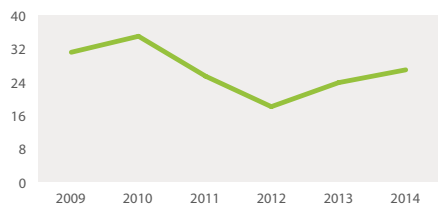




SWAZILAND

Nienke Beintema, Patricia Carmichael, and Sandra Perez

AGRICULTURAL RESEARCH SPENDING



Million emalangeni (2011 constant prices)

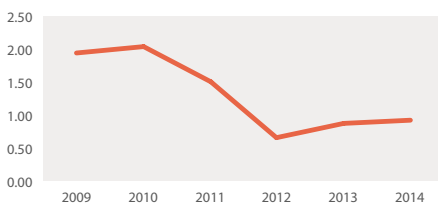
26.8

Million PPP dollars (2011 constant prices)

6.9

	SWAZILAND	BOTSWANA	LESOTHO	MOZAMBIQUE
Million emalangeni (2011 constant prices)	26.8			
Million PPP dollars (2011 constant prices)	6.9	21.3	2.4	29.3

SPENDING INTENSITY

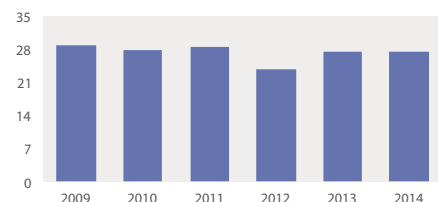


Agricultural research spending as a share of AgGDP

0.93%

Agricultural research spending as a share of AgGDP	0.93%	2.92%	0.94%	0.36%
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AGRICULTURAL RESEARCHERS



Full-time equivalents

27.4

Share of researchers with MSc and PhD degrees

90%

Full-time equivalents	27.4	137.8	45.6	308.4
Share of researchers with MSc and PhD degrees	90%	54%	46%	56%

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/Swaziland/directory for an overview of Swaziland's agricultural R&D agencies.



Declining government support

Government support to the country's main agricultural research agency, DARSS—which was already comparatively small—declined in recent years (in inflation-adjusted terms). As a result, funding levels have only been sufficient to cover staff salaries, causing a deterioration of infrastructure and equipment. DARSS has been successful in securing donor funding for various projects, which has compensated for the shortfall in government funding somewhat. Higher levels of funding are needed, however, if agricultural research in Swaziland is to become more productive and efficient.



Small institutional system

Swaziland's national research system is one of the smallest in Africa. It is also unique in that its university, UNISWA, employs more agricultural researchers (in FTEs) than does its main government research agency, DARSS. UNISWA also employs a comparatively high share of PhD-qualified researchers, whereas DARSS employed just one during 2009–2014. The total number of researchers employed at DARSS declined somewhat due to staff attrition and a slow recruitment process.



Positive policy developments

The recently approved national policy on agricultural research calls for improved priority setting. The policy also recommends that research platforms be established at both regional and national levels. It is intended that such platforms will facilitate interactions among stakeholders in determining the research agenda. In addition, a draft bill to form an agricultural research authority is currently awaiting parliamentary debate.

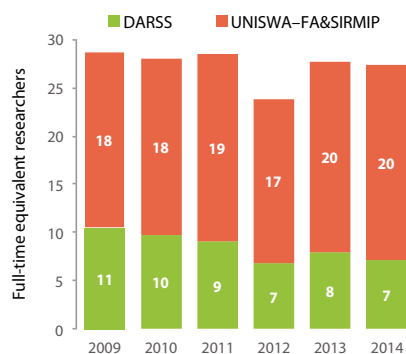


Underinvestment but high intensity

Swaziland's intensity ratio fell to 0.93 percent in 2014 as a result of declining spending levels. Although this level is close to the 1 percent minimum level recommended by the African Union and the United Nations, small countries like Swaziland generally require high investment in research and development because—in contrast with larger countries—they are unable to take advantage of economies of scale. As a result, basic research infrastructure and staffing demand greater investment.

Institutional composition of Swaziland's agricultural research

Being one of the smallest countries in Africa in terms of area and population, Swaziland has only three agencies involved in agricultural research: DARSS, a government agency, and two entities at UNISWA, the country's main university. In 2014, UNISWA employed 74 percent of the country's agricultural researchers, up from 63 percent in 2009.

