



Mitigating COVID-19: The Digital Transformation of Agri-food Value Chains

ICABR, July 31st, 2020



Food and Agriculture Organization
of the United Nations



Digitalization of Agriculture

- Digital technologies are revolutionizing agriculture.
- Digital technologies can address **multiple market failures**.
- Connectivity improved dramatically, but a digital gap remains.

**Prepare for
the future?**



Before



After



Robotics



Automatization



Horizontal farming



Vertical farming

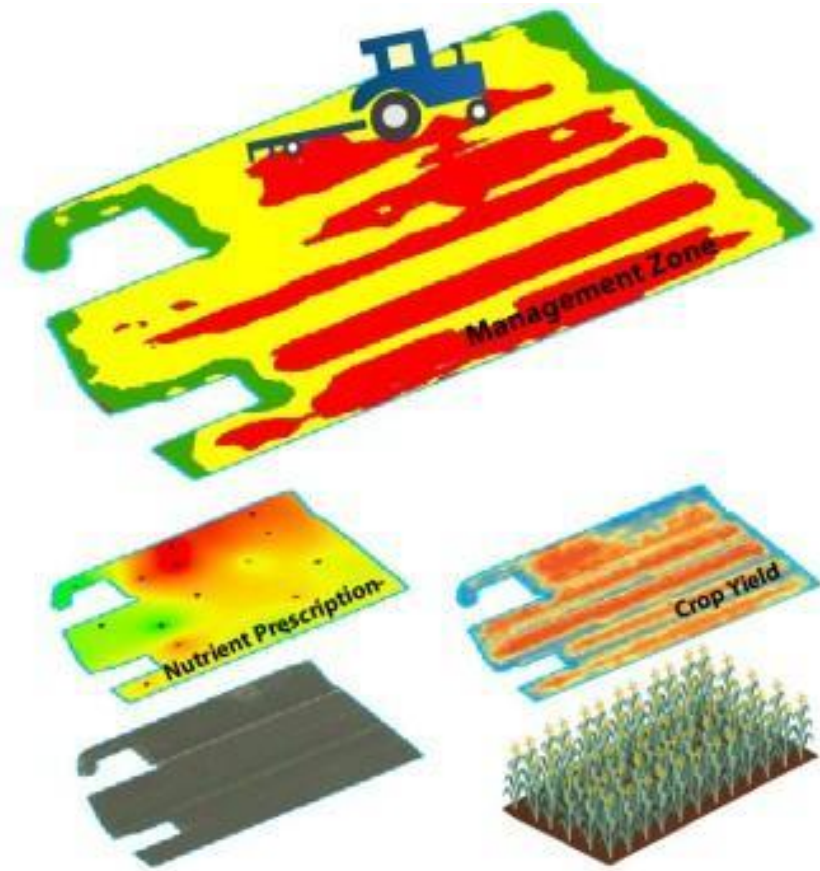


E-commerce





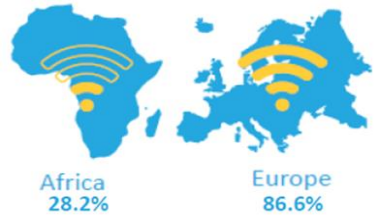
**More than 85% of ag data
and info are geospatial**



Challenges?

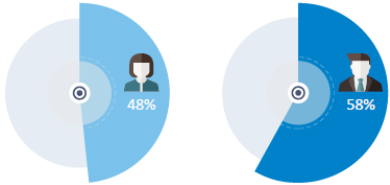


Digital realities



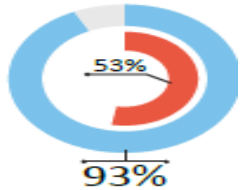
Access to internet:

87% in developed countries, 47% in developing countries, 19% in LDCs.



Digital gender gap:

Gap is small in developed countries, large in developing countries, especially LDCs.



Network coverage v.s use:

93% of the world's population lives within reach of mobile broadband, just over 53% uses the Internet.



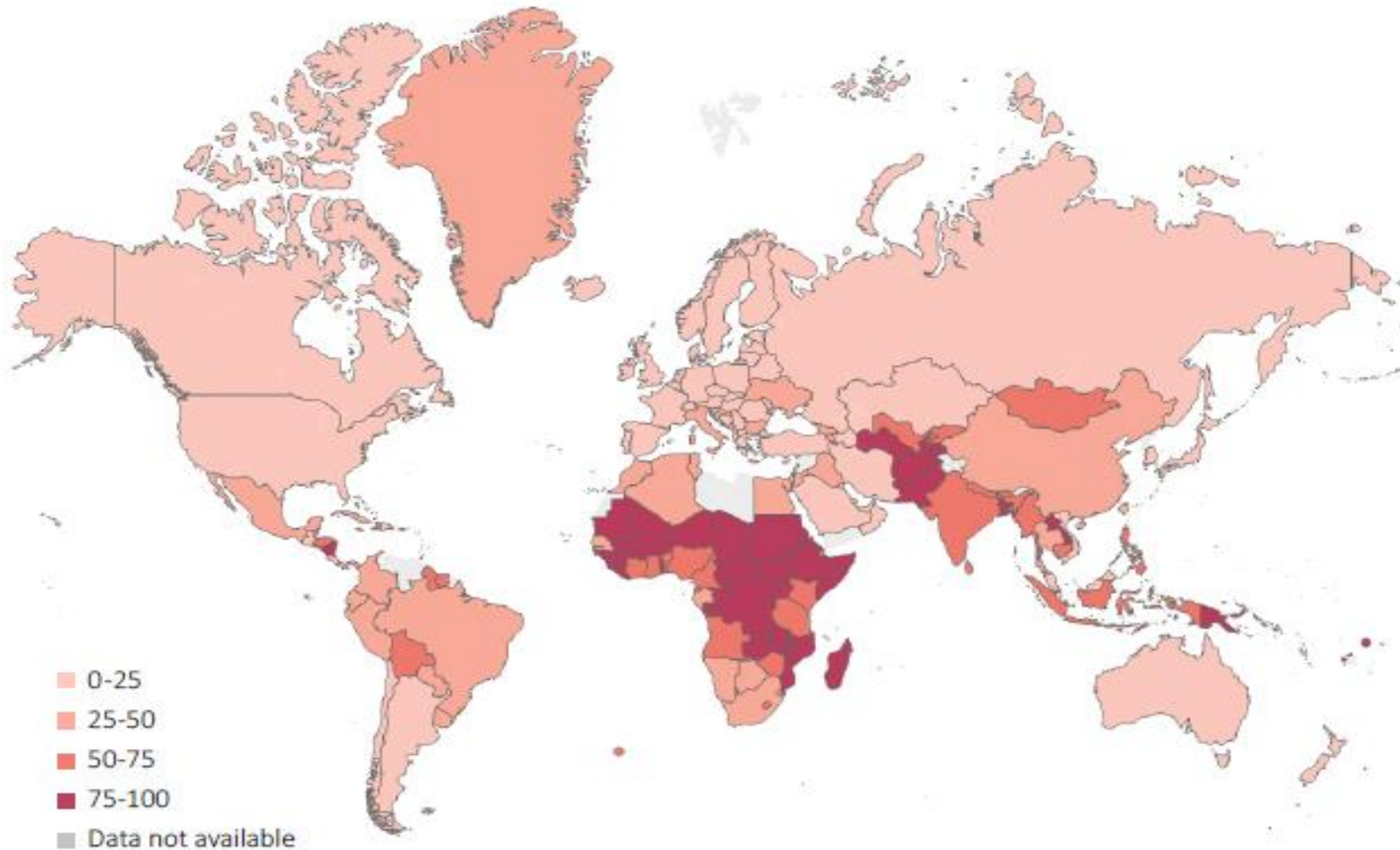
Mobile phone subscription:

67 % of the global population - 5% annual growth rate – highest in Europe and least in Africa

Barriers for digital adoption:

- Lack of **electricity**, especially in rural areas- 15% of the world population without electricity.
- **Literacy**: 13% incapable of basic reading and writing.
- Lack of **ICT skills** as a key barrier
- **Affordability**: high cost of broadband access.
- **Local content**: lack of appealing and relevant content.
- Poor **network coverage** in rural areas: the urban-rural coverage gaps remains large

Percentage of population NOT using the internet, 2019



The map of the offline population highlights regional differences in Internet usage.

Countries with the highest proportions of people not using the Internet are mostly in Africa and South Asia, although there are inter-regional differences.



Opportunities



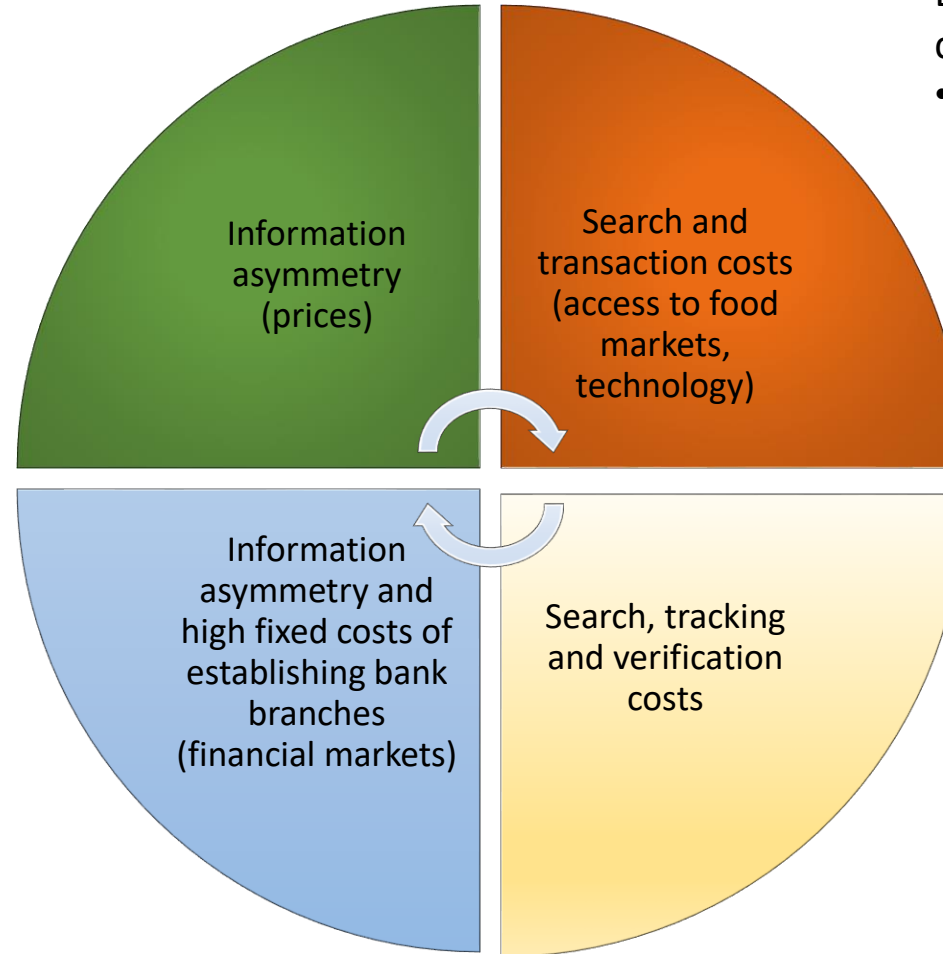
Market failures in food and agriculture

Information disseminated to farmers via **SMS services**:

- **13-14% increase** in farm gate price (Peru); decrease price dispersion (Niger)
- Often, impacts depend on the nature of commodity (perishable or not), and competitiveness

Mobile phone-based applications:

- M-Pesa (Kenya) **increased market participation by 37%** among users
- contributed to **lifting 2% of Kenyans out of poverty**
- **Female** headed households benefited most (relative terms)



Digital platforms and e-commerce improve matching:

- Esoko (Africa) reported **10-11% rise in revenues** due to better information and improved bargaining

Blockchain-based applications:

- Walmart reduced tracing time of pre-packaged mangoes **from 7 days to 2.2 seconds**

What needs to be done:

