

RWANDA

RECENT DEVELOPMENTS IN AGRICULTURAL RESEARCH

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INVESTMENT AND CAPACITY TRENDS IN AGRICULTURAL R&D

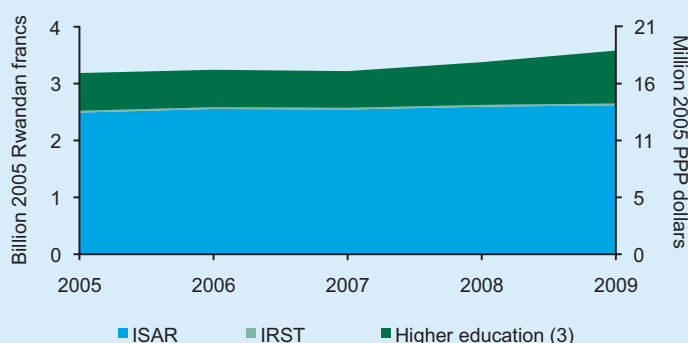
The war and accompanying Tutsi genocide of the early 1990s devastated Rwanda's agricultural research agencies, and they continue to face challenges related to the resulting loss of human resource capacity and physical infrastructure. Nevertheless, since then the country has made progress in rebuilding its agricultural research and development (R&D) system. As of 2009, investment in agricultural R&D totaled 3.6 billion Rwandan francs or 19.2 million PPP dollars, both in 2005 constant prices, which represents a slight increase over 2005 levels, largely due to modest growth in the higher education sector after 2007 (Figure 1; Table 1). Unless otherwise stated, all dollar values in this note are expressed in purchasing power parity (PPP) prices.¹ 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. As with investment, total agricultural research capacity increased slightly, from 100 full-time equivalent (FTE) researchers in 2005 to 116 in 2009 (Figure 2).

The country's main agricultural R&D agency, the Rwanda Agricultural Research Institute (ISAR), focuses on crops, livestock, forestry, agroforestry, land conservation, and water management.

Key Trends Since 2005

- Investment and human resource capacity in agricultural research and development (R&D) grew slightly between 2005 and 2009.
- Agricultural researchers are relatively younger and have lower shares of postgraduate degrees compared with other countries in the region.
- The country's main agricultural R&D agency, the Rwanda Agricultural Research Institute (ISAR), accounts for close to three-quarters of national agricultural research investments and human resource capacity.
- Agricultural R&D is highly dependent on donor and development bank funding.
- Nonprofit and for-profit private companies, although involved in some collaboration with ISAR and the higher education agencies, have minimal involvement in agricultural R&D.

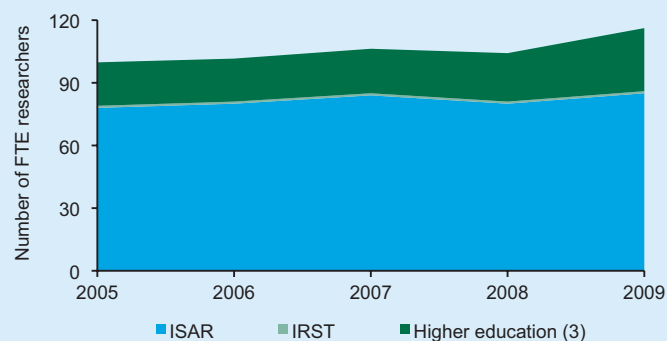
Figure 1—Agricultural R&D spending adjusted for inflation, 2005–09



Source: Calculated by authors from ASTI-ISAR 2010.

Note: Figures in parentheses indicate the number of agencies in each category.

Figure 2—Agricultural research staff in full-time equivalents, 2005–09



Source: Calculated by authors from ASTI-ISAR 2010.

Notes: Figures in parentheses indicate the number of agencies in each category. Data exclude degree-qualified technicians employed at ISAR and the higher education agencies who do not have official researcher status.

Table 1—Overview of agricultural R&D spending and research staff levels, 2009

Type of agency	Total spending			Total staffing	
	Rwandan francs	PPP dollars	Shares	Number	Shares
	(million 2005 prices)		(%)	(FTEs)	(%)
ISAR	2,619.0	14.1	73	85.0	73
IRST	30.8	0.2	1	1.0	1
Higher education (3)	930.5	5.0	26	30.2	26
Total (5)	3,580.3	19.2	100	116.2	100

Source: Compiled by authors from ASTI– ISAR 2010.

