Agricultural Research for Impact: Partnering with Feed the Future Innovation Labs

Speakers

Saharah Moon Chapotin, USAID Bureau for Food Security
R. Muniappan, Virginia Tech/ Feed the Future IPM Innovation Lab
Irvin Widders, Michigan State/Feed the Future Legume Innovation Lab

Facilitator

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Saharah Moon Chapotin
USAID Bureau for Food Security

Saharah Moon Chapotin is Division Chief for Agricultural Research at USAID. She joined USAID in 2006 as a Biotechnology Advisor, managing international partnerships to promote the adoption of conservation agriculture practices in South Asia, and develop bioengineered crops for small-holder farmers. Prior to working at USAID, Chapotin worked at the Biosafety Institute for Genetically Modified Agricultural Products at Iowa State University. Chapotin holds a B.S. in Biology from Stanford University, a Ph.D. in Plant Physiology from Harvard University, and has completed the AAAS Science and Technology Policy Fellowship Program.
Muni Muniappan is a world-renowned specialist in tropical economic entomology, biological control of insect pests and weeds, and integrated pest management. He received his doctorate from Oklahoma State University and has worked in the tropics for over 35 years. He currently serves as director of the Integrated Pest Management Innovation Lab. The program operates in 12 Feed the Future countries and concentrates on the development of IPM packages for high value vegetable crops. Muniappan is concentrating on globalizing IPM by conducting national, regional and international workshops, conferences, and symposia.
Irvin Widders
Michigan State/Legume Innovation Lab

Dr. Widders holds a Ph.D. in plant physiology from the University of California, Davis. He joined the Department of Horticulture at Michigan State University in 1982 and is currently a Professor. He has served as Director for the Bean/Cowpea Collaborative Research Support Program (CRSP) (2000-2007), the Dry Grain Pulses CRSP (2007-2012), and the Feed the Future Innovation Lab for Collaborative Research on Grain Legumes (2013-2017). Under Dr. Widders’ leadership, the program expanded to include research on human nutrition, developed ties with the CG’s Grain Legume program, and improved the livelihoods of rural poor that produce, market and consume grain legumes.
Feed the Future Innovation Labs
Research, Partnerships and Technology Scaling

Saharah Moon Chapotin
Bureau for Food Security
U.S. Agency for International Development

Ag Sector Council, April 23, 2014
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
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
Feed the Future Food Security Innovation Center

- Created in response to BIFAD CRSP study recommendations
- Leads USAID’s implementation of FTF Research Strategy in seven priority research areas
- Encourages a multi-disciplinary approach, better linkages among related projects, cross-project learning and management efficiencies
- Engages U.S. universities, international research centers, private sector, local agricultural research and educational institutions, development partners
• **Research** – the Feed the Future Innovation Labs conduct targeted research in support of the Feed the Future Research Strategy

• **Partnerships** – the Innovation Labs connect U.S. colleges and universities with developing country research institutions through research collaborations, student training and mentorship

• **Capacity Building** – Innovation Labs support graduate and undergraduate student training as well institutional strengthening, curriculum development and short-term training

• **Technology Scaling** – research outputs, including technologies and knowledge, feed into and strengthen Mission value chain programs and other technology dissemination activities

• Just one part of **broader FSIC Research portfolio**, which includes projects led by private sector, CGIAR, universities, NARS, NGOs
**Challenge:** Increase cereal yields and adaption to climate change for improved feed and fodder production

- Cereals account for approximately two-thirds of all human energy intake
- An estimated 1.2 billion poor people depend on wheat

**Solutions:**
- Invest in development and dissemination of improved cereals
- Take advantage of emerging biotech and genomic tools
- Partner with private R&D companies and US universities
- Leverage BMGF investments
- Improve fodder quality for dual purpose use

**Feed the Future Innovation Labs:**
- Sorghum & Millet, Kansas State University
- Applied Wheat Genomics, Kansas State University
- Climate Resilient Millet, University of California, Davis
- Climate Resilient Sorghum, University of Georgia
- Climate Resilient Wheat, Washington State University
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

