

ENHANCING UNITED STATES EFFORTS TO DEVELOP SUSTAINABLE AGRI-FOOD SYSTEMS IN AFRICA



by T.S. Jayne, Chance Kabaghe, and Isaac Minde

FOREWORD

Over the next few years, we have a unique opportunity to further strengthen US agriculture and transform US agricultural development programs overseas to help foster growing markets and build more stable and secure nations. The Farm Bill reauthorization in 2018 provides an important vehicle for modernizing our approach and improving the efficacy of US investments.

With a longstanding relationship with US agriculture and rural America, the Farm Journal Foundation (FJF) invited renowned experts to suggest approaches to enhance the programs and other tools that policymakers will need to generate better outcomes for US investments in agriculture and global food security. Since FJF started in 2010, it has sought to bring the expertise of US agriculture to the national policy table, providing a platform for diverse stakeholders across the US agricultural system to contribute their knowledge and ideas to feed a growing global population.

This paper on human and institutional capacity building by Dr. Thomas Jayne, Dr. Chance Kabaghe, and Dr. Isaac Minde is the first in a series of policy papers commissioned by FJF. Two additional papers on agricultural trade technical assistance and agricultural research will be released later in February. Taken together, they kick off a much needed dialogue on how US agriculture can maintain its comparative strength, share its extraordinary knowledge, tools, and know-how, and drive economic growth and stability, while ensuring US competitiveness in tomorrow's agricultural export markets.

While commissioned by the Farm Journal Foundation, these policy documents reflect the views of the authors, and are intended to stimulate interest and debate on these issues as Congress begins to consider the next farm bill and other relevant legislation.

We hope that this effort will assist policymakers in promoting a national vision and commitment to international agricultural development in US foreign policy, and continued support for US farmers utilizing US Agriculture's best practices and expertise.

The Farm Journal Foundation would like to express its thanks to its donors, our Farm Teams, HungerU students, partners and colleagues across agriculture who made these papers possible.

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The Farm Journal Foundation is a 501(c)3 organization that works with U.S. farmers, ranchers and next generation populations to inform and engage national level policymakers on the important role that the United States can and should play in addressing global food security.

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SUMMARY

Africa is on the move. The incoming presidential administration and new 115th Congress will have before them an historic opportunity to extend America's global leadership by promoting the economic transformations underway in Africa. Even with rapid urbanization and the arrival of Walmart, Africa's development still greatly depends on the performance of its agri-food systems¹. Farming remains the primary source of employment for 65 percent of the region's population. Poverty rates are declining but remain unacceptably high. Putting more money in the hands of 500 million Africans who rely on farming for their livelihoods will decisively influence the pace of growth in the rest of the economy. Virtually no country in the world has ever transformed its economy from an agrarian economy to a modern one with low poverty rates without sustained agricultural productivity growth.

Why should US citizens care? Investing in Africa's economic growth is in the United States' national interest. US exports of agricultural products to sub-Saharan Africa totaled \$2.6 billion in 2013 and will grow rapidly if Africa continues to develop. By 2050, sub-Saharan Africa will contain 2.1 billion people—22 percent of the world's population compared to 12 percent today. Rapidly rising population and incomes in Africa will increase the demand for a safe, affordable, and sustainable global food supply. US farmers and agribusiness can help themselves by helping Africa to meet its rapidly growing food needs, by investing in the region's agri-food systems, and by supporting a sustainable and efficient global food system.

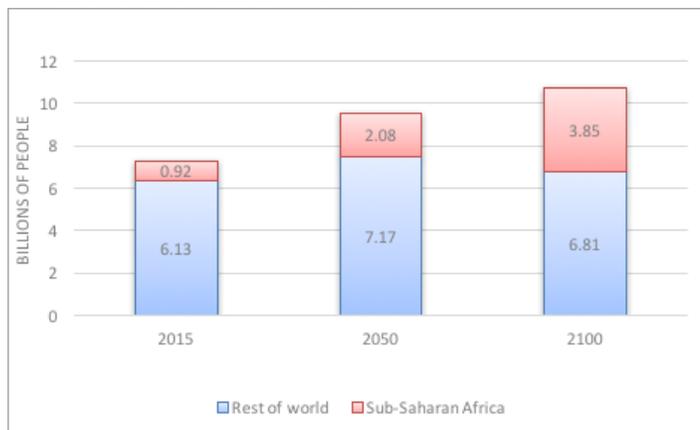
But agricultural growth rarely happens spontaneously or solely through private sector initiative, as crucial as private investment is. Private investment responds to incentives. A sustainable approach to developing mutual US-Africa interests will require greater support for the development of African public institutions to nurture the next generation of African educators, farm extension workers, research scientists, entrepreneurs and workers in agri-food systems, and policy makers. These people will greatly influence the pace and sustainability of private investment and agricultural transformation in African countries. An effective United State (US) approach will also recognize

