BIFAD REVIEW

OF

STRATEGIC HUMAN AND INSTITUTIONAL CAPACITY DEVELOPMENT (HICD) ISSUES

AND THE ROLE OF USAID AND TITLE XII

UNDER

THE FEED THE FUTURE PROGRAMS

A Report Commissioned by BIFAD

At the Request of USAID

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TABLE OF CONTENTS **Page**

III. ACRONYMS AND ABBREVIATIONS

AAAPD, Association of African Agricultural Professionals in the Diaspora

AAI, Africa-America Institute

AU, African Union

ADS 216, USAID-Higher Education Community Partnership, Functional Series 200--Programming Policy

AFGRAD Program, African Graduate Fellowship Program (1963-1990)

AGORA, Accessing Global On-line Research in Agriculture

AGRA, Alliance for a Green Revolution in Africa

ANAFE, African Network for Agriculture, Agroforestry and Natural Resources Education

APLU, Association of Public and Land Grant Universities

ATLAS Program, Advanced Training for Leadership and Skills (1991-2003)

AWARD, African Women in Agricultural Research and Development

BecA, Biosciences Eastern and Central Africa

BHEARD Program, Borlaug Higher Education for Agricultural Research and Development Program

BFS, USAID Bureau for Food Security

BIFAD, Board on International Food and Agricultural Development

CAADP, The Comprehensive Africa Agriculture Development Program

CATIE, Tropical Agricultural Research and Higher Education Center

CGIAR, Consultative Group on International Agricultural Research

CIMMYT, Maize and Wheat Research Center, Mexico City

CMAAE, Collaborative M.Sc. Program in Agriculture and Applied Economics

CRSP, Collaborative Research Support Programs

EACI, Education for African Crop Improvement

FAO, Food and Agriculture Organization

FTF, Feed the Future

HEIs, Higher Education Institutions

HESN, Higher Education Solutions Network,

HICD, Human and Institutional Capacity Development

ICT, Information and Communication Technologies

IFAD, International Fund for Agricultural Development

innovATE, Innovate for Agricultural Training and Education

I2I, Institutions-to-Institution

KNUST, Kwame Nkrumah University of Science and Technology

KSAs, Knowledge, Skills, Attitudes

LAC, Latin America and the Caribbean

LEAP Program, Borlaug Leadership Enhancement in Agriculture Productivity Program

LGU, Land Grant University

LTT, Long-term Training

M&E, Monitoring and Evaluation

MEAS, Modernizing Extension and Agricultural Systems

MOOCs, Massive Open Online Courses

NEPAD, New Partnership for Africa's Development

NGOs, Non-governmental Organizations

NARs, National Agricultural Research Systems

NUC, National University Commission

OARP, USAID Office of Agricultural Research and Policy

PEARL, Partnership to Enhance Agriculture in Rwanda through Linkages

PHEA, Partnership for Higher Education in Africa

R&D, Research and Development

RUFORUM, Regional Universities Forum for Capacity Building in Agriculture

SMAE, Small and Medium Agricultural Enterprises

STEM, Science, Technology, Engineering, Mathematics

SWOT, Strengths, Weaknesses, Opportunities, Threats

TEEAL, The Essential Electronic Agricultural Library

Title XII, of the U.S. Foreign Assistance Act

USAID, U.S. Agency for International Development

USG, U.S. Government

U.S.LGU, U.S. Land Grant University

IV. LIST OF TABLES

Page

V. LIST OF BOXES AND FIGURES

VI. ACKNOWLEDGMENTS

The HICD Review Team thanks the many people who shared with us their experience, expertise and cooperation as we conducted this study. Senior staff at the Association of Public and Land Grant Universities (APLU), particularly Dr. Mark Varner, Senior Counselor, provided invaluable assistance by facilitating all aspects of the study. Logistical and administrative arrangements worked extremely efficiently—thanks to Varner and Paula Villegas Morega, APLU Staff Associate for International Programs. A wide-ranging set of documents was made available electronically, and Dr. Varner ably assisted the team in arranging phone and personal interviews with many valuable sources. Peter McPherson, President of APLU, former USAID Administrator and former President of Michigan State University, provided an historical overview of developments in international HICD as well as valuable insights relevant to the current context.

A wide range of individuals agreed to meet or converse with the group. Interview respondents included leaders, administrators and researchers from the land grant university system, current and former USAID staff in Washington, D.C. and select field missions, as well as leaders and representatives of other government agencies and the private sector—both for profit and not for profit.

The HICD Review Team thanks directors and researchers of the Innovation Centers (some were formerly called the Collaborative Research Support Programs (CRSPs)) for sharing their insights. We were able to meet with the CRSP Council members prior to the Des Moines World Food Prize meetings (October 2012). Similarly, we benefited from interviews with Cultural Practices Principal Deborah Rubin whose organization has assembled valuable documentation of the CRSP legacy. We also thank the organization of International Agriculture Directors who met with us in Des Moines for sharing their perspectives regarding current international development issues, challenges and opportunities related to academia.

The HICD Review Team wishes to thank BIFAD and the HICD Working Group consisting of Gebisa Ejeta, Brady Deaton and Harold Martin. BIFAD Board Chair Dr. Brady Deaton provided the team valuable leadership, insights, and ongoing guidance, as did Purdue Professor Gebisa Ejeta, Chair of the HICD Working Group, who shared with us his passion for this subject. We are grateful to all for their assistance throughout the study process.

We are most grateful for the information, insights and cooperation of numerous senior USAID officials and staff: Dr. Julie Howard, Chief Scientist, Bureau of Food Security, Dr. Rob Bertram, Director of the Office of Agricultural Research and Policy (OARP), Susan Owens, Executive Director BFS/OARP BIFAD Secretariat, Dr. Clara Cohen, John Becker, Senior Advisor to the BIFAD Secretariat, Alex Deghan, Richard Greene, and many others contributed to our understanding of USAID programming, past and present, as well as plans for the future.

In the realization of this report, we extend our profound appreciation to all who contributed their knowledge and experience including those mentioned here. Any mistakes of fact or interpretation must of course rest with the authors and the conclusions and recommendations are those of the authors and do not necessarily reflect those of BIFAD and/or USAID.

VII. EXECUTIVE SUMMARY

This review focuses on the need and importance of accelerating human and institutional capacity development in agriculture in developing countries. These countries—spread across sub-Saharan Africa, Central America and South Asia—face severe food and economic insecurity and the myriad challenges of global climate change. The Obama Administration vigorously responded to global concerns over skyrocketing food prices in 2008-2010 by formulating its Global Development Policy (Appendix C), allocating $3.5 billion over three years, and creating the Feed the Future (FTF) Initiative. As a whole-of-government Initiative, the U.S. Agency for International Development (USAID) exercises primary leadership for FTF implementation. In that context, USAID, with input from other agencies, developed a process for selecting 19 FTF focus countries, (12 in sub-Saharan Africa, 4 in Asia, and 3 in the Caribbean) and has developed highly targeted strategies for enhancing agricultural productivity and food markets in key value chains and improving infant and child nutrition.

USAID released a progress report in Summer 2013 indicating impressive progress in reaching key FTF targets. This scorecard showed that U.S. government performance increased 161% between 2011 and 2012 across seven performance indicators. Creating a lasting impact in food security for the FTF countries, improving U.S. government business procedures, catalyzing U.S. government leadership and innovation, and improving U.S. government accountability are key targets of the FTF initiative. Currently no targets exist for Human and Institutional Capacity Development (HICD). The USAID Administrator and top Agency leadership have recognized that key ingredients in achieving the overall goals of FTF are competent, high-functioning humans and their institutions. Many educational institutions in FTF countries have not attained the level of academic excellence needed to accomplish the desired goals. Similarly, enhanced U.S. university capacity in science for international development, along with institutional strengthening, is needed. The number of students from FTF countries accessing U.S. institutions of higher learning has fallen over the last few decades. Europeans are now edging ahead of the U.S. in this traditional legacy of the United States government. In this context, it is time to restore the legacy of partnerships with the strong potential inherent in the U.S. university system for strengthening collaboration with developing country institutions in the agricultural and related sciences and to contribute to attaining the FTF goals, including strengthening human and institutional capacity.

The Board for International Food and Agricultural Development (BIFAD)—a presidentially appointed advisory board to the U.S. Agency for International Development—commissioned this study through its HICD Working Group to: 1) briefly review USAID's legacy in HICD efforts; 2) evaluate recent studies and literature reviews; 3) assess the status of current HICD programs and the vision for those programs; and 4) make appropriate strategic recommendations for the path forward. The Scope of Work asks for development of "*recommendations concerning a broad strategic plan for a comprehensive HICD effort by the U.S. Government as a part of the overall goals of its Feed the Future (FTF) Programs. These considerations and recommendations should contribute to the sustainability and impact of scaling those HICD efforts."*

In the process of conducting this study the HICD Review Team found that USAID's relatively recent adoption of the agency-wide Human and Institutional Capacity Development Policy has

been well received and applauded by many of the individuals and leaders with whom the HICD Review Team interacted. Overwhelmingly, the recent policy and program changes brought about by the U.S. Government—including USAID and its Bureau of Food Security—with renewed priority on international food security and agriculture and attention to institutional and human development targeted toward the food and agriculture sector are highly commended and embraced.

The HICD Review Team visited with many key individuals who have worked in developing countries and who have participated in USAID programs. The HICD Review Team also reviewed numerous reports provided by USAID and other authors that documented the successes and shortcomings of past programming efforts. USAID's legacy successes, which this HICD Review Team was charged to assess, included highly acclaimed long-term programs and successes, starting in the 1950s, linking land grant and other U.S. universities with counterpart institutions in developing countries—as well as the ongoing Collaborative Research Support Programs (CRSPs—now Innovation Labs)—along with current and promising programs in Africa, Asia and Central America. USAID's legacy programs helped build high quality higher educational institutions around the world that, today, have important programs in food and agricultural research and training. These institutions also have high impact outreach programs paving the pathways for applications of knowledge that have transformed their regions. Importantly, these legacy programs all involved long-term partnerships between U.S. universities, U.S. Government agencies and developing country institutions. The strongest criticism of U.S. efforts over the past two decades has been that institutional capacity building has not continued the strength of earlier U.S. commitments but has been weak and ineffective.

The HICD Review Team specifically attempted to assess the impacts of HICD related programs and make recommendations in the four issue area categories that were specified in the statement of work provided by BIFAD. In the body of the report issue assessments and team findings from literature and interviews are elaborated in detail. They led the HICD Review Team to the following overall recommendations that are presented here for BIFAD's consideration.

A Strengthening Institutional Capacity and Partnerships to Advance Impact Pathways:

Recommendation 1: *The HICD Review Team suggests that BIFAD encourage USAID to establish a long-term* ***Preferred Institution Partners Program*** *involving FTF country and U.S. higher education institutions. This partnership program should be built on the key attributes of USAID's legacy programs that successfully include both human and institutional capacity development. It should provide FTF higher education institutions the capability to link with U.S. institutions in a long-term partnership, to have access, on an as-needed basis, to U.S. partner institutions for expertise, curricular content, and infrastructure assistance to effectively identify and serve the education and technology needs of their local community. This institutional support capability should be available for all aspects of the FTF institution's operations and include jointly conducted research projects that engage both students and faculty. Human capacity development would be enhanced through targeted long- and short-term educational and training programs combining in-country, U.S.-based and regional training programs as appropriate and cost-effective. Institutional capacity building would*

build on USAID HICD policy principles and encompass institutional assessments and strengthening strategies.

The HICD Review Team believes that the highest impact effort USAID could undertake would be to re-establish—with modern tools and capabilities—a robust, long-term institutional capacity building initiative in at least one higher education institution in each FTF country. The HICD Review Team has described a prototype model in which a select FTF institution partners with at least two U.S. institutions, including a historically minority serving institute ion-because of special capabilities minority serving institutions can provide—to create a robust institutional partnership in which the partner institutions evolve as true peers. The partner institutions would apply the most current tools possible to teach students, including use of appropriate ICT, sandwich programs, leadership programs, and technical training encompassing development outcome-focused research programs. In addition, they would seek to develop productive partnerships with private entities and with other local educational institutions, become invaluable partners with government in developing policy and future plans, and become essential partners to all sectors of the food and agriculture system in their country. Further, we believe these partnerships, from an academic perspective, should go beyond just the food and agriculture sectors. As appropriate, they should engage other disciplines as well—where doing so could assist in solving food, agriculture, and rural community challenges. Many elements of these partnerships would need to be designed and developed to fit each unique situation, and each individual partnership would likely embody a number of different characteristics; however, many elements would be common—and would align nicely with the key attributes designed into USAID's HICD protocols. U. S. investment in human and capacity building and strengthening of higher education institutions in developing countries will pay great economic and political dividends for our country in the long run.

Recommendation 2: *The HICD Review Team urges BIFAD to encourage U.S. institutional leaders to modify their promotion and tenure protocols to appropriately recognize scholarly products in support of international engagement and development on the part of junior faculty.*

Many U.S. academic institutions discourage faculty from becoming engaged with international programs until they are advanced in their career and promoted to advanced ranks. The HICD Review Team believes this strategy fails to build U.S. institutional bandwidth and capacity. It also diminishes the potential of creative young faculty to become involved with developing country scientists and students who have the potential to truly change their world.

Recommendation 3: *U.S. institutions should develop educational and training programs, especially long-term, crafted to assure that a student's curriculum includes leadership training and experience as well as the use of current information technologies—both to receive and to deliver educational content.*

Successful graduates of training programs, especially long-term programs, will likely emerge as institutional and even national leaders. They can best serve their institutions if they have had exposure and experience in their graduate training that develops leadership skills and institutional management skills. These graduates will encounter challenges—scientific as well

as institutional—in which the capacity to use the latest information and communication technologies will help inform their decisions and advance their institutions.

Recommendation 4: *The HICD Review Team suggests that BIFAD recommend to USAID that Agency HICD efforts need an internal and external branding strategy, perhaps an agency-wide designated advocate, and a set of outcome metrics to which each agency and mission is accountable. These outcome indicators should include a clear definition of a "high capacity institution" and appropriate metrics to assess progress in moving an institution toward achieving these institutional capabilities.*

Human capacity development appears to be well understood. Most people have a good sense of what high capacity, well-trained, highly educated individuals are capable of doing, of what their skill sets entail. It is much less clear what constitutes the capabilities and attributes of high capacity institutions. The HICD Review Team has attempted to identify several of the attributes that we believe are important

HICD is a cross cutting policy with a set of goals that each of the USAID agencies and organizations are expected to advance. The HICD Review Team found that many individuals, both within USAID and external to USAID-- those whom one would have expected to be well informed about HICD--did not know about the HICD program, or at best had heard of the policy but did not know its goals or any details. The HICD Review Team also notes that several USAID reports and scorecards documenting agency progress in FTF fail to mention progress on any HICD metrics.

B. Strengthening Access to U.S. Higher Education Systems by Students from FTF Countries

Recommendation 5: *The HICD Review Team suggests that BIFAD explore with USAID the possibilities for streamlining contractual processes with U.S. institutions. This is especially important to implement Preferred Partners and as the USAID Forward policy expands.*

Developing country higher education institutions often find that contractual and business relationships with U.S. institutions can be onerous and time-consuming. USAID might be able to ameliorate these challenges by developing USAID-sanctioned protocols by which expertise at U.S. higher education institutions could be accessed more easily and quickly than is the case presently. Possibilities might include the development of overarching or umbrella agreements with one or more U.S. institutions in which the U.S. institution agrees to provide defined expertise and capabilities on request. The proposed prototype Preferred Partner institution could serve as a test case to develop such contractual measures and the risk mitigation demanded by U.S. universities. Complex contracting details could be negotiated upfront such that in-country institutions could then call on expertise and assistance via relatively simple task orders or sub-agreements. Such approaches have been used by a number of U.S. institutions to simplify doing business with private sector partners. Similar approaches might work with international institutions. USAID may already be using this or similar approaches in some cases. If so, best practices should be identified and expanded.

Recommendation 6: *The HICD Review Team urges BIFAD to encourage U.S. universities to become more comprehensively internationalized, to take steps to increase the number of students on their campuses from FTF countries—especially including agricultural and related sciences—and to make partnerships in FTF countries part of their institutional strategies--especially in the agriculture and food arenas.*

Many U.S. universities are expanding their international engagement efforts. The HICD Review Team encourages U.S. institutions to become even more comprehensively internationalized in their academic perspectives, to support measures that would encourage the admission of students from FTF countries for study at U.S. institutions, and at the same time, to develop more robust study-abroad opportunities for U.S. students, and encourage interested students and faculty to acquire the needed skills to pursue their interest in working internationally. The HICD Review Team believes that strengthened access of students from FTF countries to U.S. institutions in agricultural and related sciences could be effectively achieved under the umbrella of the proposed Preferred Partner prototype. As these institutions enhance their partnerships, a pipeline of students from FTF institutions and from U.S. institutions could be established, admission requirements and procedures could be stream-lined, and modern technologies be utilized to maximize access to U.S. HEIs by FTF students.

Recommendation 7: *BIFAD is encouraged to stress the urgency for USAID to consider the international competition in the early 21st Century in terms of HICD, and to make it a priority to retain U.S. influence in FTF countries and beyond through enhanced HICD efforts.*

Higher education institutions are key partners in implementing sustainable HICD programs in emerging economies around the world. It is clear that China, India and other nations take HICD seriously as they develop their international cooperation strategies for the 21st Century. Their vision is to engage government leaders at the highest level to develop cooperative efforts with higher education institutions. The United States used this philosophy very successfully in the past. It can renew the zeal it once put into this approach and remain the most influential provider of advanced education in the world. Such a strategy would be in the nation's self-interest.

Recommendation 8: *The HICD Review Team recommends that BIFAD encourage USAID to continue to emphasize its support for investments in HICD for women and girls.*

Numerous assessments emphasize the fact that girls' education at primary, secondary and tertiary levels is all important, as are social capital investments in the form of women's and girls' organizations, networks, and workplace and entrepreneurial skills enhancement. USAID focus on enhancing women's and youth's access to appropriate technologies throughout the production, processing and distribution systems, the HICD Review Team believes, will pay high productivity dividends.

C. Enhancing Collaboration between Developing Country Universities, U.S. Universities and other Public/Private Sector Institutions

Recommendation 9: *The HICD Review Team recommends that BIFAD encourage USAID-Washington and USAID Missions to help broker collaboration with efforts like the New Partnership for Africa's Development and its Comprehensive African Agricultural Development Program (CAADP) and with national governments of the 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. Partnerships with AGRA, CGIAR and similar organizations should be encouraged as well. Such strong collaborations can maximize total partner resources and leverage expertise and comparative advantages among the collaborating entities. Adoption of public-private partners could help defray some of the costs that formerly fell to the United States alone in earlier HICD models.*

Collaboration opportunities include AGRA and the African Union's New Partnership for Africa's Development and its Planning and Coordination Agency programs like CAADP, among others. The HICD Review Team supports ongoing USAID—and strategic U.S. university—involvement with both CAADP and AGRA. Each of these organizations targets a food-secure and prosperous Africa based on improving the lot of smallholder farmers. The HICD Review Team supports special attempts to integrate higher education institutions in this work.

Recommendation 10: *BIFAD should consider recommending that USAID-Washington, D.C. and USAID Country Missions 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. Curriculum-enhancement networks linking Preferred Partner institutions to modernize agriculture and food sector curricula might be one promising pathway.*

Relevance of curricula to needs of the agriculture and food sectors and local communities is a key gap limiting the impact of higher education institutions in FTF countries. Applied technologies that are cost-effective and easily adoptable by small farmers and small and medium size agricultural enterprises are extremely critical, as are social and nutritional sciences relevant to food and nutrition security.

Higher education institutional partnerships with private institutions and organizations offer important opportunities to advance the impact pathways related to agriculture and food systems research and education. Private institutions include local companies and international firms as well as non-profit organizations. USAID Missions could play a key role facilitating dialogue between policy specialists, private sector leaders, and higher education institutions to develop strategic plans; identify training and curricular shortcomings, including delivery pedagogy; facilitate possible internships; and support the development of appropriate technologies to advance local food and agriculture.

Recommendation 11: *The HICD Review Team urges BIFAD to recommend that USAID strive to involve FTF Country Missions in HICD program development and implementation and to encourage Missions to link with in-country public/private institutions including the HEIs (or the Government Department that represents them) to develop annual HICD goals and metrics—metrics that include increasing the number of students attending U.S. institutions of higher education.*

Knowledge and understanding on the part of USAID Missions in FTF countries of the HICD Framework and Mission roles in program development and implementation is not clear to our review team, but we feel strongly that as primary contacts with FTF country public/private institutions Missions need to play key roles at every stage HICD program outcomes from conceptualization to conclusion. Also, the priorities of in-country Missions are critical to .the success of any USAID initiatives. The Annual Program Statements of Missions are critical control points in managing the work and strategic directions of USAID's overall programs. Clearly defined HICD goals and metrics in the Annual Program Statement for each Mission, in partnership with local higher education institutions, should include a goal of increasing the number of degree seeking students in U.S. institutions

D. Building Developing Country Access to U.S. Technology

Recommendation 12: *The HICD Review Team encourages BIFAD to urge USAID, both in Washington and Country Missions, to invest in developing and nurturing scientific and educational networks in FTF countries.*

USAID's HICD program efforts could more strongly encourage and facilitate several types of potentially valuable networks: institutional alumni, professionals in the diaspora, spontaneous self-forming topical networks among leading scientists, and on-line learning networks. These horizontal networks may form spontaneously or be specifically structured. These networks represent powerful evolutionary tools used by scientists and educators worldwide. While we know that while much business—of all types—can be conducted virtually in these networks, most successful networks and virtual collaborations begin with face-to-face human contact. Networking experts agree that networks form best when based on personal relationships among a few key organizers. The HICD Review Team believes that USAID's HICD program efforts would be enhanced by creating opportunities for personal interactions among thought leaders and their students. These new delivery tools offer powerful opportunities to change education and research and, potentially, to render many old infrastructures obsolete. FTF country institutions might leap-frog many old infrastructures directly to 21st century pedagogy and delivery systems.

Recommendation 13: *The HICD Review Team recommends that BIFAD urge USAID and Country Missions to recognize the critical importance of ICT infrastructure to human and institutional capacity development and to encourage investments in the infrastructure that can allow FTF country institutions to link effectively with global digital networks in education, research, and outreach.*

Information and communications infrastructure in some FTF countries limits the full and successful exploitation of robust information and communications technologies. While investments in long-term and short-term personnel training are critical elements of successful HICD, investments in hard ICT infrastructure are also important. Limited ICT capabilities, such as reliability and bandwidth often constrain the capability to exploit digitally based networks and on-line educational content to advance human and institutional capacity outcomes.

