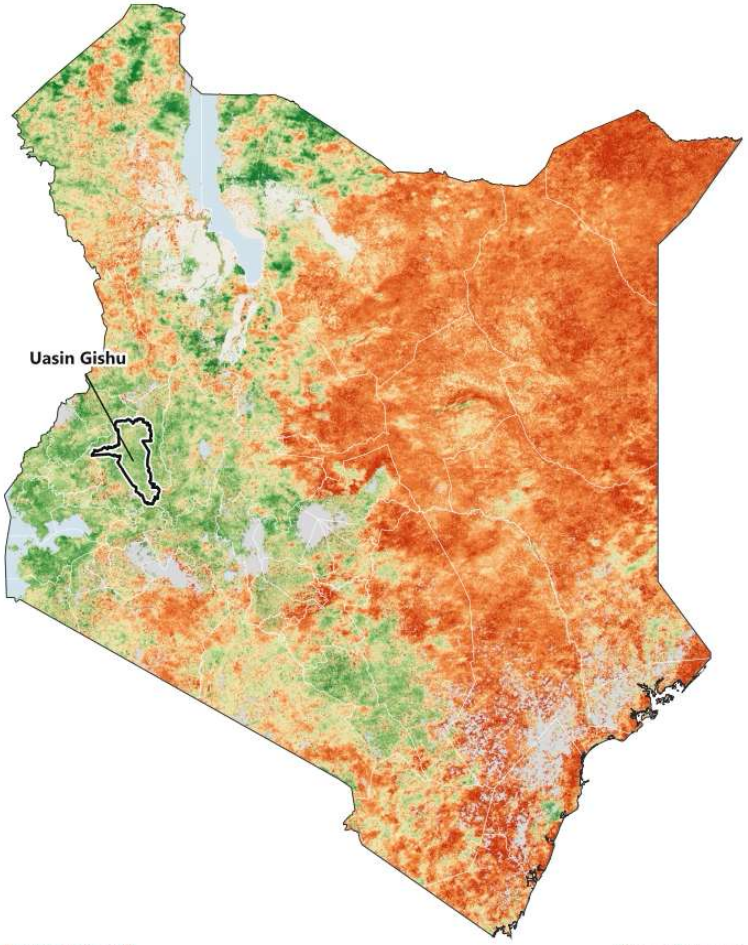
RE: ACKNOWLEDGEMENT OF RECEIPT OF THE EARLY WARNING, DROUGHT SITUATION REPORTS

Kenya's crop production in 2026 started well with early onset of the Long Rains by February 2026. Unfortunately, by May 2026, several parts of the country started experiencing dry conditions. By end of June, the impact of the severe drought



Findings contributed to: **National Food Balance Sheet, Cabinet briefings and government maize import decisions, through the ADAPT Kenya initiative**

Ministry of Agriculture & Livestock Development | Microsoft | AI for Good Lab | HARVEST | KSA | EAGC Eastern Africa Grain Council | raapid | ADAPT KENYA | Food and Agriculture Organization of the United Nations



1 January 2026

8-DAY PERIOD 1 JAN – 8 JAN

SHARE OF KENYA'S CROPLAND

4% Greener than any year 2016–2025

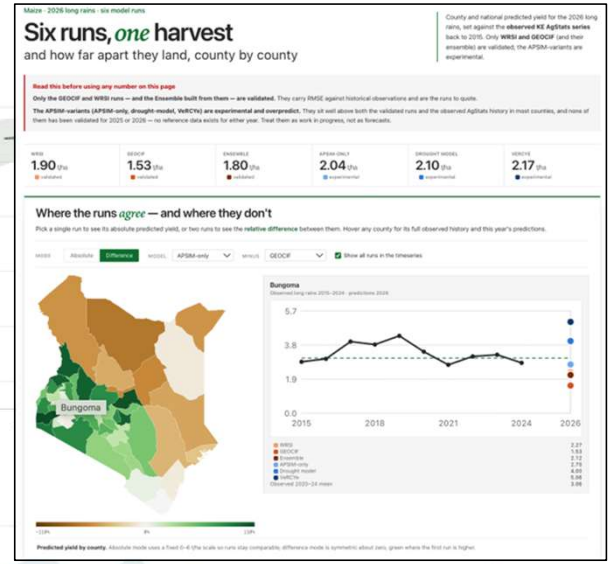
30% Browner than normal

3% Browner than any year 2016–2025

Uasin Gishu cropland NDVI

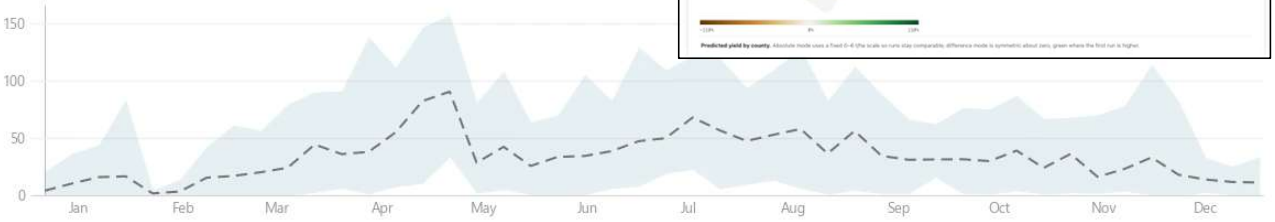
Cropland (PRUE crop count ≥ 5), county mean





Uasin Gishu rainfall

CHIRPS, mm per 8 days

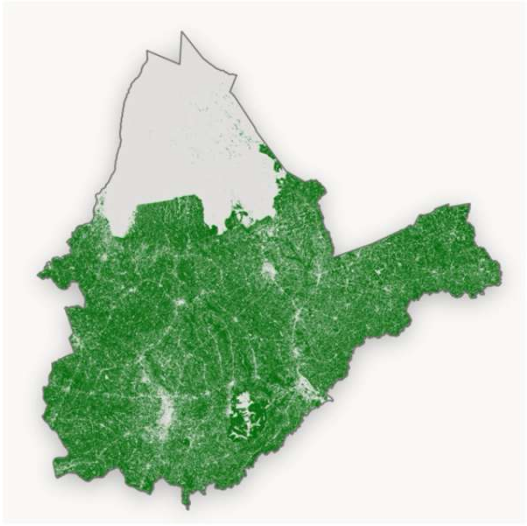


Evaluating mapping and sampling methods

Bungoma: comparing conventional and agentic approaches, from county maps to field campaigns and area estimates

COUNTY-SCALE CROPLAND COMPARISON

AI-agent map



Both: cropland

Cropland only in AI-agent map

Agreement with conventional map



Both: not cropland

Cropland only in conventional map

WHERE THEY DIFFER: A FIELD CHECK

Near the Nzoia sugar factory



Satellite

Early 2023



Conventional

11% mapped



AI agent

86% mapped

The agentic map appears to follow field boundaries more closely here.

Outlined field: 24 ha. Percentages are the share mapped as cropland, not overall map-accuracy estimates.

