Building a Global Food Security Strategy:

The Role of Higher Education in US International Development

Conference of Deans II, June 29, 2009

> *"We pledge to work alongside you to make your farms flourish and let clean waters flow; to nourish starved bodies and feed hungry minds."*
>
> *President Barack Obama, 20 January 2009*

Introduction

2009 has been a year of dramatic change. Agricultural development issues, after years on the back burner, are emerging as a key priority for international attention. Notwithstanding setbacks to the global economy and the military crises around the world, government leaders responded to the food price crisis of 2007-8 with a renewed commitment to invest in agriculture development. In April 2009, the US and other nations supported the G8 pledge to provide US$ 20 billion for developing country research, international collaboration, and dissemination of results related to agriculture and food security. The US commitment alone is expected to be over US$1 billion in 2010, more than doubling current levels of support.

A comprehensive global food security strategy that recognizes food security as a critical component of the larger national security strategy will guide decisions over these higher levels of funding. The strategy explicitly identifies colleges and universities as key players, providing exciting opportunities for higher education. The rationale for engaging higher education was outlined in the report of the first Conference of Deans meeting held in April 2008 (see Box 1). It is now time for the higher education community to build on its strengths, to meet the challenges ahead, and to contribute to building the global food security strategy.

The Conference of Deans II meeting, held on June 29-30, 2009, brought together 68 registered participants from colleges and universities, USAID, and other organizations for the purpose of:

BOX 1: HIGHER EDUCATION: A CRITICAL PARTNER IN GLOBAL AGRICULTURAL DEVELOPMENT

The first Conference of Deans meeting in April 2008 established the rationale for the key role that higher education can play in global agricultural development. It highlighted colleges and universities expertise, providing:

- Long-term perspectives on development and sustainability of short-term programs
- Trans-disciplinary, science-based knowledge capabilities
- Extensive network of global alumni and partnerships
- Links to foundations, private sector, and civil society
- Advocacy for food security as national security

BIFAD 2008

- Creating a roadmap for US universities and colleges to partner with USAID to implement the USG global food security strategy; and,
- Providing input into the design of new university-based programs that can respond to the needs of Congressional and Administration policymakers to build agricultural science capacity in the US and developing and transitional countries

The conference concluded that the global food security strategy will benefit from higher education's ability to provide scientific leadership, to establish and sustain global partnerships, to educate a new generation of agricultural specialists, and to reinvigorate teaching, research, and action to address the challenges facing agriculture under emerging conditions of climate change.

Addressing these critical issues facing agriculture will require enhanced capacity, using an integrated and sustainable approach to build partnerships at all levels of interaction.

Global Challenges

The challenges to achieving global food security are multiple and complex. The difficulties of agricultural development today include problems of long-standing, such as the consequence of inadequate financial and policy support to the sector and the constraints of poverty and hunger on productivity, as well as emerging issues such as the increasing use of biofuels, growing levels of soil salinity, and climate change. In developing countries, where the majority of the population is still actively engaged in agriculture, the challenges affect prospects for both food security and economic growth.

Agricultural advances in the 1960s helped reduce the numbers of hungry and malnourished people in the developing world. In the late 1990s however these numbers started rising. Today, the world has over 1 billion hungry people, and projections estimate an increase of 11% per year in the future. Smallholder farmers comprise half of the population affected by hunger. Children are another large segment of the hungry. About 100 million of the world's 147 million malnourished children live in Asia; over thirty million reside in Sub-Saharan Africa.

The agricultural systems needed to feed these people will build on, but differ from the high-yield, high input systems of the recent past. The agriculture for today and the future will have to use inputs more efficiently, avoid environmental degradation, and provide climate-resilient varieties to resist extremes of temperature, rising CO_2 levels, and water scarcities or excesses (see Box 2). Finding the right solutions will require greater investment in agricultural science and technology for productivity and problem-solving, applying known technologies while also looking to test and explore new technologies.

BOX 2: THE IMPACT OF CLIMATE CHANGE ON DEVELOPING COUNTRY AGRICULTURE

Projected changes will be both positive and negative. On-farm crop and livestock choices will shift, with some varieties no longer productive, but new options will also emerge.

Higher temperatures resulting from climate change may reduce yields, increase water needs, and exacerbate pest infestations. Research on rice yields in the Philippines, for example, revealed that each 1^{o} rise in nighttime temperature during the growing season could reduce grain yields by 10%.

At the same time, higher CO_2 levels in some areas may increase productivity if water supplies and soil nutrients are adequate.

Antle 2008, Peng et al. 2004, Rosegrant et al. 2009, 2007

The approach will need to be holistic, taking a system-wide approach, combining support for technology development and natural resource management with investments in rural infrastructure and education.