Notes: Figures in parentheses indicate the number of agencies in each category. Data exclude degree-qualified technicians employed at ISAR and the higher education agencies who do not have official researcher status.


Established in 1962, the Kigali-based Institute reports to the Ministry of Agriculture and Animal Resources (MINAGRI). It encompasses 5 centers, one each focusing on the high- and mid-altitude regions, a third focusing on semi-arid regions, and the remaining two focusing on livestock and land and forests. In addition, 15 research stations are located across the country. The Institute accounts for close to three-quarters of national agricultural research investments and human resource capacity. The number of researchers employed at ISAR increased from 78 FTEs in 2005 to 85 FTEs in 2009, double the average recorded in the 1980s (Roseboom and Pardey 1993). Expenditures at ISAR remained relatively stable during the 2005–09 period, averaging 2.6 billion Rwandan francs or 13.7 million PPP dollars (both in 2005 constant prices).

The only other government agency that conducts agricultural R&D in Rwanda—the Institute for Science and Technology Research (IRST)—is much smaller by comparison, accounting for less than 1 percent of the country’s total agricultural research capacity. IRST, which is administered by the Ministry of Education, Science, and Technology, conducts research in the fields of energy, the environment, health, and socioeconomics. In 2009, 1 FTE researcher was also working in the area of postharvest technologies.

The higher education sector accounted for 26 percent of national agricultural research capacity in 2009. Established in 1963, the National University of Rwanda (NUR) is Rwanda’s oldest university. Its Faculty of Agriculture commenced operations in 1978, having originally been established as a department of the Faculty of Science in 1974. In 2009, the faculty employed 7 FTE agricultural researchers. The Higher Institute of Agriculture and Animal Husbandry (ISAE) was founded in 1989; as of 2009 it employed 20 agricultural FTEs, making it the country’s largest higher education agency involved in agricultural R&D. Student enrollments tripled between 2005 and 2009 to reach about 2,400 students. The Kigali Institute of Science and Technology (KIST) was established in 1997 and employed 3 FTEs in its Department of Food Science and Technology by 2009. With the establishment of these newer agencies and the growth of the Faculty of Agriculture at NUR, the higher education sector is playing an increasing role in agricultural research.

Nonprofit and for-profit private companies, although engaged in some collaboration with ISAR and the higher education agencies, were found to have minimal involvement in

ASTI Website Interaction

 Underlying datasets can be downloaded using ASTI’s data tool at www.asti.cgiar.org/data.

 A list of the 2 government and 3 higher education agencies included in this brief is available at asti.cgiar.org/rwanda/agencies.

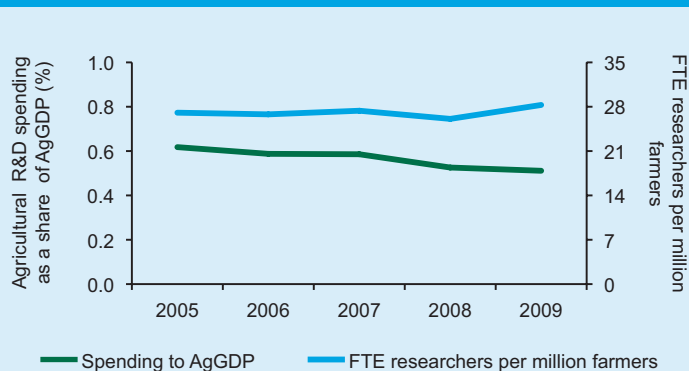
www.asti.cgiar.org/rwanda

agricultural R&D in Rwanda. As a result, analyses in this country note exclude these sectors.

As in many countries, women continue to be underrepresented in Rwandan agricultural R&D. In 2009, female researchers constituted 15 percent of the country’s total research staff (ASTI–ISAR 2010), which is lower than the shares in neighboring Uganda and Tanzania, but identical to the share recorded in Burundi (Beintema and Stads 2011). Rwanda’s average support-staff-per-researcher ratio is also low compared with many other African countries, although it increased slightly, from 1.5 to 1.9, between 2005 and 2009, comprising 0.9 technicians, 0.8 administrative staff, and 0.2 other support staff (ASTI–ISAR 2010). IRST had the highest 2009 ratio, at 4.0, whereas ISAR and the higher education agencies reported ratios of 2.2 and 1.0, respectively (it should be noted, however, that lower support-staff ratios are common in the higher education sector given that research is not the primary mandate).


