Report on the BIFAD and USAID Consultations:

Feeding the World in 2050: How Human and Institutional Capacity Development Can Support Agricultural Innovation Systems

Disclaimer: This report is made possible by the generous support of the American people through the United States Agency for International Development (USAID). The contents are the responsibility of Deborah Rubin and Caitlin Nordehn (Cultural Practice, LLC) and do not necessarily reflect the views of USAID or the United States Government.

Preface

As the chair of the USAID Board for International Food and Agricultural Development (BIFAD), it is my great pleasure to introduce this report on a series of studies and consultations related to human and institutional capacity development (HICD) that have taken place over the past year. As you all know, we face many challenges in the coming years, such as a burgeoning population, climate change, and major demographic shifts. Addressing these issues will require global knowledge, skills, and creativity, as well as a variety of innovative approaches from all possible sources.

The landscape of international development is changing rapidly. It is now a more diverse landscape, with a much broader range of public and private actors in the space. The next generation of HICD programming will look different than in the past. This report summarizes the input that scholars and practitioners working in the field of HICD have offered to enhance USAID programming to better achieve an innovative agricultural system capable of feeding the world in the 21st century.

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Executive Summary

What type of capacity development–for individuals and for institutions–can most effectively promote innovative agricultural systems capable of feeding the world's population in the 21st century? To answer this question, the United States Agency for International Development (USAID) and the Board for Food and International Agricultural Development (BIFAD) supported several studies followed by a series of consultative fora to learn from stakeholders engaged in human and institutional capacity development (HICD), particularly in the agricultural sector, about what has been working, what has not, and what activities appear to hold the greatest promise for strengthening food systems.

In this report the recommendations from the reports and the information emerging from the discussions during the different consultations are summarized and shared. The report also presents the comments raised by outside panelists, BIFAD members, and the public at the BIFAD meeting held in Washington, D.C. on February 27, 2015 to suggest possible next steps in HICD research and activities.

First there is a short review of the background to and findings of three reports that USAID commissioned from under its cooperative agreements with BIFAD and the Association for Public and Land Grant Universities (APLU). Together the reports offered over thirty recommendations to be considered by different stakeholders, including USAID, universities in the U.S. and in developing countries, national agricultural research institutions, NGOs, and firms. The three reports, each of which examines different dimensions of HICD include:

- *Human and Institutional Capacity Development: Role of USAID and Title XII Under Feed the Future Programs* (2014) by Victor Lechtenberg (Purdue University), Albert Ayeni (Rutgers University), Ralph Christy (Cornell University), and Carol Kramer-LeBlanc (Consultant).
- *Good Practices in Leveraging Long-term training for Institutional Capacity Strengthening* (2014) by Andrew Gilboy and Anne-Claire Hervy; and,
- *African Higher Education: Opportunities for Transformative Change for Sustainable Development* (2014).

A select group of themes on HICD became the focus of a consultative process to engage different stakeholders. This process was initiated by a side event at the World Food Prize on October 15, 2014 organized by BIFAD, which presented the main conclusions of the three reports and introduced a schedule of consultations in November 2014 to address the question of how HICD can support agricultural innovation systems and to consolidate recommendations for BIFAD to make regarding future USAID programming.

The main focus of the report is a synthesis of the participants' comments during the three-day e-consultation or AgExchange. Hosted by Agrilinks it provided a platform for a wide network of stakeholders to post comments and engage in a dialogue with others from around the world to address three sub-themes under the overarching theme "Feeding the World in 2050: How Human and Institutional Capacity Development Can Support Agricultural Innovation Systems." Participants registered from 22 countries in Sub-Saharan Africa, Asia, Europe, Latin America and the Caribbean, and the U.S., Canada and Mexico. The AgExchange was facilitated by eight experts from U.S. Universities engaged in human and institutional capacity programs, APLU, and USAID. The AgExchange was said to be the most successful e-consultation held to date under the new AgriLinks project.

On the first day, participants discussed examples of effective programming contributing to institutional capacity development and good measures of performance for building institutional capacity. Comments on this theme emphasized that HICD efforts are complementary. Examples ranged from USAID/Washington investments in Feed the Future Innovation Labs and the former Collaborative Research Support Programs to innovative recent programs the USAID mission programs in Tanzania and Senegal. A number of respondents praised fellowship programs such as Borlaug Leadership Education in Agriculture Program and the Borlaug Higher Education for Agricultural Research and Development program that provide opportunities to learn both critical leadership and management skills.

A different discussion thread provided opportunities to discuss tools for measuring the performance of institutions such as strategic planning tools, self-assessments, and Organizational Performance Index (OPI) and Theory of Change (ToC) approaches, as well as annual performance reviews. Several people commented on challenges using different types of organizational capacity assessment tools.

The day's closing discussion covered issues around partnerships. Respondents addressed how different types of partners can work together to mutually benefit one another including local partners, universities, government institutions, and the private sector.

On the second day, the participants discussed key constraints to developing human and institutional capacity for high performing agricultural innovation systems and possible options to overcome constraints. Much of the discussion focused on the constraints facing women entering agricultural disciplines as a result of both social and institutional inequalities.

Looking to the future, the final day of the AgExchange covered a range of promising practices, including technology, networking, and working with the private sector. Mobile phone use was highlighted as valuable for sharing extension and advisory service information with farmers and helping farmers gain access to real time market information and mobile banking. Data collected about farmers' communication needs can be used to improve services in the future.

Networks allow for sharing of resources as well as risk reduction. Networks that begin with personal relationships can be particular effective, such as those among university alumni, especially when they have a unified purpose. Networks can be expanded using new technologies and social media. Institutional networks, such as RUFORUM in Africa, can help individual organizations by providing examples of different approaches to shared problems. Among farmers, community networks help to offer examples of different agricultural practices and strengthen adoption.

Engagement with the private sector is increasing and increasingly important. Participants identified constraints facing universities seeking to work with the private sector as including difficulty in changing attitudes and behaviors. Some recommendations for strengthening engagement included learning to speak the language of the private sector, conducting labor market surveys to identify the needs of the market, and seeking private sector involvement in curriculum development.

Many of the themes and recommendations in the three reports were supported by the AgExchange. Other points, however, including the major recommendation for USAID to establish a Preferred Partner Institution Program, were not directly addressed. It was indirectly supported though by the strong support for long-term programming and U.S.-developing country university partnerships.

Findings on ways to enhance HICD that emerged from the AgExchange are listed below:

1. Design human and institutional capacity development activities strategically, ensuring that individual leadership, management, and technical skills strengthen institutions.
2. Strengthen long-term institutional capacity development activities.
3. Build diverse partnerships of mutual interest and motivation.
4. Support programs to be flexible, adaptable, and responsive to market need.
5. Build both human and institutional networks.
6. Increase women's participation in the agricultural sciences by establishing and maintaining gender-equitable institutions.
7. Increase access and use of information and communication technologies in agricultural innovation systems based on findings from careful monitoring and evaluation of real impact.

Gretchen Neisler, Director for Global Connection in Food, Agriculture and Natural Resources at Michigan State University, and Carl Larsen, Senior Agricultural Education Specialist at the World Bank gave comments on an earlier version of this report at the BIFAD public meeting in Washington, D.C. on February 27, 2015. They both supported the seven themes listed above as reflective of good HICD principles. Each of them also challenged the HICD community to think bigger and to challenge the current orientation and structure of programming in pursuit of transformative efforts able to achieve the needs of a truly innovative agricultural system for the 21st century. Neisler, in particular, emphasized the importance of point number five above, to "build both human and institutional networks" and of finding ways to actually do this. Both Neisler and Larsen emphasized the importance of context, and urged more nuanced thinking about the different roles of U.S. and African universities in HICD efforts. In addition, each agreed that long-term relational support rather than short-term project-level funding is needed to create sustainable programs.

The AgExchange did not explicitly identify next steps for USAID programming, it did validate most of the report recommendations. Possible activities for consideration by BIFAD and USAID as next steps towards future program development are:

1. To organize a series of targeted convenings with diverse partners on key topics emerging from AgExchange. Convenings are a unique type of workshop popularized by the Bill and Melinda Gates Foundation that are intended to address both new and/or intractable issues. Typically a background summary paper is prepared and distributed to the group of invited experts who represent a diverse group of between 10-12 stakeholders. These participants, in turn, each prepares a short presentation to address issues raised by (or left out of) the background paper. Presentations are organized to provide two contrasting approaches to an issue and a facilitator manages the discussion to address both pre-identified questions and those that emerge during the sessions. The meetings last for two days to provide ample time for discussion, with a focus on achieving clarification on key points that can inform the organization's workplans or policies. By bringing in a set of experts to work on a targeted and defined subject, the convenings offer more relevant access to needed expertise than is easily contributed by a standing board of advisors or scientific council. Based on the discussions in the AgExchange, the topics that might be most profitably tackled in a convening format are:
    - The role of ICT for HICD in agriculture
    - Lessons learned for strengthening partnerships for institutional change
    - Strengthening gender equality in agricultural research and development

- Assessing performance management approaches for HICD.

