

CHANGING DONOR PRIORITIES AND STRATEGIES FOR AGRICULTURAL R&D IN DEVELOPING COUNTRIES

Evidence from Africa

David J. Spielman, Fatima Zaidi, and Kathleen Flaherty

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AGRICULTURAL R&D: INVESTING IN AFRICA'S FUTURE

Analyzing Trends, Challenges, and Opportunities

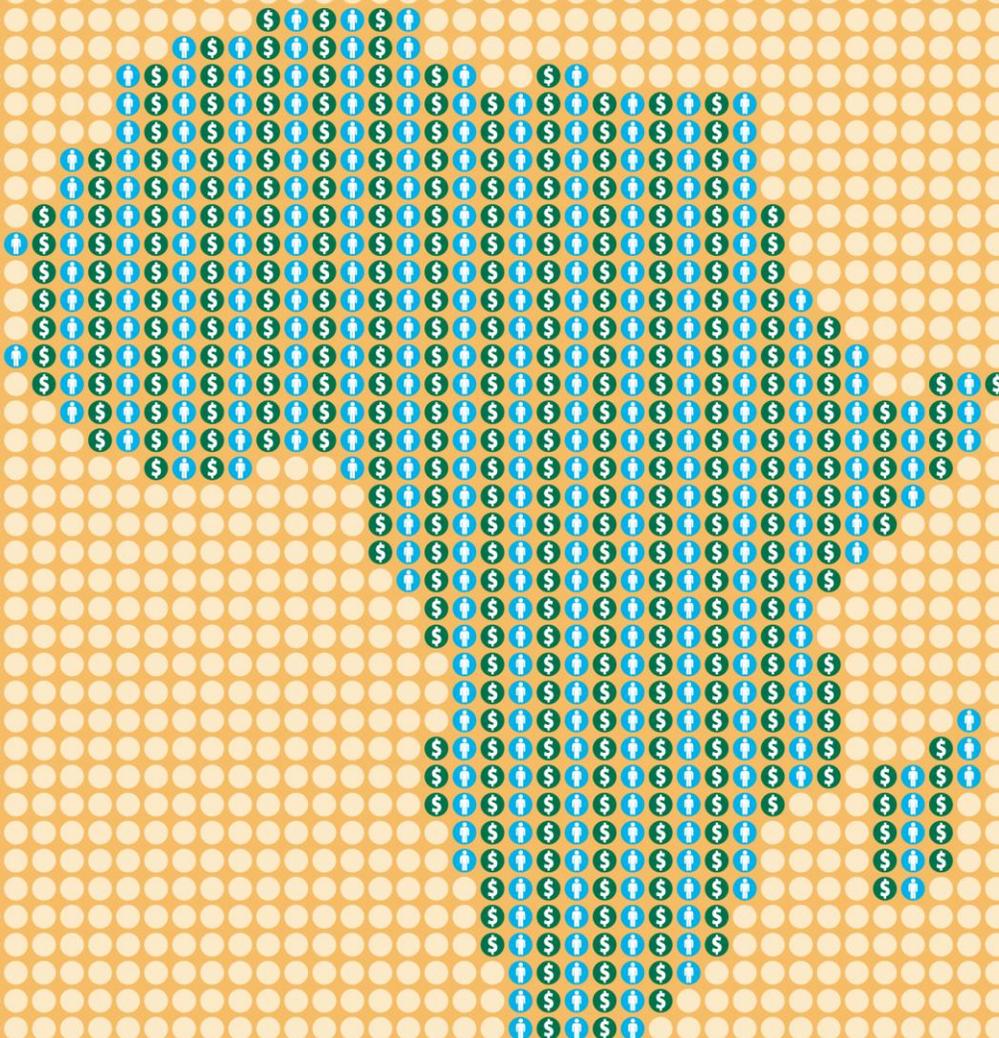


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About the Author

David J. Spielman (d.spielman@cgiar.org) is a senior research fellow in the Environment and Production Technology Division (EPTD) of the International Food Policy Research Institute (IFPRI). **Fatima Zaidi** (f.zaidi@cgiar.org) is a senior research assistant, and **Kathleen Flaherty** (k.flaherty@cgiar.org) a research analyst, within IFPRI's EPTD.

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Acronyms and Abbreviations

AATF	African Agricultural Technology Foundation
AGRA	Alliance for a Green Revolution in Africa
ASARECA	Association for Strengthening Agricultural Research in Eastern and Central Africa
CAADP	Comprehensive Africa Agriculture Development Program
CGIAR	Consultative Group on International Agricultural Research
CIDA	Canadian International Development Agency
CIMMYT	International Center for the Improvement of Maize and Wheat
CORAF/WECARD	West and Central African Council for Agricultural Research and Development
DAC	Development Assistance Committee
DFID	Department for International Development (United Kingdom)
EAAPP	Eastern Africa Agricultural Productivity Program
Embrapa	Brazilian Agricultural Research Corporation
FAAP	Framework for African Agricultural Productivity
FAO	Food and Agriculture Organization of the United Nations
FARA	Forum for Agricultural Research in Africa
FOCAC	Forum on China–Africa Cooperation
FTF	Feed the Future
GAFSP	Global Agriculture and Food Security Program
IDRC	International Development Research Center
JICA	Japan International Development Agency
KARI	Kenya Agricultural Research Institute
MDG	Millennium Development Goals
NASECO	Nalweyo Seed Company (Uganda)
NEPAD	New Partnership for Africa’s Development
ODA	official development assistance
OECD	Organisation for Economic Co-operation and Development
PCP	Pearl Capital Partners
PPP	purchasing power parity
R&D	research and development
SPFS	Special Program for Food Security (FAO)
USAID	United States Agency for International Development
WAAPP	West Africa Agricultural Productivity Program

Abstract

Recent evidence suggests that shifts in the global landscape of agriculture over the past decade have prompted significant changes in donor commitments to agricultural research and development (R&D) in Africa. New donors and donor strategies have given rise to new priorities, partners, platforms, and financing modalities—all of which have important repercussions for the organization and execution of agricultural R&D in Africa. Analysis of the pros and cons associated with these changes is limited, however, especially for countries with small populations and economies; high poverty rates; and limited technical capacity to conduct, adapt, and apply scientific research. This paper attempts to address this knowledge gap by examining key trends in donor funding of agricultural R&D, specifically in terms of changing priorities and strategies, and exploring the impact of the changes on the region's smallholder farmers and food-insecure households.