Appropriate global and national policies can support the right kind of research to reduce malnutrition, reduce poverty, and develop adaptive mechanisms to mitigate the impacts of climate change. These policies must also support higher education in the agricultural sciences both at home and abroad to ensure that the knowledge for problem-solving is perpetuated in the next generation.

The Global Food Security Strategy

USAID has played a key role in designing both the US government's new global food security strategy and the Agency's strategy that will guide its programming to help overcome the critical challenges discussed above. A significant part of its focus will be to propel the smallholders and other rural producers from hunger to food security. Addressing malnutrition and undernutrition, especially among children under two years of age, is of increasing importance and reflective of the Agency's desire to use a broad definition of food security.

The outline of the Agency approach includes the following focus areas:

- On-farm productivity, through improving access to and effectiveness of inputs
- Post-harvest activities, improving crop storage and adding value
- Market development, to raise incomes and strengthen value chains
- Attention to women, who are important but often overlooked economic actors
- Governance, to ensure supportive and functioning institutions
- Research and development to address priority gaps
- Natural resource management to promote an environmentally sound food systems

> *We must help Africa produce enough food to feed its people and create economic opportunities for this continent…We need a comprehensive approach focused on sustainability. We must address not only increasing availability of food by helping people in countries produce it, but we must make food accessible to those who need it and teach people to utilize it properly. First and foremost, the plans to establish food security must be country-developed and country-led.*
>
> *Secretary of Agriculture Tom Vilsack, 5 August 2009*

Harnessing Higher Education's "Reservoir of Talent"

Universities can help ensure that USAID and the US government more widely is building a policy based on credible scientific information related to the challenges identified above, and in a way that facilitates more effective interaction and greater transparency in USAID's decision making.

Doing so builds on a long history of mobilizing US universities for international development. In 1949, President Harry Truman called on the US universities' "reservoir of talent" in a speech on world affairs that led to the creation of a new foreign assistance program. Over the ensuing sixty years, US colleges and universities contributed to building land-grant type university programs overseas, implemented development assistance programs, and provided technical experts in all agricultural topics. The passage of Title XII in1975 and its renewal in 2000 formalized the US university relationship with USAID to address the problem of the food security and economic growth in developing countries. Today, Congress is seeking to explicitly engage US universities into its foreign assistance reform efforts, e.g., in the proposed legislation, Higher Education Collaboration for Technology, Agriculture, Research, and Extension (HECTARE).

The deliberations at the Conference of Deans II meeting identified many innovative ideas for university engagement in the years ahead.[1] The research and programming suggestions are grouped in four thematic areas:

- Recapture US Universities' Position of Intellectual Leadership
- Forge Strategic, Creative, and Sustainable Partnerships
- Engage the next generation
- Reintegrate Teaching, Research, and Action

Recapture US Universities' Position of Intellectual Leadership in Agricultural Development

US universities continue to be recognized as global leaders in agricultural sciences and technologies, and those accomplishments of the past continue to bear fruit today (see Box 3). Their leadership position as the primary architects and implementers of agricultural development policies and programs has however slipped as other sectoral interests and funding level eclipsed agriculture in recent years.

BOX 3: EXPANDING THE US LAND GRANT MODEL: FROM THE US TO INDIA TO AFGHANISTAN

In the 1950s and 1960s, in a huge institutional building effort, US university faculty built agricultural universities around the world, helping to train students and develop curricula and research and extension systems. Five leading US agricultural universities helped to build sixteen Indian agricultural universities based on the land grant model. Today, the institutional capacity that the US helped create is in turn supporting Afghanistan's agricultural recovery. The Indian government has initiated a program to fund study tours for Afghan delegations to visit Indian agricultural research laboratories and agricultural universities, including those started by USAID decades ago. India is also offering agricultural scholarships to Afghan students to study at these same schools under its Indian Technical and Cooperation Programme.

Source: USAID FY 2005 Title XII Report to Congress

The following topics emerged at the conference as particularly relevant areas of US leadership in agricultural research and extension that can provide significant benefits in agricultural development:

- systems thinking
- interdisciplinary collaboration
- research on adaptation and mitigation
- research on sustainable agriculture

Action: Establish the University "Brain Trust"

A strong theme of the meeting was the need to broaden the dialogue among different interest groups. To ensure that USAID has the benefit of US university expertise in these areas, and to make the most up to date insights accessible to USAID, the Conference of Deans endorsed continued work to establish a US university "Brain Trust." First proposed at a BIFAD meeting in Iowa in October 2008, the Brain Trust will serve as an ongoing advisory body to be managed by the BIFAD and through which USAID senior leadership can directly access high-level agricultural expertise. This university-based panel and associated task groups offers diverse experience with long-term perspectives. It can provide science-based evidence across disciplines to meet Agency needs for identifying and prioritizing critical research to respond to climate variability while also promoting a more sustainable agriculture.

