ASTI Agricultural Science & Technology Indicators
FACILITATED BY IFPRI

ZIMBABWE

RECENT DEVELOPMENTS IN AGRICULTURAL RESEARCH

Kathleen Flaherty, Percy Chipunza, and Arthur Nyamukapa

Country Note • March 2011

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

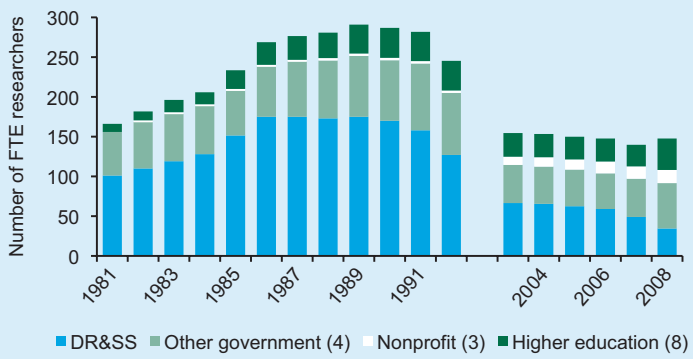
Economic decline significantly constrained agricultural research and development (R&D) in Zimbabwe after 2002. The country relied on donor sources for much of its research funding in the 1990s, but by 2003 most donors had suspended their operations in Zimbabwe. Exacerbating matters, currency devaluations and hyperinflation during 2002–08 further eroded funding levels at agricultural R&D agencies and hence their ability to conduct viable research. This situation also led to high staff turnover, with many researchers moving to the private sector or to other countries. From a peak of almost 300 full-time equivalent (FTE) researchers in 1989, R&D capacity fell to a low of 139 FTEs in 2007, rebounding slightly to 148 FTEs in 2008 (Figure 1; Table 1).

It is important to note that the depreciation of the Zimbabwe dollar and the subsequent emergence of a parallel market for foreign exchange make it especially challenging to calculate inflation-adjusted and purchasing power parity (PPP) price values. Consequently, the financial data presented in this note have been analyzed with caution. Levels of agricultural R&D spending have been calculated in constant 2005 Zimbabwe and PPP dollars for

Key Trends Since 2002

- Economic decline significantly constrained agricultural research and development (R&D) in Zimbabwe during 2002–08.
- Research spending and staffing levels at Zimbabwe's main agricultural research agency, the Department of Research and Specialist Services (DR&SS), declined considerably after 2003, in turn reducing DR&SS' share of national agricultural R&D capacity.
- The share of researchers at DR&SS with postgraduate qualifications, at only 15 percent in 2008, is very low compared with other agricultural research agencies in the country or with other main agricultural R&D agencies in Sub-Saharan Africa.
- Most donors suspended their funding of agricultural R&D in Zimbabwe by 2003.

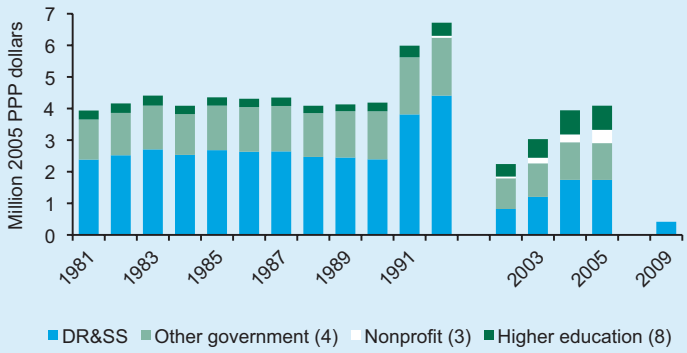
Figure 1—Public agricultural research staff in full-time equivalents, 1981–92 and 2003–08



Sources: Calculated by authors from ASTI 2010, Roseboom et al. 1995, ART 2011, and UZ 2011.

Notes: Figures in parentheses indicate the number of agencies in each category. Data include expatriate staff employed at DR&SS during 1981–92. Data for 1993–2002 were not available.

Figure 2—Public agricultural R&D spending adjusted for inflation, 1981–92 and 2002–05



Sources: Calculated by authors from ASTI 2010, Roseboom et al. 1995, ART 2011, and UZ 2011.

