



FEED THE FUTURE

The U.S. Government's Global Hunger & Food Security Initiative

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April 23, 2014

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

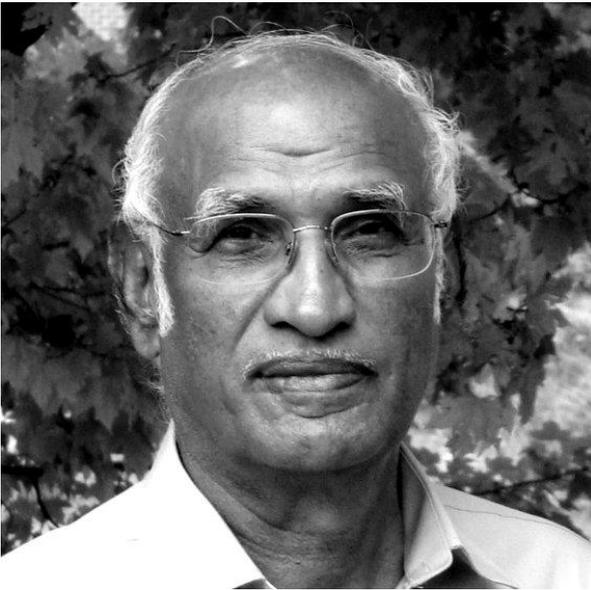
Julie MacCartee, *USAID Bureau for Food Security*



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.



R. Muniappan

Virginia Tech/IPM Innovation Lab

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**

The U.S. Government's Global Hunger and Food Security Initiative

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



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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*





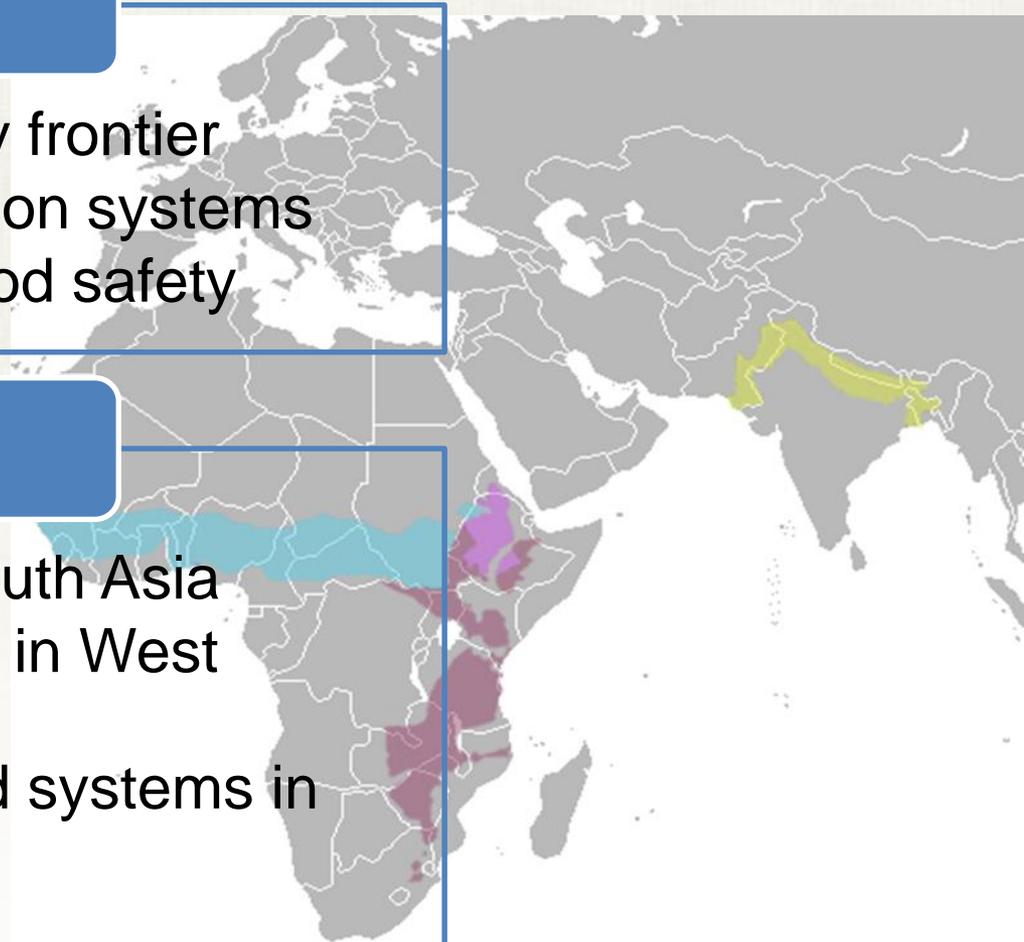
Overarching Goal: Sustainable Intensification

