

UGANDA

RECENT DEVELOPMENTS IN AGRICULTURAL RESEARCH

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LONG-TERM INVESTMENT AND CAPACITY PATTERNS IN AGRICULTURAL R&D

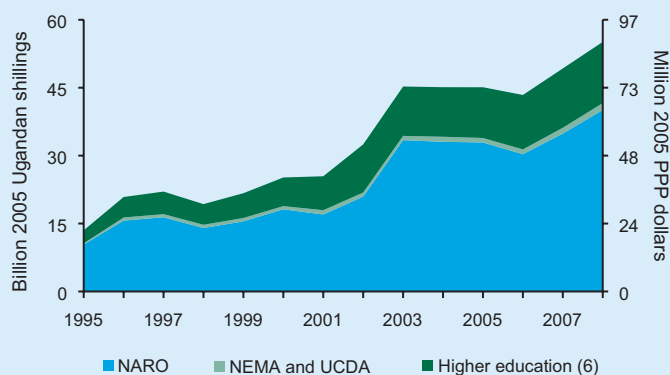
Spending on public agricultural research and development (R&D) in Uganda has grown substantially since 1995, the first year for which data were available (Figure 1).¹ In 2008, Uganda spent 54.5 billion Ugandan shillings or 88.0 million PPP dollars on agricultural R&D, both in 2005 constant prices (Table 1). Note that, unless otherwise stated, all dollar values in this note are expressed in purchasing power parity (PPP) prices.² PPPs reflect the purchasing power of currencies more effectively than do standard exchange rates because they compare the prices of a broader range of local—as opposed to internationally traded—goods and services. During the 1995–2008 period, public agricultural R&D spending quadrupled. Most of this growth was the result of long-term donor support, particularly in the form of two projects funded through World Bank loans. In more recent years, however, government contributions to the National Agricultural Research Organisation (NARO), the country’s main agricultural research agency, have increased significantly.

Overall, public agricultural research staffing levels stagnated from the mid-1980s until the early 1990s (Figure 2), following more than a decade of substantial growth (Beintema and Tizikara 2002). From 1999, agricultural researcher numbers in

Key Trends Since 2000

- Investments in public agricultural research and development (R&D) in Uganda quadrupled during 1995–2008, primarily as a result of increased donor and development bank funding, along with growth in government funding after 2005 to support increased staffing and salary levels at the country’s main agricultural research agency, the National Agricultural Research Organisation (NARO).
- After a period of decreasing agricultural research staffing levels in Uganda due to staff losses at NARO in response to low salaries from 1999 and a hiring freeze during 2002–05, human resource capacity began to rebound in the mid-2000s.
- Recent growth in agricultural research capacity at the country’s main higher education agency, Makerere University, has advanced the sector’s role in agricultural R&D in Uganda.
- The role of nonprofit organizations and private businesses—whether as a performer or a funder of agricultural research—is limited.

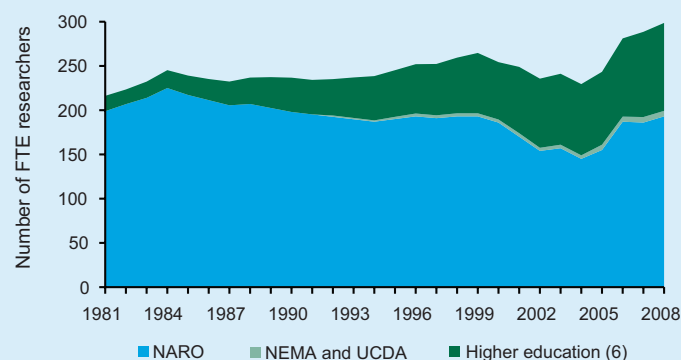
Figure 1—Public agricultural R&D spending adjusted for inflation, 1995–2008



Sources: Calculated by authors from ASTI–NARO 2009–10 and Beintema and Tizikara 2002.

Notes: Figures in parentheses indicate the number of agencies in each category. For more information on coverage and estimation procedures, see the Uganda country page on ASTI’s website at asti.cgiar.org/uganda.

Figure 2—Public agricultural research staff in full-time equivalents, 1981–2008



Sources: Calculated by authors from ASTI–NARO 2009–10 and Beintema and Tizikara 2002.

Notes: Figures in parentheses indicate the number of agencies in each category. 1981–91 data for NARO include the institute’s predecessors. Data also include expatriate research staff employed at NARO and its predecessors in the 1980s and 1990s.