how dramatically the African landscape has changed in the past few decades with respect to partnerships. Development models premised on 1980s conditions no longer fit 2016 realities. US development-oriented institutions will continue to play a critical role, but their effectiveness will depend on understanding and adapting to how Africans view their role in today's world, in which there is considerably greater local expertise, awareness, and insistence that African organizations control their national development agendas, policies, and programs. This policy brief describes this changed landscape, as well as the challenges and opportunities being created for developing innovative and effective new partnerships between US and African institutions engaged in African agri-food systems. It will outline a strategic framework to maintain US engagement in this effort, which centers on sustained commitment to capacity strengthening and leadership of African agricultural institutions.

THE CHANGING LANDSCAPE

What would an effective US development strategy toward African agriculture look like? It would be based on a recognition of how dramatically different the landscape is today in much of Africa from several decades ago and how this landscape continues to evolve rapidly. There are at least four major differences. First, the population of sub-Saharan Africa (SSA) is projected to double from 0.95 to 2.1 billion people between 2015 and 2050. SSA's share of the world's population will rise over this period from 12 percent to 22 percent (Figure 1). Rapid population growth is already putting greater pressure on local and global food systems to feed Africa's burgeoning cities, providing unprecedented opportunities for private investment in agri-food systems, especially under a favorable environment with respect to agricultural marketing and trade policies (World Bank, 2013). Moreover, as food deficits in Africa continue to grow with its share of the world's population, Africa's agricultural performance will increasingly affect global food supply and demand conditions and hence the long-term trajectory of world food prices (Figure 2).

Figure 1. Population Projections for Sub-Saharan Africa and the Rest of World

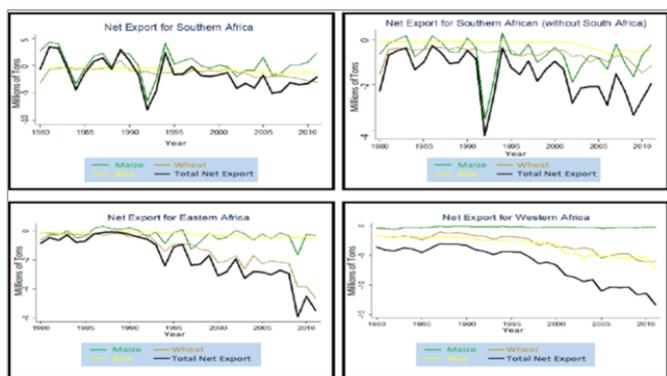


Source: United Nations (2016, mid-year projections, as of the 2014 Revision).

Notes: The estimated population for SSA was 12.3% of the world's population in 2015, and is projected to comprise 21.7% in 2050 and 36.0% in 2100.

Second, SSA is the only region of the world that is continuing to experience a rapid rise in the number of young people (Figure 3). SSA in 2015 has 18.3% of the world's developing region population below the age of 15. This fraction is projected to rise to 31.3% in 2050, and 42.6% in 2100 (Das Gupta 2016). 62 percent of Africans are below the age of 25. Africans between 15 and 35 now account for 55 percent of the region's labor force. Every year, roughly 11 million young Africans enter the labor force (Filmer and Fox, 2014), and they are considerably better educated than new entrants of previous generations. However, even the most optimistic projections suggest that only 25 percent of these young Africans will find wage jobs over the next decade. The other 75 percent will depend on farming and informal sector jobs, many of the latter related to agriculture, for their livelihoods (Figure 4). Recent evidence confirms that faster rates of agricultural productivity growth in Africa

Figure 2. Trends in grain export from Africa by region

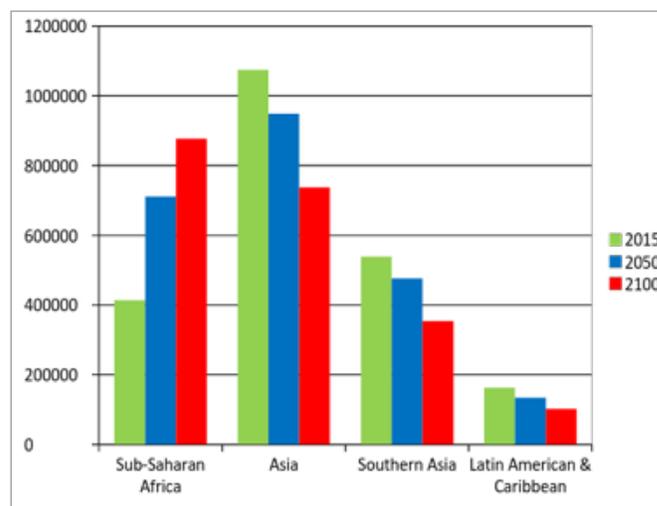


Source: Yeboah and Jayne (2016)