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-sahelian systems in West Africa
- Maize and livestock mixed systems in East and Southern Africa
- Ethiopian highlands





- 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





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

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.”



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!



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



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)



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



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



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



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Please See our Feed the Future Website



Thank You!

www.feedthefuture.gov

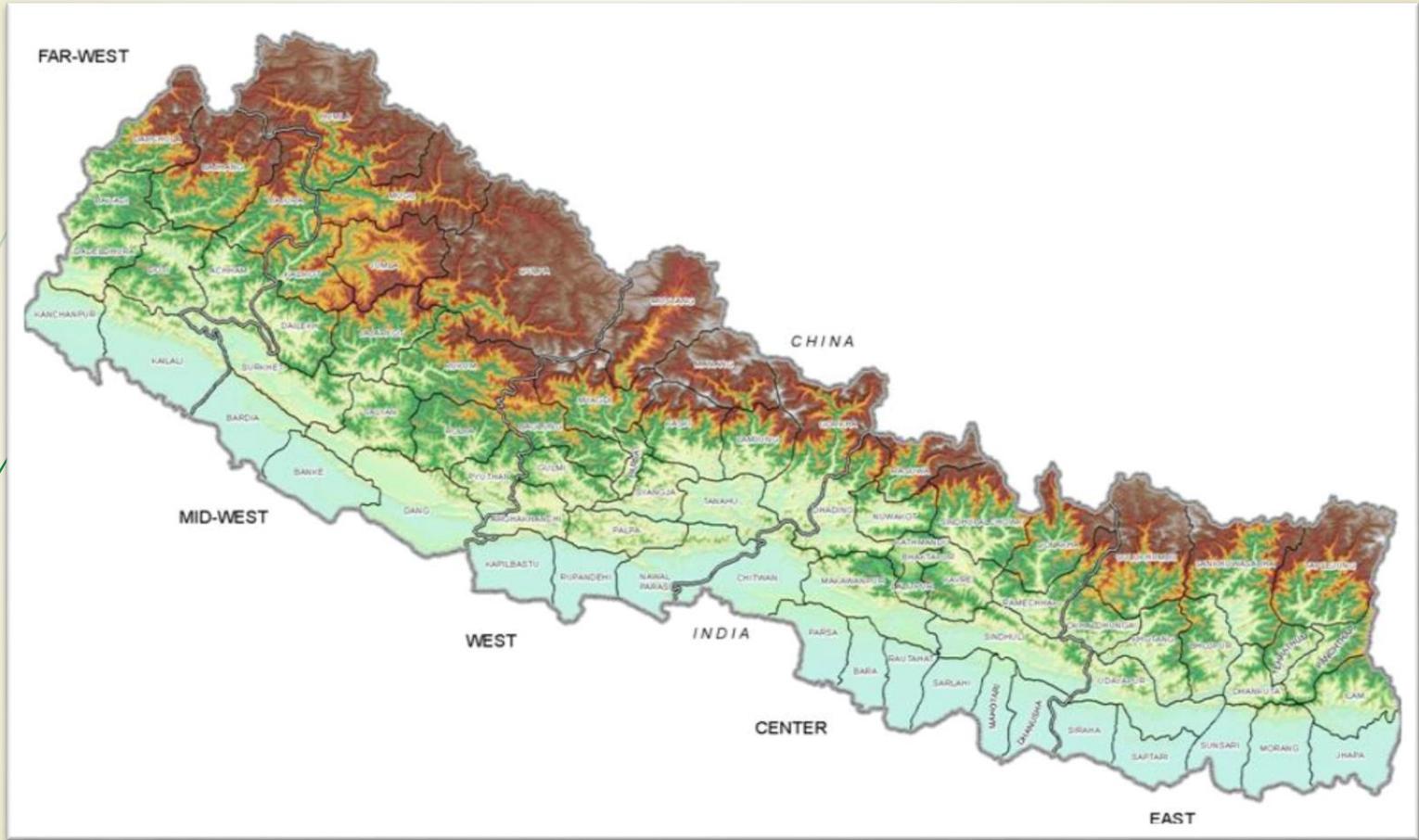
Mission, IPM Innovation Lab, KISAN Project and Private Industry Collaboration in Nepal

