Food Security
Leveraging Data and Technology Innovation

Lesly Goh
Senior Technology Advisor
June 23, 2023

Agriculture is the primary livelihood for much of the world's population, particularly the poor

Agriculture accounts for one third of global GDP[1]

60% of the world's poor depend on agriculture for their livelihoods

Agriculture contributes to 35% of the ASEAN region's employment, of which 60% are smallholder farmers

**Strengthening the incomes of Small Holder Farmers will have massive poverty reduction impact**

Through food system transformation, these SDGs will be met

Agri-food systems directly impact 5 of the 17 SDGs, playing an integral role in eliminating poverty and hunger, strengthening jobs and economic growth, and improved use of natural resources
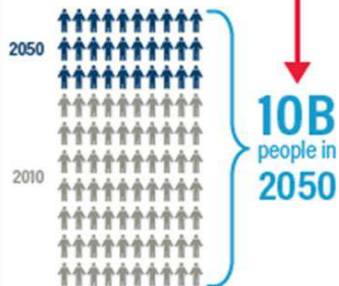
[1] As of 2014. www.devex.com/news/sponsored/opinion-how-to-address-the-impact-of-covid-19-on-global-food-systems-96892

Current and emerging challenges are massive!

How do we feed 10 billion people...

WE WILL NEED

56% more food

2010 | 2050

TO FEED NEARLY

2050
2010

10B people in 2050
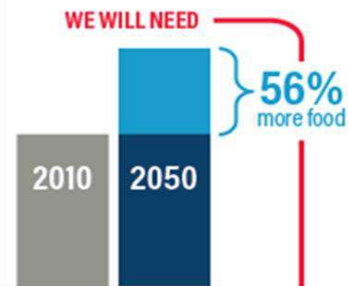
...without using more land...

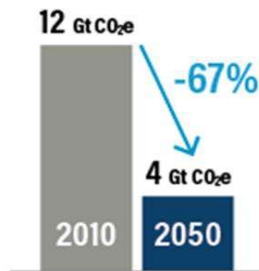**WE NEED TO PREVENT AGRICULTURE FROM EXPANDING**

we currently use **~50%** of the world's vegetated land for agriculture

TO SAVE AN AREA OF FORESTS NEARLY 2X the size of India

... while lowering emissions

WE CAN LOWER EMISSIONS

12 Gt CO$_2$e

-67%

4 Gt CO$_2$e

2010 | 2050

WITH INNOVATIVE TECHNOLOGY LIKE

Improved rice cultivation and livestock systems, reduced food loss and waste, agroforestry, landscape management and restoration

... while improving climate resilience and without contributing to further water insecurity

... while improving nutrition and building human capital

...and lifting the poor who work in the food system out of poverty?

Key **technologies** can provide **significant benefits** to smallholder farmers

Key Benefits

Biotechnology
Improved crop yields, reduced vulnerability to environmental issues, increased nutritional qualities of food crops and reduced dependence on fertilizers

Mobile Phones
Allow farmers to gain access to vital information about prices of crops and instant weather information to properly manage crops. They also serve as the main distribution channel for financial products such as loans, insurance, savings and a means to make payments

Internet / Connectivity
Brings new information resources and can open new communication channels for rural communities. Other benefits include increased efficiency, less duplication of activities, and global access to information

Data Analytics & AI / ML
Enables farmers to manage key resources including seed and fertilizers, while increasing productivity. The tremendous amount of data generated can also be used with AI / ML techniques to make informed decisions and predictions

Key Benefits

IoT Software & Hardware
Enables the creation of real-time monitoring systems, which allows farmers to quickly respond to any significant changes in weather, light, humidity, as well as the health of each crop or soil in the field

Robotics & Automation
Robots automate slow, repetitive tasks for farmers, allowing them to focus more on improving overall production yields

Blockchain / DLT
Can be used to improve the traceability of crops across the agriculture supply chain, thereby providing transparency throughout the process and potentially reducing transaction costs