Recommendation 14: *BIFAD should consider asking USAID to promote collaboration between U.S. and FTF country higher education institutions to develop and integrate appropriate agriculture and food system technologies into smallholder agriculture and SMAEs engaged in local food systems. The vision is to raise food and agricultural production and processing efficiency to encourage current operators (many of whom are women) to expand production scale and also to inspire the youth to go into agriculture and food production as a business.*

FTF countries may benefit not only from specific technologies utilized in the United States but also from the conceptual framework that recognizes and integrates perspectives from the private sector in the formulation of programs and curricula in the universities. USAID has the capacity to promote partnerships between FTF country and U.S. universities to develop collaborative programs in research and to develop appropriate technologies to address the critical needs of the FTF countries. Some of such technologies may be jointly developed and properly adapted to address short-, medium, - and long-term needs of a FTF country.

VIII. STUDY CONTEXT: STRATEGIC HUMAN AND INSTITUTIONAL CAPACITY DEVELOPMENT (HICD) ISSUES AND THE ROLE OF USAID AND TITLE XII UNDER THE *FEED THE FUTURE* PROGRAMS

A. Introduction

The Board for International Food and Agricultural Development (BIFAD)--a presidentially appointed advisory board to the U.S. Agency for International Development--commissioned this study through its HICD Working Group, chaired by Professor Gebisa Ejeta of Purdue University. The HICD Working Group asked for a meta-analysis that: 1) briefly reviews USAID's legacy in HICD efforts; 2) studies and evaluates recent publications of literature reviews; 3) assesses the status of current HICD programs and the vision for those programs; and 4) makes appropriate strategic recommendations for the path forward. BIFAD concludes the Scope of Work stating: *"starting around 1990, USAID greatly reduced its capacity building efforts and the number of students from developing countries that are provided with long-term training in the United States. BIFAD has consistently advocated for expanded efforts in training and institutional building without much impact. BIFAD is, therefore, pleased that USAID has recently strengthened its efforts with U.S. universities in these areas and is seeking BIFAD advice on what should be done and how to do it. With sustained deep interest by U.S. universities and colleges in this work, this study is expected to contribute to a BIFAD intervention in a unique opportunity for the U.S. Government and the U.S. higher education community."*

The Scope of Work for this BIFAD Study, dated 12 June 2013 resulted from discussions between BIFAD (BIFAD Chairman Dr. Brady Deaton and Dr. Gebisa Ejeta) and USAID Bureau of Food Security Senior Staff (BSF Chief Scientist, Dr. Julie Howard and BSF HICD Staff, Dr. Clara Cohen and Susan Owens).

B. Purpose of the Study

The Scope of Work asks for development of "*recommendations concerning a broad strategic plan for a comprehensive HICD effort by the U.S. Government as a part of the overall goals of its Feed the Future (FTF) Programs. These considerations and recommendations should contribute to the sustainability and impact of scaling those HICD efforts."* This review, focusing on strategies for human and institutional capacity development, is conducted in the context of the U. S. government's continued and heightened global public and private sector support for international agricultural development efforts and renewed commitment to global goals of food-, nutrition-, and economic security, and sustainable agricultural development in the context of global climate change and continuing population growth. In FY 2011, USAID devoted $82 million to funding of food security projects with Title XII universities in Feed the Future and other USAID partner countries. Of that total, nearly $42 million were allocated to 18 HICD projects. (USAID BIFAD, Title XII Report to Congress—FY 2011, May 2013). USAID and others in the development community increasingly recognize that human and institutional development goals must be met or overall development achievements could be jeopardized. As stated by Administrator Rajiv J. Shah: "Research, teaching, and extension programs are essential to the success of Feed the Future for many reasons, but the unique ability of the Title XII community to strengthen local capacity is essential to all of our efforts." (Title XII Report to Congress—FY2011).

Both BIFAD and the Association of Public and Land Grant Universities (APLU) helped engage the university community in a critical review of the FTF research strategy—especially from the perspective of the Collaborative Research Support Program (CRSP) and the Consultative Group on International Agricultural Research (CGIAR) portfolios.

This study is the second important recent study commissioned by the current BIFAD in its advisory role to USAID and follows up on the *BIFAD Review of the Collaborative Research Support Program (CRSP) Model* finalized in August 2012. That study concluded that a rigorous study of the HICD component of the CRSP Model is desirable to insure that it continues as an effective tool. Such a study would seek to assess outcomes and impact of HICD that is mediated through the CRSP model and would identify mechanisms for improved tracking of HICD outcomes. The authors found: "*In general, institution building has been less prominent and a less intentional component of CRSP HICD. We recommend an increased emphasis on institution building as a recurring element of a newly configured CRSP portfolio and a focus on strengthening host country universities' ability to train future generations of scientists.*" (BIFAD Review of the CRSP Model, 2012, p. 8). This current study builds on the BIFAD CRSP Model Review by also recognizing the critical role of human and institutional capacity development in achieving the panoply of goals under the Feed the Future Initiative. USAID is now seeking advice from BIFAD as to how USAID may most strategically drive significant developmental

impact by more effectively linking U.S.- and FTF- partners to enhance capacity of individuals and, importantly, institutions.

The roles of education at all levels, that of extension and advisory systems, links to policy formation, adequate statistical systems and an appreciation of the role of innovation systems in integrating and exploiting stores of physical, financial, natural, social and human capital[1] provide important context for understanding some of the challenges this study confronts. This study goes beyond the CRSP Model Review to consider in more depth HICD challenges and opportunities and ways in which the U.S. university system can contribute its extensive expertise to the task. It also examines recent USAID efforts of the past few years to undertake meaningful HICD measures and reforms and asks the questions: What are the indicators of HICD success? Which of these approaches are scalable? Are these sustainable?

Additional developments over the past couple of decades have contributed to the justification for this study—including aggressive competition by emerging economies around the world threatening to "upstage" the United States in its core mission and ideal of engaging developing countries in human and institutional capacity building. The need is urgent to develop new and effective strategies to meet not only aid to developing countries, but also to consider this global competition so the United States may retain its influence in international engagement. The study authors would argue that it is in institutional development, especially, where the United States has a clear competitive advantage over nearly any other country. Others may make a strong case for developing excellent human capacity, especially technical skills, but few—if any—can match U.S. land grant universities in terms of their expertise and legacy in enhancing institutional capacity for development. Also, this study importantly spends time identifying and supporting the most effective ways known of integrating women and girls into the range of development and innovation systems important for agriculture, food security and household and community livelihoods (See Appendix A). This is highlighted as one of the critical elements in achieving the returns that will optimize investments in provision of both public and private goods to meet these social demands.

In addition to BIFAD calling for a consensus report presenting an independent, well-documented, timely and focused set of recommendations, the statement of work called for a practical assessment that can be considered during decisions on allocation of funding and design of USAID projects. Specifically *"the study should give special attention and focus to the following topics and issues."*

B. Key Topics and Issues [2]

1) Strengthening Institutional Capacity and Partnerships to Advance Impact Pathways

Higher education has a critical role in helping build institutional capacities across food production chains, including but not limited to key units in government, such as extension

[1]See Jason Donovan and Dietmar Stoian, "5 Capitals: A Tool for Assessing the Poverty Impacts of Value Chain Development," Technical Series, Technical Bulletin no. 55, Rural Enterprise Development Collection no. 7, Tropical Agricultural Research and Higher Education Center (CATIE), Turrialba, Costa Rica.

[2] Topics and discussion of issues in this section are taken directly from the Scope of Work, June 2013.

systems, research facilities and policy offices. Issues to be considered include: a) the most effective ways to tie education of people into the organizations and institutions; and b) how agricultural and related colleges can strengthen the production value chain and other key institutions.

2) Strengthening Access to U.S. Higher Education Systems by Students from FTF Countries

There is increasing divergence in access to U.S. higher education systems for students from developing countries versus countries with emerging market economies. The BIFAD HICD Working Group hypothesized: a) that students from developing countries have unequal access to U.S. higher education; b) that the imbalance is attributable to reduced availability of merit-based scholarships in U.S. graduate degree programs targeted for students from lesser-developed countries; c) previous cost/benefit analysis demonstrates that U.S. participant training is an effective and efficient approach to help build leadership of scientifically lagging developing country universities; and d) the growing imbalance is not in the best interests of U.S. economic or national security as outlined in the U.S. Global Development Policy.

Issues to be considered under this topic should include: a) why some long-term training in the United States is needed, especially for graduate degrees, as opposed to all the training being done in-country or a third country; b) possible uses of new information and communication technologies (ICT) to aid in delivery of this education; c) considerations of models, methods of operation and relationships, and their relative merits, to achieve the human resource goals; d) effective approaches to tie training to a), b) and c) above; e) ways to improve training with support and coordination with the private sector, or bilateral donors, the World Bank and others; f) "levers" available to USAID leadership to help drive the number of participants in long-term training, such as the 1980's USAID directive requiring all projects to include long term training and/or engaging more actively ADS 216 (USAID-Higher Education Community Partnership) which reinforces that principle; g) approaches to increase the number of women involved in education or training, and; h) other cross-cutting issues the team feels are important.

3) Enhancing Collaboration Between Developing Country Universities, U.S. Universities and Other Public/Private-sector Institutions

Developing countries have increased their own investments in higher education, though more is needed. The numbers of colleges and universities are increasing due to the large increase in the numbers of student-aged population. These institutions are now seeking collaborative relationships to maintain and improve the quantity and quality of agricultural, food and related environmental sciences in their colleges and universities. U.S. universities could make significant contributions when working with developing country universities as they build capacity. U.S. universities can also aid in promoting enabling environments to engage with public/private-sector institutions in the development, adoption and utilization of new and innovative technologies. The BIFAD HICD Working Group fully supports the *FTF* programming to expand university linkages and draws attention to the recent major partnership projects in Tanzania and South Sudan.

Issues to be considered under this topic should include: a) the strengths and challenges of long-term university partnership projects, and possible uses of new ICT to make partnership

efforts more effective and less expensive; b) creative models, methods of operation and relationships, and relative merits of programs to advance HICD; c) ways to greatly expand support and collaboration with the private sector, foundations, other bilateral donors, the World Bank and others based on the lessons learned from not only USAID's Global Development Alliance, but also U.S. universities' experiences domestically and internationally; d) the merits and options of U.S. universities working with developing country universities to engage in development, adoption and utilization of new and innovative technologies.

4) Building Developing Country Access to U.S. Technology

U.S. universities have extensive experience working with the private sector concerning food and agricultural technologies. Considerations should include assessment of adequacy of existing mechanisms for technology access, and emerging issues. Opportunities for broadening developing country access to U.S. technologies should be identified.

IX. STUDY BACKGROUND AND METHODOLOGY

The Association of Public and Land Grant Universities (APLU), represented by Dr. Mark Varner, Senior Counselor to APLU, was designated as Secretariat for the study. BIFAD in consultation with USAID and APLU identified the study team members led by Dr. Victor Lechtenberg of Purdue University and including Dr. Albert Ayeni of Rutgers University, Dr. Ralph Christy of Cornell University and Dr. Carol Kramer-LeBlanc, former USDA economist, now a private consultant. APLU completed arrangements to engage them for the study execution. The contract number between USAID and APLU is EDH-A-00-04-00002**.**

The study team met face-to-face in Washington, D.C., in August 2013 with leadership of the Bureau of Food Security and with several individuals who had worked on previous reports or who had expertise relevant to the review. The Review Team met again in Des Moines, IA, in mid-October 2013. The Team conducted near weekly conference calls and numerous interviews with experts throughout the United States and around the world during the study period. The team targeted a study completion date of December 31, 2013.

The Des Moines team meeting was planned directly preceding the 2013 World Food Prize Meetings to permit the study team to meet with the directors and other leadership of the Title XII Collaborative Research Support Programs (now called Innovation Centers or Innovation Laboratories) as well as to interact with BIFAD officials Dr. Brady Deaton, BIFAD Chair, and Dr. Gebisa Ejeta, HICD Working Group Chair. Additional meetings held in Des Moines included the International Agriculture Directors of several land grant universities and select individuals. To complete an effective formative review, the team mapped out a series of study elements including stakeholder interviews, review of strategic documents including pertinent USG policies and analysis of findings—all guided by the topics and issues contained in the scope of work as well as a set of critical cross-cutting issues (such as gender, networks, institutional linkages) identified in the study process.

The Team chair attended the APLU annual meeting in mid-November 2013 and briefed the Deans of Agriculture on the review and met with additional key individuals. Also in November,

the team chair met with Bureau of Food Security leaders in Washington D.C. to provide an interim update on the review.

A. Elements of Study: Documents Reviewed

With the invaluable assistance of APLU and USAID, the HICD Review Team reviewed a range of strategic documents for this study including basic documents establishing the Title XII authorities of the Foreign Assistance Act of 1961, mandated Title XII Reports to Congress (FY 2011 and assorted other years), several internal USAID HICD policy documents detailing the agency's HICD goals and programs, as well as several recent reports and assessments conducted by others. Additionally, the Team reviewed USAID-, USDA- and Department of State documents related to President Obama's FTF Initiative; the BIFAD-commissioned review of the Collaborative Research Support Project Model (2012) and associated other CRSP and Innovation Center reports, including those digested by Cultural Practices for the CRSP Council and accessible through their website (see "Digest Project: Feed the Future Innovation Labs and Collaborative Research Support Programs-Learning from Success" www.culturalpractice.com/services/knowledge-management/.

The Review Team also reviewed seminal studies pertinent to understanding of critical topics associated with success of HICD efforts in effecting sustainable agricultural development and food and nutrition security in developing countries. Examples of such documents include the World Bank's *2008 World Development Report* (Byerlee et. al); the 2011 *Gender in Agriculture Source Book* of the World Bank, FAO and IFAD; the FAO *Food Insecurity Reports* and the *State of Food and Agriculture Reports*. Gilboy et al. produced *Generations of Quiet Progress: The Development Impact of U.S. Long-term University Training on Africa from 1963-2003*. Additionally, there have been assorted reviews of modern extension and advisory services as well as discussions of the concept and practice of agricultural innovation systems. The USAID-funded project Modernizing Extension and Advisory Services (MEAS) and its website agrilinks.org/activity/modernizing-extension-and-advisory-services developed by the University of Illinois provides access to valuable current information regarding the topic. Sustainability is discussed in numerous documents of the United Nations Commission on Sustainable Development, the United Nations Environment Program, the Food and Agriculture Organization, the International Fund for Agricultural Development, the Global Environment Facility and documents of the World Bank, other international financial institutions, and global and regional nongovernmental organizations. The U.S. Government has issued numerous statements regarding sustainability of environmental resource use in agriculture as well as sustainability of agricultural development programs and projects. For more information regarding literature consulted, please see References.

B. Elements of Study: Interviews Conducted

In addition to literature and policy assessment, a primary focus of our efforts was a series of broad-based interviews with key individuals who have had extensive experience in USAID, in developing nations, in USAID Mission leadership, in U.S. higher education institutions, in government, and in non-governmental organizations devoted to international development. A listing of individuals with whom we interacted and their affiliation is presented in Appendix F. The study team developed a series of interview questions focused on the topics and issues

designated in the scope of work as well as pertinent cross cutting issues. Our interview questions permitted us to be flexible in seeking information and identifying stakeholders, policy makers, higher education officials, analysts or agricultural development/food and nutrition security practitioners whom we wished to interview to obtain a diversity of views.

Interview results were posted on an intra-team Box.doc website for team commentary along with internal and external documents for review.

C. Elements of Study: Policies Reviewed

The ***Presidential Policy on Global Development*** issued in 2010 highlights international development as vital to national security. The guidelines recommend focusing efforts and resources on select countries, sub-regions and sectors where results and impacts are most achievable. The United States will "invest in game-changing innovations with the potential to solve long-standing development challenges" and, importantly, will leverage the power of research and development at home and abroad. The United States will emphasize building sustainable capacity in the public sectors of our partners at their national and community levels. (White House Fact Sheet: U.S. Global Development Policy, 2010) (www.whitehouse.gov/the-press-office/2010/09/22/fact-sheet-us-global-development-policy).

The Feed the Future Initiative (FTF) (www.feedthefuture.gov) announced in 2010 is one of three major initiatives for implementing the Global Development Policy. At L'Aquila, Italy, in the midst of the 2008-2009 food price crisis, President Obama committed the United States to investments of $3.5 billion over three years to support global food security objectives[3]. "Key elements of the FTF framework include: a comprehensive approach to food security[4] by accelerating economic growth, raising incomes through greater agricultural productivity, increasing incomes and market access for the rural poor and enhancing nutrition. Investments are focused on selected countries driven by country-owned strategies and coordinated closely with other donors." Importantly, success is measured by changes in the prevalence of poverty

[3] The FAO State of Food and Agriculture (2009) began its annual review looking back at 2008: "This is a period of grave concern for the fate of the world's hundreds of millions of poor and hungry people." At the G-8 Summit in Japan in July 2008, Ministers stated: "that the steep rise in global food prices, coupled with availability problems in a number of developing countries, is threatening global food security." As FAO notes, "The episode of 'soaring food prices' was followed in rapid succession by the most severe global financial crisis and deepest economic recession witnessed in the last 70 years. The crisis has hit large parts of the world simultaneously, pushing millions more into hunger and undernourishment." (FAO, (2009) "*World Food and Agriculture in Review,*" SOFA, 2009, p. 103).

[4] The principles established at the L'Aquila summit include:

1. Adopt a comprehensive approach to food security that focuses on advancing agriculture-led growth, reducing under-nutrition, and increasing the impact of humanitarian food assistance
2. Invest in country-led plans
3. Strengthen strategic coordination—globally, regionally, and locally
4. Leverage the benefits of multilateral institutions
5. Deliver on a sustained and accountable commitment. (L'Aquila Principles quoted in "Global Hunger and Food Security Initiative Consultation Document, UN High Level Task Force on Food Security.")

and underweight children. Research and innovation are at the core of the FTF Initiative, although this is not reflected in current funding.

D. Elements of Study: HICD Models Analyzed

USAID has a long, admirable history of helping to build human and institutional capacity in support of agricultural development and food security objectives in developing countries. The study group gained historical perspective regarding "legacy" USAID programs with HICD components via review of selected literature and a series of interviews with experts, including current and former USAID and university officials, analysts and contractors. The 2010 study by Cohen was particularly valuable in laying out both conceptual elements involved in HICD and agricultural innovation systems along with tangible real world examples. In addition, the team reviewed the Gilroy study of the African Graduate Fellowship Program and successor African Advanced Training for Leadership Program. The 2012 BIFAD CRSP Model Report was scrutinized carefully as the 17 CRSP Programs, in light of declining commitments elsewhere, represent one of the most significant commitments made by USAID and university partners to HICD for agriculture and food security.

In its analysis of HICD, the Team has included both historical and cross-sectional perspectives on HICD models, ranging from early institution-institution building or strengthening efforts to intensive long-term U.S. based student degree-training programs to newer efforts to utilize information and communication technologies (ICT) to lower costs and enhance connectivity between U.S. and developing country universities. Also included are various combinations of elements including sandwich programs, networks, South-South training programs, and programs integrating distance learning with on-the-ground mentoring. Finally, we mention some of the newest developments in education including Massive Online Open Courses (MOOCs). In evaluating alternative approaches, we conducted a situation and meta-analysis, considered the problems of gender equity (Appendix A) and sustainability and scalability along with cost-effectiveness and rates of return where available (Appendix B).

X. KEY ISSUES ASSESSMENTS

A. Strengthening Institutional Capacity and Partnerships to Advance Impact Pathways

Nearly all the experts interviewed for this review and much of the literature consulted emphasized the inextricable link between human and institutional capacity development. However, the point has also been made that high quality individual capacity development, particularly high caliber technical competence, does not alone assure that institutions where such individuals return and are employed will be high capacity institutions. Institutional capacity goes well beyond simply assembling a cadre of highly trained scientists and faculty. Our investigation revealed a broadly held view that individual capacity development, especially with the re-invigoration of HICD efforts over the last several years, is progressing better than institutional capacity development.

Long-term impacts of shortcomings in institutional capacity development are reflected in several well-recognized challenges:

a) Loss of highly trained individuals from institutions (brain drain) due to inhospitable work environment or uncompetitive resource environment (strengthened local institutions can contribute to higher retention),
b) Weak institutions produce poorly trained leaders
c) Marginal quality and rigor of the food and agriculture curriculum,
d) Relative absence of private sector partnerships, and lack of institutional polices to encourage such partnerships,
e) Significant procurement challenges due to various bureaucratic policies and procedures and generally poor institutional infrastructure to support innovations in education and research,
f) Lack of institutional involvement in local agricultural and food policy planning and strategy,
g) Meager, if any, relationships with community colleges, other universities, and non-academic public institutions,
h) Lack of support for professional development and modern scientific and educational networking, including ICT connectivity,
i) Fragmentation and isolation of research and teaching programs,
j) Relatively minimal engagement with other scientific and educational institutions,
k) General lack of facilities to support competitive 21st century teaching and learning.
l) Non-competitive scholarship and negligible impact on community development,
m) Limited zeal or effectiveness in attracting external resources such as grants, contracts and endowments.

USAID's HICD framework importantly defines many aspects and expectations of human and institutional capacity development. However, it does not provide a clear statement of those attributes that would characterize "high capacity" institutions. The HICD Review Team considers that high capacity institutions would embody attributes or employ strategies that effectively address each of the challenges noted above.

Human capacity development appears to be well understood. Most people have a good sense of what high capacity, well-trained, highly educated individuals are capable of doing, of what their skill sets entail. It is much less clear what constitutes the capabilities and attributes of high capacity institutions. The HICD Review Team has attempted to identify several of the attributes that we believe are important

HICD is a cross cutting policy with a set of goals that each of the USAID agencies and organizations are expected to advance. The HICD Review Team found that many individuals, both within USAID and external to USAID-- those whom one would have expected to be well informed about HICD--did not know about the HICD program, or at best had heard of the policy but did not know its goals or any details. The HICD Review Team also notes that several USAID reports and scorecards documenting agency progress toward FTF goals fail to mention progress on any HICD metrics.

The HICD Review Team urges BIFAD to encourage USAID to define a set of attributes that characterize the capabilities of high capacity institutions. In other words, what does successful institutional capacity development look like? Included in these attributes should be indices or metrics that can be tracked over time to assess improvement in institutional capacity.