BUNGOMA MAIZE-AREA ESTIMATES (ha)

Two-stage sampling	OlmoEarth maize (pixel counted)	EO- random Stratified Sample: Red Edge Position estimate	Ministry maize
93,356 ± 19,172	**83,674**	**76,853 ± 6,657**	**75,426**

Bungoma County Field Campaign

implemented by County Field Officers, coordinated by MoALD, in collaboration with ESTELLA and WRI

Rapid crop assessment

75%

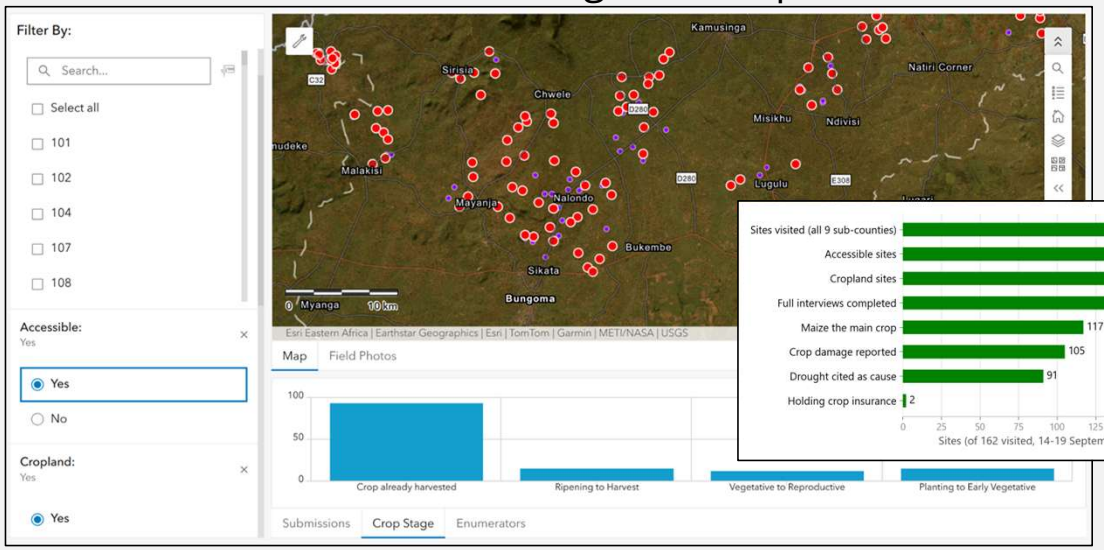
experienced crop damage during the long rains season

80%

of farmers still had food stocks

But half reported this will not be enough to sustain through to the next harvest.

Data Collection Dashboard: Bungoma sample frame collection



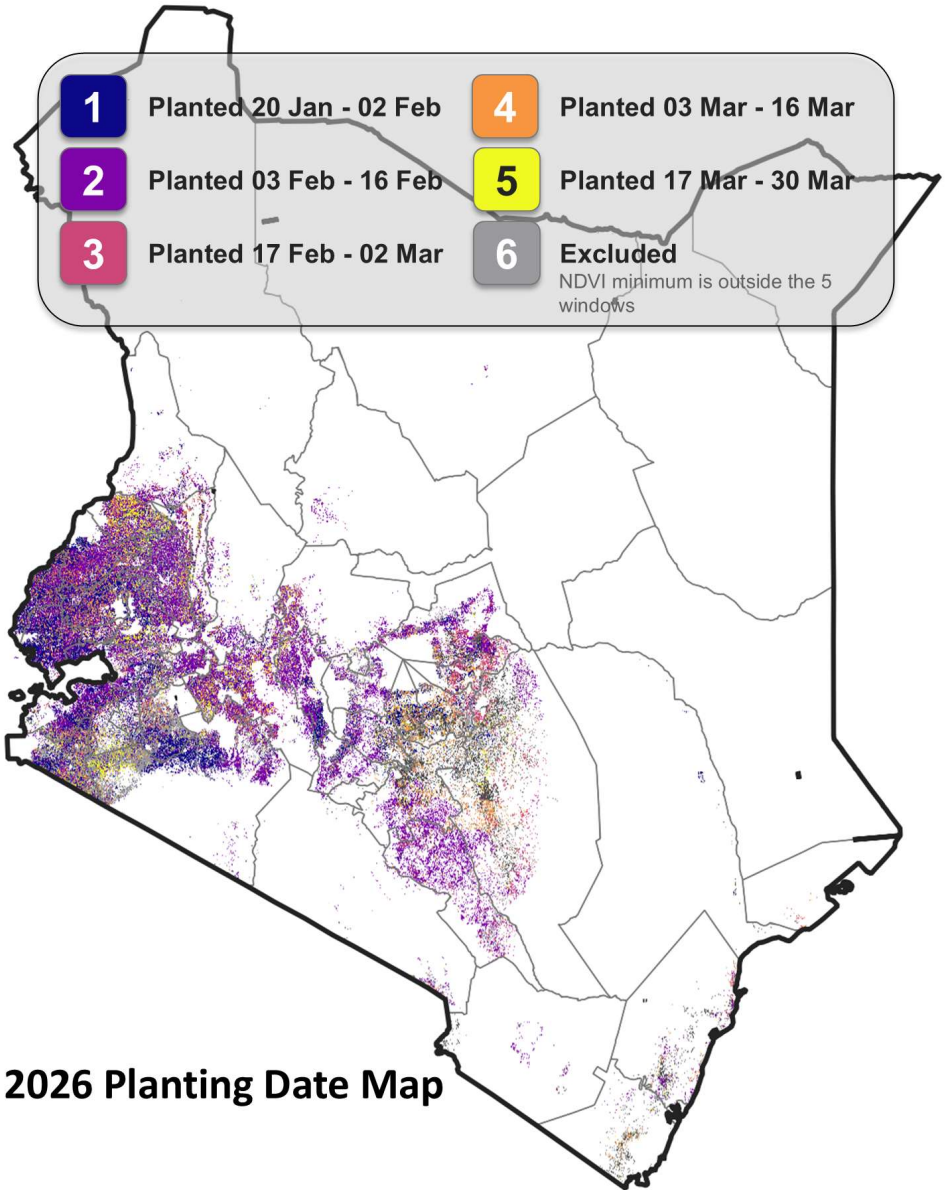




Monitoring Planting Date: Big Impact on 2026 Long Rains Yield Outcomes

Adjacent maize fields in the 2026 long rains, planted less than a month apart, with sharply different outcomes (FEWS NET field photograph). Small differences in planting time had a big impact on growth stage at which a crop was impacted by drought





RAAPID: Supporting El Niño preparedness & response in Eastern and Southern Africa