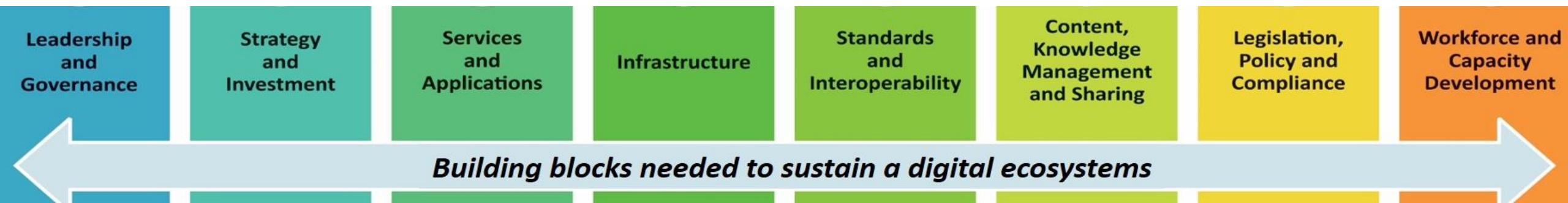
Basic conditions must be met

SOFT Infrastructure

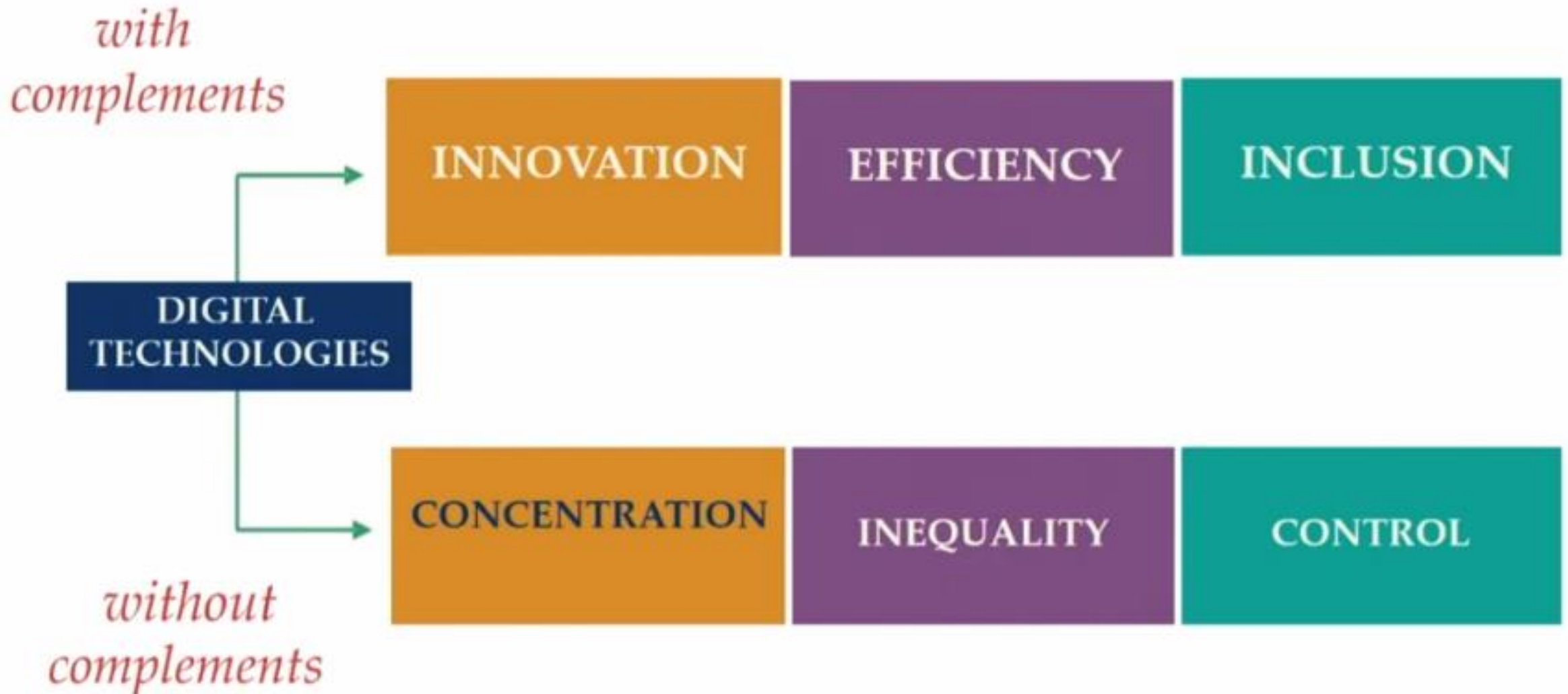
- Establishing **inclusive** digital ecosystem and enabling environment – holistic approach to investment and policies
- **Human capital** development – empowerment, digital literacy and skill development, e.g. rural youth, women to bridge digital divide
- Regulatory **framework, standards & interoperability** – data governance, ownership and security
- **Innovative** and **effective PPP** – incentives, inclusiveness, and sustainability

HARD Infrastructure

- Digital & physical **infrastructure** – roads, electricity, storage facility, trade facilities, etc.
- Internet **coverage**, mobile and smart phones **services**
- **Connectivity** – mobile networks, telecom services, information technology networks in rural areas
- **Data** collection, storage, insights and dissemination

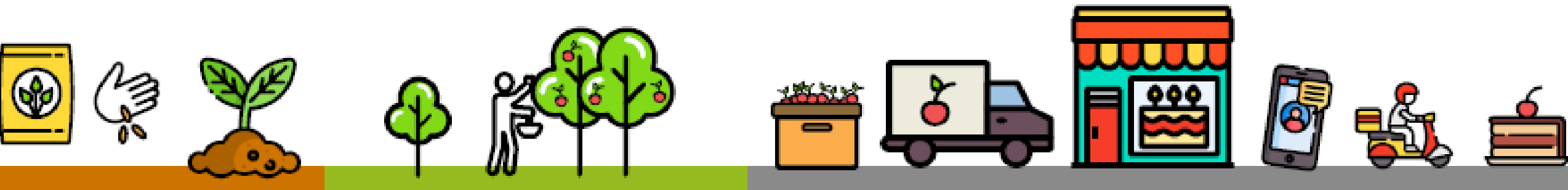


Digital technologies hold benefits as well as risks



Key principles for digital rural transformation

- **Capacity** development – at all levels horizontally and vertically is key
- **Content** – (co)creation, customization, adaptation, use - relevance to small scale producers, local appropriation
- **Context** matters – no one size fits all - locally applicable, accessible, & affordable solutions
- **Simple** – keep it simple - more inclusive, scalable and impactful
- **Sustainable** – positive impacts in economic, social, environmental & institutional terms – do no harm
- **Systems** approach – integrated & holistic approach across the disciplines and sectors



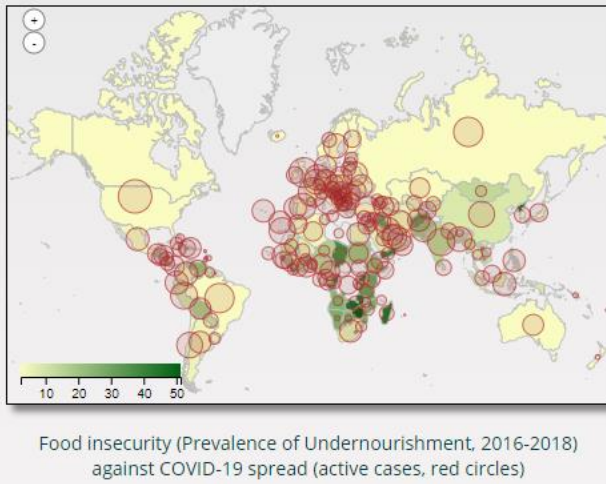
Strategy:

- (a) Data
- (b) Tools
- (c) Capacity building



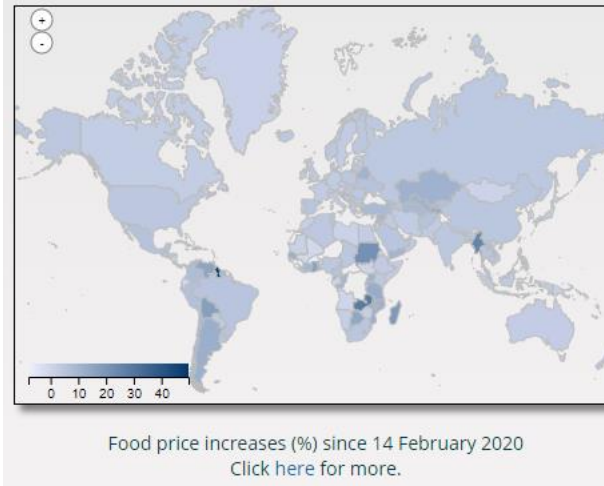
Digital technologies: Data

FAO's Big Data tool on food chains under the COVID-19 pandemic



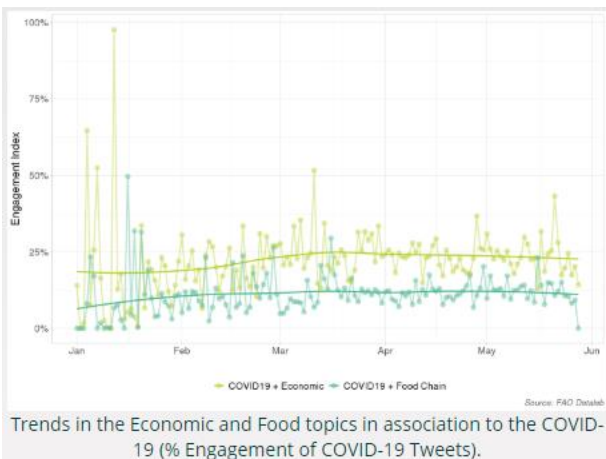
News Search

- news coverage of COVID-19 impact on food value chains across the world, showing food insecurity prevalence.



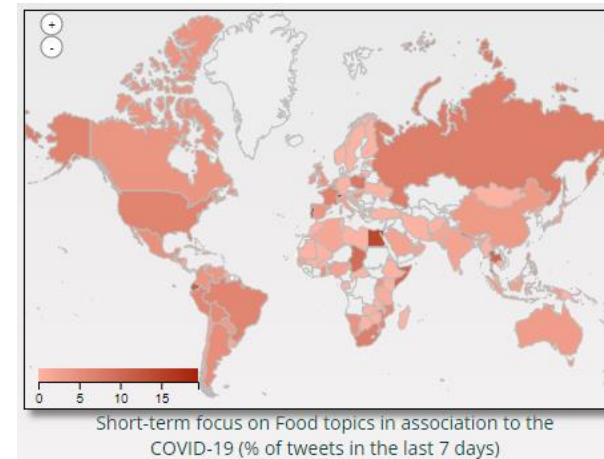
Food Price Monitor

- The tool monitors food prices and their trends daily, worldwide.
- Sends warnings on prices changes
- the global average prices on increases since 14 February



Twitter Semantic Search

- twice-a-day coverage of the Twitter accounts of 270+ newspapers world-wide to capture new topics, trends, related terms, distribution and connections.



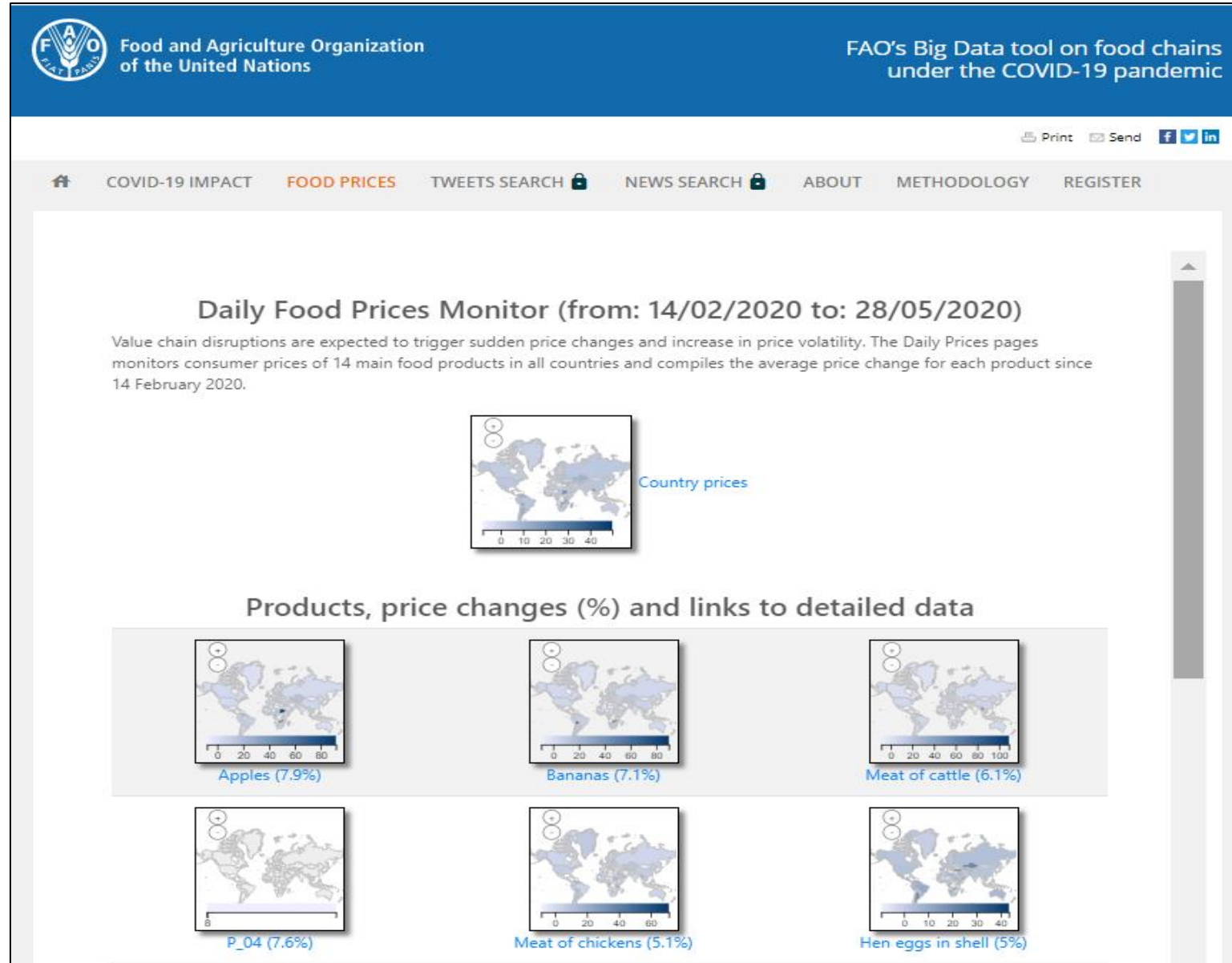
Covid-19 Impact Analysis Tool

- the tool carries out a sentiment analysis, for the world and by country, to monitor how economic and food topics evolve within the COVID-19