Building institutional capacity is clearly dependent on having a strong cadre of well-educated and well- trained faculty and staff. However, this alone does not result in a high capacity institution because many other factors are involved beyond scientific staff including necessary administrative leadership and competent business practices. The HICD Review Team believes that the most effective way to build institutional capacity in FTF countries is to revitalize (adopt **but update)** the institutional partnership model that USAID supported so successfully in the 1970s and 80s. Institutional capacity building efforts have not been especially successful since that model was abandoned. If institutional capacity development is indeed a top priority as a component of USAID's current HICD efforts, then some form of long-term institutional partnerships must again be put in play.

The U.S. land grant university (LGU) model remains the best model in the world for designing higher education institutions to meet the agriculture and food system challenges of the FTF countries in the first half of the 21st century. This model or aspects of the model continue to be emulated by countries and institutions around the world. The integration of education and research as well as public outreach and engagement has had proven success. It works! While this conclusion may be obvious and quite intuitive to most food and agriculture academics in the United States, it is not common in FTF countries. The integration of research and learning and, in turn, the linking of research and teaching to impact pathways from research findings to application must become a common attribute of higher education and related partner institutions in FTF countries. Absent the integration of these academic missions, the prospect of these countries developing sustainable agriculture and food systems is dim.

Re-establishing the sort of U.S.-LGU and FTF country higher education institutional partnerships that can achieve sustainable outcomes and support the long-term impact pathways expected is not easy. Because resources for this work have been very limited for the past three decades, much capacity has been lost from the LGUs and will need to be rebuilt. Many of the passionate experts and leaders in U.S. institutions of the 70s and 80s are now gone. However, even though not easy, revitalizing university partnerships is an achievable goal. One reason this is true is that many LGUs are more attuned to the need for international engagement today as a key component of their pedagogy than they were in the more recent past. Students and faculty in these institutions will readily engage to form and lead partnerships with institutions in FTF countries, assuming that there are modest long-term funding streams to support the marginal costs of doing so. Many U.S. institutions have faculty members with ties to FTF countries that are eager to re-engage and "give-back" to their home institutions and home countries. In some cases, these individuals could form a critical engagement core. Such key faculty at U.S. institutions could be the passionate advocates to encourage colleagues and peers to join efforts to build FTF institutions and lead institution–to-institution partnerships. Of significance in this regard is the Association of African Agricultural Professionals in the Diaspora (AAAPD). This is a recently formed organization that has a database of multi-disciplinary African Professionals in the Diaspora, many of whom are

academicians, researchers, extension specialists, agricultural economists and development agents.

Preferred Institution Partners Program: A Prototype for Building Sustainable, High Capacity FTF Country Institutions.

USAID's legacy successes in institution building and its recent successes in several African countries where developing country higher education institutions have partnered with U.S. universities provide compelling evidence suggesting key elements of university partnership models are critical to success in growing the capacity of FTF institutions. The key challenge is how to construct such partnerships in a manner that captures and builds on the most important characteristics of successful U.S. institutions and, at the same time, capitalizes on 21st century ICT, as well as other technologies, to achieve cost efficiencies and various economies of scale and scope. The HICD Review Team proposes for BIFAD's consideration a prototype model that recognizes key lessons learned from past successes and failures and capitalizes on the wealth of new technologies and capabilities.

We propose a Preferred Partnership Program that builds on the concept of peer-to-peer institutional partnerships and on the premise that FTF institutions would be partnered with at least one (preferably two or more) U.S. Land Grant or other globally engaged universities. These universities would be selected for specialized expertise that would align with the most important food and agricultural needs of the FTF country. Each partnership would involve all three components of the LGU mission: learning/teaching, discovery/research, and engagement/outreach. As the defined programs evolve over time, FTF institution faculty, administrators, leaders and students would have the capability to continually connect, on an as needed basis, to their U.S. institutional partners and counterparts for counsel and assistance on any topic that might advance their institutional capacity to support faculty and students, their private sector stakeholders, and other partners. Preferred Partnerships would embody the following characteristics:

A. Each FTF country would identify at least one higher education institution with a curriculum in food and agriculture, as a Preferred Partnership Institution. These institutions would be paired with at least two globally engaged U.S. universities (preferably a Land Grant University) including at least one minority serving institution (1890 Land Grant University) as primary partners. To the extent possible, institutional pairing should capitalize on relationships that might already exist from USAID legacy and other past programs, such as the Malawi Nutrition Program involving the Bunda College of Agriculture (Appendix D).

B. A primary goal of these partnerships should be to achieve, very quickly, full integration of teaching, research, and outreach/engagement mission areas within the FTF institutions. Integration and coordination of these mission areas is essential to building the sustainable capacity for institutions to positively impact the pathways to commercialization of new technologies and the pathways to practical applications of knowledge and problem solutions generated by more robust research and teaching. The FTF institution and the U.S. partners should strive to build close personal, as well as

academic, relationships such that FTF institution personnel have ready access to their U.S. partners, for expertise and resources regarding course content, consultation, research, outreach, private sector partnerships etc.

C. The primary academic focus of these partnerships should be in the food and agriculture sectors, but the relationships should not be limited to these academic fields. Other fields such as, engineering, technology, management, entrepreneurship, community development, or health sciences could also be possibilities for partnership activities. Each of these disciplines might contribute significant expertise to developing various components of food security and agriculture technology pathways.

D. Programs developed should include Long-term Ph.D. training as well as short-term professional development and non-degree, certificate based credentialing.

E. Successful graduates of training programs, especially long-term programs, will likely emerge as institutional and even national leaders. They can best serve their institutions if they have had exposure and experience in their graduate training that develops teamwork, leadership, strategic planning, and visioning skills as well as exposure to "best practices" in institutional management. These graduates will encounter challenges—scientific as well as institutional—in which the capacity to use the latest information and communication technologies will help inform their decisions and advance their institutions.

F. Girls' education at primary, secondary and tertiary levels is all important, as are social capital investments in the form of women's and girls' organizations, networks, and workplace and entrepreneurial skills enhancement. USAID focus on enhancing women's and youth's access to appropriate technologies throughout the production, processing, and distribution systems-- the HICD Review Team believes--will pay high productivity dividends

G. The partner institutions should consider developing joint research programs in which faculty from both institutions would work together to solve practical problems that are important to both countries. These programs might also involve student projects, perhaps determined through a competition that would engage students in both the U.S. and FTF institutions on the same teams.

H. Specific measurable goals for the FTF institutions might include the following:
    a. Number of highly trained alumni currently employed in other institutions who have been re-engaged in some manner.
    b. Revisions in the curriculum to assure rigor and access.
    c. Number of private sector partnerships created.
    d. Development and monitoring of institutional strategic plan.
    e. Improvements in internal infrastructure—consistent with strategic plan.
    f. Engagement with local institutions (academic and non-academic).

g. Number of adjunct faculty engaged from national research centers and other institutions.
h. Improvements in ICT connectivity and access.
i. Number of students enrolled in some form of distance or blended delivery courses.
j. Competence in attracting external funding through grants, contracts, endowments, etc.
k. Tracking of employment records of college graduates as a measure of quality of academic curriculum.
l. Faculty scholarship achievements and impact on community.

This is not intended to be an all-inclusive list. Other goals and attributes may very well be included as defined by the partnership institutions.

I. In developing the Preferred Partnership Program institutions should strive to use modern ICT to the fullest extent possible to reduce the time and cost associated with long-term training programs, to expand the reach of professors and experts beyond their own locales, and to share knowledge and experiences that can enhance learning.

This Preferred Partner prototype description is not intended to be exhaustive, or to constrain future possibilities. Rather, it is intended to provide a glimpse of what a robust institutional capacity development program might entail—one that is built on proven concepts of the past, on USAID's legacy successes, but with contemporary innovative technologies.

Finding 1: The recent changes in USAID, ushered in by the adoption of the agency wide Human and Institutional Capacity Development Policy appears to be well conceived and applauded by many of the individuals and leaders with whom the HICD Review Team visited. Overwhelmingly, the recent changes brought about via the Bureau of Food Security and its attention to institution and human development were welcomed. The common message was: It is great to see USAID back in the food and agriculture business!.

Without doubt, the strongest criticism of U.S. efforts over the past three decades was that attention to institutional capacity building has been weak and ineffective. The legacy successes, which this review team was charged to assess, were the highly acclaimed programs and successes starting in the 1950s, along with a couple current and promising programs in Africa. These legacy efforts succeeded in building institutions, in many corners of the world that are successful today and have developed sustained food and agricultural research, training, and high impact outreach pathways for applications of knowledge that has transformed their regions.

The HICD Review Team believes that the highest impact effort USAID could undertake would be to re-establish—with modern tools and capabilities—a robust, long-term institutional capacity building initiative in at least one higher education institution in each FTF country. The HICD Review Team has described a prototype model in which a select FTF

institution partners with at least two U.S. institutions, including a historically minority serving institution, to create a robust institutional partnership in which the partner institutions evolve as true peers. These Preferred Partners would apply the most current tools possible to teach students; including use of appropriate ICT, sandwich programs, leadership programs, and technical training including development outcome-focused research programs. In addition, the Preferred Partners would seek to develop productive relationships with private entities and with other local educational institutions, become invaluable partners with government in developing policy and future plans, and become essential partners to all sectors of the food and agriculture system in their country. We believe these partnerships, from an academic perspective, should go beyond just the food and agriculture sectors. They should, as appropriate, engage other disciplines as well—where doing so can assist in solving food, agriculture, and rural community challenges. Many elements of these partnerships would need to be designed and developed to fit each unique situation and each individual partnership would likely embody a number of different characteristics; however, many elements would be common—and would align nicely with the key attributes designed into USAID's HICD protocols.

Further, we believe these programs should capitalize on every opportunity to engage students of each partner institution in special projects and in cross-country and cross-cultural teams to develop solutions to local problems. The power of such student engagement efforts is well established. It needs to be harnessed to advance the goals of these special Partnership Institutions.

Recommendation 1: ***The HICD Review Team suggests that BIFAD encourage USAID to establish a long-term Preferred Institution Partners Program involving FTF country and U.S. higher education institutions. This partnership program should be built on the key attributes of USAID's legacy programs that successfully include both human and institutional capacity development. It should provide FTF higher education institutions the capability to link with U.S. institutions in a long-term partnership, to have access, on an as-needed basis, to U.S. partner institutions for expertise, curricular content, and infrastructure assistance to effectively identify and serve the education and technology needs of their local community. This institutional support capability should be available for all aspects of the FTF institution's operations and include jointly conducted research projects that engage both students and faculty. Human capacity building would be enhanced through targeted long- and short-term educational and training programs combining in-country, U.S.-based and regional training programs as appropriate and cost-effective. Institutional capacity building would build on USAID HICD policy principles and encompass institutional assessments and strengthening strategies.***

Finding 2: Many U.S. academic institutions discourage faculty from becoming engaged with international programs until they are advanced in their career or promoted to advanced ranks. The HICD Review Team believes this strategy fails to build U.S. institutional bandwidth and capacity. It also diminishes the potential of creative young faculty to become

involved with developing country scientists and students who have the potential to truly change their world

Recommendation 2: ***The HICD Review Team urges BIFAD to encourage U.S. institutional leaders to modify their promotion and tenure protocols to appropriately recognize scholarly products in support of international engagement and development on the part of junior faculty.***

Finding 3: Successful graduates of training programs, especially long-term programs, will likely emerge as institutional and even national leaders. . They can best serve their institutions if they have had exposure and experience in their graduate training that develops leadership skills and institutional management skills. These graduates will encounter challenges—scientific as well as institutional—in which the capacity to use the latest information and communication technologies will help inform their decisions and advance their institutions.

Recommendation 3: ***U.S. institutions should develop educational and training programs, especially long-term, crafted to assure that a student's curriculum includes leadership training and experience as well as the use of current information technologies—both to receive and to deliver educational content.***

Finding 4a: Knowledge and understanding of USAID Missions in FTF countries of the HICD initiative and their involvement in program development and implementation is not clear to our review team but we feel strongly that as the primary contact with FTF Country public/private institutions Missions need to play key roles at every stage of major HICD programs from conceptualization to conclusion. Also, the priorities of in-country missions are critical to the success of any USAID initiatives. The Annual Program Statements of missions are critical control points in managing the work and strategic directions of USAID's overall programs. Clearly defined HICD goals and metrics in the Annual Program Statement for each mission, in partnership with local higher education institutions, should include a goal of increasing the number of degree seeking students in U.S. institutions.

Finding 4b. Human capacity development appears to be well understood. Most people have a good sense of what high capacity, well-trained, highly educated individuals are capable of doing, of what their skill sets entail. It is much less clear what constitutes the capability and attributes of high capacity institutions. The HICD Review Team has attempted to identify several of the attributes that we believe are important

HICD is a cross-cutting policy with a set of goals that each of the USAID agencies and organizations are expected to advance. The HICD Review Team found that many individuals, both within USAID and external to USAID-- those whom one would have expected to be well informed about HICD--did not know about the HICD program, or at best had heard of the policy but did not know its goals or any details. The HICD Review Team

also notes that several USAID reports and scorecards documenting agency progress in Feed the Future fail to mention progress on any HICD metrics.

Recommendation 4: ***The HICD Review Team suggests that BIFAD recommend to USAID that Agency HICD efforts need an internal and external branding strategy, perhaps an agency-wide designated advocate, and a set of outcome metrics to which each agency and mission is accountable. These outcome indicators should include a clear definition of a "high capacity institution" and appropriate metrics to assess progress in moving an institution toward achieving these institutional capabilities.***

B. Strengthening Access to U.S. Higher Education Systems by Students from Feed the Future (FTF) Countries

There is increasing divergence in access to U.S. higher education systems for students from developing countries versus countries with emerging market economies. The top three countries sending students to the United States for higher education--China, India and South Korea--occupy some 50 percent of all slots held by foreign students (Institute for International Education, 2013). The only African country among the top 25 countries sending students to the United States for higher education is Nigeria, at rank number 19 (7,316 students in 2012-2013, which is less than 1 percent of the total).

Additionally, the number of international students in U.S. universities by field of study shows that agriculture has remained flat at a very low level whereas math, computer science, engineering, business and management have grown dramatically, attracting upwards of 200,000 students in the case of math, computer science and engineering (Institute of International Education, 2013). Among the FTF countries, agricultural systems are extremely important to the countries' development prospects—yet, often the necessary connection between this critical economic sector and the commitment to develop competent scientists and leaders of these systems is absent.

Lack of access to quality higher education can have adverse impacts on national development, particularly in an era of increasingly important knowledge economies. Analysis from the World Bank shows that the rate of return to higher education exceeds that for primary and secondary education in African countries and approaches 20 percent. Education for women and girls is particularly valuable. Returns to tertiary education are highest where incomes are lowest (Montenegro and Patrinos, 2013).

Unequal access to the U.S. higher education system stems from a number of factors, including reduced availability of merit-based scholarships in U.S. graduate degree programs and lack of commitment to advanced education by developing countries with adequate internal revenue streams. U.S. universities face rising costs and, as one response, have sought internationally mobile students who can pay full out-of-state costs. Accordingly, rapidly developing or wealthy countries of Asia, the Middle East and Latin America have gained disproportionate access to U.S. institutions.

Students from developing countries also face difficulties meeting U.S. university entrance requirements including English language requirements, Graduate Record Exam requirements and addressing the transaction costs of applications which can carry a high financial cost. Many times curricula in developing countries differ from U.S. expectations or cannot be easily compared. These issues argue for an approach such as that of the Borlaug BHEARD Program implemented by a consortium led by Michigan State University that takes on the challenge of matching African students with U.S. universities and helping to smooth the application process and transitions.

Most FTF country institutions also lack adequate guidance on the requirements for admission to U.S. institutions, which limits student access to graduate training opportunities that are available in those U.S. institutions that offer relevant study programs. The FTF countries, therefore, need help in bringing to their awareness the training opportunities U.S. universities may offer especially in those fields of study that are relevant to the FTF initiative.

Also, policy makers in some of the FTF countries have limited knowledge of the relevance of world class academic training and professional competence in agriculture and food systems and how much value may be gained by investing in graduate or long-term training to support sustainable HICD in this important socio economic development sector. The USAID Mission, working with the appropriate government departments in the FTF country, could promote scholarship awards by the FTF country government to qualified students to undergo graduate training at predetermined U.S. LGUs.

Educational institutions at all levels in developing countries-- including higher education-- face many difficult challenges as they attempt to deal with rapidly increasing numbers of students due to population dynamics, limited support from governments, and inadequate infrastructure, especially that needed to adopt new information and communication technologies. The educational curricula of many FTF Country higher education institutions are neither current nor rigorous. Developing country universities can benefit from students trained with modern curricula and through partnerships with U.S. institutions, particularly in the agricultural sciences. At the same time, U.S. universities can benefit from exposure to the unique conditions including agro-ecosystems found in partner countries in the developing world.

Analyses have demonstrated that U.S. participant training is an effective and efficient approach to help build leadership of scientifically lagging developing country universities (Gilboy, A., H. Carr, T. Kane, R. Torene, 2004, and BIFAD CRSP Review Team, 2012). Numerous experts we interviewed concurred that some U.S.-based training produces undeniable benefits in terms of acquisition of soft skills and technical skills as well as building long-term relationships and allegiances among U.S. and developing country researchers, agriculturalists, educators and policy makers. Exposure to both the U.S. food and agricultural system (for profit and not-for-profit) and the U.S. higher education system provides access to a menu of institutional and technological options that would not otherwise be available.

Therefore, the BIFAD HICD Review Team concurs with the BIFAD HICD Working Group that the growing imbalance among countries in access to the U.S. higher educational system is a severe detriment to many developing countries—particularly in Africa—and is not in the best

interests of U.S. economic or national security as outlined in the U.S. Global Development Policy. Similarly, the United States will benefit from enhanced exposure to conditions and students from developing countries. The HICD Review Team recommends that USAID seek the means to facilitate an optimal amount of long-term training in the United States—some for graduate degrees--as opposed to all such training occurring in-country or in a third country. At the same time, the Team recognizes value in shorter-term training for more limited purposes.

The Team also encourages continued exploration of the panoply of new educational models and tools, including use of ICT, in blended models. The development of sandwich programs, distance education programs, professional networks, MOOCs, and computer- or cell-phone based materials may all serve valuable functions. However, strengthening access of FTF countries to U.S. higher educational institutions must be accorded a higher priority if the HICD initiative is to ensure and accelerate the impact of investments in higher education in these countries.

The BIFAD HICD Review Team has considered the role of new information and communication technologies (ICT) in increasing access to U.S. higher education institutions by students from FTF countries. Increasingly, these technologies can aid in the delivery of some educational materials along with sustaining linkages among networks of colleagues, science professionals, students and mentors, or other agriculturalists. Due to costs of U.S.-based education and to the implicit time required taking developing country students away from their home countries, ICT technologies rightfully are being scrutinized for the role they might play in global education. Application of ICT technologies in education is growing worldwide, but unevenly. Methods and results remain in flux. ICT encompasses a range of technologies including internet-based courses, mobile learning devices, electronic extension, etc. Such technologies can broaden access, remove the need to transport students or obtain their visas, and reduce

Box 1: Expanding the Effectiveness of MOOCs

MOOC Camp is a new initiative of the Department of State to host facilitated discussions around massive open online courses (MOOCs) at U.S. Embassies, Consulates, American Spaces, and other public spaces around the world. Facilitated discussions are led by alumni who have participated in U.S. government exchange programs, such as the Fulbright program, and U.S. Embassy staff, who are familiar with the course materials. U.S. Embassies and Consulates in more than 40 countries are currently participating, in subjects ranging from entrepreneurship and college writing to science and technology. Course content is drawn from major MOOC providers, including Coursera and edX, as well as from multiple Open Course Ware providers.

On October 30, the Bureau of Educational and Cultural Affairs announced a partnership with online education provider Coursera to expand learning opportunities worldwide as part of its MOOC Camp initiative. The State Department and Coursera will work together to engage young people and promote interest in U.S. higher education.

The State Department is committed to identifying new models that offer broad learning opportunities, help meet the aspirations of young people around the world, and offer skills and knowledge that they can use to succeed in life. MOOC Camps do exactly that – all the while offering students a chance to test-drive a U.S. higher education experience. Program participants will also be able to learn more about opportunities to study in the United States through EducationUSA, a network of hundreds of student advising centers around the world that the State Department supports. Participation in the program is free and open to the public.

living and educational costs. However, organizing on-line learning to obtain quality results remains challenging as does the economic business case. The future role of ICT in global education will obviously evolve over time and offers profound opportunities for enhancing the educational tool-kit. Whether the role will be complementary to more traditional place-based learning or will truly disrupt and redesign business as usual remains to be seen.

There is another key point that is often missed: The current approaches that U.S. universities utilize in the teaching pedagogy for ICT-enhanced learning is based on the U.S. model for costs of broadband connectivity. Developing countries must integrate ICT technologies into their own teaching paradigm to reflect their different pricing model for these services.

With respect to human resource goals, the HICD Review Team investigated some of the different models, methods of operation and relationships, and their relative merits, to enhance both technical and leadership skills of individuals and their institutional environment. We believe that significant economic, social, and political challenges in FTF countries can best be addressed through effective ongoing U.S.-FTF country cooperation among higher education partners.

Perhaps the higher education needs of FTF countries could be jointly defined and effectively addressed through cooperation between a reputable U.S. organization such as APLU and FTF country agencies in charge of higher education. The U.S. organization (APLU) and FTF country agencies for higher education working together, could broker connections between universities and also help link students to U.S. universities for appropriate higher education, tailored to the human and institutional needs of the FTF country for capacity development.

Key measures to enhance long-term training programs to produce leaders who are well trained in both technical and institutional leadership skills and who are effectively networked with both domestic and U.S. based colleagues include:

- Incorporate leadership training and experience into the academic curriculum for long-term trainees. Successful graduates of these programs will likely emerge as institutional leaders. They deserve to have exposure, even experience, in their graduate training that develops leadership and institutional management skills.
- Develop capacity for continuing, connect-back linkages on the part of graduates once they leave the U.S. institution and return to their home country. These graduates will encounter challenges—scientific as well as institutional—in which the capacity to link back to their mentors and colleagues where they studied can mean the difference between success and failure.
- Assure that long-term trainees are well trained and experienced in use of modern information technology, both to receive as well as to deliver useful, highly technical information.

Some special considerations are involved in identifying approaches that can increase the number of women involved in education or training. These are considered in detail in Appendix A.