1. INTRODUCTION

During the past 50 years, agricultural science in many developing countries has benefited greatly from support from industrialized countries. Donors have provided financial support to national agricultural research systems, supported scientific training at foreign universities, organized in-country training programs, allocated staff to assist in training and research, and helped develop an international architecture that facilitates the movement of knowledge and materials for agricultural research and development (R&D). Both financial and technical assistance have played a critical role in designing and expanding national research systems that, in turn, have contributed greatly to enhancing agricultural productivity and improving food security. Thus it is puzzling that donor funding for agricultural R&D in developing countries began to decline dramatically in the mid-1980s. This downturn in multilateral and bilateral donor funding that persisted for nearly two decades led to noticeable disruptions in public spending on agricultural R&D in many African countries.

Donor support was withdrawn in many countries due to concerns over inefficient and inflexible research bureaucracies, poor project management, and long lags between research and impact (Byerlee 1998; Rukuni, Blackie, and Eicher 1998). In other countries, donors sought to leverage economies of scale and scope among small countries with similar R&D needs by reallocating funds to regional, rather than national, research systems (Pardey and Pingali 2010; Lele et al. 2010). In still other countries, donor support came to a halt following the completion of large-scale, donor-funded projects often involving the construction of laboratories and research facilities (Beintema and Stads 2011).

More generally, and throughout the developing world, donors simply withdrew from agricultural R&D because of competition for funding with health, education, and other social-sector investments, and because of complacency over high global food surpluses and low commodity prices (Christensen 1994; World Bank 2008).

As a result, donor funding and public spending on agricultural R&D became highly volatile between the mid-1980s and late-1990s, making it difficult for national research organizations to develop scientific capacity, infrastructure, and research agendas that supported agricultural growth and development (Beintema and Stads 2006).¹

This state of affairs persisted despite ample evidence on the high social and economic returns to agricultural R&D (Maredia, Byerlee, and Anderson 2000; Alston et al. 2000; Evenson and Gollin 2003; Raitzer and Kelley 2008; and Renkow and Byerlee 2010) and despite ample evidence on the favorable productivity and poverty impacts of agricultural R&D (Evenson and Rosegrant 2003; Pratt and Fan 2010). Only in the past decade have signs of a recovery been evident.

Recent analysis shows that public investments in agriculture and agricultural R&D in many Sub-Saharan African countries have started to move away from crisis. New commitments from governments and foreign donors over the past decade have put agriculture back on the agenda and attracted new resources to the task, sizable portions of which have been channeled to Sub-Saharan Africa (Figure 1). Public spending on agricultural R&D in the region grew at a rate of 2.4 percent during 2001–08, totaling over \$1.7 billion in 2008 (measured in constant 2005 purchasing power parity [PPP] dollars) (Beintema and Stads 2011).² While the upward trend is largely concentrated in the region's larger countries—Nigeria, South Africa, Kenya, Ghana, Uganda, Ethiopia, and Sudan, which together accounted for 70 percent of public R&D spending in 2008 (Beintema and Stads 2011)—the potential for similar growth and spillover benefits for smaller countries is significant.

Unfortunately, the quality of data on levels and trends in donor funding makes it difficult to analyze these changes precisely: estimates of donor funding for agricultural R&D in Sub-Saharan Africa vary widely. The Organisation for Economic Co-operation and Development (OECD 2011) estimates commitments (not disbursements) for 2009 at just \$67.1 million (in constant 2009 prices), inclusive of

¹The implications of this volatility are further examined by Stads (2011).

²Equivalent to \$0.8 billion in constant 2005 U.S. dollars.

bilateral (the Development Assistance Committee [DAC]) and multilateral assistance. However, the OECD estimates omit commitments from private donors, such as the Bill and Melinda Gates Foundation (BMGF). A study by Morton (2010) estimates donor funding for agricultural R&D in Sub-Saharan Africa in 2009 at approximately \$450 million. Coppard (2010) places the 2008 figure at about \$245.6 million (in constant 2007 prices).

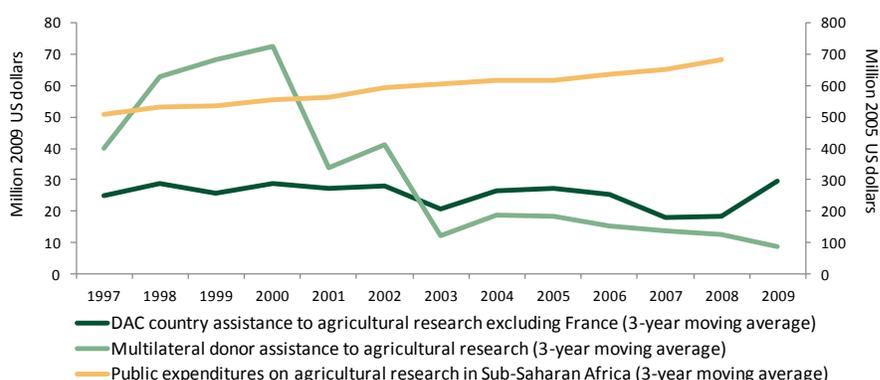
These gains were partly the result of traditional donors returning to agriculture during the first decade of the new millennium, but they were also the result of new donors entering the landscape. Renewed, expanded, and more diversified funding contributed much to this increase in public expenditure on agricultural R&D in Sub-Saharan Africa and other developing regions.

Nonetheless, donor funding to agricultural R&D in Africa remains tenuous at best. Funding still tends to be fairly volatile from year to year and uncoordinated among donors at regional and national levels. There are also concerns that donor funding to agricultural R&D is becoming concentrated in downstream activities at the expense of longer term upstream research (Pingali 2010). There are justified claims that these donor commitments—including the expansive declarations of funding given out at high-profile summits—are merely a repackaging of existing commitments or are not translating into actual disbursements (Coppard 2010). Vocal criticism suggests that R&D priorities are being set by donors and their constituents rather than the recipient countries (Lele et al. 2010; Lele 2009).

