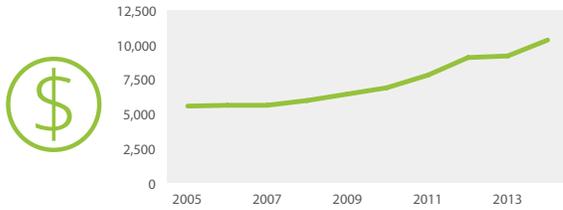


RWANDA

Nienke Beintema, Aimable Gatete, and Sandra Perez

AGRICULTURAL RESEARCH SPENDING



Million Rwandan francs (2011 constant prices)

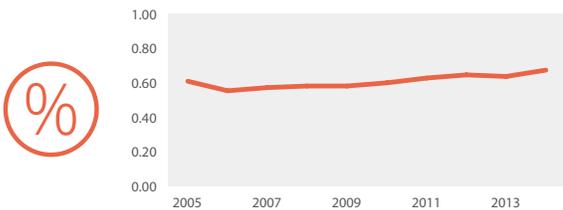
10,338.7

Million PPP dollars (2011 constant prices)

39.6

	RWANDA	BURUNDI	KENYA	UGANDA
Million Rwandan francs (2011 constant prices)	10,338.7			
Million PPP dollars (2011 constant prices)	39.6	13.1	274.1	152.5

SPENDING INTENSITY

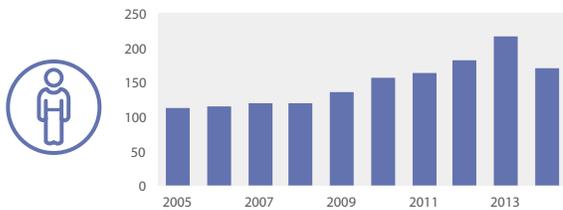


Agricultural research spending as a share of AgGDP

0.67%

	RWANDA	BURUNDI	KENYA	UGANDA
Agricultural research spending as a share of AgGDP	0.67%	0.46%	0.79%	0.97%

AGRICULTURAL RESEARCHERS



Full-time equivalents

169.3

Share of researchers with MSc and PhD degrees

77%

	RWANDA	BURUNDI	KENYA	UGANDA
Full-time equivalents	169.3	141.4	1,178.5	477.9
Share of researchers with MSc and PhD degrees	77%	76%	80%	80%

Notes: Data above are for 2014. Research conducted by the private for-profit sector is excluded from this factsheet due to lack of available data. Information on access to further resources, data procedures and methodologies, and acronyms and definitions are provided on Page 4. See www.asti.cgiar.org/Rwanda/directory for an overview of Rwanda's agricultural R&D agencies.



Continuing spending growth

Agricultural R&D spending grew by one-third during 2011–2014. At RAB, growth was driven by increased donor support, whereas at UR-CAVM it was driven by increased human resource capacity. The total number of researchers increased during 2011–2013, but sharply declined in 2014 due to a restructuring of RAB's researcher classifications: an MSc degree is now the minimum requirement for scientists to qualify as researchers, so most junior researchers were reclassified as research technicians.



Strong funding support

The Government of Rwanda has provided strong support to RAB over the years, contributing the largest share of its funding. Nevertheless, these funds primarily cover the cost of salaries, with a small portion available for day-to-day operations. RAB relies on external sources of funding for its research activities and has been highly successful in establishing a diverse funding portfolio that includes both regional organizations and international organizations, such as CGIAR, FAO, and many others.



Capacity strengthening needed

Rwanda has one of the youngest pools of agricultural researchers in Africa. Furthermore, the number of researchers with PhD degrees remains small. The government has supported the development of a number of agricultural MSc and PhD programs at UR-CAVM, together with the hiring of international researchers to mentor young scientists at RAB. These strategies have been insufficient to date, so it is important that the government continues to invest in higher education and local postgraduate training programs in agricultural sciences.

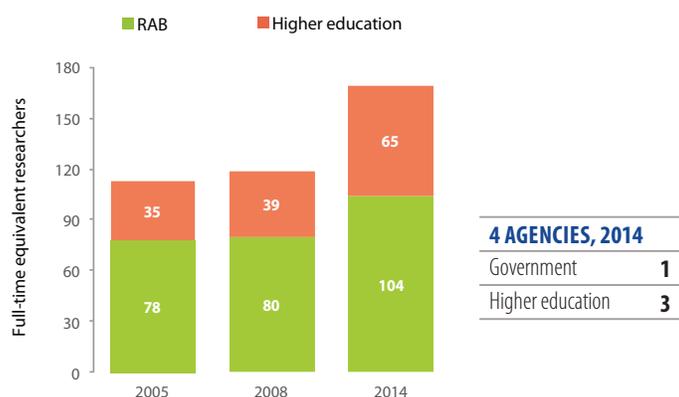


Institutional consolidation

The agricultural sector in Rwanda has continued to grow over time. Demand for a more efficient agricultural R&D and extension system prompted the government to merge separate research and extension entities focusing on crops, livestock, and natural resource management to form RAB. Lack of associated improvements in the staff salary and benefits structure have led to staff dissatisfaction, so it is important that these anomalies be promptly addressed.