A common, cross-country indicator of agricultural research investment is the research intensity ratio, in this case measured as total spending on agricultural R&D as a percentage of agricultural output (AgGDP). In 2009, for every \$100 of agricultural output in Rwanda, \$0.51 was invested in agricultural R&D. (Figure 3). This represents a decline from the 2005 ratio of \$0.62 and indicates that expenditure levels failed to keep pace with an increase in the


Figure 3—Intensity of agricultural research spending and capacity, 2005–09




Sources: Calculated by authors from ASTI–ISAR 2010, World Bank 2010, and FAO 2009.

ASTI Website Interaction

 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 were estimated. More information on data coverage is available at asti.cgiar.org/rwanda/datacoverage.

 More relevant resources on agricultural R&D in Rwanda are available at asti.cgiar.org/rwanda.

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country's AgGDP. By comparison, neighboring country ratios include \$0.50 for Tanzania, \$1.24 for Uganda, and \$1.43 for Kenya (Beintema and Stads 2011). An alternative measure of research intensity—the number of FTE agricultural researchers per million farmers—remained fairly constant between 2005 and 2009, averaging 27 FTEs.

INSTITUTIONAL STRUCTURE AND POLICY ENVIRONMENT

In 2009, the Directorate of Science, Technology, and Research was reinstated within the Ministry of Education, having been transferred to the Minister of Science and Technology's Office of the President in 2006. The Rwanda National Science, Technology, and Innovation Policy, drafted in 2005, stipulates the establishment of a national council or commission for science, technology, and innovation (NCSTI). The policy also proposes the creation of a science and technology commission for each sector, but the legislation needed to do so has yet to be enacted (UNU-IAS and MINISTR 2006). Agricultural science and technology (S&T) priorities are currently based on the 2004 National Agricultural Policy and Phase II of the Strategic Plan for the Transformation of Agriculture (PSTA II) developed by MINAGRI. The policy's objective is to convert subsistence farming to modernized agriculture, while contributing to economic growth, poverty reduction, food security, and natural resource preservation (RoR-MINAGRI 2009).

Institutions under MINAGRI have undergone recent restructuring. As part of a larger decentralization process, extension was devolved to local administrations in 2004–05. A government decision in January 2009 brought research and extension agencies together under the authority of a new Rwanda Agricultural Board (RAB). RAB oversees ISAR, the Rwanda Agricultural Development Authority (RADA), and the Rwanda Animal Resources Development Authority (RARDA). The restructuring may help to address some of the problems of management, fragmentation, and coordination between research agencies, as well as weak linkages with extension agencies and farmers, as identified in a recent assessment of agricultural

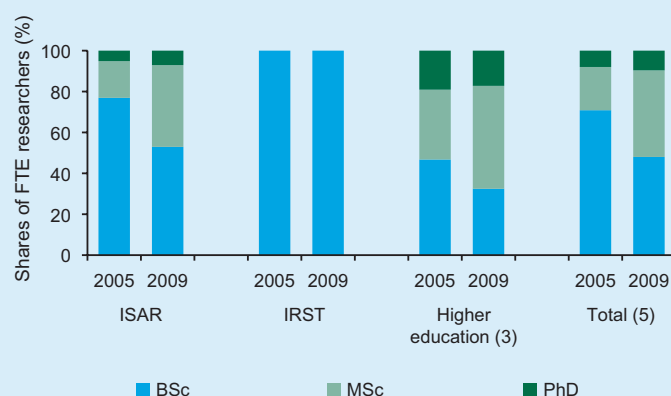
research and technology transfer (Tizikara, Wilcock, and Habyarimana 2007).

Collaboration among national agencies and with regional and international agencies continues to be a significant aspect of agricultural R&D in Rwanda. ISAR collaborates on joint projects with the universities. 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), the International Center for Tropical Agriculture (CIAT), Bioversity International, the International Maize and Wheat Improvement Center (CIMMYT), and the International Institute of Tropical Agriculture (IITA). At a regional level, Rwanda participates in the Regional Universities Forum for Capacity Building in Agriculture (RUFORUM), the Association for Strengthening Agricultural Research in Eastern and Central Africa (ASARECA), and the Forum for Agricultural Research in Africa (FARA).