Transformative, interconnected pathways to change

Healthy People

1. Better diets
2. One Health/Prevention of zoonotic diseases
3. Improved food safety

Healthy Planet

4. Reduction in GHGs
5. Reduction in pollution
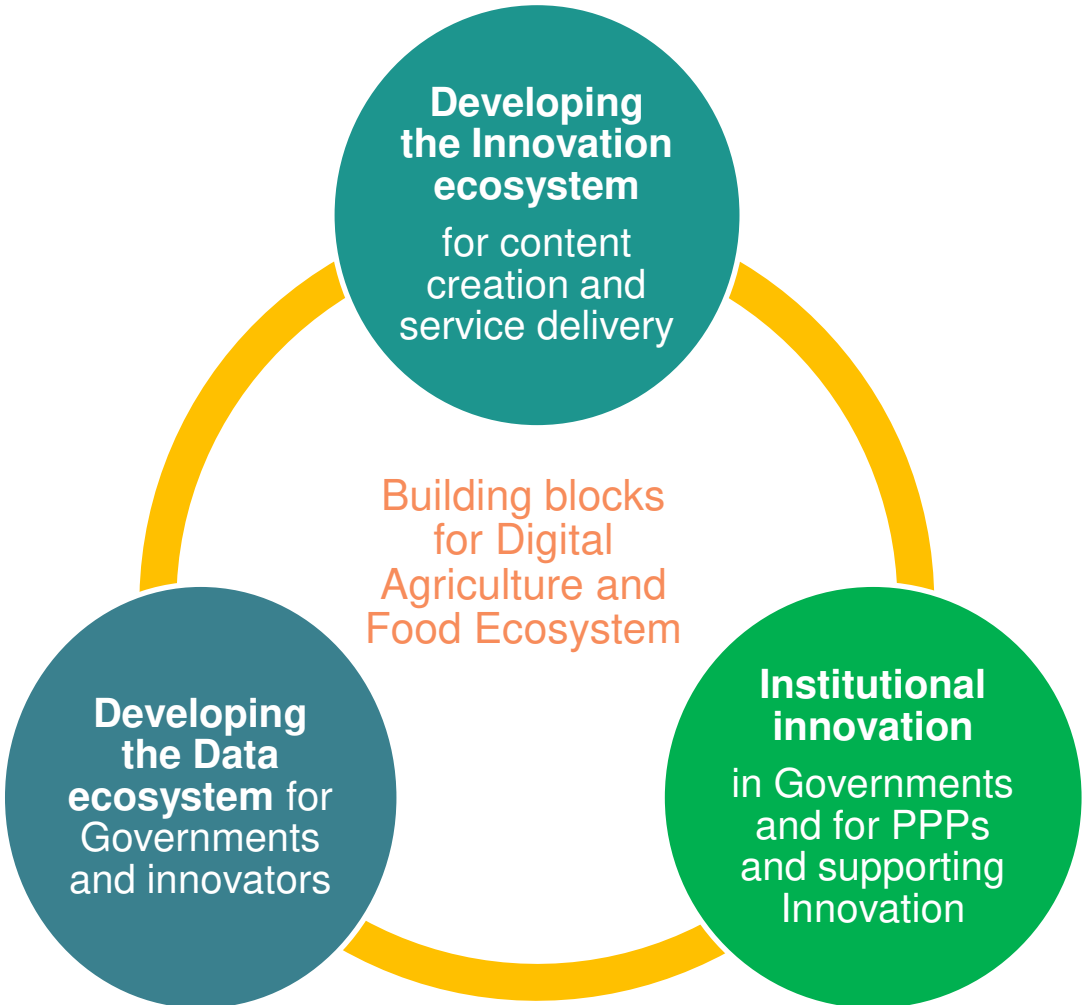6. Improved land, water and food loss and waste (FLW) management

Healthy Economies

7. Promotion of productivity growth
8. Increased job creation
9. Maintaining trade flows

Source: World Bank Food System 2030 https://www.worldbank.org/en/programs/food-systems-2030/overview

FS2030 Refined Theory of Change

Source: World Bank Food System 2030 https://www.worldbank.org/en/programs/food-systems-2030/overview

Developing the Innovation ecosystem for content creation and service delivery

Developing the Data ecosystem for Governments and innovators

Institutional innovation in Governments and for PPPs and supporting Innovation

Building blocks for Digital Agriculture and Food Ecosystem

Food Security:
Digital transformation of agri-food systems requires addressing three fronts

Increase **Farmer Incomes** through greater value-addition and improved profitability

Reduce **Food Prices** through increasing productivity and lowering trade barriers

Increase **Nutrition** through diversifying domestic production and quality of nutritious foods

Enhance **Sustainability** through "greening of agriculture" (reducing emissions and carbon footprint)