Muni Muniappan
Director
IPM innovation Lab
Virginia Tech



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Nepal



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**



**Trichoderma Compost
Packages for Market**



**Women producing
Trichoderma in their
backyard**



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



Grafted Field



Non-grafted Field

Pheromone traps



**Eggplant fruit and
Shoot borer**



Cut worms



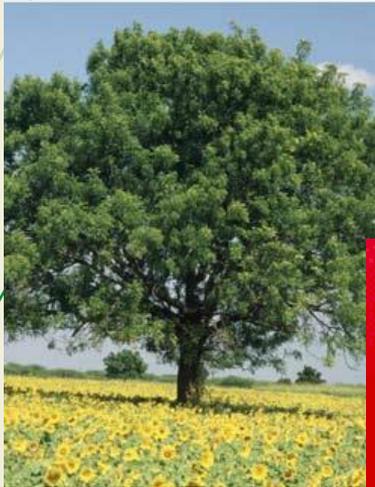
Fruit flies

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



Peanut bud necrosis virus-infected tomato



Unrogued field



Rogued field

Gemini virus control in tomato

Transmitted by
white flies
Primarily *Bemisia tabaci*

Healthy tomato



Virus infected tomato



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 Agricare Meeting



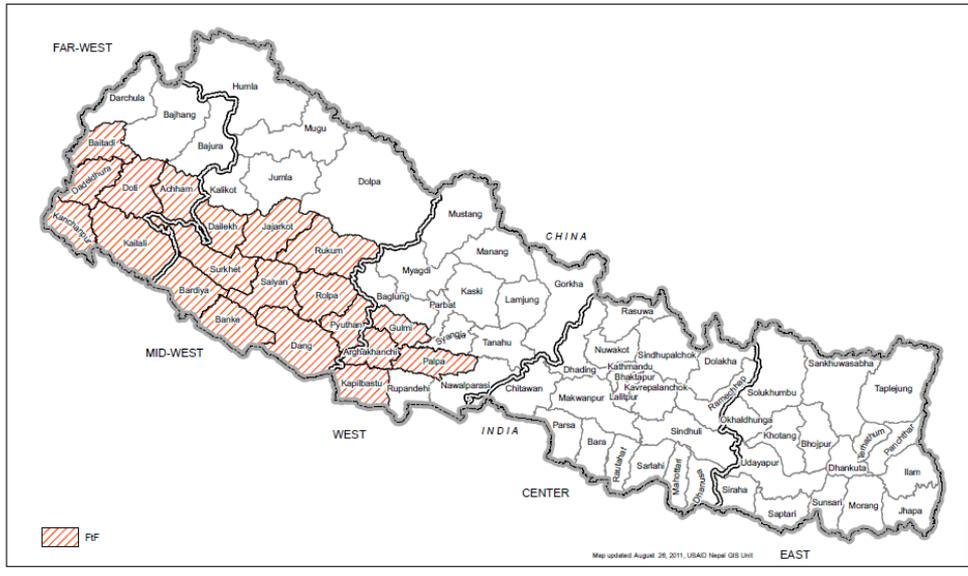
Mission with IPM IL Partners



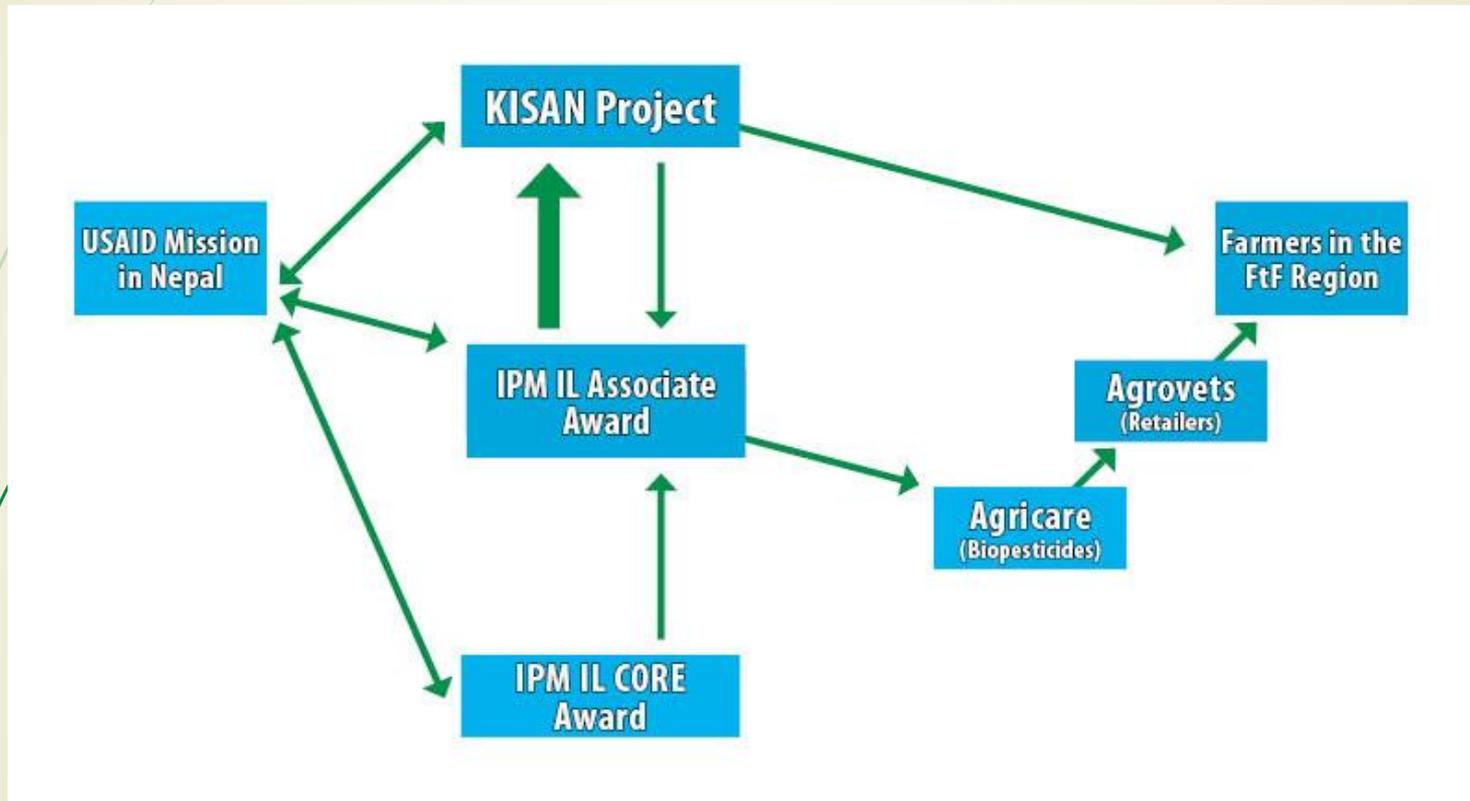
Meyer in a Tomato Farm

Nepal

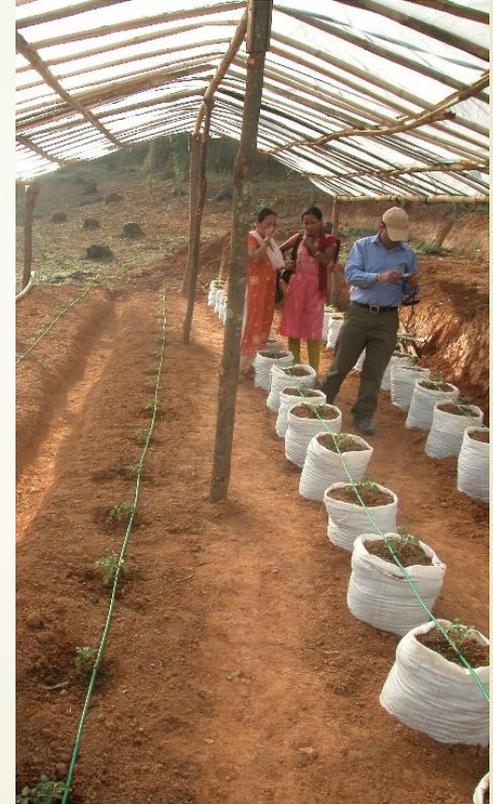
FtF Program Districts



Flow Chart - Collaboration



IPM IL and KISAN Demonstration Fields

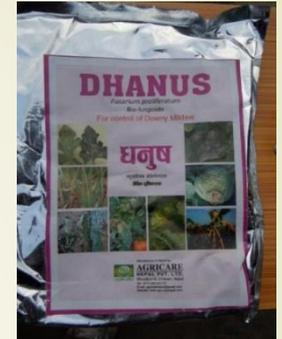