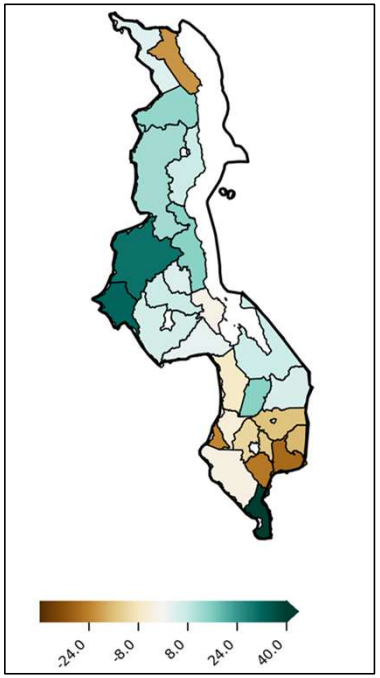
Regional preparedness

Co-developed with countries and regional partners

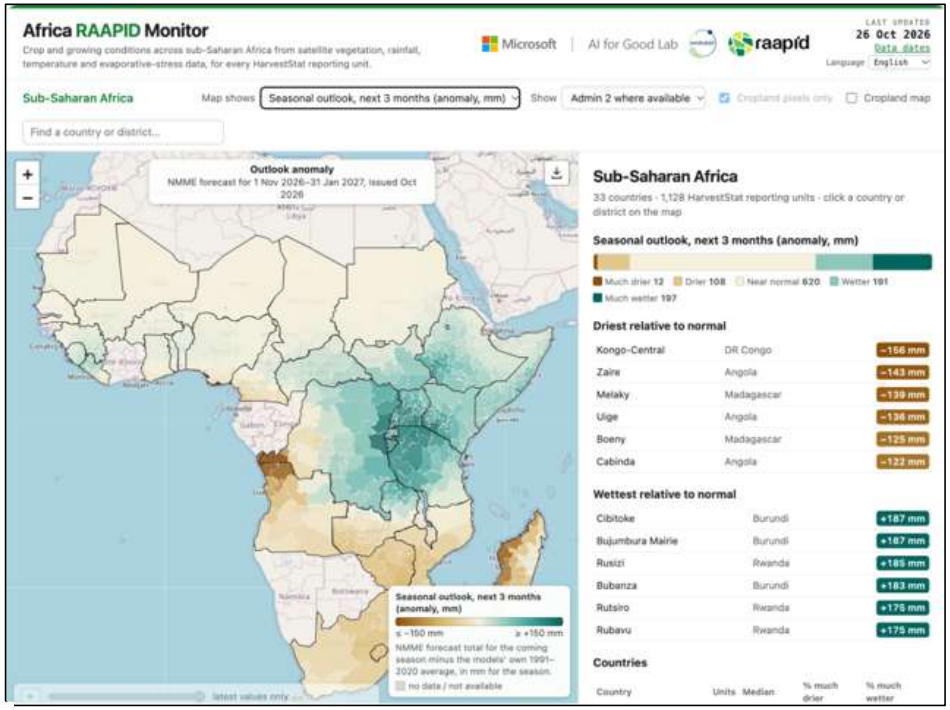
Combining seasonal outlooks, satellite monitoring, and crop assessments to identify risks before and during the season.

Informing decisions

- Pre-positioning grain stocks
- Planning food imports
- Targeting cash assistance



% departure from 2018-2022 mean Maize, 2026



Seasonal rainfall outlook | November 2026–January 2027

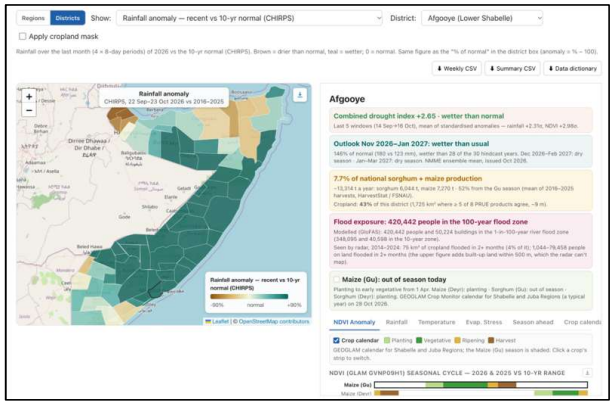
Somalia: Monitoring for Earlier Action

Connecting forecasts, crop conditions, rainfall, population density, and flood exposure to preparedness

WORKING IN PARTNERSHIP WITH IN COUNTRY AND REGIONAL PARTNERS INCLUDING

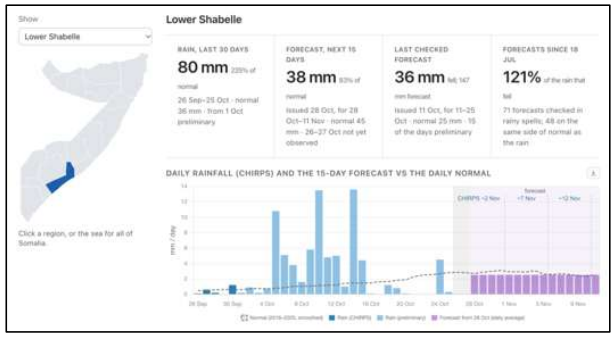
Odoros, the Prime Minister's Office

Crop & drought conditions



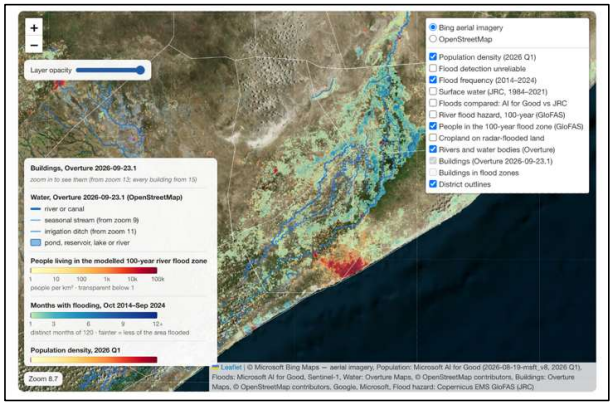
Track crop conditions

Rainfall & forecasts



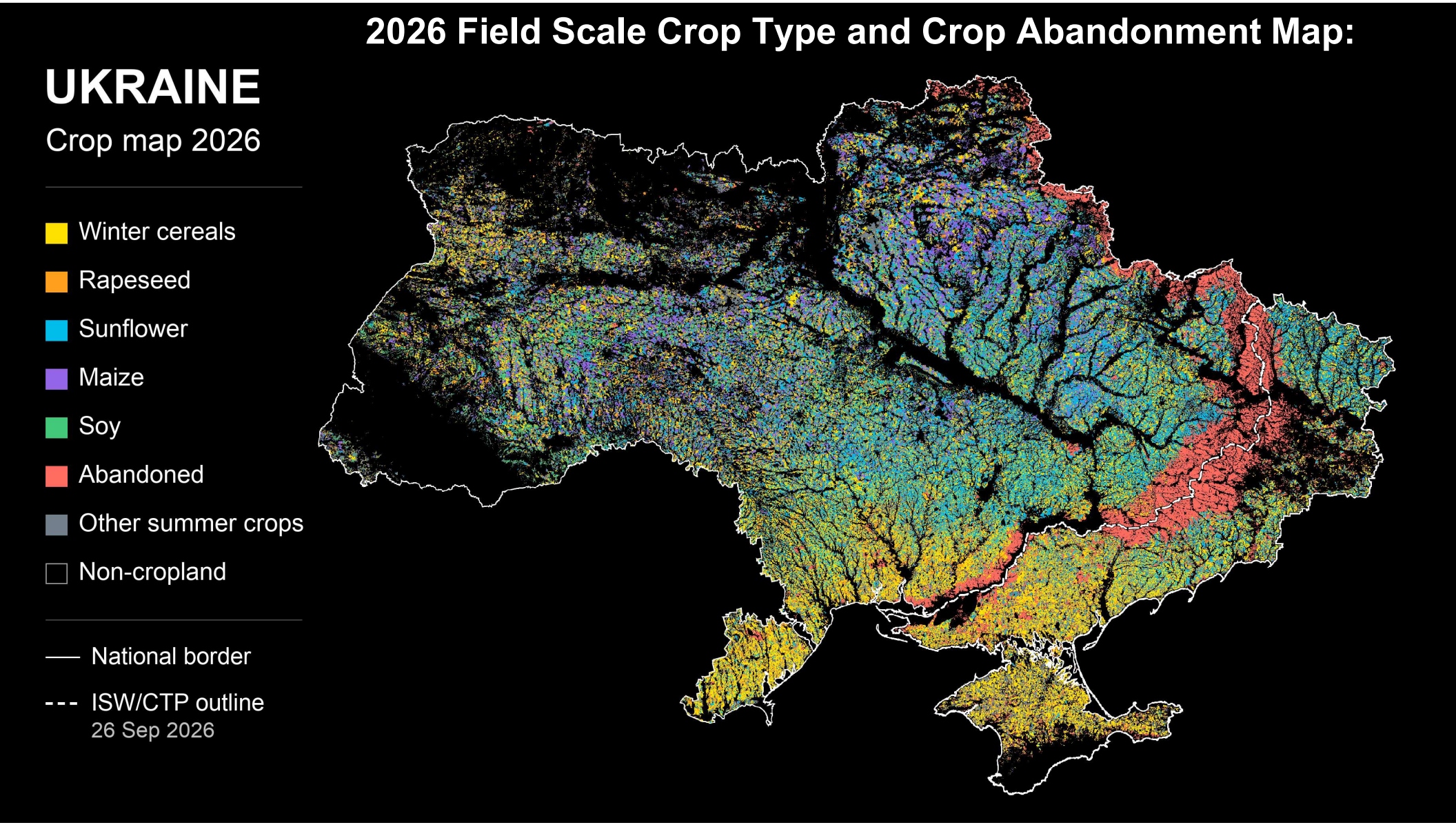
Monitor rainfall forecasts and observations

