Transforming Food, Land and Water Systems in a Climate Crisis

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THE CHALLENGE
1.4 billion living in Poverty

1 billion more People by 2030

1.5 billion people depend on Degraded Land

USD 7.5 billion lost to extreme Weather (2010)

Nearly 1 billion going Hungry

14% more Food needed per decade

UK Met Dept
Major Stressors and Shocks

Growing food demand:

- Growing populations
- Changing consumption habits
- Urbanisation

- 2010 – 2018: from 32 million to 56 million undernourished
- Map (March-May 2021): 19.6 million people estimated to require food assistance
- 52 million W-Africans overweight or obese + suffering micronutrient deficiencies
Major Stressors and Shocks

At the same time, growing diversity of shocks:

- Pests and zoonoses
- Market volatility and trade disruptions
- Worsening insecurity
  - State fragility and conflicts
  - Extreme weather events: drought and flooding
EXTREME EVENTS

We are at 1°C
Many records are being broken

In many regions we have only 9 growing seasons to reach 750 M farming households

Number of record-breaking monthly temperature extremes

now 5X times more

Coumou et al. (2013) Climatic Change

Dry record-breaking events in SSA have increased by up to 50%

Worldwide, the number of extreme climate events is increasing at an alarming rate.
The mega challenge of African agriculture adaptation to climate change

Change in length of growing period in a +4 °C world (2090)

Farming as we know it now, will not be feasible in many places
TRANSFORMING FOOD, LAND AND WATER SYSTEMS
Many have said that transformation is required in food systems, showing where the best levers are to bring about this transformation.
Climate-resilient agriculture

Viable approach to achieve **sustainable use of natural resources** in crop and livestock production systems and across food, land, and water systems.

- **Long-term productivity** +
- **Enhance incomes of farmers and other food system actors** +
- **Improve the affordability of food** +
- **Increase resilience to the impacts of climate change**

Climate resilience is the ability of a system to ‘bounce back’ from the impacts of climate-related stresses or shocks.
**Resilience:** Needs to encompass a variety of stressors and shocks

- **Demographic changes**
- **Social and technological changes**
- **Political upheaval**
- **Financial crises**
- **Pandemics**
- **Others**

- **Vulnerabilities in one area can reinforce vulnerabilities in another:** building resilience to climate change and climate impacts influences and is influenced by other forms of resilience within the system.

- **Resilience-building activities can have positive knock-on effects, mitigating other expressions of vulnerability, such as poverty and food insecurity.** Prioritising these activities requires the careful consideration of trade-offs.
Going beyond technologies...
Drought-tolerant maize boosts food security

- Working with consumers
- Working with producers
- Working with 100s private sector players

- Developed 100 new varieties
- Released across 13 countries
- 40 million beneficiaries

✓ Reduces need to use more land
✓ Resilience to drought
✓ Yields up to 35% more grain
Local Technical Agro-Climatic Committees in Latin America

Scaling Out

We have helped establish 50+ MTA across Latin America empowering about 350 institutions with agro-climatic information.

~250K farmers Latin American of maize, rice, beans, coffee, fruits, vegetables and livestock are making better decisions using agro-climatic information.

In 11 Latin American countries:
- Colombia
- Peru
- Ecuador
- Mexico
- Chile
- Paraguay
- Honduras
- Nicaragua
- Guatemala
- Panamá
- El Salvador

Together with local, national and regional partners.
Supply Networks. How are products connected?

Understanding the needs of tailored climatic information

Circular migration plots showing the flow of information between products in Guatemala Borouncle et al 2020
https://doi.org/10.1016/j.clsir.2019.100137
2
Better predictions
Weather and crop predictions


NextGen – AcToday project

A new generation of climate forecast
3
Empowerment
Institutional strengthening
We need to transform ourselves

Agricultural research for development

“publish or perish.”

fragmented, inefficient, duplication, overly supply-based, siloed

How can we change?

More strategic agendas
Clear theories of change
Less fragmented
Involving stakeholders from Day 1
Attention to deployment
Success = benefits to society

Difficult to deliver end-to-end, sustainable and scalable solutions
Thank You!