



Alliance



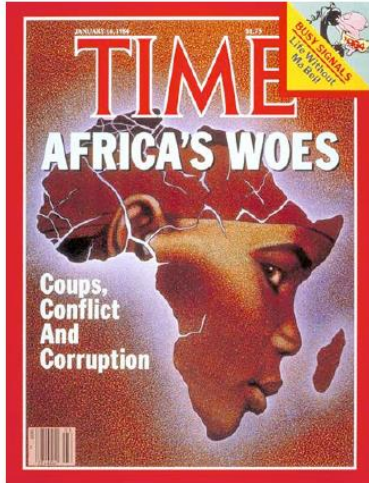
# Future of agriculture and food under climate change in Africa

Input for discussion with Jonathan Rosenthal, Economist Africa editor

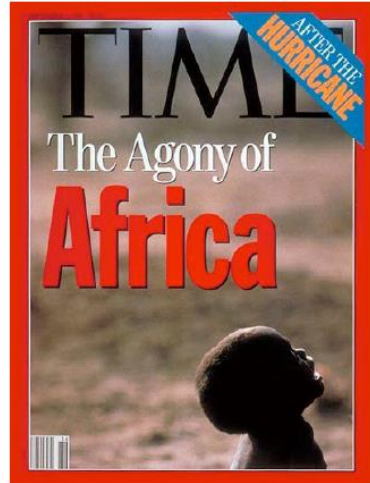
Nairobi, 14<sup>th</sup> of January 2020



1984



1992



2011



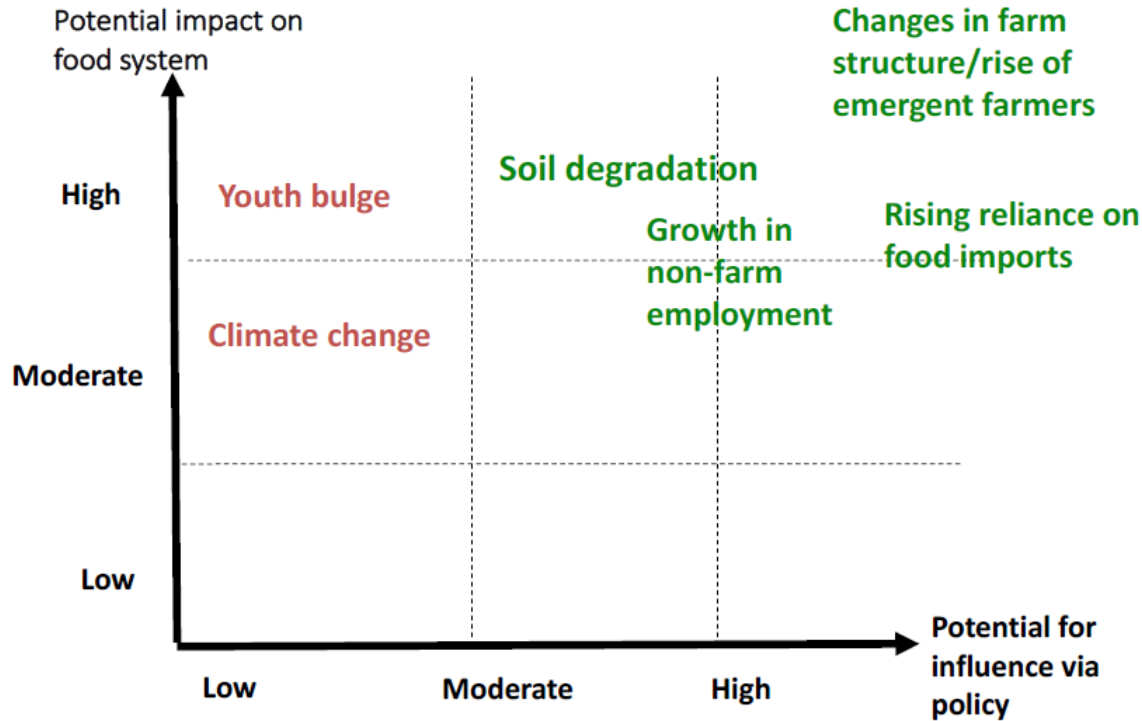
“

**MO IBRAHIM**

The lost opportunity  
Of the past decade is  
deeply concerning.  
Africa has a huge  
challenge ahead.  
Young citizens of  
Africa need hope,  
prospects and  
opportunities.



