Operational Implications of Integrating Climate Smart Agriculture into Feed the Future Activities

Speaker

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Also Featuring

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Rob Bertram

Rob Bertram is the Chief Scientist at the USAID Bureau for Food Security where he serves as a key adviser on a range of technical and program issues to advance global food security and nutrition. In this role, he leads USAID's evidence-based efforts to advance research, technology and implementation in support of the U.S. Government's global hunger and food security initiative, Feed the Future. Bertram's academic background in plant breeding and genetics includes degrees from University of California, Davis, the University of Minnesota and the University of Maryland.

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Climate Smart Agriculture in Feed the Future

Rob Bertram

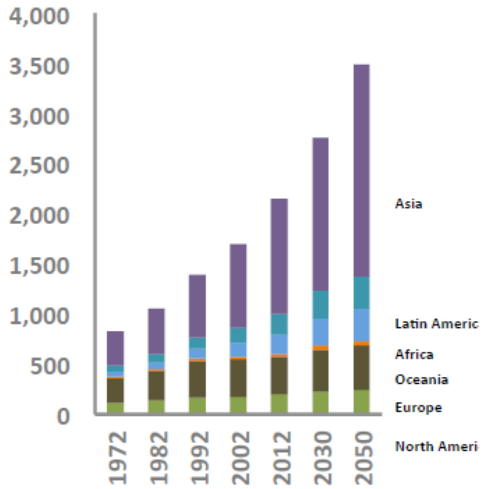
U.S. Agency for International Development

USAID
FROM THE AMERICAN PEOPLE

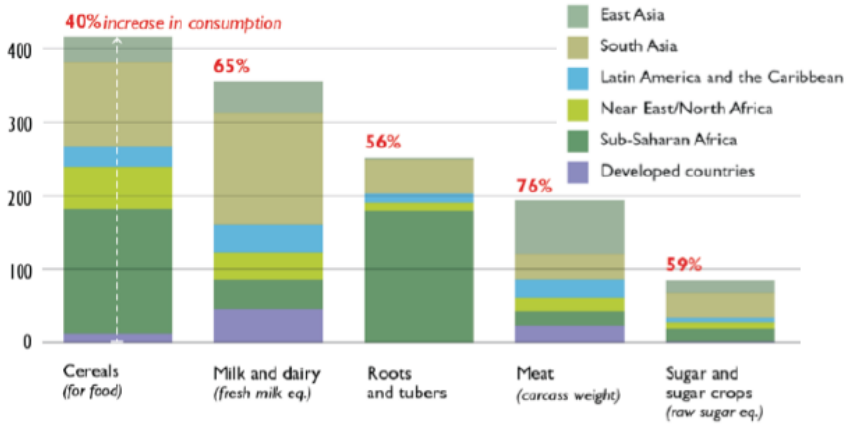
1 PRODUCTIVITY

Feeding 9 Billion People in 2050

Food Production by Region 1972-2050
(Constant 2004-06 US$)



Food Demand By Commodities in 2050 relative to 2005-07
(Billion kg per year)



CEA 2013 based on FAO 2012

Sadler, M. 2015. The Role of Resilient Supply Chains in the Face of Climate Change

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New Ways of Doing Business under Feed the Future

- *Country-led*
- *Focus on Women and Gender*
- *Integrate Nutrition and Agriculture*
- *Support Sustainable Intensification*
- *Increase Economic Resilience*
- *Strengthen Capacity of Local Institutions*
- *M&E to support real-time learning*
- *Impact analysis to build a strong evidence base*