Source: Watch on-demand the recordings: https://content.planet.com/l/planet-explore23
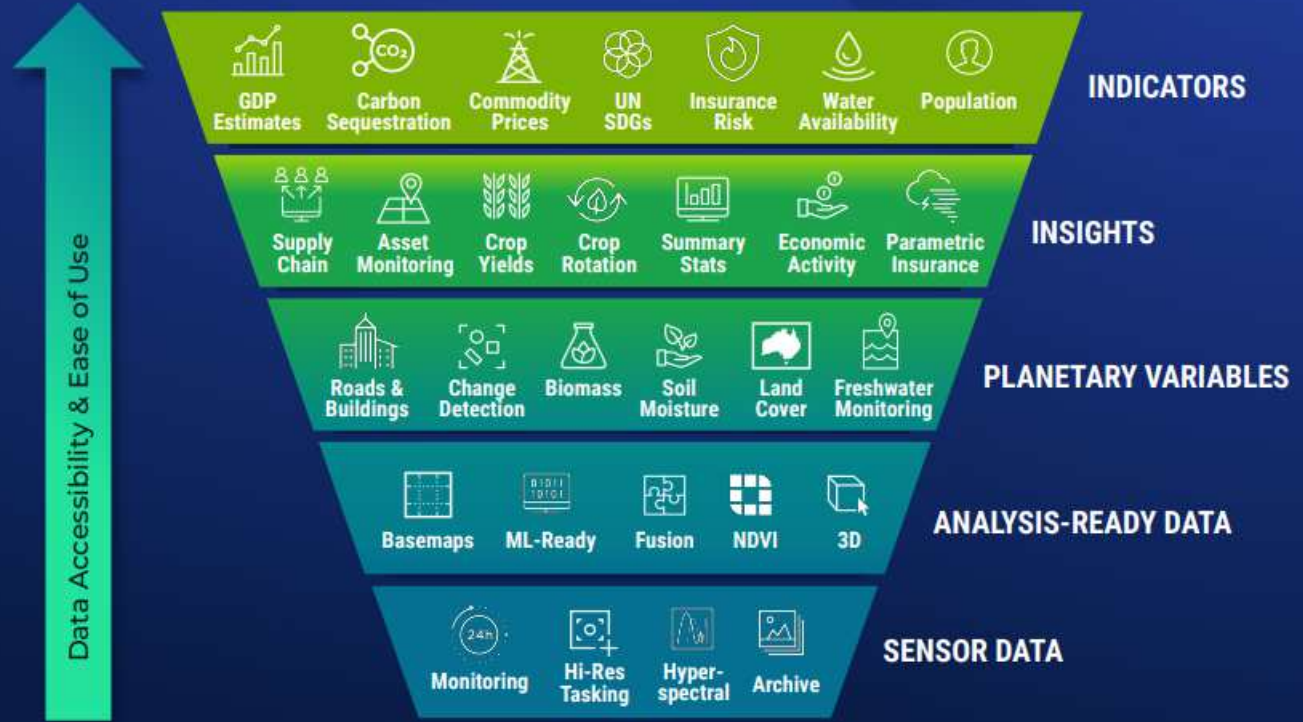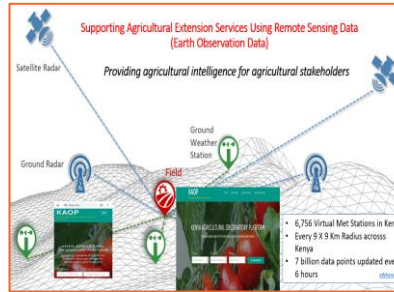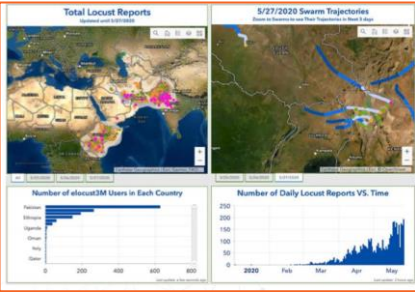
Key Data and Digital interventions in Kenya

Kenya Big Data Center

Micro Weather Observatory

Desert Locusts warning and response
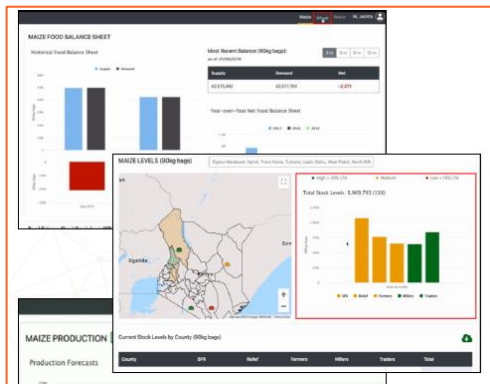

Farmers Digital Registry and Farm Geotagging

Digital Food Balance Sheet
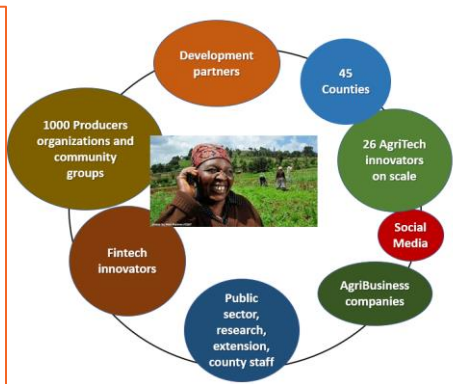

One Million Farmers Platform

Digital e-voucher system

Digitizing Producer Organizations

Source: Scaling Up Disruptive Agricultural Technologies in Africa https://openknowledge.worldbank.org/handle/10986/33961

ASEAN-BAC Food Security Working Group

Targeted outputs by Sep 2023

- **Recommendations for key policies and initiatives that support Food Security priorities and objectives**, with the Inclusive Closed-Loop as legacy initiative

- **Alignment on Single Narrative approach that enables each ASEAN member to create tailored policies and strategies** that increase productivity, create better markets, improve distribution and access, and ensure food safety, quality, and nutrition

- **Articulation of Inclusive Closed-Loop model as an effective partnership ecosystem model** for developing a farmer-based food industry

Source: PISAgro https://www.pisagro.org/

Alternate Chair
Bernardino Vega

Chairman
M. Arsjad Rasjid P.M.

Board Member
Maspiyono

ASEAN BAC Policy Manager
Arif Rachmat

Stakeholder Manager
William Sabandar

ASEAN-BAC Secretariat
Gil Gonzales

KADIN International Affairs Secretariat
Noto Suoneto

Ministry of Agriculture – Special Staff
Joice Triatman

Knowledge Partner: **BAIN & COMPANY**