Finding 5. Developing country higher education institutions often find that contractual and business relationships with US institutions can be onerous and time-consuming. USAID might be able to ameliorate these challenges by developing USAID sanctioned protocols by

which expertise at US higher education institutions could be accessed much more easily and quickly than is the case presently. Possibilities might include the development of overarching or umbrella agreements with one or more US institutions in which the US institution agrees to provide defined expertise and capabilities on request. Complex contracting details might be negotiated upfront. In-country institutions could then call on expertise and assistance via relatively simple task orders or sub-agreements. Such approaches have been used by a number of US institutions to simplify doing business with private sector partners. Similar approaches might work with international institutions. USAID appears to be already using this or a similar approach in some cases, as described at the recent HICDPro Rollout Conference (Ronald Regan Building, February 26, 2014). This approach might be expanded to include a "Higher Education Pro" approach to procurement challenges.

Recommendation 5: ***The HICD Review Team suggests that BIFAD explore with USAID the possibilities for streamlining contractual processes with U.S. institutions. This is especially important to implement Preferred Partners and as the USAID Forward policy expands.***

Finding 6: Many U.S. universities are expanding their international engagement efforts. The HICD Review Team encourages efforts of U.S. institutions to become more internationalized in their academic perspectives, to support measures that would encourage the admission of students from FTF countries for study at U.S. institutions. Institutions are also encouraged to develop more robust study-abroad opportunities for U.S. students, and encourage interested students and faculty to acquire the needed skills to pursue their interest in working internationally. We believe that strengthened access of students from FTF countries to U.S. institutions could be effectively achieved under the umbrella of Preferred Partner Institutions and as these institutions enhance their partnership over time, a pipeline of students from FTF institutions and from U.S. institutions could be established, admission requirements and procedures could be streamlined, and modern technologies be utilized to maximize access to U.S. HEIs by FTF students.

Recommendation 6: ***The HICD Review Team urges BIFAD to encourage U.S. universities to become more comprehensively internationalized, to take steps to increase the number of students on their campuses from FTF countries—especially including agricultural and related sciences—and to make partnerships in FTF countries part of their institutional strategies—especially in the agriculture and food arenas.***

Finding 7: Higher education institutions are key partners in implementing sustainable HICD programs in emerging economies around the world. It is clear that China, India and other nations take HICD seriously as they develop their international cooperation strategies for the 21st Century. Their vision is to engage government leaders at the highest level to develop cooperative efforts with higher education institutions. The United States used this philosophy very successfully in the past. It can renew the zeal it once put into this approach

and remain the most influential provider of advanced education in the world. Such a strategy would be in the nation's self-interest.

Recommendation 7: ***BIFAD is encouraged to stress the urgency for USAID to consider the international competition in the early 21st Century in terms of HICD, and to make it a priority to retain U.S. influence in FTF countries and beyond through enhanced HICD efforts.***

Finding 8: Girls' education at primary, secondary and tertiary levels is all important, as are social capital investments in the form of women's and girls' organizations, networks, and workplace and entrepreneurial skills enhancement. USAID focus on enhancing women's and youth's access to appropriate technologies throughout the production, processing and distribution systems-- the HICD Review Team believes--will pay high productivity dividends.

Recommendation 8: ***The HICD Review Team recommends that BIFAD encourage USAID to continue to emphasize its support of investments in HICD for women and girls.***

C. Enhancing Collaboration between Developing Country Universities, U.S. Universities and Other Public/Private-sector Institutions

The FTF initiative showed remarkable performance improvement between 2011 and 2012, averaging 161 percent gain measured across seven performance indicators (Table 1). These achievements were realized through active collaboration with stakeholders from the public and private sectors and affirm the immense power in stakeholder collaboration as envisioned by the FTF initiative. Though it may be implied in some instances, the performance indicators used to measure FTF accomplishments between 2011 and 2012 did not reflect vividly any metrics in the realm of HICD advancement. Four key questions the US Government through the FTF initiative seeks to answer satisfactorily in the years ahead are:

- ***Are we creating lasting impact?*** Are our beneficiaries and development stakeholders seeing positive and sustainable change in peoples' lives as a result of our food security investments?
- ***Are we holding ourselves accountable?*** Are we publicly reporting our Feed the Future spending and development results through transparent systems?
- ***Are we improving the way we do business?*** Are we changing our process of delivering food security assistance that more effectively coordinates resources and leverages capacity from internal and external stakeholders to meet our goals?; and
- ***Are we promoting innovation?*** Are we applying new approaches to leadership, decision making and programming that enhance the impact of our food security resources?

The HICD Review Team holds the view that a strong HICD is imperative to be able to provide sound solutions to the above questions and also believes that the higher education institutions (HEIs) in the United States and FTF countries are key instruments for developing such sound and sustainable solutions. Just as active collaboration with several stakeholders has enabled the FTF initiative to achieve impressive gains between 2011 and 2012, likewise, the HEIs in the United States and FTF countries need strong collaborations among institutions and also with the public and private sectors in order to build strong and sustainable institutions.

Developing countries have increased their own investments in higher education, though more is needed. The numbers of colleges and universities are increasing due to demographics. These institutions now seek collaborative relationships to maintain and improve the quantity and quality of agricultural, food and related environmental sciences in their colleges and universities. U.S. universities can contribute significantly when working with developing

Table 1: Performance of the Feed the Future Initiative between FY11 and FY12.

Feed the Future Performance Indicators	FY 11 Actual	FY 12 Actual	Percent increase FY11 to FY12
Rural households benefiting directly from U.S. Government interventions	6,640,455	9,200,276	38.5
Individuals who have applied new technologies or management as a result of U.S. Government assistance	1,760,993	7,448,159	323
Hectares under improved technologies or management practices due to U.S. Government assistance	2,397,456	3,791,549	58.1
Number of organizations that applied new technologies or management practices as a result of U.S. Government assistance	13,925	44,100	216.7
Value of agricultural & rural loans ($ million)	103.6	156.1	50.7
Children under five reached with U.S. Government-supported nutrition programs	8,814,584	12,038,528	36.6
Individuals who have been trained in child health & nutrition through U.S. Government programs	157,240	792,471	404
Average increase in performance across performance indicators	---	---	161

Excerpted from: "Feed the Future: The US Government's Global Hunger & Food Security Initiative" Progress Scorecard 2013 (http://feedthefuture.gov/sites/default/files/resource/files/feed_the_future_scorecard_2013.pdf Accessed 01/22/14)

country universities as they build capacity. Particularly, U.S. universities can help model enabling environments and relationships to engage with public- and private- sector institutions in the development, adoption and utilization of new and innovative technologies. This Review Team fully supports *FTF* programming to expand U.S.- FTF partner-country university linkages and draws attention to the major partnership project between the Ohio State University consortium and Sokoine University in Tanzania.

Many strengths and challenges of long-term university partnerships exist. In the "Golden Age" era of U.S. university involvement in institutional development, relationships of years, if not decades, with partner universities or ministries in developing countries, were expedited by continuing USAID support. In many cases university commitment and the forging of valuable relationships among scholars, researchers and colleagues strengthened such long term partnerships. Incentives were in place to facilitate and reward the collaborative work: faculty recognition and tenure possibilities, travel funds, and student support. In the current era, ICT may make partnership efforts more effective and less expensive and should be developed.

The BIFAD HICD Team encourages USAID to expedite formation of long-term partnerships between targeted agricultural higher education institutions in FTF countries and one or two selected U.S. universities, according particular consideration to linking U.S. 1862 land grants, or universities with similar missions, with 1890 minority-serving institutions that are skilled in working with small-holder agriculture. In such partnerships, specific performance outcomes and metrics should be jointly identified and progress measured and reported annually. In addition, outcomes and metrics should include an agenda for institutional change and focus on addressing the human resource needs of both public sector and private sector institutions. Additionally, the possible uses of ICT should be integrated progressively into the planning over time. We think that USAID's iAGRI in Tanzania provides a promising example of how long-term university partnerships integrating leadership training, networking among institutions, and the private sector hold promise and could proceed.

This Review Team also believes there is great value in more effectively engaging young people in international development endeavors. If global engagement is important for the U. S., this applies especially to engaging early career faculty at U.S. universities by creating incentives for junior faculty to become involved with students and institutions in FTF countries, but to do so in ways that allow them to achieve scholarly recognition such that they can advance in their careers. USAID might consider, for example, a prestigious "presidential young scholar/fellow award" or a "presidential international scholar/fellow award." These might be modeled after a similar program at the National Science Foundation. These would be prestigious awards, with a significant enough monetary benefit to attract the very best scientific talent. Such awards would be of a nature that would be widely recognized by U.S. institutions in the promotion and tenure of faculty. They would be designed to get young faculty at U.S. institutions engaged in international research and education early in their career while providing the resources needed for them to be scientifically productive. One version of such a program might be limited to U.S. young scientists. Another option might be a program to partner with FTF country governments or institutions and offer fellowships to a two-member team with one member from each country, with the stipulation that the research and educational endeavors

they undertake would be of benefit to each institutions or country. Regardless of the details, the goal of such a program would be to engage young academics in international research and education and, at the same time, provide a mechanism for doing so that would be recognized by their academic peers as equivalent to the prestigious awards that young academics might receive from NSF or other US scientific and research agencies.

Another opportunity might be to engage students. A growing number of U.S. college students are passionate about becoming involved in public service and humanitarian endeavors. Similarly, companies and non-profit organizations are increasingly interested in humanitarian projects. Coupled with the growing desire on part of many U.S. universities to develop more robust international engagement, this represents an opportunity for USAID and its HICD program. The HICD Review Team is aware of examples in which student teams have become involved, indeed developed, small scale projects to address important problems in low income settings in the United States as well as internationally. Two examples include Engineers Without Borders (http://www.ewb-usa.org/) and the Engineering Projects in Community Support (https://engineering.purdue.edu/EPICS/Projects/Teams). Both of these programs are student based and expose students to working in teams and in difficult environments and circumstances to solve important practical problems. We believe a program along these lines, specifically targeting FTF countries, could have merit. Such a program could be constructed in a competitive manner such that student teams would submit proposals for review before receiving modest funding to carry out the project. While the projects would undoubtedly be important, the most valuable outcome from such a program would be the development of human capacity.

The HICD Review Team notes that organizations worldwide have become more horizontal than vertical and more networked and linked than hierarchal. This reality requires institutions skilled at working together in partnerships—partnerships with other universities and with private and public sector entities. Many of these partnerships will make use of ICT linking scientists together. Wagner (2011) pointed out in an interview with the HICD Review Team that scientists in developing countries often form valuable partnerships with U.S. and other developed country scientists to adapt technology to specialized local conditions. Niches in developing countries can be identified to afford scientists opportunities to each bring something to the table in a scientific partnership and also adapt the application of a scientific technology to important local problems.

A major part of institutional capacity development includes building skills, networks and appropriate partnerships with the private sector. Private sector partnerships afford potential funding, technology advances, and improved managerial capacity strengthening in FTF countries. For example, USAID's Global Development Alliance (GDA), a global model for public-private partnership, has led to improved social and economic conditions in low-income countries. Since 2001, GDA has formed over 1,500 alliances leveraging nearly $19 billion in combined public and private sector resources (http://www.usaid.gov/gda). Further, FTF has arranged more than 660 partnerships in 2012 and leveraged over $115 million with public-private investments in agriculture. The HICD Review Team believes that to accelerate transfer of technology, access to capital, and improved management skills in FTF countries, the nature of the partnership between major corporations and USAID should be altered toward increased

support for small to medium agribusiness enterprises along food supply chains, while capacity within FTF universities to engage with the private sector must strengthen.

Many of the partnerships under GDA are "transactional" or deals made around specific investments within subsectors of developing countries. The Review Team believes what is needed is more strategic partnerships, such as USAID's recent Memorandum of Understanding with Walmart, wherein long-term goals and strategies for reaching stated goals are made explicit. Also, Walmart has developed multiyear programs directly with major land-grant universities, to include U.C. Davis, University of Arkansas, Tuskegee University and Cornell University, to develop and strengthen outreach programs for small-holder farmers (http://corporate.walmart.com/global-responsibility/environment-sustainability/global-responsibility-report). Monsanto has a capacity building program with Texas A&M(http://agnews.tamu.edu/showstory.php?id=1086), Master Card with Michigan State, University(http://www.msu.edu/stories/master-card-foundation/), and Goldman Sachs has launched a multi-year, multi-university program to train 10,000 women in business(http://www.goldmansachs.com/citizenship/10000women/). All of those corporate-university-agency programs have multi-year strategic arrangements that seek to build capacity, improved access, or develop monitoring and evaluation (M&E) models to advance sustainable development in developing countries.

The motivation of corporations to engage in programs that have the objectives of reducing poverty, sustaining the environment, or advancing social goals have been the subject of much debate and research. Indeed among practitioners of corporate social responsibility, the positions on corporate engagement is mixed; some organizations see their willingness to engage in social problems as a strategy to strengthen their bottom lines while other companies do not formerly have commitments to programs that are not directly tied to their profits. Although social engagement is very much voluntary on the part of companies, governments in recent years have developed initiatives to promote corporate social responsibility in low income communities. Those initiatives include tax deduction for charitable donations and public-private partnerships. The strongest reasons for companies to engage in social responsibility voluntarily are well documented. First, demand for skilled workers in developing countries requires companies to invest in improving the local labor pool. Firms may invest in local vocational schools, on-job training, and directly in the primary and secondary schools in their communities. Many firms engage in social responsibility because such initiatives can enhance their brands or corporate image. Finally, corporate social responsibility programs have been linked to improved business performance.

What then is the role of the state? It is widely considered that the enlightened role of government is to create an “enabling environment” for private sector activities. In this role, the state is largely responsible for the provision of public goods, infrastructure, and the enforcement of contracts—so called essential enablers. Due to the lack of pre-market enablers, and high transaction costs, most Feed the Future countries are rated very low on the World Bank’s Ease of Doing Business index. Therefore critical public investments are needed to create an improved business environment in low income countries as a first priority. However, due to the capacity of the state in low-income countries to deliver the

essential enablers, it is often the case where the state must promote “innovative institutions” or “smart partnerships” with the private sector to foster economic development. USAID can play a major role is creating partnerships with major corporations in developing countries.

Promising results show the need for continued support of small to medium agribusinesses enterprises (SMAEs). The central role of production agriculture (small farmers, in particular) in economic development is widely understood. Agriculture employs a high percentage of the population, constitutes a large share of the national GDP, and accounts for the major components of household expenditures. However, increasingly critical is for USAID to pay much closer attention to agribusiness-- those off-farm private sector players that include commercial enterprises, collective organizations such as producer associations, and firms involved in both input and output markets. To accelerate economic growth, economic performance of this segment of the food supply chain can be improved with investments in hard and soft infrastructures, capacity strengthening of their management, and greater access to capital, technologies and to policy makers. A comprehensive view of SMAE development-- a micro-economic agenda--in FTF countries must be given serious consideration, as much attention as has been paid by the World Bank, International Monetary Fund, and Ministers of Finance to "macro-economic" conditions of developing countries. This micro-economic strategy should look at ways to improve the competitiveness of the SMAE of FTF countries. Historically, often the SMAE sector has been viewed by policy makers as "exploitative middle-men," without a clear understanding of the role markets play in achieving economic development goals. Mistrust of the private sector, under appropriate enabling environments and effective regulatory policies, is counter-productive. We find no comprehensive program or model for SMAE development to recommend, but several initiatives in South Africa, between Cornell University and Stellenbosch University, and in East and West Africa with ANAFEA point to some promising results.

Necessary investments and partnerships with the private sector go beyond corporate social responsibilities (CRS) to encompass fresh thinking around strengthening African business networks and connecting those networks to capabilities in African universities. FTF countries’ universities are not well known for having effective partnerships or relationships with the private sector, especially with SMAE, but here USAID can play a creative role in leveraging U.S. land-grant university expertise with private sector investors to form effective partnerships. The Review Team believes that U.S. universities can play a major role in developing relationships with the private sector to build human capital and strengthen institutional capacity in Feed the Future countries. For example, US Land Grant Universities have developed high-quality certificate programs for agribusiness companies in their respective states. From those certificate programs, some universities, for example Purdue, Michigan State, and Cornell have promoted short courses for executive training of managers of agribusiness firms. And, US universities have long established world-class agribusiness MS and PhD degree programs that offer training to those who seek a career in research or teaching. It should also be recognized that agribusiness networks among African universities such as ANAFAE, representing over 20 African institutions, was established to strengthen institutional capacities to engage the agribusinesses in their respective countries. This network of universities can serve as an effective model for advancing work with the private sector in each country, connecting this sector to new technologies, information, and markets,

while strengthening the capacity of the universities to partner with entrepreneurs and valued added food companies. Finally, FTF universities are not well positioned to develop skills required by domestic and regional food systems. FTF countries must improve their workforces to effectively provide trained graduates to manage their rapidly evolving food systems. Forming effective partnerships with the private sector, U.S. universities, and USAID is a model for engagement that merits high consideration.

Finding 9: USAID, through its **c**ollaboration with organizations such as the New Partnership for Africa's Development and its Comprehensive African Agricultural Development Program (CAADP), Alliance for a Green Revolution in Africa (AGRA), the Consultative Group on International Agricultural Research (CGIAR), and similar organizations focusing on agricultural research, development and outreach to smallholder farmers, should encourage these organizations to work with HEIs to advance HICD goals. The HICD Review Team applauds USAID involvement with these organizations as they target a food secure and prosperous Africa and in developing countries around the world. In such collaborations, USAID should promote the integration of FTF country and US HEIs into these organizations' programs, perhaps including linkages such as adjunct faculty appointments, as a strong sustainability element for the FTF countries.

Recommendation 9: ***The HICD Review Team recommends that BIFAD encourage USAID-Washington and USAID Missions to help broker collaboration with efforts like the New Partnership for Africa's Development and its Comprehensive African Agricultural Development Program (CAADP) and with national governments of the 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. Partnerships with AGRA, CGIAR and similar organizations should be encouraged as well. Such strong collaborations can maximize total partner resources and leverage expertise and comparative advantages among the collaborating entities. Adoption of public-private partnerships could help defray some of the costs that formerly fell to the United States alone in earlier HICD models.***

Finding 10a: Relevance of the curricula to needs of the agriculture and food sector is a key gap limiting the impact of higher education institutions in FTF countries. This is especially true of technologies adoptable by the small farmers and small -scale processors for whom appropriate technology transfer protocols are critical.

Finding 10b: Higher education institution partnerships with private institutions and organizations offer important opportunities to advance the impact pathways related to agriculture and food systems, especially at the workforce level. Private institutions involve both local companies and international firms. USAID Missions could be in key positions to facilitate dialogues between policy specialists, private sector leaders, and higher education institutions to develop strategic plans, identify training and curricular shortcomings, facilitate possible internships, and support the development of appropriate technologies to advance local food and agriculture.

Recommendation 10: ***BIFAD should consider recommending that USAID-Washington and USAID Country Missions 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. Curriculum-enhancement networks linking Preferred Partner institutions to modernize agriculture and food sector curricula might be one promising pathway.***

Finding 11a: Knowledge and understanding of USAID Missions in FTF countries of the HICD initiative and Mission involvement in program development and implementation is not clear to our review team, but we feel strongly that as primary contact with FTF country public/private institutions. Missions need to play key roles at every stage of major HICD programs from conceptualization to conclusion. Also, the priorities of in-country missions are critical to the success of any USAID initiatives. The Annual Program Statements of Missions are critical control points in managing the work and strategic directions of USAID's overall programs. Clearly defined HICD goals and metrics in the Annual Program Statement for each Mission, in partnership with local higher education institutions, should include a goal of increasing the number of degree seeking students in U.S. institutions.

Finding 11b: Higher education institution partnerships with private organizations offer much opportunity to advance the impact pathways related to agriculture and food systems. These private organizations include both local companies and international firms. USAID Missions could be in key positions to facilitate dialogues between policy specialists, private sector leaders, and higher education institutions to develop strategic plans, identify training and curricular shortcomings, and support the development of appropriate technologies to advance local food and agriculture.

Recommendation 11: ***The HICD Review Team urges BIFAD to recommend that USAID strive to involve FTF Country Missions in HICD program development and implementation and to encourage Missions to link with in-country public/private institutions including the HEIs (or the Government Department that represents them) to develop annual HICD goals and metrics---metrics that include increasing the number of students attending U.S. institutions of higher education.***

D. Building Developing Country Access to U.S. Technologies

U.S. universities have extensive experience working with the private sector concerning food and agricultural technologies. U.S. land grant universities, particularly, have encompassed research, teaching and extension functions ranging from agricultural production technologies through all aspects and stages of the value-added chain—marketing, distribution, food science and processing, nutrition and consumption. Each phase of the value chain involves links to the private sector—to assure that the curriculum is relevant and accurate and that the universities produce students with needed knowledge and skills. Developing countries may benefit not only from specific technologies utilized in the United States but also from the conceptual

framework that recognizes and integrates perspectives from the private sector in the formulation of university curricula.

Many new developments in science and technology hold promise for increasing productivity in developing countries in the 21st century. Technological advances, realized through public and, increasingly, private investments in research and development, are increasing production globally. These include improved technologies for nutrient, soil, water, and pest management, precision agriculture (such as the use of global positioning devices in farming) and agricultural biotechnology. Advances in livestock breeding and veterinary science will increase both the quantity and quality of animal protein available to consumers. Crops and animals that can tolerate a wider range of environmental conditions and offer consumers desired characteristics, such as nutritional value and extended shelf life, are being developed. Innovations in biological and information sciences have resulted in several emerging fields—such as nanotechnology, which refers to the ability to manipulate individual atoms and molecules—that may form the foundation for new technologies that will be used to improve sustainable agricultural production and protect ecosystem functions.

The full benefits of scientific breakthroughs and new technologies will not be realized in developing countries without effective dissemination of new know-how and its adaptation to local conditions. These successful research and technology transfer activities, increasingly, will depend on cooperative endeavors between developed and developing countries and between public and private institutions. Developing countries must determine which technologies and advancements will address their unique economic social, and environmental needs. Then these countries can benefit from working with developed countries and institutions to develop, adapt, and transfer productivity-increasing technologies to farmers in their own countries. (USG, 2008)

Appropriate technologies

Production agriculture, primary food processing, and distribution chains in FTF countries suffer significantly from technology handicaps. Labor is inefficient and productivity consequently hampered due to high dependence on manual labor for agricultural operations from field to fork. The sheer difficulty of agricultural work impairs women's contributions and significantly reduces the desirability of participation in agriculture by youth. Access to appropriate and affordable technologies therefore remains a high priority to raise per capita productivity and make agricultural and the food system more attractive to men and women and girls and boys.

U.S. agricultural and food technology is generally highly sophisticated, expensive, and targeted at large-scale operations. It maximizes returns to costly labor. Most FTF countries are not suited to capital-intensive technology. Instead, they are characterized by abundant labor, low labor costs, high capital costs, human capital limitations (limited education, cultural constraints) and agro-environmental constraints. Thus, U.S. science and technology must be adapted to fit local conditions.