Flood exposure

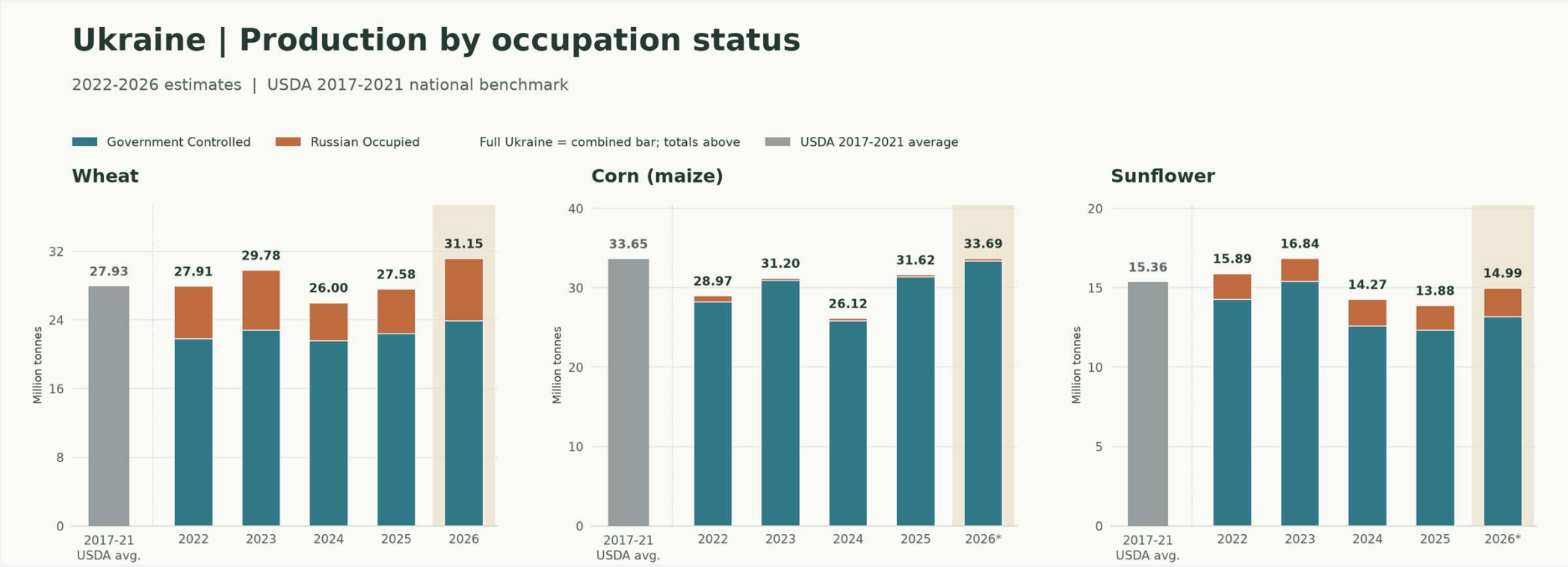


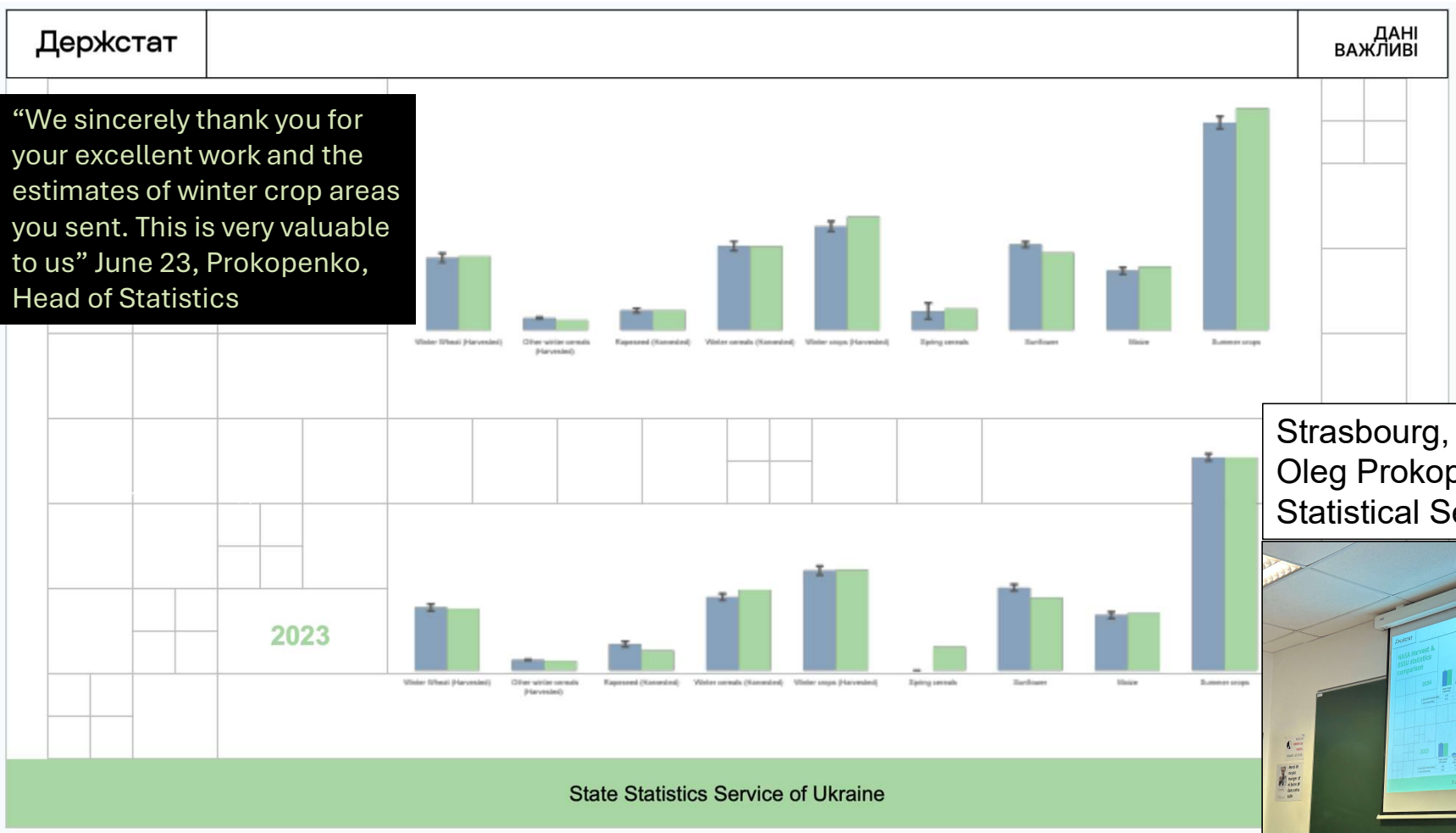
Identify people and cropland exposed to flood risk

