Weathering and halting the perfect storm: food system solutions

CGIAR RESEARCH PROGRAM ON Climate Change, Agriculture and Food Security

CCAFS

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Program Director

1. Mega food system challenges
2. Progress is significant
3. But, we need a food system transformation

The mega adaptation challenge

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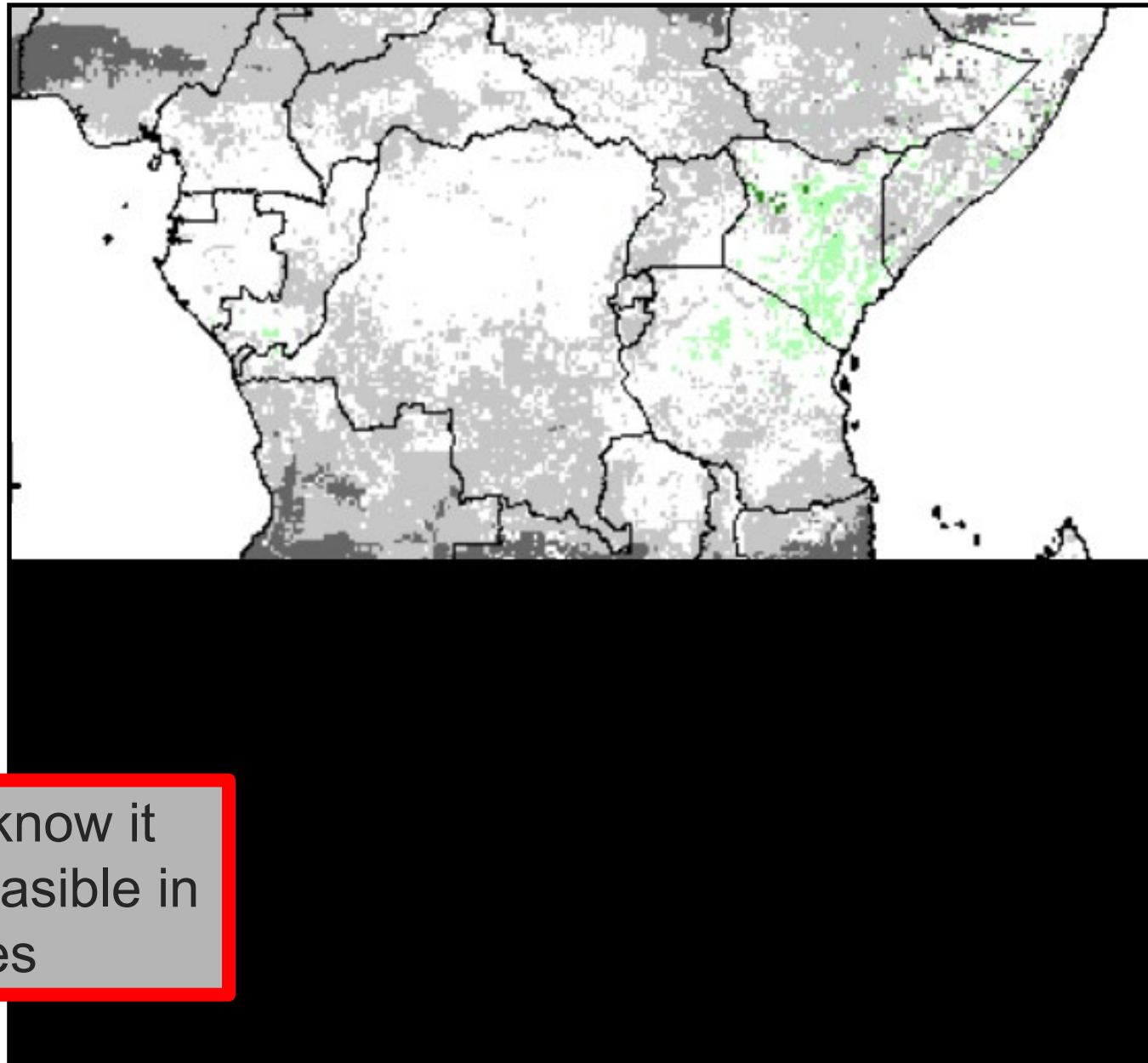
Change in length of growing period in a +4 °C world (2090)



- >20% loss
- 5-20% loss
- No change
- 5-20% gain
- >20% gain

Farming as we know it now, will not be feasible in many places

Many records are being broken

In many regions we have only 11 growing seasons to reach 500 M farming households