2. To support investments in cost-effective, documented "best practices" for institutional change that would: i) include an analysis of the reasons that previous recommendations have not been implemented, ii) test recommendations against evidence, and iii) identify the most critical constraints to success.
3. To initiate and moderate a conversation about identifying goals for institutional performance and assessment that would be of mutual benefit for USAID and universities. For example, the suggestion in the Lechtenberg et al. report (2014) to "to modify promotion and tenure protocols to recognize scholarly products on international engagement and development by junior faculty" (reported in Table 1) is one such topic on which USAID and universities could have a substantive discussion, negotiating a set of goals and assessment measures for common benefit.

Transcripts of the AgExchange are available at: http://agrilinks.org/agexchange/agexchange-resource/agexchange-transcript. The resources mentioned are documented at: http://agrilinks.org/agexchange/9189/resource

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I. Introduction

Achieving the goals of enhanced global food security as envisioned in the United States Government's Feed the Future (FTF) Initiative will require individuals who are highly skilled in relevant disciplines working in efficiently functioning institutions both in the U.S. and overseas. According to a report commissioned by the United States Agency for International Development (USAID) with the Board for International Food and Agriculture Development (BIFAD), "many educational institutions in FTF countries have not attained the level of academic excellence needed to accomplish [these] desired goals. Similarly, enhanced U.S. university capacity in science for international development, along with institutional strengthening, is needed" (Lechtenberg et al. 2014:1).

To learn from stakeholders engaged in human and institutional capacity development (HICD), particularly in the agricultural sectors, about what has been working, what has not, and what activities appear to hold the greatest promise for strengthening food systems, BIFAD along with the United States Agency for International Development (USAID) recently supported a series of consultative fora. The process of consultations mobilized different communication channels and techniques to engage a wide network of stakeholders to address the question of how HICD can support agricultural

[1] Word cloud provided by Anne Clare Hervy using Wordle (www.wordle.net/create) from transcripts of the e-consultation.

innovation systems to influence future USAID programming. The consultations followed the publication of three reports that BIFAD and the Association for Public and Land Grant Universities (APLU) commissioned to examine different dimensions of HICD (Box 1).

Box 1: Commissioned Reports on HICD

BIFAD Commissioned Report on *Human and Institutional Capacity Development: Role of USAID and Title XII Under Feed the Future Programs* (2014) by Victor Lechtenberg (Purdue University), Albert Ayeni (Rutgers University), Ralph Christy (Cornell University), and Carol Kramer-LeBlanc (Consultant).

APLU commissioned the report *Good Practices in Leveraging Long-term training for Institutional Capacity Strengthening* (2014) by Andrew Gilboy and Anne-Claire Hervy.

APLU's Knowledge Center for Higher Education for African Development commissioned the report *African Higher Education: Opportunities for Transformative Change for*

Stakeholders in HICD strengthening include individuals from higher education institutions, national agricultural research institutes, ministries of agriculture, USAID, firms, and local community-based organizations. These stakeholders participated in three complementary forums to provide feedback on effective programming that supports human and institutional performance improvement, key constraints and possible options for human and institutional capacity development, and promising practices to support high performing agricultural innovation systems. The three fora included a side event at the World Food Prize on October 15, 2014; a webinar, and a three-day online consultation. These activities were supported by USAID, APLU, Cultural Practice, LLC, and the USAID Bureau for Food Security (BFS) Knowledge Driven Agriculture Development Program (KDAD).

This report first provides a short review of the background to and findings of the three commissioned reports that set the stage for the sequence of events that culminated in the AgExchange e-consultation. An overview of the different consultative events that took place in October and November of 2014 follows. The main focus of the report is a synthesis of the participants' comments during the three-day e-consultation, organized around the guiding themes that structured the event. Emerging issues that cut across several of the themes are also presented. The final section of the report uses the AgExchange conversation to supplement the findings of the three commissioned reports and other materials to inform next steps in HICD research and activities.

II. Background

USAID has a long history of investing in human and institutional capacity development in the agricultural sector. Even before the passing of Title XII in 1975 which provided authorizing legislation for strengthening the engagement of U.S. universities in agricultural development, USAID had already been supporting the development of agricultural universities abroad and sending U.S. university faculty and advisors to provide advice to developing country ministries of agriculture, livestock, and fisheries. The passage and reauthorization of Title XII broadened the type of engagement possible, including both short-term contract work for technical assistance as well as long-term institutional programming, such as that exemplified by the former Collaborative Research Support Programs (CRSPs) now renamed and re-envisioned as the Feed the Future Innovation Labs. These USAID-funded programs have for over

thirty years supported U.S. universities and partners overseas to jointly pursue scientific investigations to overcome critical agricultural constraints facing global food systems (Rubin 2008).

In recent years, USAID has deepened its support to many different types of higher education programs, with a new focus on linking the individual and the institutional aspects of HICD. For example, current programming includes individual fellowships, knowledge management activities, institutional networking programs, as well as continued interest and funding in agricultural research and education programs. A selection of only some of these myriad programs include several types of fellowship programs (e.g., Borlaug Leadership Enhancement in Agriculture Program (LEAP) and Borlaug Higher Education for Agricultural Research and Development (BHEARD) fellowships at the University of California-Davis and Michigan State University respectively and the African Women in Agricultural Research and Development (AWARD) implemented through the Consultative Group for International Agriculture Research (CGIAR)), institution building for universities and national agricultural research organizations (e.g., Innovative Agricultural Research Initiative (iAGRI) in Tanzania and Education and Agricultural Research (ERA) in Senegal), research programs on specific crops or agricultural and environmental systems approaches (e.g., the FTF Innovation Lab for Soybean Value Chain Research), curricular development support, networking programs, and knowledge management activities (e.g., Virginia Tech's Innovation for Agricultural Training and Education (InnovATE) APLU's Knowledge Center on Higher Education for African Development, AgriLinks).

Each of the three commissioned reports listed earlier addresses different dimensions of USAID's support for HICD. The first report responded to a request by former USAID Administrator Raj Shah to obtain BIFAD's advice on how USAID should address HICD challenges in the future.

To that end, BIFAD established an HICD Working Group, chaired by BIFAD member Gebisa Ejeta from Purdue University. This group developed a scope of work (SOW) for conducting the study. The SOW asked for the study to recommend a broad strategic plan for HICD as part of the overall goals of FTF, contributing to the sustainability and scaling of HICD efforts. It acknowledged that universities, while a critical player supporting human and institutional capacity building, have over time, been joined by other actors with different skills and interests. At the same time, the context of HICD has also changed, with the views of developing countries themselves are increasingly important in defining both the context and structure of HICD activities. Another component of the SOW was to review HICD performance metrics in terms of both program outputs and outcomes.

The resulting report (Lechtenberg et al. 2014) gives a comprehensive review and assessment of the broad range of USAID's investment in higher education in agricultural fields on the many components of the SOW. As shown in its recommendations in Table 1, the report identified priority actions in four major areas: i) Strengthening Institutional Capacity and Partnerships to Advance Impact Pathway; ii) Strengthening Access to U.S. Higher Education Systems by Students from FTF Countries; iii) Enhancing Collaboration between Developing Country Universities, U.S. Universities and other Public/Private Sector Institutions; and iv) Building Developing Country Access to U.S. Technology.

As will be seen in the AgExchange discussion in Section IV of the report, nearly all of these recommendations found general support among the consultation participants.

Table 1: Recommendations from the BIFAD HICD Report
(NOTE: THE RECOMMENDATIONS HAVE BEEN EDITED FOR SPACE)

A. Strengthening Institutional Capacity and Partnerships to Advance Impact Pathways
#1: *Establish a long-term **Preferred Institution Partners Program** to link FTF country and U.S. higher education institutions (HEIs).*
#2: *Encourage U.S. institutional leaders to modify promotion and tenure protocols to recognize scholarly products on international engagement and development by junior faculty.*
#3: *U.S. institutions should develop educational and training programs, especially long-term, to include leadership training and experience as well as the use of ICT—both to receive and to deliver educational content.*
#4: *Develop an internal and external branding strategy for USAID supported HICD efforts, and identify outcome metrics to which each agency and mission is accountable*.
B. Strengthening Access to U.S. Higher Education Systems by Students from FTF Countries
#5: *Streamline contractual processes with U.S. institutions*
#6: *Encourage U.S. universities to internationalize, to increase the number of students from FTF countries—especially including agricultural and related sciences, and to forge more partnerships in FTF countries in the agriculture and food arenas*.
#7: *Urge USAID to look at international competition today through an HICD lens and to prioritize maintenance of HICD as a mechanism of influence.*
#8: *Encourage USAID to continue to support investments in HICD for women and girls.*
C. Enhancing Collaboration between Developing Country Universities, U.S. Universities and other Public/Private Sector Institutions
#9: *Encourage USAID/W and USAID Missions to help broker collaboration pan-African (e.g. CAADP and AGRA) and national strategic efforts in FTF countries to jointly support HEIs' involvement in community-focused food and agricultural research, education and outreach with the aim of advancing HICD goals in the areas of interest to all stakeholders.*
#10: *Encourage coordinated support among USAID/W and Country Missions for work with in-country policy leaders, private sector entities and higher education institutions to strengthen curricula relevant to the agriculture and food sectors and to include a focus on the needs of farmers, small businesses and local communities.*
#11: *Encourage greater involvement of FTF Country Missions in HICD program development and implementation*
D. Building Developing Country Access to U.S. Technology
#12 *Encourage USAID to invest in developing and nurturing scientific and educational networks in FTF countries.*
#13: *Encourage greater attention to and increase investments in ICT infrastructure that will strengthen links between FTF country institutions and digital HICD networks in agriculture and food security*
#14: *Promote collaboration between U.S. and FTF country HEIs to develop and integrate appropriate agriculture and food system technologies into smallholder agriculture and SMEs*