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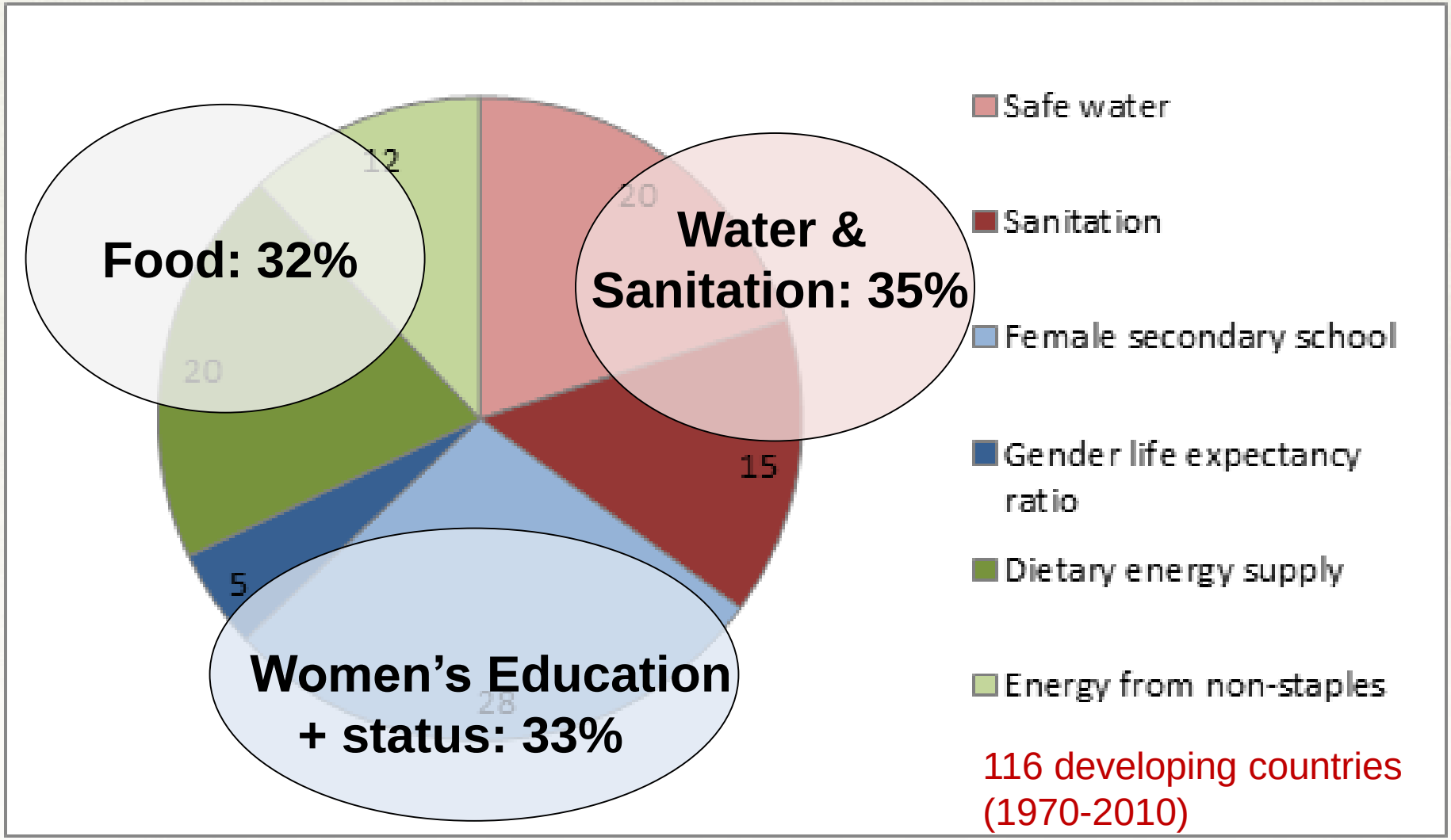
What Does Feed the Future Do?

1. *Help farmers produce more*
2. *Help farmers get more food to market*
3. *Support Research & Development to improve smallholder agriculture in a changing climate*
4. *Strengthen Regional Trade*
5. *Create a better Policy Environment*
6. *Improve Access to Nutritious Food and Nutrition Services*