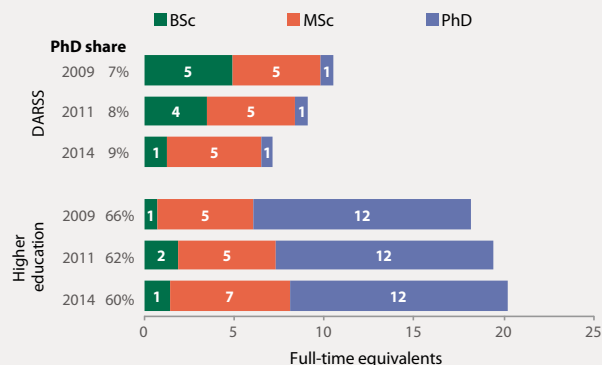


3 AGENCIES, 2014

Government	1
Higher education	2

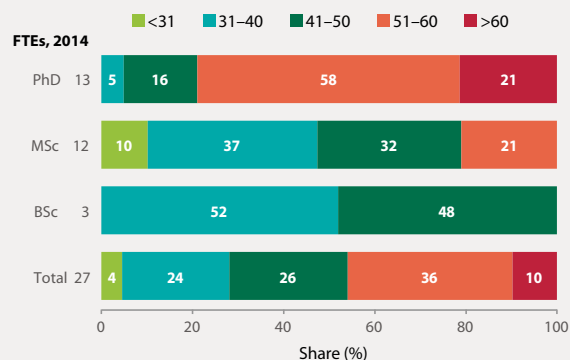
Swaziland's agricultural researchers by qualification level

DARSS employed only one PhD- and five MSc-qualified researchers during 2009–2014, but two DARSS researchers are currently undertaking PhD-training in South Africa. Unsurprisingly, UNISWA employed comparatively more PhD-qualified researchers. Its overall number of agricultural researchers (in FTEs) remained fairly constant during 2009–2014.



Swaziland's agricultural researchers by age bracket

In 2014, 79 percent of Swaziland's PhD-qualified agricultural researchers were in their 50s and 60s. Unsurprisingly, researchers qualified at the BSc- and MSc- level were considerably younger. Overall, the distribution of researchers by age shifted only marginally during 2011–2014.



Swaziland's share of female researchers

Overall, the share of female researchers in Swaziland remained almost constant during 2011–2014. UNISWA employed a slightly higher share of female researchers than did DARSS.



By qualification level, 2014

BSc	27%	MSc	34%	PhD	24%
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By institutional classification, 2014

DARSS	27%	UNISWA	31%
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Swaziland's MSc- and PhD-qualified agricultural researchers by discipline

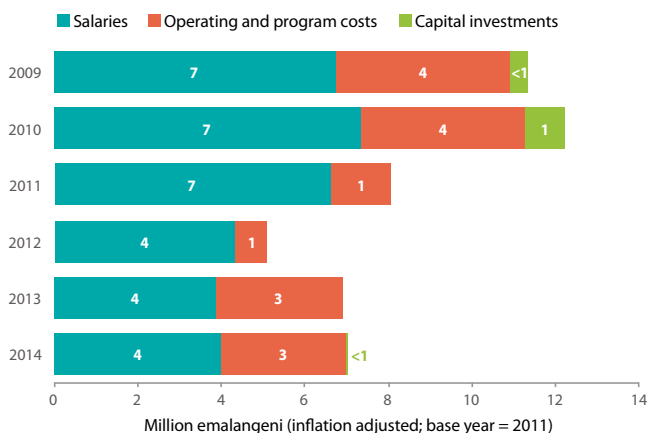
About one-third of Swaziland's MSc- and PD-qualified agricultural researchers are crop scientists. Socioeconomics and extension also constitute relatively strong disciplines. As of 2014, the country employed no PhD-qualified researchers in key areas such as plant breeding and soil science.

Agricultural researchers, 2014	FTEs		Share (%)	
	MSc	PhD	MSc	PhD
Plant breeding/genetics (incl. biotechnology)	1	–	8	–
Plant pathology	1	0.3	5	2
Seed science and technology	–	1	–	5
Other crop sciences	4	2	32	12
Animal breeding/genetics	–	0.3	–	2
Animal husbandry	–	1	–	5
Animal nutrition	–	0.3	–	2
Dairy science	–	0.3	–	2
Poultry	–	0.3	–	2
Veterinary medicine	–	0.3	–	2
Zoology/entomology	–	0.3	–	2
Forestry and agroforestry	–	–	–	–

Agricultural researchers, 2014	FTEs		Share (%)	
	MSc	PhD	MSc	PhD
Fisheries and aquatic resources	–	–	–	–
Soil sciences	1	–	8	–
Natural resources management	1	1	8	5
Water and irrigation management	–	0.3	–	2
Ecology	–	1	–	5
Biodiversity conservation	–	–	–	–
Food sciences and nutrition	1	1	8	7
Socioeconomics (incl. agricultural economics)	1	2	10	16
Extension and education	0.3	2	3	14
Other sciences	2	2	19	13
Total	12	13	100	100

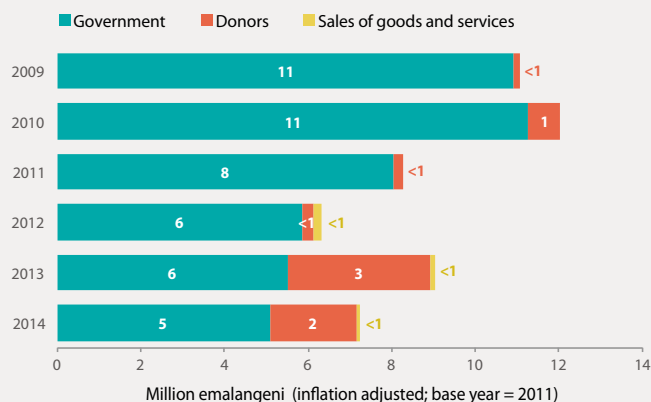
DARSS' spending by cost category

Due to falling government funding and resulting losses of staff, DARSS' salary bill declined during 2009–2014. Expenses for day-to-day operations and research activities fluctuated during this timeframe, and capital investments were minimal or nonexistent.