2026 Field Scale Crop Type and Crop Abandonment Map:

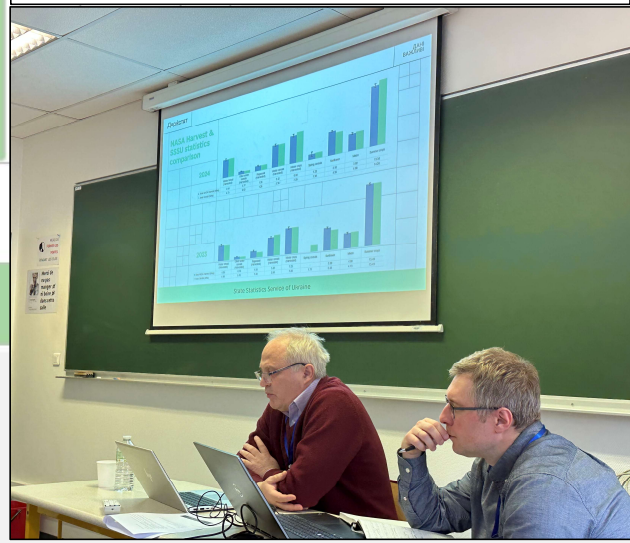


2026 Production Increase across all crops, including in Russian-held territories





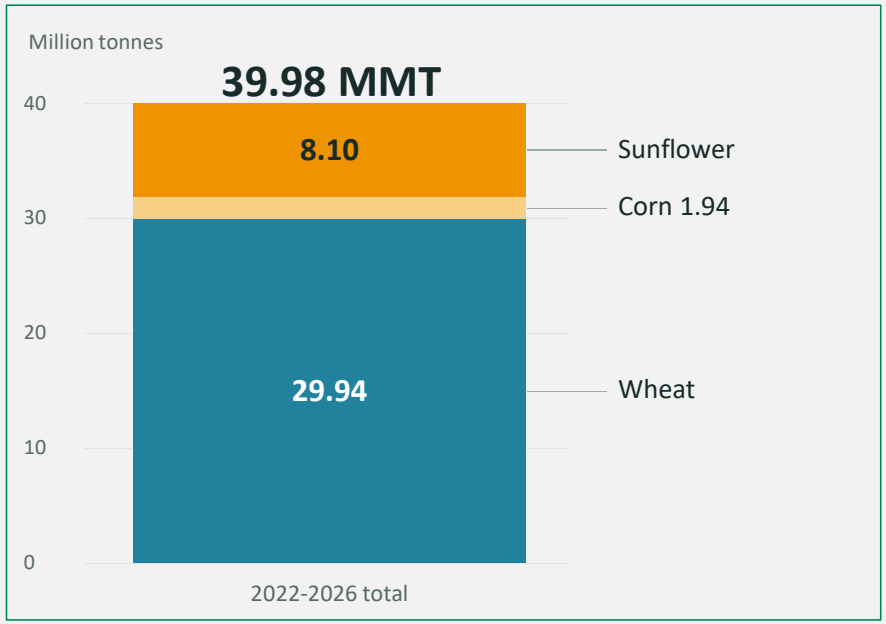
Strasbourg, February, 2026
Oleg Prokopenko, Head of State Statistical Service of Ukraine



Ukraine adapted legal framework to include EO for National Stats
Working to transfer capacity to Ministry of Agriculture

