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FTF Global Food Security and Research Strategy
The Global Challenge: Achieving Sustainable Food Security

- 925 million people suffer from chronic hunger.
- Demand for food is projected to increase by 50 percent over the next 20 years.
- Increased demand will come primarily from population and income growth in middle-income countries.
Feed the Future Goals

• Accelerate inclusive agriculture sector growth
• Reduce child undernutrition

Comprehensive strategy includes attention to the entire value chain and enabling environment: including research, extension, information and policy analyses and seeks to leverage strategic partnerships.

Sources: Photoshare w/ permission
Cross Cutting Themes

Foster inclusive, sustainable agricultural productivity gains and improvements in child nutrition

- Resilience to climate change
- Sustaining natural resource base
- Gender awareness/inclusivity
Global agricultural research

A key element of the FTF strategy

- 34% social rate of return in Africa (Alston et al. 2000)
- 44% social rate of return globally (Alston et al. 2000)
Our Specific Objective

Define *problem-focused* agricultural research topics that meet the FTF objectives to:

• Build a *Global Research* agenda

• Complement with *national & regional* investments in FtF Focus Countries
Building a Research Portfolio

• Identify researchable constraints
• Establish criteria for selection of priorities
• Build pipeline of short, medium, long term impact
• Manage risk with portfolio approach – fewer high risk, more lower risk investments

Source: Andrew Kiggundu, NARO
Possible domains for research...

Biophysical---- Socio-behavioral ---- Economic ---- Policy

production (genetics, breeding, agronomy, vaccines)
disease detection (diagnosis, epidemiology)
post harvest & food safety
food-based solutions to nutrition
extension and capacity building
markets & trade policy
credit, finance, insurance
**Investment criteria**

- Relevance to poverty, women and children and enhances food supply stability
- Likelihood of success
- Cost/benefit considerations
- Economic sustainability for producers/adopters
- Natural resources sustainability: water, soil, ecosystem and climate change
- Institutional sustainability: engagement of national and regional partners
- Time frame: timeline, milestones, near- or long-term impact
- Risks: potential impacts on vulnerable groups, environment or breakdown in key pathways
Defining FTF Research Priorities

Using poverty & nutrition lens: Identify key production systems where hunger and poverty are significant…

Sub-national poverty ca. 2005
(<$1.25/day)

Source: Stan Wood et al. (IFPRI) 2009.
Child stunting

Source: USAID and IFPRI, Harvest Choice maps
Global Hunger Index (IFPRI)

Note:
Data for the index includes the 2000-2007 period, therefore the index does not capture the impacts of the increase in food prices and the global economic crisis.

Source: International Food Policy Research Institute

10/14/09
Farming Systems

Source: Dixon, 2001
Outcome of this process

What? **Sustainable Intensification**
Requires component technologies

Where? **Specific focal Agro-ecologies**
Spillovers to other region

Who? **Leveraging partnerships**
US Universities
International Ag Research Centers
National Agriculture Research Systems
Private Sector – local and international
FTF Research Themes

1. Advancing the Productivity Frontier

2. Transforming agricultural systems through sustainable intensification

3. Improving nutrition and food safety
Advancing the Productivity Frontier

- Overcoming major crop, farm animal, and fish productivity constraints: increase yields and incomes
- Breeding and genetics for major crops, livestock, fish
- Livestock & small ruminant infectious diseases
- Animal feed improvements (availability/quality)
- Technology adoption
- Policy
Climate resilient cereals

- Target environments: South Asia and Africa
  - Drought, salinity, nitrogen use efficiency, heat, flooding, yield potential

- Address major emerging challenges
  - Water availability, climate change population pressure, resource use

- Potential for enormous impact
  - Food security, income generation, environmental benefits

- Private sector partnerships
  - Pipeline of promising technologies; leverage private sector technologies, resources, product development expertise
Transforming Key Production Systems

• Integrate global technology with site specific natural resource, social science, and market research
• Link global research partners with regional & national
• Integrate research with development interventions
  o Rice-Wheat system of South Asia
  o East Africa highlands system
  o Southern & East African maize-based systems
  o West African Sudano-Sahelian systems

Working with CGIAR, NARS, private sector, universities, policy makers
Indogangetic Plains