Table 1—Overview of public and private agricultural R&D spending and research staff levels, 2008

Type of agency	Total spending			Total staffing	
	Ugandan shillings	PPP dollars	Shares	Number	Shares
	(million 2005 prices)		(%)	(FTEs)	(%)
Public					
NARO	40,073.0	64.7	72.6	193.0	63.0
NEMA	207.6	0.3	0.4	1.0	0.3
UCDA	736.3	1.2	1.3	5.3	1.7
Higher education (6)	13,514.8	21.8	24.5	99.4	32.5
Subtotal public (9)	54,531.7	88.0	98.8	298.7	97.6
Private (3)	670.9	1.1	1.2	7.5	2.4
Total (12)	55,202.6	89.1	100	306.2	100

Source: Compiled by authors from ASTI–NARO 2009–10.
 Note: Figures in parentheses indicate the number of agencies in each category.

the public sector began to fall as a result of severe losses at NARO, a situation that was further exacerbated by a recruitment freeze from 2002 until 2005 as part of a reform process. Full-time equivalent (FTE) research capacity in the public sector rebounded after the recruitment ban was lifted, reaching 299 in 2008.

In 2008, NARO accounted for 73 percent of Uganda’s public and private research spending and 63 percent of its FTE research staffing. NARO comprises 15 public agricultural research institutes (PARIs), which fall into two categories: National Agricultural Research Institutes (NARIs) and Zonal Agricultural Research and Development Institutes (ZARDIs). Five NARIs carry out strategic research of national importance related to crops, fisheries, forestry, livestock, and semi-arid agriculture, respectively. A sixth constitutes the National Agricultural Research Laboratories. The nine ZARDIs carry out adaptive or applied research related to the country’s agroecological zones. Seven of these previously operated as agricultural research and development centers (ARDCs) but were upgraded to institutes in the mid-2000s.

The contraction of NARO’s staffing levels during 1999–2005 stemmed initially from a high number of resignations based on significant erosion in real salary levels compared with those offered by other agencies, as well as lack of promotional and other opportunities. The 2002–05 reforms exacerbated the situation, partly by affecting morale but specifically by halting the recruitment of replacement staff. When the recruitment freeze was lifted in 2005, a functional analysis of NARO concluded that, to fulfill the reform mandate, including the upgrading and expansion of the country’s ZARDIs, the agency would need to increase its overall staffing levels from 850 to 995, including 299 researchers. As a result, hiring recommenced, and by 2008 the agency’s researcher numbers had returned to the levels recorded in 1999 (193 FTEs). This total had reached 202 FTEs as of July 2010. Given the rate of acceleration of staffing levels, recruitment for the additional 97 research positions is being undertaken in phases and is expected to be completed in 2014.

The pace of growth has meant that NARO’s pool of research staff is relatively young, with more than half of its postgraduate staff being 40 years old or younger as of 2007 (ASTI–AWARD 2008). This situation forms a stark contrast to many other African countries, where aging pools of research staff have become a major concern.

Agricultural R&D capacity in the higher education sector has increased significantly since the 1980s—from 12 FTEs in 1981, to 75 FTEs in 2001, and 99 FTEs in 2008—such that it now accounts for one-third of the country’s public agricultural research capacity. Uganda’s main university, Makerere University, which is largely responsible for this growth, operates four faculties that conduct agricultural research. In 2008, the Faculty of Agriculture (FA) employed 37 FTEs, the Faculty of Veterinary Medicine (FVM) employed 29 FTEs, the Faculty of Forestry and Nature Conservation (FFNC) employed 15 FTEs, and the Faculty of Science (FS) employed 7 FTEs involved in agricultural research. Makerere University also includes the Institute of Environment and Natural Resources (IENR), which employed 8 FTEs in 2008. The country’s other higher education agency involved in agricultural research, Nyabeyya Forestry College (NFC) conducts forestry research, and in 2008 employed 5 FTEs.

The role of other agencies in public agricultural research in Uganda is small. One other government agency was identified, the National Environmental Management Authority (NEMA), which employed only 1 FTE researcher in 2008.³ The only nonprofit agency identified as conducting agricultural research in Uganda is the Uganda Coffee Development Authority (UCDA). Although it has grown since the 1990s, UCDA employed just 5 FTE researchers in 2008 and accounted for about 1 percent of the country’s total public R&D spending. Most of Uganda’s coffee research is still done by NARO’s National Crops Resources Research Institute (NaCRRI). Producer organizations also exist for various other crops such as cotton, tea, oilseeds, flowers, and horticulture. These organizations, however, neither conduct nor fund research.