Closing a blind spot in agricultural statistics: Nearly 40 million tonnes

Cumulative production, 2022-2026



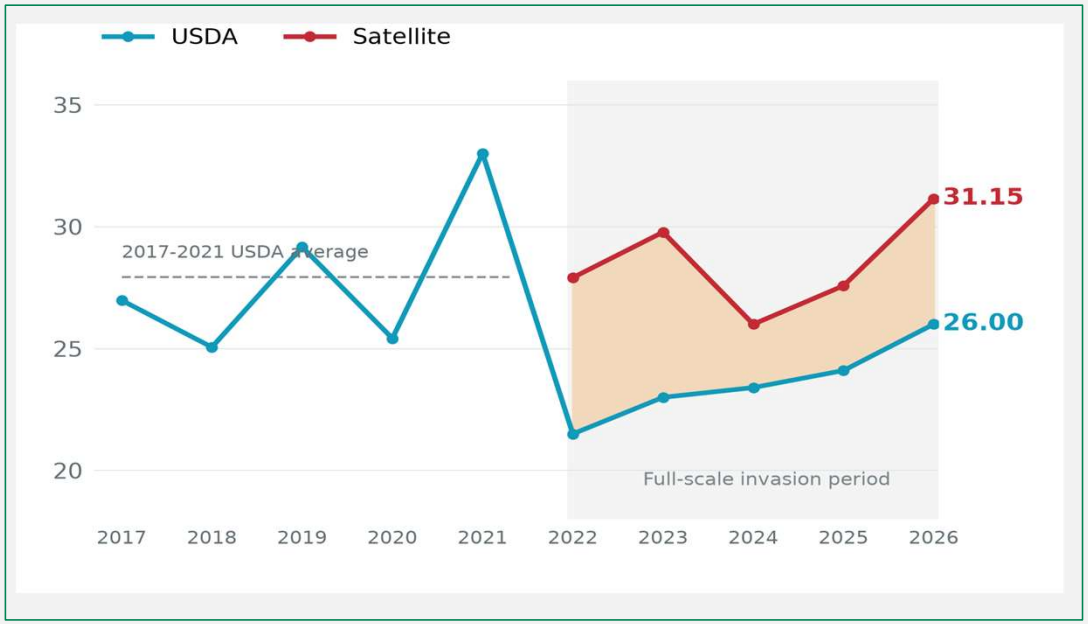
WHEAT ONLY

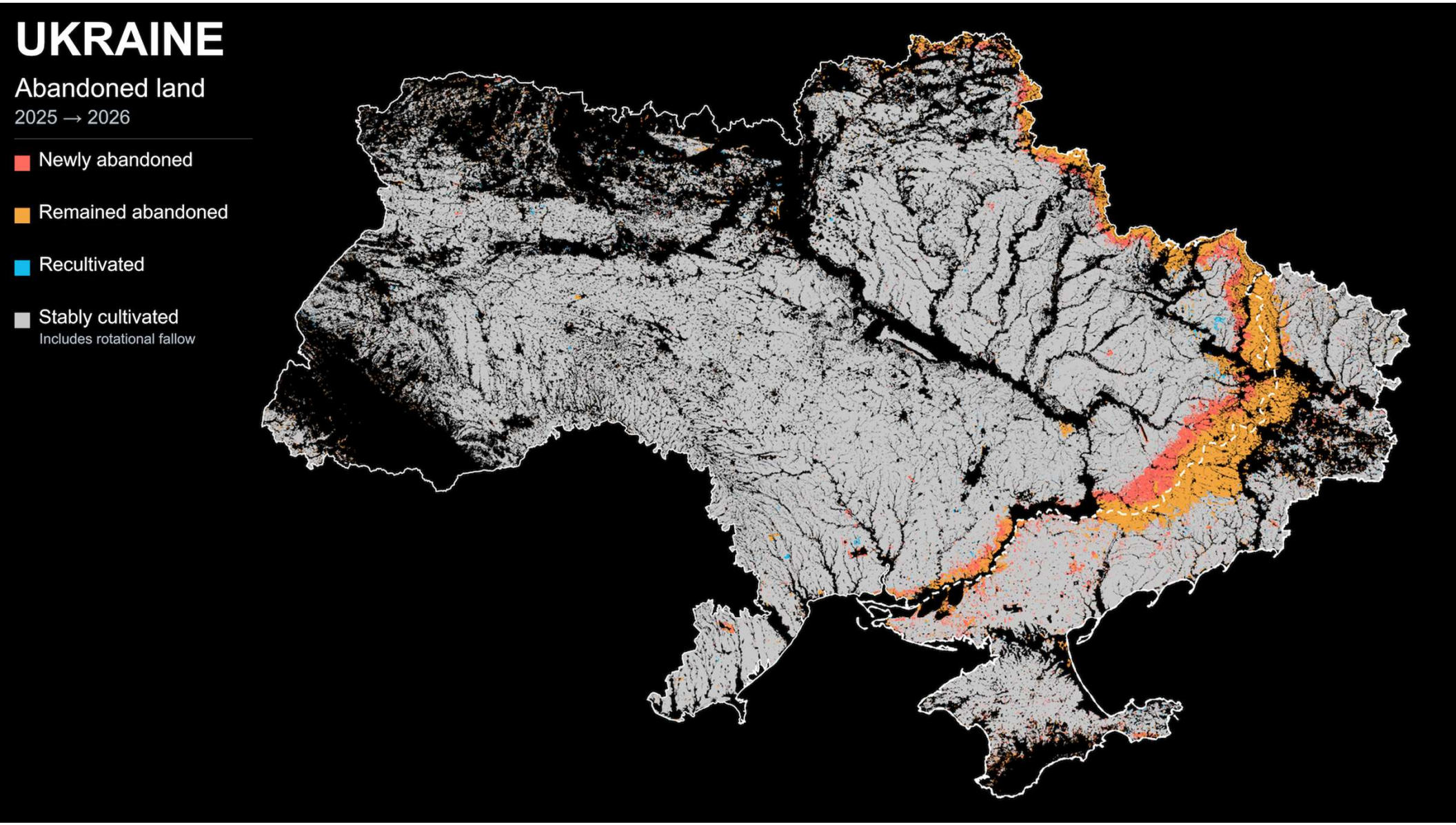
29.94 million tonnes

~130 M people/ year

Comparison with USDA Statistics

Satellite estimates vs USDA

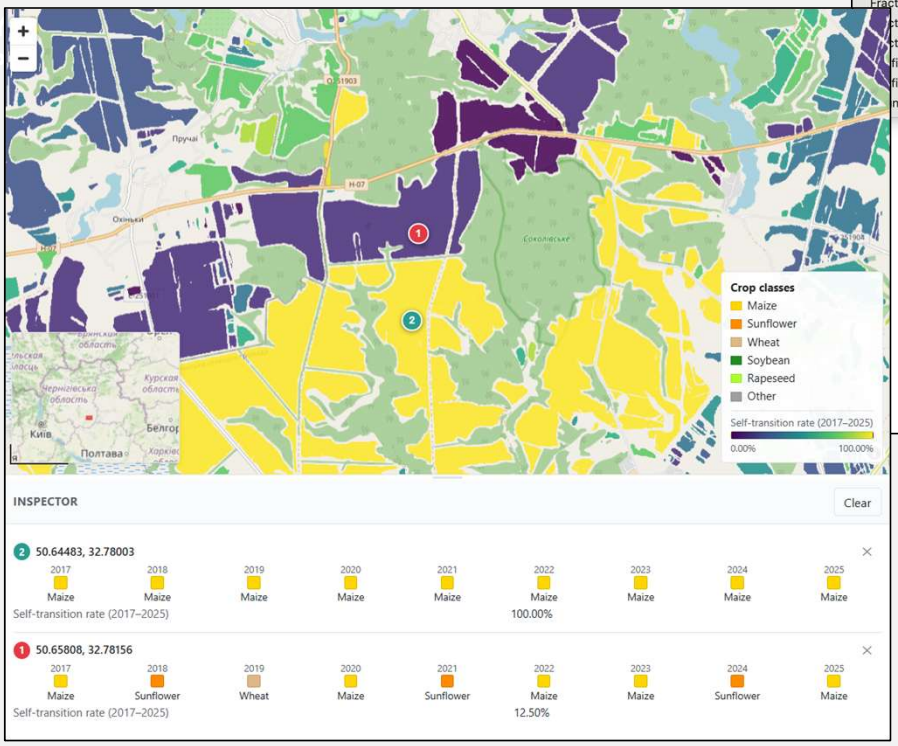


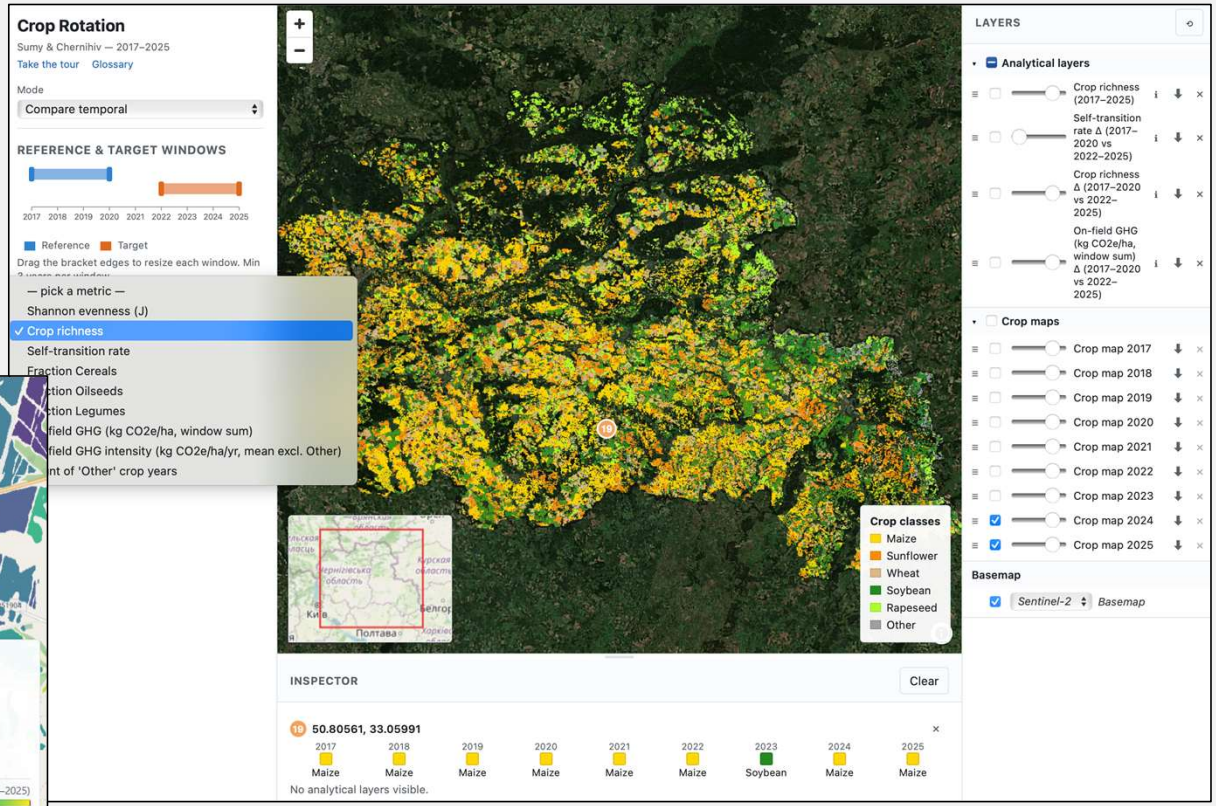

UKRAINE
Abandoned land
2025 → 2026
Newly abandoned
Remained abandoned
Recultivated
Stably cultivated
Includes rotational fallow

RAAPID Spinoff enabled: A platform to support green finance in Ukraine

Crop Rotation Assessment: 2017- 2025