Hervy and Gilboy's (2014) report, "Good Practices in Leveraging Long-term Training for Institutional Capacity Strengthening" focuses on the ways that training programs for individuals can be structured and supported to encourage and achieve better outcomes for the institutions in which they work. The report offers practical suggestions for creating better links between the needs of the institution and the types of trainings offered to individuals, having identified that the disjuncture between training goals and institutional needs to be a key factor in reducing training impacts (2014: 8). Like the BIFAD report discussed above, the report also highlighted the importance of providing individuals with training in leadership and "soft skills" including mentoring as ways useful ways that can help to create and sustain change within institutions (2014: 12-13). Greater attention to both choosing the right performance indicators for measuring institutional strengthening and putting in place an effective monitoring system can improve the benefit of individual training on institutions. The report includes many resources.

The third report, "African Higher Education: Opportunities for Transformative Change for Sustainable Development" (2014), focuses on similar issues for Africa looking broadly at higher education in all sectors. It looks at the current operations of Sub-Saharan African higher education institutions (HEI) at system and institutional levels (see Table 2). It reviews evidence to support the critical importance that African higher education institutions offer to achieve development goals, reporting that:

> Higher education contributes to social and economic development through four major missions: 1. The formation of 'human capital' (primarily through teaching); 2. The building of knowledge bases (primarily through research and knowledge development); 3. The dissemination and use of knowledge (primarily through interactions with knowledge users); and 4. The maintenance of knowledge (inter-generational storage and transmission of knowledge).

Table 2: Recommendations for USAID's Investments in African Higher Education Institutions

A.	**Recommendations to USAID on the Development and Management of the Agency's Higher Education Portfolio**
	1. Concentrate USAID Investments: focus on a few countries, combine system level interventions with comprehensive long-term institutional partnerships
	2. Intervening at the Institution-level: Higher education partnerships should be at the core of USAID's efforts in HICD and these partnerships should be long-term and comprehensive
B.	**Programmatic High Priorities at the Institutional Level**
	1. Professional Development of Faculty and Staff
	2. Strengthening the Capacity of Institutions to Use Labor Market Data to Improve Quality and Relevance
	3. Strengthening the use of and experimentation with e-learning in African higher education institutions
	4. Supporting the Search for Other-than-Public Revenue for Higher Education
C.	**Programmatic High Priorities at the Country Level**
	1. Assessing and Improving Overall Quality of Higher Education Institutions
	2. Assessing and Improving the Responsiveness of HEIs to the Labor Market
	3. Strengthening E-Learning and the Use of Information and Communications Technology in Higher Education
	4. Working with ministries on finding solutions to the finance challenges of higher education

III. The AgExchange Suite of Activities

To provide feedback on approaches to building human and institutional capacity to support agricultural innovation systems described in the three reports summarized in Section II, BIFAD and USAID set up a process for engaging stakeholders to "groundtruth" the reports' recommendations and to seek input on future programming possibilities. The consultations included four complementary activities to engage different sets of stakeholders In sequence these activities included a side event at the World Food Prize, Twitter chat on Youth and Agriculture, a Webinar, and a three-day online consultation or "AgExchange." Each event had a unique communication purpose, as described below, but also help to set the stage for the cumulative discussions covered in the AgExchange consultation.

World Food Prize Side Event (October 15, 2014)

BIFAD sponsored a side event following the public BIFAD meeting in Des Moines, Iowa prior to the World Food Prize meetings being held there. The side event featured a panel with the authors of the three recent reports on capacity development in agricultural development (Box 1), a panel responding to the three reports, and a preview of the BIFAD/USAID/APLU E-consultation.

BIFAD Chair Brady Deaton, BIFAD member Gebisa Ejeta, USAID/BFS Senior Deputy Assistant Administrator Richard Greene, and APLU Vice President of International Programs Montague (Tag) Demment welcomed the panel and audience, providing an introduction to the topic. The report authors then highlighted the key recommendations in the reports and implications for USAID HICD programming. A panel including Greg Traxler from the Bill and Melinda Gates Foundation, Ruth Onian'go a Kenyan nutritionist and Editor in Chief of the African Journal of Food, Agriculture, Nutrition and Development, and David Bathrick, a retired USAID Agricultural Development Officer, reflected on the themes of the three reports. Greg Traxler commented that the Gates Foundation uses a three-pronged approach to support post-baccalaureate education including training individuals through research grants, building networks of scientists, and using mentorship to fill gaps in training. David Bathrick noted that government and private organizational support will be needed and emphasized also the need to continue to work with land grant universities to build the next generation of scientists. Ruth Oniang'o acknowledged the history of U.S. engagement of students from around the world and argued in favor of greater support for them at U.S. universities and follow up with them after graduation. A preview of the then upcoming webinar and AgExchange was also provided.

Twitter Chat (November 13, 2014)

The Twitter chat hosted on Agrilinks engaged people around the world to discuss the potential for greater involvement of youth in agricultural development and how they will contribute to feeding the world by 2050. The online chat was led by experts from USAID, Young Professionals for Agricultural Development (YPARD), APLU, and Penn State's United Nations Educational, Scientific and Cultural Organization Chair. The chat was organized around four guiding questions:

1. What are the biggest hurdles facing youth in agriculture?
2. What skills do youth need to be most effective in agricultural innovation?
3. What agricultural policies and programs promote youth capacity building and development?
4. What informational resources are available to help empower youth who are interested in working in agriculture?

The Twitter Chat responses to these questions parallel many of the points raised in the following AgExchange discussion. The most common challenges raised included a lack of access to productive resources such as land, finance, and technology, but many participants also noted the critical role of education. Lack of both technical knowledge, including business skills, and lack of "soft skills" related to leadership were frequently raised. In addition to these skills, several participants emphasized the importance of networking and support groups or associations, such as Future Farmers of America and 4-H clubs. University programs are critically important in reaching youth and changing attitudes about the opportunities that careers in agriculture and agribusiness can offer. New attention to the importance of youth is reflected in the development of organizational policies to support youth programming, including that at USAID, FAO, and UNESCO among others. A summary of the Twitter Chat is available at the following website: http://agrilinks.org/blog/novembers-askag-twitter-chat-recap-youth-agriculture

Webinar: "Feeding the World in 2050: How Human and Institutional Capacity Development Can Support Agricultural Innovation Systems" (November 17, 2014)

This webinar kicked off the three-day AgExchange. It hosted the report authors or representatives of the commissioned reports to offer expert perspectives on the how the reports' findings can support USAID's future investments in HICD. USAID/BFS Chief Scientist Rob Bertram opened the session and discussed USAID's commitment to HICD as a critical investment for promoting agricultural development. Susan Owens, Division Chief of the HICD/BIFAD Division (USAID/BFS Office of Agriculture Research and Policy) introduced the presenters: Mark Varner, Senior Counselor of APLU, speaking for the authors of the BIFAD report; Andrew Gilboy of Associates for Global Change speaking on the "Good Practices in Leveraging Long-term Training for Institutional Capacity Strengthening" report and Anne Clare Hervy of APLU summarizing the report, ""African Higher Education: Opportunities for Transformative Change for Sustainable Development."

The webinar brought in 73 participants from academia and/or university research institutions, for profit, firms, USAID Washington, USAID Missions, other governments, non-profits/private voluntary organizations, and other donor organizations. Deborah Rubin of Cultural Practice, LLC moderated the session. Audio and web chat transcripts as well as the presentation slides from the webinar are available at Agrilinks: http://agrilinks.org/agexchange/agexchange-resource/resources-agexchange-kick-webinar

AgExchange: Feeding the World in 2050: How Human and Institutional Capacity Development Can Support Agricultural Innovation Systems (November 18-20, 2014)

The three-day online AgExchange hosted by Agrilinks provided a platform for a wide network of stakeholders to post comments and engage in a dialogue with others from around the world to address three sub-themes focused under the overarching theme "Feeding the World in 2050: How Human and Institutional Capacity Development Can Support Agricultural Innovation Systems." Participants registered from 22 countries in Sub-Saharan Africa, Asia, Europe, Latin America and the Caribbean, and the U.S., Canada and Mexico (Annex 1). The AgExchange was facilitated by eight experts from U.S. Universities engaged in human and institutional capacity programs, APLU, and USAID (Box 2). Of the 176 participants, 66 actively participated in posting over 570 posts over the three days. This AgExchange had the highest level of participation to date compared to previous AgExchange events. Cultural Practice, LLC drafted summary posts covering the sub-themes for each day (Box 3). The AgExchange was said to be the most successful e-consultation held to date under the new AgriLinks project. The AgExchange

discussion is available at Agrilinks: http://agrilinks.org/agexchange/agexchange-feeding-world-2050-how-human-and-institutional-capacity-development-can.