Contribution of Different Sectors to Improving Nutrition Globally

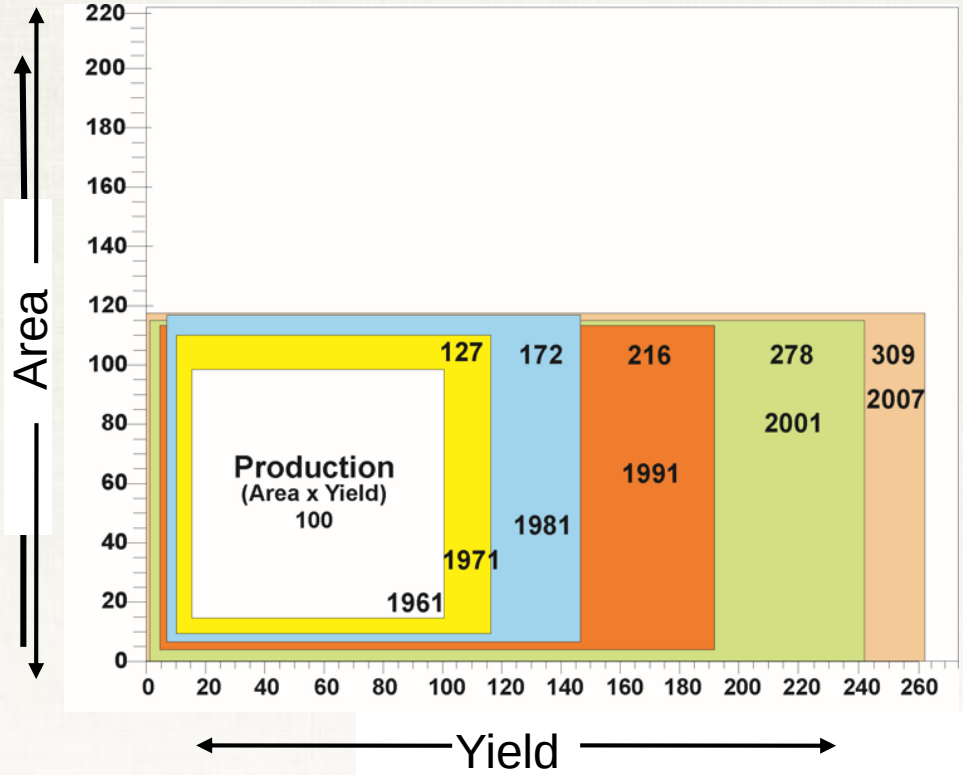


Source: Smith and Haddad, 2013

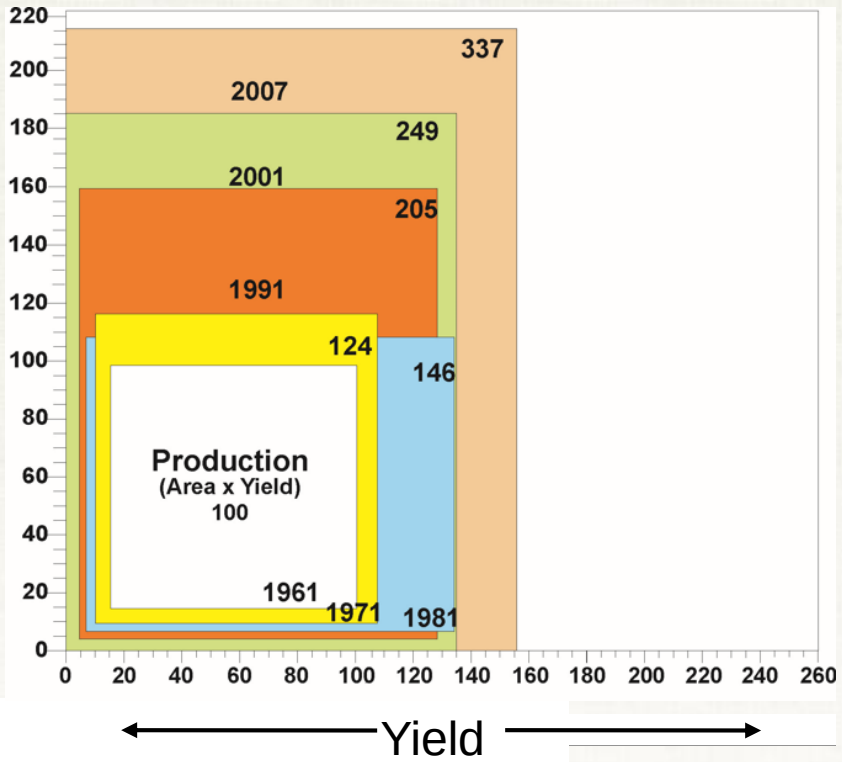
Sustainable Intensification:

- Increased productivity per unit land, labor, capital, etc.
- Considers whole-farm & household issues
- Efficient, prudent use of inputs
- Conserve or enhance natural resources
- Increased resilience
- 'Livelihood lens' takes into account socio-economic, nutritional, gender, & cultural conditions

Intensification vs. Extensification



South Asia



Sub-Saharan Africa

Climate-Smart Ag

- Launch of Alliance at UNGA, Sept 2014
  - Many countries, World Bank, IFAD, FAO
- "Triple-win Concept"
  - Increased productivity and income
  - Increased adaptation
  - Reduced GHG footprint (mitigation)
- Implications
  - Developed countries
  - Developing countries, especially smallholders

Framework Paper: CSA in FTF

1. Sound climate data and science
2. Development of climate smart technologies and innovations
3. Strengthen human and institutional capacity
4. Strengthen the enabling environment
5. Partnerships for Impact

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CSA GLEE—Content Overview

- Policy Context for CSA
- What is climate science telling us?
- CSA: An approach—not a list
- How to work with/integrate climate services?
- Vulnerability assessments: how to be a smart consumer?
- LED: from absolute reduction to bending the curve

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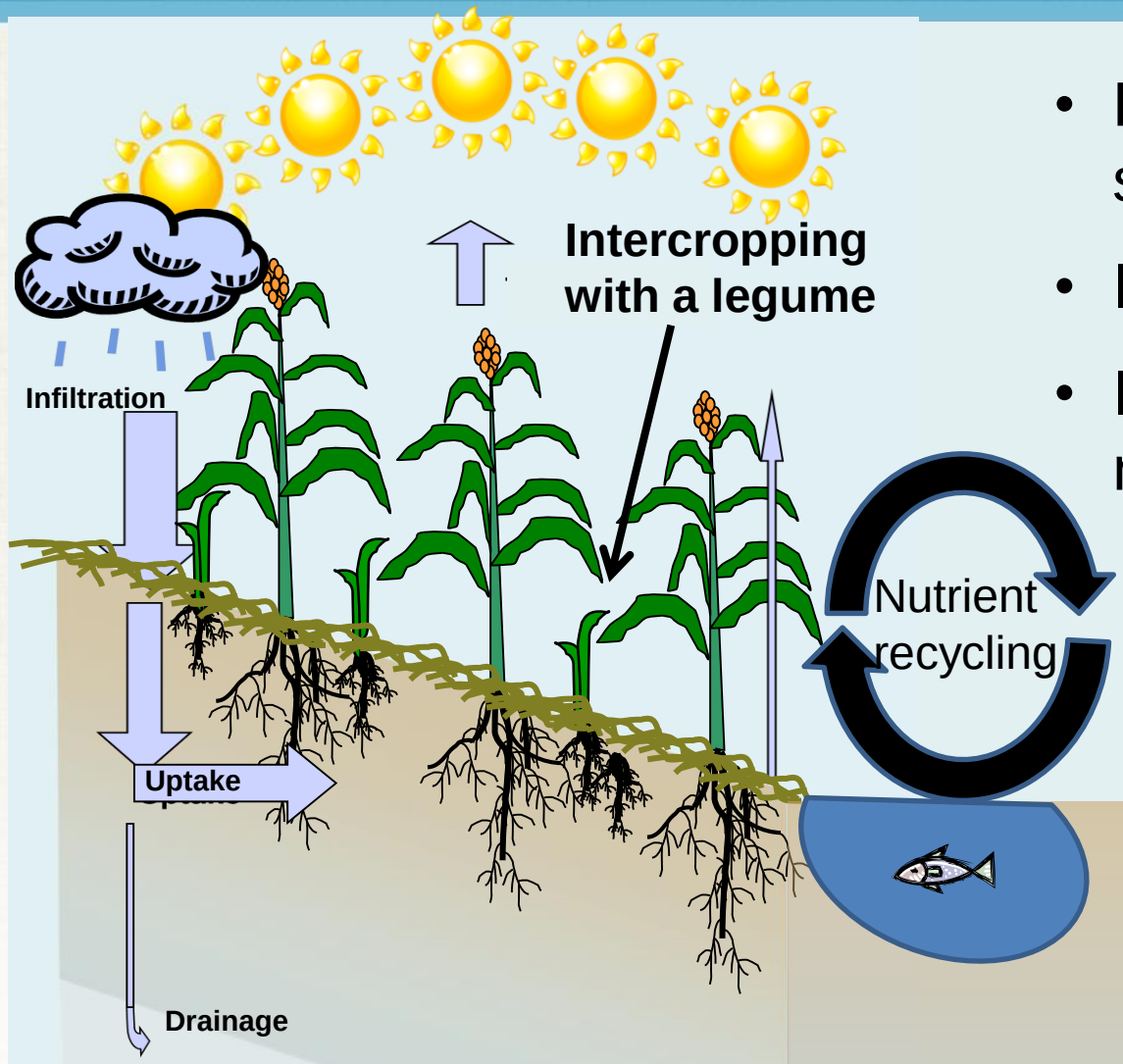
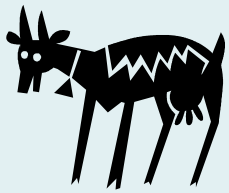
CSA GLEE—Content Overview (cont'd.)