DARSS' funding sources

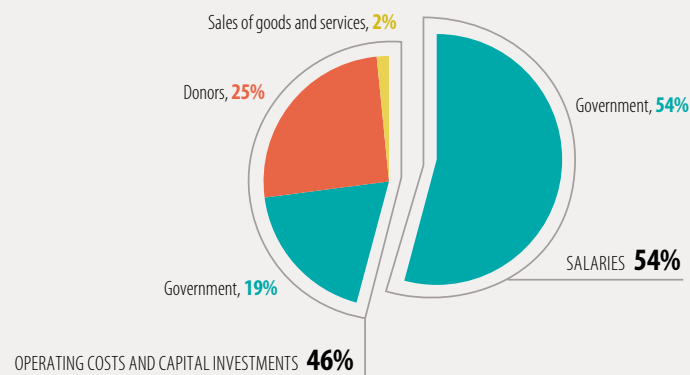
Economic crisis necessitated a significant decline in government funding to DARSS from 2011. Contributions from donors, such as FAO and CGIAR centers, increased, however. Although DARSS raised some revenues through the sale of goods and services, it did not benefit from these funds because they are channeled back to the national Treasury.



DARSS' spending and funding compared

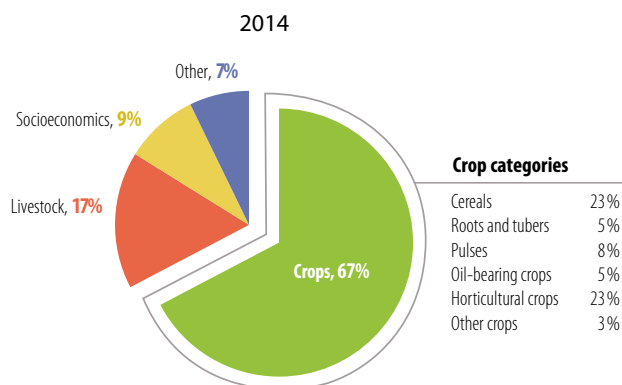
Although government contributions to DARSS declined, on average, contributions were sufficient to cover salaries and some other expenses. Spending on operating costs and capital investments was low, however; for example, the department has a serious shortage of vehicles.

2012–2014 average



Swaziland's agricultural researchers by area of focus

In 2014, 67 percent of the total agricultural researchers conducted crop research, and 17 percent undertook livestock research. That same year, 34 and 30 percent of all crop researchers focused on maize and vegetable research, respectively. Other major crops under investigation were beans and soybeans.



DARSS' recently released crop varieties

In 2013, DARSS released four maize varieties (three drought-tolerant and one higher yielding), as well as three bean varieties biofortified with zinc and iron. The department released no new varieties in 2012 or 2014, and UNISWA-FA released no new varieties during 2012–2014.

Crop	Number of varieties, 2013
Maize	4
Beans	3
Total	7

DARSS' and UNISWA-FA's recent peer-reviewed publications

In addition to 2 book chapters, UNISWA-FA published an average of 27 articles in international journals and 1 in national journals per year during 2012–2014. Unsurprisingly, DARSS' publication record was substantially lower. Publications per researcher averaged 1.2 per year.

Type	Number of publications, 2012–2014 annual average		Per FTE researcher
	DARSS	UNISWA-FA	
Journal articles			
International	0.3	27.0	1.142
Regional	0.3	0.0	0.014
National	0.0	1.0	0.042
Books	0.0	0.0	0.000
Book chapters	0.0	0.7	0.028
Total	0.7	28.7	1.226

Resources for Swaziland

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



ASTI's **agency directory** provides a view of agencies that conduct agricultural research in Swaziland, 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
- DARSS** Department of Agricultural Research and Specialist Services
- FAO** Food and Agriculture Organization of the United Nations
- FTE(s)** full-time equivalent(s)
- PPP(s)** purchasing power parity (exchange rates)
- R&D** research and development
- UNISWA-FA** University of Swaziland, Faculty of Agriculture and Consumer Sciences
- UNISWA-SIRMIP** University of Swaziland, Swaziland Institute for Research in Traditional Medicine, Medicinal Plants and Indigenous Food Plants

ABOUT ASTI, IFPRI, AND DARSS

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 **Department of Agricultural Research and Specialist Services (DARSS)**, Swaziland's principal agricultural research agency, falls under the Ministry of Agriculture and is responsible for the development and identification of agricultural production technologies to ensure food security and sustainable growth of the agro-business sector.

ASTI/IFPRI and DARSS 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 DARSS.