are associated with rising employment opportunities and labor productivity in the non-farm segments of the economy (Christiaensen et al., 2011; Yeboah and Jayne, 2016, see Figures 5 and 6). A vibrant agricultural sector will profoundly improve youth employment prospects and political stability.

Third, many more Africans today possess professional white-collar job expertise related to agri-food systems, both in the public and private sectors, than 25 years ago. Many were educated internationally, possess valuable technical skills, and can operate effectively in their countries given superior knowledge of local culture and connections with centers of local power. Many are eloquent spokespersons and advocates for African agriculture and are capable of influencing African government investments. An effective US strategy toward African agricultural development will engage African professionals more than in the past.

Figure 3. Projected Population Aged Less

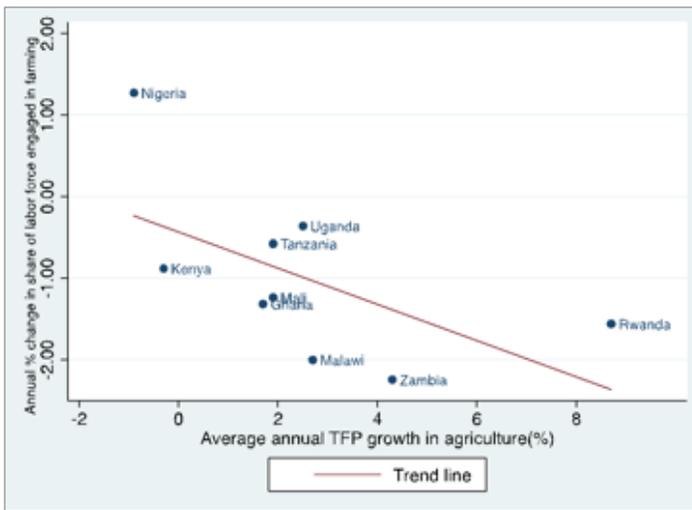


Source: United Nations 2016.

However, conditions have not changed much in at least one important respect. Despite public agricultural institutions' newly lauded role in providing public goods², many such institutions in Africa are no more effective in fulfilling their mandates than they were three decades ago—in some cases, less so. National agricultural research and extension systems remain chronically underfunded and, with a few notable exceptions, have had little impact, though there is strong evidence that public expenditures to agricultural research and extension services are effective in promoting agricultural productivity growth and poverty reduction (Economist Intelligence Unit, 2008; Fan et al., 2009). Governments in Asia and Latin America provide much more funding to their agricultural research and extension systems, and

these countries are, not surprisingly, reaping major rewards from these investments.

Figure 5. Association between Total Factor Productivity Growth and Change in Share of Labor Force Engaged in Farming



Source: Yeboah and Jayne 2016. Changes in the share of the labor force engaged in farming are derived primarily from Living Standards Monitoring Surveys (LSMS) national data sets described in Yeboah and Jayne (2016). Mean annual agricultural TFP growth rates are from United States Department of Agriculture Total Factor Productivity (USDA TFP) dataset (Fuglie 2015); the time periods for computation of TFP growth rates are lagged two years relative to the dates of the LSMS surveys. Spearman

THE VISION

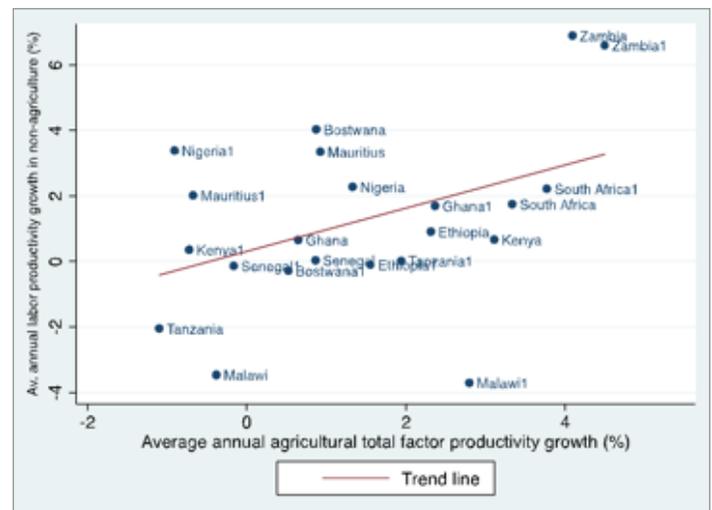
There are strong mutually shared aspirations in the United States and throughout Africa that could be realized through more effective support for African agriculture. US and African governments share core interests in promoting private investment in African food systems in partnership with local firms and in supporting fair agricultural trade and a sustainable global food system. It is increasingly recognized that African agricultural exports in the majority of cases do not compete with US farm interests and are in most instances highly complementary. Rising farm incomes in Africa promote growth multipliers that expand private investment and employment opportunities in African agri-food systems and more broadly in the rest of the economy. Rising incomes in Africa also promote US export interests (Meade et al., 2011; Trostle and Seeley, 2013). Moreover, sustainable agricultural development in Africa promotes political and economic stability in the region. These are the benefits that would emerge from strong partnerships between African governments, the private sector and