Notes: Figures in parentheses indicate the number of agencies in each category. Zimbabwe officially adopted a multiple currency regime in 2009. The official exchange rate of December 30, 2005, was used to calculate 2005 values (US$1=84,588 Zimbabwe dollars); use of the parallel exchange rate for that day would reduce these values (US$1=96,000 Zimbabwe dollars). Data for 1993–2001 and 2006-08 were not available.

Table 1—Overview of agricultural research staff levels, 2003 and 2008

Type of agency	2003 Number (FTEs)	2003 Shares (%)	2008 Number (FTEs)	2008 Shares (%)
Public				
DR&SS	66.5	43	34.5	23
Other government (4)	48.0	31	57.1	39
Nonprofit (3)	10.3	7	16.5	11
Higher education (8)	29.8	19	39.6	27
Subtotal (16)	154.5	100	147.7	100
Private (1)	8.0		10.0	
Total (17)	**162.5**		**157.7**	

Sources: Compiled by authors from ASTI 2010, ART 2011, and UZ 2011.

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

Table 2—Overview of public agricultural R&D spending, adjusted for inflation, various years

Type of agency	Zimbabwe dollars 1992	2002	2003	2004	U.S. dollars 2005	2009
	(billion 2005 prices)				(million 2005 prices)	
DR&SS	155.6	27.1	39.8	57.6	1.8	0.4
Other government (4)	95.5	34.1	37.6	42.9	1.3	
Nonprofit (3)	2.5	1.5	5.8	8.2	0.4	
Higher education (8)	45.6	13.4	20.2	26.2	0.8	
Total public (16)	**299.2**	**76.1**	**103.4**	**134.9**	**4.4**	

Type of agency	Shares 1992	2002	2003	2004	2005	2009
	(%)					
DR&SS	52.0	36.6	39.7	44.2	42.6	
Other government (4)	31.9	43.8	35.1	30.2	28.5	
Nonprofit (3)	0.8	2.0	5.8	6.3	10.3	
Higher education (8)	15.3	17.6	19.5	19.4	18.7	
Total public (16)	**100**	**100**	**100**	**100**	**100**	

Sources: Calculated by authors from ASTI 2010 and Roseboom et al. 1995.

Notes: Figures in parentheses indicate the number of agencies in each category. Zimbabwe officially adopted the use of a multiple currency regime in 2009. The official exchange rate of December 30, 2005 was used to calculate 2005 values (US$1=84,588 Zimbabwe dollars); use of the parallel exchange rate for that day would reduce these values (US$1=96,000 Zimbabwe dollars).

the period 2002–04, and in 2005 U.S. and PPP dollars for the years 2005 and 2009. 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.

In 1992, Zimbabwe spent a total of 299 billion Zimbabwe dollars or 9 million PPP dollars on public agricultural R&D, both in 2005 constant prices, compared with just 76 billion Zimbabwe dollars or 2 million PPP dollars in 2002 (Figure 2; Table 2). Investment levels appear to have increased to 4 million PPP dollars between 2003 and 2005, but inflation pressures intensified in 2005, and research staff losses began to accelerate. Spending data for the country's main research agency, the Department of Research and Specialist Services (DR&SS), indicate that research expenditures fell dramatically from 1.7 million PPP dollars in 2005 to less than 0.4 million in 2009. The 2009 adoption of a multiple currency regime and subsequent macroeconomic adjustments enabled the agency to stabilize, and preliminary data indicate a slight increase in expenditures during 2010.

In addition to decreased investment, DR&SS experienced high staff turnover. Whereas the agency accounted for up to two-thirds of national agricultural research investments and human resource capacity in the 1980s and early 1990s (more than 150 FTEs in the early 1990s), by 2008 it employed less than a quarter of the nation's public research staff (35 FTE researchers).

