TOC for your review

• FTF story
• Nutrition goal
• Productivity challenge
• Sustainable Intensification imperative
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
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**
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
Agricultural growth enhances hunger reduction

- Increases household incomes and diversifies diets
- Reduces food prices to benefit poor net food buyers
- Creates employment; stimulates rural nonfarm economy
- Generates government revenues

Subsectoral growth matters (e.g. small vs. large farms; staple vs. cash crops)

Whether subsectoral growth reduces hunger depends on

- Its linkages with rest of economy
- Its initial size and geographic concentration
- Its growth potential
- Market opportunities

Calorie deficiency-growth elasticities, Tanzania (2000-07)

Source: Fan and Brzeska 2012

Source: Pauw and Thurlow 2010
Contribution of Different Sectors to Improving Nutrition Globally

Food: 32%

Water & Sanitation: 35%

Women’s Education + status: 33%

116 developing countries (1970-2010)

Source: Smith and Haddad, 2013
Nutrition through diet diversification

• Quality protein
• Legume availability and accessibility
  • Productivity increases critical
• Utilization – consumer requirements
  • Faster cooking
  • Prepared products
Focus on Legumes …

- Nutrition driver
- Food and Feed
- Economic opportunity/returns
  - gender
- Environmental benefits
  - BNF
  - Soil organic matter
  - Systems intensification
Continuum of Research Investment: Basic to Applied

Basic

Translation

Applied

Utility

NSF, USDA, DOE

USAID
FTF Research Program Areas

3 Major Research Programs
- Program for Climate Resilient Cereals
- Program for Advanced Research on Plant & Animal Diseases
- Program for Productive Legumes

Program anchoring research in key farming systems

Integrated Cross-Cutting Programs
- Program for Policy Research and Support
- Program for Sustainable Intensification
- Program for Safe and Nutritious Foods
- Program for Human and Institutional Capacity Building
Story of soy productivity gains over 50 years

Figure 1: Soybean world trends (calculated from FAOSTAT 2010) (Source: Abate et al., 2012)
Foundational investments to accelerate productivity gains

- Climate Resilient Chickpea Innovation Lab
- Climate Resilient Cowpea Innovation Lab
- Climate Resilient Bean Innovation Lab
Legume Productivity

- Peanut & Mycotoxin Innovation Lab
- Legume Innovation Lab
- Soy Value Chain Research Innovation Lab
- CIAT, IITA, ICRISAT, ICARDA legume research
- Bt cowpea (AATF)
Smallholder Transformation essential to reducing poverty

$558 / ha / year
= Median value from improved technologies

2 ha farm size

adapted from Harris & Orr 2014.
Intensification vs. Extensification

South Asia

Sub-Saharan Africa
Integrating more complex practices

- Extend the growing season
- Integrate perennial crops
- Integrate legumes for nitrogen
- Integrate livestock & aquaculture
- Appropriately scaled mechanization

Intercropping with a legume

Infiltration

Uptake

Drainage

Nutrient recycling
“The main problem I was facing was soil infertility...”
DOUBLED-UP LEGUME SYSTEM

- Increases plants’ efficiency of fertilizer use
- Improves yield of protein-rich grains
- Provides fuel & feed
- Reduces soil erosion

(Glover et al. 2012)
Benefits

• Same maize yields with $\frac{1}{2}$ the fertilizer
• 50% greater protein yield
• Permanent soil cover
• Decreased risk, labor requirements
• Livestock fodder production
• >8,000 adopters in Malawi

(Snapp et al. 2010)
Benefits from perennial pigeon-pea shrub-diversified maize

Doubled-up Maize/Legume Systems

Snapp et al. in press PNAS
Cowpea Intercropped
Biotech to combat pests & diseases

Using genetic engineering to solve problems difficult to address with conventional breeding around **pest & diseases** to increase resilience to biotic stresses

Cassava Resistant to mosaic disease / brown streak in E. Africa

Disease resistant banana in E. Africa

Insect resistant cowpea in W. Africa

Insect resistant Eggplant in S. Asia
Bt cowpea: positive results

- *Maruca* damage
- Confined Trial
- Puerto Rico
- Now being tested in Africa
- Economic and environ. benefits
Thank you!