

### 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

+6 °C

+7 °C

UK Met Dept

+4 °C

4 °C

Wa

# **Major Stressors and Shocks**

- **Growing food demand:**
- □ Growing populations
- Changing consumption habits
- Urbanisation



CGIAR Serves for a food-secure luture

- 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 overwei**ght 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%

Lehmann et al. (2018) Geophysical Research Letters

#### Worldwide, the number of extreme climate events is increasing at an alarming rate



#### **Climate vulnerability is closely linked to poverty**

FIGURE 10A. Areas of extreme climate vulnerability60



#### FIGURE 10B. Percentage of population in multi-dimensional poverty in three global regions<sup>61</sup>



# 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**

Transform research, development and innovation systems to deliver impacts at scale





Transforming Food Systems Under a Changing Climate

transformingfoodsystems.com



### 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



Political upheaval



Social and technological changes



•• 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

**Financial crises** 

• 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...**

#### AFRICA Drought-tolerant maize boosts food security



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

✓ Yields up to 35% more grain

Reduces need to use more land

✓ Resilience to drought

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

#### Local Technical Agro-Climatic Committees in Latin America



#### Supply Networks. How are products connected?

#### Key 1



## User-centered work



### 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.cliser.2019.100137



Building bridges between supply and demand. Understand the information flows



#### Capacity building and co-design



#### TOOL Evaluating seasonal climate predictability Designed for MOS applications

The International Research Institute or Climate and Society

Circuits Productability Tool 21 In Data Options View

[3] Esquivel et al. (2018). Climate Services. doi: 10.1016/j.cliser.2018.09.001

predictions Weather and crop predictions

Better

#### NextGen – AcToday project International Research Institute (IRI) for Climate and Society Válido para Hecho en Lead Time Pronóstico hecho para [92W-91.5W, 14.5N-15N] localizado en o cerca de Sololá, Guatemala [mm] gorg n-Aug 2019 probability of exceedance issued May 201

A new generation of climate forecast



Key 2



Key 3







# We need to transform ourselves

Agricultural research for development



Difficult to deliver endto-end, sustainable and scalable solutions 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

### **Thank You!**

