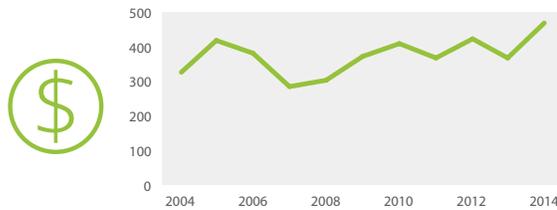


MOZAMBIQUE

Nienke Beintema and Antonieta Nhamusso

AGRICULTURAL RESEARCH SPENDING



Million meticals
(2011 constant prices)

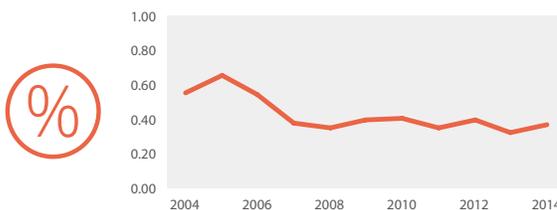
469.9

Million PPP dollars
(2011 constant prices)

29.3

	MOZAMBIQUE	ZIMBABWE	MALAWI	KENYA
Million meticals (2011 constant prices)	469.9			
Million PPP dollars (2011 constant prices)	29.3	43.4	28.1	274.1

SPENDING INTENSITY

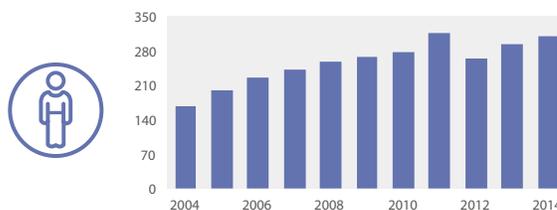


Agricultural research
spending as a share
of AgGDP

0.36%

	MOZAMBIQUE	ZIMBABWE	MALAWI	KENYA
Agricultural research spending as a share of AgGDP	0.36%	1.44%	0.53%	0.79%

AGRICULTURAL RESEARCHERS



Full-time
equivalents

308.4

Share of researchers with
MSc and PhD degrees

56%

	MOZAMBIQUE	ZIMBABWE	MALAWI	KENYA
Full-time equivalents	308.4	208.7	158.3	1,178.5
Share of researchers with MSc and PhD degrees	56%	58%	81%	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/Mozambique/directory for an overview of Mozambique's agricultural R&D agencies.



Spending and capacity increase

Substantial, if volatile, growth in government support led to increased agricultural research spending during 2011–2014. Despite this overall growth, Mozambique still invests a very low share of its AgGDP in agricultural research—0.36 percent in 2014—which is well below the recommended 1 percent target set by the African Union and the United Nations. Agricultural researcher numbers declined sharply in 2012 and 2013 due to contractions in BSc-qualified researchers. The number of MSc- and PhD- researchers, however, continued to increase during 2011–2014.



Dwindling donor support

Mozambique received substantial donor funding to rebuild its agricultural research system after the political conflict that ended in 1992, but donor support has been negligible since 2011. Aside from a World Bank loan to support rice research under APPSA, IIAM, the country's principal agricultural research agency, is entirely dependent on government funding. Although government contributions to IIAM have increased over time, they remain low, especially in terms of day-to-day operations and capital investments.



Training needed

Agricultural researchers in Mozambique are mostly young, trained to the BSc or MSc level, and in need of mentoring and experience. As of 2014, only 11 percent held PhD degrees. One constraint to training is the lack of relevant MSc- and PhD-training programs in Mozambique. APPSA, funded through a World Bank loan, includes a large human resource development component, but further mechanisms are needed to strengthen the country's pool of agricultural researchers both through training, improved remuneration, and other incentives.