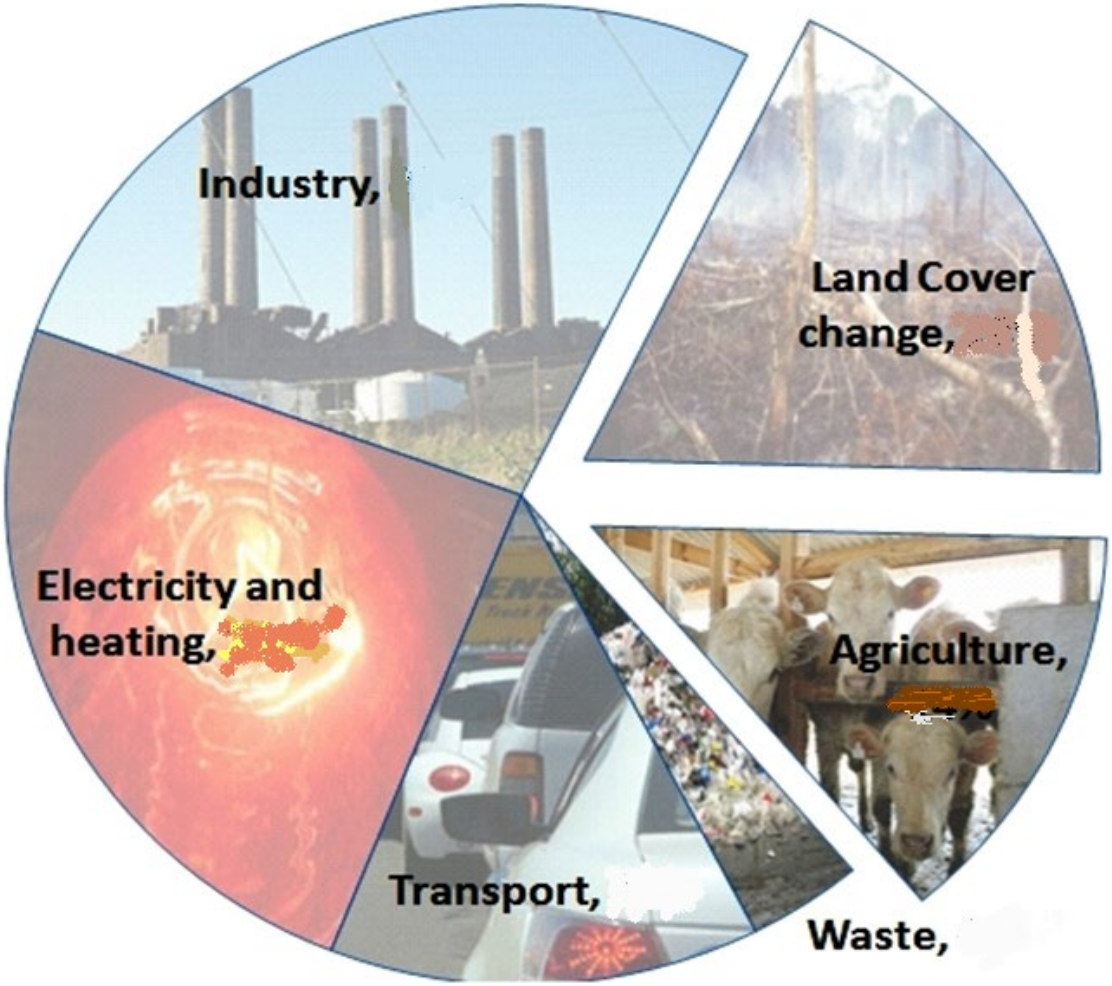
Number of record-breaking monthly temperature extremes now 5X times more

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*

The Mega Mitigation Challenge



19-29% global GHGs from food systems

Vermeulen et al., 2012 ERER

Current agricultural technologies perhaps can only achieve 20-40% of what is needed by 2030