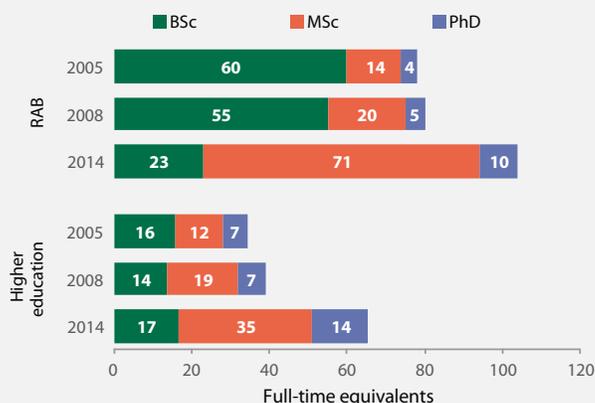
Institutional composition of Rwanda's agricultural research

In 2012, a number of higher education agencies involved in agricultural training and research were merged to form UR-CAVM. The number of FTE researchers employed in the higher education sector almost doubled between 2005 and 2014, causing that sector's share of total agricultural researchers to rise from 31 to 39 percent.



Rwanda's agricultural researchers by sector and qualification level

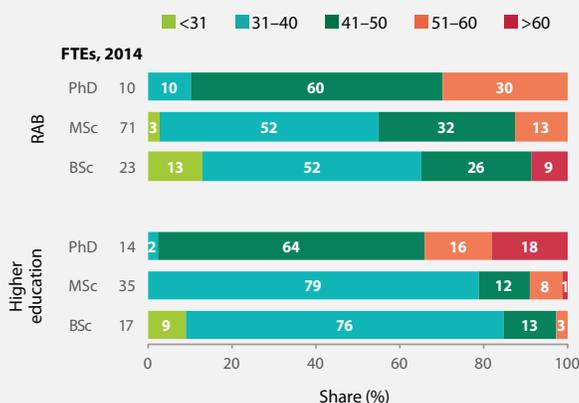
The number of MSc-qualified researchers increased substantially during 2005–2014 both at RAB and within the higher education sector. The number of researchers with PhD degrees at both organizations also increased over time but remained comparatively small in absolute terms.



Note: The government and higher education agencies employed a number of technical support staff qualified to the BSc- and MSc-level; these staff members do not have official researcher status.

Rwanda's agricultural researchers by age bracket

The majority of Rwanda's agricultural researchers are in their 30s. As of 2014, less than 40 percent of all researchers were over 40 years old. Unsurprisingly, researchers with PhD degrees were comparatively older; over 30 percent were in their 50s or 60s.



Rwanda's share of female researchers

Overall, the share of female researchers rose from 16 to 23 percent during 2008–2014. As of 2014, shares of female researchers with PhD degrees were comparatively lower than those with BSc or MSc degrees. Similarly, the share of female researchers over 50 years old was comparatively lower than shares for the other two age brackets, which is not unusual.



By qualification level, 2014

BSc **20%** MSc **25%** PhD **17%**

By age bracket, 2014

< 41 **23%** 41–50 **27%** > 50 **10%**

Rwanda's MSc- and PhD-qualified agricultural researchers by discipline

As of 2014, Rwanda employed 16 plants breeders and geneticists with MSc- and PhD degrees (13 percent of all FTEs), almost all of whom were employed at RAB. The remaining MSc- and PhD-qualified researchers focused on a wide variety of disciplines.

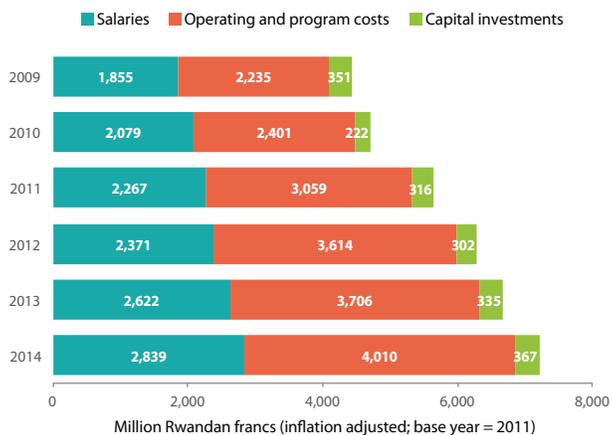
Agricultural researchers, 2014	FTEs		Share (%)	
	MSc	PhD	MSc	PhD
Plant breeding/genetics (incl. biotechnology)	13	3	13	12
Plant pathology	3	0.3	3	1
Plant physiology	0.3	–	0.3	–
Botany	0.3	–	0.3	–
Seed science and technology	1	0.3	1	1
Other crop sciences	21	2	20	8
Animal breeding/genetics	2	2	2	7
Animal husbandry	2	0.3	1	1
Animal nutrition	4	2	4	7
Dairy science	1	0.3	1	1
Poultry	1	0.3	1	1
Veterinary medicine	3	1	3	5
Zoology/entomology	3	–	3	–
Other animal and livestock	3	–	2	–