Box 2: AgExchange Facilitators

Clara Cohen, Senior Science Policy Advisor, USAID, BFS/ARP

Amanda Crump, UC Davis, Deputy Director, Feed the Future Innovation Lab for Collaborative Research on Horticulture

Henry Fadamiro, Auburn U, Assistant Dean & Director of Global Programs, College of Ag.

Tom Hammett, Virginia Tech U, Director, InnovATE

Anne-Claire Hervy, Associate Vice-President for International Development and Programs and Director, Knowledge Center on Higher Education for African Development, APLU

David Kraybill, Ohio State U/Sokoine U, Director, iAGRI

Mark Varner, Senior Counsel, BIFAD, APLU

Stephen Weller, Purdue U, Principle Investigator, Feed the Future Innovation Lab for Collaborative Research on IPM and Horticulture Innovation Lab

IV. Synthesis of the E-Consultation, November 18-20, 2014

The synthesis of the key sub-themes for the AgExchange draws on the 570 posts made by participants and facilitators from 24 countries (including the U.S.) around the world during the three-day online AgExchange. It is also supported by the content of the presentations made during the AgExchange kick-off webinar, the comments from the Twitter Chat on Youth in Agriculture, and the discussion of the World Food Prize side event. Each sub-theme drew on responses to multiple sub-questions prepared by the planning committee in advance of the AgExchange. A full list of those questions is given in Annex 2.

Box 3: AgExchange Sub-themes and Schedule

Day One (Nov. 18)

- Examples of effective programming contributing to institutional capacity development and good measures of performance for building institutional capacity

Day Two (Nov. 19)

- Key constraints to developing human and institutional capacity for high performing agricultural innovation systems and possible options to overcome constraints

Day Three (Nov. 20)

- Promising practices: role of technology, networks, working with the private sector

The synthesis presented below is organized according to the themes that structured the AgExchange on each day's discussion (see Annex 2). It strives to accurately reflect the opinions of the participants in the consultations, the majority of whom are important stakeholders in the process. Stakeholders are those affected by changes in capacity development in higher education, especially those who may be highly impacted by changes but have low influence (e.g. students and their parents). Stakeholder consultation is understood here as a

structured dialogue for hearing, understanding, and responding to stakeholder interests and concerns. It is thus important to emphasize that the discussion presented here is not a report on a formal survey or in-depth research on these topics, but a report on a global conversation that offers insight bur is not a rigorous scientific review.

A. Effective programming for human and institutional performance improvement (Theme A, Day 1)

Different types of training, non-training, and a combination of training and non-training interventions have been effective in supporting high performing agricultural innovation systems. One point raised early on in the discussion on Day 1 was that the central definition of "human and institutional capacity development" has been problematic, sometimes conflating the human and the institutional dimensions, assuming that improvements in human capacity will automatically lead to institutional strengthening. Alternatively, in the past, some understood HICD as being achieved only through a simplistic model of classroom training and the transmission of technical knowledge, with no or little attention to the complementary "soft skills" in leadership, planning, management that are needed both to help individuals in their own careers but also to achieve institutional strengthening [21] [23] [7]. As evidenced through the sharing of knowledge and resources during the e-consultation's four activities, often effective programming combines both training and non-training interventions (see definitions in Annex 3) to support both human and institutional capacity development. Additionally, human training interventions have the potential to contribute to institutional performance improvement if sensitively and thoughtfully designed to do so, but will not happen automatically (Hervy and Gilboy 2014). Some examples are illustrated below.

A1: Training Interventions

Participants during the AgExchange wrote positively about their experiences with a range of training interventions and provided several examples where building students' soft skills like leadership and management contributed to changes in institutional norms, including: the African Women in Agricultural Research and Development (AWARD), The West Africa Centre for Crop Improvement (WACCI), The Regional Universities Forum for Capacity Building in Agriculture (RUFORUM), The Innovative Agricultural Research Initiative (iAGRI), Escuela de Agricultura de la Región Tropical Húmeda (EARTH University), Escuela Agricola Panamericana (Zamorano University) program in Honduras, FTF Innovation Labs, and former Collaborative Research Support Programs (CRSPs). For example EARTH University in Costa Rica uses a curriculum that provides opportunities for agricultural students to build entrepreneurial skills in addition to technical skills and provides links to the international agribusiness community [2]. Further evaluation is needed to understand how aspects of programs like EARTH can be scaled-up or replicated in other areas [3]. Partnerships between US and developing country universities can facilitate staff exchange and scholarships to enhance learning similar to the Preferred Partnership Program proposed in the BIFAD HICD report which would link peer institutions in the U.S. and FTF countries to build both human and institutional capacity to support a high performing agricultural innovation system [4].

A2: Non-training interventions

Non-training interventions like mentoring, informal social networking events, educational clubs, and sharing educational videos can complement technical and soft skill training [5] [6]. Non-training interventions work with individuals and teams at the grassroots to support continuous learning practices and identify more appropriate solutions to business and performance problems. This process can be

called *learning in situ*. For example, it could allow students to shadow faculty members in the field or laboratory to observe where they gain leadership skills and have opportunities to consult experts in their fields [3] [8]. This approach is similar to the "do-reflect-apply," a method which has been used in Peace Corps [9]. The Lima Rural Development foundation program called Abalimi Phambili (Farmers First), a South African rural development non-profit, has supported young agricultural students in six-month long field-based internships to develop administrative and communication skills and apply technical training in the field [2]. A similar learning method has also been applied at Zamorano University and the iAGRI program among others [10] [3]. The D-Lab model which began at the Massachusetts Institute of Technology builds students' technical skills and also provides them with the skills they need to work with and design for clients, building both hard and soft skills. The D-Lab model has been applied through partnerships with the FTF Innovation Lab for Collaborative Research on Horticulture and Zamorano University in Honduras and Kasetsart University in Thailand [11].

A3: Combining training and non-training interventions

Integrating non-training interventions into training programs can strengthen an institutions' performance [12]. In particular, students who studied in the U.S. who return home to apply their technical skills may return to an institution facing many constraints like weak management and limited funding which can be discouraging. Non-training inventions can build leadership skills, help students learn how to engage the private sector, network with alumni, and build a community focused on producing first-class research [12]. An analysis of those institution-specific constraints could be done prior to the training to match the best non-training interventions with each student [13].

A4: Measuring Performance Improvement

Measuring performance improvement can be challenging particularly at the institutional level. Within the agricultural innovation system the goal is to measure not only the physical technologies, but also social capital, including knowledge and networks. Measuring performance improvement can include identification of needs and opportunities for innovation, network formation and management, developing testing and adapting opportunities, knowledge and information exchange, provision of an enabling environment for innovation, market formation, resource mobilization and creation of legitimacy/counteract resistance to change [14]. Tools and approaches used to measure performance improvement include strategic planning tools, self-assessments, the Organizational Performance Index (OPI), Theory of Change (ToC) approaches, and annual performance reviews [15]. The OPI measures four different areas of improvement in effectiveness, efficiency, relevance and sustainability [18]. Gilbert's Behavioral model [16] was mentioned as another tool for identifying the root cause of a constraint that often that the working environment is itself the biggest constraint [17].

> One good way to [build linkages between partners] is as a mutual institution improvement project. Each institution begins to do a gap analysis…deciding on which indicators are meaningful in their own contexts, but each is willing to admit that improvement is possible and necessary. U.S. institutions cannot be instructing those of other nations to become more like us, as we all need to learn how we can be better and more effective in the rapidly changing context of food and agriculture in the places we can most directly effect.
>
> Cornelia Flora
> Charles F. Curtiss Distinguished Professor Emeritus
> Iowa State Universitv

A5: Role of Partners

Partnerships frequently emerge when there is mutual interest for improvement; however, potential partners need to be aware of those mutual goals [19] [20] [21]. Diverse actors and organizations contribute to the complexity of the agricultural innovation system, which in part is defined as a complex

web of related individuals and organizations (Rajalathi et al. 2008). Partnerships between diverse actors may only be possible if organizations advertise their capabilities and seek out partners that may be unaware of that mutual interest [21] [22]. A complex web of partnerships can include partnerships between local organizations, universities, government institutions, and the private sector. The expertise and capacity of complementary development partners can be leveraged to strengthen other institutions' performance in agricultural innovation systems.

B. Key constraints and possible options to develop the necessary human and institutional capacity for high performing agricultural innovation systems (Theme B).

The discussion about constraints to HICD programming included many well-known conditions that restrict higher education institutions from developing effective programs such as: insufficient financial resources, lack of accountability structures, and hesitancy among students to study agriculture. Actors in the agricultural education community are well aware of these common constraints, but despite this awareness and efforts to address these constraints, few examples of sustainable institutional change were raised in the discussion [1].