- Portfolio Assessments—shared lessons
- Technical considerations:
  - Systems perspective and NRM
  - Component technologies
  - Expanding farmer choice—CSA Imperative
- Partnerships—spanning farm to fork
- Operationalizing CSA—application of knowledge and tools
- Monitoring and Evaluation—metrics

Integrating more complex practices



- Extend the growing season
- Integrate perennial crops
- Integrate legumes for nitrogen



- Integrate livestock & aquaculture
- Appropriately scaled mechanization


“The main problem I was facing was soil infertility…”

Rhoda used groundnuts and pigeon peas for the first 6 years and…

"…I was one of the farmers who were assisted by a local NGO with 5 tree species which I planted in my field."


“This is why I started keeping pigs and goats to continue support for my children in school…and I am supporting this family mainly buying of salt, sugar, soap, relish.”

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Still needed: Smallholder Irrigation, Mechanization

Credit: Documentation Center of Cambodia (DC-Cam) /Makara Ouch

Envisioning the future: CA, diversification, + PA =

11% Crop Yield Increase

46% Energy Decrease

71% Irrigation Decrease

32% Profitability Increase

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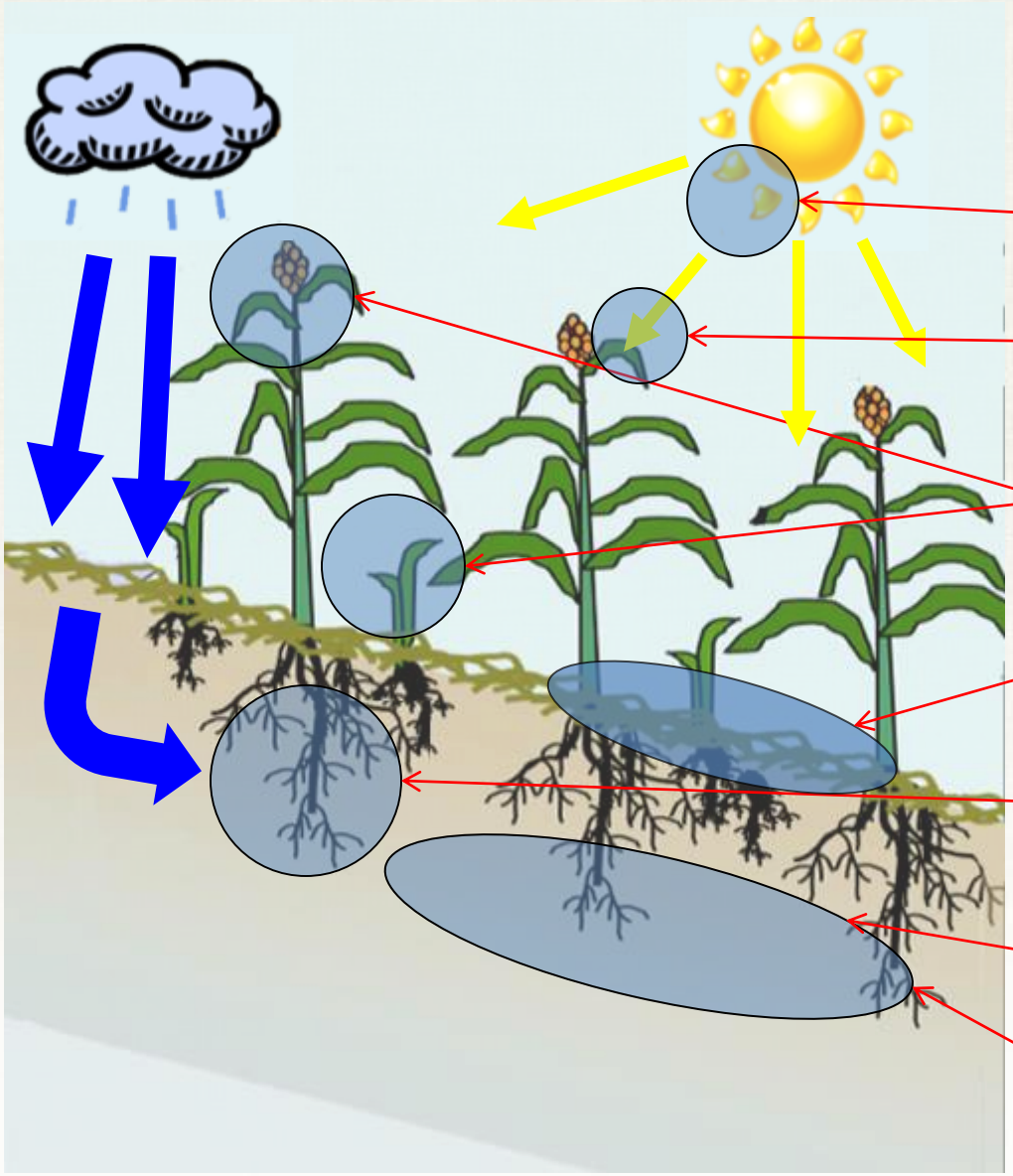
Science for CSA in smallholder agriculture