In light of these concerns, more information is needed to facilitate an understanding of what lies behind these aggregate trends. Where are these new funds coming from, and what types of donors are providing them? Where are these funds being invested, and have specific donor's interests changed the allocation of funds across different priority areas? How are the funds being invested, and are new modalities being explored to improve the returns to agricultural R&D? This paper attempts to shed light on these questions, yet their exploration comes with certain challenges. Donors define agriculture differently, and thus the available data on their commitments and disbursements to agricultural development can be difficult to compare. Similarly, donors define specific agricultural subsectors differently, again making data comparisons difficult (Coppard 2010). This is particularly relevant to data on donor spending on agricultural R&D, for which definitions, measurements, and practices for obtaining data deviate greatly from the conventional standards set forth by OECD (2002) and used by the Agricultural Science and Technology Indicators (ASTI) initiative (2010).³

³OECD figures cited in this paper are drawn from the OECD's *Development Database on Aid Activities* (CRS Online) and include the following items listed under "Official Development Assistance" (ODA): ODA Grants, ODA Grant-like, ODA Loans and Equity Investment. This type of aid includes investment projects, sector programs, and technical cooperation (OECD 2011).

Figure 1. Selected donor commitments and government spending on agricultural research in Sub-Saharan Africa, 1997–2009



Source: Authors, based on data from OECD (2011) and Beintema and Stads (2011).

Note: Development Assistance Committee (DAC) and multilateral assistance to agricultural research are measured on the left-hand scale; public expenditures on agricultural research are measured on the right-hand scale. DAC country assistance figures do not include France due to unexplained discrepancies in OECD data, which record official development assistance to agricultural research as climbing steadily from US\$7.3 million in 1995 to US\$63.5 million in 2006, followed by a massive increase to US\$297.6 million in 2007 before dropping to US\$29.9 million in 2008 (all in nominal terms). OECD's multilateral donor trend does not include the African Development Bank and the International Bank for Reconstruction and Development.

2. TRENDS IN DONOR FUNDING TO AGRICULTURAL R&D IN AFRICA

Since about 2001, evidence has emerged suggesting an upward shift in donor support to agricultural development. The drivers of this change include recognition that international commodity prices were trending upward, that developing-country governments were again prioritizing agricultural growth, and that new approaches were improving the ways in which projects were run (World Bank 2011a).

The upward reversal of funding to overall agricultural development can also be traced to a succession of global political events that began in 2000, when 189 countries signed onto the United Nation's Millennium Development Goals (MDGs) and committed to such goals as halving extreme poverty and hunger by 2015. Given that rural communities account for a disproportionate amount of this poverty and hunger, and an extensive body of evidence shows how agricultural growth can reduce poverty and promote wider economic growth, the path to prosperity in Africa traveled directly through the agricultural sector. But good intentions are rarely enough, and it was not immediately evident that agriculture was primed to receive more attention on the global development agenda as a result of the MDGs. For that to happen—and for the MDGs to be realized—more regional and national ownership of the MDG agenda was needed.

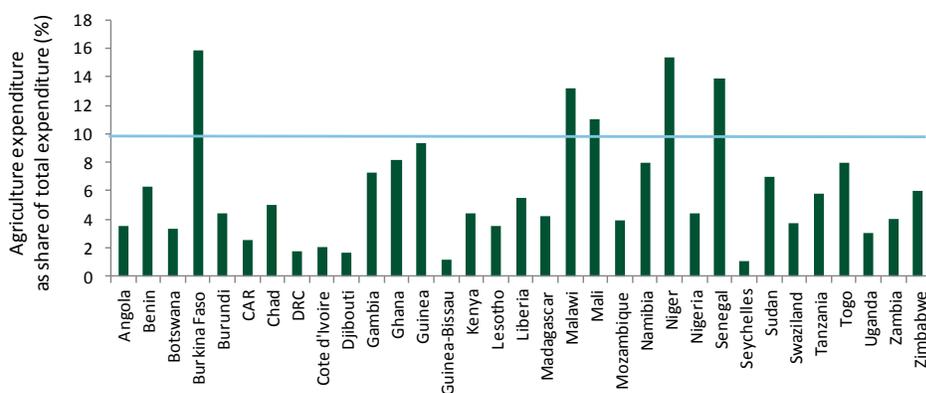
A watershed event was the formulation of the Comprehensive Africa Agriculture Development Program (CAADP), launched at a summit of African heads of state in Maputo in 2003. CAADP is an undertaking of the New Partnership for Africa's Development (NEPAD), itself established in 2001 to assert African ownership over the region's growth and development agenda. CAADP's aim was to improve food security, enhance nutrition, and increase rural incomes in Africa by increasing public investment in agriculture to 10 percent of national budgets per year and raising agricultural productivity by at least 6 percent per year. The African ownership and leadership of NEPAD and CAADP played a key role in putting agriculture squarely on the regional and national development agendas.

Unfortunately, recent expenditure reviews suggest that budgetary support to agriculture is not meeting the CAADP target in most countries (Figure 2). Only Burkina Faso, Malawi, Mali, Niger, and Senegal surpassed the 10 percent target in 2007, while a large majority of countries are still budgeting for agriculture at levels between 5 and 10 percent (Fan, Omilola, and Lambert 2009). A number of issues

ranging from low stakeholder participation in the CAADP process to poor data availability and quality have further exacerbated the challenges of meeting these targets (Morton 2010).