RESEARCH STAFF QUALIFICATIONS AND TRAINING

BSc-qualified staff accounted for about half of Rwanda's total agricultural research capacity in 2009, whereas researchers with MSc degrees constituted 42 percent, and those with PhD degrees represented 10 percent (Figure 4). Average qualification levels of research staff improved significantly between 2005 and 2009, and the number of MSc-qualified staff actually doubled. Compared with neighboring countries, however, the share of junior level (BSc-qualified) staff is still rather high, indicating the need for further training and capacity building. Overall, Rwanda's agricultural research staff is also relatively young compared with other countries in the region. In 2009, for example, half of all agricultural researchers were under 40, 36 percent were between 41 and 50, only 13 percent were over 51, and none were over 60 (ASTI-ISAR 2010). With the exception of 5 researchers, all staff at ISAR graduated after the Rwandan genocide and war; inexperience and lack of institutional memory pose serious constraints. The prevalence of younger researchers, however,

Figure 4—Qualifications of researchers by institutional category, 2005 and 2009



Source: Calculated by authors from ASTI-ISAR 2010.

Notes: Figures in parentheses indicate the number of agencies in each category. Data exclude 0.2 FTE technicians qualified to the MSc level and 7 qualified to the BSc level (given that they are not officially classified as researchers).

means that Rwanda will not begin losing its more senior staff to retirement for some years to come (the official retirement age is 65 years).

Universities worldwide generally employ higher shares of agricultural researchers with PhD and MSc degrees, and this holds true in Rwanda. In 2009, the share of PhD-qualified researchers in the higher education sector was 17 percent, whereas the share of MSc-qualified researchers accounted for about 50 percent; corresponding shares at ISAR were 7 and 40 percent, respectively.

Shares of female researchers differed somewhat across agencies and degree levels. The share of women was the highest at the BSc level, accounting for 17 percent of all researchers in this degree category (ASTI-ISAR 2010). The shares of female researchers with PhD and MSc degrees were lower, however, accounting for 2 and 15 percent of all PhD- and MSc-qualified researchers, respectively. The higher education agencies employed slightly more women at the MSc level than at the BSc level.

Rwandan universities do not offer any PhD training in agricultural sciences, but various donors have funded training for scientists abroad. The Department for International Development (DFID) funds training through the Strengthening Capacity in Agricultural Research and Development in Africa (SCARDA) initiative, which is in turn coordinated by FARA and implemented by ASARECA in its member countries. Phase 1 of the Rural Sector Support Project (RSSP), funded by a World Bank loan and the Government of Rwanda, provided scholarships for 15 scientists at ISAR (2 PhDs and 13 MScs) and 120 rural engineers at ISAE (World Bank 2008a). The capacity building program of the Netherlands Organization for International Cooperation in Higher Education (Nuffic) provided grants for 10 MSc and 5 PhD candidates in the Netherlands during 2003–09. It also supported, in collaboration with the Faculty of Agriculture at NUR and Wageningen University, the development of an MSc degree program in agroforestry and soil management. Students began enrolling in the program in 2006; the first students graduated in 2008.

Training programs in Rwanda are limited because of the generally low capacity in the area of S&T, but the government supports degree-level training and short courses for its staff at CGIAR centers and in countries such as Kenya, Tanzania, South Africa, and Uganda. These opportunities are open to all researchers who meet the application requirements, such as being involved in a priority research area. In return for PhD

training, researchers are expected to commit to eight years of employment at their home institute, whereas the required commitment for MSc training is four years. Nevertheless, such agreements can be difficult to enforce.

As many researchers are away on training at any given time, the agencies are often left understaffed. To fill vacant positions (and by offering competitive salaries), the government has attracted many foreign, contract-based scientists from such countries as Burundi, the Democratic Republic of Congo, Ghana, Kenya, Nigeria, and Uganda. A number of the university staff members are from the United Kingdom, India, or Kenya.