Most of Uganda’s private sector related to agriculture is profit oriented. These enterprises contract their research needs to NARO or other agencies or individuals. Three companies were

ASTI Website Interaction

- More details on institutional developments in agricultural research on Uganda are available in the 2003 country brief at asti.cgiar.org/pdf/Uganda_CB1.pdf.
- Underlying datasets can be downloaded using ASTI’s data tool at www.asti.cgiar.org/data.
- This brief presents aggregated data; additional graphs with more detailed data are available at asti.cgiar.org/uganda/datatrends.

www.asti.cgiar.org/uganda

identified as carrying out some agricultural research: Kinyara Sugar Works Ltd., Nalweyo Seed Company (NASECO) Ltd., and Community-based Vector Control Organization (COVECO). Combined, these organizations accounted for 8 FTE researchers in 2008.

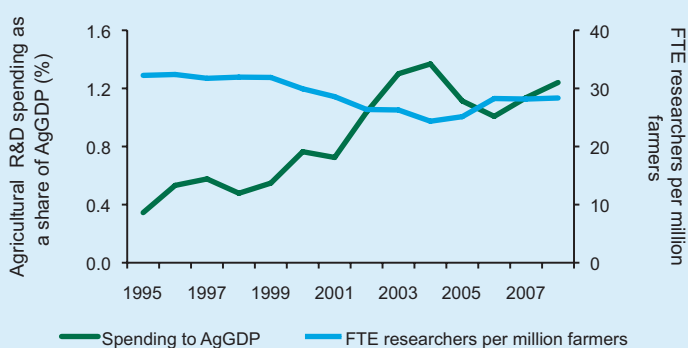
The percentage of female researchers changed little from 2000 to 2008 (ASTI–NARO 2009–10; Beintema and Tizikara 2002). In 2008, shares at NARO and in the higher education sector were 23 and 20 percent, respectively. Despite staff increases at NARO, support-staff numbers have decreased since 2001 (ASTI–NARO 2009–10). In 2008, the organization employed 465 technicians, administrative, and other support staff—30 fewer than in 2001. Of note, about half of the technicians held either MSc or BSc degrees (see the section on staff qualifications for more information). Given that support staff losses were even higher than researcher losses, the ratio of support staff to researchers fell from 2.9 in 2001 to 2.4 in 2008. Comparable ratios in the higher education sector were lower, averaging 1.8 support staff for every researcher—a common phenomenon across countries, given that research is a secondary activity at the higher education agencies.

Total public spending as a percentage of agricultural output (AgGDP) is a commonly used indicator of comparative agricultural R&D spending across countries. In 2008, Uganda invested \$1.40 in agricultural R&D for every \$100 in agricultural output (Figure 3). The intensity ratio fluctuated from year to year during the 1995–2008 period, following varied trends in agricultural R&D spending combined with relatively static AgGDP levels. Another intensity indicator—the number of agricultural FTE researchers per million farmers—decreased slightly despite recent increases in the country’s research capacity. In 2008, the country employed 28 FTE researchers for every 1 million farmers.

INSTITUTIONAL STRUCTURE AND POLICY ENVIRONMENT





The most significant change in the institutional structure of agricultural R&D in Uganda since 2000 is the transformation of NARO from an agency to a consortium. Prior to 2005, NARO was a semiautonomous entity, able to set its own administrative policies (Beintema and Tizikara 2002). The organization

Figure 3—Intensity of agricultural research spending and capacity, 1995–2008



Sources: Calculated by authors from ASTI–NARO 2009–10; Beintema and Tizikara 2002; World Bank 2009; and FAO 2009.

ASTI Website Interaction

-  A list of the 2 government agencies, 1 nonprofit, 6 higher education, and 3 private agencies included in this brief is available at asti.cgiar.org/uganda/agencies.
-  Detailed definitions of PPPs, FTEs, and other methodologies employed by ASTI are available at asti.cgiar.org/methodology.
-  The data in this brief are predominantly derived from surveys. Some data are from secondary sources or were estimated. More information on data coverage is available at asti.cgiar.org/uganda/datacoverage.
-  More relevant resources on agricultural R&D in Uganda are available at asti.cgiar.org/uganda.