millions of African farmers and entrepreneurs supported by enlightened US development assistance programs.

THE CHALLENGE

How can US agricultural development assistance more effectively help achieve Africa's agricultural development vision? Representatives of agencies such as the United States Agency for International Development (USAID), Millennium Challenge Corporation (MCC), and United States Department of Agriculture (USDA) understand the importance of building the capacity of local institutions in developing countries, those that create and adapt new agricultural technologies (research and development), those that disseminate information about more profitable and sustainable management practices (agronomy, animal sciences, extension services, agribusiness, and economics), and those that provide trusted policy guidance to African leaders (policy institutes). For clarity, the range of local institutions discussed here include African universities, agricultural training colleges and vocational schools, national agricultural research and extension systems, and policy institutes and think tanks. These local institutions

Figure 6. Association between Agricultural Total Factor Productivity Growth and Labor Productivity in the Non-



Source: Yeboah and Jayne 2016. Agricultural total factor productivity growth rates derived from USDA TFP dataset (Fuglie 2015) and computed as mean annual rates over 2001-2005 and 2006-2011 periods; labor productivity growth rates (mean annual rates over 2001-2005 and 2006-2011 period) derived from Groningen Global Development Centre (<http://www.rug.nl/research/ggdc/>) employment data for corresponding periods. NB: two points are shown for each country; the latter period (2006-2011) for each country is denoted with "1" (e.g., Malawi1 represents Malawi 2006-2011). Spearman Correlation coefficient =

can play a critical role in achieving the vision, but they will need new forms of support.

Overcoming perceived threats to objectivity

African policy makers' utilization of policy analysis depends on their confidence in the objectivity of those providing the analysis. External technical assistance has had some successes, but its track record in influencing agricultural policies has been limited. In 2007, the World Bank concluded that technical assistance in support of agricultural policy reform—the vast majority of it undertaken by external analysts—has been among the least effective forms of development assistance in Africa.

Because Africa has a longstanding history of powerful external influence in its political and economic affairs, persisting even after formal colonial ties with European countries were severed, some African leaders understandably distrust outside technical assistance perceived to reflect interests not fully in tune with African priorities. It may be too early to establish that African leaders strongly value the recent creation of autonomous African-led agricultural policy institutes, but such institutes in a handful of countries have proven to be quite effective in influencing policy even within a short time frame. Lack of local African ownership and insufficient local voice in policy analysis may explain why some African governments have distanced themselves from policy prescriptions developed by otherwise well-meaning initiatives such as the Comprehensive African Agricultural Development Programme (CAADP).³

The value of US-funded technical analysis is weakened if the US is perceived to have vested interests in the analytical agenda or conclusions of technical analysis. Analysis intended to guide African government policies on topics such as trade barriers and the setting up of legal frameworks to guide policy toward adoption of genetically modified seeds (GMOs) are often viewed with scepticism. Some African policy makers privately question the objectives of the New Alliance for Food Security and Nutrition, launched in 2012 as a partnership between several African governments, donor country governments, and the private sector. Rightly or wrongly, civil society and the media sometimes portray the initiative as an attempt to expand international private firms' position in local markets and potentially weaken local autonomy over politically sensitive sectors of the economy.