INVESTMENT TRENDS

Expenditures

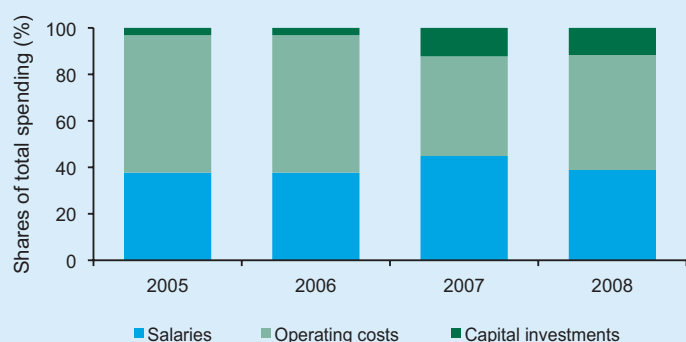
The allocation of research budgets across salaries, operating costs, and capital investments affects the efficiency of agricultural R&D, so detailed cost-category data were collected from government agencies as part of this study. In 2008, salaries accounted for 39 percent of total agricultural R&D spending at ISAR, while operating and program costs accounted for 49 percent, and capital investments for 12 percent (Figure 5). This distribution represents relatively consistent spending on salaries, which are comparable across the government and higher education agencies, but low compared with international organizations.

Operating costs were relatively well-funded, exceeding the cost of salaries in most years. Capital investments were three times higher during 2007/08 compared with earlier years. Both the government and donors fund operating costs and capital investments. Despite the increases, capital investments fall short of the needs of many agencies. Upgrading research facilities and equipment at the higher education agencies remains a particular challenge (Tizikara, Wilcock, and Habyarimana 2007).

Funding Sources

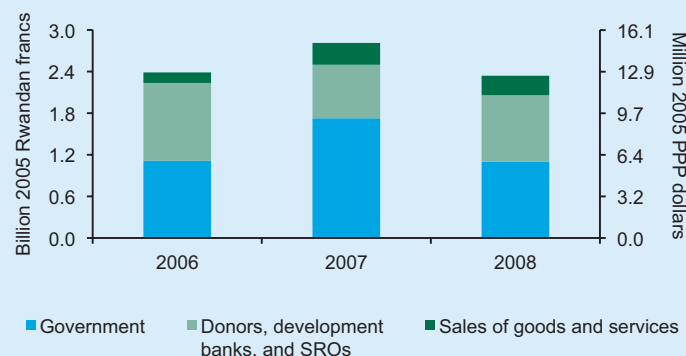
Agricultural research in Rwanda is funded by the national government, donors, and development banks, supplemented by the sale of goods and services. During 2006–08, government funding ranged from 47 to 61 percent of total funding at ISAR (Figure 6). In 2008, government funding accounted for 47 percent of the Institute's total funding, donor funding for 41 percent, and

Figure 5—Cost category shares of ISAR, 2005–08



Source: Calculated by authors from ASTI– ISAR 2010.

Figure 6—Funding sources of ISAR, 2006–08



Source: Calculated by authors from ASTI– ISAR 2010.

Note: SROs indicates subregional organizations.

internally generated resources for 12 percent. Donor and development bank funding appears to have been more erratic, which is a common trend based on fluctuations in the yearly allocation of funding. Further, donor funding is often susceptible to disbursement delays, which seriously affect agencies that are highly donor-dependent.

RSSP Phases I and II, co-financed by the World Bank and the Government of Rwanda, were significant sources of funding to Rwanda's agricultural sector from 2001. The first phase, with a value of US\$48 million, ran until 2008 and included two major components: (1) marshland/hillside development and export diversification and (2) implementation coordination and monitoring and evaluation. Originally, there had been a third component on agricultural services valued at US\$9.6 million, but this was restructured as a subcomponent on capacity building and technical assistance to community and partner organizations valued at US\$6.2 million. As noted earlier, this project provided funding for capacity strengthening of ISAR and ISAE researchers, and for the recruitment of eight senior ISAR scientists to fill positions left vacant while researchers undertook training (World Bank 2008a). This component also provided ISAR with funding for equipment (ISAR 2002).

RSSP Phase II, with a value of US\$35 million, is expected to run until 2012 with a similar major component on marshlands and hillside development. Phase II continues to provide funding for capacity strengthening at ISAR and ISAE (World Bank 2008b); funding for training is likely to be lower than in Phase I, because Phase II no longer includes the specific subcomponent on capacity building.

Rwanda's agricultural research agencies are funded by a variety of other donors, including the Belgian Development Agency (BTC); the Food and Agriculture Organization of the United Nations (FAO); DFID; the Swedish International Development Cooperation Agency (Sida); the Alliance for a Green Revolution in Africa (AGRA); the Rockefeller Foundation; the governments of Germany, the Netherlands, and Belgium; and CGIAR centers.