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comprised a fragmented set of research institutes and centers with a central governance structure. In 2005, the new National Agricultural Research Policy significantly reformed NARO, transforming it from a predominantly public entity to a more pluralistic institution. NARO is now responsible for coordinating agricultural research service providers. It is expected to oversee and guide agricultural research and ensure the quality of research outputs. The higher education agencies, civil society organizations, and nongovernmental organizations are also considered part of NARO. These agencies are able to seek external funding and are free to opt out of NARO should they so choose. The expanded national agricultural research system (NARS) includes a broader cross-section of stakeholders and nonpublic agricultural research providers. In line with the principles of decentralization and of separating research funding from service provision, the reforms also sought to establish more client-responsive research services by decentralizing the research system. A significant achievement was the transformation of NARIs and ZARIs to become semiautonomous institutes responsible to their own multistakeholder management committees.

National Agricultural Advisory Services (NAADS) were established through the 2001 NAADS Act as a key pillar of the Plan for the Modernization of Agriculture to improve farmers’ access to knowledge and enhance agricultural productivity. NAADS was designed as an institutional response to the failure of the costly and ineffective traditional extension system. By emphasizing farmer empowerment, decentralization, and subsidiarity, NAADS sought fundamental reform in the delivery

of extension services in favor of a more demand-driven, farmer-owned, and farmer-accountable extension system. NAADS was conceived as a 25-year program of institutional development to be implemented in phases until it achieves full institutional and financial sustainability.

The growth of Makerere University can be partly attributed to the establishment of the University Directorate of Human Resources in 2005. The Directorate helped to hasten the process of appointing and promoting staff. It also monitors and evaluates staff development and follows up on and encourages completion of the university's staff development programs.

Collaboration between NARO and Makerere University has always been strong and has been strengthened recently through the newly established Competitive Grant Scheme (see the section on funding sources for more information). For example, in the scheme's recently concluded projects, 20 percent of the scientists that participated (49 of 242) were from Makerere University. In addition, a large number of MSc students from Makerere are being supervised by NARO staff, and their research has contributed substantially to NARO's overall research activities. Collaboration with regional and international agencies continues to be a significant aspect of research at NARO and Makerere University. Many collaborative projects are implemented jointly with centers of the Consultative Group on International Agricultural Research (CGIAR) and cover research on different commodities and thematic issues. These centers include the International Potato Center (CIP), International Center for Tropical Agriculture (CIAT), International Maize and Wheat Improvement Center (CIMMYT), WorldFish Center, and International Food Policy Research Institute (IFPRI).

RESEARCH STAFF QUALIFICATIONS AND TRAINING

Qualifications of agricultural research staff in Uganda have not changed significantly since 2001 (Figure 4). At NARO, a majority of the staff are trained to the postgraduate level. In

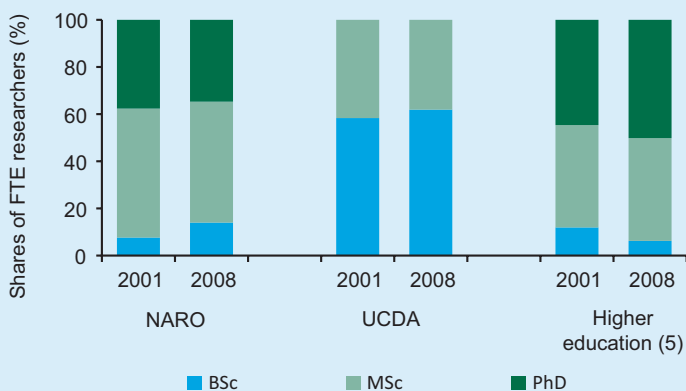
2008, researchers with PhD degrees accounted for 35 percent of NARO's research staff, while 51 percent of FTE researchers held MSc degrees. UCDA employed no researchers with PhDs. In 2008, 38 percent of UCDA staff were MSc-qualified, whereas 62 percent held BSc degrees. At NARO the number of female researchers with PhD degrees has remained unchanged since 2000. Universities generally have a higher share of PhD-qualified staff than do other agencies, and this is true in Uganda as well, where 50 percent of all FTE researchers in higher education sector in 2008 held PhDs.

Half of all the technicians employed by agricultural R&D agencies in Uganda held a university degree. Of the 193 technicians in 2008, 32 were MSc-qualified and 73 held BSc degrees (Figure 5). Most of these technicians were employed at NARO, and many of them obtained their degrees on their own. Although the number of research positions increased in recent years, opportunities for technicians to be promoted to the researcher level remain limited as they must comply with the specific competencies listed in the vacancies. Furthermore, scientist vacancies are currently filled by individuals who hold, at minimum, an MSc degree.