USAID has the capacity to promote partnerships between FTF countries and U.S. universities to develop collaborative programs to research and develop appropriate technologies to address the critical needs of the FTF country. Needs may be jointly identified and technologies adapted

to address short-, medium- and long-term needs. USAID can work with FTF countries to understand the human and institutional dimensions of the appropriate technology needed to drive sustainable development in any given country and circumstance.

U.S. universities with strong programs in designing and fabricating agricultural implements for small-scale farming are needed to train graduate students from FTF countries in small farm mechanization. This is an area of need where investments in human and institutional capacity development can be measured readily based on advancement in appropriate technology adaptation to agricultural productivity in FTF countries after the U.S. trained graduates have returned home. Such technologies must be designed to be affordable and manageable by the resource-poor farmer, recognizing that many small farmers are women.

In summary, currently developing countries do not have ready access to rapidly changing and evolving food system technologies--from field to fork--that characterize the United States. Additionally, information and communications technologies, while promising, are currently insufficient and unreliable in many developing countries. Access to modern ICT infrastructure in developing countries is highly variable and remains an important work in progress. While evolving rapidly, the current situation in many cases limits the use of sophisticated information and communications to reliably deliver educational programs and share research and other technical information. We know that open data access and open innovation networks are critical to innovation and to creative cultures and organizations such as universities. These sorts of networks are also critical in creating the culture in which high-octane individuals want to live and work.

ICT is an effective tool for advancing extension and outreach in agriculture and food systems. This tool is gaining traction at unprecedented rates in FTF countries primarily as a human capacity development phenomenon. It is driven by the private sector with profit as the primary driving force. So far there is limited traction at the institutional level.

Finally, while advances in ICT offer much potential, the HICD Review Team believes that ICT is unlikely to supplant completely face-to-face delivery of educational content. ICT can be a powerful adjuvant but will likely be most effective in blended delivery approaches.

Finding 12a: Horizontal networks, both spontaneously forming and specifically structured, are evolving, powerful tools being used by scientists and educators worldwide. While much business—of all types—can be done virtually in these networks, most successful networks and virtual collaborations begin with face-to-face human contact. These new tools offer truly disruptive opportunities to change education and research.

Finding 12b: There is significant opportunity to expand benefits from scientific and educational networks. USAID's HICD efforts should encourage and facilitate these networks. Institutional alumni, networks of professionals in the diaspora, spontaneous self-forming topical networks among leading scientists, on-line learning networks are all examples. Networking experts agree that networks form best when based on personal relationships among a few key organizers.

Recommendation 12: ***The HICD Review Team encourages BIFAD to urge USAID, both in Washington and in Missions, to invest in developing and nurturing scientific and educational networks of FTF countries.***

Finding 13. Information and communications infrastructure in many FTF countries limit the full and successful exploitation of robust information and communications technologies. While investments in long-term and short-term training are critical elements of successful HICD, investments in ICT infrastructure are also important. Capabilities in many FTF countries limit the full and successful exploitation of robust information and communications technologies.

Recommendation 13: ***The HICD Review Team recommends that BIFAD urge USAID and USAID Country Missions to recognize the critical importance of ICT infrastructure to human and institutional capacity development and to encourage investments in the infrastructure that can allow FTF country institutions to link effectively with global digital networks in education, research, and outreach.***

Finding 14: FTF countries may benefit not only from specific technologies utilized in the United States but also from the conceptual framework that recognizes and integrates perspectives from the private sector in the formulation of institutions and curricula in the universities. USAID has the capacity to promote partnerships between the FTF country and U.S. universities to develop collaborative programs to research and develop appropriate technologies to address the critical needs of the FTF countries. Some of such technology needs may be jointly developed and properly adapted to address short- , medium- and long-term needs of a FTF country.

Recommendation 14: ***BIFAD should consider asking USAID to promote collaboration between U.S. and FTF country higher education institutions to develop and integrate appropriate agriculture and food system technologies into smallholder agriculture and SMAEs engaged in local food systems. The vision is to raise food and agricultural production and processing efficiency to encourage current operators (many of whom are women) to expand production scale and also to inspire the youth to go into agriculture and food production as a business.***

XI. RECOMMENDATIONS SUMMARY

The HICD Review Team believes these are recommendations represent actions and program improvements that BIFAD might recommend to USAID to improve HICD in FTF countries. Some of these recommendations would be relatively easy to implement; others much more difficult. Some would be most appropriate at the agency level, some at the mission level, and some are best suited for U.S. Universities. Some of these recommendations might be germane to several entities of the HICD implementation domain. Table 2 is an attempt by the HICD Review Team to map these recommendations to the respective Key Issues on which we believe they would have primary and secondary impact.

Table 2. Key Issues and Their Impacting Recommendations

KEY ISSUE	RECOMMENDATIONS Primary Impact	RECOMMENDATIONS Secondary Impact
Strengthening Institutional Capacity and Partnerships to Advance Impact Pathways	1, 7, 8, 11	9, 4,10, 12
Strengthening Access to U.S. Higher Education Systems by Students from FTF Countries	2, 6, 13, 14	1
Enhancing Collaboration between Developing Country Universities, U.S. Universities and other Public/Private Sector Institutions	3, 4, 12	1, 5, 7
Building Developing Country Access to U.S. Technology	5, 9, 10	1

List of Recommendations:

Recommendation 1: *The HICD Review Team suggests that BIFAD encourage USAID to establish a long-term* ***Preferred Institution Partners Program*** *involving FTF country and U.S. higher education institutions. This partnership program should be built on the key attributes of USAID's legacy programs that successfully include both human and institutional capacity development. It should provide FTF higher education institutions the capability to link with U.S. institutions in a long-term partnership, to have access, on an as-needed basis, to U.S. partner institutions for expertise, curricular content, and infrastructure assistance to effectively identify and serve the education and technology needs of their local community. This institutional support capability should be available for all aspects of the FTF institution's operations and include jointly conducted research projects that engage both students and faculty. Human capacity building would be enhanced through targeted long- and short-term*

educational and training programs combining in-country, U.S.-based and regional training programs as appropriate and cost-effective. Institutional capacity building would build on USAID HICD policy principles and encompass institutional assessments and strengthening strategies.

Recommendation 2: *The HICD Review Team urges BIFAD to encourage U.S. institution leaders to modify their promotion and tenure protocols to appropriately recognize scholarly products in support of international engagement and development on the part of junior faculty.*

Recommendation 3: *U.S. institutions should develop educational and training programs, especially long-term, crafted to assure that a student's curriculum includes leadership training and experience as well as the use of current information technologies—both to receive and to deliver educational content.*

Recommendation 4: *The HICD Review Team suggests that BIFAD recommend to USAID that Agency HICD efforts need an internal and external branding strategy, perhaps an agency-wide designated advocate, and a set of outcome metrics to which each agency and mission is accountable. These outcome indicators should include a clear definition of a "high capacity institution" and appropriate metrics to assess progress in moving an institution toward achieving these institutional capabilities.*

Recommendation 5: *The HICD Review Team suggests that BIFAD explore with USAID the possibilities for streamlining contractual processes with U.S. institutions. This is especially important to implement Preferred Partners and as the USAID Forward policy expands.*

Recommendation 6: *The HICD Review Team urges BIFAD to encourage U.S. universities to become more comprehensively internationalized, to take steps to increase the number of students on their campuses from FTF countries—especially including agricultural and related sciences--and to make partnerships in FTF countries part of their institutional strategies--especially in the agriculture and food arenas.*

Recommendation 7: *BIFAD is encouraged to stress the urgency for USAID to consider the international competition in the early 21st Century in terms of HICD, and to make it a priority to retain U.S. influence in FTF countries and beyond through enhanced HICD efforts.*

Recommendation 8: *The HICD Review Team recommends that BIFAD encourage USAID to continue to emphasize its support of investments in HICD for women and girls.*

Recommendation 9: *The HICD Review Team recommends that BIFAD encourage USAID-Washington and USAID Missions to help broker collaboration with efforts like the New Partnership for Africa's Development and its Comprehensive African Agricultural Development Program (CAADP) and with national governments of the 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. Partnerships with AGRA, CGIAR and similar organizations should be encouraged*

as well. Such strong collaborations can maximize total partner resources and leverage expertise and comparative advantages among the collaborating entities. Adoption of public-private partners could help defray some of the costs that formerly fell to the United States alone in earlier HICD models.

Recommendation 10: *BIFAD should consider recommending that USAID-Washington, D.C. and USAID Country Missions 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. Curriculum-enhancement networks linking Preferred Partner institutions to modernize agriculture and food sector curricula might be one promising pathway.*

Recommendation 11: *The HICD Review Team urges BIFAD to ask USAID to involve FTF Country Missions in HICD program development and implementation and request that Missions link with in-country public/private institutions including the HEIs (or the Government Department that represents them) to develop annual HICD goals and metrics.*

Recommendation 12: *The HICD Review Team encourages BIFAD to urge USAID, both in Washington D.C. and in Country Missions, to invest in developing and nurturing scientific and educational networks of FTF countries.*

Recommendation 13: *The HICD Review Team recommends that BIFAD urge USAID and Country Missions to recognize the critical importance of ICT infrastructure to human and institutional capacity development and to encourage investments in the infrastructure that can allow FTF country institutions to link effectively with global digital networks in education, research, and outreach.*

Recommendation 14: *BIFAD should consider asking USAID to promote collaboration between U.S and FTF country higher education institutions to develop and integrate appropriate agriculture and food system technologies into smallholder agriculture and SMAEs engaged in local food systems. The vision is to raise food and agricultural production and processing efficiency to encourage current operators (many of whom are women) to expand production scale and also to inspire the youth to go into agriculture and food production as a business.*

APPENDIX A. GENDER IN AGRICULTURE

(For a comprehensively detailed discussion of all these issues see Sourcebook (2009) World Bank, FAO, IFAD.)

Understanding the importance of gender issues in agricultural and food systems is critical to getting policies and projects right and making a positive difference in livelihoods and food and nutrition security. Women play an extremely important role in agriculture and food production as well as in reproduction and family care. Often, women have heavy responsibilities but unequal access to productive inputs.

In sub-Saharan Africa (SSA), the composition of rural households has changed over the past two decades reflecting the significant impacts of HIV and AIDS. The death of young adults has frequently resulted in a missing generation of parents who were the agriculturalists. Farms have been left in the hands of children and grandparents with subsequent detrimental impacts on agriculture. Further, migration of men to urban or other alternative locations seeking economic opportunity has frequently left women "to carry the full burden of agricultural production, but often with no legal protection or rights to property ownership." (WBSB, p. 1) A harsh fact is that land grabbing from AIDs widows has been prevalent in SSA.

Other important factors and trends affecting agriculture worldwide provide enhanced opportunities for agriculturalists, in general, and women, in particular, but increase uncertainties and may raise equity concerns—global markets and trade policies, for example,. Globalization of markets favors producers whose products can meet international standards for safety and quality. These requirements can be better satisfied by producers who have access to knowledge and information, to effective technologies, and exhibit economies of scale: frequently not characteristics of smallholder producers. Women, particularly, traditionally have faced restricted access to credit, land, input markets, and information/education putting them at a disadvantage in evolving markets. At the same time they assume heavy responsibilities, not only for production but reproduction and family/household maintenance.

Why is Gender Equality important?

Gender is the economic, social, political, and cultural attributes and opportunities associated with being a man or a woman. Gender equality means "equal access to the opportunities that allow people to pursue a life of their own choosing and to avoid extreme deprivations in outcomes." (Global Monitoring Report 2007 definition). The significant dimensions of gender equality include: rights, resources, and voice. (World Bank 2007c: p.106, cited in Gender in Agriculture Source Book, p. 2).

Many economists have noted that gender equality proves crucial for societal economic efficiency. In the agricultural sector, gender inequalities in access to and control over resources are persistent. Women have poorer access to credit, to land, to appropriate technologies and productive inputs. These deficiencies result in economic inefficiency as well as poverty, undermining sustainable and inclusive development of the sector. In addition gender inequalities and distributional disparities result in differences in a variety of outcomes. Gender roles and relationships affect household/family welfare and food security.

In SSA and South Asia women are largely unrecognized as farmers by policy makers, community leaders, and opinion makers despite being the main producers. (For example, in Uganda, 75 percent of producers are women). Women are also active in marketing, food processing, as laborers and entrepreneurs. "However, the design of many development policies and projects continues to assume incorrectly that farmers and rural workers are mainly men," (World Bank 2007b, p.3).

Box 2. Strategies to Address Gender Issues in the Education and Training Components of Agricultural Development Projects

To increase women's enrollment in agricultural courses

- Conduct campaigns in secondary schools to promote agriculture as a career for women
- Increase girls' enrollment in secondary schools and particularly in science courses
- Provide scholarships for women to attend agricultural courses at colleges or universities
- Provide supplementary, precollege courses in science and other subject as needed
- Provide separate boarding facilities for women or a completely separate college if necessary
- Encourage parents' visits to training colleges to help them ascertain that the facilities are suitable for their daughters

To increase training in gender issues for everyone

- Appoint a staff person with gender expertise as a teaching/training coordinator to review gender issues in all training modules
- Insert modules on gender issues in agricultural college and university courses
- Include gender issues in in-service training and use information from gender studies to prepare training sessions
- Send teachers on short-term training courses in gender issues
- Engage agricultural college staff and students in gathering project preparation data on gender issues

To increase training for women in projects

- Include minimum targets for training of women agricultural technicians
- Make study tours and training abroad accessible to women staff
- Set minimum targets for training of women farmers
- Consider conducting agricultural training with literacy activities
- Include a functional literary training component in agricultural training courses
- Include specific targets for women and men participants in agricultural training, depending on their literacy levels
- Collaborate with other ministries, agencies, or NGOs on functional literacy
- Include a grassroots management training component to train rural women farmers in business management techniques, financial management, human resource management, marketing, and running small businesses, for example, as in the World Bank's pilot projects in Burkina Faso, India, Malawi, Nigeria, and Senegal, developed by the Economic Development Institute (EDI) and in FAO's numeracy projects for women entrepreneurs in West African countries (Benin, Cote d'Ivoire, and Ghana).

Source: **Gender in Agriculture Source Book, World Bank, FAO, IFAD.**

Women face obstacles in making their voices heard in government and other policy arenas. "For instance, recent studies stress that women's representation and gender integration into national plans and agricultural sector strategies remains a challenge (World Bank, 2005b).

Women are much less likely to have representation on financial boards, water boards, etc., "Significant gender inequalities can be found in peoples' access to other key productive assets and services: land, labor, financial services, water, rural infrastructure, technology, and other inputs." In general, roughly 70 to 90 percent of formal ownership of land is skewed toward men in SSA and LAC. (Doss 2005; Quisumbing, Estudillo, and Otsuka, 2004). Also, Deere and Leon, 2003 (Sourcebook p. 2).

The Millennium Development Goals adopted by the global community depend on improvements in gender equality: these include MDG 1—halving the proportion of hungry and poor people; MDG 3- promoting gender equality; and MDG 4—maternal and child health improvements (all by 2015.)

The Sustainable Livelihoods Approach (DFID, UK) is used to "provide a conceptual framework for the complexities and synergies of gender equality, livelihoods, food security, and poverty reduction." The holistic concept of livelihood strategies is based on human, physical, financial, natural, and social assets. "Livelihoods have been defined as comprising "the capabilities, assets (including both material and social resources) and activities required for a means of living. A livelihood is sustainable when it can cope with and recover from stresses and shocks and maintain or enhance its capabilities and assets both now and in the future, while not undermining the natural resource base." (Cited in World Bank Gender Source Book, p. 4.)

Gender analysis is often used to examine "gender asymmetries in access to and control over assets; gender asymmetries in participation and power in land, labor, financial, and product markets; gender-differentiated distribution of risks and gains along value chains; gender asymmetries in market information, extension services, skills, and training; gender asymmetries in participation and leadership in rural organizations; gender asymmetries in rights, empowerment, and political voice; gender asymmetries in household composition and labor availability (dependency ratios, migration, and disability); physical and agro-ecological risks and their gender-differentiated impacts and vulnerability." (WBGSB, p. 5).

Women and Food Security

How are gender issues related to food security? Food security, is defined at the individual, household, national, regional, and global levels as being achieved when all people, at all times, have physical, social, and economic access to sufficient, safe, and nutritious food to meet their dietary needs and food preferences for a healthy and active life. (FAO, 2001).

Poverty is the main driver of food insecurity. "Improvements in agricultural productivity are necessary to increase rural household incomes and access to available food but are insufficient to ensure food security. Evidence indicates that poverty reduction and food security do not necessarily move in tandem. The main problem is lack of economic (social and physical) access to food at national and household levels and inadequate nutrition (or hidden hunger). Food security not only requires an adequate supply of food but also entails availability, access and

utilization by all—men and women of all ages, ethnicities, religions and socioeconomic levels." (WBGSB, p11).

"Agricultural interventions are most likely to affect nutrition outcomes when they involve diverse and complementary processes and strategies that redirect the focus beyond agriculture for food production and toward broader consideration of livelihoods, women's empowerment, and optimal intra-household uses of resources. Successful projects are those that invest broadly in improving human capital, sustain and increase the livelihood assets of the poor, and focus on gender equality." (WB, 2007b).

Research over time has shown that women play an often, differentiated role in both agricultural production and contributions to household food security. Women tend to produce food staples and may also produce commercial crops. "When they have an income, substantial evidence indicates their income is more likely to be spent on food and children's needs. Women are generally responsible for food selection and preparation and for the care and feeding of children. Women are the key to food security for their households (Quisumbing and others 1995, cited in WBGSB p. 12).

Women also tend to be the last to eat in many rural households where their status is low, contributing to their own under-nutrition.

Examination of time use in rural areas has shown that women bear disproportionate responsibility for locating and carrying water and firewood for the family as well as foodstuffs for cooking, marketing or processing, and caring for children as well as sick family members. Food fields may be farther away than the commercial crop fields, necessitating time-consuming travel between fields. In short, labor bottlenecks and lack of appropriate technologies for women's use contribute to overall economic inefficiency in the agricultural and food sector. They also result in suboptimal family nutrition, health and welfare outcomes.

A final consideration is related to impacts of natural resource scarcities as well as changes in climate. Increased population and food needs necessitate either intensification of agriculture on existing land or bringing more, often marginal lands into production. As soils, water and other resources are depleted, women must travel farther afield to attain food, firewood and water for the family, fallow periods to restore soil fertility are shortened, and a vicious cycle ensues.

Table 3. The Educational Gender Gap in Selected Developing Countries

Country/Region	Adult (15+) literacy rate (%)		Population (25+) Attained Primary Education (%)		Population (25+) Attained Secondary Education (%)		Population (25+) Attained Tertiary Education (%)	
	Female	Male	Female	Male	Female	Male	Female	Male
Asia & Pacific	92	97	…	…	…	…	…	…
Bangladesh	52	61	42	53	13	21	4	5
Cambodia	66	83	25	48	3	10	…	…
Nepal	48	73	…	…	…	…	…	…
Tajikistan	100	100	96	98	74	84	6	15
Latin America & Caribbean	91	92	…	…	…	…	…	…
Guatemala	70	81	26	34	9	12	2	5
Haiti	45	53	…	…	…	…	…	…
Honduras	85	85	54	52	20	19	5	5
Sub-Saharan Africa	51	69	…	…	…	…	…	…
Ethiopia	29	49	15	34	5	9	0	1
Ghana	61	73	…	…	…	…	…	…
Kenya	84	91	47	67	18	48	0	0
Liberia	57	65	…	…	…	…	…	…
Malawi	68	81	11	29	2	8	0	1
Mali	20	43	18	19	6	5	3	1
Mozambique	43	71	…	…	…	…	…	…
Rwanda	68	75	…	…	…	…	…	…
Senegal	39	62	7	15	3	7	0	1
Tanzania	67	79	42	57	1	2	1	1
Uganda	65	83	37	50	8	13	2	4
Zambia	62	81	…	…	…	…	…	…
USA	…	…	99	99	88	87	40	38
World	80	89	…	…	…	…	…	…

Sources: Literary: World Bank, World Development Indicators 2013 (data 2005-2011);
Cumulative educational attainment of population aged 25 years and older: UNESCO *Latest year available

APPENDIX B: Returns on Investments in Tertiary Education

Cost and expenditures of tertiary education

Any evaluation of the returns to investment in tertiary education must consider both costs and benefits. Like any other investment, human capital development has associated costs including "direct expenses and earnings or consumption *foregone* by students, by trainees, and by workers engaged in labo*r* mobility" (Mincer, 1993). The cost of education is often split into private (costs to family or individual) and public investment (cost to government and society). Tuition and fees serve as a good proxy for measuring individual expenditure while public expenditure can be derived from government budgets. Table 4 below shows the expenditures on education in Feed the Future countries. For comparison purposes, USA expenditures are also tabulated. Three key observations are worth pointing out from this table. First the expenditures on education vary greatly across the different countries with a strong positive correlation between expenditures and economic development. Second, in most of the countries, the expenditures per student are much higher for tertiary education than both primary and secondary education combined. Third, compared to other FTF countries, Malawi and Tanzania have much higher expenditures in higher education at $6,330 and $4,555 respectively.

Benefits to tertiary education

While there is broad consensus on the pivotal role of education improving economic development, the returns to investments in education are difficult to quantify. It is useful to classify returns to gains from tertiary education into two categories – individual benefits and societal benefits. Individual benefits, often captured by increased earning of the individual/graduate over their lifetime are the most tangible and easier to compute. Note that such private returns are a function of the job market and the general level of economic development, reflecting the national capacity to pay for human capital. A recent World Bank report estimates that each additional year of tertiary education in Sub-Saharan Africa can yield 10 percent to 15 percent returns in the form of higher wages (World Bank, 2009). Societal benefits on the other hand are more difficult to quantify but are nonetheless critical to the wellbeing of every nation. Both directly and through 'spillover' effects, tertiary education promotes entrepreneurship, investment, public health, civic engagement and leadership (Cunninghum, 2008; Bloom et al, 2006). Further, tertiary education also significantly reduces the likelihood of an individual being dependent on society for support or being incarcerated.