Ineffective governance is another major obstacle to change because many institutions lack champions at policy and planning levels who can advocate for or implement those changes [1] [24] [3. Some argued that institutional change is a long-term process which is difficult to achieve because donors do not invest over long periods of time [25] [26]. Shifts in administrative priorities can halt or reduce investments [26].

Institutional rigidity also inhibits opportunities for partnerships among diverse actors which could then support capacity development activities that build both technical and soft skills [8]. Some programs are taking innovative approaches to build bridges across disciplines and schools within a single institution. The Association of African Businesses Schools works with African universities to build bridges between business and management colleges and universities and departments of agriculture [27]. Work environment constraints can also inhibit performance improvement [17].

Constraints and Opportunities for Reducing Gender Inequalities in HICD

Limitations to achieving gender equity in agricultural research and innovation systems is a key constraint to building high performing agricultural innovation systems through HICD. There are fewer women than men in agricultural sciences because of "pipeline" issues or not enough women starting in lower grades and lack of adequate support and mentorship [8]. Recent reports document disparities between men's and women's participation in agricultural research and higher education and the constraints (Manyire and Apekey 2013; Beintema and Marcantonio 2010). The mentorship programs implemented through the Consultative Group for International Agricultural Research (CGIAR)'s AWARD Fellowship program supports women agricultural scientists throughout the agricultural innovation system to not only complete their academic program but have the skills to participate in the workforce on farms, in research facilities, in markets and policy forums (AWARD 2014) [8] [28].

Discriminatory attitudes about women's participation in agricultural research and higher education are key constraints to women's participation. Removing institutional barriers that limit women's participation is critical. Research programs need to be gender responsive from design to delivery and should engage women to inform innovation design. There are also limitations to development of partners' influence on institutional performance [29].

There are policies and programs in place which support gender equity including USAID's Policy on Gender Equality and Female Empowerment (2012). The USAID policy has expanded staff training on gender, gender advisor appointments in the missions, and gender analyses of new programs. A partnership called Indaba Agricultural Policy Research Institute (IAPRI) between the University of Michigan, the University of Zambia, Alliance for Common Trade in Eastern and Southern Africa (ACTESA/COMESA), Zambia Agriculture Research Institute (ZARI), Zambia's Ministry of Agriculture and Livestock and Ministry of Commerce and Trade , and other collaborating partners has promoted policy dialogue on gender equity as well as long-term and short-term training for women [26]. A new USAID award Integrating Gender and Nutrition within Agriculture Extension Services (INGENAES) is focused on strengthening networks to improve farmer systems through extension with greater attention to both gender and nutrition [30].

A number of recommendations to improve gender equity in HICD were noted in APLU's report on African Higher Education:

> Increased equity can be sought by intervening to promote equity at earlier stages of education and by allocating funds directly to students rather than institutions. Financial aid seems to be the most effective form of equity intervention. Gender equity can be raised through national strategies, affirmative action, pre-entry support, gender sensitization courses, development of female teachers and gender audits (2014: 21).

C. Promising practices that can be put in place to build needed human and institutional capacity for agricultural innovation systems (Theme C)

To overcome the constraints identified in the previous section it was suggested that stakeholders need to collaborate and support both long and short-term investments in HICD. Programs that develop both soft and hard skills also support trainees to build skills are also promising way to ensure that trainees can be influential in work environments [33].

C1: Role of Technology

Increased access and use of information technologies can improve institutional performance among different actors in the agricultural innovation system. These can include mobile phones, instructional videos, online learning courses, and social media. Mobile phones can be used to share extension and advisory service information with farmers and help farmers gain access to real time market information and mobile banking. Collecting data about farmers' communication needs can be used to improve services in the future. Some mobile phone and IT extension and advisory service programs include Grameen's Community Knowledge Worker program, International Center for Tropical Agriculture (CIAT) and Agro-Insight's farmer-to-farmer video training, Digital Green, and Scientific Animations Without Borders. Many of these programs are supported through public-private partnerships.

Social media is another key way to share best practices among young farmers. For example, the group Mkulima Young, engaging youth in agriculture issues, has over 30,000 followers on its Facebook page sharing information about farming practices.

In higher education in agriculture participants also noted useful applications of e-learning tools including the use of Massive Open Online Courses (MOOCs) [34]. Investments in technological infrastructure can support innovation and expanding open access for scholarly journals may be one way for institutions to

build capacity in a resource scarce environment [31] [32] [29]. The iAGRI program is currently working with Sokoine University of Agriculture to help the university gain access to scholarly works through a system called LibHub, an online information resource discovery tool which allows users to access electronic resources from different providers through a single portal.

C2: Promise of Networks

> "…agriculture cuts across multiple ministries, departments and agencies and to achieve the goals of food security and agriculture they have to work together as a network."
>
> David Tardiff-Douglin
> Senior Development Specialist
> DAI, Inc., Director of Africa LEAD II

Both human and institutional networks have the potential to benefit research communities as well as farmer communities in agriculture innovation systems, extending the reach of new technologies and information beyond the institution or individual. The Regional Universities Forum for Capacity Building in Agriculture (RUFORUM), a network of 42 institutions in Africa, collaborate to address problems in another member institution [35]. Networks like these can reduce risk and facilitate the sharing of resources. Similar networks include Collaborative Master of Science in Agriculture and Applied Economics (CMAAE), Education for African Crop Improvement (EACI), Partnership for Enhancing Agriculture in Rwanda through Linkages (PEARL/SPREAD), and Biosciences Eastern and Central Africa (BecA) (Moock 2011). Networks often form incrementally based on farmers' and stakeholders' mutual needs [2]. Successful networks may require incentives for participants and mutual advantage for all actors. Additionally, institutions can connect with local community networks and leaders, trusted by the communities institutions are working with, to showcase agricultural innovations which may increase adoption of new technologies and practices [36] [37]. Institutional and human networks, like professional or alumni networks, can lead to spillovers of available technology or information to extend the reach of the research, technology, or human knowledge beyond the program to increase the capacities of individuals or institutions to achieve their goals [35] [28].

C3: Public Private Sector Engagement

Increased collaboration between the private and public sectors including research universities and institutions is another promising practice that can promote HICD to support agricultural innovation systems. Universities and institutions in particular need to learn how to "speak the language" of the private sector, conducting labor market surveys to identify the needs of the market, and private sector involvement in curriculum development [38]. Institutional constraints like the institutional rigidity, resistance to change, and adopting new approaches however, can limit the initiation of these conversations between the universities and the private sector. Fostering better relationships between NGOs and the private sector require clear and realistic expectations on both sides.

C4. Envisioning 2020 and Beyond: Emerging Findings from the AgExchange for the Design and Support of Future HICD programming

1. ***Design human and institutional capacity development activities strategically, ensuring that individual leadership, management, and technical skills strengthen institutions.***

The agricultural innovation system is defined as a "network of organizations, enterprises, and individuals that bring new products, new processes, and new forms of organization into economic use, together with the institutions and policies that affect their behavior and performance" (Rajalathi et al. 2008). In

this system the institutions and people are linked and influence each other. Training interventions designed to help build trainees' technical as well as "soft skills" give trainees the tools to overcome institutional constraints and become champions for change in their institutions.

2. *Strengthen long-term institutional capacity development activities.*

Institutional change is a long-term process. Committing to funding long-term institutional change and ensuring that there is appropriate monitoring support is necessary to see performance improvement. Factors like shifts in administrative priorities and donor commitments need to be addressed in the design of the initial programs to ensure that the investment is sustainable.

3. *Build diverse partnerships of mutual interest and motivation.*

The agricultural innovation system is defined in part as a complex web of related individuals and organizations. This complex web consists of partnerships built on mutual interest and motivation. A diverse set of partners, including public-private partnerships, support innovation. Efforts that build awareness of mutual interests could bring together diverse partnerships that support innovation and high performing agricultural innovation systems.

4. *Support programs to be flexible, adaptable, and responsive to market needs.*

A demand-driven approach to HICD will help to ensure that universities and workplace training alike is providing students and employees with the skills needed to succeed and contribute to a vibrant agricultural innovation systems. Sandwich programs, practical trainings providing hands-on experiences in conjunction with targeted course work, mentoring, and virtual classrooms and other on-line programs are all possible avenues for enhancing responsiveness to market needs.

5. *Build both human and institutional networks*

Tapping into human and institutional networks can help extend the benefits of technology, human capital, and ideas beyond one project or program. Institutional networks can also reduce risks and facilitate the sharing of information. Promoting opportunities for collaboration between networks is one pathway to diffuse technology and knowledge that can benefit stakeholders in the agricultural innovation systems and their institutions. Networks alone are not sufficient, however. As Moock stated in a review of the role of networks in building the next generation of African agricultural scientists:

> The crucial role of networks over the next decade is to ensure that the bond between higher education and practical, problem-solving science and technology capacity in Africa is a sturdy one backed by expanded access to technical resources, peers, reliable finances, and genuine local buy-in for sustained political support (2011).

6. *Increase women's participation in the agricultural sciences by establishing and maintaining gender-equitable institutions.*

Disparities between men's and women's participation in agricultural sciences persist. Academic programs need to be more gender responsive from design to delivery to attract and retain women in their programs. Fellowship programs like AWARD and Borlaug LEAP have shown promise in supporting women in academic programs to complete degrees or to provide the supplementary training and exposure needed to succeed in the workforce. Increasing opportunities for women's participation in gender-responsive research or fellowship programs has the potential to increase women's participation in the agricultural sciences.

