Innovations for Global Food Security: Advancing Legume Productivity and USAID’s Feed the Future Program

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Outline

✓ Feed the Future background
✓ Agricultural research and capacity development investments under Feed the Future
✓ Opportunities for faculty, students, and administrators
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.

• Diversified diets increasingly in demand – especially animal source foods.
Global Food Prices

Source: FAO
Feed the Future

✓ Announced in 2009 at G-8 Summit in L’Aquila, Italy, with $3.5 B investment
✓ Reduce poverty and undernutrition
✓ Country-led
✓ Staples-led growth
✓ Dietary quality: legumes, animal source foods, horticulture
✓ Emphasis on S&T

Photo: Borlaug Foundation
Why Agriculture?

“GDP growth originating in agriculture is at least twice as effective in reducing poverty as GDP growth originating outside agriculture.”
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**
FTF invests $1 Billion/yr

**Bilateral Funding:** through USAID Missions

– Country investment plans prioritize donor funds
  
  • Value chain programs integrated with nutrition and resiliency
  
  • Direct gov-to-gov engagement (e.g. policy, institutional reform, etc.)

**Central Funding:** Washington-based programs

~10% for R&D to contribute to broader development agenda
Overarching Goal: Sustainable Intensification

Three research themes:

- Advancing the productivity frontier
- Transforming key production systems
- Improving nutrition and food safety

Anchored by key geographies:

- Indo-gangetic plains in South Asia
- Sudano-sahelien systems in West Africa
- Maize and livestock mixed systems in East and Southern Africa
- Ethiopian highlands
Food Security Innovation Center

- Climate Resilient Cereals
- **Productive Legumes**
- Advanced approaches to animal and plant pests & disease
- Sustainable Intensification
- Nutritious & Safe Foods
- Policy
- Human & Institutional Capacity Development
• Poverty Reduction
  – Increase cereal productivity and profitability (through N-fixing ability)
  – Good source of income, esp. women
• Improved Human Nutrition
  – Excellent sources of macro and micronutrients
• Environmental benefits
  – Critical crop for sustainably intensified production systems –N-fixing ability
  – Multi-purpose crops for people and farm animals
The humble legume helps

“…farmers fields flourish…”

and their pocket books too!
Program for Research on Legume Productivity

**Challenge:** Increase productivity and availability of legumes

- Abiotic stresses decrease legume yields by up to 40%
- Pests and diseases can decrease yields by up to 35%
- The grain legume value chain directly benefits women, especially in Africa

**Solutions:**
- Elevate legumes as major investment area under the research strategy
- Tackle yield, climate resilience and biotic stresses for staple legumes
- Utilize private sector knowledge and skill in transgenic and emerging genomic tools

**Example Projects:**
- Grain Legumes Innovation Lab
- Peanut & Mycotoxins Innovation Lab
- Climate Resilient Cowpea Innovation Lab
- CGIAR Grain Legumes CRP
Productive Legumes Investments

- Legume (Michigan State – with UCR)
- Peanut & Mycotoxin (University of Georgia)
- **Climate Resilient Cowpea (UCR)**
- Climate Resilient Beans (Penn State)
- Climate Resilient Chickpea (UC Davis)
- Soy Value Chain Research (U. Illinois)
- Bt Cowpea (AATF)
- CGIAR Research Program for Grain Legumes
Innovation Labs Advancing Legume Productivity

Where we work

Chickpea
Cowpea
Soy
Peanut
(+ Haiti)
Common Bean
(+ Central America)
New black bean varieties
grown by >50,000 households

Program: Feed the Future Innovation Lab for Collaborative Research on Grain Legumes

University lead: Michigan State University
• Core research for 10+ years on variety development
  • Focus on Central American highlands
  • Beans contribute to nutrition and income gains
• Scale-up effort
  • Honduras, Guatemala, Nicaragua, Haiti
  • Community seed systems get varieties to farmers
• >50,000 households received seed

Quiche Hunapu variety
Cowpeas for West Africa

Cowpea dishes in Burkina Faso

Mono-cropped & Intercropped
How do we do this work?

UC Riverside faculty

Drs. Roberts & Close

Collaborate with researchers in West Africa

Dr. Issa Drabo
Burkina Faso

To develop cowpea varieties grown by these farmers

To consume & sell in the market
Importance of US capacity

• IL model requires US capacity in key fields
  – Dual benefit - US and partner countries

• Global conversation on plant breeding capacity gaps – public and private sector

• Cereals have stronger private sector support… legumes research needs a strong public sector base

• Feeding 9 billion people requires R&D

• R&D requires PEOPLE!
### Indicative Assessment of Required Agricultural Postgraduates in Selected Developing Countries

<table>
<thead>
<tr>
<th>Country</th>
<th>Actual Number of Postgraduates in Developing Countries</th>
<th>Postgraduates needed in developing countries today to match the number in developed countries in the 1960/70s (farm-based)</th>
<th>Postgraduates needed in developing countries today to match the number in developed countries in the 1960/70s (area-based)</th>
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<td><strong>Africa</strong></td>
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</tbody>
</table>

For Students and Faculty:

Needed Skills and Experience

• Soft skills beyond core research training
  – Budgeting, communications, management, teamwork, leadership, working across disciplines, entrepreneurial orientation

• Build experience – GO ABROAD!
Opportunities for Funding & Engagement

• Contracts: [https://www.fbo.gov/](https://www.fbo.gov/)
• Grants: [www.grants.gov](http://www.grants.gov)
• E-Training modules on partnering with USAID on [www.usaid.gov](http://www.usaid.gov)
• Higher Education APS, senior adviser on higher ed
• Virtual internships (US Dept of State/USAID)
  – [http://www.state.gov/vsfs/](http://www.state.gov/vsfs/)
Opportunities

International Agricultural Research Collaboration

• Upcoming RFPs from Sustainable Intensification (K-State) and IPM Innovation Labs (Virginia Tech) (faculty)

• NSF’s PEER program (PEER Science and PEER Health)
  – www.nationalacademies.org/peer

• Research and Innovation Fellowships (NSF GRFP eligible)
  – http://www.usaid.gov/RIFellowships

• LINKAGES program with CGIAR (faculty)

• US Global Food Security Fellows Program (for American graduate students) and Summer Institute
  – http://www.purdue.edu/discoverypark/food/borlaugfellows/
  – Deadline ~ March every year
Capacity Development

• Farmer-to-Farmer volunteers

• Borlaug Leadership Enhancement in Agriculture Program (students and mentors)
  – http://borlaugleap.org/

• Borlaug Higher Education for Agricultural Research and Development (students and mentors)
  – http://bheard.isp.msu.edu/
Advisory and Unfunded Engagement

- Webcasts, Streaming, and Online Discussions
  - Discuss the high-level and programmatic strategies in a public venue accessible to potential partners everywhere
- International Development Community and Resources
  - Training and Resources for Professional/Curriculum Use
  - Communities of Practice (e.g., AgriLinks)
  - Crowdsourcing and Data
- Public Meetings
  - Board for International Food and Agriculture Development
  - Advisory Committee on Voluntary and Foreign Aid
“We will drive the growth of the future that lifts all of us up.”
– President Barack Obama, 2009

Thank You!

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www.feedthefuture.gov