DR&SS, which falls under the Ministry of Agriculture, Mechanization, and Irrigation Development, comprises three divisions focusing on crop research, animal research, and research services. The Crop Research Division in turn consists of six research institutes, including three commodity-based institutes focusing on horticulture, coffee, and cotton. As the country's primary food crop, maize continues to be the most widely researched crop. Other important crop research focuses on sorghum and horticulture. The Animal Research Division consists of four research stations and two service units. Livestock research primarily focuses on beef and dairy cattle, small ruminants, and poultry, in addition to pastures and forages. In the past, fisheries research was conducted by the Aquatic Ecology and Fisheries Research Branch of the Department of National Parks and Wildlife Management, but DR&SS took over this mandate in the 1990's. In addition to providing technical services to the other two divisions, the Research Services Division oversees seven subunits, including two institutes—the Plant Protection Research Institute and the Chemistry and Soil Research Institute. These two institutes have regulatory functions and combine research and provision of specialist services to clients.

Other agricultural R&D agencies in Zimbabwe have faced similar constraints since 2000, but none were as severely affected as DR&SS. Four other agencies together accounted for 39 percent of total public research staff in 2008. Focusing on Zimbabwe's primary export crop, the Tobacco Research Board (TRB) is the largest of these agencies. TRB employed 29 FTE researchers in 2008, nearing its 1990s capacity after a contraction to 17 FTEs in

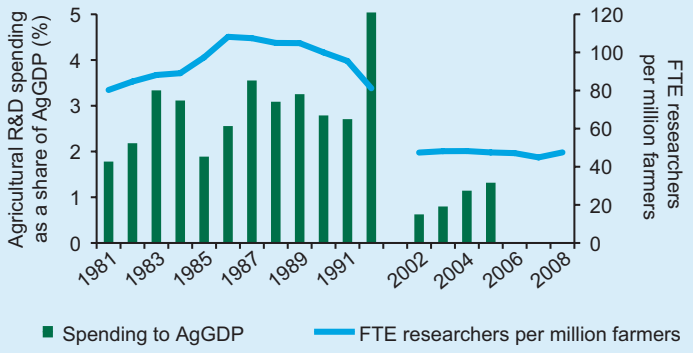
ASTI Website Interaction

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

A list of the 5 government, 3 nonprofit, and 8 higher education agencies included in this brief is available at asti.cgiar.org/zimbabwe/agencies.

www.asti.cgiar.org/zimbabwe

Figure 3—Intensity of agricultural research spending and capacity, various years



Sources: Calculated by authors from ASTI 2010, Roseboom et al. 1995, ART 2011, UZ 2011, World Bank 2010, and FAO 2009.

Note: Data for 1993–2001 and 2006-08 for agricultural research spending or for 1993-2001 for capacity were not available.

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 note 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/zimbabwe/datacoverage.
- More relevant resources on agricultural R&D in Zimbabwe are available at asti.cgiar.org/zimbabwe.

www.asti.cgiar.org/zimbabwe

2006. The next-largest agency, the Department of Veterinary and Laboratory Services (DVLS), employed 17 FTEs in 2008, followed by the Forestry Research and Training Division of the Forestry Commission with 10 FTEs in 2008, and the Institute of Agricultural Engineering (IAE) with only 1 FTE that year. DVLS is responsible for livestock research but primarily focuses on disease control rather than livestock production improvement. IAE conducts research on agricultural engineering, off-farm postharvest technologies, natural resources, and socioeconomics. Forestry research is the mandate of the Forestry Commission.

Three main nonprofit agencies conduct agricultural research in Zimbabwe. The Agricultural Research Trust (ART) was established in 1982 by the Commercial Oilseeds Producers' Association and Commercial Grain Producers' Association, with later financial support from the cereal and cattle producer associations. ART conducts both crop and livestock research and in 2008 employed 7 FTEs. The African Institute for Agrarian Studies (AIAS) and the Ruzivo Trust conduct research on natural resources and socioeconomics. AIAS was established in 2003 and employed 6 FTEs in 2008; Ruzivo Trust was established in 2004 and employed 4 FTEs in 2008.