IPM IL and KISAN Activities



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

Agricare Products and Facilities



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



Talking to a Woman Farmer



Meeting with Private Agribusiness Leaders



Thank You



Feed the Future Innovation Lab
for Collaborative Research on
Grain Legume



Extending “Seed” of Improved Bean Varieties to Smallholder Farmers



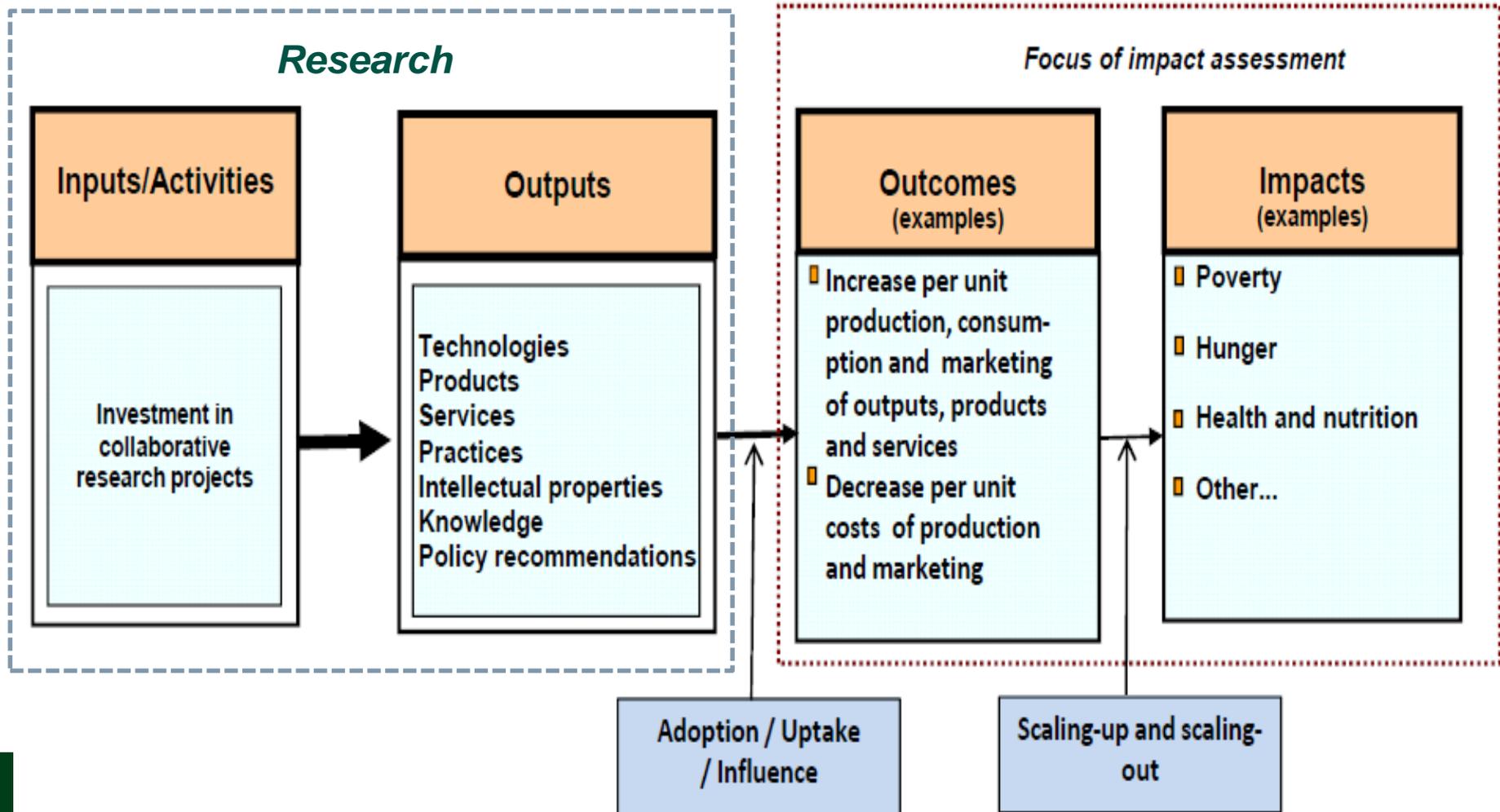
Irvin Widders

Michigan State University



Impact Pathway

Legume Innovation Lab Projects