# African mega-trends



Thomas Jayne at MSU

**Land degradation** results in USD 68 billion in annual losses in SSA, USD 300-400 billion is needed for restoration (Montpellier Panel, 2014)

Africa's annual food import bill \$35 billion \$110 billion by 2025 (Africa Development Bank)

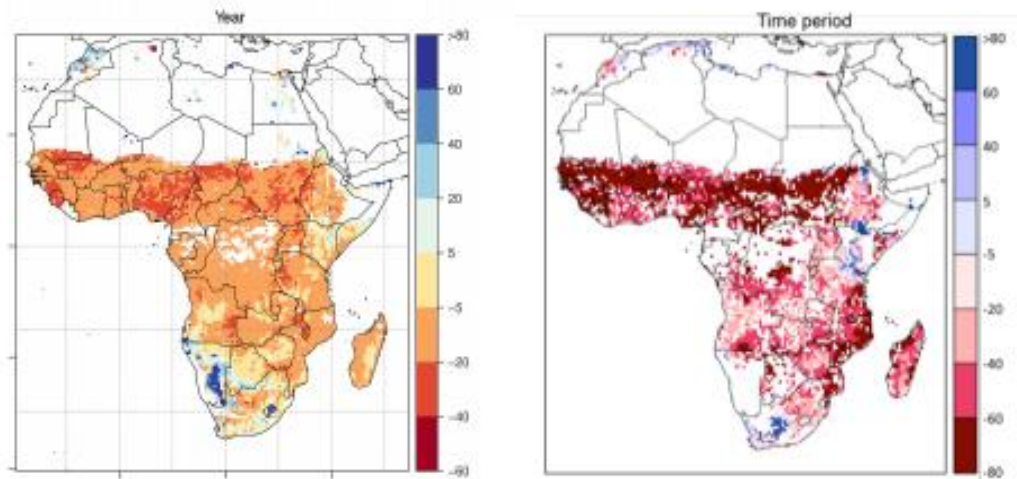
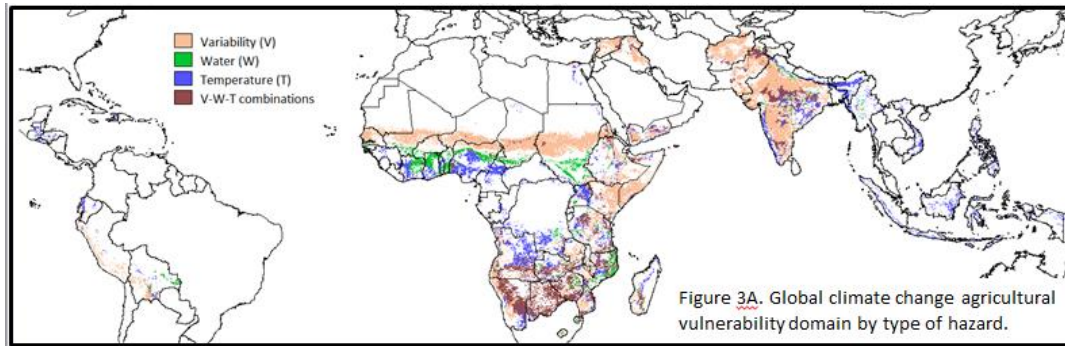
250 million more mouths to feed by 2030 (Department of Economic and Social Affairs. World Population Prospects: The 2017 Revision)

72% of global farmers have less than 1 hectare but the medium scale farmer (20-100ha) is rapidly rising