In contrast to a number of other countries where the pool of researchers is approaching retirement age, NARO does not have serious difficulties filling scientist positions given the high quantity and quality of Makerere University graduates. The organization is experiencing some capacity constraints, however. For example, most scientists prefer to work in or close to Kampala, which has made it difficult to recruit scientists for the institutes located far from the capital. Furthermore, NARO has experienced a relatively high turnover of more experienced and better performing scientists to international and regional agencies or to countries like Rwanda that are able to offer better financial incentives.

Phase I of the Agricultural Research and Training Project (ARTP) provided funding for postgraduate training of NARO staff at Makerere University, which resulted in a significant increase in PhD-qualified staff (Beintema and Tizikara 2002). ARTP's second phase focused on short-term training, although it did provide

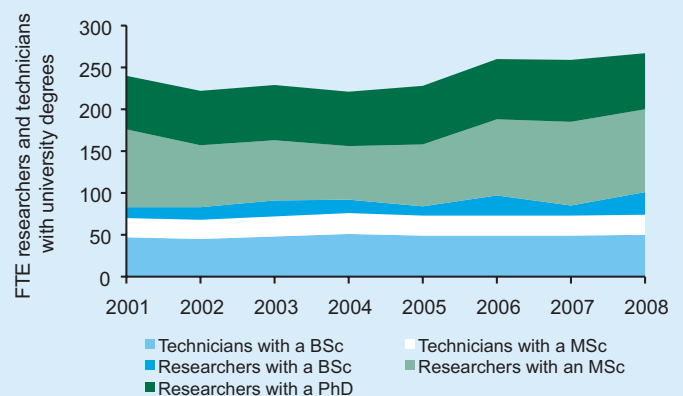
Figure 4—Qualifications of researchers by institutional category, 2001 and 2008



Source: Calculated by authors from ASTI–NARO 2009–10.

Notes: Figures in parentheses indicate the number of agencies in each category. 2008 data are for researchers only and therefore exclude 32 and 73 FTE technicians holding MSc and BSc degrees, respectively. Figure excludes NEMA and NFC due to lack of data.

Figure 5—Full-time equivalent researcher and technician trends at NARO, 2001–08



Source: Calculated by authors from ASTI–NARO 2009–10.

funding for researchers who had begun PhD- and MSc-level training during ARTP I to continue their training to completion.

In 2000, the Swedish International Development Cooperation Agency (Sida) initiated a large multidisciplinary program at Makerere University that provided PhD training. Furthermore, most projects funded by external donors at NARO and Makerere include PhD and MSc training programs. A number of other new initiatives are providing scholarships, such as the Millennium Science Initiative of the National Council for Higher Education, the Alliance for a Green Revolution (AGRA), and the Regional Universities Forum for Capacity Building in Agriculture (RUFORUM). Additional funding for scholarships is provided by a number of bilateral and international organizations, including the European Union, CGIAR centers, and the governments of Germany and Norway. Furthermore, numerous self-supported PhD and MSc students are enrolled at Makerere University. As a result of these new initiatives, student numbers at Makerere University have at least tripled in the past few years. This has created time constraints for faculty members, which have been addressed through a number of initiatives (such as scholarships funded through RUFORUM) that include financial incentives for supervision. Although the majority of students remain Ugandan, an increasing number of enrollments at Makerere University are from countries recovering from conflict, such as Burundi, DR Congo, Liberia, Rwanda, and southern Sudan.

INVESTMENT TRENDS

Expenditures

The allocation of research budgets across salaries, operating costs, and capital investments affects the efficiency of agricultural R&D, so detailed cost category data were collected from the government agencies as part of this study. Salaries accounted for 33 percent of total expenditures at NARO in 2008, compared with 56 for operating costs and 11 percent for capital investments (Figure 6). These shares mark a significant shift from 2001, when capital investments accounted for 67 percent

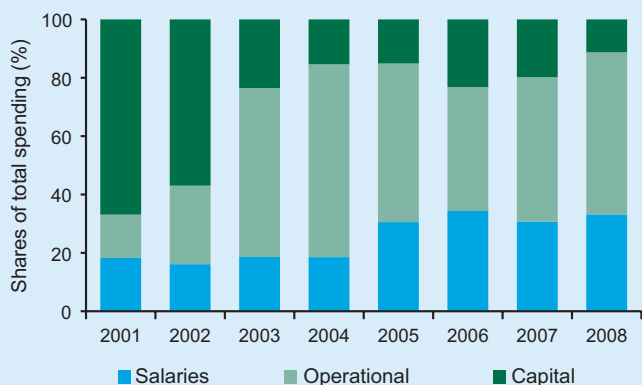
of expenditures due to substantial investments in NARO's infrastructure as part of ARTP I.