The higher education sector accounted for 27 percent of total public agricultural research capacity in Zimbabwe in 2008. The main agency, the University of Zimbabwe, operates two faculties and one department conducting agricultural research. The Faculty of Agriculture employed 15 FTE researchers in 2008 and conducts research on crops (including maize, cassava, soybeans, millet, and fruit) and livestock (including beef, dairy, sheep and goats, and pastures and forages). The Department of Biological Sciences employed 5 FTE researchers in 2008 who focused on crop, livestock, and natural resources research. That year, the Faculty of Veterinary Science employed 2 FTE researchers, who focused their research primarily on disease management of beef and dairy cattle, but also on other types of livestock. Human resource capacity at the University of Zimbabwe, particularly in terms of PhD-qualified researchers, declined after 2001 as salaries became less attractive, and the number of students enrolled in programs declined. Zimbabwe's second-largest university, the National University of Science and Technology (NUST), established the Institute for Rural Technologies (IRT) in 2007; IRT employed 14 FTE researchers in 2008. Several new universities have also been established since 2000. Of these, two private universities—the Faculty of Agriculture and Natural Resources at Africa University (FANR-AU) and the Women's University in Africa (WUA)—conduct research on both crops and livestock. In 2008 FANR-AU employed 1 FTE and WUA employed 2 FTEs. A new public university, the Center for Agriculture and Rural Development at Lupane State University (CARD-LS) focuses on livestock and natural resources; in 2008, it employed 1 FTE.[1]

In the private sector, SeedCo is one of the most long-established for-profit companies conducting agricultural research in Zimbabwe. SeedCo focuses on maize seed and employed 10 FTE researchers in 2008, twice as many compared with the early 1990s.

While numbers of support staff (particularly technicians) declined considerably at DR&SS and other government agencies during 2001–08, levels remained constant at the nonprofit and higher education agencies. In 2001, the support staff per researcher ratio averaged 8.4, whereas by 2008 it had fallen to 5.8, comprising 2.8 technicians, 0.8 administrative staff, and 2.1 other support staff (ASTI 2010).

The research intensity ratio—total spending on agricultural R&D as a percentage of agricultural output (AgGDP)—is a common indicator of agricultural R&D spending across countries. In 2005, for every $100 of agricultural output, Zimbabwe invested $1.32 in agricultural R&D (Figure 3), which is less than half the corresponding ratio recorded in the late-1980s and early 1990s. This 2005 ratio is higher than countries like Mozambique ($0.38) and Zambia ($0.29), yet lower than others, such as South Africa ($2.02) and Namibia ($2.03); two countries with relatively high ratios in the African region (Beintema and Stads 2011). It should also be noted that, rather than reflecting higher investment levels than certain countries, Zimbabwe's ratio actually indicates a considerable decline in AgGDP levels compared with the 1990s. Another ratio, the number of agricultural researchers per million farmers, also declined from a peak of 108 FTEs in 1986 to 48 FTEs in 2008.

INSTITUTIONAL STRUCTURE AND POLICY ENVIRONMENT

In the early 2000s, the government of Zimbabwe recognized the need for science and technology (S&T) activities to focus more effectively on national interests. Consequently, the government launched the country's first S&T policy in 2002, the objective of which was to strengthen institutional coordination and management across all S&T sectors (Muchena 2003). The portfolio of Minister of State for S&T Development in the President's Office was subsequently established. In 2007, the department became a stand-alone Ministry. The development of S&T relating to the agricultural sector is expected to address food production, environmental, and employment needs. A specific agricultural research policy does not exist currently, but the agricultural ministry provides advice on policy issues specific to agricultural research. Other government R&D agencies are administered by their line ministries.

DR&SS has been in existence since 1948, although it has been reorganized and renamed several times. Following the onset of land reform in Zimbabwe in 2000 and the subsequent shift in the structure of the country's agricultural sector, many institutional changes have occurred in efforts to meet the demand for research services and new technologies. In 2001, DR&SS was merged with the former Agricultural Technical and Extension Services Department (Agritex) to become the Department of Agricultural Research and Extension (AREX). In 2007, the Department of Agricultural Research for Development (DAR4D) was formed from the research arm of AREX in order to accommodate new developments in the sector. DAR4D's primary mandate was to conduct research on new technologies to arrest continually declining production and productivity levels. AREX's extension component was separated to become Agritex once again. In 2009, following the Global Political Agreement that ushered in Zimbabwe's Government of National Unity, DAR4D reverted to its earlier name, DR&SS.