[1] A full report on the conference prepared by ENCOMPASS LLC will be available on the APLU website, http://www.aplu.org.

Initial steps could include convening a small group of scholars to review recent overview documents (e.g., the reports of the International Assessment of Agricultural Knowledge, Science and Technology for Development (IAASTD) conducted through the World Bank and studies prepared by the National Academy of Sciences on emerging agricultural technologies and agricultural science education). The group could prepare a combined overview of the issues and identify where needed expertise could be found. The results could be shared with the USAID leadership.

Forge Strategic, Creative, and Sustainable Partnerships

The US higher education community has partnered with USAID for over fifty years to shape the international agricultural research and development agenda. Raising agricultural productivity is critical to achieving economic growth in developing countries. Through agriculture research, the parameters for productivity increases are identified and intensified, helping people across the globe to grow and sell agricultural products more effectively, feeding their families and earning higher incomes while sustaining, even improving, the environments in which they live and work. Research on agricultural policy simultaneously promotes the enabling environment that helps agribusinesses, small and large, to prosper. By funding research as well as development interventions, USAID ensures that research results inform new directions for development interventions while at the same time supports the testing research of applications in the field to identify new topics for further research.

BOX 4: PROVEN PARTNERSHIP PROGRAMS

- **Higher Education for Development (HED)** manages grants supported by USAID and US higher education associations to strengthen US colleges' and universities' engagement in international development issues. It funds innovative partnerships to link U.S. and developing country institutions address topics from agriculture, natural resource management, and food security to business, health, and technology. HED joined other groups in July 2007 to create the ***Africa-U.S. Higher Education Collaboration Initiative,*** to support and enlist African institutions of higher learning to lead and ultimately transform the continent's path to development. (See www.hedprogram.org).

- **The Collaborative Research Support Program (CRSP)** supports long-term collaborative university research, mobilizing US technical expertise "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 CRSPs empower host country institutions to address recognized needs and constraints though the creation of new technologies and knowledge while concurrently developing human resource capacity and competencies in strategic areas of agriculture and natural resource sciences, thus leading to institutional self-reliance and sustainability (Widders and Mywish 2007)

Current CRSP programs involve over 60 US colleges and universities and 200 partners in more than 70 developing countries. The CRSPs have helped over 3,145students between 1978 and 2007 to obtain degrees in agriculturally-related fields. CRSP programs tackle problems such as aflatoxin, avian flu, striga control, market access, pest infestation, and resource management, and the development of higher-yielding and drought and pest resistant varieties of legumes and other crops.
(See Widders and Mywish 2007; BIFAD approved CRSP Guidelines, 2005)

Proven Partnerships

In today's highly complex and interconnected world, partnerships are critical to achieving development goals. The US higher education community has a

long history of partnerships with developing countries that mobilized US expertise to create many of today's prominent institutions in agriculture education, research, and extension (Box 4).

Partnerships for Today and Tomorrow

In the 21st century, agriculture is linked to new and changing challenges. In addition to the proven programs, the US higher education community is committed to finding new models of partnerships to harness US expertise while encouraging local leadership and decision-making by developing country institutions. One possibility is strengthening broader alliances of partners who share mutually defined objectives, e.g., to build local agricultural capacity and to create new agricultural institutions. These new alliances would expand university to university links to include, as do the CRSP and some other programs, links between universities, government institutions, foundations, NGOs, and the private sector.

Action: Create a US National Food Security University

The suggestion of establishing a **US National Food Security University** received broad support. The US NFSU is envisioned to be a degree-granting consortium. It would use a hybrid of distance and face-to-face teaching to build capacity for teaching faculty; raise awareness and support for agricultural research and food security issues; and strengthen the partnership between agricultural universities in the US government by linking agricultural research to support global strategic issues. Foundations and the private sector would also be important partners.

BOX 5: PARTNERSHIP IDEAS FOR TODAY AND TOMORROW

Future successful partnerships were characterized as having:

- ✓ local leadership and local ownership
- ✓ long-term perspectives and stable funding
- ✓a focus on problem-solving
- ✓opportunities for capacity building

Program ideas included:

- **Global Development Alliance for Agriculture (GDAA)** that would build on the successful model of USAID's GDA, focusing on international agri-business.
- **Regional Centers of Innovation** would also partner universities, research centers, and the private sector to work on issues of productivity, nutrition, markets, financing, systems thinking, and capacity building. The goal would be to provide scalable solutions for food security.
- **Small Farmer Value Chain Consolidation** to support on-the-ground collaborative relationships with host country investigators to create large-scale organizations of producers linking them directly to processors, distributors, and exporters. Programs would assist farmers in these groups to obtain information about prices, input costs, market information, and production information.