One of NARO's most serious problems since its establishment had been the ongoing erosion of staff salaries, with the result that the remuneration of NARO scientists was far below the levels of colleagues at similar agencies (Beintema and Tizikara 2002). This made it extremely difficult for NARO to compete for qualified staff, with the result that a large number of scientists resigned and morale was significantly weakened. To redress this trend, the government approved a 100-percent salary increase, effective in July 2005, which was partially funded by ARTP II. Since that time, salary levels have continued to increase at a rate of about 10 percent per year. The combination of these salary increases with the aforementioned growth in researcher numbers after 2005 resulted in a quadrupling of salary costs in real terms (adjusted for inflation) from 2001 to 2008. The share of salaries in NARO's total spending also increased, from less than 20 percent per year during 2000–04 to about one-third of the annual budget during 2005–08. Total expenditure on salaries is expected to increase further as a result of the recently released government budget for 2010–11, which includes a 30 percent increase in scientists' salaries.

Funding Sources

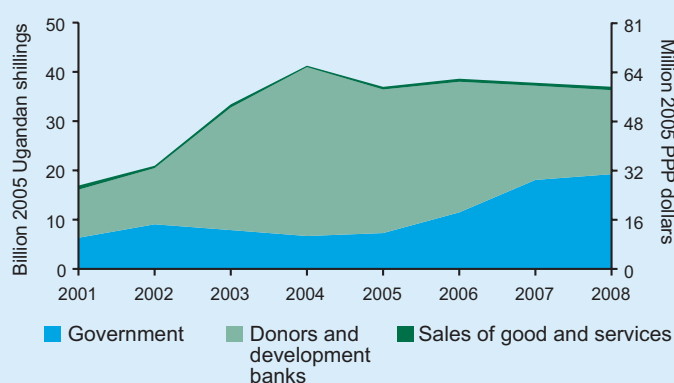
The primary funding sources for agricultural R&D in Uganda are the national government, a large number of multilateral and bilateral donors, and development bank loans. A small amount of funding is derived from the proceeds of the sale of goods and services or from commodity levies. The main source of funding for NARO shifted from primarily donors before 2007 to the government in 2008 (Figure 7). To support its restructuring, the increases in staff salaries, and the establishment of the ZARDIs, NARO received very high levels of donor support during 2003–06. On average, these contributions—including the World Bank loan to support ARTP II—accounted for 76 percent of total funding during this four-year period. Since mid-2005, when the

Figure 6—Cost category shares of NARO, 2001–08



Source: Calculated by authors from ASTI–NARO 2009–10.

Figure 7—Funding sources of NARO, 2001–08



Source: Calculated by authors from ASTI–NARO 2009–10.

new NARS policy was adopted, the government also increased its contributions to NARO, which accorded with its agreement with the World Bank at the end of ARTP II. It should be noted, however, that most of the increased funding was allocated to salary increases, and did not actually represent growth in research capacity or outputs.

In 2008, donors provided 46 percent of NARO's total funding, and the national government provided 52 percent. Some of the government funding, however, included funding derived from donors and loan-financed programs such as ARTP. For example, certain donors used to fund specific projects but now disburse funding to the Ministry of Finance, which is responsible for determining allocation priorities.

NARO generates additional income in the form of nontax revenues through leasing excess land, hiring premises for events, renting premises to tenants, conducting research for private companies, and selling or licensing technologies it has generated.

The World Bank has been the main source of funding for agricultural research in Uganda. The Bank provided the loan for ARTP I, which ran from 1992 until 2000 at a cost of US\$25 million and funded NARO's institutional development, research programs, and rehabilitation of its research institutes, along with postgraduate training of Makerere University faculty staff.