Overcoming low spending on agricultural R&D by African governments

Of all types of agricultural expenditures, spending on research and development is among the most crucial to growth (Pardey et al., 2006), yet most African agricultural research systems are woefully underfunded. Their weaknesses constrain the pace of agricultural productivity growth in the region (Fuglie and Rada, 2013). Asian farmers benefit from the fact that their governments spend over eight times more annually on agricultural R&D on average than African governments.⁴ Not surprisingly, the pace of agricultural productivity growth in Asia has eclipsed that of Africa over the last several decades. While advances in ICTs are making it increasingly feasible to provide information to farmers even in the most remote

areas, the binding constraint is now an inability to provide farmers with proven "best practices" due to decades of neglect of agricultural research and development under localized conditions, not the inability to communicate with farmers. International R&D cannot fully substitute for local R&D because agricultural technologies, especially seed varieties, must be locally adapted, tested, and refined to suit Africa's highly varied agro-ecological conditions. Building African R&D capacity requires

sustained investments in people, facilities, lab equipment, budgets for field trials, and other recurrent costs. And because the benefits of most agricultural R&D investments accrue broadly and cannot be captured by firms investing in them, there is a strong role for sustained support for public R&D. Building the capacity of strong African public agricultural R&D and extension systems should be a priority area for US assistance.

Unfortunately, little progress has been made over the past several decades in building African universities and scientific crop and livestock institutes to develop improved technologies appropriate for the wide range of African farming conditions, as the USDA and Land Grant systems did for farmers in the US. Similarly, little progress has been made to rehabilitate weak national agricultural extension systems. US development assistance has typically addressed these weaknesses by providing grants to organizations in the Consultative Group on International Agricultural Research (CGIAR) system, private development-oriented companies, and international universities. The US makes such grants with the intention of developing alternative modes of technology transfer and extension; it projects the view that African public sector organizations are too dysfunctional to generate positive

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outcomes from direct grants within the short timeframes that grantees are typically given. As a result, R&D projects are often structured to bypass or work around public sector organizations. The setting up of parallel channels to meet 3- to 5-year grant objectives is understandable in some respects, but it leads to a vicious circle in which African public sector agencies are perceived as too weak to contribute productively to grant activities and outcomes, justifying future grants meant to bypass them again.

Therefore, a key challenge for US development assistance is to find cost-effective ways of building the capacity of local institutions—those providing R&D, extension, education, policy analysis, and dissemination—to support agricultural productivity growth and broader economic transformation in the region. To do so, it is necessary to identify the parts of US assistance that are working well, those that aren't, and what to do about it.

HOW TO STRENGTHEN THE US APPROACH

Sub-Saharan Africa contains some of the fastest growing economies in the world, though performance has been quite variable across the region. Countries investing in their agricultural sectors have obtained more rapid rates of agricultural productivity, greater poverty reduction and more rapid pace of exit of the work force out of farming (Badiane et al., 2016; Yeboah and Jayne, 2016). Economic growth and rapid population growth have combined to push Africa's food imports to record levels in recent years, \$43.6 billion in 2011. That same year, the value of US agricultural exports to SSA reached a record \$2.9 billion (USDA, 2013). Food imports to SSA are projected to continue to rise rapidly. While the evidence is based on a limited number of countries, studies generally find that agricultural productivity growth in developing countries tends to raise national incomes and increase the demand for commodities from world markets (e.g., Rada and Regmi, 2010). For these reasons, there are strong mutual US-African business interests in promoting the productivity of African farmers and the broader agri-food systems on which they depend.

The United States has one of the most dynamic and productive agricultural systems in the world. Historians and economists point to the land-grant university system, the US Cooperative Extension Service, the USDA and its Economic Research Service (ERS), and other public

agricultural institutions as major drivers of US agricultural growth (Bonnen, 1989). The United States is capable of providing needed leadership and expertise to support institutional capacity building in Africa. We propose that the main thrust of a new approach be to shift the role of US public institutions from providing the technologies, services, and answers themselves to helping African organizations to do so.

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There remain many crucial roles for US institutions to work closely with African organizations, in discovery, foresighting, and frontier research in areas where expensive infrastructure and facilities and/or specialized human capital developed

over many decades gives a comparative advantage for some international organizations in some tasks. But the proposed new thrust would build collaboration and capacity building between international and public African organizations more explicitly and effectively by directly involving African organizations early in the design phases of US development frameworks and strategies, programs and projects.

A new model of technical assistance? US assistance should emphasize long-term capacity building support to African universities and national research and extension systems themselves. While it will take decades-long support and innovative program design to meaningfully strengthen R&D and extension systems in African countries, their weaknesses continue to put the region's agricultural sectors further and further behind the rest of the world.

How to develop mutually beneficial partnerships between US development partners and local agricultural organizations?