Based on studies in the 1980s and 1990s, Table 5 shows the social as well as private rates of return to education in selected countries. In this table, the *social rate of return* is based on pre-tax earnings, includes foregone earnings and public and private outlays, while the *private rate of return* is based on post-tax earnings, private returns to individuals, and excludes public costs and taxes. A key conclusion from this table is that primary education generates the highest social and private profitability in most developing countries (Psacharopoulos and Patrinos,

Table 4: Expenditures on Education in Feed the Future Countries (USD per Student)

Country/Region	Primary education	Secondary Education	Higher education
South Asia	86	178	506
Bangladesh	53	72	166
Cambodia	53	...	215
Nepal	86	65	270
Tajikistan	...	...	101
Latin America & Caribbean	1291	1354	1073
Guatemala	243	159	485
Honduras	389	...	851
Sub-Saharan Africa	172	177	...
Ghana	126	288	1631
Ethiopia	62	34	80
Kenya	136	129	1264
Malawi	28	120	6330
Mali	108	249	1346
Mozambique	49	279	...
Rwanda	39	224	724
Senegal	163	...	1855
Tanzania	107	85	4555
Uganda	34	98	515
Zambia	34	196	...
USA	10688	11771	10098

Source: World Bank, most recent year available (2004-2011)

2004). Other studies from the same era also reach similar conclusions. Using countries' economic performance during 1960-85 to capture the externalities from education, Mingat and Tan (1996) estimated the social return to education. While confirming the social profitability of education, the study suggests the following investment priorities based on maximizing returns: low income countries should prioritize primary education, middle income countries should prioritize secondary education and high income countries should expand coverage of higher education.

Based on such evidence as presented in Table 5, the international development community, during much of the 1980s and 1990, encouraged developing countries to focus on primary and secondary education leading to the neglect of tertiary education (Bloom et al, 2006). A growing body of literature suggests conventional economic measures of returns on educational investment do not accurately reflect the social value added by higher education (Lewis, 2009). The multiplier effects of research and development — a core function of tertiary education — were also largely ignored in most studies. Moreover, as pointed out by Bennel (1996) most country level rates of return on education studies undertaken in sub-Saharan African countries had theoretical and empirical limitations that undermined their credibility. Bloom et al, show quantitative evidence that expanding tertiary education in sub-Saharan Africa will "promote faster technological catch-up and improve a country's ability to maximize its economic output". For example, a one-year increase in the tertiary education stock would increase the long-run steady-state level of African GDP per capita due to factor inputs by 12.2%. Trends in technology have also increased returns to tertiary education relative to primary and secondary education especially in STEM (Science, Technology, Engineering and Math) related fields. In light of this new evidence, key donor institutions, including the World Bank, now acknowledge that "neglecting tertiary educations could seriously jeopardize long term growth prospects for Sub-Saharan African countries, while slowing progress toward Millennium Development Goals, many of which require tertiary level training to implement" (World Bank, 2009). Figure XYX summarizes the prevailing conceptual framework on the returns to tertiary education in developing countries.

In a very recent study, Montenegro and Patrinos (2013) show private rates of return (in the wage job market) across a range of countries are more concentrated around the mean than previously thought; that the basic model used across many studies is more stable than one may have expected, and private returns are higher/lower in the higher/lower schooling levels.

They review previous studies that consistently demonstrated that:

1) "Private returns to schooling are generally positive and the cross-economy average is 10 percent per year of schooling
2) Returns seem to be higher in low or middle income economies than in industrialized economies
3) Returns are highest at the primary schooling level and become smaller (although still large) at the secondary and tertiary levels of schooling
4) Estimated returns to schooling are higher for women than for men
5) Returns to schooling have declined modestly over time despite rising average levels of schooling attainment, suggesting that the world demand for skills has been increasing as world skill supply has also increased."

Their study found that the average rate of return to another year of schooling is 10.4 percent and remarkably stable across models. By world region, the returns to schooling are highest in sub-Saharan Africa, significantly above the global average. Returns to countries by national income groupings show lower than average returns for lower middle-income countries and high returns for low income and upper middle-income countries. One important result in their study is that:

> "By level of schooling, the returns are highest at the tertiary level, on average at 16.8 percent, followed by primary at 10.3 percent and secondary at 6.9 percent. Returns to schooling are highest for all levels in sub-Saharan Africa reflecting the scarcity of human capital in this region. Returns to schooling by educational level and region (based on data from 2000-2011) show that rates in sub-Saharan Africa, returns to primary, secondary and tertiary level schooling are 13.4 percent, 10.8 percent and 21.9 percent, respectively."

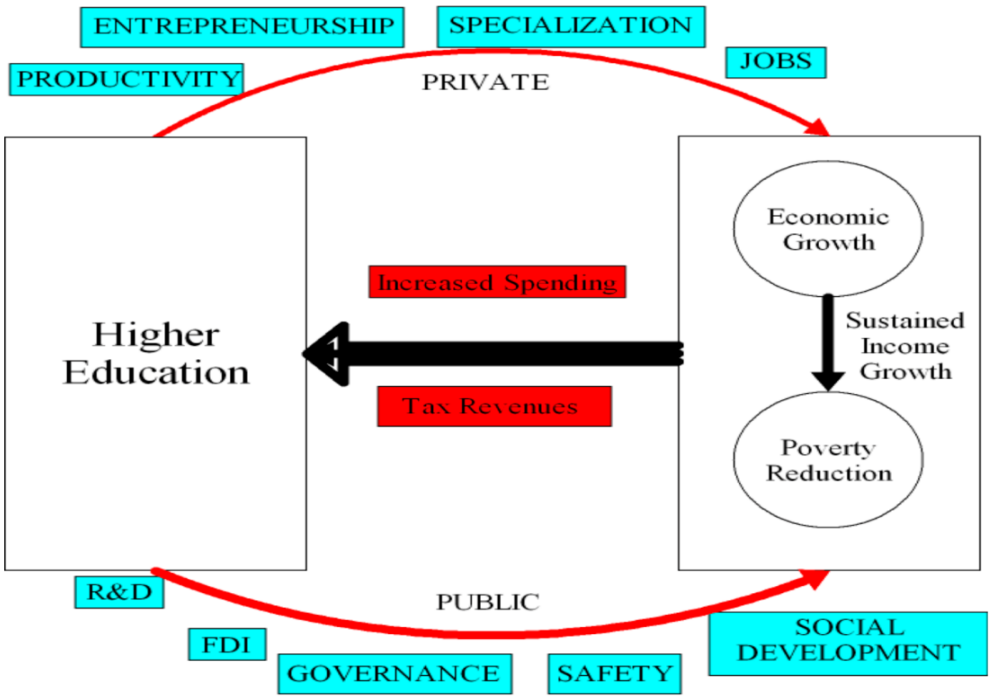

Figure 1: Conceptual Framework for Returns to Higher Education (Source: Bloom et al, 2006)

Table 5: Rate of Return of Education in Selected Countries (%)

Country/Region	Social Rate of Return			Private Rate of Return			Date of Data
	Primary education	Secondary Education	Higher education	Primary education	Secondary Education	Higher education	
Asia	20	13	12	39	19	20	1993
Nepal	15.7	8.1	9.1	16.6	8.5	12	1999
Latin America	18	13	12	26	17	20	1993
Guatemala				33.8	17.9	22.2	1989
Honduras	18.2	19.7	18.9	20.8	23.3	25.9	1989
Sub-Saharan Africa	24	18	11	41	27	28	1993
Ghana	14.9	14.4	11.9	24.7	24.2	26.6	1996
Ethiopia	18	13	16.5	24.5	17	37	1967
Kenya		10			16		1980
Liberia	41	17	8	99	30.5	17	1983
Malawi	14.7	15.2	11.5	15.7	16.8	46.6	1982
Senegal	23	8.9	...	33.7	21.3	...	1985
Tanzania	...	...	...	7.9	8.8	...	1991
Uganda	66	28.6	12	...	...	...	1965
Zambia	...	...	...	...	...	19.2	1983
USA	...	10	12	...	...	...	1987
World	18	13	11	...	...	...	1994

Source: Psacharopoulos and Patrinos (2004)

Appendix C. Summary of Important Policies Related to HICD

A ***Global Food Security Research Strategy*** was developed in 2010 through a consultative process within the U.S. Government involving USAID, USDA and the Department of State. The strategy is to invest in agricultural research that will help increase agricultural productivity (affecting the availability of food), but also increase income to purchase food (affecting stable household access to food) and the quality of food consumed (affecting utilization and nutritional status) along with contributing to overall economic growth. "FTF adopts a new paradigm to catalyze agriculture-led economic growth by focusing on environmentally-sustainable productivity gains through research that is purpose-driven, impact-oriented and operates in close coordination with deployment of research outputs, extension, education, evaluation and feedback at the individual country level." (USG cited in CRSP Study). Necessary policy reforms and strengthened institutions, including markets are also a focus of FTF.

"FTF advocates a whole-of-government philosophy to 'identify and generate synergies between domestic and international research investments and join with other major development partners to ensure that country, regional, and global investments are integrated for maximal impact. " Key partnerships between the USAID and USDA, the Norman Borlaug Commemorative Research Initiative to Reduce Hunger and Poverty, as well as partnerships with U.S. and other universities and CGIAR institutions can help produce global public goods and are dual use generating benefits to both U.S. and other countries."

FTF also envisions more explicit program linkages to national and regional investments by our partners and with the USAID overseas missions and offices to address both human and institutional constraints. "New efforts will be aimed at strengthening institutional and policy environments and higher education and value-chain constraints." Important linkages among U.S. research partners, international research centers, national and regional research partners as well as relevant user communities at the local levels need to be nurtured and strengthened.

USAID's implementation of the FTF Global Food Security Research Strategy additionally prioritizes the following three big ideas:

1. Heat and drought tolerance for climate-adapted cereals
2. Advanced technology solutions for animal and plant diseases
3. Legume productivity for improved nutrition and household incomes.

"FTF also targets policy research to help provide an enabling environment for agriculture; social science and nutrition research to improve food utilization, understand behavioral change and household decision making—including gender dynamics; as well as increased availability and access to high quality foods for improved diets (animal sourced food, horticulture and aflatoxin control).

"Finally, the FTF program is anchored in four major production systems—each exemplified by a "deep dive" country—that will make a significant difference to large numbers of poor, malnourished people. Systems prioritized for sustainable intensification include":

1. Indo-Ganges Plains, Bangladesh, rice-wheat system to be intensified through conservation agriculture, legume intercropping, nutrient-use efficient crops.

2. East Africa, Tanzania mixed maize system
3. Sudano-Sahelian, Ghana, transect from maize-based to agro-pastoral systems, to include irrigated rice systems
4. Ethiopian Highlands, Ethiopia, new sustainable intensification programs including legumes, wheat, sorghum, use of conservation agriculture and integrated pest management.

USAID's HICD Policy/the USAID Forward Policy/ and the 2012 Gender Equality and Female Empowerment Policy.

Three important USAID policies contribute to a changing environment for HICD going forward. In 2009 USAID issued its *Agency-wide HICD Policy*; in 2010 the *USAID Forward Policy;* and in 2012 the *Gender Equality and Female Empowerment Policy*.

The Agency-wide HICD Policy defined HICD as a "USAID model of structured and integrated processes designed to ***identify root causes of performance gaps*** in host country partner institutions, address those gaps through a wide array of ***performance solutions*** in the context of all human performance factors, and enable cyclical processes of continuous performance improvement monitoring systems." A key concept is that until knowledge or skills acquired by trainees have been applied in a specific work situation, there is essentially no impact. Implementation of the HICD model including both human and institutional development requires:

A. Identification of partner organizations
B. Obtaining partner commitment
C. Forming a stakeholder group
D. Conducting a performance assessment
E. Preparing a performance solutions package
F. Implementing performance solutions
G. Monitoring change in partner organizations' performance. (USAID Human and Institutional Capacity Development (HICD) Policy Paper: A Mandatory Reference for ADS Chapter 201, 2/15/2009)

The 2010 USAID Forward Policy is germane to this white paper for its emphasis on partnerships, innovation and measuring results—but also for the future opportunity the study team has found for USAID to develop indicators and results pertinent to HICD. The HICD policy appears to provide a logical taxonomy, but what appears to be missing is the identification of desired critical capabilities and performance metrics. What are the desired institutional capabilities against which a performance assessment can be made?

From the USAID website*: "*Several years ago, USAID set the ambitious task of transforming itself as an agency. This large-scale reform agenda, USAID Forward, is an effort to strengthen the Agency by embracing new partnerships, investing in the catalytic role of innovation and demanding a relentless focus on results. Taken together, the reforms have formed the foundation of a new model for development; one that can represent the best of American ideals abroad, while advancing the security and prosperity of Americans at home.

"USAID released the first ever USAID Forward Progress report in March 2013 highlighting the successes and challenges in reforming the Agency and delivering better, more sustainable results. Over the past two years, the reforms have touched upon every part of our work and set important, evidence-based targets for us to meet. USAID Forward hasn't just changed the way we work; it's changed the results we can deliver. The report included a scorecard of indicators based on data. Building on our commitment to transparency, the raw data sets are now available in downloadable format. This data captures a snapshot in time of our progress at the end of 2012 and we are pleased that we've made even more progress since then. More importantly, we have created a system for regularizing this data collection into Agency systems and will make that data available on an annual basis*." (www.usaid.gov/usaidforward).*

Again, the BIFAD Review Team will point out a critical need to include HICD results and indicators in future USAID Forward Progress reports.

2012 Gender Equality and Female Empowerment Policy (USAID.gov)

"*Achieving our objectives for global development will demand accelerated efforts to achieve gender equality and women's empowerment. Otherwise, peace and prosperity will have their own glass ceiling*." -- -Hillary Clinton, January 2012.

USAID investments are aimed at achieving three overarching outcomes for all people. These outcomes are especially important for males and females who are marginalized or excluded due to ethnicity, gender identity, sexual orientation, lack of income, disability, or other factors. They reflect the gamut of activities that USAID can undertake across multiple sectors and fields to achieve the goal of this policy: 1) Reduce gender disparities in access to, control over and benefit from resources, wealth, opportunities, and services – economic, social, political, and cultural; 2) Reduce gender based violence and mitigate its harmful effects on individuals and communities, so that all people can live healthy and productive lives in mutual respect; 3) Increase capability of women and girls to realize their rights, determine their life outcomes, and influence decision making in households, communities, and societies. These outcomes are deliberately set at a general level. However, in strategic planning and project design at the country or sub-national level, they should be adapted into specific results that have associated targets and indicators for tracking progress. For instance, in a food security strategy, the first outcome could be operationalized as "Reduce the gap between female and male farmers' access to productive inputs and services (credit, seeds, new technology, and agri-cultural extension) by 25 percent." Indicators like the Women's Empowerment in Agriculture Index should be used to track progress toward this specific result in different country contexts. Further discussion of these options will be provided in forthcoming Implementation Guidance (http://www.usaid.gov/what-we-do/gender-equality-and-womens-empowerment) See for USAID Gender Equality and Female Empowerment policy .(pdf.usaid.gov/pdf_docs/pdact200.pdf

Appendix D. USAID Legacy Programs

U.S. universities participated in significant capacity building programs in post-World War II Europe/Asia and other parts of the developing world beginning in the late 1940s and continuing through the end of the 20th century. USAID funding to agricultural education or research and policy institutions peaked in about 1962 and many of the investments at that time benefitted Europe, the Latin American-Caribbean (LAC) regions and Asia.. In the 1960s and 1970s USAID attention expanded to other parts of Latin American and Caribbean countries and parts of Sub-Saharan Africa, Northern Africa, and the Middle East. (USAID. *USAID Funding for Agricultural Education Institutions, 1951-2004*).

According to a September 1991 U.S. Office of Technology Assessment Report "*New Opportunities for U.S. Universities in Development Assistance: Agriculture, Natural Resources, and Environment,"* USAID has over time utilized universities for: 1) Research and teaching generation; 2) Extension and technology transfer; 3) Education and training; 4) Less developed country institution building; 5) Capacity building of U.S. universities. However, OTA staff also noted an effective decline in U.S. university participation in USAID development assistance under Title XII at that time. Factors contributing included: "decline in USAID involvement in large institution-building activities, a decline in the Agriculture, Rural Development and Nutrition budget, much of which initially was directed to U.S. agricultural university project collaboration, and earmarking of those funds for other purposes, growing Mission management of programs involving private sector development and marketing elements for which private sectors tend to be preferred and a growing preference by USAID and host country project leadership for fully open competition in procurement of services." (U.S. OTA Report, OTA-BP-F-71). Other factors impeding collaboration of universities on USAID projects included incompatibility in university time schedules, university tenure policies, conflict between domestic interests versus foreign aid projects, etc. Finally, OTA staff noted trends toward fewer, bigger projects managed by non-university consulting/project management firms.

Dr. Julie Howard, USAID Chief Scientist for the Bureau of Food Security and Senior. Adviser to the USAID Administrator for Agricultural Research and Extension summarized the historical impacts of USAID investments over about 50 years from the 1950s to 1996, noting that capacity development activities had taken place in some 63 agricultural universities in 40 countries. Strong commitment to long-term, U.S.-based training over the period 1960-1998 led to 15,588 students from developing countries trained in U.S. academic degree programs in agriculture and 25,211 in various technical programs related to agriculture. During subsequent years and continuing up till now, USAID has modified and reduced its commitment to long-term U.S.-based training for developing country students while at the same time emerging market economies, especially China, India, Brazil have been sending increasing numbers to the United States for higher education.

AFGRAD/ATLAS

One of the most significant legacy programs funded by USAID was the African Graduate Fellowship Program (AFGRAD, 1963-1991) followed by its successor program the Advanced Training for Leadership Program (ATLAS, 1991-2003). These programs trained over 3,200

African professionals for Ph.D. and M.A. degrees at U.S. universities at a cost of about $182 million over this 40-year period. (equivalent to $366 million in 2003 dollars when Gilboy et al. evaluated the program impacts). The fields of study varied according to country needs. Gilboy and team highlighted 13 major findings in their evaluation:

1) "USAID's multi-million dollar investment in long-term training for over 40 years produced significant and sustained changes that furthered African development in measurable ways.
2) Long-term degree training at U.S. institutions was critical in creating the necessary foundations for significant impact to occur (changes in knowledge, skills and attitudes or KSAs).
3) Participants reported that changes in institutional performance were attributable to U.S. training and gave concrete examples as justification.
4) Running against prevailing views, participants cited critical thinking and research skills rather than improved technical and scientific knowledge more frequently as critical to achieving impact.
5) Changes in attitudes towards work consistently appeared as major benefits.
6) No difference in impact was observed between Ph.D. and master's graduates.
7) Improved management was a frequently cited training benefit even though it received minimal attention during training.
8) Participants from the Education sector reported consistently higher impact and less difficulty applying their acquired knowledge and skills in their institutions than other sectors.
9) Participants with degrees in financial fields, or those with MBAs, recorded lower impact than those in agriculture, health and education.
10) Although women reported more difficulty applying their knowledge and skills at the workplace than men, they reported impressive anecdotal examples of impact where they were able to apply their skills and knowledge.
11) No correlation could be found regarding impact and the frequency with which participants returned to their original workplace
12) Participants returned to their home countries after their U.S. training when conditions permitted. There is no significant evidence that long-term U.S. training under these sponsored programs contributed to any brain drain of African human resources.
13) ATLAS/AFGRAD participants surveyed were well-advanced in their careers, making significant contribution to development," (Results quoted from Gilboy et al., 2003).

Collaborative Research Support Programs (CRSPs)

Beginning in the 1970s and continuing with the decline of alternative institution—to—institution programs, the Collaborative Research Support Programs (CRSP) with U.S. land grant universities (under Title XII of the Foreign Assistance Act), represented de facto the primary vehicle through which the U.S. land grant agricultural research community provided agricultural development expertise to developing country partners. The CRSPs were partially funded by USAID and with university co-funding included significant investments in HICD, especially human capacity development through long-term training.

The CRSPs are a partnership between U.S. universities, developing country institutions, and USAID designed to apply science and technology and build human and institutional capacity to address issues of hunger and poverty. This objective clearly flows from the various revisions of Title XII legislation dating from 1961. Most recently, the "Famine Prevention and Freedom from Hunger Act of 2000" states:

> *The Congress declares that, in order to achieve the mutual goals among nations of ensuring food security, human health, agricultural growth, trade expansion and the wise and sustainable use of natural resources, the United States land-grant universities, other eligible universities, and public and private partners of universities in the United States and other countries, consistent with sections 103 and 103A of this Act, for: (1) global research on problems affecting food, agriculture, forestry, and fisheries; (2) improved human capacity and institutional resource development for the global application of agricultural and related environmental sciences; (3) agricultural development and trade research and extension services in the United States and other countries to support the entry of rural industries into world markets; and (4) providing for the application of agricultural sciences to solving food, health, nutrition, rural income, and environmental problems, especially such problems in low income, food deficit countries.*

Core elements of the CRSPs are:

1. CRSPs are led by a Management Entity at a major U.S. University that subsequently assembles a consortium of institutional partners in the United States and in developing countries.
2. A scientific research agenda is defined to solve significant development challenges in the agricultural and related sciences (the majority of challenges were traditionally commodity based).
3. Capacity building, especially human capacity development is central to the CRSP model and involves both developing country students/researchers and also emerging scientists in the United States.
4. The CRSPs are understood to provide mutual benefits to the United States and partner countries.
5. Each of the CRSPs is characterized by long-term investments, some with roots going back three decades. "Investment in research requires long term, sustained support to promote development impacts. CRSP longevity also recognizes the time it takes to develop human capacity, especially at the graduate degree level. Such long-term presence has also provided a mechanism for the development of regional networks, "spillover" benefits to non-participant countries from a given CRSP, and the emergence of new institutional partnerships that further enhance the CRSP consortia" (Points and text taken from BIFAD Review of the CRSP Model, 2012, p. 18-19.)
6. Typically, the CRSPs leverage significant additional resources to supplement the core budget provided by USAID/Washington. These resources may include USAID Mission buy-ins, private sector producer organizations, philanthropic foundations, and university partners (frequently through graduate assistantships, cost sharing, and reduced indirect cost rates.)

7. Aside from the above near-uniform characteristics, there are some variations across the spectrum "in areas including management and governance structures, monitoring and evaluation mechanisms, and resource deployment processes "(ibid, p. 19) permitting needed flexibility.

Historically, there have been 17 CRSPs with these ten currently in operation:

1. AquaFish, Management Entity Oregon State University
2. BASIS/Assets and Market Access, U.C.-Davis
3. Dry Grain Pulses (Pulse), Michigan State University
4. Global Nutrition, Tufts University
5. Horticulture, U.C. Davis
6. Integrated Pest Management (IPM), Virginia Tech
7. Livestock-Climate Change (LCC), Colorado State University
8. Peanut, U. GA
9. Sorghum, Millet and Other Grains (INTSORMIL), U. NE
10. Sustainable Agriculture and Natural Resources Management (SANREM), Virginia Tech.