Collaboration among national agencies and with regional and international agencies has been constrained in the past decade due to the political and economic environment. Nevertheless, some international research agencies, such as those of the Consultative Group on International Agricultural Research (CGIAR), continue to operate in Zimbabwe, including the International Crops Research Institute for the Semi-Arid Tropics (ICRISAT), the International Water Management Institute (IWMI), the International Center for Tropical Agriculture (CIAT), the International Institute of Tropical Agriculture (IITA), the International Maize and Wheat Improvement Center (CIMMYT), and Bioversity International. At a regional level, Zimbabwe is a member of the Southern African Development Community (SADC) and participates in the Regional Universities Forum for Capacity Building in Agriculture (RUFORUM), the Soil Fertility Consortium for Southern Africa (SOFECSA), and the New Seed Initiative for Maize in Southern Africa (NSIMA) (Mutisi 2009). The country also hosts the Africa Centre for Fertilizer Development (ACFD), established by the African Union. At the national level, DR&SS and the University of Zimbabwe have a long history of collaboration.

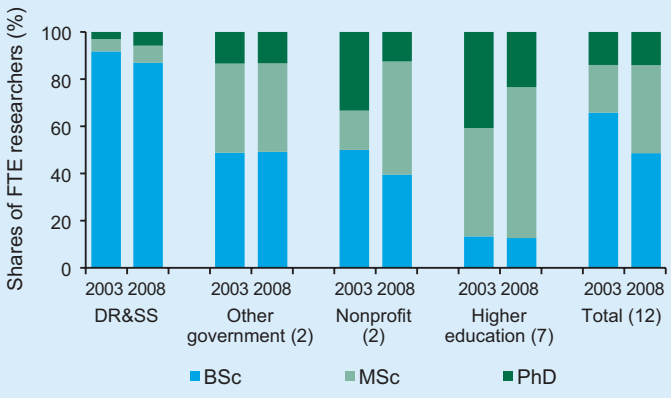
RESEARCH STAFF QUALIFICATIONS AND TRAINING

BSc-qualified staff accounted for about half of Zimbabwe's total agricultural research capacity in 2008, whereas researchers with MSc degrees comprised 37 percent, and those with PhD degrees comprised 14 percent (Figure 4). The share of MSc- and PhD-qualified staff is much lower than the Sub-Saharan African averages of 43 and 30 percent, respectively (Beintema and Stads 2011). The number and share of BSc-qualified staff decreased greatly from 2003, mainly due to staff losses at DR&SS. As previously mentioned, DR&SS has very few staff with postgraduate qualifications; in 2008, only 6 percent of researchers held PhD degrees, and only 7 percent held MSc degrees. Of the other government agencies, whereas most of the researchers at IAE held BSc degrees, at least half of TRB's staff were qualified to the postgraduate level. The nonprofit agencies reported an increase in staff with MSc degrees, leading to an increasing overall share during 2003–08.

Universities worldwide generally have higher shares of agricultural researchers with PhD and MSc degrees, and this is true for Zimbabwe as well. In 2008, MSc- and PhD-qualified researchers accounted for 64 and 23 percent of research capacity at the higher education agencies, respectively. As mentioned, the University of Zimbabwe lost a number of PhD-qualified faculty staff over the 2001–08 period. The number of individual staff members (headcounts, not FTEs) fell from 20 to 12 in the Faculty of Agriculture and from 10 to 6 in the Faculty of Veterinary Sciences.

Training needs are significant across all agricultural R&D agencies in Zimbabwe, but particularly at DR&SS. Many experienced staff members departed between 2000 and 2008, so new staff are especially in need of training. Although capacity building initiatives are currently in place, and the government encourages staff to pursue higher education, funding for human resource development is inadequate. At DR&SS and the universities, some staff members have been able to access scholarships provided by countries such as China, India, the

Figure 4—Qualifications of researchers by institutional category, 2003 and 2008



Source: Calculated by authors from ASTI 2010.

Notes: Figures in parentheses indicate the number of agencies in each category. Data are for researchers only and therefore exclude 2 FTE technicians holding BSc degrees.

Netherlands, and the United Kingdom. Most researchers in Zimbabwe received their degrees from the University of Zimbabwe.

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 for the government agencies as part of this study.