Feed the Future Innovation Labs:
• Grain Legumes, Michigan State University
• Peanut & Mycotoxin, University of Georgia
• Soybean Value Chain Research, U. of Illinois
• Climate Resilient Beans, Penn State University
• Climate Resilient Chickpea, UC Davis
• Climate Resilient Cowpea, UC Riverside
Challenge: Protect animals and tropical staples from major pests and diseases

- Plant diseases on major food crops cause up to 40% of pre-harvest losses.
- Over 90% of the world’s wheat acreage is susceptible to wheat stem rusts.
- Over 1.6 billion families depend on livestock for their income and nutrition.

Solutions:

- Leverage US science and leadership in advanced genomic/biotech tools.
- Utilize transgenic tools for critical plant diseases.
- Build public sector capacity to use biotech tools.

Feed the Future Innovation Labs:

- Genomics to Improve Poultry.
- Rift Valley Fever Control in Agriculture.
Program for Research on Safe and Nutritious Foods

Challenge: Sustainably increase production and consumption of highly nutritious foods and diversify diets

- Fruits, vegetables and animal source foods provide critical micronutrients for child development
- One third of children under five in low income countries are stunted
- Half of all children and pregnant women are anemic

Solutions:

- Nutrition research on behavior, food utilization and household dynamics
- Research on production/consumption biofortified and nutrient-rich crops
- Develop options to strengthen post harvest handling and food safety
- Invest in horticulture, animal sourced food value chains

Feed the Future Innovation Labs

- Aquaculture & Fisheries, Oregon State University
- Nutrition, Tufts University
- Horticulture, University of California, Davis
- Reduction of Post-Harvest Loss, Kansas State University
- Adapting Livestock Systems to Climate Change, Colorado State University
Challenge: Create supportive agricultural policy environments

- Help countries embrace predictable, inclusive, evidence-based and transparent policy formulation and implementation

Solutions:
- Work with host-country governments and multilateral institutions to improve enabling policy environments
- Address land and natural resource governance and resilience policy, nutrition policy constraints.
- Improve function of and access to markets

Feed the Future Innovation Labs:
- Food Security Policy, Michigan State University
- Assets & Market Access BASIS University of California, Davis
Challenge: Fundamentally Transform Key Production Systems

- In Africa, 65% of agricultural land suffers from physical and chemical degradation
- African cereal and milk yields are less than half the global average

Solutions:
- Integrate research outputs, policy and nutrition in production systems
- Focus multiple interventions within targeted geographic areas
- Diversify major production systems with improved crops and animals
- Evaluate and disseminate improved soil and water management practices

Feed the Future Innovation Labs:
Sustainable Ag. & Natural Resource Management (SANREM), Virginia Tech
Integrated Pest Management, Virginia Tech
Small-Scale Irrigation, Texas A&M University

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NEW Sustainable Intensification (RFA closes May 15)
NEW Integrated Pest Management (RFA closes June 24)
**Challenge:** Professional and organizational capacities are inadequate to address agricultural challenges and opportunities

- Public agricultural institutions are weak
- Private sector needs skilled employees
- Experienced faculty and managers are retiring
- Women hold few management positions

**Solutions:**
- Strengthen human and institutional capital base
- Support best practice development
- Support women in agricultural research
- Develop human skills through fellowships and long-term degree training

**Example Projects:**
- All the Feed the Future Innovation Labs have capacity development activities
- InnovATE – Agricultural Training & Education
- African Women in Agricultural Research and Development (AWARD)
- Borlaug Higher Education for Agricultural Research and Development
Remarks by Administrator Rajiv Shah to the CGIAR Board of Directors
Friday, December 7, 2012

“Nearly fifty years ago, when USAID Administrator William Gaud coined the term Green Revolution, he was speaking not just about the new varieties of wheat and rice, but about the vast potential of agricultural technology to open new frontiers in development.