Agricultural researchers, 2014	FTEs		Share (%)	
	MSc	PhD	MSc	PhD
Forestry and agroforestry	2	1	2	4
Fisheries and aquatic resources	1	1	1	4
Soil sciences	9	1	8	4
Natural resources management	1	0.4	1	2
Water and irrigation management	2	1	2	3
Ecology	1	0.1	1	0.2
Biodiversity conservation	–	–	–	–
Food sciences and nutrition	6	2	6	8
Socioeconomics (incl. agricultural economics)	4	1	4	4
Extension and education	3	–	3	–
Other sciences	19	6	18	26
Total	106	24	100	100

Note: Data are estimates based on an agency sample representing 99 percent of the total number of FTE researchers.

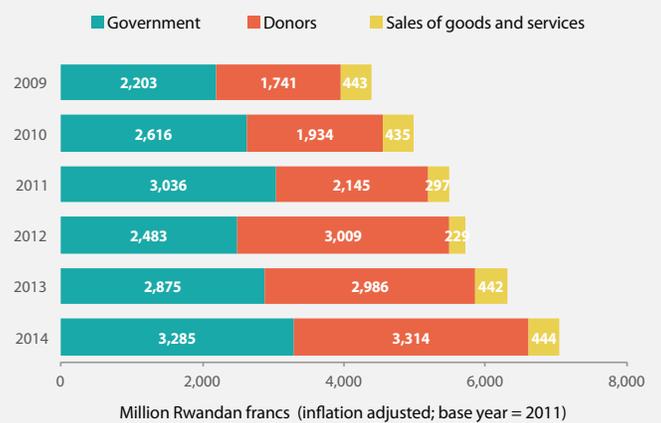
RAB's spending by cost category

On average, salaries and related expenses accounted for about 40 percent of RAB's total agricultural research spending during 2009–2014. Given significant donor contributions, RAB had substantial revenues for its research activities and operating costs; nonetheless, capital investments remained low, averaging only 5 percent per year.



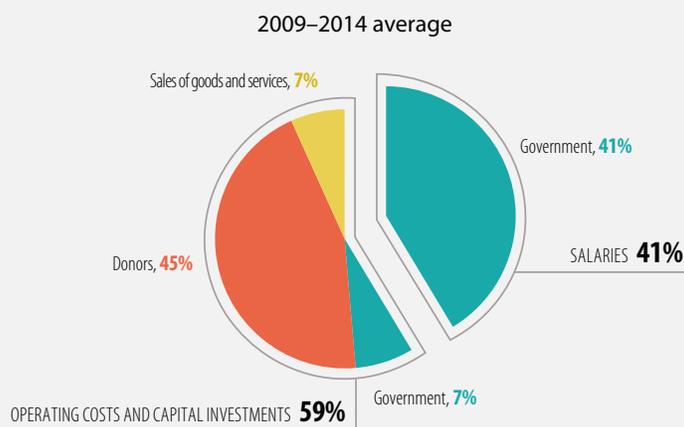
RAB's funding sources

RAB relies on outside sources of funding for its research activities and has established a diverse portfolio of donors that includes regional organizations and international organizations, such as CGIAR, FAO, and others.



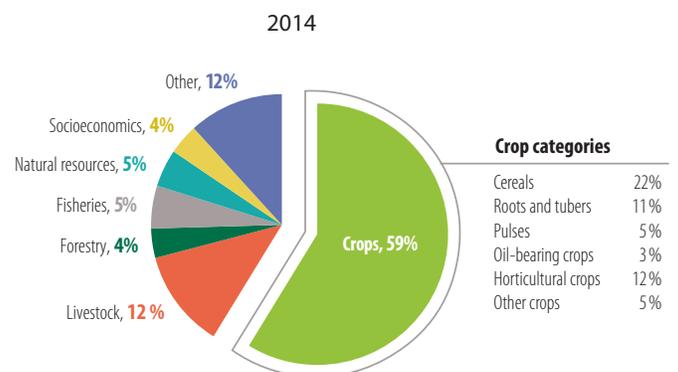
RAB's spending and funding compared

The majority of national government funding is allocated to staff salaries, and the small remaining amount to operating and other costs. On average, donors contributed 45 percent of RAB's total funding during 2009–2014, which was used to finance research activities, other operating costs, and capital investments.