Information on location-specific response—agronomy, weather, pests

Tolerance to higher **temperatures** (including modifying transpiration)

Improved **photosynthetic** efficiency (on the longer horizon)

Improved nutritional quality through **biofortification** of cereals/legumes (including as fodder)

Reduce tillage through biotech-enabled **weed** management

More efficient uptake of **water**, including tolerance to moderate drought

More efficient usage of soil **nitrogen** (both organic and synthetic)

Tolerant of more **saline** soils & brackish water (including removing salt from soils)

WHAT HAPPENS DURING DROUGHT

- **Drought stress has most severe impacts in period immediately preceding pollination**, resulting in poor kernel development and ear size

- Breeding for drought tolerance may affects maize **plant physiology** in several ways including
  - Redirection of plant “resources” toward ear development
  - Variable/deeper root depth
  - Shifting soil water uptake
  - Shifting to earlier maturity (drought “avoidance”)

- Over past 10 years, **160 DT** varieties released by public sector and partners.

Credit: Corn and Soybean Digest

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Cereals: Major Accomplishments and Impacts

Heat Tolerant Maize in South Asia – CIMMYT, Purdue, NARS from India, Nepal, Bangladesh, Pakistan, Pioneer and 10 other seed companies

Heat tolerant hybrids released:

- 17 hybrids that outperform the best commercial varieties in yield licensed to partners for scale out in targeted geographies/market. Achieved within 3 years!
- Unanticipated outcome: some varieties preferred by women farmers.

Pipeline of breeding materials:

- More than 700 heat tolerant hybrids under testing.
- Using genomic tools and approaches to identify gene combinations that will thrive under heat and other stressful environments.