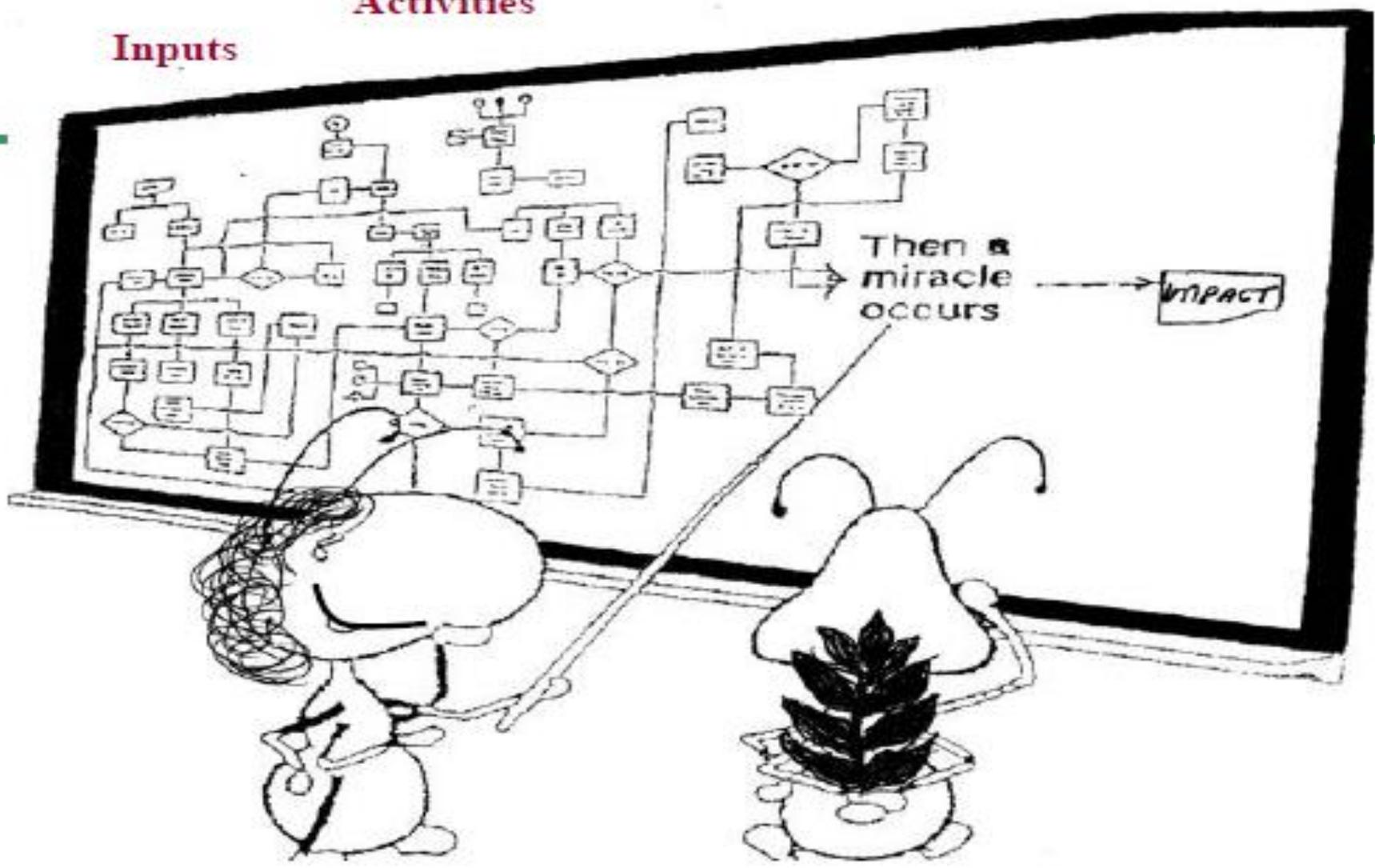


Arrows in the impact chain indicate the direction of influence and its thickness indicates level/degree of influence on an effect

Outputs

Activities

Inputs



That's great, but I think we might need just a *little* more detail right here.



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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)***



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

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



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