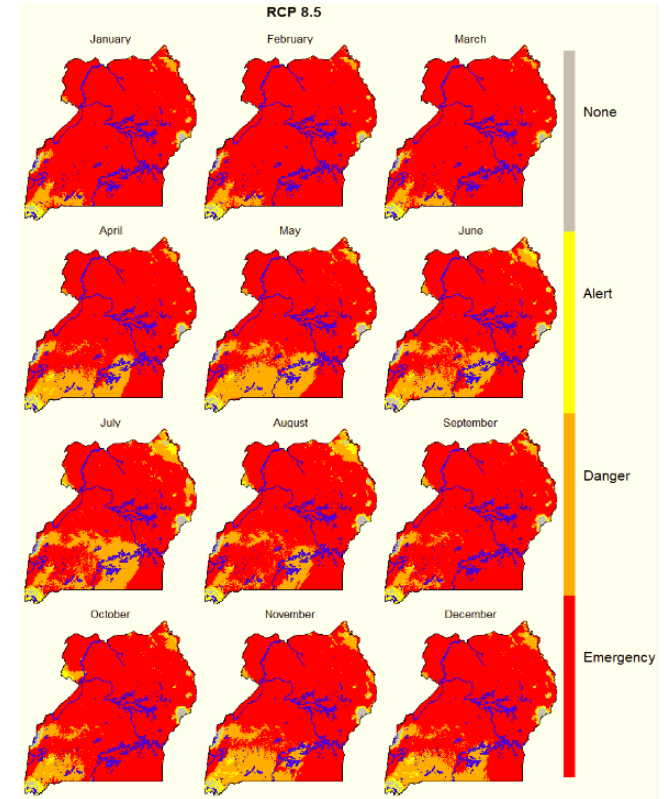
## Changing diets

- Staples diversifying
  - Increased consumption of fruits, vegetables and animal-based products
  - More "fast foods"
- (Staatz, J. and F. Hollinger (2016), OECD Publishing, Paris)

# Climate change impacts on crops and livestock



Projected changes in maize and bean production by 2050s under RCP 8.5 (Ramirez-Villegas & Thornton, 2015)



Projected areas of pigs under heat stress in Uganda 2040-2069 period under RCP 8.5 (Mutua et al. in review)

# Climate finance – the ‘unbankable’ smallholder?

01

## Risks in Agriculture

Risks in agriculture are high, diverse and increasing with climate change

## Risk is a barrier to investment

Agricultural risks make investing too expensive and thereby inaccessible to farmers

02

03

## De-risking Agriculture

Can de-risking agriculture help unlock finance for African agriculture?

African agriculture accounts for about **70% of employment** and more than **40% of the GDP** but less than **3% of bank lending**

ALPHABET SOUP

# You've probably never heard of CGIAR, but they are essential to feeding our future

No other institution has done as much to feed our world as CGIAR.

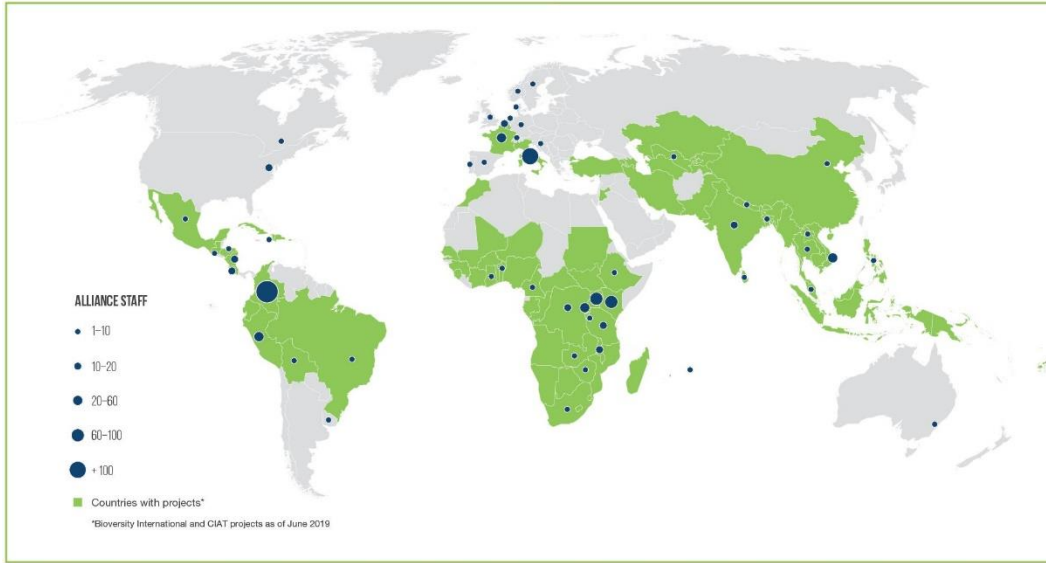
By **Bill Gates** | July 09, 2019 • 4 minute read



“What’s for dinner? It’s a question asked every day in homes around the world. No other organization has done as much to ensure families—especially the poorest—have an answer to that question as **CGIAR**, the world’s largest global agricultural research organization.”