Nonetheless, CAADP put agricultural development back on the agenda in a process that was sufficiently based in African ownership. As a result, other complementary efforts were made to strengthen the contribution of agricultural science, technology, and innovation in the region's agricultural development. A hallmark of these efforts is the 2006 Framework for African Agricultural Productivity (FAAP), which provides a roadmap to improving agricultural productivity by enabling and accelerating innovation. FAAP responds to CAADP Pillar IV, which provides a strategy for revitalizing, expanding, and reforming Africa's agricultural R&D capacity and shifting away from a technological package approach to a more integrated innovation system approach that actively engages public, private, and civil society stakeholders (FARA 2006). Importantly, FAAP encouraged bilateral and multilateral donors to take a more coordinated approach to funding agricultural development programs; responding to stakeholder priorities; and harmonizing activities at the country, program, and project levels.

Figure 2. Public expenditure on agriculture as a share of total budgetary expenditure, selected countries, 2007



Source: Fan, Omilola, and Lambert (2009); Fan (2011); the Regional Strategic Analysis and Knowledge Support System (RESAKSS) database of the International Food Policy Research Institute.

New and Renewed Donor Commitments

In reality, there is little evidence to suggest that the MDGs, CAADP, or FAAP were immediately able to catalyze new resources from foreign donors or governments for agricultural development and agricultural R&D. Arguably, it was the entry of the Bill and Melinda Gates Foundation in 2005 that provided a much needed catalyst in support of these initiatives.⁴ Between September 2003 and June 2011, the Foundation awarded 269 grants totaling US\$1.822 billion for agricultural development).⁵ Of

⁴ In fact, while the Bill and Melinda Gates Foundation's program on agricultural development did not begin until 2005, its first grant in the field of agriculture was given in September 2003 to support the activities of the HarvestPlus Challenge Program to reduce micronutrient deficiencies in developing countries by breeding higher levels of essential micronutrients into staple crops. The grant was given to the International Food Policy Research Institute (IFPRI) in the amount of US\$25 million over four years, but it was not identified as a grant for the African region in the Foundation's searchable grants database (BMGF 2011); the figures given above correct for this error.

⁵ The foundation's three largest grantees for agricultural development in Africa include AGRA, which has received \$329 million since 2006; Technoserve, which has received \$66 million since 2007; and the International Center for the Improvement of Maize and Wheat (CIMMYT), which has received \$65 million since 2007.

these, 152 grants totaling US\$1.142 billion were partly or entirely for agricultural development in Africa, and 80 grants totaling US\$642 million were partly or entirely directed to agricultural R&D in the region.⁶ In a few short years, the Foundation has invested over 40 percent of its sizable portfolio on African agricultural development and agricultural R&D⁷; its investments have changed the donor landscape dramatically.

An important investment by the Bill and Melinda Gates Foundation is the Alliance for a Green Revolution in Africa (AGRA), established in 2006 as an initiative owned and driven by African priorities. AGRA has received funding from the Foundation on the order of US\$4.2 million per year and, at present, is a large and influential funder throughout the region with strong connections to NEPAD, a leadership position among donors and development agencies working on agricultural R&D in the region, and a diversified range of investments in agricultural science, capacity building, and market development (Morton 2010).

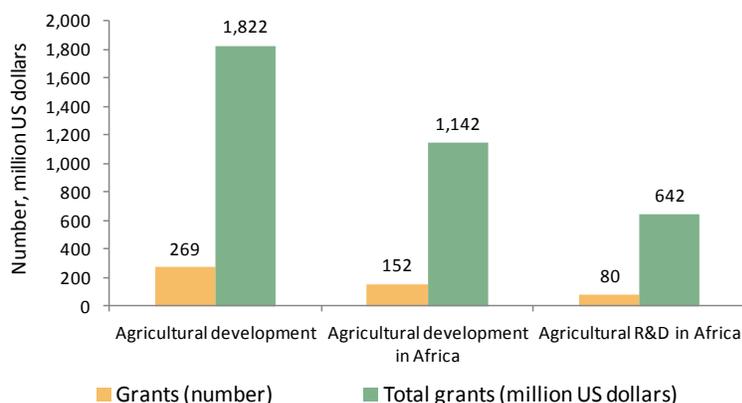
This is not to say that the Foundation changed the landscape through the sheer size of funding; it is still just one among many large donors to agricultural development. Its funding to agricultural development in 2009 was US\$273 million, 43 percent of the comparable investment by the U.S. Agency for International Development (USAID) that year, and about 11 percent of the \$2.6 billion committed to agriculture by multilateral and bilateral donors. Moreover, these figures may overestimate the relative contribution of the Foundation, as many of its grants are multiyear commitments that suggest lower levels of total funding when measured annually.

Nonetheless, the Bill and Melinda Gates Foundation's influence on the global agricultural development agenda has been more than proportional to its financial contribution during the past five years. It has brought high-profile tranches of new funding to the research agenda, invested in both the established field of cultivar improvement and the more novel field of biofortification. It has also helped convene several agricultural research initiatives that have been successful in leveraging funding from other donors willing to buy into the Foundation's strategic priorities. These investments, alongside other large-scale initiatives on livestock improvement, nutrition, data and statistics, and organizational reforms represent a significant injection of new life into the global agricultural research system. The Foundation's comparative advantage comes from its refreshingly creative perspectives, its willingness to take on a strong leadership role, its openness to partnership with other donors, and its ability to operate without the excess baggage of a large bureaucracy or conflicting constituent interests that hamper many multilateral and bilateral donors.

⁶ Since "agricultural R&D" is not a specific search term in the Foundation's searchable grants database (BMGF 2011), agricultural R&D grants were identified as grants given (1) to organizations that by name and mandate relate primarily to agricultural research, including, but not limited to, all international agricultural research centers and some universities, colleges, research institutes, and think tanks; (2) to "study," "evaluate," "test," "assess," "monitor," or "examine," a particular intervention or to "support" such actions; (3) to "develop" indicators, metrics, and measurement systems for monitoring, evaluating, or assessing a particular intervention; (4) to improve productivity through research, or (5) to otherwise "advance understanding" through research. Grants not included are those given primarily and explicitly (1) for communications, information sharing, project development, proposal preparation, or capacity strengthening or (2) for promotion, delivery, marketing, or dissemination of agricultural technologies.

⁷ Grants for activities in *both* Sub-Saharan Africa and Asia are not prorated or otherwise adjusted in these calculations.