It wasn’t long before the Consultative Group on International Agricultural Research (CGIAR) was formed. The CGIAR was a response to a growing recognition that a worldwide network of agricultural research centers was needed to carry on the ideals of the Green Revolution.

Today, we have technologies that can help farmers grow more productive crops and improve water management. The evidence base is growing around a select number of technologies that—if taken to scale—can impact tens of millions of lives.”

“But those technologies are not reaching nearly enough farmers.”
How can you partner with the Feed the Future Innovation Labs?

**Missions** and other USAID Bureaus/Offices can:

- Support locally relevant, targeted, applied research
- Access recent research outputs – technologies and knowledge
- Create linkages to your value chain investments – bring scientific experts into circle of implementing partners
- Strengthen scaling agenda through results of pilots/evidence base
- Train students and strengthen research and educational capacity
- Strengthen local institutions – in support of USAID Forward
- Invite Innovation Lab staff to partner’s meetings

**Mechanisms:**

- **Associate Awards** to LWAs (some OAA assistance is available, ask me)
- **Buy-ins** (limited in scale)
- Field level engagement between Innovation Labs and implementing partners
- Identify trainees and help set research priorities that support value chains
- Ask your friendly AOR for assistance!
How can you partner with the Feed the Future Innovation Labs?

Leader with Associates – Missions/OPs can do Associate Awards, but they can also accommodate limited buy-ins:

- Sorghum & Millet, Kansas State University
- Grain Legumes, Michigan State University
- Peanut & Mycotoxin, University of Georgia
- Soybean Value Chain Research, University of Illinois
- Adapting Livestock Systems to Climate Change, Colorado State University
- Aquaculture & Fisheries, Oregon State University
- Horticulture, University of California, Davis
- Reduction of Post-Harvest Loss, Kansas State University
- Nutrition, Tufts University
- Sustainable Ag. & Natural Resource Management (SANREM), Virginia Tech
- Integrated Pest Management, Virginia Tech
- Food Security Policy, Michigan State University
- Assets & Market Access BASIS, UC Davis

Forthcoming LWAs - September 2014:
- Sustainable Intensification
- Integrated Pest Management
How can you partner with the Feed the Future Innovation Labs?

Cooperative Agreements (non-LWAs):

**Small-Scale Irrigation, Texas A&M University**
Climate Resilient Chickpea, University of California, Davis*

**Applied Wheat Genomics, Kansas State University**
Climate Resilient Millet, University of California, Davis
Climate Resilient Sorghum, University of Georgia
Climate Resilient Wheat, Washington State University*

**Climate Resilient Beans, Penn State University**
Climate Resilient Cowpea, UC Riverside

**Genomics to Improve Poultry, University of California, Davis**
Rift Valley Fever Control in Agriculture, University of Texas, El Paso

Ways to work with them:
- technical interactions and partnerships
- student training and capacity development
- buy-ins (in most cases)
How can you partner with the Feed the Future Innovation Labs?

**U.S. Colleges and Universities and other research institutions can:**

- Apply to be lead institution on BFS-supported research program
- Join a consortium applying to BFS RFA
- Apply for competitive sub-awards under Innovation labs
- Partner with existing Innovation Lab to support a new Associate Award
- Join an existing research program
- Collaborate with existing research programs
- Host students under Capacity Development programs
- Attend a project meeting
How can you partner with the Feed the Future Innovation Labs?

Forthcoming Opportunities for Title XII institutions

• Feed the Future Innovation Lab for Sustainable Intensification (May 15)

• Feed the Future Innovation Lab for Integrated Pest Management (June 24)

• New Livestock Research priority setting process – two upcoming opportunities for public input (announcements forthcoming):
  
  ❖ **Crafting USAID's livestock research agenda – animal science priorities under Feed the Future**
  American Society for Animal Science, July 24, 2014, Kansas City, MO

  ❖ **E-consultation on animal research priorities** – week of July 28, 2014

• USAID Mission staff – look for notice of internal consultations on animal research
How can you partner with the Feed the Future Innovation Labs?