<https://www.gatesnotes.com/Development/How-CGIAR-is-feeding-our-future>

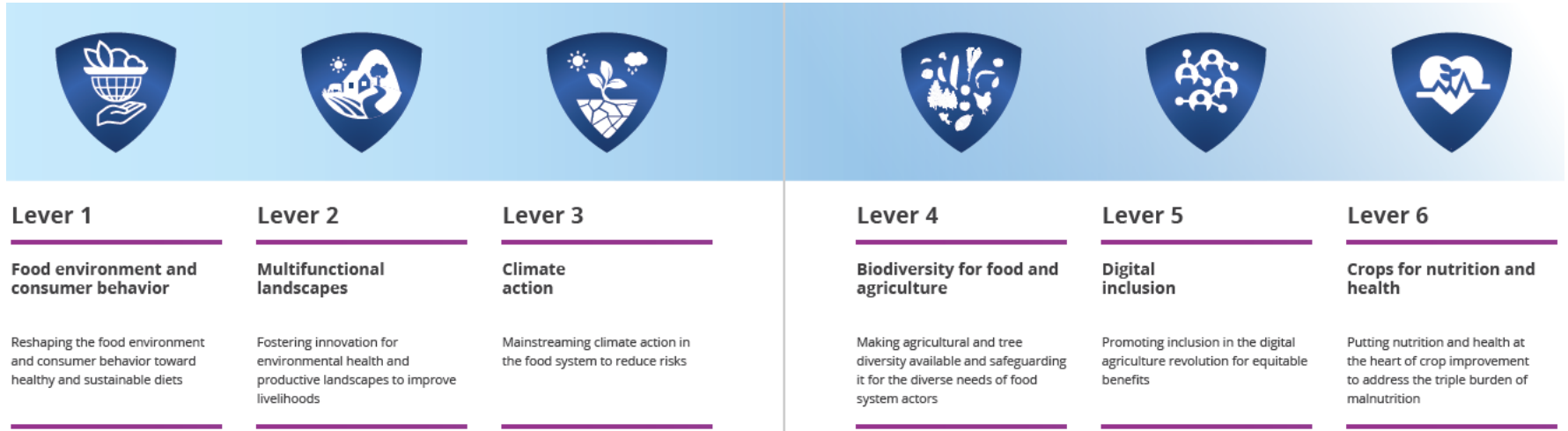
# Bioversity CIAT: Alliance4Science



## Partnerships are vital to deliver impact at scale

UN agencies, international financial institutions, national research organizations, governments, civil society organizations and private sector

The Alliance is part of CGIAR, a global research partnership for a food-secure future.





# Drought-resilient and bio-fortified bean varieties

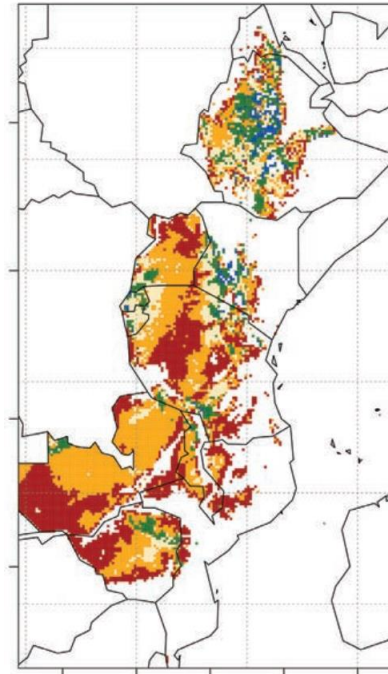
## Lever 6

### Crops for nutrition and health

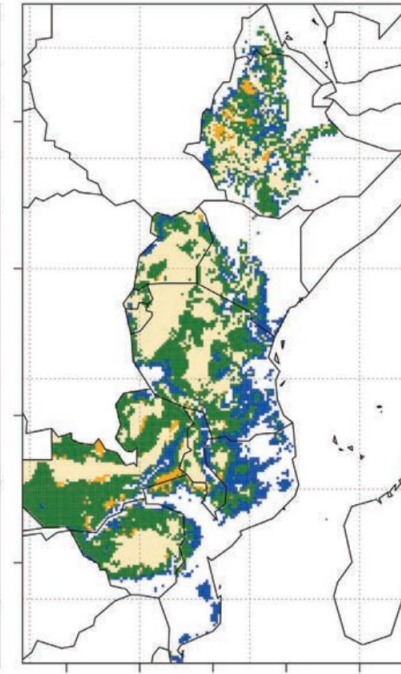
Putting nutrition and health at the heart of crop improvement to address the triple burden of malnutrition








### Non-heat tolerant bean varieties



### Heat tolerant varieties



### East & Southern Africa

-  Area that becomes unsuitable
-  Areas that remain viable but with lower suitability
-  Areas that maintain similar suitability
-  Areas that increase in suitability
-  New areas that become viable