Many capacity building grants to non-governmental organizations (NGOs) and US universities are subject to problems resulting from incomplete alignment of the grantee organization's objectives and the grantor's.⁵ Project support may be designed to build sustainable institutional capacity, but grant recipients may have many additional objectives. Grantees raise revenues through overhead rates on the grant and enhance preeminent capacity in particular thematic areas. Overhead charges may account for as much as 50 percent of the total value of US grants to some grantees, such as international universities, NGOs, and private for-profit companies. University faculty face strong incentives to publish in scholarly journals, which

often encourage them to prioritize resources for their own research programs rather than build the capacities of host-country universities and institutes. As a result, capacity building assistance is often less effective than it could be. US development organizations must get more involved in grant management and find new ways to align the interests of grantor and grantee.

International universities play an important 'public goods' role in producing policy-relevant knowledge and new technologies that can be successfully adapted in developing countries and by discovering emerging trends that shape public discussions on important topics in African agriculture. Continuing this type of work is crucial but should be done in a way that brings along local African institutions in the process as equal partners. US assistance can be more effective in promoting long-term collaboration and mutual capacity building between international and African research organizations.

US capacity building programs must consider how to make long-term individual capacity building more cost-effective. The training of scientists with master's and doctoral degrees at major land-grant universities in the United States costs at least \$55,000 per year when relocation costs, living costs, and overheads are counted. The total cost is four times that of producing MSc graduates through the sandwich program at the University of Pretoria in South Africa, which may serve as a model for experimentation and replication in other fields. This program allows graduate students from developing countries to get classroom training at the University of Pretoria, but conduct field research for their theses in their home countries under the joint supervision of local and international professors. Where regional demand is sufficient, US universities may also consider providing affordable graduate-level training at overseas campuses in collaboration with one or more African universities.

Stop bypassing local African policy institutes and universities. Few African-led policy institutes or universities have been centerpieces of long-term US capacity building support. Despite some notable successes in recent years whereby US development assistance has built the capacity of local policy research institutes, progress has generally been very limited. The perception that these institutions are weak has effectively sidelined them in policy-oriented grant-making processes.

Instead, significant grants intended to assist in developing agricultural policy, monitoring and data generation capacity have been allocated to international organizations that provide important services to local organizations, such as ministries of agriculture, but that devote a small fraction of their budgets to helping African organizations deliver such services themselves.

Current forms of capacity building support to African research institutes may do little to build those entities' long-term development. Prime recipients of US grant funds often attempt to build the capacity of African research institutes by contracting with individuals within them. At any given time, the majority of researchers in a particular institute or university department may be funded through individual consulting contracts on a disparate range of issues as determined by the prime recipients of bilateral and multilateral donors as well as the major international development foundations. This current mode of involvement of African institutes in agricultural policy work may retard their ability to develop their own coherent policy analysis programs and may do little to build long-term capacity of the institutes themselves (Omamo, 2003).

As a response to the global food crisis in 2007–9, the 111th US Congress introduced legislation that would have created a US Global Food Security Program that included the establishment of a Higher Education Collaboration for Technology, Agriculture, Research, and Extension (HECTARE) Program designed to develop and sustain the education, research, and institutional support for a developing country's agricultural science and education sector. The bill was not enacted into law.

Global leaders committed themselves to addressing global food security programs at a [G-8 Summit in L'Aquila Italy in 2009](#). The United States responded by establishing the [Feed the Future](#) program. While comprehensive in a number of areas such as support for women and smallholder farmers, market development, and access to seeds, a strong higher education and human and institutional capacity program is absent. A single HECTARE-type program has been established, and that one, [Innovative Agricultural Research Initiative \(iAGRI\)](#) is funded at the USAID Mission level in Tanzania. Ohio State leads a consortium of six US universities—Michigan State, Virginia Tech, University of Florida, Tuskegee, Iowa State—working to build both human and institutional capacity at Tanzania's Sokoine University. The iAGRI program has been very successful in helping the Tanzanian agricultural

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sector, and represents an example worth emulating.

Until universities in developing countries are strengthened, they will not be able to partner with American researchers tackling food security issues. With open borders and the ease of travel, plant and animal disease spread quickly around the world. Researchers and scientists must be able to work together to counter these threats.

PROPOSED CHANGES

It is time to consider a new way of doing business at US congressional and executive levels and with non-government actors. First, policy makers must understand the long-term nature of institution strengthening. Focusing on demonstrating achievements over short time horizons encourages partners' programs to obtaining quick, unsustainable wins rather than tackle the fundamental problems of weak public sector agricultural institutions. Within their own borders, countries around the world have discovered the importance of public education, agricultural research, farm extension, and data generation and analysis units in contributing to agricultural growth and economic transformation (Bonnen 1998; Eicher and Haggblade, 2013; Fan et al., 2009; Economist Intelligence Unit, 2008).