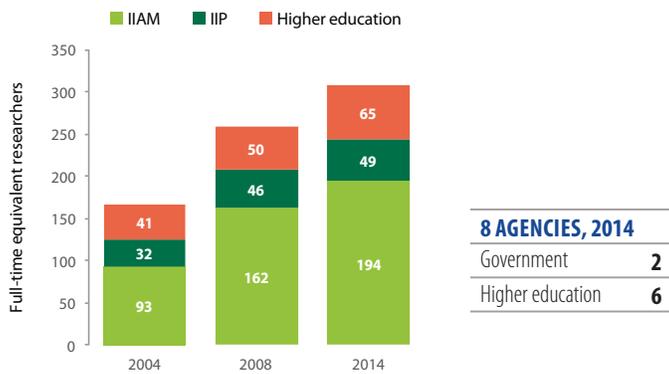


Challenges to food security

Mozambique still faces frequent food production shortages, particularly in areas prone to droughts and flooding. Research has the potential to provide the necessary technological solutions to enable the country to reverse declining agricultural productivity trends and achieve food security. Increased investments in human resources, infrastructure, and research programs are needed, as is the creation of incentives and mechanisms to strengthen the provision of extension and advisory services and involve the private sector in agricultural research.

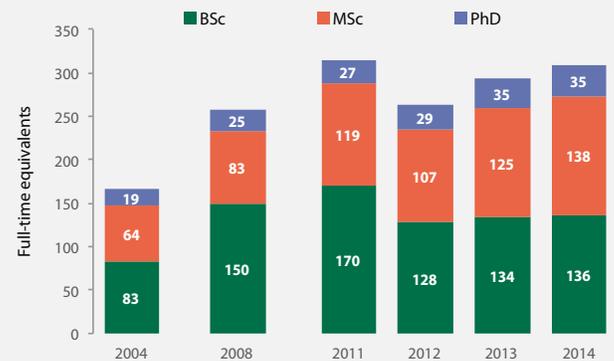
Institutional composition of Mozambique's agricultural research

The overall institutional composition of agricultural research in Mozambique changed little during 2004–2014, although IIAM's dominance in terms of agricultural researcher numbers expanded from 56 to 63 percent of the country's FTEs.



Mozambique's agricultural researchers by qualification level

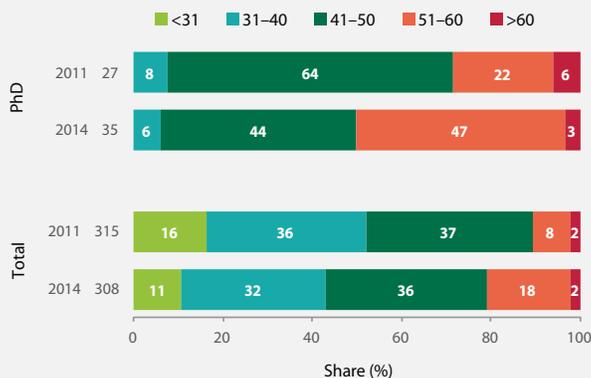
Expansion in the number of agricultural researchers during 2004–2011 was predominantly among those qualified to the BSc level. In contrast, overall numbers of MSc- and PhD-qualified researchers continued to rise during 2011–2014, but the number of BSc-qualified fell in both the government and higher education sectors.



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.

Mozambique's agricultural researchers by age bracket

In 2014, about 40 percent of Mozambique's agricultural researchers were in their 20s or 30s, down from 52 percent in 2011. Half of all PhD-qualified researchers were 51 years of age or older in 2014, representing a substantial increase over the 2011 share of 28 percent—driven by shifts in the age distribution of researchers employed at IIAM.



Mozambique's share of female researchers

The overall share of female researchers rose minimally during 2008–2014, from 33 to 35 percent. As of 2014, shares of women were fairly evenly distributed across qualification levels, but comparatively more female researchers were 50 years or older (41 percent).



By qualification level, 2014

BSc	35%	MSc	36%	PhD	32%
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By age bracket, 2014

< 41	38%	41–50	29%	> 50	39%
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Mozambique's MSc- and PhD-qualified agricultural researchers by discipline

As of 2014, Mozambique employed around 30 plant breeders and geneticists with postgraduate degrees, representing 17 percent of the country's MSc- and PhD-qualified researchers. Approximately three-quarters of these researchers were employed by IIAM. (Agro)forestry and veterinary medicine were other strong disciplines, accounting for 17 and 10 percent, respectively of all MSc- and PhD-qualified researchers.