Crop rotation sustainability metrics allow to localize and flag fields with high or low crop rotation diversity, in support of lower interest loan program



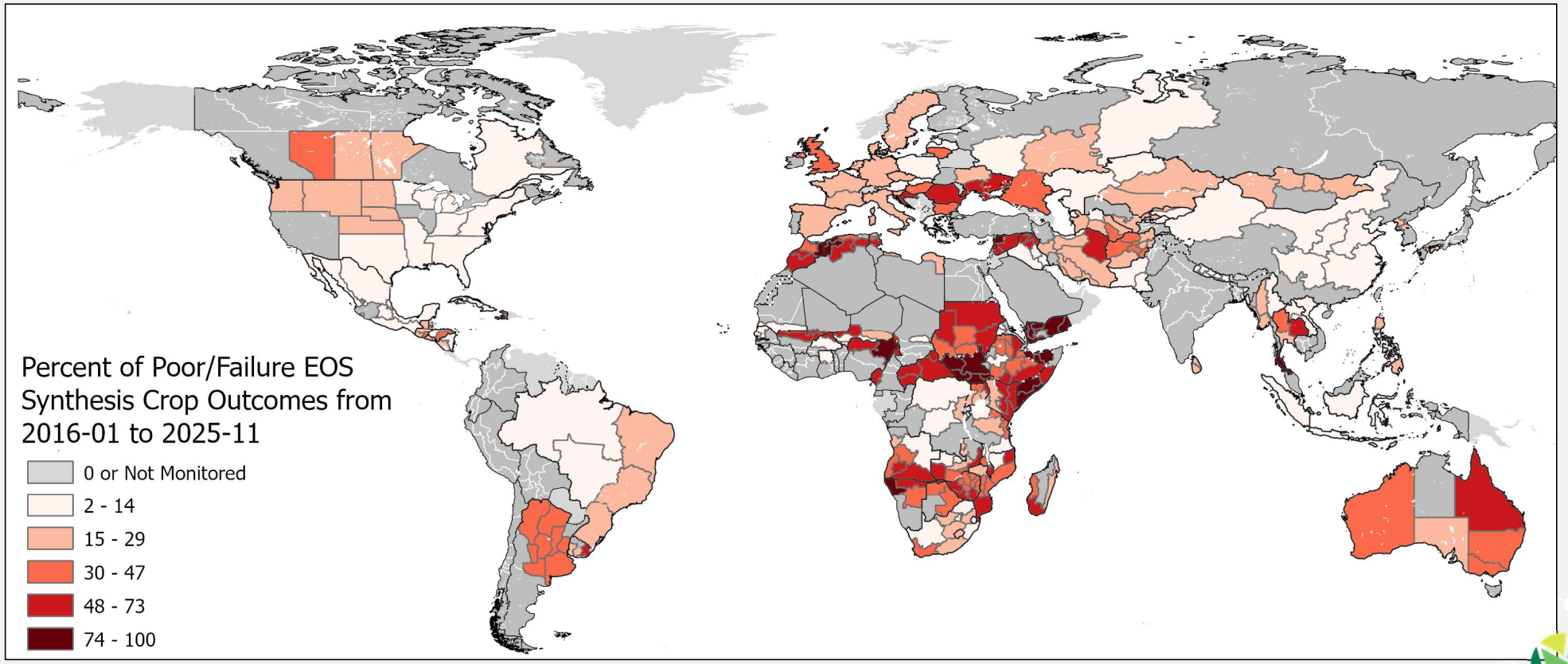


Different tested models achieve F1-scores >= 0.95 for major crops in the study region.

HARVEST · FAO FIAT PANIS · Université de Strasbourg · University of Maryland · Microsoft | AI for Good Lab

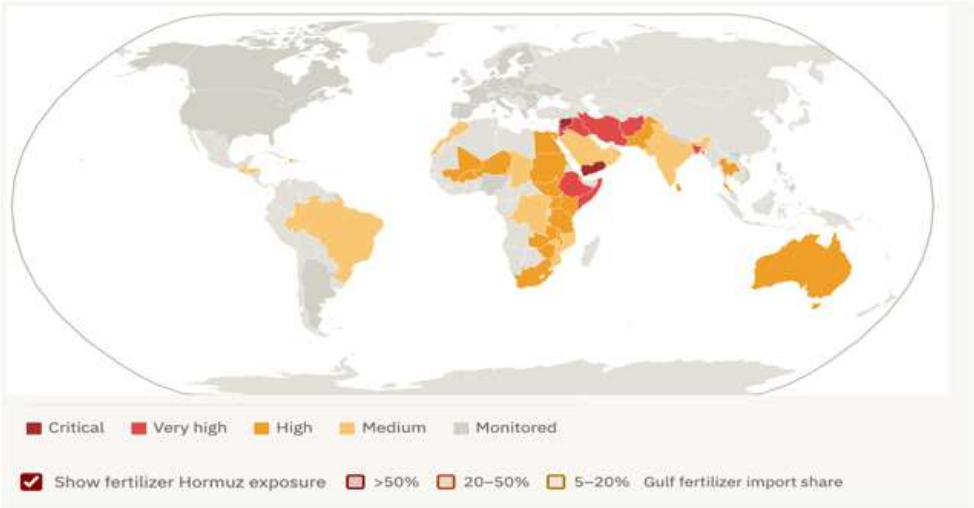
Crop Monitor
a geoglam initiative

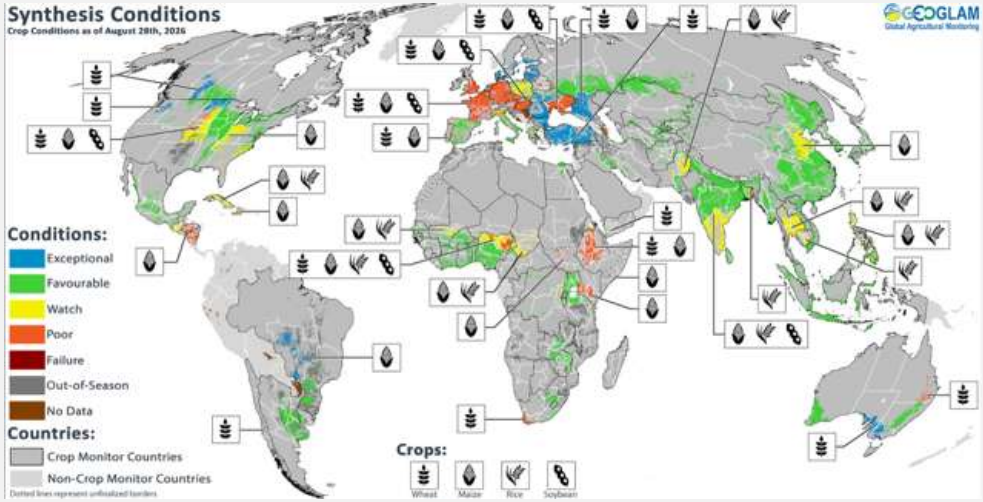
RAAPID Focus Regions Based on Crop Shortfall Hotspots 2016-2025
Based on GEOGLAM Crop Monitor Data



Compounding risks demand shared intelligence

The Hormuz assessment highlighted the need for coordinated early warning triggers.