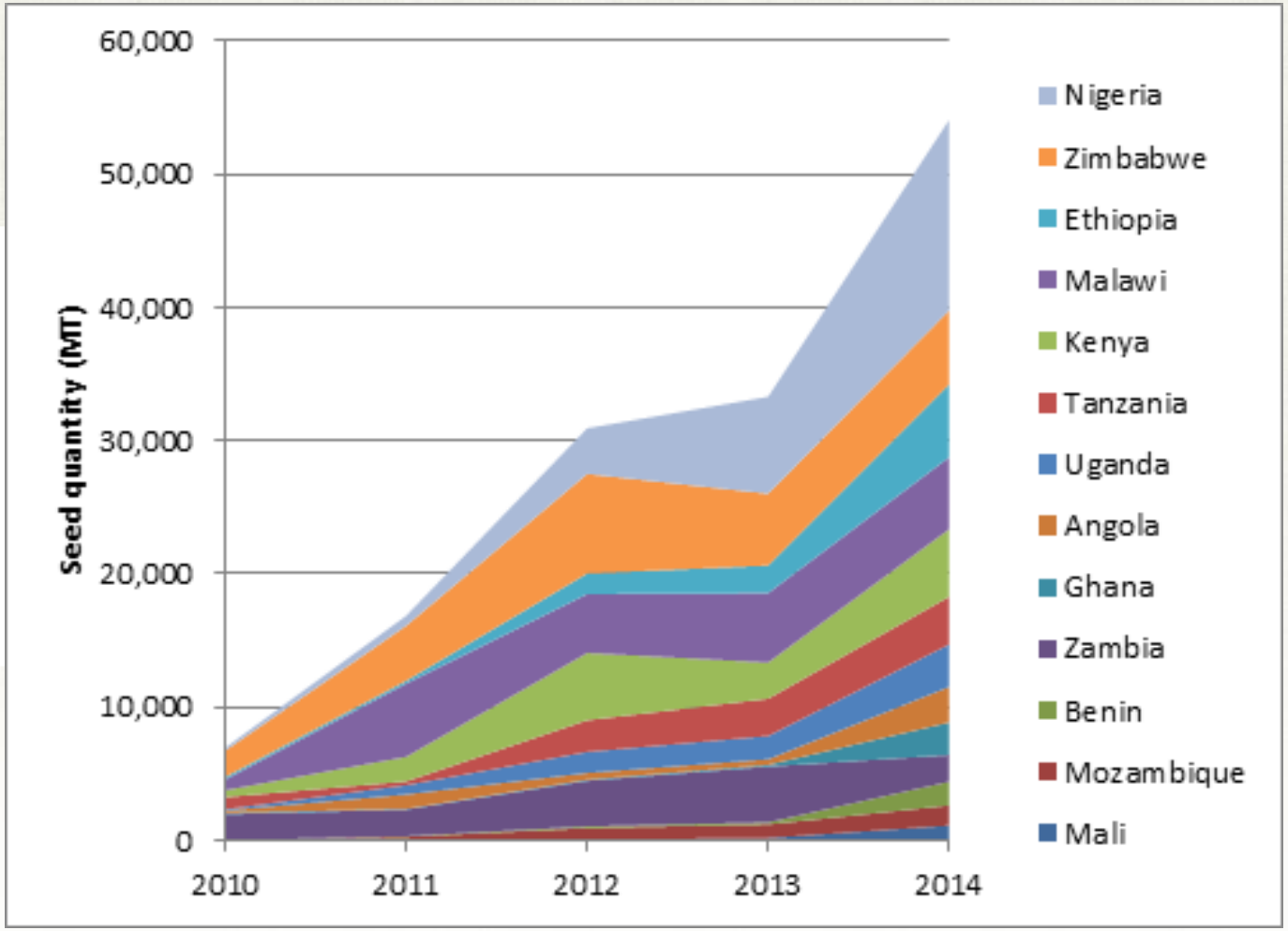
Successful public-private partnership

- Private company partners increased from 3 to 11.

TRENDS IN PRODUCTION OF STM SEED

Material coming from **CGIAR/NARS** only

Extrapolates to around 5.5M Households growing DTM



CSA spanning value chains

Major opportunities for CSA…and profit!

- Input market—resource use efficiency
- Irrigation innovation/efficiency
- Reduce postharvest losses
- Market efficiency—better information for farmers
- Drying/processing innovations
- Streamline trade to reduce transit times (e.g., at borders)

BAA: Engaging Private Sector in CSA

Unlock private sector engagement in CSA through:

- Secure private sector commitments to smallholder CSA
- Engage private sector actors in the co-development and implementation of CSA action plans
- Facilitate an expanding CSA value chain / landscape community of practice to unlock additional investments for smallholder CSA at scale