ASARECA and FARA, in addition to organizing training programs, also implement competitive grant schemes for research funding, and ISAR has been successful in obtaining grants through this mechanism. The S&T policy envisioned that NCSTI would establish a national research fund that would allocate 0.5

percent of its yearly budget to competitive R&D funding (though not specifically related to agriculture), but as of 2011 NCSTI was not yet operational (UNU-IAS and MINISTR 2006).

RESEARCH ALLOCATION

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). In 2009, 60 percent of Rwanda's agricultural researchers were involved in crop research, 16 percent focused on research related to livestock, 5 percent focused on postharvest issues, a further 5 percent focused on forestry, and 4 percent focused on natural resources (Figure 7).

Commodity Focus

Taking a closer look at crop and livestock research, commodities such as potatoes, maize, and fruit were the most heavily researched, with shares of 8 to 10 percent of total FTE crop and livestock researchers across agencies (Table 2). Rice, bananas and plantains, wheat, coffee, and vegetables followed, with shares of 6 to 7 percent. Within livestock research, dairy was the most researched commodity, at 10 percent, followed by sheep and goats, at 7 percent, and swine, at 3 percent.

CONCLUSION

Rwandan agricultural research agencies have been restored since the first half of the 1990s, but challenges still remain. Agricultural research capacity grew modestly between 2005 and 2009, from 100 to 116 FTEs. This growth mainly occurred in the higher education sector. Overall, the qualification levels of research staff clearly improved between 2005 and 2009, given that the number

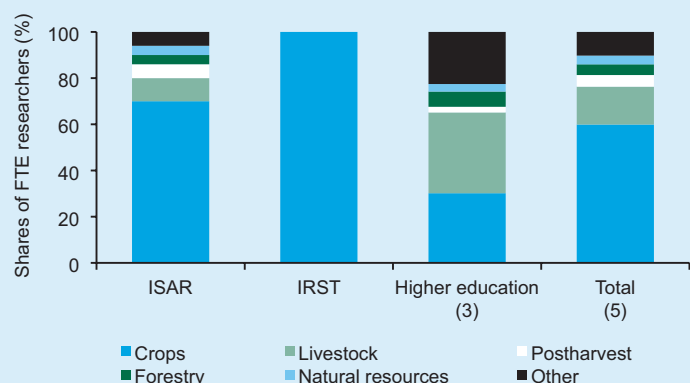
Table 2—Crop and livestock research focus by major item, 2009

	ISAR	IRST	Higher education (3)	Total (5)
Crop items	Shares of FTE researchers (%)			
Potatoes	8.8	—	13.1	9.6
Maize	8.8	—	10.2	9.0
Fruit (other than bananas)	8.8	—	4.9	7.8
Rice	8.8	—	0.3	6.8
Bananas and plantains	8.8	—	0.0	6.7
Wheat	6.3	—	4.3	5.7
Coffee	7.5	—	0.5	5.9
Vegetables	5.0	—	6.2	5.2
Other crops	25.0	100.0	6.9	21.8
Livestock items				
Dairy	7.5	—	17.0	9.5
Sheep and goats	5.0	—	12.8	6.7
Swine	—	—	14.9	3.3
Other livestock	—	—	9.0	2.0
Total crop and livestock	100	100	100	100

Source: Calculated by authors from ASTI- ISAR 2010.

Note: Figures in parentheses indicate the number of agencies in each category.

Figure 7—Research focus by major commodity area, 2009



Source: Calculated by authors from ASTI- ISAR 2010.

Note: Figures in parentheses indicate the number of agencies in each category.

of MSc-qualified staff doubled. Rwanda's agricultural research staff is, however, younger and less well-qualified in terms of postgraduate degrees when compared with staff in other countries of the region. Despite government and donor training efforts, greater investment is needed to raise staff qualifications to the levels necessary across all agencies and to increase the proportion of senior staff. The lack of national PhD programs in the agricultural sciences is also a significant constraint to improving qualification levels. To overcome these challenges in the short run, the country has managed to attract a large number of foreign scientists on a contract basis to fill a number of vacancies. Ongoing training initiatives will need to address the problem in the longer term.