COMPLEMENTARY EXPERTISE

EO, AI & agentic systems	Trade & supply	Climate	Humanitarian conditions	Markets & prices	Policy & finance
Planting, inputs, production	Flows, access, dependencies	Seasonal outlooks, ENSO	Ground evidence, needs	Local prices, volatility	Policy shifts, national debt

OUTLOOKS & TRIGGERS COMMITTEE

Joint interpretation. Shared outlooks & alerts.

Shared system- adaptable for uptake

Each partner applies the insights to its own mandate and decisions.

Exploring AI Agents as Complimentary Intelligence

Each agent maintains a structured knowledge base and ingests daily signals to produce grounded, sourced assessments per-country, flagging where human attention is needed.

Daily Data Updates

- News & Conflict
- Trusted Reports
- Remote Sensing & Meteorology
- Trade & Markets Data

Country Expertise

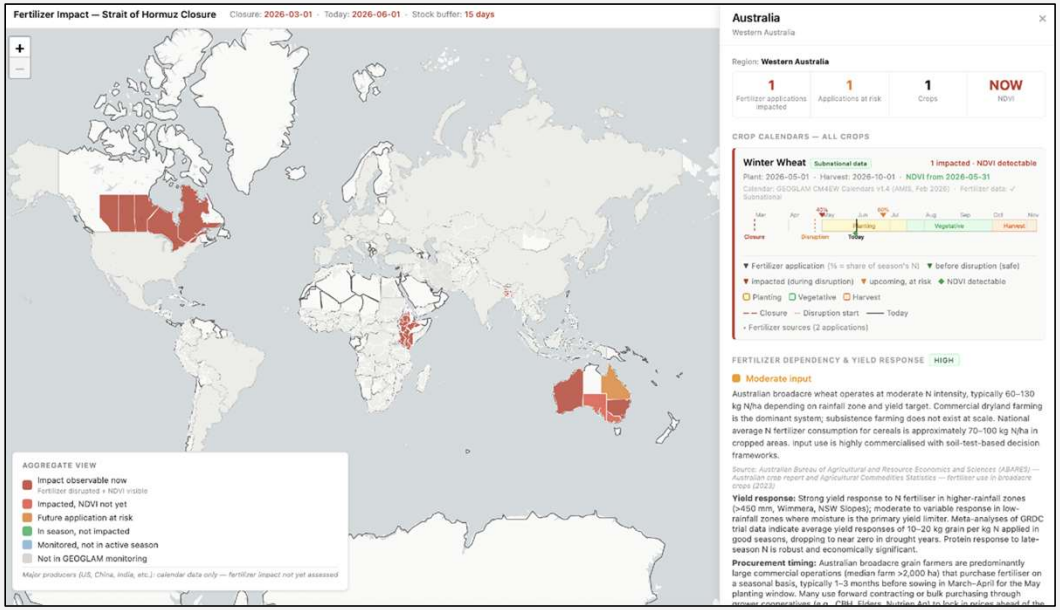
Crop Calendars, Historical Maps, Yields, Production, Practices Information etc.

Country AI AGENT

AI reasoning over all inputs

Assessments & Insights

Agent = A LLM with reasoning that can take actions



Daily Outputs

- Situation summary with confidence levels & sources
- Regional risk signals & anomalies
- Evidence-backed outlooks & scenarios

How to to get involved



Advise

Priorities, decisions, timing, uncertainty



Share

Experience, expertise operational feedback



Partner

Develop common data, methods, benchmarks



Co-fund

Rapid assessments, infrastructure, and capacity

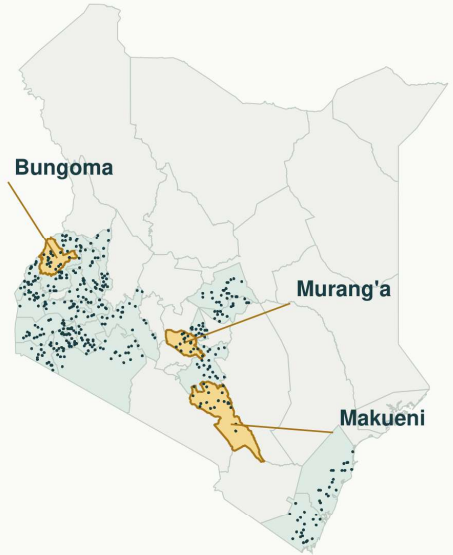
KENYA / AREA-FRAME SAMPLING

County Sample Frames

Based on MoALD prioritization

01 National coverage

County sample locations across Kenya

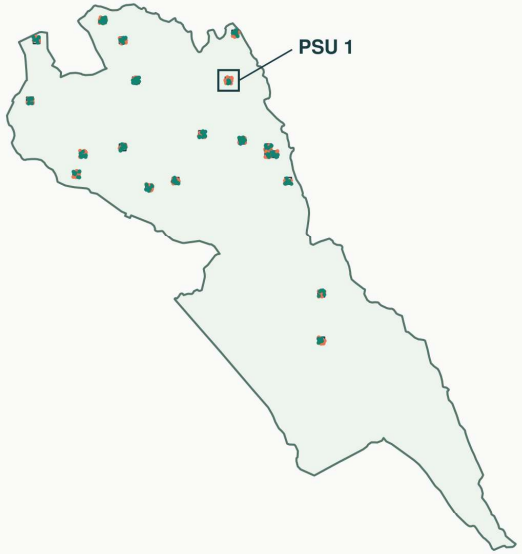


Done / ongoing Other sampled counties

• Sample locations

02 Makueni County

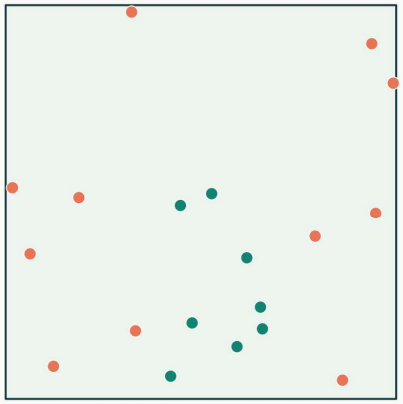
20 selected PSUs / 400 sample points



Selected primary sampling unit (PSU)

03 Inside one PSU

19 sample points within a 2 km x 2 km unit



Secondary sampling units (SSUs)

Each dot is a location for field assessment.

This PSU: 8 cropland + 11 non-cropland

POINT STRATA ● Cropland ● Non-cropland