Digital technologies: Data

Food Price Monitor

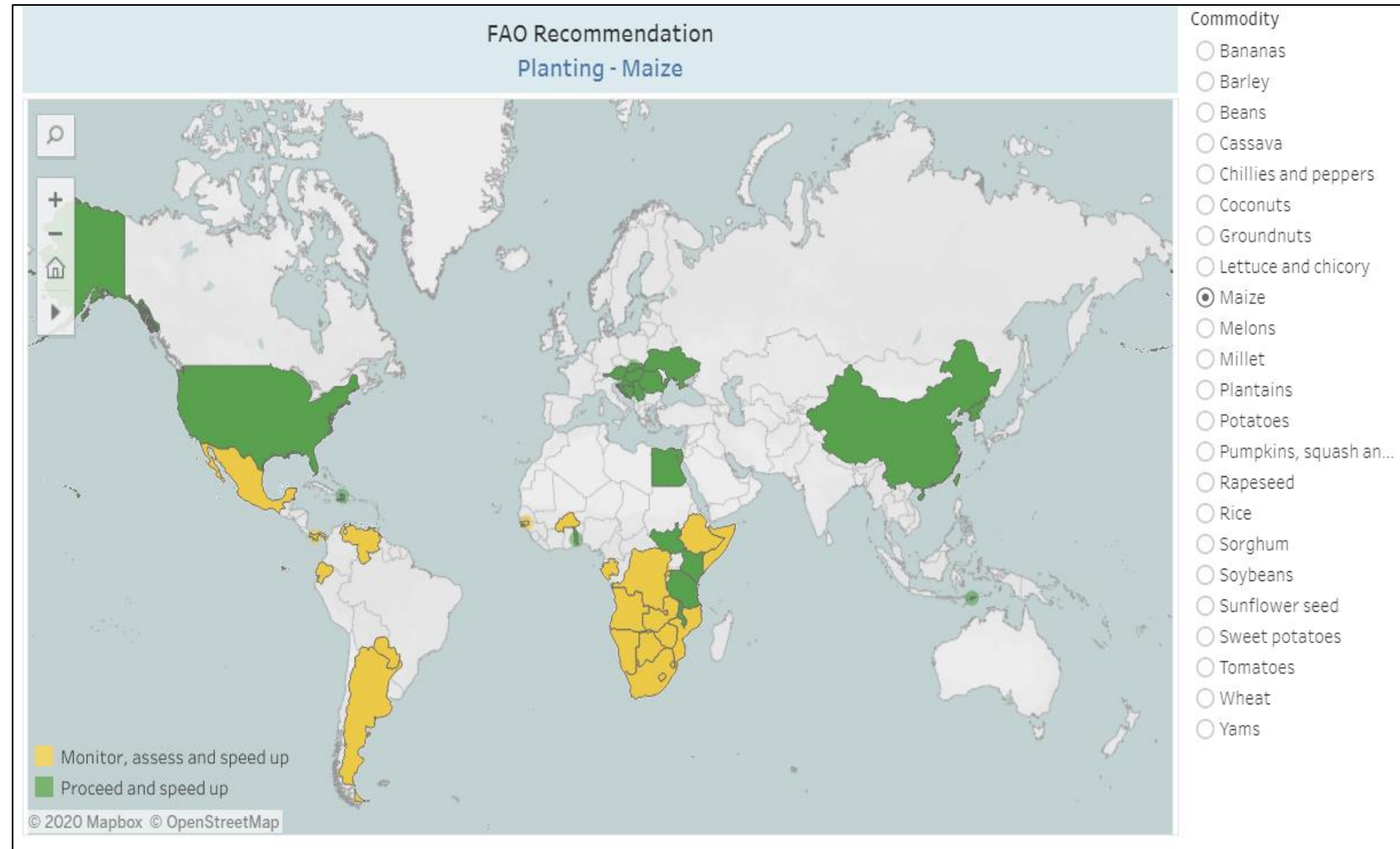
- Daily Food Prices Monitor (from: 14/02/2020 to –date)
- The Daily Prices pages monitors consumer prices of 14 main food products in all countries
- Compiles the average price change for each product since 14 February 2020.



Digital technologies: Data

Crop Calendars and COVID-19

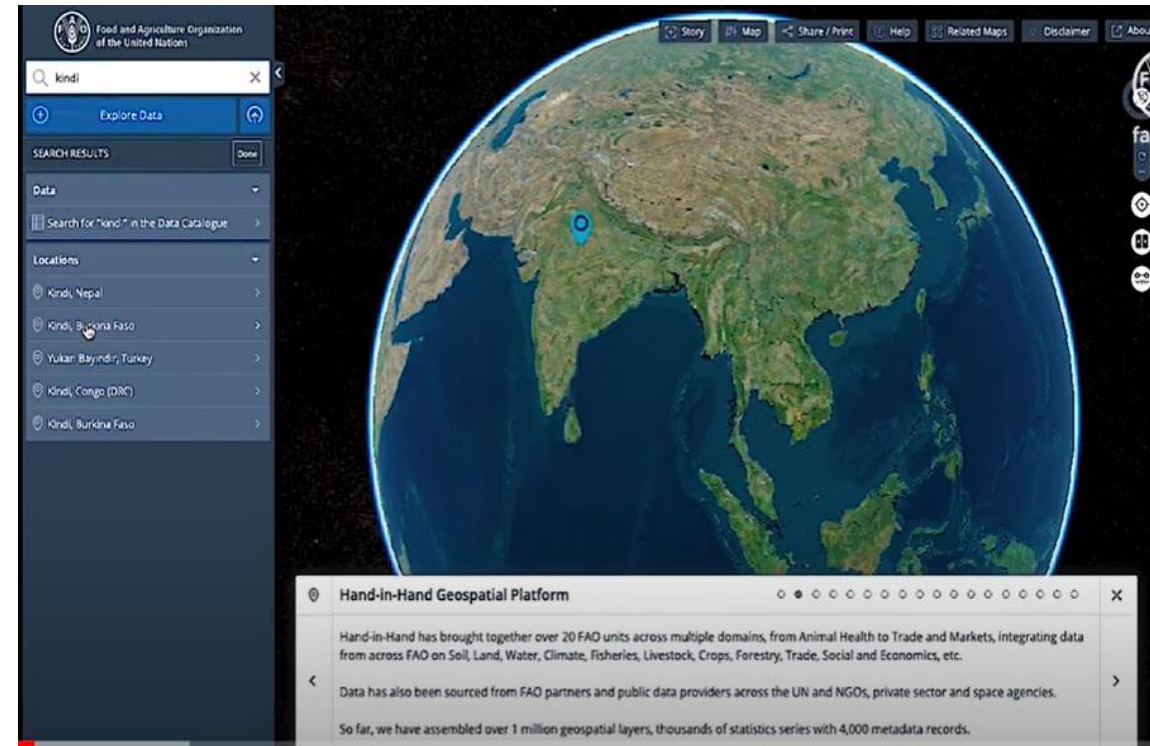
- Shows both **planting** and **harvesting** tasks during the COVID-19
- The mapping tool displays information on planting and harvesting months for key food and agriculture commodities
- The commodities are chosen based on their importance for each country in terms of value of production or because they constitute a key food staple.