The task of transforming African agriculture should shift to provide and expect leadership from African experts and organizations, even as both international and local players remain involved. It is not an either/or issue but one of achieving the appropriate balance, with cooperative partnerships at the foundation (Omamo, 2003). Effective US assistance will also recognize that collective action is required to address many types of challenges, such as climate change, sustainable agricultural intensification, and promoting free and fair trade. Currently, development assistance tends to side-step many collective action problems by creating parallel organizations and systems that can be sustained only as long as donor projects remain funded.

The stakes are high. If the countries of Africa can upgrade their agricultural institutions, they will not only raise living standards and expand employment opportunities but also address social problems borne of youth underemployment and poverty. Leaders need look no further than Syria and other Middle Eastern countries to see how a large population of unemployed and disaffected youth can coalesce into militant groups, potentially leading to

widespread violence, mass migration, the creation of fragile states, massive humanitarian expenditures, and US military interventions. Such situations might have been moderated or avoided with earlier well-conceived development support. Many African countries currently enjoy rapid economic growth, but its sustainability is not assured, and many others lag far behind.

Congressional Action: The US Congress may consider an approach that more effectively encourages relevant US agencies to recognize the long-term nature of capacity building work in key agricultural institutions in developing countries, and give them the authority to provide appropriate funding and oversight framework for such efforts.

- Capitalize on USDA's extensive knowledge and technical expertise to enhance understanding in developing nations on regional technical regulations, trade facilitation, and overcoming barriers to market.
- Foster knowledge transfer and capacity training for post-farm gate processing, production, and transport.
- Expand the Innovative Agricultural Research Initiative (iAGRI) program model to a multi-country pilot to scale up teaching, research, and extension programs that address organizational development challenges

by providing management training and matching local organizations with sister organizations in the US.

- Update the Bayh-Dole Act to provide incentives to academic institutions that develop patentable innovations out of federally funded research to license technology to entities or individuals in developing countries for lower fees, and potentially with a longer patent protection period if a certain share of licensing goes to developing countries. The

African Agricultural Technology Foundation may be used as a model.

- Amend the Bayh-Dole Act to cover patent rights for innovations developed through joint federal/non-federal research projects, such as will be promulgated under FFAR.
- Create mechanisms to help land-grant faculty members with agricultural experiment station appointments through funding from the Hatch Act to identify and recruit scientists from universities in developing countries to work jointly on research projects.
- The Farmer-to-Farmer program, established in the 1985 Farm Bill, enables American farmers, extension specialists, and others in the US agricultural community

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to provide short-term, on-the-ground technical assistance to counterparts in developing countries. Congress could give USAID the flexibility to offer extension personnel and other agricultural specialists longer term assignments to work with counterpart institutions in Africa. This approach might allow USDA to apply its domestic extension experience internationally to strengthen counterpart African public sector extension systems.

- Under the current Peace Corps program, create a one- to two-year agricultural specialization program for US students and faculty in partnership with 4-H or Future Farmers of America (FFA) that focuses on strengthening the capacity of African agricultural extension systems. 4-H already operates in 50 countries around the world; the basic structure is already present in many places.
- As some development agencies such as the Gates Foundation do, mandate lower overheads on grants to international development partners.

With the Global Food Security Act enacted, USAID now has more explicit authority to operate international agricultural development and research programs. Within that framework, USAID can more closely monitor how activities aimed at fostering agricultural institutions are funded and managed, with particular attention to the following:

1. Move to longer-term institutional capacity support, based on the recognition that time frames for progress on institutional capacity building may realistically require sustained commitments of a decade or more. Periodic reviews can be conducted to assess whether sufficient progress is being made to warrant continuation.
2. For grants where the lead grantee is an international partner, consider putting greater oversight and direction on the activities of US partners—universities, NGOs, and private development firms—so that their activities directly target capacity building objectives within the grant. In many cases, this will require more intensive official review of grant budgets to ensure that sufficient grant funds are flowing to recipient organizations and that the effort expended by US university staff is devoted to directly supporting particular objectives of the grant.
3. Where appropriate, require that substantial shares of total project funds be sub-contracted to local African partners (perhaps with a minimum threshold) with oversight of how such funds are allocated.