In 2009, salaries accounted for 30 percent of agricultural R&D spending at DR&SS, while operating costs accounted for 63 percent, and capital investments for 6 percent (Figure 5). This distribution represents an unusually low share of spending on salaries, reflecting the sharp decline in numbers of research staff after 2007. In 2009, salaries amounted to only 0.1 million PPP dollars compared with 0.9 million PPP dollars in 2005 (both in 2005 constant prices). Salaries at the government agencies and universities are generally not competitive with those at nongovernment and international organizations, or in the private sector, making it difficult to attract and retain staff. In absolute terms, operating costs in 2009 were about the same as those recorded in 2005.

Capital investment needs are significant across all the agricultural R&D agencies in Zimbabwe. Given a climate of macroeconomic decline and reduced donor funding, most agencies have struggled with inadequate facilities, equipment, and transportation for research. Another expenditure constraint is timely and complete release of budgeted government funding. Agencies depend on government funding received on a monthly basis, but disbursement continues to be erratic.

Funding Sources

Agricultural research in Zimbabwe is primarily funded by the national government; a number of agencies supplement this funding through donors and the sale of goods and services. Financial support for research activities has undergone a considerable decline in recent years, and the lack of funding continues to be a major impediment. As mentioned, in the 1990s, donor funding constituted a significant share of research funding, but by 2003 most donors had suspended their operations in the country. Since 2005, no competitive funding for research has been available. Private contracts for research undertaken by government agencies have also declined since 2005 due to economic hardship.

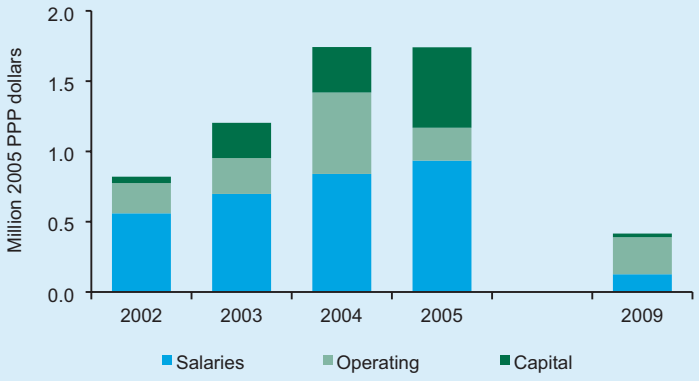
With the stabilization of the economy in 2009, some donors have begun to return to Zimbabwe. Some of the current primary donor support for agricultural research activities at government and higher education agencies comes from the European Union (EU), International Atomic Energy Agency (IAEA), and the Food and Agriculture Organization (FAO). The largest donor-funded projects are currently funded by the governments of China and Ireland and involve livestock disease research and control. Smaller projects (of less than US$20,000) are being funded by the Common Fund for Commodities, CIMMYT, and the Switzerland Development Corporation (NEPAD and MOA 2009).

Among all the agencies, DR&SS appears to have been most significantly affected by the environment of the past decade, largely because it heavily relied on funding from the government and foreign donors. DR&SS and DVLS have managed to generate some revenues through the sale of services, such as regulatory inspections and registration fees, along with the sale of agricultural products, but this income is limited. In contrast, TRB has not been as deeply affected given its more consistent funding sources, including a levy on tobacco and revenues from the sale of commercial goods and services. As a result, TRB was able to hire additional researchers during the 2005–08 period.

Among the nonprofit agencies, AIAS receives funding from a wide range of donors, including the World Bank, European Union, the United Nations Development Programme (UNDP), Norwegian Agency for Development (NORAD), Canadian International Development Agency (CIDA), International Development Research Centre (IDRC), and French Embassy. AIAS supplements its revenues by providing consultancy services. ART raises funds through the sale of goods and services, primarily to producer/commodity organizations (ART 2009). The Ruzivo Trust has received funding from the Kellogg Foundation.

The years of 2005–08 were particularly difficult in terms of research funding for universities, as competitive research funding was suspended. At the University of Zimbabwe, the university research board also suspended operations, and the numbers of both students and faculty staff declined. Funding for final year student research projects has been especially limited. Collaboration has, however, continued on a number of CGIAR center–funded projects, but neither government nor donor funding has returned to 1990s levels.