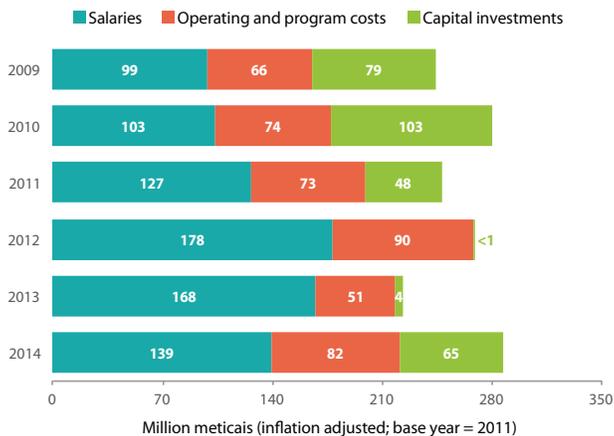
Agricultural researchers, 2014	FTEs		Share (%)	
	MSc	PhD	MSc	PhD
Plant breeding/genetics (incl. biotechnology)	23	7	17	20
Plant pathology	3	0.3	2	1
Plant physiology	0.4	1	0.3	3
Botany	0.3	—	0.2	—
Seed science and technology	4	—	3	—
Other crop sciences	6	1	4	3
Animal breeding/genetics	4	1	3	4
Animal husbandry	1	0.3	1	1
Animal nutrition	2	2	1	5
Dairy science	1	0.3	0.5	1
Poultry	1	—	0.5	—
Veterinary medicine	15	2	11	6
Zoology/entomology	2	1	2	2

Agricultural researchers, 2014	FTEs		Share (%)	
	MSc	PhD	MSc	PhD
Other animal and livestock	88	2	6	7
Forestry and agroforestry	27	2	19	6
Fisheries and aquatic resources	10	2	7	6
Soil sciences	1	0.3	0.4	1
Natural resources management	3	3	2	8
Water and irrigation management	3	0.3	2	1
Ecology	2	1	2	4
Biodiversity conservation	2	0.3	2	1
Food sciences and nutrition	8	2	6	7
Socioeconomics (incl. agricultural economics)	1	1	1	3
Extension and education	11	5	8	14
Total	137	35	100	100

Note: These are estimates based on an agency sample, representing 94 percent of the total number of FTE researchers.

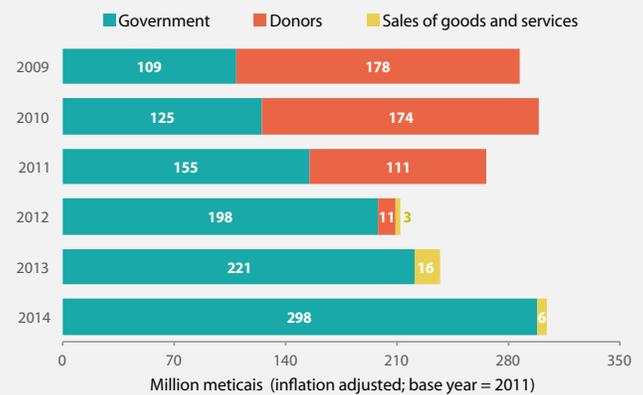
IIAM's spending by cost category

Spending across categories fluctuated over time at IIAM, largely based on shifts in government and donor support. Shares allocated to salaries increased substantially during 2012 and 2013, accompanied by considerable contractions in capital investments in those years. As of 2014, shares returned to a more balanced distribution.