USAID Investments in Bean Breeding

Bean/Cowpea CRSP

(1982-2006)

Dry Grain Legumes CRSP

(2007-2012)

Legume Innovation Lab

(2013-2017)

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



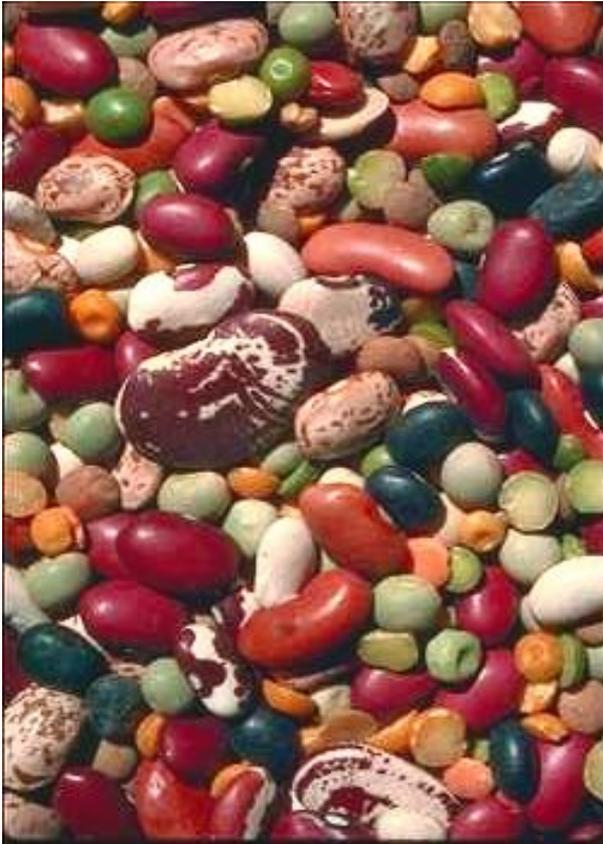
Feed the Future Food Innovation Lab for Collaborative Research on Grain Legumes

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
 - Number of varieties disseminated
 - Number of farmer organizations benefitted
 - Number of farmers trained in seed production
 - Productivity increased (%)
- >100,300
 - 24
 - 416
 - 3,687
 - 15 – 30%