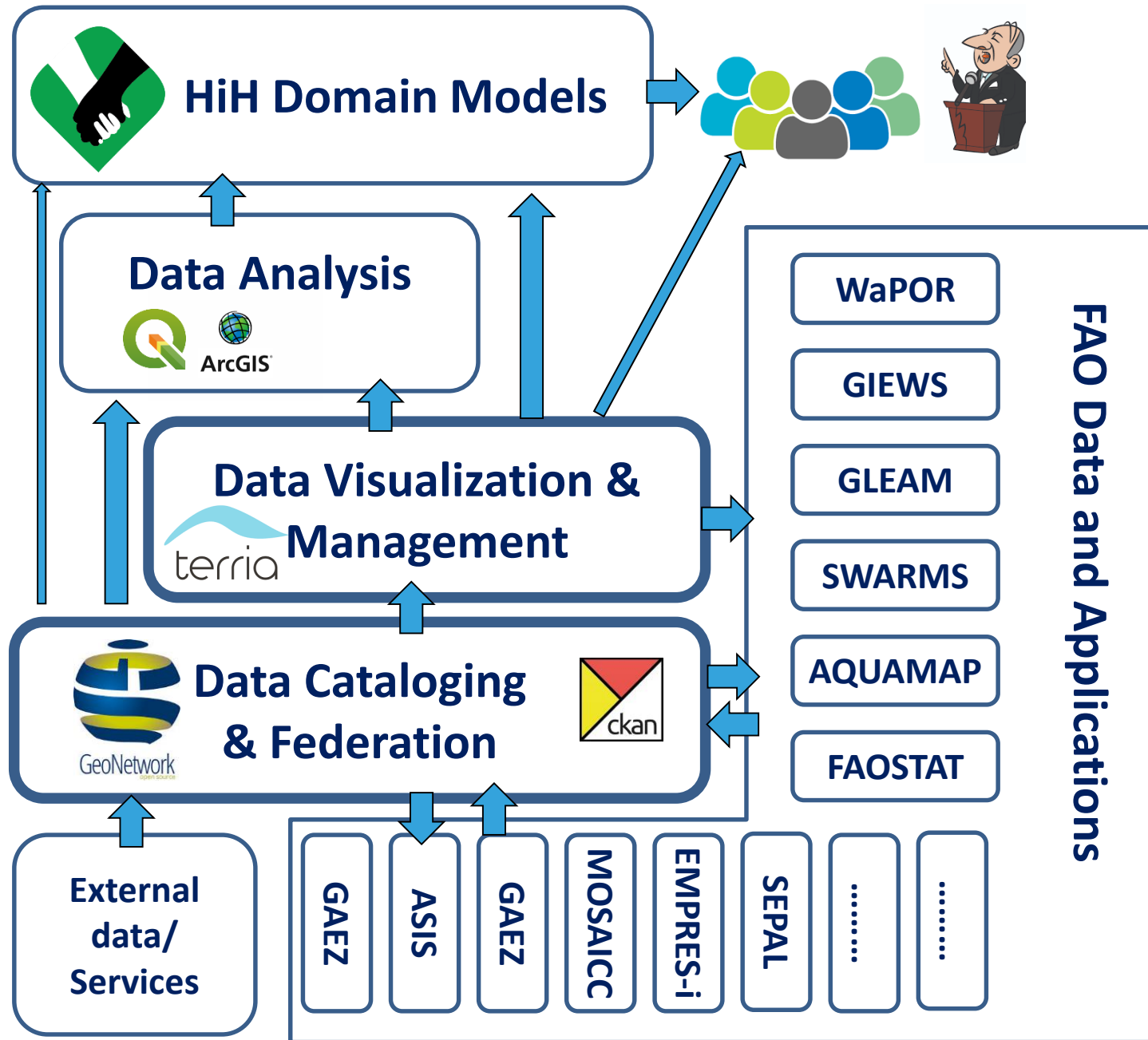
Digital technologies: Data

1. Hand-in-Hand Initiative and Geospatial Platform

- An evidence-based, country-led and country-owned initiative to accelerate SDG1 and SDG 2
- Using the most advanced geospatial modelling and analytics, to identify the biggest opportunities to raise the incomes and reduce the inequities and vulnerabilities of rural populations
- Substantial geospatial data asset and growing 4000+ metadata and 1300+ data series 1,000,000+ geodata layers and thousands of statistics series
- 14 geospatial data channels and working committees -
Soil, water, land, climate, fishery, forestry, livestock, crops, trade, socio-economics, etc



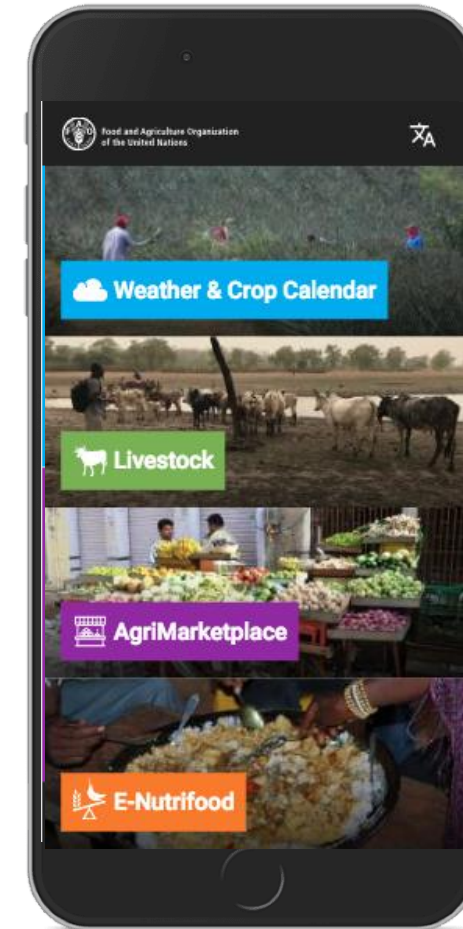
- <https://data.review.fao.org/map/story/>
- Intro video:
https://m.youtube.com/watch?v=MzkIM2KN_I