Development partners can:

- Invite Innovation Lab personnel to join your project and provide technical support
- Access innovations, technologies, management practices from Innovation Labs
- Contribute to establishing Innovation Lab research priorities that will advance your value chain targets or objectives
- Establish joint field sites and get advantage of research findings in your ZOI
- Pilot new research outputs and provide feedback to research partners
- Access training and capacity building opportunities for your staff
- Attend project meetings or invite Innovation Lab staff to implementation meetings/stakeholder workshops
Please See our Feed the Future Website

Thank You!

www.feedthefuture.gov
Mission, IPM Innovation Lab, KISAN Project and Private Industry Collaboration in Nepal

Muni Muniappan
Director
IPM innovation Lab
Virginia Tech
IPM Package for Tomato

- Select disease free and high yielding seeds
- Produce healthy and disease free seedlings
- Treat seeds or seedlings with *Trichoderma*
- Grafting on resistant rootstock for bacterial wilt
- Staking and mulching
- Pheromone traps for *Helicoverpa* and *Spodoptera*
- Use of parasitoids and predators
- Rogueing and host free period for control of virus diseases
- Use of Biopesticides such as neem
- Use of microbial pesticides such as NPV, *Metarhizium*, and *Beauveria*
Healthy Seedling Production
Using Plastic Trays and
Coconut Pith
Trichoderma and Pseudomonas Production in India
Trichoderma Production in Bangladesh

Trichoderma Compost Production Facility

Women producing Trichoderma in their backyard

Trichoderma Compost Packages for Market

Tricho-leachate
Eggplant and tomato grafting

Eggplant grafting in Bangladesh
- Eggplant yield ↑ 249% in Bangladesh
- Technology transferred to India, Nepal, Philippines, Honduras, Ecuador, Uganda, Senegal, Mali, Kenya and Ohio
Pheromone traps

- Eggplant fruit and Shoot borer
- Cut worms
- Fruit flies
Use of Parasitoids and Predators
Use of Neem Products

Neem Tree

Neem Flowers

Neem Formulations
Peanut bud necrosis virus control in tomato

- Transmitted by thrips
- Common in India
- Rogueing is effective in controlling this virus

Unrogued field

Peanut bud necrosis virus-infected tomato

Rogued field
Gemini virus control in tomato

Transmitted by white flies
Primarily *Bemisia tabaci*

Host free period for 3 months is effective in reducing the incidence
Mission Involvement in IPM Innovation lab Activities

Meyer in Virus Diseases Workshop

Kneuppel at Agriculte Meeting

Mission with IPM IL Partners

Meyer in a Tomato Farm
Nepal
IPM IL and KISAN Demonstration Fields
IPM IL and KISAN Activities

IPM IL Training Session for KISAN  Innovation Lab Council Visit to IPM IL and KISAN Fields
Biopesticide and Biofertilizer Products

Agricare Facility

A Stall at the Exhibition
Agrovets in FtF Region

- Agrovet Selling Products
- Agrovet Store
- IPM IL Scientists Discussing with Agrovets
- Agrovet Explaining to Visitors
Administrator Shah’s Visit to IPM IL Plot

Visit to an IPM Plot

Meeting with Private Agribusiness Leaders

Talking to a Woman Farmer
Thank You
Feed the Future Innovation Lab for Collaborative Research on Grain Legume

Extending “Seed” of Improved Bean Varieties to Smallholder Farmers

Irvin Widders
Michigan State University
Impact Pathway
Legume Innovation Lab Projects

**Research**

- **Inputs/Activities**
  - Investment in collaborative research projects

- **Outputs**
  - Technologies
  - Products
  - Services
  - Practices
  - Intellectual properties
  - Knowledge
  - Policy recommendations

**Focus of impact assessment**

- **Outcomes** (examples)
  - Increase per unit production, consumption and marketing of outputs, products and services
  - Decrease per unit costs of production and marketing

- **Impacts** (examples)
  - Poverty
  - Hunger
  - Health and nutrition
  - Other...