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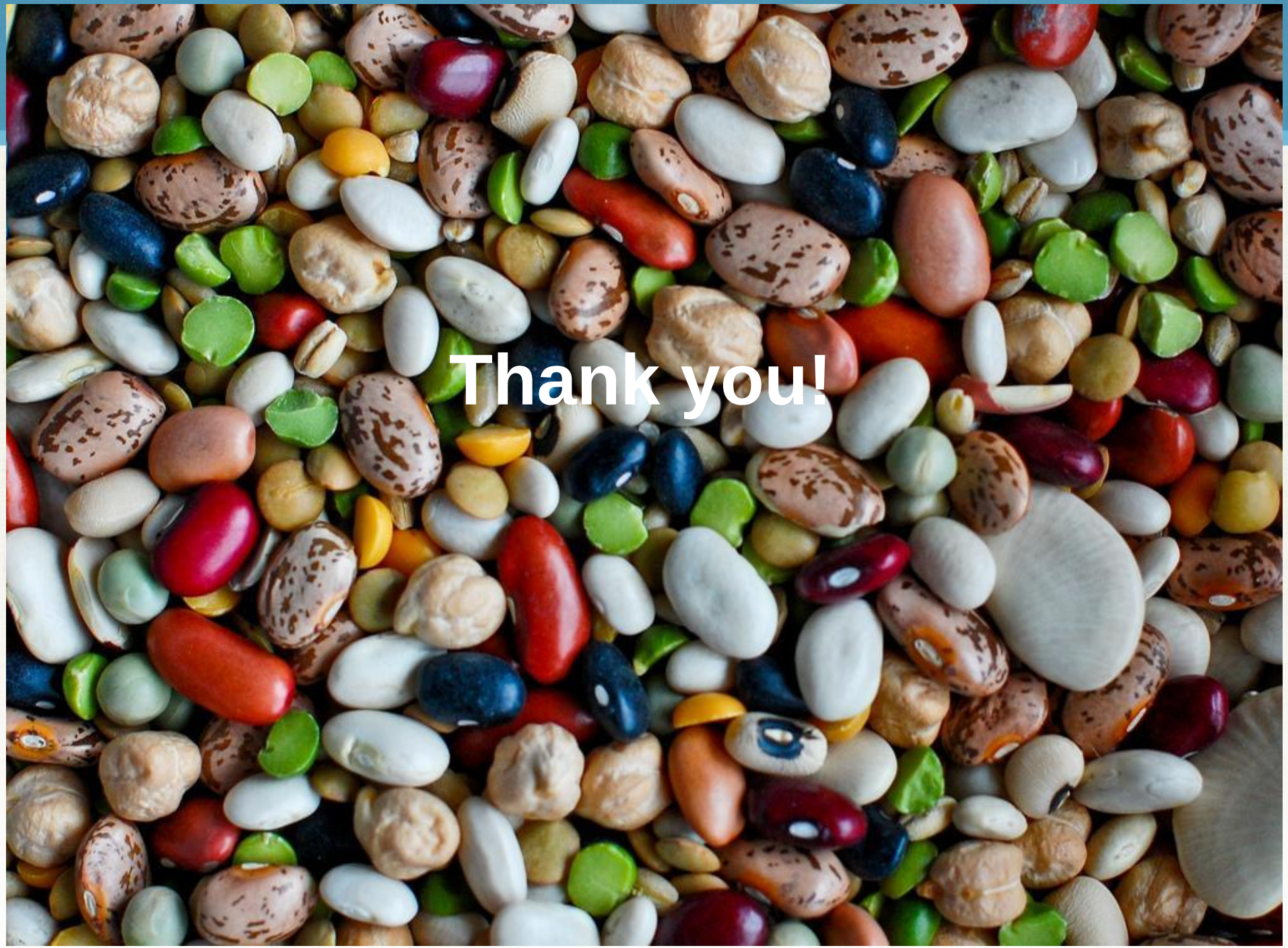
CSA in FTF—looking ahead

- Dissemination of Framework Paper
- Integrate CSA across portfolio
- Food Security in context with EO on CRD
- GLEEs, Climate Smart Ag Training Course
- Strategic access of Climate Services
- Integrate with other investments—especially information
- Active role in GACSA, other fora
- On-going learning agenda—continued dialogue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Questions and Answers

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