# Farming systems and landscape resilience

## Lever 2

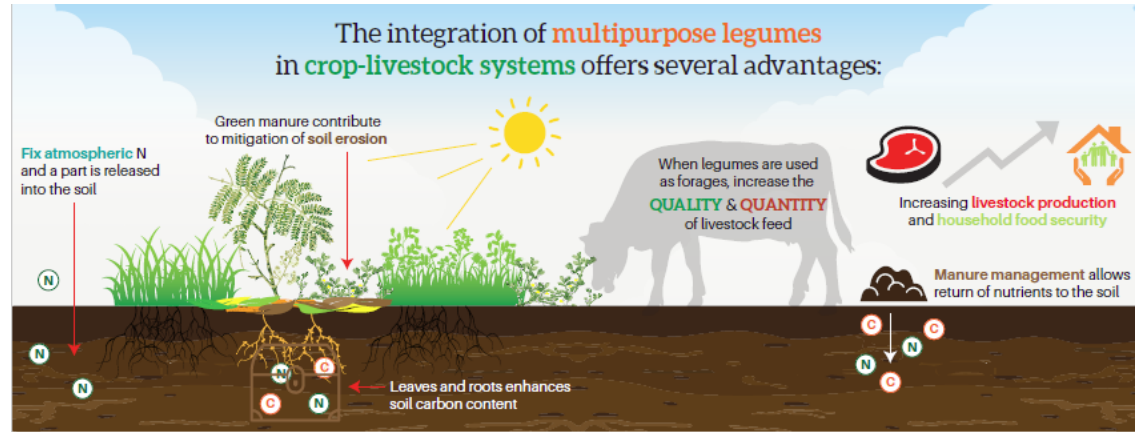
### Multifunctional landscapes

Fostering innovation for environmental health and productive landscapes to improve livelihoods

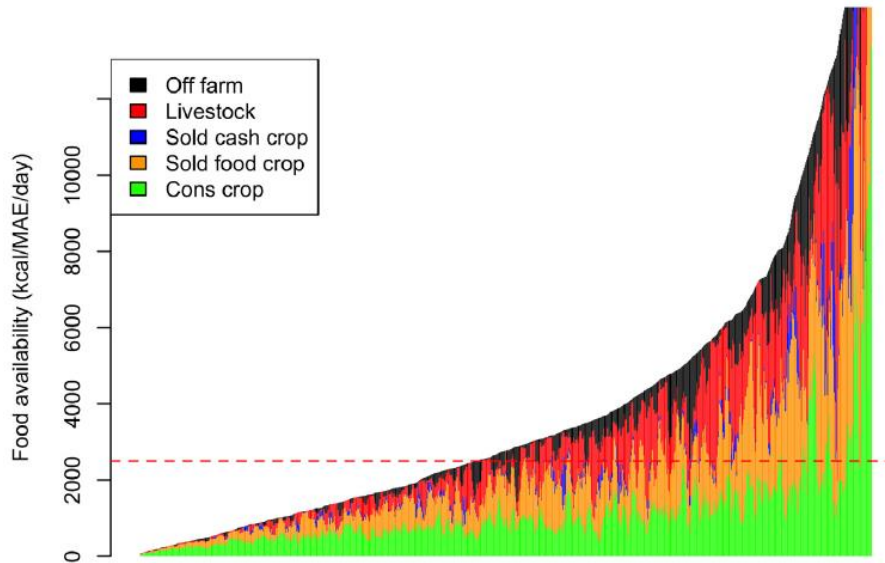
## Lever 4

### Biodiversity for food and agriculture

Making agricultural and tree diversity available and safeguarding it for the diverse needs of food system actors



Crop-livestock integration – livestock as buffer in times of crop failure



Farming system diversification (Paul et al. 2018)