Rwanda's agricultural researchers by area of focus

In 2014, 59 percent of the country's FTE researchers conducted crop research, whereas only 12 percent undertook livestock research. Major crops under investigation were the cereals maize, rice, and wheat, along with potatoes, vegetables, bananas, beans, coffee, and cassava.



RAB's recently released crop varieties

Rwanda's primary agricultural research agency, RAB, released 12 new bean varieties, 4 sweet potato varieties, and 4 soybean varieties during 2012–2013. No new varieties were released during 2014.

Crop	Number of varieties, 2012–2013
Beans	12
Sweet potatoes	4
Soybeans	4
Total	20

RAB's recent peer-reviewed publications

During 2012–2014, RAB published an average of 11 journal articles per year, and UR-CAVM 31 journal articles per year, primarily in international journals. Both organizations also published books or book chapters. Publications per researcher averaged 0.25 across the three-year period.

Type	Number of publications, 2012–2014 annual average		
	RAB	UR-CAVM	Per FTE researcher
Journal articles			
International	7.3	22.3	0.157
Regional	1.7	2.3	0.021
National	2.0	5.7	0.041
Books	3.0	1.3	0.023
Book chapters	1.3	0.0	0.007
Total	15.3	31.7	0.249

Resources for Rwanda

This factsheet presents recent data on the performance of agricultural research in Rwanda, primarily focusing on key financial, human resource, institutional, and output indicators, while also highlighting relevant trends, challenges, and institutional changes. Additional resources are available at www.asti.cgiar.org and include:



ASTI's **interactive country page** for Rwanda features national agricultural research investment and capacity data, a data exploration and download tool, as well as access to a variety of country publications.



ASTI's **benchmarking tool** allows key agricultural research indicators to be ranked and compared across African countries.



ASTI's **data download tool** provides access to more in-depth ASTI datasets and graphs for Rwanda and many other countries.



ASTI's **agency directory** provides a view of agencies that conduct agricultural research in Rwanda, along with their locations and key agency-level indicators.

ASTI Data Procedures and Methodologies

- ▶ The **data underlying this factsheet** were predominantly derived through primary surveys, although some data were drawn from secondary sources or were estimated.
- ▶ **Agricultural research** includes research conducted by the government, higher education, and nonprofit sectors; research conducted by the private for-profit sector is excluded due to lack of available data.
- ▶ ASTI bases its calculations of human resource and financial data on **full-time equivalent (FTE) researchers**, which take into account the proportion of time staff actually spend on research compared with other activities.
- ▶ ASTI presents its financial data in 2011 local currencies and **2011 purchasing power parity (PPP) dollars**. PPPs reflect the relative purchasing power of currencies more effectively than do standard exchange rates because they compare prices of a broader range of local—as opposed to internationally traded—goods and services.
- ▶ ASTI estimates the **higher education sector's research expenditures** because it is not possible to isolate them from the sector's other expenditures.
- ▶ Note that **decimal rounding** can cause totals to be one point higher or lower than the sum of their parts.



For more information on ASTI's data procedures and methodology, visit www.asti.cgiar.org/methodology.

Acronyms

AgGDP	agricultural gross domestic product
FAO	Food and Agriculture Organization of the United Nations
FTE(s)	full-time equivalent(s)
PPP(s)	purchasing power parity (exchange rates)
RAB	Rwanda Agriculture Board
R&D	research and development
UR-CAVM	University of Rwanda, College of Agriculture, Animal Sciences, and Veterinary Medicine

ABOUT ASTI, IFPRI, AND RAB

Working through collaborative alliances with numerous national and regional R&D agencies and international institutions, **Agricultural Science and Technology Indicators (ASTI)** is a comprehensive and trusted source of information on agricultural R&D systems across the developing world. ASTI is led by the **International Food Policy Research Institute (IFPRI)**, which—as a CGIAR member—provides evidence-based policy solutions to sustainably end hunger and malnutrition and reduce poverty. The **Rwanda Agriculture Board (RAB)**, under the Ministry of Agriculture and Animal Resources, is Rwanda's principal agricultural research agency. RAB conducts research on crops, livestock, forestry, fisheries, agricultural engineering, socioeconomics, and natural resources.

ASTI/IFPRI and RAB gratefully acknowledge participating agricultural R&D agencies for their contributions to the data collection and preparation of this factsheet. ASTI also acknowledges the Bill & Melinda Gates Foundation and CGIAR Research Program on Policies, Institutions, and Markets for their generous support of ASTI's work in Africa south of the Sahara. This factsheet has been prepared as an ASTI output and has not been peer reviewed; any opinions are those of the authors and do not necessarily reflect the policies or opinions of IFPRI or RAB.

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