Digital technologies: Tools

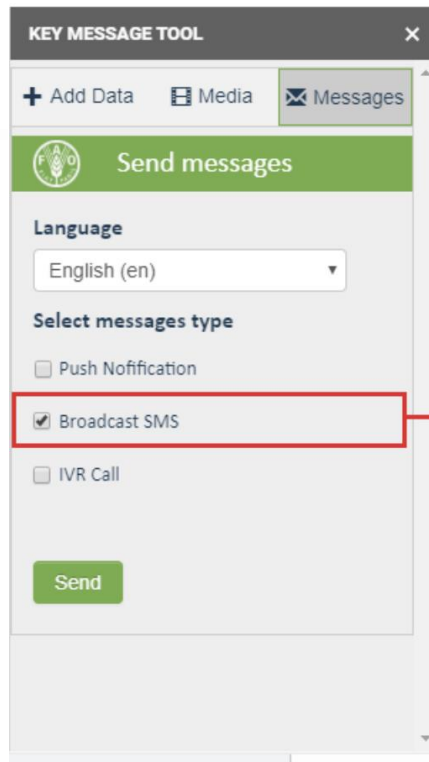
FAO Digital Services Portfolio

- Offer information & advisory messages to farmers in the field
- Connect directly Governments to Rural Farmers
- A platform working as a SaaS
- Implemented in,
 - Rwanda
 - Senegal
 - Egypt
 - Tanzania (Up coming)



Digital technologies: Tools

DSP: Notifications

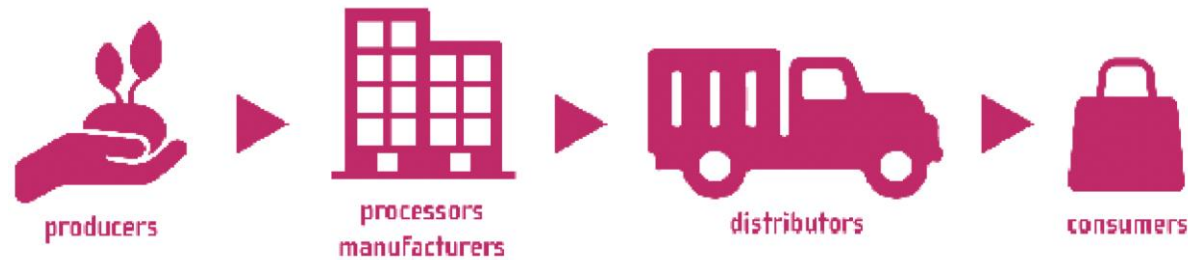


The screenshot shows a web application titled 'KEY MESSAGE TOOL'. It has three tabs: '+ Add Data', 'Media', and 'Messages'. The 'Messages' tab is active, showing a 'Send messages' section. Under 'Language', 'English (en)' is selected. Under 'Select messages type', 'Broadcast SMS' is selected and highlighted with a red box. Other options are 'Push Notification' and 'IVR Call'. A green 'Send' button is at the bottom.



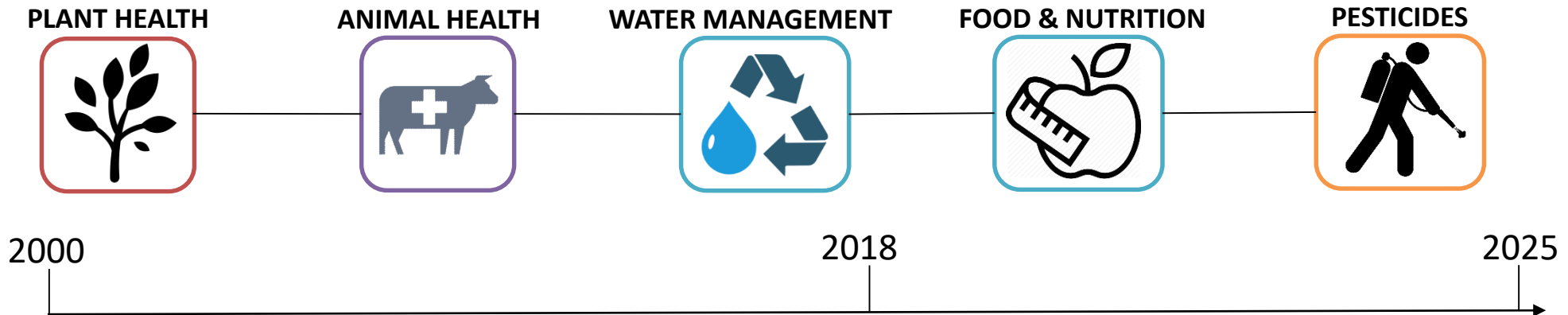
Digital technologies: Tools

Digital Intelligence Platform: Improving value-chain decision making



food and agriculture value chain

business capabilities



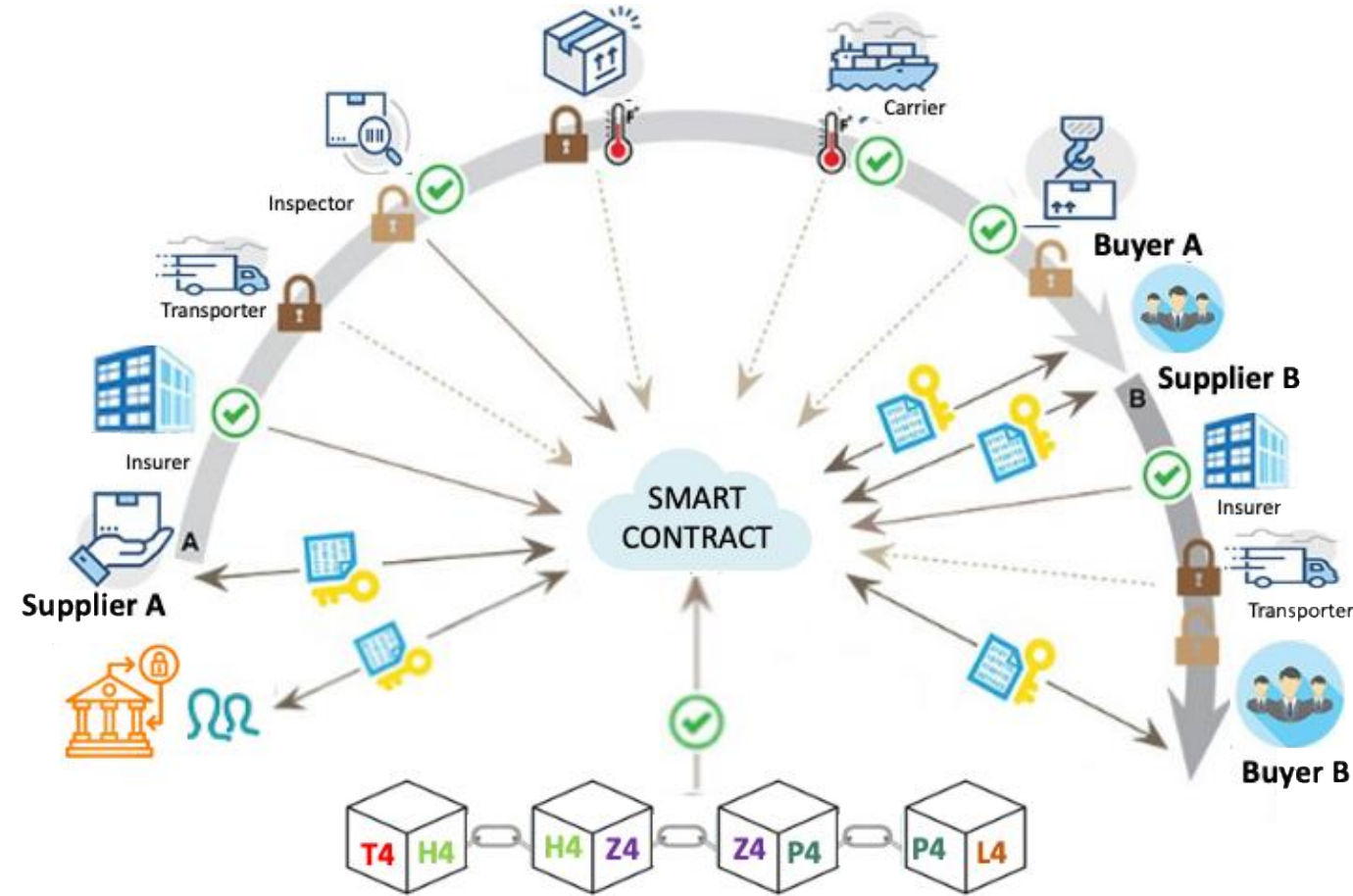
- What is the national problem?
- How is the country doing?