Engage the Next Generation

The need to build capacity in the agricultural sciences and related agribusiness fields, both in the US and in developing countries is critical, and should be a central element of any university/USAID partnership. Declines in agricultural experts hinder the recruitment of technical specialists even within USAID. The numbers of undergraduate students studying agriculture in the US have been declining nationally since the 1970s, and those

entering the field have less on-farm experience than in previous generations. This is not surprising, given the decreasing number of farms and the rising average age of farmers in the US. And changes in the global food system require students in the agricultural sciences and agribusiness fields to develop skills that are not learned on the farm.

A recent report by a committee of the National Academy of Sciences argues for a transformation of agricultural education to meet the needs of the new agriculture of today. Several of its recommendations were echoed by the Conference of Deans (see Box 6), and speak both to recruiting more students into agriculture as well as changing the content of undergraduate education.

BOX 6: STEPS FOR "TRANSFORMING AGRICULTURAL EDUCATION FOR A CHANGING WORLD"

The National Academy of Sciences recommended steps for achieving change in agricultural education:

- **Implement Strategic Planning** for recruitment, retention, and preparation of students.
- **Broaden Treatment of Agriculture across the Curriculum** by bringing agricultural topics into the basic physical and social sciences.
- **Broaden the Student Experience** to provide needed job skills in communication, teamwork, and management
- **Prepare Faculty to Teach Effectively**, using new technology and drawing on new research about adult learning
- **Reward Exemplary Teaching**
- **Build Stronger Connections among Institutions**, among public and private universities and within and between regions.
- **Start Early** and teach students in K-12 classes about the food system and encourage wider involvement in programs such as 4-H and National FFA
- **Build Strategic Partnerships** with the private sector.
- **Review Undergraduate Programs**

In African nations, student enrolments in agricultural sciences were increasing through the mid-1990s, paralleling increases in tertiary education overall, but numbers varied by country depending on the level of resources and numbers of institutions. Tertiary education, however, has been relatively neglected by donors and national governments, and agricultural education has been severely affected.

Conference participants stressed the need for greater investments in agricultural education, and to link formal and informal learning systems. They also recognized the importance of bringing more girls into the agricultural sciences and working to make these educational programs gender-equitable.

<u>Actions:</u>

- Mobilize university and other institution-based networks of alumni world-wide to bring on board the next generation of agricultural scientists and business owners. In the words of one participant, "this is an opportunity to mobilize America's 'soft power" and 'smart power.'"
- Develop programs at US universities that would create synergy among study abroad programs, international service learning, and foreign student programs in the colleges of agriculture.

> *Most importantly and not to be underestimated, you [the universities] bring to the table the next generation of the world's leaders. You all are responsible for shaping them, developing them, and preparing them. No matter how much conversation we have in this room, the ability of USAID and the ability of the US to have a leadership role in the global environment is going to be because of the people that you have developed – the students that you are developing, who you have taken under your wing, and the professors that you are preparing to have a global view of the world.*
>
> *Karen Turner, Director, Office of Development Partners, USAID, 30 June 2009*

Reintegrate Teaching, Research, and Action

Advancing agriculture under the global food security initiative must embrace an integrated approach. It will be trans-disciplinary and interdisciplinary, combining physical and engineering science-based knowledge for technology transfer and application with social science knowledge on extension and adoption to help the right products meet the needs of the producers, processors, and buyers throughout the value chain.

New program design will be enhanced if faculty and development officials are able to spend more time seeing problems from multiple viewpoints by participating in faculty and professional exchanges. This can be done on a one-to-one basis, as in the past, by establishing programs for individuals, or it can be the goal of new centers of excellence for food security education and experimentation that will bring practitioners and faculty members together in different venues to craft viable solutions to critical problems.

Action:

- To achieve this new modality of integrated teaching, research, and action, the dialogue between USAID and its university and other partners, needs to expand, through greater use of faculty and professional exchanges and structured forums.
- It is also necessary to redesign the way that USAID approaches its assistance and acquisition mechanisms to streamline funding and reporting, while also reducing barriers to accessing university expertise and to enhancing the value of that knowledge for development goals.

In Sum, although serious technical and social issues face the agricultural sector, much of the needed knowledge is already available. To be effective, however, it must be adapted and applied to specific locations, and that requires developing the right kind of capacity in science and business to meet the challenges already identified and those yet to come. Universities can provide the suite of capabilities for the teaching, the research, and the action.

> *Universities can help to achieve **the overall goal** to support and advance agricultural science and technology development and agricultural education to ensure a safe, secure, and sustainable food supply in 2030 under conditions of global climate change.*

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