In 2009, investment in agricultural R&D in Rwanda totaled 3.6 billion Rwandan francs or 19.2 million PPP dollars (both in 2005 constant prices), representing a slight increase over 2005 levels. The country's agricultural research agencies are highly dependent on donor and development bank funding. Furthermore, the 2009 research intensity ratio of \$0.51 indicates that investment in agricultural R&D is relatively low in Rwanda compared with the overall importance of the sector to the economy. In addition, the translation of research results into agricultural development has been weak given the lack of coordination between research, extension, and end-users. The recent restructuring of ISAR and the extension agencies under the authority of RAB is intended to address this issue. However, investment and capacity limitations must also be addressed if the new Board is to lead a more effective agricultural research and extension system.

NOTE

¹ Financial data are also available in current local currencies or constant 2005 U.S. dollars via ASTI's Data Tool, accessible at www.asti.cgiar.org/data.

REFERENCES

- ASTI-ISAR (Agricultural Science and Technology Indicators and Rwanda Agriculture Research Institute). 2010. Agricultural science and technology indicators survey. Unpublished surveys. Washington, D.C., and Kigali.
- Beintema, N., and G. J. Stads. 2011. *African agricultural R&D in the new millennium: Progress for some, challenges for many*. Food Policy Report. Washington, D.C.: International Food Policy Research Institute.
- FAO (Food and Agriculture Organization of the United Nations). 2009. FAOSTAT databases. <<http://faostat.fao.org/site/452/default.aspx>>. Accessed March 23, 2010.
- ISAR (Rwanda Agriculture Research Institute). 2002. *Looking towards 2010: ISAR strategic plan*. Kigali, Rwanda.
- Roseboom, J., and P. G. Pardey. 1993. *Statistical brief on the national agricultural research system of Rwanda*. Statistical Brief No. 1. The Hague: International Service for National Agricultural Research (ISNAR).
- RoR-MINAGRI (Republic of Rwanda-Ministry of Agriculture and Animal Resources). 2009. *Strategic plan for the transformation of agriculture in Rwanda - Phase II (PSTA II) Final Report*. Kigali.
- Tizikara, C., D. Wilcock, and P. C. Habyarimana. 2007. *Needs assessment and action plan for improving agricultural research and technology transfer: Final report*. Kigali and Washington, D.C.: Republic of Rwanda and World Bank.
- UNU-IAS and MINISTR (United Nations University-Institute of Advanced Studies and the Republic of Rwanda's Ministry of Science, Technology and Scientific Research). 2006. *The Republic of Rwanda's policy on science, technology and innovation*. Yokohama and Kigali.
- World Bank. 2008a. *Implementation completion and results report (IDA-34830 IDA-3483A) on a credit in the amount of SDR 37.2 million (US\$48.00 million equivalent) to the Republic of Rwanda for a rural sector support project I*. Washington, D.C.
- _____. 2008b. *Project appraisal document on a proposed grant in the amount of SDR 21.3 million (US\$35 million equivalent) to the Republic of Rwanda for a Rwanda second rural sector support project in support of the second phase of the rural sector support program (APL) I*. Washington, D.C.
- World Bank. 2010. World development indicators (WDI) and Global development finance (GDF). <http://databank.worldbank.org/ddp/home.do?Step=2&id=4&hActiveDimensionId=WDI_Series> (accessed November 10, 2010).

IFPRI-ROME

Agricultural Science and Technology Indicators (ASTI) initiative
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IFPRI is one of 15 agricultural research centers that receive their principal funding from governments, private foundations, and international and regional organizations, most of which are members of the Consultative Group on International Agricultural Research (www.cgiar.org).

ISAR is the principal agricultural research institution in Rwanda and holds a broad mandate for crop, livestock, forestry, and natural resources research.

The Agricultural Science and Technology Indicators (ASTI) initiative compiles, analyzes, and publishes data on institutional developments, investments, and human resources in agricultural R&D in low- and middle-income countries. The ASTI initiative is managed by the International Food Policy Research Institute (IFPRI) and involves collaborative alliances with many national and regional R&D agencies, as well as international institutions. The initiative, which is funded by the Bill & Melinda Gates Foundation with additional support from IFPRI, is widely recognized as the most authoritative source of information on the support for and structure of agricultural R&D worldwide. To learn more about the ASTI initiative visit www.asti.cgiar.org.

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