Reductions in other sectors will not be enough to achieve targets

Wollenberg et al., 2017 Global Change Biology

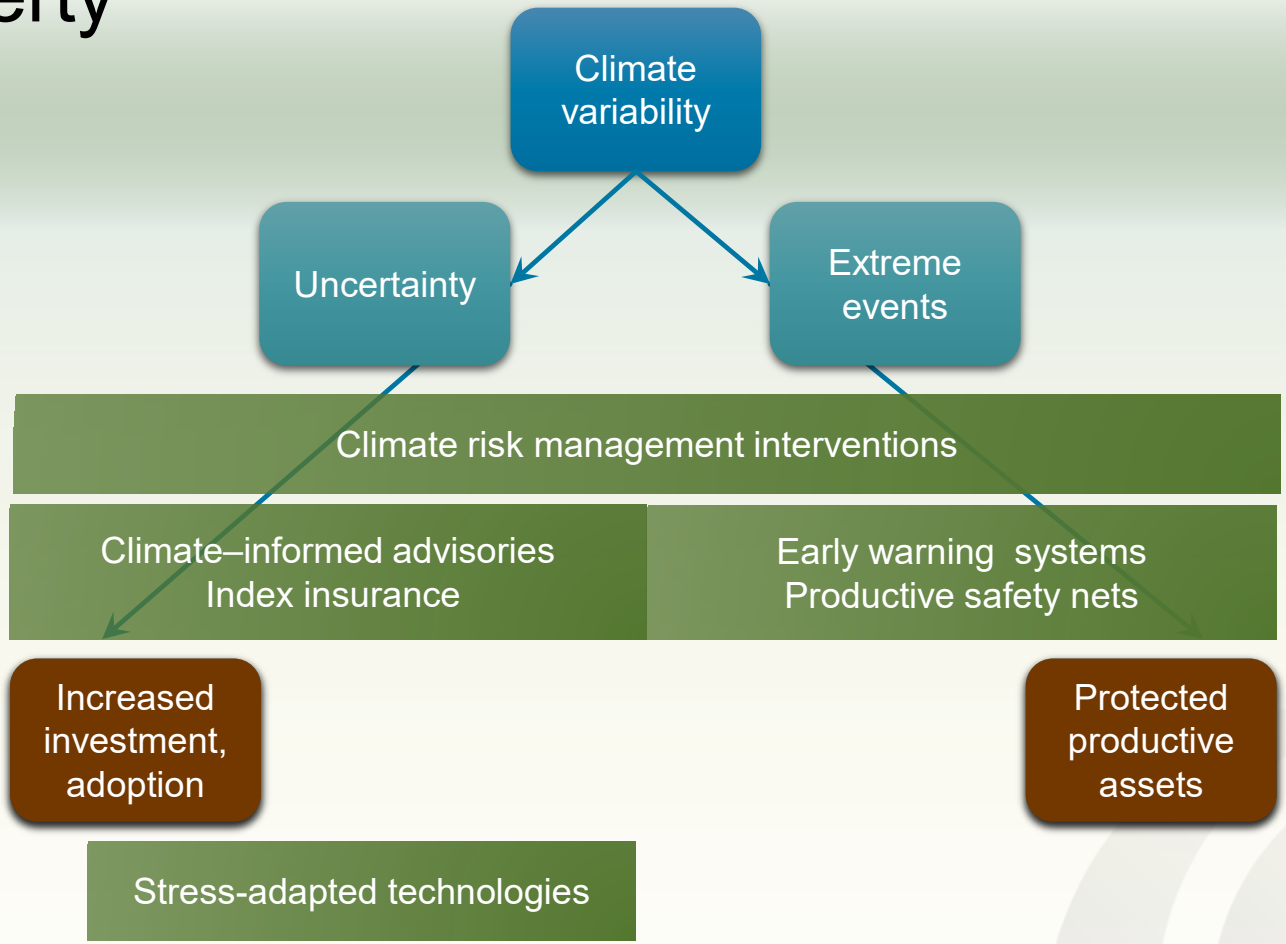
How are agric practices changing?

	Percentage of households of each type				
	Stepping up *(intensifying)*	**Stepping out** *(accumulating non-ag assets)*	**Hanging in** *(coping)*	**Scraping by** *(> 5 food deficit months)*	
East Africa	14	12	43	32	100%
West Africa	11	6	70	14	100%
South Asia	17	17	58	9	100%
South East Asia	12	15	63	10	100%
Latin America	21	14	60	6	100%

Thornton et al. (2018)

How do we scale up change?

Climate risk drives poverty



Massive expansion of use of stress-tolerant varieties

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Drought tolerant maize:

- >100 new varieties
- 2 million smallholders
- 13 countries

CIMMYT International Maize and Wheat Improvement Center

IITA Research to Nourish Africa

Lots of work on heat-tolerant wheat

Universities: The University of Sydney; The University of Adelaide; Curtin University; The University Of Queensland

Government: Queensland Government; Australian Government Department of Agriculture, Fisheries and Forestry; NSW Department of Primary Industries; GRDC; Agriculture Victoria; AustralianGrains Genebank

Institutions: ICARDA; CIMMYT

Private industry: AGT; edstar; LongReach; Bayer CropScience


650,000 insured in sub-Saharan Africa
BUPARVEX
UMOJA
kilimo salama Available Here
10s of millions
accessing extension
through mobile phones

ICRISAT
INTERNATIONAL CROPS RESEARCH INSTITUTE FOR THE SEMI-ARID TROPICS

esoko

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Within a few seasons of R&D 300,000 farmers paying for climate-informed advisory services

aWhere

Toto Agriculture

MOFA

airtel

tigo

MTN

everywhere you go

Solar powered irrigation as a "remunerative crop"

- Sell to the grid
- Sell water to other farmers
- More secure irrigation water
- Positive GHG implications
- Limited over-pumping if incentives right

- USD 21.5 billion investment in rolling out 2.75 M solar irrigation pumps in India

5% cropland in Africa irrigated – global average 20%
Can solar be an energy and water solution?

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IWMI International Water Management Institute

Australian Government
Australian Centre for International Agricultural Research

But, a significant challenge:

- Climate change intensifying
- Less that 20% of small-scale farmers are stepping up
- Must reach 500 million smallholders

What will it take to get food system transformation?

Dinesh et al 2018 CCAFS Infonote
Campbell et al., 2018 Current Opinion

Thank you

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