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4. Where appropriate, engage in direct long-term contracts with African universities and institutes, with international partners as sub-recipients with clearly specified roles and budgets in service to the long-term building of local institutional capacities.
5. Recognize that institution building involves much more than research capability. Local African organizations can benefit from capacity building in many respects, including (i) the preparation of well-designed proposals capable of achieving important objectives in a realistic manner; (ii) the ability to spend on funds granted over specified time periods, including the administrative capacity to issue sub-agreements and payouts to sub-partners; (iii) delivering on the terms of reference in a timely manner and at a satisfactory level of proficiency; and (iv) the ability to prepare and pass financial audits. US development partners can build the capacity of African organizations to satisfy these criteria, and progress is indeed being made.
6. Consider greater use of performance contracts with specific capacity building deliverables based on project proposals and work plans prepared jointly by African and international partners, and endorsed by high-level management within all parties.
7. Encourage grant recipients to set up advisory boards comprised of representatives from a range of African stakeholder organizations in the recipient country's agricultural sector to periodically advise and guide the activities of US grantees.
8. Encourage international lead grantees to involve African partners through institutional contracts rather than through individual consultancies.
9. Support African universities' efforts to undertake land-grant university activities that have been, and in some cases continue to be, very effective for rural communities in the United States. US agricultural development assistance may encourage partnerships with local and international land-grant universities, engaging with local and international NGOs to co-create effective ways of serving the interests of local communities.
10. Regarding US assistance to the CAADP process and other US initiatives designed to provide policy guidance to African governments, support long-term partnerships between African universities and policy institutes and US development partners to simultaneously build capacity and support African policy institutes' efforts to liaise directly with African governments.

CONCLUSIONS

Agricultural productivity growth is at the heart of Africa's economic transformation, and investing in Africa's economic growth is in the United States' national interest. Over the past 15 years, African governments that have effectively promoted farm productivity growth have enjoyed faster rates of poverty reduction, higher rates of labor productivity in the non-farm segments of the economy, and a more rapid exit of the labor force out of farming. Because the economies of most African countries still depend largely on the performance of agriculture, public investments in agricultural productivity growth will be an important component of an effective youth employment strategy. Young people between 15 and 34 years of age account for roughly 60 percent of Africa's labor force. Often considered more of a burden than a benefit, Africa's youthful workforce could open up a wide range of economic opportunities in farming, in the downstream stages of agri-food systems and in the broader non-farm economy, with the right mix of policies and public investments toward agriculture.

African agri-food systems of the future will require upgraded and profoundly expanded skill sets relative to what local education and training systems are currently producing. Developing the skills and jobs to move the continent towards a productive twenty-first century agriculture will require transforming the content and approach of African agricultural education, research, extension, and policy analysis institutions. And, now that ICTs are increasingly able to overcome problems of remoteness, the transformative power of ICTs is increasingly dependent on our ability to generate appropriate information for dissemination through ICTs. This means a serious commitment to overcome decades of neglect in supporting localized, context-specific adaptive public agricultural research and extension programs.

The time has arrived for the United States to invest directly in long-term capacity building of African universities, agricultural training colleges, vocational schools, national crop science research organizations, extension systems, and policy analysis institutes. International private companies, universities, and NGOs have important but increasingly redefined roles that put African institutions in the lead. African governments should show greater financial commitment to building the capacity of public agricultural organizations, and innovative cost-sharing arrangements among foundations, international development agencies, and African governments might provide scope for leveraging greater mutual commitment to the development of African agri-food systems.

The United States can help the stronger African universities and research institutes to carry out many of the land-grant activities that US universities undertake at home, providing

know-how and extension support to farmers and local agri-business firms, and training the next generation of young Africans to contribute to their nations' development. Once enacted, the proposals made here will take time to generate their full impact. This is why there is no time to waste in getting started.

END NOTES

1. We use the term “agri-food system” rather than “agricultural sector” to emphasize the importance of agricultural input and commodity trade, agro-processing, retailing, preparation of foods away from home, as well as farming, in providing employment and generating economic growth and transformation in countries in their early stages of development (Johnston and Mellor, 1961; Allen et al., 2016).
2. Public goods include those that would be under-provisioned if left to the market; a partial list relevant here would include investments in generating new technologies in areas where they could not necessarily be paid for by the users themselves; technologies such as open pollinating varieties in which private companies might not recoup the costs of generating them; investments in educational systems, policy analysis and policy institutes, and agricultural extension systems, which may produce high returns to society but not to any particular firm investing in them.
3. African governments have for the most part sought to exclude policy issues from the CAADP process, instead focusing on the level and composition of public expenditures to the agricultural sector.
4. Twenty-eight Asian governments spent 7.52 billion USD in support of public agricultural R&D in 2000 compared to 1.46 billion USD by the 44 sub-Saharan African governments for which data was available (Pardey et al., 2006), an eight-fold difference per country between Asia and Africa.
5. These problems, also referred to as “principal-agent problems,” tend to make it costly for grantors to adequately oversee the activities of the grantee.

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