Figure 3. Bill and Melinda Gates Foundation funding for agricultural development and agricultural research, 2003–11



Source: Authors, based on data from BMGF (2010).

Note: The projects covered in these calculations include (1) single- and multiyear project commitments, (2) projects that include, but are not limited to, regional coverage of Sub-Saharan Africa, and (3) funding for research on crop biofortification in 2003 that is classified as “global health” and not “global development” by BMGF (2010).

It is important to mention the renewed role of U.S. funding to agricultural development and agricultural research. The return of USAID to the agricultural development landscape in 2002–03 came with new priorities articulated in a series of position papers and programs, such as the 2002 Initiative to End Hunger in Africa and the 2004 Linking Producers to Markets strategy (IRG 2005). The traditional goal of increasing agricultural productivity was largely retained, but new pathways to reaching this goal were laid out. Domestic, regional, and international market and trade policy became key priorities alongside engagement with nonstate actors, such as community-based producer organizations. Science and technology remained a high priority, carrying over the commitment to agricultural research from previous eras.

The key difference between earlier USAID investments in agricultural research and those of the early 2000s came from recognition that fragmented project-driven interventions would not generate desired outcomes. Much more deliberate and strategic interventions at the public policy and institution-building levels were needed, coupled with continued investment in infrastructure, education, research, and other fields.

The Obama Administration’s Global Hunger and Food Security Initiative, launched in 2008, has attempted to heighten this support to agricultural development and agricultural research. In 2009, the Feed the Future (FTF) initiative committed \$3.5 billion to agricultural development and food security programs over three years, while also leveraging additional donor commitment to integrated programming around inclusive, agriculture-led growth and nutritional improvement bridging humanitarian relief, sustainable development strategic coordination, and accountability (FTF 2011).

This should not be taken to imply that the Bill and Melinda Gates Foundation and USAID are the only donors to agricultural development and R&D in Sub-Saharan Africa. Other donors have been active in this field for decades and have demonstrated a long-term commitment to supporting the region’s agricultural research systems. Key donors include the United Kingdom’s Department for International Development (DFID), the Canadian International Development Agency (CIDA), the International Development Research Center’s (IDRC), the Japan International Cooperation Agency (JICA), and Germany’s Federal Ministry for Economic Cooperation and Development, among many others.

For example, within its extensive portfolio of agricultural development projects, DFID funds the Research into Use program (approximately £38,000,000 from 2006 to 2012, covering both Sub-Saharan Africa and South Asia), the Africa Enterprise Challenge Fund’s Research into Business program

(£12,500,000 from 2009 to 2015), both of which are designed to support agricultural R&D and its application to solving specific production and marketing constraints.

DFID, along with the Italian government, the European Commission, and the World Bank, also supports the Sub-Saharan Africa Challenge Program, an initiative that began in 2004 to support R&D specifically focused on supporting smallholders across the region. Current funding levels for the program total approximately US\$5 million per year.

IDRC funds the Agriculture and Food Security program, which is designed to find good practices that link new agricultural technologies to existing farming systems in Sub-Saharan Africa and South Asia. Funding for the program was on the order of C\$25–30 million in 2010–11 (IDRC 2010). The International Finance Corporation (IFC), the private investment arm of the World Bank group, is also involved in agricultural development, although little in their lending portfolio directly suggests a focus on investing in R&D companies or programs. Still, in recognition of the potentially strong development impact of agribusiness, IFC sharply increased its activity in the sector with commitments of approximately \$100 million to the agribusiness sector in Sub-Saharan Africa in 2010–11 compared with an annual average in the previous decade of just \$18 million per annum (IFC 2010).

Several other donors have also entered the field of agricultural development and agricultural R&D in recent years. While many of these organizations explicitly target their funding to development projects, several have invested in R&D projects with direct or indirect benefits for Africa. Of note are several small charitable foundations associated with the crop-science industry, such as the Syngenta Foundation for Sustainable Agriculture, CropLife International, and the Barwale Foundation. While much of their funding is more frequently targeted to charitable activities and development projects, they have also contributed significantly to several high-profile agricultural R&D initiatives.

For example, Syngenta Foundation's involvement dates back to 1999 when it provided funding for the Insect Resistant Maize for Africa project, a venture that aimed to introduce pest resistance traits into maize varieties and hybrids commonly cultivated in East Africa. The foundation invested approximately US\$9.2 million over a 10-year period to support the project's principals, the Kenya Agricultural Research Institute (KARI) and the International Maize and Wheat Improvement Center (CIMMYT) (see Mugo et al. 2008). Barwale Foundation funds research investments in rice and sorghum focusing on breeding using marker assisted selection to enhance yield potential, biotic and abiotic stress tolerance, and hybridization potential (Barwale Foundation 2011).

Other charitable foundations that have supported agricultural R&D in Sub-Saharan Africa include the Gatsby Charitable Foundation, which finances Pearl Capital Partners (PCP) group,⁸ an investment initiative targeting small and medium-sized agribusinesses in Eastern Africa. PCP made several investments in seed companies that host their own breeding programs, including \$1 million in the Kenyan company Western Seed in 2008 and \$350,000 in the Uganda's Nalweyo Seed Company (NASECO) in 2006 (Fletcher 2011).

A less heralded trend in donor funding to agricultural R&D has been the growth of South–South official development assistance, notably from Brazil, China, and India to Sub-Saharan Africa. China's most significant engagement in Africa's development was set forth in 2000 by the Forum on China–Africa Cooperation (FOCAC), via the ambitious “Program for China–Africa Cooperation in Economic and Social Development” (AATF 2010; FOCAC 2009). Beyond its commitments to canceling debts, reducing trade barriers, and increasing development assistance for African countries, the program committed resources to training African agricultural scientists and establishing agricultural technology demonstration centers with the support of Chinese expertise. Between 2003 and 2008, more than 4,000

⁸ PCP is an African investment management group that manages the portfolio of African Agricultural Capital, an agricultural fund established with a US\$7 million investment from the Gatsby Charitable Foundation, the Rockefeller Foundation, and Volksvermogen NV; since 2005, the Gatsby Charitable Foundation has provided an additional US\$2 million to the fund (see Fletcher 2011 for further details).