**Adoption / Uptake / Influence**

**Scaling-up and scaling-out**

*Arrows in the impact chain indicate the direction of influence and its thickness indicates level/degree of influence on an effect*
That’s great, but I think we might need just a little more detail right here.
Associate Award to the Legume Innovation Lab:

“STRATEGIC INVESTMENT IN RAPID TECHNOLOGY DISSEMINATION: COMMERCIALIZATION OF DISEASE RESISTANT BEAN VARIETIES IN GUATEMALA, NICARAGUA, HONDURAS AND HAITI” (BTD)
Justification for Bean Technology Dissemination (BTD) Project:

Response to “Feed the Future”-

- To significantly increase bean productivity
- To disseminate technologies resulting from investments in research
- To promote staple crops with high nutritional and health value
Objectives of Bean Technology Dissemination Project

To provide small-holder farmers with access to:

• Improved bean varieties with high yield potential
• Quality “seed”
• Varieties of preferred market classes and culinary attributes
USAID Investments in Bean Breeding

Bean/Cowpea CRSP  
(1982-2006)

Dry Grain Legumes CRSP  
(2007-2012)

Legume Innovation Lab  

Bean Varieties released in:

**Central America**
- 13 – small red
- 2 – small black
- 1 – small white

**Caribbean**
- 4 - red mottled
- 4 – small black
- 3 – small and large white
- 1 – light red kidney
Sustainability Goals of BTD

- Promote the establishment of sustainable seed systems
- Instill an appreciation for the importance of planting quality seed of beans
Challenges to Establishing Sustainable Seed Systems for Beans

- Farmers can plant grain they have saved or bought
- Bean seed is large
- Planting rates are high (50-80 kg/ha)
- Costs of certifying seed production are high
- Costs to package, handle and transport seed to villages are high
BTD Seed Multiplication and Dissemination Strategy

“Community Seed Banks”

- Leader farmers identified to receive training in seed production
- Provided “registered” seed to plant 0.5 – 1.0 ha
- Produced “Quality-Declared” seed for 20 – 40 smallholder farmers in a community
- Stored seed for future planting seasons
Advantages of Informal Community-Based Seed Systems

- Farmers assume responsibility for “seed security”
- Opportunity to select preferred varieties
- Farmers have access to affordable quality seed
Achievements of BTD

- Beneficiaries reached with 5 – 20 lb sacks of bean seed • >100,300
- Number of varieties disseminated • 24
- Number of farmer organizations benefitted • 416
- Number of farmers trained in seed production • 3,687
- Productivity increased (%) • 15 – 30%
“MasFrijol” - Guatemala
Linking Agriculture to Nutrition

**Increasing Bean Productivity**
- Promote locally adapted and preferred varieties
- Establish community seed banks ("Almacenes")
- Access to PICS sacks for household storage

**Improving Nutrition through Increased Bean Consumption**
- Increase appreciation of beans as an “ancestral” staple crop and food
- Nutrition education focused on women’s groups
- Recipe competition, videos, mobile education units

Feed the Future Food Innovation Lab for Collaborative Research on Grain Legumes
MasFrijol Partnership

Community Almacenés and Health Posts

National Agriculture Research Organization
CECODE Communications for Development
Ministry of Public Health

Public Health Technicians
Extension Agronomists
Seed PICS Nutrition Edu
Seed - A marvelous technology!
Contact Information

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Thank you for joining us!

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Take a moment to respond to our survey.
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Stay In Touch
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Upcoming Events
#AskAg Twitter Chat: Knowledge Gaps to Scaling Ag Tech
April 29
May Ag Sector Council | Updates from Previous Seminars

Agrilinks and the AG Sector Council Seminar Series are products of the USAID Bureau for Food Security under the Feed the Future Knowledge-Driven Agricultural Development (KDAD) project.