The second phase of ARTP, which ran from 2000 until 2009, provided US\$26 million and continued to support demand-driven, client-oriented technology development and dissemination, and promoted the active participation of stakeholders, especially farmers and the private agribusiness sector, in research planning and implementation. The first few years of ARTP II concentrated on moving "on-the-shelf" technologies at research institutes into farmers' fields, as well as identifying and disseminating existing indigenous knowledge. The project provided some support for institutional development and reforms to transform NARO and strengthen the focus on the transfer and adoption of superior technologies. This included the decentralization of research to the country's nine agroecological zones through the establishment of the ARDCs (World Bank 1999), which have since been upgraded to ZARDIs.

In 2010, Uganda became the fourth country to receive funds from the World Bank through the Eastern African Agricultural Productivity Program (EAAPP). The program will provide US\$30 million to the Ugandan government and will focus on cassava research in particular. Also, World Bank support will continue with the Agricultural Technology and Agribusiness Advisory Services (ATAAS) project, which began in June 2010 (World Bank 2010) and will provide a total of US\$678 million, comprising US\$519 million in cofinancing from the government, US\$120 million from the World Bank, US\$7 million from the Global Environment Facility (GEF), plus US\$32 million from the International Fund for Agricultural Development (IFAD), the Danish International Development Agency (Danida), and the European Union. The project encompasses four main components: strengthening the national agricultural research system, enhancing partnerships between agricultural research and advisory services, strengthening the national agricultural advisory services, and supporting agribusiness services and market linkages.

Other major donors to agricultural R&D in Uganda include the Rockefeller Foundation, the United States Agency for International Development (USAID), the Bill and Melinda Gates Foundation, Sida, the Gatsby Charitable Trust, the International

Development Research Centre (IDRC), the Lake Victoria Environmental Management Programme (LVEMP), the Food and Agriculture Organization of the United Nations (FAO), CIP, the United Kingdom Department for International Development (DFID), the Norwegian Agency for Development Cooperation (NORAD), the Association for Strengthening Agricultural Research in Eastern and Central Africa (ASARECA), and the United Nations Development Program Global Environment Facility (UNDP-GEF).

In order to complement core research, NARO established the aforementioned Competitive Grant Scheme (CGS) to address agricultural research priorities at nationally and at the zonal level (NARO 2009). The scheme has two components, the National Competitive Agricultural Research and Development Fund (NCARDF) and the Zonal Competitive Agricultural Research and Development Fund (ZCARDF). NARO's Council (NAROC), the governing body for agricultural research in Uganda, will oversee NCARDF and provide guidance for ZCARDF. CGS is expected to strengthen the NARS and increase efficiency to help NARO harness the country's existing research capacity, promote research partnerships and collaboration, improve access to funding by other service providers, and hasten the adoption of improved agricultural technologies. The maximum grants available under NCARDF and ZCARDF will be US\$250,000 and US\$50,000, respectively. Funding for the grants will be derived from public institutions, the private sector, and donors. Funding from the private sector will be matched by NAROC to encourage public-private research partnerships.

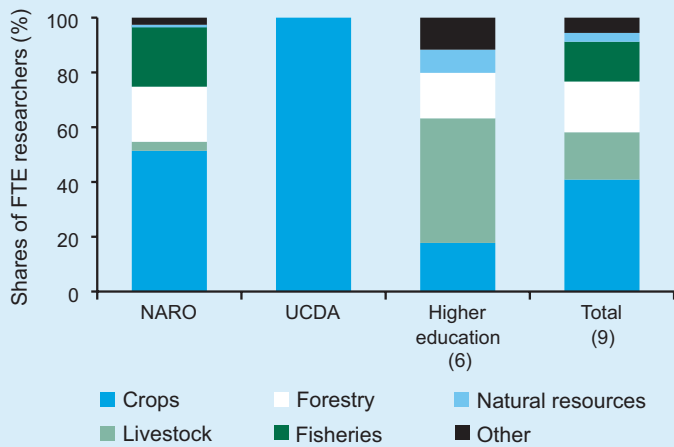
Although faculty salaries are funded by the government, research activities undertaken by the higher education sector remain donor driven (in terms of operating and capital costs). Generally, individual researchers secure their own funding through applications to donors, such as the Rockefeller Foundation, the Carnegie Corporation, and the Bill and Melinda Gates Foundation. The Inter-University Council for East Africa, which requires participation from different countries, funds some projects. As previously mentioned, AGRA is a new donor to the university and, in addition to training and capacity building, is funding research on soybean breeding and traditional crops.