African students traveled to China for short-term (three-week to three-month) courses related to agriculture (Brautigam 2009).

A significant part of China's commitment to African agricultural development is contained in a donation of US\$30 million to the Food and Agriculture Organization of the United Nations (FAO) in 2009. The aim of this donation was to expand China's contribution to FAO-led efforts to eradicate hunger and poverty by assisting developing countries to improve agriculture and food production under the umbrella of FAO's Special Program for Food Security (SPFS). China, along with other developing countries, uses SPFS as a vehicle to provide experts, technicians, and technical support to national and regional food security activities (FAO 2010). Technology transfers and spillover effects are an implicit outcome of the program design, with the potential to parallel other donor initiatives and programs, such as AGRA (see Brautigam 2009).

Brazil's engagement in Sub-Saharan Africa is also expanding. Its research linkages with the region were strengthened in 2006 with the opening of an international office for the Brazilian Agricultural Research Corporation (Embrapa) in Accra, Ghana. This office has pioneered a number of technology transfer partnerships across the region and has been followed by the Africa Brazil Agriculture Innovative Marketplace launched in 2010 during the Brazil–Africa Dialogue on Food Security, Fighting Hunger, and Rural Development. The marketplace aims to benefit smallholders by enabling Africa–Brazil research partnerships (Barka 2011).

Table 1. South–South cooperation agreements under the FAO Special Program for Food Security, 2010

Host country	Cooperating country	Agreement signed
Chad	Vietnam	2010
Gabon	China	2007
Sierra Leone	China	2006
Mali	Vietnam	2005
Togo	Tunisia	2005
Caribbean Islands	China	2004
Djibouti	Morocco	2005
Nigeria	China	2003
Central African Republic	Morocco	2002
Malawi	Myanmar	2002
Guinea Bissau	Cuba	2002
Congo, Republic of	Vietnam	2001
Lesotho	India	2001
Mozambique	India	2001
Swaziland	Pakistan	2000
Cameroon	Egypt	2000
Ghana	China	2000
Cape Verde	Cuba	2000
Equatorial Guinea	Cuba	2000
Mali	China	2000
Madagascar	Vietnam	1999
Gambia	Bangladesh	1999
Tanzania	Egypt	1999
Mauritania	China	1999
Benin	Vietnam	1998
Burkina Faso	Morocco	1998
Niger	Morocco	1998
Eritrea	India	1998
Ethiopia	China	1998
Senegal	Vietnam	1996

Source: FAO 2010.

Global Crisis and Donor Responses

The increase in political will generated by the MDGs and NEPAD, the leadership provided by the Bill and Melinda Gates Foundation, and the entry of new donors from the private sector and the South were not able to catalyze change quite like the global food price crisis of 2007–08. The rapid escalation in the price of the world’s essential food staples drove home the reality that the global community had not invested sufficient resources in ensuring continuous productivity growth in agriculture. In turn, this meant that greater resources had to be allocated to agricultural R&D (among other priorities) to kick start sustained and long-term productivity growth.

Thus, the G8 countries pledged US\$22.5 billion to agricultural development at their L’Aquila Summit in 2009. That year, the United States’ pledge was presented under its expansive FTF Initiative, committing at least \$3.5 billion over three years to agricultural development and food security programs (FTF 2011). The European Commission committed some \$3.8 billion, while other donors made similar commitments on separate, parallel, or integrated tracks. As a result of these catalytic events, donor commitments to agricultural R&D increased dramatically. What remains to be seen is whether these commitments will be matched by actual disbursements.

Following the global food price crisis, the private sector also jumped into the food security and agricultural R&D arena. Monsanto’s “Imagine” campaign, for instance, placed the crop science multinational at the head of tomorrow’s technology solutions for securing the world’s food supply. It has become an active player in regional and national discourses on agricultural R&D topics, such as seed market improvement, biotechnology, and biosafety in Sub-Saharan Africa.

Similarly, some level of South–South cooperation was directly influenced by the global food price crisis, notably several large acquisitions of land for the production and export of food to countries. These acquisitions were made in countries such as Ethiopia, Madagascar, and Mozambique by private companies from India, Saudi Arabia, and South Korea (von Braun and Meinzen-Dick 2009; Kachika 2010). The potential for beneficial technology spillovers from these land acquisitions—most of which are likely to depend on imported inputs, equipment, techniques, and farmers—are eclipsed by larger concerns about secretive and inequitable deal-making that favors local political and economic elites over vulnerable communities with existing claims over the lands in question.

Changing Priorities in Donor Funding to Agricultural R&D

Underlying these changing trends in funding for agricultural research are changing donor priorities and modalities involving funding to (1) the international agricultural research system, (2) regional and subregional organizations, and (3) the private sector.

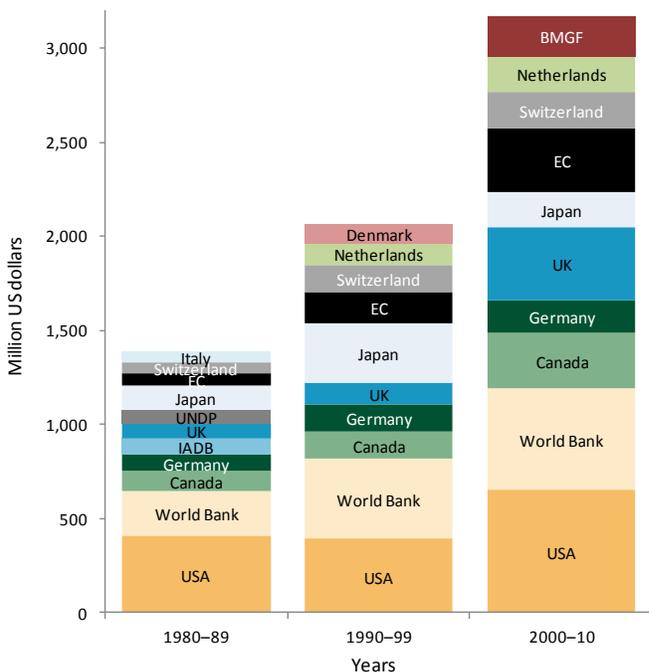
Funding to the International Agricultural Research System

A key change in the bilateral and multilateral donors’ approach to agricultural development relates to their increased commitment to coordinating their funding. Efforts to this end include, for example, the Global Agriculture and Food Security Program (GAFSP), a financial intermediary fund for which the World Bank serves as Trustee. With an available US\$521 million (of US\$925 million pledged by most of the world’s major donors), GAFSP seeks to support strategic investment plans for national and regional agriculture and food security through both public- and private-sector financing (GAFSP 2011). Agricultural extension, training, and research figure significantly in GAFSP’s investment portfolio, although exact figures on their allocations are not publicly available.