7. *Increase access and use of information and communication technologies in agricultural innovation systems based on findings from careful monitoring and evaluation of real impact*

Information technologies like mobile phones, instructional videos, and online-learning forums increase agricultural innovation system stakeholders' access to information. Some technologies like mobile phones which are increasingly more prevalent in developing country contexts are facilitating the spread of information to farmers. Investments in information technology infrastructure in higher education institutions could strengthen students', researchers' and staffs' access to current and relevant research in journals and their connectivity to networks outside of their institution. However, the ease of promoting these technologies varies from country to country and within countries, where those who might benefit most are also the most difficult to reach. Impact evaluations of ICT for agriculture will be an important component of determining which technologies can have the greatest value among different groups.

Transcripts of the AgExchange are available at: http://agrilinks.org/agexchange/agexchange-resource/agexchange-transcript. The resources mentioned are documented at: http://agrilinks.org/agexchange/9189/resource

V. Next steps

Many of the themes and recommendations in the three reports were supported by the AgExchange. Participants strongly supported recommendations on the importance of expanding the use of new types of ICT and repurposing old ones, of establishing and strengthening partnerships between educators and farmers, researchers and practitioners, and of universities in the U.S. and developing and emerging countries. They also mirrored report recommendation to integrate leadership and management skills into agricultural education programs. Respondents enthusiastically supported efforts to build networks within regions and across the globe and to find new opportunities to achieve gender equality in higher education. Last, but not least, participants agreed on the importance of finding ways to more productively engage with the private sector.

Some of the topics raised by the facilitators were left unexplored and some of the report recommendations were not addressed in the AgExchange discussions. For example, Lechtenberg et al. (2014) recommended, as a high priority task, that USAID establish a "Preferred Institution Partners Program." This program is envisioned as a mechanism to give access to FTF country higher education institutions, to U.S. universities on a long-term and "as-needed basis, to …expertise, curricular content, and infrastructure assistance to effectively identify and serve the education and technology needs of their local community." The institutional support capability might involve trainings (short and long term) as well as a wide range of management issues and/or jointly designed and conducted research.

The consultations definitely supported the principle that institution building requires long-term commitment and partnership, but the details of this were not well-elaborated on, and the idea of having a privileged set of partnerships for some institutions was not discussed.

Another topic receiving less discussion than expected was that of performance monitoring reform and improvement. Again, the principle that more appropriate performance monitoring systems are needed was strongly endorsed, and some suggestions of different systems and examples were mentioned. However, concrete and specific ideas about transformation were not elaborated upon. As Carl Larson

suggests in his discussion summarized below, the performance goals need to be jointly agreed upon by donor and grantee.

Opportunities to employ formal training and non-training approaches synergistically was not addressed, although examples of each on their own were plentiful. And finally, while many examples were provided of different short-term successes in institutional change were offered, few examples of sustained and sustainable examples emerged. This is in part because formal monitoring ends after project completion so that examples that can be shown to be the direct result of project interventions are hard to prove. Similarly, while many cases of new ICT applications were raised, there is a dearth of formal impact evaluations to help build understanding of what works and what doesn't.

At the BIFAD public meeting in Washington, D.C. on February 27, 2015, Gretchen Neisler, Director for Global Connection in Food, Agriculture and Natural Resources at Michigan State University, and Carl Larsen, Senior Agricultural Education Specialist at the World Bank presented formal comments on an earlier version of this report Their remit was to review the findings from the three original reports and the summary report of the consultations and, to the extent possible, to place their comments within a broader frame of issues related to HICD. Both speakers fulfilled this obligation fully, raising important issues for consideration by BIFAD.

Neisler concurred with the seven emerging findings reflected in the consultative discussions, noting that they reflect key principles of HICD. At the same time, she challenged the stakeholders to think more critically about how we can truly achieve the next level of capacity development, what Clara Cohen of USAID called "Capacity Development 2.0," of designing and monitoring capacity development programming of both individuals and institutions to achieve the agricultural innovation systems that we are ultimately seeking. She explained, "We can certainly train individuals in areas of technical competency and communication skills but unless people and institutions use these skills to engage in mindful, critical decision making we have not enhanced their capacity."

Both Neisler and Larsen emphasized the importance of context, and urged more nuanced thinking about the different roles of U.S. and African universities in HICD efforts. In addition, each agreed that long-term relational support rather than short-term project-level funding is needed to create sustainable programs.

Carl Larsen began his comments with a story about two different educational institutions, both located in the same city, but whose students had different experiences. In one case, many of the students left during their first year and the university had no tracking system to follow their graduates' success. The other group kept their students engaged through their education program and tracked their post-graduate activities to know that 100% of their students had gotten jobs. Ironically, the two institutions employed the same faculty, but held them to different standards and expectations for learning outcomes (and probably compensated them differently for their performance).

Larsen used this example to explore a vision for supporting HICD in the agricultural innovation system. He argued that future HICD interventions should not simply tweak current systems of research, education, and training but strive to transform them to be able to operate more effectively in the dynamic environment facing agriculture today. Like the second school described above, institutions

need to clearly define the goals for staff and systems to produce the students who can both get hired as well as make the organizations in which they work more effective.

Achieving these goals is difficult in an environment in which donor funding operates on a four to five year timeline, limiting implementation of the activities needed to initiate and maintain long-term institutional change. He argued for funding measures that could be extended to up to 10 years to allow for collaboration and fostering of institutional change. He also recommended that institutions be held to performance-based funding, where institutions could decide themselves how to meet a set of goals commonly agreed upon with the donor, but if the goals were not met, the funding would be reduced or terminated. This recommendation reinforced a concluding comment that best practices going forward need to be adapted to the local context and meet institutions' specific needs. Similarly, Neisler advocated for drawing more systematically from the educational science that underlies systems thinking, looking at participatory leaning tools, and generally considering a range of different

Finally, Larsen, who participated in the AgExchange from Uganda, also suggested restructuring future online consultations to work on a 24 hour schedule that would encourage greater participation from Asian and African countries, rather than maintaining a U.S. based time frame. He also recommended writing a shorter version of the summary, perhaps focusing on the seven themes identified from the AgExchange, which could become a "sales" piece to capture the key messages of the reports and the consultations that could inspire and energize new action on HICD issues.

The AgExchange did not explicitly identify next steps for USAID programming, it did validate most of the report recommendations. Possible activities for consideration by BIFAD and USAID as next steps towards future program development are:

4. To organize a series of targeted convenings with diverse partners on key topics emerging from AgExchange. Convenings are a unique type of workshop popularized by the Bill and Melinda Gates Foundation that are intended to address both new and/or intractable issues. Typically a background summary paper is prepared and distributed to the group of invited experts who represent a diverse group of between 10-12 stakeholders. These participants, in turn, each prepares a short presentation to address issues raised by (or left out of) the background paper. Presentations are organized to provide two contrasting approaches to an issue and a facilitator manages the discussion to address both pre-identified questions and those that emerge during the sessions. The meetings last for two days to provide ample time for discussion, with a focus on achieving clarification on key points that can inform the organization's workplans or policies. By bringing in a set of experts to work on a targeted and defined subject, the convenings offer more relevant access to needed expertise than is easily contributed by a standing board of advisors or scientific council. Based on the discussions in the AgExchange, the topics that might be most profitably tackled in a convening format are:
    - The role of ICT for HICD in agriculture
    - Lessons learned for strengthening partnerships for institutional change
    - Strengthening gender equality in agricultural research and development
    - Assessing performance management approaches for HICD.
5. To support investments in cost-effective, documented "best practices" for institutional change that would: i) include an analysis of the reasons that previous recommendations have not been implemented, ii) test recommendations against evidence, and iii) identify the most critical constraints to success.

6. To initiate and moderate a conversation about identifying goals for institutional performance and assessment that would be of mutual benefit for USAID and universities. For example, the suggestion in the Lechtenberg et al. report (2014) to "to modify promotion and tenure protocols to recognize scholarly products on international engagement and development by junior faculty" (reported in Table 1) is one such topic on which USAID and universities could have a substantive discussion, negotiating a set of goals and assessment measures for common benefit.