Figure 5—DR&SS spending by cost category, 2002–05 and 2009



Source: Calculated by authors from ASTI 2010.

CONCLUSION

In the past, Zimbabwe earned a reputation in Africa for its long-established national agricultural research system and high-quality academic institutions. After 2000, however, economic decline constrained the government's ability to provide adequate funding for agricultural research. In 1992, total public agricultural R&D spending amounted to 299 billion Zimbabwe dollars or 9 million PPP dollars (all in 2005 constant prices), whereas by 2002 this amount had fallen to only 76 billion Zimbabwe dollars or 2 million PPP dollars. Although expenditures grew between 2002 and 2005, inflationary pressures intensified in 2005 and research staff losses began to accelerate. The situation was exacerbated by

the withdrawal of donor funding since 2003. In addition, private companies affected by the economy were unable to contract research services as they had done in the past.

Most of the research agencies in Zimbabwe are in need of financial resources to retain and employ additional personnel and to improve their laboratory facilities. Training needs are also significant. BSc-qualified staff accounted for half of Zimbabwe's total agricultural research capacity in 2008 and 87 percent of research staff at DR&SS—a significant percentage compared with the main public agricultural R&D agencies in other countries of the region.

DR&SS has been most severely affected, having lost almost half of its research capacity between 2003 and 2008. While most of these losses were among junior (BSc-qualified) staff, in general, DR&SS employs very few staff with postgraduate qualifications. Inadequate resources have greatly constrained research operations at DR&SS. In addition, frequent reorganization of DR&SS and Agritex have taken a toll, further impeding departments in their efforts to achieve their mandates.

NOTES

[1] Another relatively new public university, Bindura University of Science Education, operates a Faculty of Agriculture and Environmental Science, but no agricultural research was conducted in 2008 due to financial constraints.

REFERENCES

ART (Agricultural Research Trust). 2011. About ART. <http://www.artfarm.co.zw/FactSheet.htm> Accessed January 4, 2011.

ASTI (Agricultural Science and Technology Indicators). 2010. Agricultural science and technology indicators survey. Unpublished surveys. Washington, D.C.

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.

Muchena, O. 2003. Zimbabwe's science and technology policy. *DPMN Bulletin* X: 4, November.

Mutisi, C. 2009. *Implementation and coordination of agricultural research and training (ICART) in the SADC region: Situation analysis of agricultural research and training and support strategies for the national agricultural research system in Zimbabwe*. Gaborone: Southern African Development Community.

NEPAD and MOA (New Partnership for Africa's Development and Ministry of Agriculture, Mechanisation, and Irrigation Development). 2009. Review and stocktaking report on ongoing development efforts in Zimbabwe and their alignment with CAADP targets and principles. NEPAD and MOA, Harare, Zimbabwe.

Roseboom, J., P. Pardey, N. Beintema, and G. Mudimu. 1995. *Statistical brief on the national agricultural research system of Zimbabwe*. Statistical Brief No. 20. The Hague: International Service for National Agricultural Research (ISNAR).

UZ (University of Zimbabwe). 2011. Faculty of Science: Biological Sciences. <http://www.uz.ac.zw/science/biology/#>. Accessed January 4, 2011.

World Bank. 2010. World Development Indicators (WDI) & 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
c/o ESA, Food and Agriculture Organization (FAO)
Viale delle Terme di Caracalla • 00153 Rome, Italy
Telephone: +39-06-570-53192 / 56334 • Skype: ifpriromeoffice
Fax: +39-06-570-55522 • Email: asti@cgiar.org
www.asti.cgiar.org

Facilitated by:
INTERNATIONAL FOOD POLICY RESEARCH INSTITUTE
2033 K Street, NW • Washington, DC 20006-1002 USA
Tel: +1-202-862-5600 • Skype: ifprihomeoffice
Fax: +1-202-467-4439 • Email: ifpri@cgiar.org
www.ifpri.org

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).

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.

The authors thank the 12 agricultural research agencies that participated in the ASTI survey, without whose commitment this country note would not have been possible. The authors also thank Michael Rahija for his research assistance, and Nienke Beintema and Gert-Jan Stads for valuable comments on an early draft of this note. ASTI gratefully acknowledges the generous support from the Bill & Melinda Gates Foundation.