US Benefits from Strategic Investments in Developing Country Agriculture and Food Security

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Purpose

• Study will focus on how US Government’s strategic investments in developing country agriculture and food security benefit US producers and consumers through a variety of avenues
• Examine both direct and indirect benefits of increasing output and incomes in USAID partner countries
• Study will not address humanitarian food aid or nutritional food assistance programs.
Potential benefits from agricultural assistance:

- Improving agricultural productivity in USAID partner countries => increasing income and expanding markets and trade
- Promoting bio-security
- Promoting research and innovation => spillover effects of benefit to US producers
- Providing training, education, capacity development and resilience
- Providing geopolitical benefits
- Other?
Benefits from programs aimed at improving productivity gains

- Increased R&D leads to improved productivity
- Improved incomes => reduction in poverty, reduction in hunger
- => Improved household purchasing power
- As income rises, household diets shifts towards meat, dairy and poultry, fresh fruits and vegetables
- To the extent that dietary shifts lead to increased trade => potential benefits for US producers

Note: Data are 2009-11 averages for selected developing countries. Logarithmic growth curve based on both developing and developed countries. GDP = Gross Domestic Product. Source: USDA, Economic Research Service using USDA Agricultural Projections to 2022 and supporting data.
Benefits from programs promoting biosecurity

• Preventing spread of agricultural and food threats
• Addressing emerging crop and livestock pests and diseases
• Benefits for both target countries where agricultural losses can be quite high due to pests and diseases and to US producers by preventing spread
Benefits derived from R&D investments in USAID partner countries

- R&D efforts in target countries can lead not just to increase productivity but also may have spillover effects that benefit US producers
- Benefits may accrue through numerous avenues including
  - institutional research collaboration
  - Development of publicly funded databases
  - Protecting biodiversity through gene banks

Agricultural productivity growth has accounted for most of the output growth between 1948 and 2011

Source: USDA, Economic Research Service productivity accounts.
Benefits from programs that provide education, capacity building and build resilience

• Education programs that build capacity
  – Improving human capital raises productivity
  – Improve income
• Programs aimed at providing resilience (e.g., agricultural insurance programs)
  – Help producers mitigate impacts of disasters
  – Improves incomes, investment, productivity
What are the geopolitical benefits of food security?

While food riots are often a symptom rather than cause of unrest, food shortages can ignite political unrest.

By increasing productivity and incomes and by building resilience, agricultural assistance may increase food security in target partners.
How much can be quantified?

- Large literature on impacts of R&D on productivity that lends itself to potential modeling.
- But many benefits are more difficult to measure and to quantify.
- Our approach will be to try to model those benefits where data are available and depend on case studies and other approaches where data are scarce and relationships more tenuous.
Modeling framework for analyzing impact of development aid

- Impact of R&D funding on total factor productivity
  - Draw on extensive literature (Renkow and Byerlee 2010; Evenson and Gollin 2003; Evenson and Rosegrant 2003; Fuglie 2014; Villoria 2011; Alston, Pardee, etc)
  - Impact on R&D stocks
  - Assumptions on lags between R&D investments and outcomes

- Estimating impact on producers and consumers using MIRAGRODEP, a global computable general equilibrium model
Modeling framework (cont’d)

- Impact of productivity gains on household income and expenditures in USAID target partners utilizing dataset developed by Martin and Ivanic (2014)
  - 285,000 representative households in 31 countries
  - represents about 65% of world’s poor
  - Includes large emerging economies, including importers and exporters of food products
- Analyze trade impacts
- Analyze impacts on US producers/consumers
Use of case studies where benefits may be less direct

collaborative research on sorghum and millet

- The Sorghum and Millet Innovation Lab, led by Kansas State University, developing research that is improving productivity both in Africa and US
- Improving millet and sorghum production—important food crops in Sub-Saharan Africa
- Research also help to screen sorghum lines to identify germplasm resistant to sugarcane aphids
- Address resistance against sorghum anthracnose—toxic fungus found along Gulf coast and inland
We need your input!

- To identify relevant studies and databases
- To identify potential case studies and potential avenues of benefits not considered here
- Comments on proposed methodology and approach
Thanks!

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