- What is the village problem?
- How is the village doing?

- How will happen to my crops?
- What should I do?

Digital technologies: Tools

Distributed Ledger Technologies (DLT)



- A decentralized, consensus-based record keeping system.
- An innovation that will have significant impact in agri-food value chains.

systems of observation



(e.g. WAPOR, River Level gauges)

2015 drought
2017 El Nino phenomena
...previous early warning situations

... new early warning situations
2020 Somalia flooding
2020 drought situation

digital intelligence platform



data-driven users



data-driven products



PLANT
HEALTH



WATER
MANAGEMENT



FOOD &
NUTRITION



EARLY ACTION
FORECASTS



NATURAL RESOURCES
CLASSIFICATION



systems of engagement



(e.g. fao.org, FAST)

....new supplier / capabilities



systems of record

(e.g. FAOSTAT)



\$0 marginal costs (one to many effect)



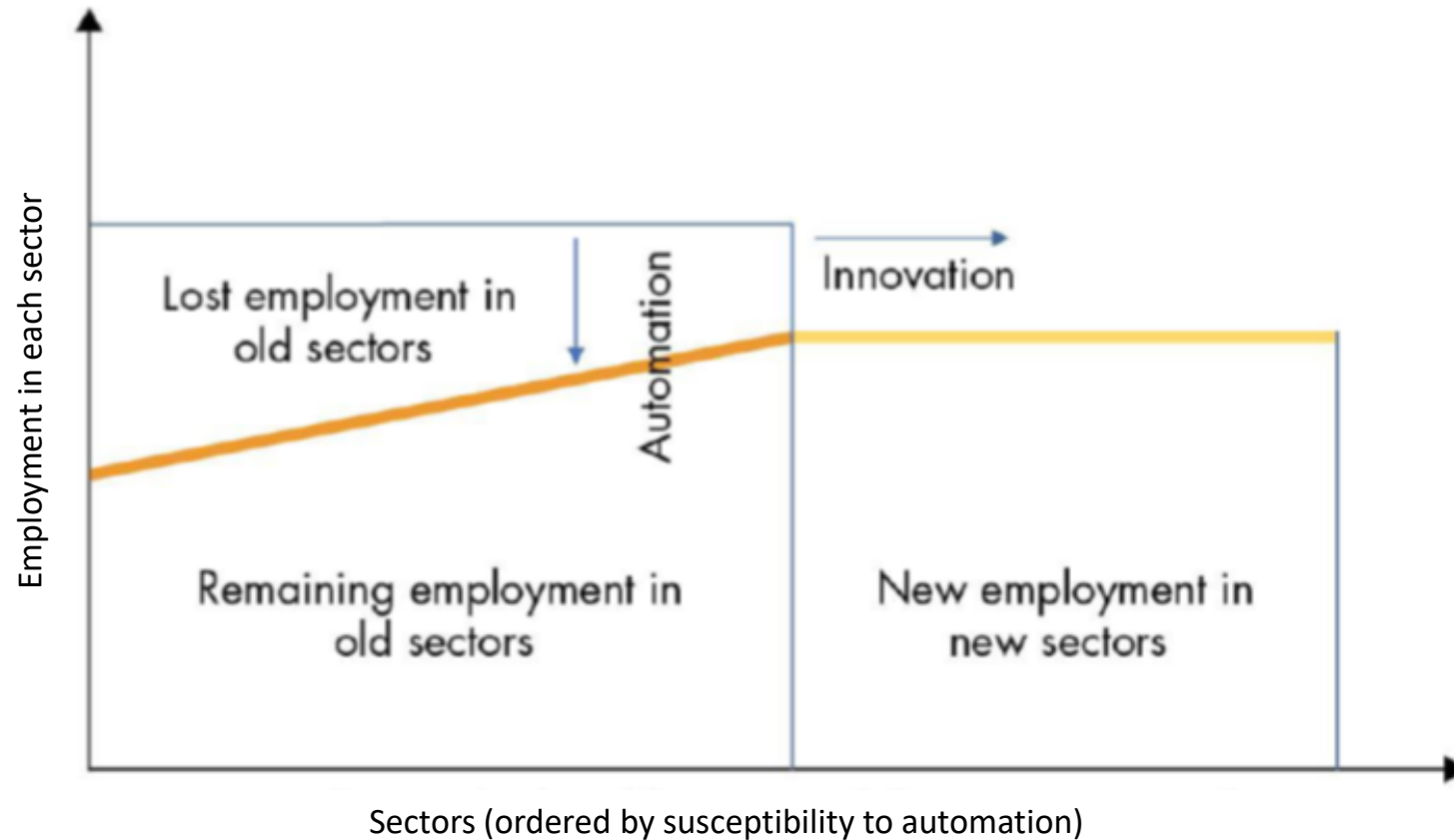
Network effects (impact and scale)



modularized suppliers

Digital technologies: Capacity building

COVID 19 Accelerated: The Forces of Automatation and Innovation will Shape Future Employment



Source: World Bank, WDR
(2018)



Thank you



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