- Home to 900M people (1/7 world population)
- Breadbasket of S. Asia - dominated by rice-wheat, rice-rice, rice cotton systems
- Key constraints - Water, labor, climate change, soil fertility, available land
- Cereal Systems Initiative for South Asia
  USAID/Gates funded

  - Resource conserving technologies
  - Higher cropping intensity & abiotic stress tolerant varieties
  - Diversified cropping systems for nutrition and incomes
  - Improved policies – local, national and regional
  - Public-private technology and knowledge delivery models
### IRRI-CIMMYT-TNAU-COLLABORATIVE PROJECT

#### CEREAL SYSTEMS INITIATIVE FOR SOUTH ASIA (CSISA)

**SOUTH INDIA (TAMIL NADU) - RESEARCH PLATFORM**

**Details of Scenarios**

<table>
<thead>
<tr>
<th>Scenario</th>
<th>CS-Tillage - Establishment</th>
<th>Crop viability (%)</th>
<th>Drivers of change</th>
<th>Expected output</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>R (pud) - R (pud) - Bg (ZT)</td>
<td>20-40</td>
<td>Business as usual</td>
<td>Understand where we are</td>
</tr>
<tr>
<td>2</td>
<td>R (pud) - R (pud) - Bg (ZT)</td>
<td>20-40</td>
<td>BMP (no resource constraint)</td>
<td>Max. crop productivity (no constraint)</td>
</tr>
<tr>
<td>3</td>
<td>DSR - R (Unpud) - Bg (ZT)</td>
<td>75-100</td>
<td>BMP (water, labour, energy constraint)</td>
<td>Max. productivity (saving natural resources)</td>
</tr>
<tr>
<td>4</td>
<td>M(ZT) - R (Unpud) - M (ZT)</td>
<td>75-100</td>
<td>BMP with futuristic cell (water, labour, energy constraint)</td>
<td>Max. system productivity (saving natural resources)</td>
</tr>
</tbody>
</table>

**Site:** TRRI, Aduthurai (E Block - NF)

**Period:** Mar 2008 to Nov 2011

**Design:** RBD Replication: 3 Plot size: 2.000

**Treatments:** Rice - Rice system (4 crop scenarios)

**commenceement:** Cover crop - Kurrulli (OS) - 2009

**Experimental crop - Thaladi (WS) - 2009**

**Funded by:** BMGF, USAID, WB and Syngenta

Project management

Dr. S. K. Ladha & Team
Eastern & Southern African Mixed Maize

- Supports more than 60 million people on 246 million hectares
- More than 50 million below poverty & nearly 4.5 million children stunted
- Low soil fertility and low adoption of improved cultivars
- High potential for increased use of conservation agriculture, integration of leguminous trees, shrubs, and food crops
- Entry points: Ideas from FTF Forum participants
Sudano-sahelian

- Supports more than 136 million people on nearly 800 million hectares
- More than 30 million below poverty & over 3 million children stunted
- Drought, unpredictable rainfall and low soil fertility limit crop productivity
- High potential for use of conservation agriculture and integration of leguminous trees, shrubs, and food crops
- Need to identify entry points
Ethiopian highlands

- Supports over 28 million people on 44 million hectares
- 18 million below poverty and more than 4.2 million children stunted
- Soil erosion and low soil fertility limit crop productivity
- Wheat stem rust resistance critical component
- Double crop yields through improved soil management, increased disease resistance and integration of legumes
Enhanced Nutrition & Food Safety

• Nutrition research – food based approaches
• Grain legume productivity
• Animal sourced foods
• Biofortification of staple crops
• Reduce/eliminate mycotoxin contamination
• Reduce post-harvest losses

Source: Kenya Weekly
Insect resistant cowpea

- Bt gene confers resistance to Maruca podborer

- Proven technology in other crops – cotton, maize

- Important crop and protein source for subsistence farmers

- Confined field trials
  - underway and successful in Nigeria,
  - approved in Burkina Faso
  - pending in Ghana

- Partners: NARS, CSIRO, AATF, Purdue, Rockefeller, Monsanto
Global Research Partners

- US University-based programs (CRSPs and others)
- CGIAR
- USAID-funded competitive programs including private sector and universities
- NARS partners in focus countries
- USDA/NIFA and USDA/ARS
- USDA/USAID Norman Borlaug Commemorative Research Initiative
Questions?

www.feedthefuture.gov

Feed the Future
the U.S. Government’s
global hunger and food security
initiative