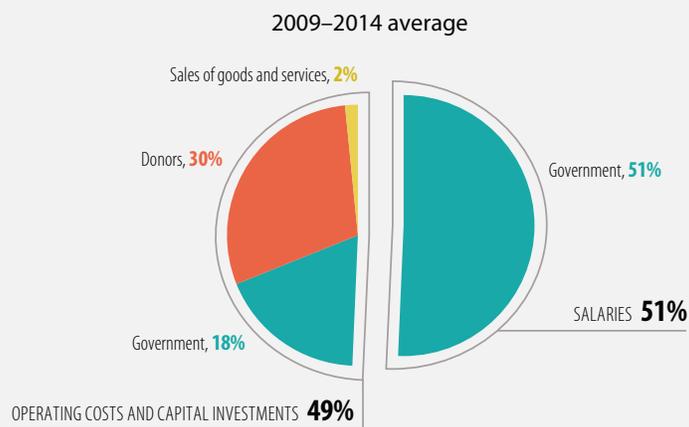
IIAM's funding sources

Donor contributions to IIAM declined during 2011–2012 and were nonexistent in 2013 and 2014. Government support gradually increased from 2011 (in inflation adjusted terms), ultimately compensating for the donor declines by 2014. From 2011 onward, IIAM also began generating small shares of revenues through the sale of goods and services.



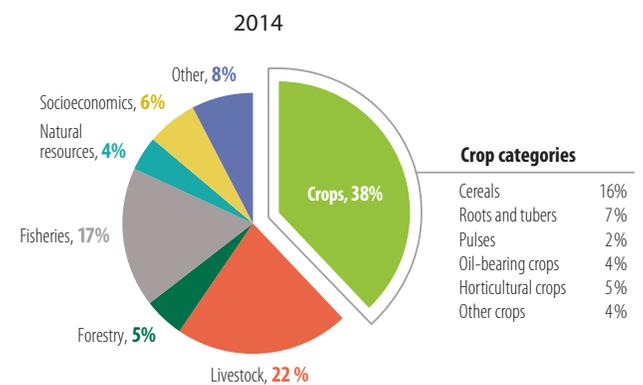
IIAM's spending and funding compared

The shift in shares of government and donor funding during 2009–2014 has meant that government contributions have increased to support not only salary-related expenses, but other costs as well. In 2014, based on its participation in APPSA, IIAM also began to receive funding through a World Bank loan.



Mozambique's agricultural researchers by area of focus

In 2014, 38 percent of the country's FTE researchers conducted crop research, whereas 22 percent undertook livestock research. Major crops under investigation were the cereals maize, rice, and cassava, followed by fruit, vegetables, sweet potatoes, beans, and soybeans.



IIAM's recently released crop varieties

IIAM, Mozambique's primary agricultural research agency, released 14 new varieties during 2013–2014, the majority of which were vegetables (cabbage, tomatoes, lettuce, and carrots).

Crop	Number of varieties, 2013–2014
Vegetables	10
Rice	3
Groundnut	1
Total	14

IIAM's recent peer-reviewed publications

IIAM published an average of 17 journal articles per year during 2012–2014, primarily in international journals. Publications per researcher averaged 0.1 per year.

Type	Number of publications, 2012–2014 annual average	
	IIAM	Per FTE researcher
Journal articles		
International	11.3	0.061
Regional	2.7	0.014
National	3.0	0.016
Books	0.3	0.002
Book chapters	0.0	0.000
Total	17	0.093

Resources for Mozambique

This factsheet presents recent data on the performance of agricultural research in Mozambique, 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 Mozambique 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 Mozambique and many other countries.



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

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MOZAMBIQUE

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Key Indicators Financial Resources Human Resources Research Focus Regional comparison

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
- APPSA** Agricultural Productivity Program for Southern Africa
- FTE(s)** full-time equivalent(s)
- IIAM** Agricultural Research Institute of Mozambique
- IIP** Fisheries Research Institute
- PPP(s)** purchasing power parity (exchange rates)
- R&D** research and development

ABOUT ASTI, IFPRI, AND IIAM

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 **Agricultural Research Institute of Mozambique (IIAM)** is the country's principal agricultural research agency. It falls under the Ministry of Agriculture and focuses on crop, livestock, forestry, and natural resources research.

ASTI/IFPRI and IIAM 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 IIAM.

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