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[1] Charles Maguire, Consultant, Former Senior Institutional Development Specialist, World Bank

[2] Amy Thom, Agricultural Programme Manager, Lima Rural Development Foundation

[3] David Kraybill, Director, The Innovative Agricultural Research Initiative (iAGRI)

[4] Saeed Sheikh, Founder and President, Somaliland University of Technology

[5] Susan Owens, Executive Director, Board for International Food and Agricultural Development

[6] Fanuel Tagwira, President, Africa University

[7] Mark Varner, Senior Counsel, BIFAD, APLU

[8] Deborah Rubin, Director, Cultural Practice, LLC

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[11] Brenda Dawson, Communications Coordinator, Feed the Future Innovation Lab for Collaborative Research on Horticulture

[12] Isaac Minde, Deputy Director, The Innovative Agricultural Research Initiative (iAGRI)

[13] Sonia Arias, Technical Advisor, Learning & Performance Solutions, FHI 360

[14] Alemu Sokora Nenko, Lecturer/Researcher, Department of Rural Development and Agricultural Extension, Haramaya University

[15] Multiple participants on the discussion on performance improvement

[16] Steven Kelly, Senior Partner, Knowledge Needs Opportunity (KNO) (Webinar)

[17] Andy Gilboy, Senior Partner, Associates for Global Change

[18] David Hirschmann, Professor, American University, School of International Service

[19] Eva Kassara, Partners Coordinator, Partners for Development

[20] Cornelia Flora, Distinguished Professor, Department of Sociology, Iowa State University

[21] Gary Alex, Farmer-to-Farmer Program Manager, U.S. Agency for International Development (USAID), Bureau for Food Security

[22] Stephen Weller, Professor, Purdue University, Horticulture and Landscape Architecture

[23] David Hansen, Senior Fellow, APLU

[24] Anne-Claire Hervy, Associate Vice-President for International Development and Programs, Association of Public and Land-grant Universities (APLU)

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[26] Kristy Cook, Senior Technical Advisor, Cultural Practice, LLC

[27] David Tardif-Douglin, Principal Development Specialist, Development Alternatives Incorporated, Inc.

[28] Shana Gilette, Advisor, U.S. Agency for International Development, Bureau for Food Security

[29] Hale Tufan, Project Manager, Cornell University

[30] Jeannie Harvey, Gender Analyst, U.S. Agency for International Development, Bureau for Food Security

[31] Tom Hammett, Professor of Sustainable Biomaterials; Director, InnovATE Project, OIRED; Associate Director, Conservation Management Institute, Virginia Tech

[32] Ed Garrett, External Researcher at ÖMKi, Hungarian Research Institute of Organic Agriculture

[33] Amanda Crump, Associate Director, Feed the Future Innovation Lab for Collaborative Research on Horticulture

[34] Henry Fadimaro, Alumni Professor, Assistant Dean, and Director of Global Programs, College of Agriculture, Auburn University

[35] Moses Osiru, Deputy Executive Secretary, Regional Universities Forum for Capacity Building in Agriculture (RUFORUM)

[36] Esther Ngumbi, Research Fellow, Auburn University

[37] Renee Pardello, Assistant Dean, University of Minnesota Extension

[38] Samantha Alvis, Specialist-International Development and Programs, Association of Public and Land-grant Universities; Leland International Hunger Fellow

Annex 1: AgExchange Participants' Countries

Africa
1. Ethiopia (4, 2.3%)
2. Ghana (4, 2.3%)
3. Kenya (4, 2.3%)
4. Nigeria (1, 0.6%)
5. Rwanda (1, 0.6%)
6. Senegal (2, 1.1%)
7. Somalia (1, 0.6%)
8. South Africa (1, 0.6%)
9. Tanzania (5, 2.8%)
10. Uganda (1, 0.6%)

Asia
11. Bangladesh (3, 1.7%)
12. India (3, 1.7%)
13. Pakistan (1, 0.6%)
14. Vietnam (1, 0.6%)

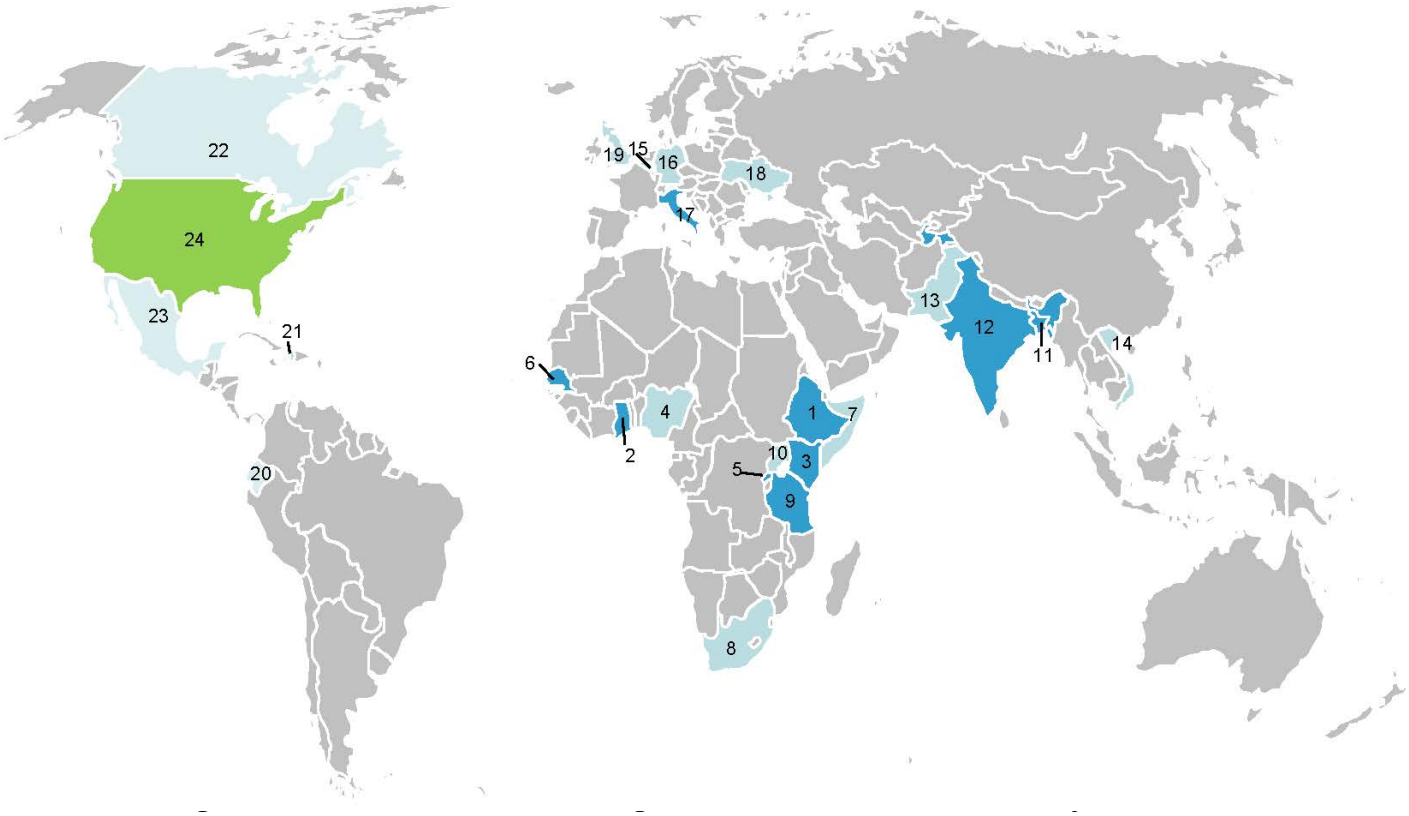
Europe and Eurasia
15. Belgium (1, 0.6%)
16. Germany (1, 0.6%)
17. Italy (3, 1.7%)
18. Ukraine (1, 0.6%)
19. United Kingdom (1, 0.6%)

Latin America and the Caribbean
20. Ecuador (1, 0.6%)
21. Haiti (1, 0.6%)

North America
22. Canada (1, 0.6%)
23. Mexico (1, 0.6%)
24. United States (132, 75%)

Not Reporting (1, 0.6%)

Figure 1: Map of AgExchange Participants



Annex 2: AgExchange Sub-themes and questions

Dates: November 18-20, 2014

Overarching Theme:

Feeding the World in 2050: How Human and Institutional Capacity Development Can Support Agricultural Innovation Systems

Focus Institutions:

- Institutions of higher education institutions including universities, colleges, and vocational schools
- National Agricultural Research System (NARS), National Agricultural Research Organizations (NAROs) and National Agricultural Research Institutes (NARIs),
- Ministries of Agriculture,
- USAID bureaus and missions and other donor organizations,
- Firms, and
- Local community-based organizations and local private-voluntary organizations

Focus Audiences:

- Agricultural researchers (including scientists in USAID-funded Innovation Labs and CGIAR programs),
- Agricultural extensionists,
- Other faculty, students, and development practitioners,
- NGO partners
- HICD experts/practitioners
- Government officials, and
- Representatives from donors and the private sector.

Sub-Themes:

A. On Day 1, we will look at examples of effective programming that have contributed to institutional performance improvement as well as discuss tools and resources to measure institutional transformation/change. Specifically, we will be examining:

A1: Effective programming for institutional performance improvement

a. What are specific examples of effective interventions that have worked to improve institutional performance in agricultural innovation systems?
   i. What are examples of training interventions?
   ii. What are examples of non-training interventions?
   iii. What are effective ways of combining the two when training is considered a necessary part of strengthening the performance of an institution?

A2: Tools and Resources to Measure Institutional Transformation

a. What are useful tools to measure institutional performance improvement?
b. What challenges have you faced in measuring institutional transformation/change?

A3: Role of Partners

a. What role do partners have in improving institutional performance and measuring institutional performance?
b. How is the expertise and capacity of development partners leveraged to strengthen other institutions' performance in agricultural innovation systems?