A related effort to this end is the donor community’s continued efforts to strengthen the Consultative Group on International Agricultural Research (CGIAR), which received donor funding on the order of US\$606 million in 2009. Donors have worked closely with the CGIAR in recent years to initiate wide-ranging reform. The aim of this work is to strengthen the CGIAR system’s capacity to provide a more systematic and coordinated approach to generating high-impact research for development. It is

hoped that the reforms will be an improvement over the previously piecemeal and project-driven approach to funding within the CGIAR.

Figure 4. Donor funding to the Consultative Group on International Agricultural Research, 1980–2010



Source: CGIAR (2011).

Note: BMGF indicates the Bill and Melinda Gates Foundation; EC, the European Commission; UNDP, the United Nations Development Programme; and IDB, the Inter-American Development Bank.

Funding to Regional and Subregional Research Organizations

Increasingly, donors are investing in regional and subregional agricultural R&D organizations and networks, for example, the Forum for Agricultural Research in Africa (FARA), the Association of Strengthening Agricultural Research in Eastern and Central Africa (ASARECA), and the West and Central African Council for Agricultural Research and Development (CORAF/WECARD). The original intent of developing and funding these entities was largely to capture knowledge spillovers from R&D between large and small countries in an integrated and coordinated manner. In effect, these organizations were seen as a more effective and efficient way of organizing and developing research networks across the continent (Mrema 1997). Interestingly, many of these organizations have evolved from fairly basic coordinating bodies into management units charged with overseeing complex regional R&D projects. Still, estimates from FARA (2006) suggest that just 1 percent of all funding for Africa’s agricultural productivity programs (including both public and private expenditures at local, national, subregional and global levels) are administered by these regional and subregional organizations.

In fact, none of these organizations conducts research per se—they neither own nor manage research facilities, laboratories, or other infrastructure. Rather, they coordinate research across multiple countries and manage the exchange of knowledge and information among scientists and other stakeholders. While their importance in capturing knowledge spillovers is well recognized, their growing importance begs the question of whether donors are merely leveraging them to reduce the time and effort needed to support research organizations across a large number of countries. If so, then there is

limited wisdom in strengthening regional coordination bodies without intensive efforts to first strengthen national research capabilities.⁹

The World Bank has taken an innovative spin on this regionalized approach to agricultural R&D. Two such investments, the East Africa Agricultural Productivity Program (EAAPP) and the West Africa Agricultural Productivity Program (WAAPP), aim to enhance capacity strengthening and technology transfers through knowledge sharing and regional specialization in agricultural research (World Bank 2007, 2009, and 2010). EAAPP involves four countries, Ethiopia, Kenya, Tanzania, and Uganda and an investment of US\$90 million over six years. The original phase involved three countries in West Africa, Ghana, Mali, and Senegal (US\$51 million), followed by a second phase focused in Burkina Faso, Côte d'Ivoire, and Nigeria (US\$119 million); a third phase was recently approved to include Benin, The Gambia, Liberia, Niger, Sierra Leone, and Togo (US\$84 million), all implemented in six year phases (World Bank 2011b).

The programs will establish commodity-specific regional “centers of excellence” charged with conducting R&D of immediate relevance not only to the host country, but also to the wider region. For some of these smaller countries, rather than centers of excellence, program activities will focus on capacity strengthening of national research agencies and technology generation, dissemination, and adoption. Implementation of the programs is being overseen by ASARECA and CORAF for their respective subregions. A Southern African productivity program is planned to follow the establishment of a similar agricultural R&D coordinating body for the Southern Africa Development Community (Nyirenda 2011).

These programs will likely have a significant impact on agricultural R&D in these countries; however, this new subregional approach has not changed the traditional bilateral financing mechanism by which the World Bank directs funding to country governments to be delivered to specific national agricultural research agencies. Certain agencies will benefit during the program implementation, but, as seen with past World Bank projects, others may struggle with the loss of funding when the program ends. And other areas of agricultural research may be left behind when certain commodities take precedence. Whether these programs are constructive engagements that leverage regional spillover effects, overcome small-country constraints, and sustainably improve capacity and resource deficits of national agricultural research agencies remains to be seen.

Funding to the Private Sector

Extensive discourse surrounds the role of the private sector in agricultural R&D. Much of it has to do with the issue of appropriability—whether profit-maximizing firms need to retain some form of market power over their innovations to recoup their investments in R&D, and whether that power must come at the expense of the small-scale, resource-poor farmer (see, for example, Pingali and Traxler 2002; Spielman 2007; and Pardey and Pingali 2010). This concern is manifested in the debate over hybrid seed development, biotechnology, agrichemicals, and other modern input. Partly as a result of this controversy, few donors provide direct funding to private firms to encourage their involvement in research topics—such as specific crops, traits, technologies, or practices—that are critical to developing-country needs.¹⁰

There are several exceptions to this firewall between donor funding and the private sector. For example, USAID has provided direct funding to Arcadia Biosciences and Ceres (both U.S. companies) and to Maharashtra Hybrid Seeds Company (an Indian company) to conduct research on abiotic stress tolerance in rice and wheat (USAID 2011). Similarly, USAID and many other donors have indirectly supported public–private partnerships in which private firms bring their own resources to donor-funded projects (Spielman, Hartwich, and von Grebmer 2010). Such projects cover topics ranging from

⁹The evolution and role of supranational R&D organizations in Africa is treated more completely by Roseboom (2011).