“MasFrijol” - Guatemala

Linking Agriculture to Nutrition

Increasing Bean Productivity

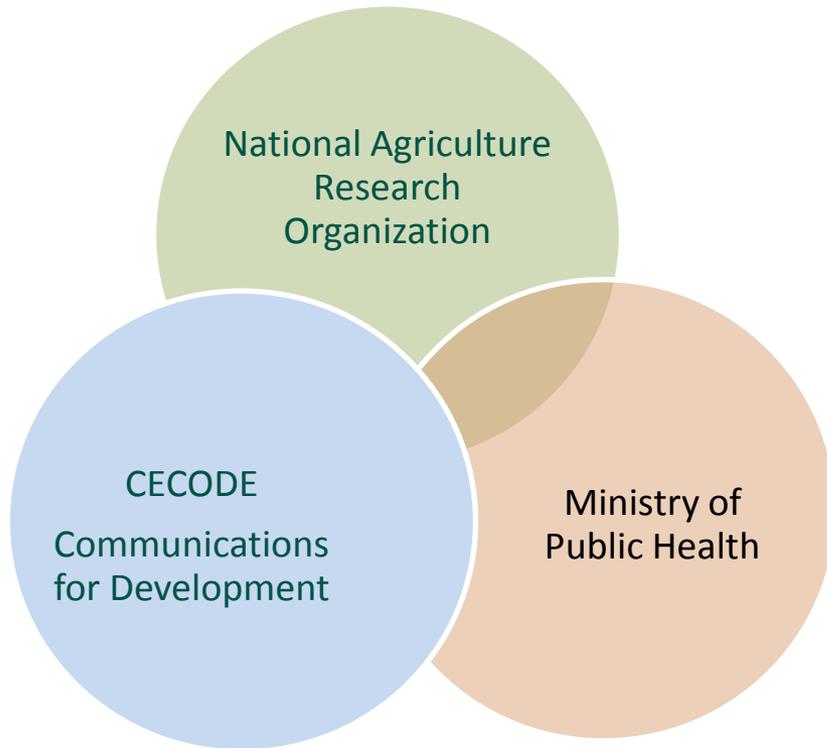
- Promote locally adapted and preferred varieties
- Establish community seed banks (“Almacenes”)
- Access to PICS sacks for household storage

Improving Nutrition through Increased Bean Consumption

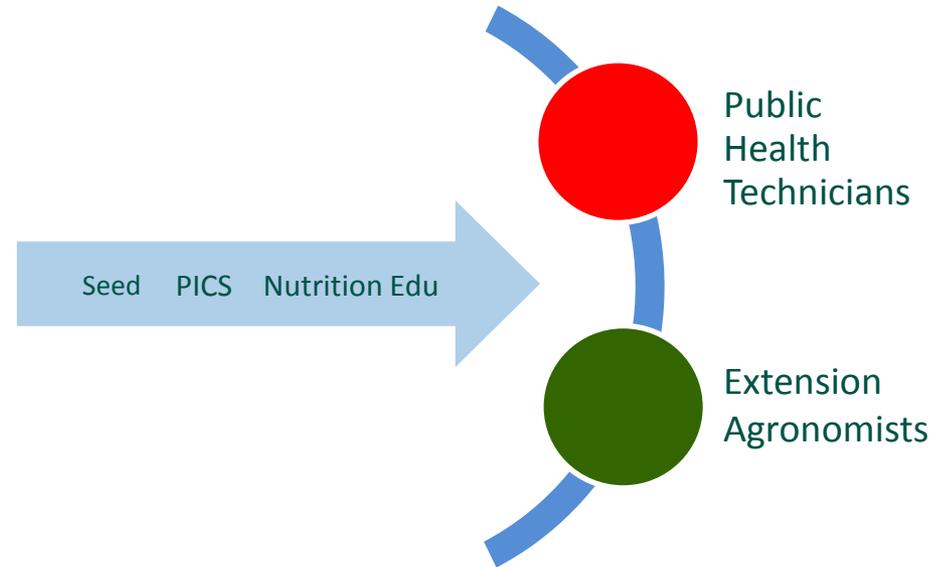
- Increase appreciation of beans as an “ancestral” staple crop and food
- Nutrition education focused on women’s groups
- Recipe competition, videos, mobile education units



MasFrijol Partnership



Community Almacenes and Health Posts



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

Seed- A marvelous technology!



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

Contact Information

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

Thank you for joining us!



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Take a moment to respond to our survey.

You can also visit the [event page](#) to post comments & questions.



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