B. On Day 2, we will be discussing key constraints and possible options to develop the necessary human and institutional capacity for high performing agricultural innovation systems. Specifically, we will be examining:

B1: Constraints

a. What conditions or factors restrict higher education institutions from developing more effective programs in agricultural development?
b. What inhibits the achievement of excellence in institutions of other institutions in NARs, and Government Ministries?
c. What limits institutions' abilities to improve and to innovate?
d. What limits the achievement of gender equity in the agricultural research and innovation system, e.g., equal opportunities for men and women across disciplines, equity in hiring, promotion, compensation, and retention?
e. What are some possible limitations to development partners' influence on HICD?

B2: Possible options to address constraints. Recognizing the limitations discussed earlier:

f. With limited budgetary resources how can we program HICD for maximum impact?
g. What examples of policies in support of gender equity in agricultural research and innovation systems exist?
h. How can development partners help to overcome these constraints?
i. What types of linkages and coordination are needed among key actors in the agricultural innovation system? How can USAID programming build linkages and networks among key actors in agricultural innovation systems?

C. On Day 3, we will continue to discuss promising practices that can be put in place to build needed human and institutional capacity for agricultural innovation systems. Specifically, we will be examining:

C1: The role of technology

a. How can information technologies enhance our efforts to improve institutional performance among the different actors in the agricultural innovation system? What can we say about the types and level of technology that we will need in 2020?
b. What are innovative models for using communication technologies? How they are innovative?

C2: The promise of networks

a. What is the role for networks in HICD for agriculture?
    i. What are cost-effective models for building new and sustaining existing networks?
    ii. What mechanisms can promote sharing and learning both within and across networks?
    iii. What does it take to develop networks?

C3: Building partnerships with the private sector

a. What does the public sector have to offer the private sector that would attract mutually beneficial partnerships?
b. How do we best speak to the core business interests of the private sector?
c. How do you best enable and encourage institutions to seek private sector funding?
a. Who can be partners?

C4: Envisioning 2020 and Beyond

b. What are other promising practices for building the capacity of institutions for more vibrant and effective agricultural innovation systems?

Annex 3: Key definitions for the AgExchange

Human and Institutional Capacity Development (HICD)

- HICD is defined as a series of structured and integrated processes designed to remove significant barriers to the achievement of an institution's goals and objectives. HICD involves the systematic analysis of all the factors that affect performance, followed by specific interventions that address gaps between desired and actual institutional behaviors.[i]

- Capacity development is the process by which individuals, groups, organizations, institutions, and societies develop their abilities - both individually and collectively - to set and achieve objectives, perform functions, solve problems and to develop the means and conditions required to enable this process.[ii]

- A process whereby people, organizations, and society as a whole unleash, strengthen, crate, adapt, and maintain capacity over time.[iii]

- The ability of a collective or individual to achieve its goals; a process of change; occurring at multiple levels.[iv]

- [The process of improving] the potential performance of the organization as reflected in its resources and is management.[v]

Agricultural Innovation System (AIS)

- …represents a move away from a more linear interpretation of innovation as a sequence of research, development, and dissemination, to an interpretation that recognizes innovation as a complex web of related individuals and organizations—notably private industry and collective action organizations—all of whom contribute something to the application of new or existing information and knowledge. The framework addresses novel issues such as the capacity of individuals and organizations to learn, change and innovate, the nature of iterative and interactive learning processes among innovation agents, and the types of interventions that enhance such capacities and processes.[vi]

- An innovation system can be defined as a network of organizations, enterprises, and individuals that focuses on bringing new products, new processes, and new forms of organization into economic use, together with the institutions and policies that affect their behavior and performance. The innovation systems concept extends beyond the creation of knowledge to encompass the factors affecting demand for and use of knowledge in novel and useful ways. Innovation systems not only help to create knowledge; they provide access to knowledge, share knowledge, and foster learning.[vii]

- An innovation system is a network of organizations, enterprises, and individuals focused on bringing new products, new processes, and new forms of organization into economic use, together with the institutions and policies that affect their behavior and performance.[viii]

Agricultural Education and Training

- Agricultural education and training (AET) is the principle source of skilled human resources for agriculture and rural development and the third pillar of the Agricultural Knowledge and Information System (AKIS) model that comprises research, extension and education and that serves the rural population in both the public and private sectors. AET's network of Universities, institutes, vocational technical colleges, high schools and farmer training centers is designed to develop and upgrade knowledge and skill on a continuous basis.[ix]

Performance Improvement

- Performance Improvement (PI) touches many aspects of an organization--aligning strategy, defining leadership, building talent, creating culture, and influencing markets. Over the years, great organizations have realized the value of human performance improvement.

- Efficient machinery operation, quality control, nor information access alone make an organization outstanding -- it is people, with their skills, knowledge, motivation, values, and dreams who make organizations thrive and prosper.

- PI systematically links organizational and business goals and strategies with the workforce responsible for achieving those goals.[x]

National Agricultural Research System (NARS)

- *NARS are defined, in a given country, as encompassing all institutions public or private devoting full time or partially their activities to agricultural research and committed to a national research agenda.* Generally, the following categories of such institutions are identified as follows:

  (i) institutions whose mandate is to carry out research only, such as the NARI (National Agricultural Research Institute);

  (ii) higher education institutions devoting their activities to teaching and research: they are the faculties of agriculture and related disciplines and the faculties of social sciences and economics of the universities;

  (iii) technical departments of some ministries, development agencies that carry out some adaptive research programmes; and

  (iv) NGOs and the private sector.[xi]

- A National Agricultural Research System comprises all public, semi-public, and private agricultural R&D entities in a country including universities, government laboratories, private sector research, and NGO or producer-led research enterprises, as well as any governance structures (e.g., an agricultural research council or coordination unit) and funding agencies or instruments (e.g., competitive funding schemes). Agricultural

research implementing agencies can be divisions or departments within ministries, (semi-autonomous institutes, universities (mostly faculties of agriculture, but also others), development-oriented NGOs, units or institutes that are part of farmer organizations or commodity boards, and units or departments that are part of private companies. Strictly speaking, only research that targets primary agricultural production (including crops, livestock, forestry, and fisheries production and on-farm processing) should be considered, but in practice often the whole agro-food chain is covered (including agricultural input industries and off-farm food processing industries). NARS entities may have mandates that are broader than those defined here and therefore only partially overlap with the NARS concept. [xii]

Long-term Training

- Long-term training can be defined as a broad range of programs including degree and non-degree training of a technical nature (but not "study tours" or conference attendance), as well as long-term leadership training.[xiii]

Training interventions

- Participant training is either short-term technical training or longer-term, degree-earning academic education for mid to high-level professionals from the public and private sectors.[xiv]

- Formally structured learning activities, generally in a classroom, that do not lead to an academic degree. Can include technical courses at community colleges, technical institutes or universities, on–the-job activities tied to technical- area classroom work, or any combination of such formally structured, non-degree producing instructional activity.[xv]

- [Training]… is traditionally focused on designing, developing, delivering and managing instruction – in the form of courses, workshops, eLearning, and other training events.[xvi]

Non-training Interventions

Institutional performance improvement models generally identify a set of components to organizational structures that include the individuals within organizations and the (physical and non-physical) structures within which they operate. USAID's HICD model identifies six components which are described below. Per USAID's handbook, "**Training** is the performance solution that is effective in addressing performance gaps related only to [individuals'] skills and knowledge." **Non-training interventions** therefore refer to any intervention focused on making improvements to the other five components. It can involve *infrastructure develop* to improve the environment in which people work; designing or changing institutional policies and protocols; improving clarity of or understanding of individual's roles and responsibilities; or any number of other interventions that aren't specifically about improving the skills and knowledge of the individuals within an organization.

ENVIRONMENTAL	**Information** • Roles and performance expectations are clearly defined; employees are given relevant and frequent feedback about the adequacy of performance. • Clear and relevant guides are used to describe the work process. • The performance management system guides employee performance and development	**Resources and Tools** • Materials, tools, expert support, and time needed to do the job are present. • Processes and procedures are clearly defined in reference documentation. • Overall physical and psychological work environment contributes to improve performance; work conditions are safe, clean, organized, and conducive to performance.	**Incentives** • Financial and non-financial incentives are present; measurement and reward systems reinforce positive performance. • Jobs are enriched to allow for fulfillment of employee needs. • Overall work environment is positive, where employees believe they have an opportunity to succeed; career development opportunities are present.
INDIVIDUAL	**Knowledge and Skills** • Employees have the necessary knowledge, experience and skills to do the desired behaviors. • Employees with the necessary knowledge, experience and skills are properly placed to use and share what they know. • Employees are cross-trained to understand each other's roles.	**Capacity** • Employees have the individual capacity to learn and do what is needed to perform successfully. • Employees are recruited and selected to match organization's needs. • Employees are free of emotional limitations that would interfere with their performance.	**Motives** • Motives of employees are aligned with the work and the work environment. • Employees desire to perform the required jobs. • Employees are recruited and selected to match the realities of the work situation.

Endnotes

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