¹⁰Note that growth of private investment in developing-country agricultural R&D is treated by Pray, Gisselquist, and Nagarajan (2011).

biotechnology applications for cultivar improvement, to better postharvest storage and processing techniques.

The World Bank, with support from the Bill and Melinda Gates Foundation and CIDA, has started an “Agricultural Pull Mechanism” initiative designed to reward the private sector for participation in pro-poor agricultural R&D. Pull mechanisms are designed to encourage private firms to research, develop, and market products against ex post incentive payments (McAdams 2011). These mechanisms have shown promise in the pharmaceuticals field, for example, by providing firms with advance market commitments for the development and production of vaccines for neglected diseases affecting developing countries.

The Rockefeller Foundation and the Bill and Melinda Gates Foundation, among other donors, have also invested in specific mechanisms to manage some of the impediments to greater private investment in agricultural R&D. The African Agricultural Technology Foundation (AATF) is one such investment. AATF facilitates the exchange of proprietary technologies between the public and private sectors to support R&D efforts relating to crops that are vital to African smallholders.

Other modalities are also emerging, for example, donor funding of science parks, agribusiness parks, and competitive grant schemes that target the private sector. There are also suggestions of agglomeration effects in places such as Hyderabad, India, or Nairobi, Kenya, where concentrations of international, public, and private research facilities—combined with growing markets and decent infrastructure—are stimulating the growth of R&D.

While these activities are all tentative or exploratory, they offer donors a new and innovative avenue to fund agricultural R&D where public research is insufficient, or where private-sector approaches may be more efficient or better designed and managed.

3. DISCUSSION

The evolution of donor funding for agricultural R&D indicates several important trends. First, both donors and donor priorities have diversified over time. The small circle of donors who fund traditional areas of research, such as cultivar improvement for productivity growth, is now a much wider circle of donors who fund a wider range of research encompassing conserving natural resources, improving public policies, linking agriculture and nutrition, adapting to climate change, and strengthening the agribusiness sector. This is not new information in and of itself. However, it is important to consider whether diversification has been accompanied by greater coordination among donors to tackle these issues in an integrated manner. The evidence above suggests that some level of donor coordination is emerging, although further examination of ground realities—country-level programming—is needed.

Second, donor modalities have shifted over time. Funding for discrete research projects has been joined by funding for research on issues such as policy reforms and institution building. With more investment in these areas and less investment in small projects, some hope exists for improving developing-country capabilities to conduct R&D within a conducive and supportive environment. However, further analysis is needed on the distribution of donor funding between small projects and larger reform processes.

Third, donors are increasingly interested in funding an expansion of private-sector involvement in developing-country agricultural R&D. This involvement comes in several forms, including (1) direct funding to private firms for R&D activities, (2) involvement of private firms in collaborative research with the public sector, and (3) incentives that encourage greater spending by private firms on R&D activities that are outside of their core business. However, it is likely that donors will be unable to fully exploit this opportunity due to constituent and activist concerns over public funds being allocated to for-profit entities; controversial research topics, such as biotechnology; or controversial companies, such as multinational crop-science firms.

Fourth is the issue of country voice. To what extent are country priorities incorporated into donor funding priorities, strategies, and decisions? The Africa Union, NEPAD and CAADP, as well as the regional and subregional research organizations in Africa, provide an important platform for articulating country voices. But has the sense of urgency created by the global food price crisis led donors to commit resources and initiate programs that do not sufficiently capture the voices of food-insecure households and small-scale, resource-poor farmers? And are governments that are charged with representing these voices sufficiently cognizant of their own constituents' priorities?

Fifth is the issue of capacity. In order for agriculture research to create sustainable change, it needs to be complemented with investments that build stronger research organizations and systems. Funding to regional and global forums, dialogues, and processes are not a substitute for investments in building national scientific capacity, reforming organizational structures and cultures, and creating policy incentives that encourage science in the service of society and economy.

4. CONCLUSION

Evidence suggests that changing priorities and strategies among bilateral, multilateral, and philanthropic donors are channeling more resources into agricultural R&D. The trend is a welcome reversal of the downturns in funding for agricultural development experienced between the mid-1980s and late-1990s. With renewed funding, donors are taking a hard look at their priorities and the modalities through which they disburse funds. Several focal areas of investment, including a renewed emphasis on cultivar improvement for agricultural productivity growth, can be viewed as a positive change. Other focal areas, including nutrition–agriculture linkages, are also positive developments. However, challenges remain with respect to how these investments will yield returns. Growing donor reliance on regional and subregional organizations and networks may help countries capture knowledge spillovers from regional R&D, but the capacity limitations of these organizations and networks are not insignificant. Continued efforts to reform the CGIAR pose as many questions as they do answers. And investments targeting the private sector are still nominal with a limited sense of how and where to channel additional funds to firms working on pro-poor agricultural R&D.

Continued and coordinated efforts to address these issues are needed to strengthen agricultural R&D in Africa. And agricultural R&D in Africa is a necessary input to meeting the CAADP aims of increasing agricultural growth rates in Africa.

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The Agricultural Science and Technology Indicators (ASTI) initiative compiles, analyzes, and publishes data on levels and trends in agricultural R&D investments, capacities, and institutional arrangements in developing countries. ASTI is managed by the International Food Policy Research Institute (IFPRI) and involves collaborative alliances with many national and regional R&D agencies.

Jointly convened by ASTI/IFPRI and the Forum for Agricultural Research in Africa (FARA), the conference, "Agricultural R&D -- Investing in Africa's Future: Analyzing Trends, Challenges, and Opportunities," brought together experts and stakeholders from the region to contribute their expertise for the purpose of distilling new insights and creating synergies to expand the current knowledge base. The themes under focus were (1) Why African governments under invest in agricultural R&D; (2) How human resource capacity in agricultural R&D can be developed and sustained; (3) How institutional structures can be aligned and rationalized to support agricultural R&D; and (4) How the effectiveness of agricultural R&D systems can be measured and improved.

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