It is worthwhile to note that over time, BIFAD and USAID have reacted to new concerns and opportunities and overseen an expansion of the CRSP portfolio beyond the original commodity foci. Interest in environmental sustainability led to the IPM and SANRAM CRSPs in the 1990s. Climate change was added to reorient the livestock CRSP, and recognition of the importance of human nutrition and food security as well as trade expansion, social sciences, and gender issues have begun to figure into both research and HICD activities.

Following the launch of the Feed the Future Initiative and after consideration of the BIFAD CRSP Model Report of 2012 USAID announced changes in the CRSP programs including focus on the 19 Feed the Future Countries, relabeling them as Innovation Labs, and adding seven new FTF Innovation Labs beyond the ten existing CRSP missions.[5] The BIFAD CRSP Model

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[5] Poultry Innovation Lab at University California, Davis
http://news.ucdavis.edu/search/news_detail.lasso?id=10759

Common Bean Innovation Lab at Pennsylvania State University
http://news.psu.edu/story/294033/2013/11/05/research/professor-leads-project-breed-beans-resistant-climate-stresses

Climate-resilient Cowpea Innovation Lab at University of California, Riverside (also expands on their CRSP work subcontract from Michigan State University)
http://ucrtoday.ucr.edu/18766

Sorghum Innovation Lab at University of Georgia
http://news.uga.edu/releases/article/uga-led-international-team-receives-grant-to-improve-sorghum-productio/

Applied Wheat Genomics at Kansas State University (no FtF country listed, only CIMMYT)
http://www.ksre.ksu.edu/news/story/climate_resilient103013.aspx

Rift Valley Fever Control Innovation Lab at University of Texas, El Paso with Sokoine University
http://newsuc.utep.edu/index.php/latest-news-2/1229-utep-receives-major-biomedical-research-project-award-to-improve-the-food-supply-in-africa-by-preventing-rift-valley-fever-disease-in-sheep-and-cattle

Small Scale Innovation Lab at Texas A&M University
http://today.agrilife.org/2013/11/05/borlaug-grant-irrigation-africa/

Review team was explicitly asked how to improve HICD in developing countries as one of its four key study questions. This led to CRSP Report Recommendation 6*:* "*Foster and enhance the institutional capacity building dimension of CRSPs and other USAID projects."*

The report stated: "Frequently referred to as a "gem" embedded within the CRSP model, the capacity building element (HICD), particularly degree training, is one of the keys to the enduring legacy of the CRSPs and one that is not replicated by any other development model, thus should be continued." CRSPs reported that collectively about 20-25 percent of their resources are invested in long-term degree training programs in more than 60 U.S. universities and have supported at least 3,280-degree students from 72 countries. To the quote the report: "*The particular merit of the CRSP is HICD built around research as the training vehicle, an approach that equips young scientists with a set of skills to more effectively apply science to pressing development challenges*. This approach also develops relationships with U.S. scientists that enhance the capacity of the CRSP and other host country research efforts to deliver relevant new knowledge and ultimately make impacts in the host country or region. "We conclude that a rigorous study of the HICD component of the CRSP Model is desirable to insure that it continues as an effective tool. Such a study would seek to assess outcomes and impact of HICD that is mediated through the CRSP model and would identify mechanisms for improved tracking of HICD outcomes. Again, to quote the report: "*In general, institution building has been less prominent and a less intentional component of CRSP HICD. We recommend an increased emphasis on institution building as a recurring element of a newly configured CRSP portfolio and a focus on strengthening host country universities' ability to train future generations of scientists."* (BIFAD Review of the CRSP Model, 2012, p. 8).

HICD Models and Taxonomy

This section discusses a broader range of HICD models. These include examples of institution-to- institution relationships, long-term training models, networks of various types, "sandwich" programs, and distance learning approaches. Figure 2 maps some of the prominent models of capacity building and strengthening at the level of individuals and/or institutions. Two of the models (institutions-to-institution (I2I) and networks) represent efforts to build capacity at the level of the institution; the other three (long-term training (LTT), sandwich programs, and distance learning) have the individual as their primary focus. However, it is important to note at the outset that these models do not exist in isolation; rather, they represent different approaches to capacity building, and, many programs have used a combination of these–and other–methods to build capacity in developing country institutions of higher learning. Thus, although they are discussed separately, it is important to keep in mind that they rarely exist independently of each other.

Figure 2 charts the level of commitment required in terms of time and financial resources for each HICD model. It suggests (on the Y axis) that I2I and LTT require larger investments of resources and greater commitment on the part of U.S. (or other donor) institutions than models such as sandwich programs, networks, or distance learning. The outcomes are also different, especially in terms of institutional capacities achieved and sustained. As the sandwich and distance learning models are more focused on the individual, it seems likely that

they may not attain goals of institutional strengthening unless they are explicitly integrated into the institution's curriculum.

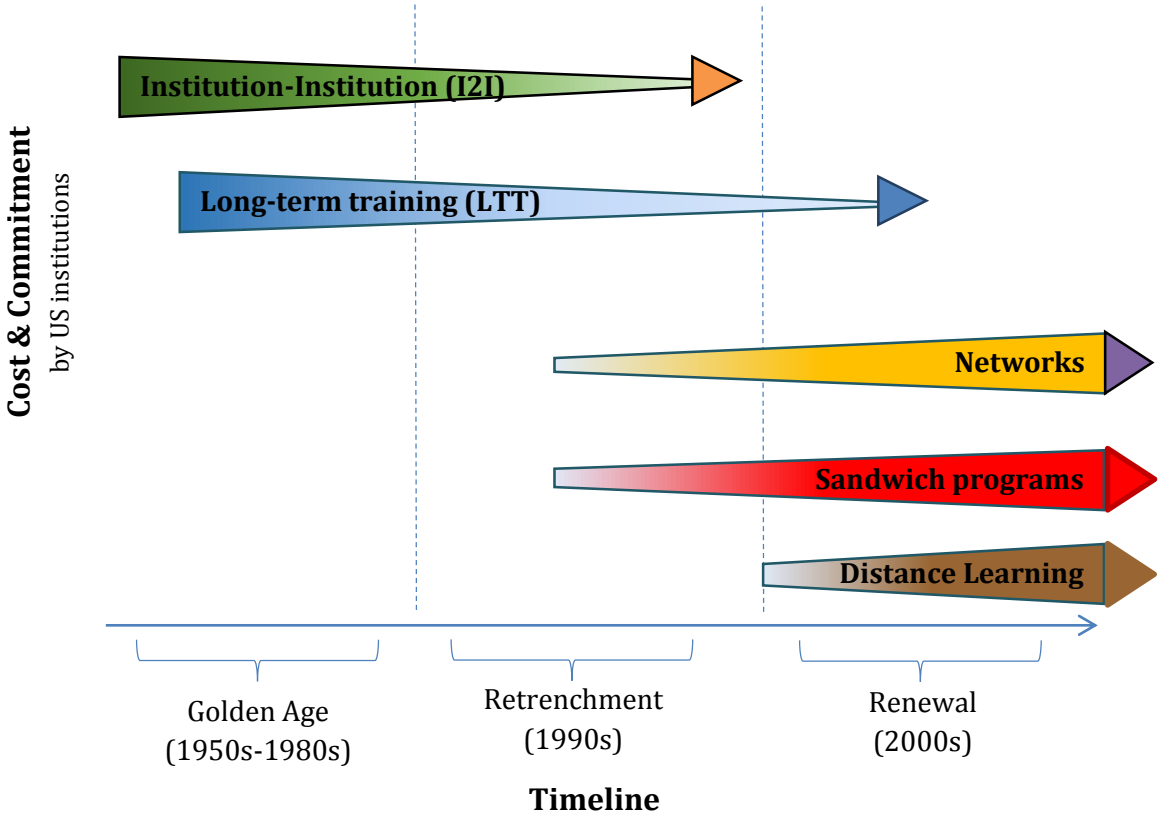

Figure 2. Models of individual and institutional capacity strengthening in developing country contexts.

The X axis captures the chronological development of these models, showing that I2I, also referred to as institutional twinning (BIFAD, 2003:, pp.17-18), and long-term training programs were prominent during the heyday of U.S. involvement in higher education in developing countries. Indeed, the investment was significant, and not just through USAID: "Between 1964 and 1990, the World Bank financed 41 projects in universities (both agricultural and general) in 25 countries at a level of $713 million" (Cohen, 2010, p 19).

With the advent of the 1990s, funding waned and these models declined during the so-called "Retrenchment" period (BIFAD, 2003, p. 11). Interest picked up somewhat around 2000, giving way to the "Renewal" period, but I2I and LTT initiatives have not rebounded to earlier strength to date (BIFAD 2003: 12). At the same time, with the advent of novel communication and information technologies, and probably also in response to decreasing funding for the more involved I2I and LTT programs, developing country institutions – on their own or along with developed country partners – pioneered new approaches to providing high quality tertiary education. These new models include networks, sandwich programs, and distance learning. They all require less commitment of time and resources from individual institutions,

but, if done well, networks, sandwich programs, and distance learning (or their combinations) may represent a good investment of resources.

Reviewing these five models of capacity strengthening:

Institution-to-Institution (I2I): Prominent during the "Golden Age" of U.S. capacity building efforts in developing country institutions, this model involves a U.S. institution (or institutions) making a substantial long-term commitment to significantly increase capacity in a developing country institution. Administered by U.S. universities, these programs often represented the joint efforts of universities and funding agencies such as the U.S. government (primarily through USAID), private foundations, or the World Bank. Many of the early examples included U.S. land-grant universities partnering with developing country institutions to build institutional capacity through training programs and the building of much-needed infrastructure.

The first example of an I2I program dates back to 1948, when Michigan State University (and the National Association of Land Grant Universities) partnered with the U.S. government to offer assistance to India to build new agricultural universities similar to U.S. land-grant institutions (Herdt,, 2006, p. 3). "Over the next 20 years eight Indian agricultural universities were organized with the assistance of faculty and administrators from land grant universities in Ohio, Illinois, Missouri, Pennsylvania, Kansas, and Tennessee with approximately $42 million of USAID support" (Herdt, 2006, p.3).

This successful start was followed by many other programs, including the partnerships between Oregon State University and Kasetsart University in Thailand, Oklahoma State University and Alemaya University of Agriculture in Ethiopia, the University of Kentucky and the University of Wisconsin's program with the Bogor Institute of Agriculture, Michigan State University's connection to the University of Nigeria at Nsukka (Herdt, 2006). Other examples include Cornell University's partnership with the University of the Philippines at Los Banos (Turk 1974), or Michigan State University helping to launch the first MBA degree program in Brazil (Smuckler, 2003). To be successful, these programs needed significant amounts of time and resources from the supporting institutions. For instance, the Cornell program in the Philippines lasted over 20 years, and included both institutional capacity building incorporating long-term faculty exchanges and an active graduate education programs through which Cornell students studied in the Philippines and students and staff from the Philippines enrolled at U.S. institutions. The program was supported financially by Cornell, USAID and the Ford and Rockefeller Foundations. (Smuckler, 2003).

During the 1990s, interest and funding for these programs began to wane for several reasons (BIFAD, 2003), including political strife in Africa, the improvement of universities in Asia and Latin America, and, importantly, an institutional paradigm shift from "institutional building to structural adjustment, policy reform, and governance" (BIFAD, 2003,p. 11). Given this new landscape, I2I programs – and funding for them – declined, although the early 2000s saw a resurgence of interest in supporting capacity building in education in developing countries. A prominent example of this is the Partnership for Higher Education in Africa (PHEA), which ran for a decade between 2000 and 2010.

PHEA was a joint initiative by the Carnegie Corporation of New York, the Ford Foundation, the John D. and Catherine T. MacArthur Foundation, and the Rockefeller Foundation to strengthen capacity in African universities. Three additional partners – the William and Flora Hewlett Foundation, the Andrew W. Mellon Foundation and the Kresge Foundation later joined the program. During the program's run, these foundations invested $440 million in African institutions of higher education (Parker, 2010). As Parker notes in her evaluation of the program, "achieving such a scale of funding and period of working together was highly unusual among funders, particularly given the especially complex logistics of working across nine countries, seven foundations, and five time zones" (Parker, 2010, p. 9). At the outset, the partners agreed on their vision of success for the participating institutions, which included the following:

- "Effective use of information and communications technologies;
- A diverse student body;
- Creation of high-level professional talent and new ideas;
- Transfer of skills essential for national development;
- Strengthened university management and global engagement" (Parker, 2010, p. 15).

The PHEA was not without its challenges, many of which stemmed from the fact that it was such a large-scale initiative, so decision-making was often slow, and collaborating across the institutions was not always easy. At the same time, the initiative could point to some important successes: an important one is the bandwidth initiative that provided participating institutions faster access to the internet at a lower cost (Parker, 2010). PHEA also helped create regional networks and built capacity within individual institutions. Through these initiatives, Parker concludes, the PHEA, "laid the groundwork for future work to tackle one of the most pressing issues in African higher education: nurturing the next generation of academics" (Parker, 2010, p. 25).

Another example, the Collaborative Research Support Programs (CRSP) is highlighted above. CRSPs are mentioned here as a sort of a hybrid of I2I and LTT in the sense that they were conceived with an explicit focus on both individual and institutional capacity development. As seen, the 2012 program evaluation by BIFAD concluded that efforts on the individual capacity building side had been significantly more successful than those focused on institutional capacity (BIFAD 2012). Whereas individual capacity building is a key element of CRSPs, a further positive element of them is that the research agenda is driven by developing country needs.

Long-term training (LTT): Long-term training represents a model of capacity building focused on the individual. The "classical" model of long-term training associated with the "Golden Age" refers to students from developing countries attending U.S. (or other developed country) institutions of higher education to earn a degree. This approach made sense during that period, especially since local institutions lagged far behind U.S. or European universities. But as funding for LTT has waned in the United States, and since many developing country institutions had, in fact, improved, questions were raised about possible alternatives to LTT. Specifically, questions emerged about the value of North-South vs. South-South training, the value of short vs. long-term training, among others (Cohen, 2010). These questions were

warranted because, along with its benefits, over time some of the disadvantages of LTT also became evident. Cohen (2010) gives a thorough and balanced assessment of overseas/long-term training.

Specifically, referring to work done by Eicher (2009), Cohen suggests that the "overseas experience is critically important in allowing students to see different ways of doing research than that practiced in their home countries and for expanding students' professional networks" (Cohen, 2010, p. 37). Being able to spend time at a well-resourced institution is especially helpful for students from countries where the funding for research is lacking. Further, researchers point out that many people who studied in the United States and subsequently returned to their countries retained a positive image of and feelings towards the United States, and, when they assumed important positions in the political or economic spheres, their prior experience in America had a positive influence on their country's relationship with the United States (Tuttle, 2011, p. 7).

However, not all students return to their countries. In fact, the low return rate (and the resulting brain drain) is one of the chief criticisms of the LTT model. Indeed, according to data published by the National Science Board, the rate of return for science and engineering graduates is 55 percent (Cohen, 2010, p. 37). Another problem is that students who return after spending what may be over five years outside their country lack a local professional network and may find it difficult to fit in within the local academic environment. Recognizing this issue, in its Asian fellowship program, the Agricultural Development Council (ADC) provided "institutional innovations, mentoring, and incentives" to its fellowship recipients (Cohen, 2010, p. 38). The returning students had access to conference and research grants and local support to build their careers, and all this made a significant difference to their satisfaction with their post-program experience (Cohen., 2010, p. 37). This is an excellent argument for stronger institutional capacity development along with individual development. The main reason many individuals don't stay is because the institutions in which they are working lacks capacity to support their work and to leverage their efforts.

By contrast, is the successful example of the CRSPs, mentioned earlier. A study conducted by Jamora (2007) collected data from 97 M.Sc. and Ph.D. students in the CRSPs over the course of 25 years (1980-2005). This study found an 84 percent return rate by the end of the period. The program had similar support mechanisms, including mentoring and research grants upon returning home (Jamora ,2007). Clearly, the success of these approaches in part depends on the research/academic environment in the home country; however, this example points to the fact that there are ways to encourage higher rates of return and a better return experience.

Similarly to I2I, the prominence of LTT also declined during the Retrenchment Period: while funding had started to decline for these programs, concurrently, the cost of education in the United States had been on the rise. This increase in fees continues to date, but in the meantime, educational institutions in other parts of the world have attained prominence and now offer similar quality graduate training at a lower cost. These alternative institutions are located in the developed world (e.g., Australia), and also in emerging markets (South Africa, Eastern European countries, and, more recently, China) (Cohen, 2010 and BIFAD, 2003). Alternative program structures, such as sandwich (also called "hybrid" (Cohen 2010) programs also gained in popularity.

Sandwich programs: Sandwich programs are a variant of individual training, but represent a cost-saving because the students only spent a portion of their studies (typically a year) at a developed country institution. During that year, they complete advanced coursework or develop their research proposal (BIFAD, 2003, p. 19). Sandwich programs have become a popular alternative in the past decade; there are a number of programs between African and European institutions (e.g., Wageningen University and Research Center or the University of Cape Town's University Science, Humanities and Engineering Partnership in Africa (USHEPiA)). USAID has also developed a pilot sandwich program (Cohen, 2010). In short, sandwich courses represent a cost saving alternative to the model of LTT discussed above, in which, at least in principle, they afford students the opportunity to train at institutions with more resources for research and training in their fields.

But sandwich programs are not without their challenges. Specifically, the 2003 BIFAD report points out that sandwich programs are "contingent upon mutually productive faculty-to-faculty linkages and an incentive structure that encourages and rewards local faculty members to mentor visiting graduate students who will ultimately receive their degrees from their home university" (BIFAD, 2003, p.,19). Secondly, a related problem is that students have reported delays with finding co-supervisors who were responsive and available, which ultimately caused delays in the students' progress (BIFAD, 2013, p. 19)

Such challenges notwithstanding, Tuttle (2011) supports sandwich programs and encourages the development of new initiatives between U.S. institutions and their developing country counterparts. Specifically, she reviews two different types of pilot projects: the first is a "traditional" sandwich program where students take advanced courses at U.S. institutions but earn their degrees from their home institution. The second model allows students to earn degrees from a U.S. institution, but the focus of their research must be on a problem relevant to their country. In other words with both approaches, the researcher focuses on "local problems" (Tuttle, 2011, p.12). An added benefit is that upon returning to their countries, students often join their university as staff members, thereby strengthening institutional capacity (Tuttle, 2011, p. 12).

Networks: In part with the decline in the more costly I2I and LTT programs, other models came to the forefront. One of these is networks, which Moock defines as *"postgraduate training and collaborations that strengthen institutions, unimpeded by geography—such as a collection of agricultural scientists capitalizing on greatly improved mobility and telecommunications to transcend institutional and national boundaries"* (Moock, 2011, p. iv).

Networks have gained some prominence as an alternative tool as funding for I2I and LTT was drying up, and as developing country institutions were searching for alternatives to leverage the limited funds of each individual institution. Along with the growing availability of ICT (Information and Communication Technology) solutions, networks are a natural progression, which, in principle, present a promising alternative for a variety of reasons:

- Using ICT, networks allow institutions in the same geographical area to build connections to each other in ways that were not easy before.
- Networks eliminate the problem of 'brain-drain' of LTT.
- Networks pool and leverage individual institutional funds.

- Well-designed networks are able to attract funding both from overseas institutions, foundations, and national governments.
- Networks also support institutional capacity building, and, in this sense, they recapture a valuable aspect of the I2I model (Moock, 2011, pp. 2-3).

One of the most important benefits of networks, especially loosely formed, spontaneous networks may be the scientific and professional interaction that they afford—at low cost.[6] From the standpoint of U.S. institutions, supporting networks is clearly less costly in terms of time and finances, as these costs are shared with other partners. However, networks are only as strong as the participating institutions, so if a network starts with institutions that lack capacity, the network's strength and potential will be greatly diminished. Moock also points out some additional potential challenges, such as the need to align the network's goals with national development goals, while at the same time maintaining a coherent purpose and set of goals for the network itself that stem from competitive advantage (Moock ,2011, pp. 12-13).

In her analysis, Moock goes as far as claiming that networks have the potential to restructure traditional models of tertiary education. For example, she calls for "scientist entrepreneurs" (Moock, 2011, p. 5) who will pursue research agendas keeping in mind the financial and social benefits of their research; she also envisions networks to benefit greatly from distance learning. Moock also suggests that networks need not be limited to academic institutions only: "future faculty—unfettered by traditional university procedures—may be primarily based in non-university settings, such as government ministries, NGOs, NARS, private businesses, think tanks, and so on, and work on contract for universities for a portion of their time" (Moock,,2011, p. 16).

The last example, AWARD, represents an interesting hybrid of a network and individual training. The program was launched by the CGIAR Gender and Diversity Program. The emphasis is building capacity in the individual, much of it through mentoring, but in the process of building capacity in these individuals, the program also builds institutional capacity to the extent that upon graduating from the AWARD program, attendees are able to compete for and assume more senior positions. The program offers two-year fellowships to "fast track the careers of African women delivering pro-poor R&D." AWARD "selects women scientists already working closely with the rural poor on tackling poverty and hunger; it focuses on career development, adding value to existing academic training programs; it nourishes the talent pipeline for agricultural R&D through carefully tailored fellowship packages for women

[6] Some examples of networks include:
- Regional Universities Forum for Capacity Building in Agriculture (RUFORUM) (www.ruforum.org),
- Collaborative MSc Program in Agriculture and Applied Economics (CMAAE) (www.aercafrica.org),
- Education for African Crop Improvement (EACI) (www.agra-alliance.org)
- Biosciences eastern and central Africa (BecA) (http://hub.africabiosciences.org/)
- Partnership to Enhance Agriculture in Rwanda through Linkages (PEARL), (http://borlaug.tamu.edu/projects-by-region/sub-saharan-africa/rwanda-spread/)
- African Network for Agriculture, Agroforestry and Natural Resources Education (ANAFE) (http://www.anafeafrica.org)
- African Women in Agricultural Research and Development (AWARD) http://www.awardfellowships.org)

with bachelor's master's and doctoral degrees; it engages with African leaders of agricultural R&D, both men and women, to raise awareness and build networks; it is multidisciplinary.

Distance learning: "Distance learning," the use of information and communication technologies (ICT) to provide education through electronic means (through web conferencing, live streaming, Skype, email, etc.), without the instructor and the student having to be in the same physical location, has great potential. It is important to distinguish distance learning from other ICT tools, such as access to online databases like TEEAL or AGORA. The latter form a part of building institutional capacity, while the focus of distance learning is still the individual.