In an increasing number of countries, agricultural production or export taxes are providing an additional source of funding for agricultural research (Echeverría and Beintema 2009). Although Uganda has a number of export crops, only limited revenues are derived from commodity taxes. In fact, producer organizations have been reluctant to commit funds to research. Commodity taxes are currently being collected on coffee, tea, cotton, oilseeds, horticultural, livestock, and fisheries exports, but almost all of these revenues are being used for nonresearch purposes, such as marketing, extension, and administration. The only exception is UCDA, for which research activities are funded through revenues from the coffee levy. As previously mentioned, however, most of the coffee research is undertaken by NARO and funded by the government.

ALLOCATION OF PUBLIC RESEARCH ACROSS COMMODITIES

Given that the allocation of resources across various lines of research is a significant policy decision, detailed information was collected on the number of researchers working in specific commodity and thematic areas (in FTEs).

Figure 8—Research focus by major commodity area, 2008



Source: Calculated by authors from ASTI–NARO 2009–10.

Notes: Figures in parentheses indicate the number of agencies in each category. Total of 9 agencies includes 1 FTE researcher at NEMA focused on natural resources.

In 2008, 41 percent of the 299 FTE agricultural researchers in Uganda focused on crop research (Figure 8). Forestry was the next most significant area of research, accounting for 19 percent of researchers, followed by livestock (17 percent), fisheries (15 percent), and natural resources (3 percent). Areas of focus for the remaining researchers include socioeconomics and agricultural engineering.

Commodity Focus

The predominant crop commodity under research in Uganda is coffee, representing a 15 percent share of all crop and livestock research (Table 2). Bananas and plantains (14 percent) are also main commodities under research, with other significant crops including cassava, oil palm, other fruits, cocoa, groundnuts and tea, each representing shares of between 3 and 5 percent of all crop and livestock research. In terms of livestock, the dominant items under research are swine, dairy, and poultry, representing shares of 6 percent each of total commodity research.

CONCLUSION

Public agricultural R&D investment in Uganda grew substantially during 2000–08. Initially, growth stemmed from increased donor funding, mainly through the World Bank loan-funded project ARTP II; more recently, government support increased significantly, but it largely served to redress serious contractions both in staffing and salary levels occurring from 1999 to 2005. Reductions in researcher numbers during 1995–2005 mostly resulted from staff departures at the country’s main agricultural research agency NARO, in association with a reform process that resulted in low salaries, lack of promotional and other opportunities, low morale, and ultimately a hiring freeze

Table 2—Crop and livestock research focus by major item, 2008

	NARO	UCDA	Higher education (3)	Total (5)
Crop items				
Shares of FTE researchers (%)				
Coffee	17.4	100	3.7	14.9
Bananas and Plantains	20.3	—	4.2	13.9
Cassava	7.7	—	—	4.7
Oil Palm	7.3	—	—	4.4
Other Fruits	5.5	—	—	3.3
Cocoa	5.1	—	—	3.1
Groundnuts	2.4	—	4.4	3.0
Tea	4.8	—	—	2.9
Other crops	23.6	—	15.7	20.0
Livestock items				
Swine	2.2	—	13.9	6.4
Dairy	1.5	—	15.0	6.3
Poultry	1.1	—	14.2	5.8
Other livestock	1.3	—	28.9	11.2
Total crop and livestock	100	100	100	100

Source: Calculated by authors from ASTI–NARO 2009–10.

Notes: Figures in parentheses indicate the number of agencies in each category. NEMA and three higher education agencies did not conduct crops or livestock research.

between 2002 and 2005. After the recruitment restrictions were lifted in 2005 and a 100-percent salary increase was instated, total agricultural researcher numbers at NARO increased considerably. Total research capacity at Uganda’s main higher education agency, Makerere University, also grew in recent years, strengthening the role of this sector in the performance of agricultural R&D. Despite these positive advancements, the Ugandan government still faces a number of challenges. Agricultural R&D remains highly dependent on donor funding, the role the nonprofit and private for-profit sector in agricultural R&D remains small, and income from the commercialization of research outputs is highly limited.

NOTES

- ¹ Spending data were only available from 1995 onward, whereas research capacity data were available from 1971 (see also Uganda: Data In Focus, Part A available on ASTI’s website at asti.cgiar.org/uganda/datatrends).
- ² Financial data are also available in current local currencies or constant 2005 US dollars in the ASTI data tool, (www.asti.cgiar.org/data).
- ³ A number of other government agencies were consulted but are not involved in research activities. The National Forestry Authority, for example, focuses on land cover mapping, and the Biomass Project of the Forest Department conducts GIS surveys and inventories.

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