Integration of perennials into landscapes



# Digital Atlas of Agricultural Adaptation: data guiding investments

## Lever 3

### Climate action

Mainstreaming climate action in the food system to reduce risks



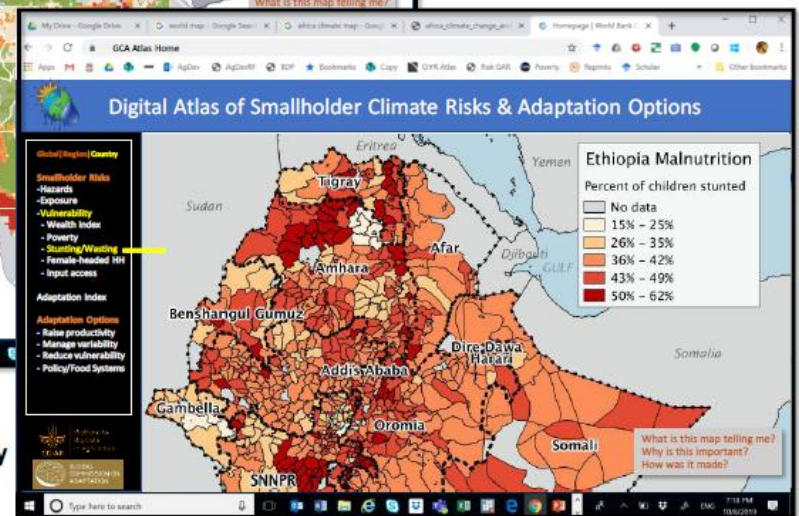
Global  
- Hazards  
- Heat stress

**Digital Smallholder Adaptation Atlas**  
Mock-up showing 3 levels of geographic focus and sample layers from each of the Risk factors: Hazard, Exposure & Vulnerability



Region  
- Exposure  
- Crops  
- Crop impacts

Country  
- Vulnerability  
- Stunting





# Efficient value chains through data

## Level 1

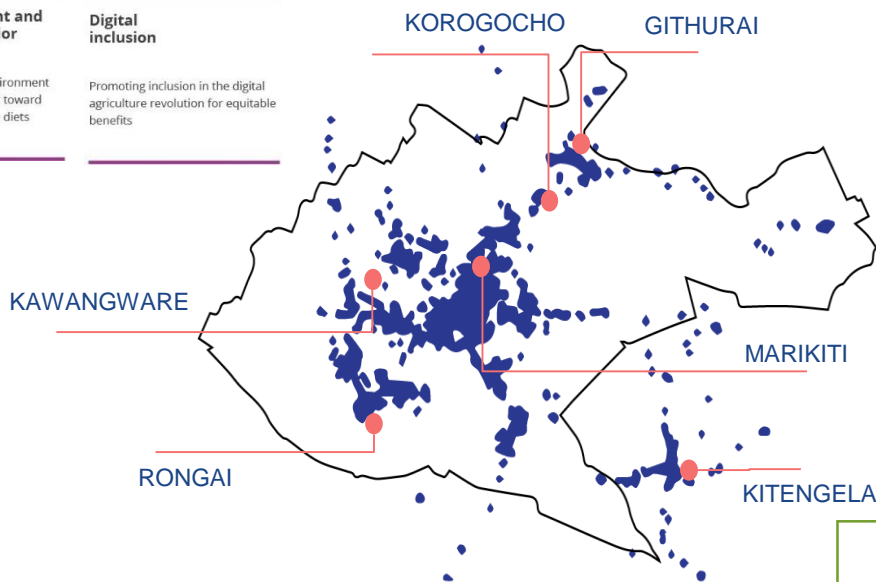
### Food environment and consumer behavior

Reshaping the food environment and consumer behavior toward healthy and sustainable diets

## Level 5

### Digital inclusion

Promoting inclusion in the digital agriculture revolution for equitable benefits



## Consumers

# 700,000

Families near Twiga vendors

## Required Data

- Knowledge, attitudes & practice
- of FFV consumption



## Vendors

Blue dots are the Twiga foods vendors within Nairobi and the neighborhood

# 14,000

Twiga Foods vendors in Nairobi

## Existing Data

- Transaction data
- GPS location
- Vendor profiles
- Contact details

## Data capture models

- Data Management System



## Wholesale markets

Red dots are the main wholesale markets in Nairobi

# 6

wholesale markets act as price setters

## Required Data

- Commodity types
- Quantity demanded
- Prices
- Units of measure
- Place of origin
- Product quality

## Data capture models

- ICT Tools
- Bulk SMS
- Market Research Assistants (MRAs)

# Food for thought

- **Climate adaptation is not only about changing a technology/variety, but about complex diversification and systems transformation**
- **Trade-off resilience and productivity?**
- **Digital agriculture is an emerging opportunity (two-way), especially for upcoming youth**
- **Healthy diets are key in Africa's rural-urban transition**
- **How can leapfrogging towards sustainable intensification be supported, avoiding pitfalls of the industrial model?**
- **Farm size is a central question to whether Africa can feed itself**
- **De-risking agriculture is needed to unlock finance; blended finance and impact investors are needed**

Alliance



# Thank you!

Birthe Paul and colleagues

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