Distance education has the potential to connect students and instructors from distant parts of the world where cost would prohibit sustained face-to-face interaction. At the same time, it also has the potential to reach many more students than would be possible through the conventional mode of education (i.e., students and faculty being physically located at the same institution, with the students taking lectures presented by the faculty member). In fact, Moock envisions that in the future, "The best faculty with multiple chairs in Africa and overseas may be able to video-in their lectures while sitting at a different base than their home university" (Moock, 2011, p. 16).

Unfortunately, despite its great potential to reduce costs and facilitate partnerships, distance education has yet to gain prominence as an effective tool for training although the possibility is expanding rapidly. The lag is mostly due to the fact that in developing countries, especially in Africa, ICTs continue to be, by and large, unreliable and relatively expensive. It is important to note that the issue is fundamentally one of economics – that is, the technology needed for ICT does exist, but at present it is beyond the means of many developing countries and institutions at levels and speeds that are needed for distance education. A clear illustration of this slow progress is that the 2003 BIFAD report ends on the hopeful note that as the ICT "infrastructure grows, there will be more opportunities to test the benefits of providing education electronically" (BIFAD, 2003, p. 20). In contrast, Tuttle's report in 2011, eight years later, concludes that: "There is great potential, but the current state of both connectivity and education indicates that in-person exchanges will be most important for some time" (Tuttle 2011, p. 12). In short, for the time being, distance learning remains a promising idea that has not yet managed to overcome the digital divide. Cohen (2010) reaches a similar conclusion: "New models of online coursework, lectures, and seminars via teleconference are rapidly becoming available but are not yet a proven model for granting degrees in African countries" (Cohen, 2010, p. 40).

Distance learning technology does exist, so its availability is mostly a matter of availability of resources. All indications are that countries with less connectivity will gain more connectivity over time. But an important question is whether and how much distance education can, and more importantly, *should* be a substitute for face-to-face interaction with instructors? Researchers have not been able to respond to this question definitively yet, but the Team's sense is that the evidence is pretty clear. The most effective Distance Learning does not fully replace face-to-face modes of delivery, but when used in a blended model gives better learning outcomes than face to face—for many students. The pay-off for developing countries would be

in the leverage they could achieve. There could also be significant advantage if they partnered with other institutions to leverage expertise and human assets.

As such, it may be that, the question to ask is: Given that distance learning and online education are here to stay, what do we need to be aware of to ensure that we can design and run effective distance learning that yields comparable – or better – results to traditional models?

In their article on distance education programs Rovai and Downey identify a number of key factors relevant to online education, including those that pertain to pedagogy. They list the following as characteristics of successful online learning:

- Online course design and teaching require an extensive investment of time; more upfront planning and preparation is required as online teachers must create course materials prior to course start.
- Online learning comes with a different set of expectations for teachers, including 24/7 availability, responding to e-mails from students, and tutoring students.
- Student–content, student–student, and student–teacher interactions change dramatically in an online learning environment as a result of computer-mediated communication.
- Engaging students and facilitating and moderating online discussions effectively require specialized skills on the part of the teacher.
- Assessment of student learning online is more complex because of issues regarding identity security and academic honesty and when direct observation of the student by the teacher is the best assessment approach.
- Online teachers and students must develop personal time management skills.
- Online courses require teachers who are technologically competent and can use technology effectively to facilitate student learning" (Rovai and Downey 2010: 146).

What is clear from this list is that online learning requires a lot of work and preparation and, importantly, that transferring a "traditional" course to an online learning environment is not a simple task. When it comes to creating such programs for developing countries – and, particularly, in developing countries – we must think carefully not only about the ICT capacity but also the human capacity needed to carry out these programs successfully.

SELECTED ADDITIONAL HICD INITIATIVES – Current or Recent-

The following highlights briefly selected additional HICD initiatives underway under the auspices of USAID programming with Title XII and other universities.

The Innovative Agricultural Research Initiative (iAGRI): aims to strengthen training and collaborative research capacities of Sokoine University of Agriculture in Tanzania. iAGRI is operated by Ohio State University in conjunction with a consortium of U.S. universities to increase food security and build capacity in Tanzania. iAGRI has a focus on leadership for agricultural professionals. It also attempts to assure that institutional goals are aligned with stakeholders in the national economy and with international stakeholders. National stakeholders include the government, NARS, and university alumni. Change management is another focus of the program—with the goal of enabling the university administration to develop and utilize best practices. Capacity building efforts aim to strengthen the capacity of

Sokoine University of Agriculture to develop and implement institutional, internship, and outreach programs. Ongoing projects include a gender assessment to recommend ways that gender-related needs might be better accommodated. An advising/mentoring study examines how the university can structure effective mentoring; improvements in the quality assurance and promotion bureau, acquisition of computer projectors for classrooms, creation of a classroom services unit, pedagogical workshops, and a pilot teaching assistant program (www.iagri.org/capacity-building) are all some of the activities under way. There is also examination of a strategy to promote more systematic and impactful outreach on the part of SUA to the agribusiness sector.

Higher Education Solutions Network (HESN): "university engagement that harnesses innovation and encompasses Title XII objectives." (Title XII Report to Congress). In 2012 USAID solicited proposals for Development Labs that would "harness the intellectual power of great American and international academic institutions and that catalyze the development and application of new science, technology, and engineering approaches and tools to solve some of the world's most challenging development problems" (www.usaid.gov/hesn). USAID hopes to improve its understanding of development problems and solutions through better data and analysis; test, evaluate, and catalyze technologies for development; design, create, and incubate revolutionary approaches in addressing development problems including the incubation of new low-cost technologies and innovations; promote entrepreneurship to sustain and scale these tools and approaches; and harness the enthusiasm and interest of students for development" (www.usaid.gov/hesn). The inaugural USAID Development Labs include: University of California, Berkeley; Duke University; Michigan State University; The College of Women and Mary; Texas A&M University; Makerere University (Uganda); Massachusetts Institute of Technology (2 awards).

Innovation for Agricultural Training and Education (InnovATE) Program: A new Leader-with-Associates agreement supporting agricultural education and training capacity development is being implemented by a consortium of U.S. universities led by Virginia Tech. The mission of the InnovATE project is to develop the human and institutional capacity needed so that developing countries can promote rural innovation to achieve food security, reduce poverty, conserve natural resources and other rural problems. InnovATE is just getting underway: its first public event was a recent symposium on these subjects attracting 150 stakeholders including government leaders, development organizations and industry representatives to discuss challenges facing global agricultural education and agricultural education practitioners.

Modernizing Extension and Advisory Services (MEAS) USAID has selected the University of Illinois at Urbana-Champaign to lead this project to modernize extension advisory services and systems in developing countries. "The objective for MEAS is to define and disseminate good practice strategies and approaches to establishing efficient, effective and financially sustainable rural extension and advisory service systems in selected countries. Our goal is to transform and modernize these extension services, so that they can play a key role in both increasing farm incomes and enhancing the livelihoods of the rural poor, especially farm women (www.meas-extension.org). In addition to the leader award, there is a consortium of partner universities and there are associate awards--one to the Ministry of Agriculture in

Georgia to further its extension modernization. A second associate award is to Tajikistan's Farmer Advisory Services Tajikistan (FAST) program . The FAST Program intends to build capacity of local institutions and community based organizations and contribute to agrarian reform in selected districts of Khatlon Province. (www.meas-extension.org/home/associate-awards/farmer-advisory-services-tajikistan-program-fast).

Borlaug 21st Century Leadership Programs: There are different programs—short-term, longer-term—both for students and for professionals (http://borlaugleap.org/).

- **BHEARD Program, Michigan State University.** Michigan State University was selected to implement The Borlaug Higher Education Agricultural Research and Development (BHEARD) Program. MSU will work in close partnership with USAID/Bureau of Food Security, USAID missions, APLU, and CIMMYT. This is a major new USAID effort to increase the number of agricultural scientists and strengthen scientific institutions in developing countries. The program will support long-term training of agricultural researchers at the master's and doctoral levels and will link scientific and higher education communities in Feed the Future Countries and the United States. The program will launch in Ghana, Uganda, Mali, Mozambique, and Bangladesh and possibly expand after that. There will be an emphasis on training a cadre of researchers to build scientific capacity along with a broader set of human and institutional capacity-building measures, "particularly if additional USAID mission or leveraged funds can be mobilized." BHEARD will also support the development, testing and evaluation of new models of capacity building. APLU will develop a knowledge-sharing system to identify innovative and effective mechanisms for capacity building and to promote shared learning across programs.

- **LEAP Program, U.C. Davis.** The Norman E. Borlaug Leadership Enhancement in Agriculture Program (info@borlaugleap.org) awards fellowships to graduate students in the field of agriculture and related disciplines. The program honors Dr. Norman Borlaug who believed that researchers could benefit greatly from receiving mentoring by both a U.S. university faculty member and a CGIAR scientist. CIMMYT is one of the partners in this program. The Program is supported through the USAID Feed the Future Borlaug 21st Century Leadership Program. It is managed by the International Programs Office, College of Agricultural and Environmental Sciences, University of California, Davis.

African Women in Agricultural Research and Development (AWARD) (www.awardfellowships.org/about-us/our-mission.html). This leadership network has as a mission *"to build an effective and transferable career development program for women in agricultural research and development in sub-Saharan Africa.*" It is further described under networks above. To give an indication of its size in 2014, a recent news release describes the 2014 award program: **"**Following a highly competitive process, 70 individuals were chosen as 2014 fellowship winners. AWARD Fellowships are awarded on the basis of intellectual merit, leadership capacity, and the potential of the scientist's research to improve the daily lives of smallholder farmers, especially women. Following a highly competitive process, 70 individuals were chosen as 2014 fellowship winners. AWARD Fellowships are awarded on the basis of

intellectual merit, leadership capacity, and the potential of the scientist's research to improve the daily lives of smallholder farmers, especially women: (http://awardfellowships.org/)

Malawi Nutrition Program. The HICD Review Team thinks that this program is well designed and is being well executed. It is long-term and leverages resources from several sources. It is aligned to Government policy and therefore enjoys a significant level of commitment by the Government of Malawi. The involvement of the Bunda College of Agriculture is a strong sustainability component; it helps the College learn a lot from several collaborating partners and to acquire needed facilities (infrastructure, lab, equipment, materials, etc.) to improve research, teaching and outreach activities. Such exposure will enhance Bunda College of Agriculture's curriculum development capacity to serve better the needs of the community. .

In Malawi, nutrition is a serious health and development problem. In 2004, nearly half of the children were stunted, a reflection of chronic shortages in food quantity and quality. To confront this challenge USAID, along with other development partners, has engaged the Government of Malawi (GOM) on the Scaling Up Nutrition (SUN) and 1,000 days movements. USAID is a member of various technical working groups on nutrition, and is a key and founding member of the Donor Nutrition Coordination Group (DoNuts). One key outcome of this engagement and coordination with other donors is that there is minimal duplication of effort. This collaborative engagement to solve Malawi's malnutrition problem has led to the reduction of children stunting and underweight from 53percent in 2004 to 14 percent in 2012. USAID's nutrition programming is a lynchpin across various U.S. Government initiatives, and is thus funded through multiple sources: Feed the Future, Food for Peace, Global Health, and PEPFAR.

USAID's program focuses on preventing chronic under-nutrition by linking behavior change communication with agricultural value chains and health service delivery; preventing and controlling micronutrient malnutrition through food fortification; institutionalizing community-based management of acute malnutrition; and building the capacity of government staff working in the nutrition sector at all levels. USAID's program is aligned to the Government of Malawi's nutrition policies, as well as Malawi's framework for the SUN and 1000 days initiatives.

The Wellness and Agriculture for Life Advancement (WALA) program transmitted health messages to nearly 140,000 households on improved practices related to nutrition, food preparation, exclusive breastfeeding, complementary feeding and sanitation. As a result, 70 percent of children aged 0-5 months were exclusively breastfed; and 30 percent of breast-fed children aged 6-23 months received a minimum acceptable diet, up from a baseline value of 12 percent in 2009.

USAID is supporting the treatment of severely malnourished children at the community level through the institutionalization of Community-based Management of Acute Malnutrition (CMAM) into existing activities of health facilities. In FY 2012, 61,003 children were treated in the program and 262 people were trained in CMAM. There are now 502 health facilities with established capacity to manage acute under-nutrition, representing 81percent of all the health facilities, and surpassing the Ministry of Health's (MOH) 80 percent target.

One of the biggest challenges to nutrition is the limited capacity of the GOM to plan and implement nutrition programs. USAID is funding twelve students in the Food and Nutrition Master's program at Bunda College of Agriculture, which has partnered with USAID's Nutrition Innovation Laboratory project to develop postgraduate training in dietetics. USAID also trained 3,667 implementing partner and government staff on nutrition, drawn from the Ministries of Health, Agriculture and Gender. **(Source: USAID) Malawi Nutrition Fact Sheet (2012-13)** (http://www.usaid.gov/malawi/fact-sheets/usaid-malawi-nutrition-fact-sheet-2012-13)

Appendix E. The Global Landscape of HICD

Advancing sustainable human and institutional capacity development at home and abroad has been at the core of the rise of the United States to the world's super power status since the latter half of the 20th Century. The emerging economies worldwide have learned (and are still learning) from this unique development model and are adapting it to their own development goals nationally and internationally for the 21st Century. The recent rise of China, India and Brazil to the second tier global economic status has a lot to do with the adoption of HICD models that are working for them at home and abroad. In particular, China's meteoric rise to the second largest economy within the current decade amplifies the indispensability of a solid policy on HICD. In this section of our report we examine briefly the HICD models adopted by these emerging economies to appreciate current strategies and role for HEIs moving forward in the 21st Century.

China's HICD Model: To China establishing a strong HICD policy is imperative to be able to support the needs of a large human population (>1.3 billion) at home in an increasingly competitive global economy. Among various initiatives to address the political and socio-economic priorities of the 21st Century, China has established strong relationships with several regions of the world. At the core of the relationship is cooperation in HICD. For this report China's approach to HICD in Africa is used as the example. Africa is a target for international cooperation to establish mutually beneficial long term relationships that support sustainable socioeconomic and political development priorities in a dynamic world.

In 2000, the Forum on China-Africa Cooperation (FOCAC) was formed at a Ministerial Conference held in Beijing to maintain peace, seek stability and promote development in Africa and China (http://www.focac.org/eng/dwjbzjjhys/t952503.htm). Since forming FOCAC, five Ministerial conferences have been held between Chinese and African leaders to advance the areas of cooperation stated in the 2000 FOCAC document. Emerging from FOCAC progress has been made in China-Africa exchanges and cooperation in political, economic, trade, development, cultural and other fields as well as in ***institution-building***. Among several accomplishments of FOCAC the following are relevant to the role of HEIs in China's HICD model for Africa:

- China implemented 105 clean energy projects in Africa, built five new agro-technology demonstration centers, sent 50 agro-technology teams to African countries, provided medical equipment, materials and medicines to 30 hospitals and 30 malaria prevention and treatment centers, built 19 new schools and provided supplies to 42 schools in Africa.
- China trained 24,000 professionals for Africa, including 1,500 head masters and teachers, 3,000 agricultural experts and 3,000 medical workers; and offered 5,710 and 6,316 government scholarships in 2010 and 2011 respectively
- By the end of 2011, under the China-Africa Science and Technology Partnership Program, China had implemented 88 China-Africa joint research and demonstration projects and hosted 42 African research personnel for post-doctoral studies in China
- The China-Africa Joint Research and Exchange Program supported 14 international seminars in China and Africa, and sponsored 500 Chinese and African scholars for

academic exchanges and visits. Under the framework of the Program, Chinese and African academic institutions carried out 28 projects (Source: (http://www.focac.org/eng/dwjbzjjhys/t952503.htm)

At the 5th Ministerial Conference in Beijing in July 2012, the Chinese President Hu Jintao announced the following HICD measures for the country's cooperation with African countries:

a) China will support the African integration process and help Africa enhance its own capacity for overall development
b) China will continue to increase assistance to Africa by bringing the benefits of development to African people. China will build more agricultural technology demonstration centers to help African countries increase production capacity
c) China will implement the African Talents Program to train 30,000 personnel in various sectors, offer 18,000 government scholarships and build cultural and vocational training facilities.
d) China will help African countries enhance capacity building in meteorological infrastructure and forest protection and management
e) China will also continue to carry out well drilling and water supply projects in Africa to provide safe drinking water for the African people
f) China will deepen medical and healthcare cooperation, send 1500 medical personnel to Africa and continue carrying out the Brightness Action Campaign to provide free treatment for cataract patients

In 2012 a book edited by **Anshan and April and** titled "Forum on China-Africa Cooperation: The Politics of Human Resource Development" was published which assesses specific measures raised under FOCAC including training and exchange, human resource development, medical cooperation and knowledge production. It further examines the impact of FOCAC on human resources capacity. From an African continental side, options are being provided to develop human resource capital on the continent. The book also demonstrates how the educational measures in FOCAC not only promote sustainable development particularly in Africa, but also illustrate a different angle as to how FOCAC is strengthening relations between the two regions through soft power (http://www.ai.org.za/products-page/product-category/forum-on-china-africa-cooperation-the-politics-of-human-resource-development). Going forward, China's policy focus in the coming years is to improve fiscal policy through *institutional reforms.* HEIs are expected to play significant roles in developing appropriate manpower for China and cooperating countries to support government's vision for growing the economy in the 21st Century.

It is not clear which government department has the responsibility to implement Chinese HICD policies, but literature shows that the government has adopted a process of engaging government leaders at the highest level in China and Africa to jointly craft the guidelines for establishing and implementing the pathway to sustainable HICD in Africa.

India's HICD Model: With a human population expected to overtake that of China by 2050, India, like China, faces a daunting challenge of sustaining a strong economy to meet its domestic needs and also fulfill its regional, continental and global obligations. Unlike China, India's policy on HICD seems to be at the early stages of formation and seems to follow a similar path as that of China --- use soft power to cultivate cooperation with strategic partners around the world to advance socioeconomic and political interests in the 21st Century. For India, raising education standards to meet the challenges of rising human population, diminishing resources and climate change is the primary focus of development in the years ahead (OECD 2013 *Economic Outlook for Southeast Asia, China and India 2014: Beyond the Middle-Income Trap*, OECD Publishing). For the purpose of this report the country's approach to HICD in Africa is our focus.

India's Ministry of External Affairs (MEA) is central to foreign policy implementation on international cooperation (http://meaindia.nic.in/indiaafricasummit/). In 2008, MEA organized the first Africa-India Summit in New Delhi which brought Indian and African leaders together to develop and adopt a philosophy for cooperation. The participation and the format of the 2008 Africa-India Summit were decided in consultation with the African Union Commission and the permanent representatives of the member states. The context for cooperation is summed up in the following quote:

"*India and Africa have a historic relationship and this has grown into a sustainable partnership. From our struggle against colonialism and apartheid, we have emerged to jointly accept the challenges of a globalizing world. Whether we have to deal with threats to international peace and security, the threat from international terrorism or the scourge of poverty, we believe that India and Africa traverse the same path, share the same values and cherish the same dreams."*

The philosophy for cooperation document also stated that:

"We have a vision for a partnership with Africa for the 21st century. This vision will take us beyond our strong bilateral relationships, our close ties with regional economic communities and develop a new paradigm of cooperation which will take into account Africa's own aspirations for pan-African institutions and development programs".

The 2nd Africa-India Summit took place in Addis Ababa, Ethiopia, in 2011 at the end of which the Africa-India Framework for Enhanced Cooperation (FEC) was crafted. Among several areas of cooperation listed in FEC, Cooperation in Science, Technology, Research and Development emphasized strong cooperation between India and Africa's HEIs (http://www.indiaafricasummit.nic.in//?1502 Accessed 12/22/13). The Africa-India Summit is at the early stages of implementing the Plan of Action developed in 2011 and needs time to be able to assess the accomplishments of the cooperation in relation to sustainable HICD.

It is apparent that China and India take HICD seriously as they develop international cooperation strategies for the 21st Century. Role for HEIs is paramount in their considerations for advancing sustainable HICD. This instructed their vision to engage government leaders at the highest level to define and craft the guidelines for cooperation and the appropriate role for

HEIs. Both China and India seem to agree that HEIs must be given responsibility to lead in developing appropriate manpower for their homelands and strategic partners. The US used this philosophy very successfully in the past. It can renew the zeal it once put into this approach and remain on top as the most influential super power of our time. Failure to do so will pass the opportunity to the emerging economies who will take over the immense power embedded in a strong and sustainable HICD.

APPENDIX F: Interviewees and Affiliations

Julie Howard	USAID
Rob Bertram	USAID
Paul Weisenfeld	USAID
Richard Greene	USAID
Susan Owens	USAID
John Becker	USAID
Andrew Gilboy	Associates for Global Change
Peter McPherson	APLU
Tag Demment	APLU
Anne-Claire Hervy	APLU
David Sammons	U of FL
Vicki Wilde	AWARD
Caroline Wagner	Ohio State University
Eric Crawford	Michigan State University and BHEARD
Joyce Moock	Independent Consultant
Deborah Rubin	Cultural Practices
Malcolm Butler	Independent Consultant/USAID/APLU
Tully Cornick	HED
Cornelia Flora	Iowa State University
Andrew Manu	Iowa State University
Brady Deaton	BIFAD and University of Missouri
Gebisa Ejeta	BIFAD and Purdue University
E. Mark Erbaugh	Ohio State University
Gretchen Neisler	Michigan State University
John Ferrick	University of Wisconsin
Tom Gill	Penn State University

Innovation Lab Council

Jeff Griffiths (Tufts)	Irv Widders (MSU)
Hillary Egna (OR State)	Muni Muniappian (VT)
Diana Fahrenbruck (CSU)	David Hoisington (UGA)
Adrian Ares (VT)	Tim Dalton (KSU)
Nat Bascom (KSU)	Michael Carter (UC Davis)
Beth Mitcham (UC Davis)	

Ken Cassman	University of Nebraska and Consultative Group
Tom Hammett	Virginia Tech and InnovATE
Clara Cohen	USAID
David Kraybill	iAGRI and Ohio State University
Andrea Bohn	University of Illinois and MEAS
Karen Duca	KNUST, Ghana and AAAS Fellow at USAID
Jeff Reidinger	Michigan State University and University of Washington
Roy Steiner	Gates Foundation
Bob Easter	President, University of Illinois; Former BIFAD Chair

APLU Board on Agriculture Assembly, Administrative Head's Council

Jay Akridge (Purdue)	Bruce McPheron (Ohio State)
Larry Arrington (U Tenn)	Teferi Tsegaye (KY State)

(and more than 30 others at a group meeting)

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