

# SENEGAL

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## KEY INDICATORS, 2000–2011

Total Public Agricultural Research Spending	2000	2008	2011
CFA francs (million constant 2005 prices)	5,989.3	6,001.4	6,230.8
PPP dollars (million constant 2005 prices)	23.8	23.8	24.8
<b>Overall Growth</b>		<b>0%</b>	
<b>Total Number of Public Agricultural Researchers</b>			
Full-time equivalents (FTEs)	133.3	134.3	112.2
<b>Overall Growth</b>		<b>1%</b>	
<b>Agricultural Research Intensity</b>			
Spending as a share of agricultural GDP	0.97%	0.82%	0.83%
FTE researchers per 100,000 farmers	4.55	3.72	2.85

Note: Acronyms, definitions, and an overview of agricultural R&D agencies are available on page 4.

► Agricultural R&D spending remained relatively constant during 2000–2011. Recent government reforms and the launch of the second phase of WAAPP (2013–2017) are expected to enhance future spending levels.

► The number of agricultural researchers employed at ISRA and at ITA has steadily declined in recent years, while researcher numbers in the higher education sector have increased.

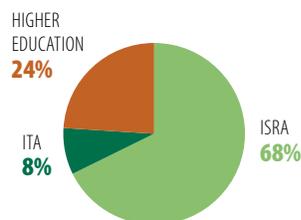
► The private sector plays an important role in agricultural R&D in Senegal compared with most countries of West Africa; in 2011, private companies accounted for 16 percent of the total number of (public and private) agricultural researchers.

## FINANCIAL RESOURCES, 2011

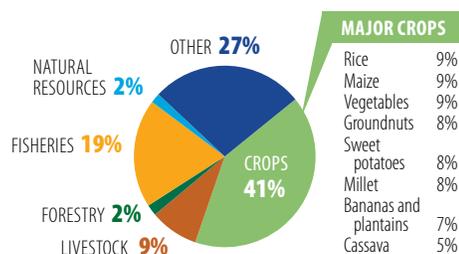
Spending Allocation	
Salaries	61%
Operating and program costs	30%
Capital investments	9%
Funding Sources	
Government	50%
Donors and development bank loans	31%
Sales of goods/services	19%

Note: Due to availability, financial data only include ISRA and ITA.

## INSTITUTIONAL PROFILE, 2011



## RESEARCH FOCUS, 2011

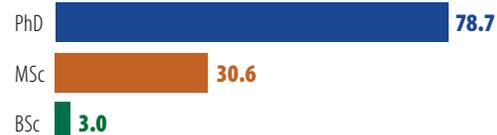


Notes: Major crops include those that are the focus of at least 5 percent of all crop researchers; 37 percent of total crop researchers focused on a wide variety of other crops.

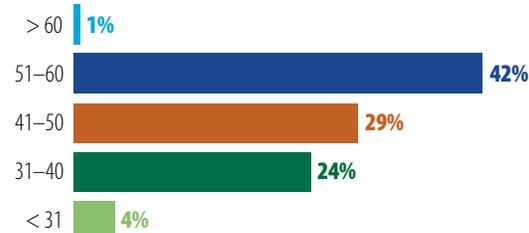
## RESEARCHER PROFILE, 2011



### Number by qualification (FTEs)



### Share by age group (years)



Note: Due to availability, gender and age data only include ISRA and ITA.

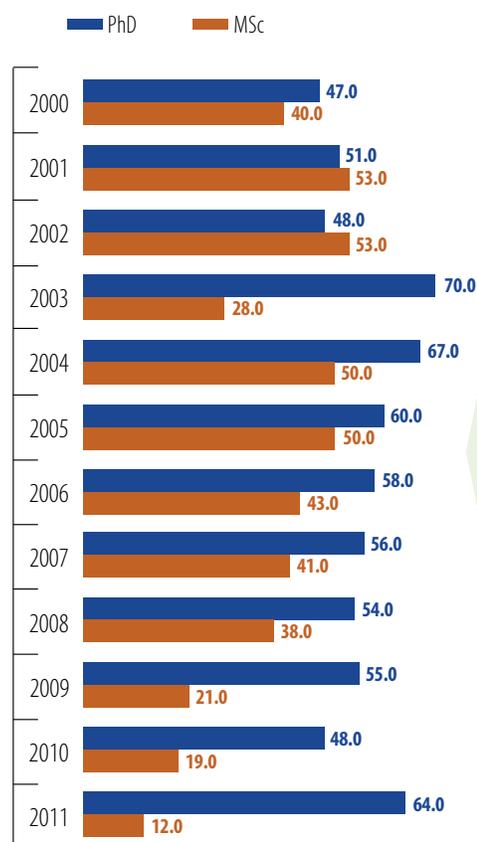
## CHALLENGE

- ▶ Recruitment restrictions, in combination with many highly qualified researchers retiring or leaving for more lucrative positions at the private sector and international organizations, have caused significant capacity losses at ISRA over the past decade. ISRA's current pool of researchers (and their skill mix) is inadequate for the institute to effectively accomplish its mandate.

## POLICY RESPONSE

- ▶ In 2012 the government more than doubled researchers' salary levels at ISRA and improved their promotional opportunities to halt the high attrition rate. In addition, to return capacity to the preferred level of about 130 researchers, it was determined that ten new researchers would be recruited and trained yearly over the next five years.

Number of researchers at ISRA by qualification level, 2000–2011 (FTEs)



The number of researchers employed at ISRA gradually fell between 2004 and 2011, mostly among those qualified to the MSc level. Nevertheless, the institute managed to maintain a relatively large capacity of PhD-qualified researchers. ISRA's pool of researchers remains one of the most highly qualified among West African national agricultural research institutes.

### ▶ REVERSING THE LOSS OF RESEARCH CAPACITY AT ISRA

Despite undertaking numerous training initiatives, ISRA continued to face significant challenges in retaining well-qualified staff because of large disparities in the salary levels it offered compared with those of the higher education and private sectors. To address this problem, in March 2012 the government approved large-scale increases to raise the base salaries of junior, midlevel, and senior researchers by 91, 108, and 128 percent, respectively. As a result, some salaries now exceed those of scientists at UCAD. These measures had a positive effect on the motivation of ISRA's researchers. Many of those who left the institute in recent years have shown interest in returning.

Another incentive measure involved changing opportunities for career advancement at ISRA. Prior to the 2012 changes, the only pathway by which researchers could advance was to become the head of a research center. With the changes, career advancement is now directly linked to a researcher's CAMES ranking, and high-ranking researchers can earn salaries equal to or higher than those of research center heads. Researchers are now motivated to publish extensively, excel in their fields, and commit to a career in research rather than in management. In the long run, however, additional factors—such as offering well-funded and coordinated research programs and well-equipped and maintained facilities—will be equally important.

Note: In 2011, ISRA employed 48 technical support staff with MSc degrees and 77 with BSc degrees. These staff members do not have official researcher status.

## CROSS-COUNTRY COMPARISONS OF KEY INDICATORS

	Total number of researchers, 2011 (FTEs)	Growth in number of researchers, 2008–2011	Share of PhD researchers, 2011 (FTEs)
<b>Senegal</b>	<b>112.2</b>	<b>-16%</b>	<b>70%</b>
Mali	307.0	-4%	33%
Burkina Faso	218.0	-12%	48%
Mauritania	62.9	-12%	25%

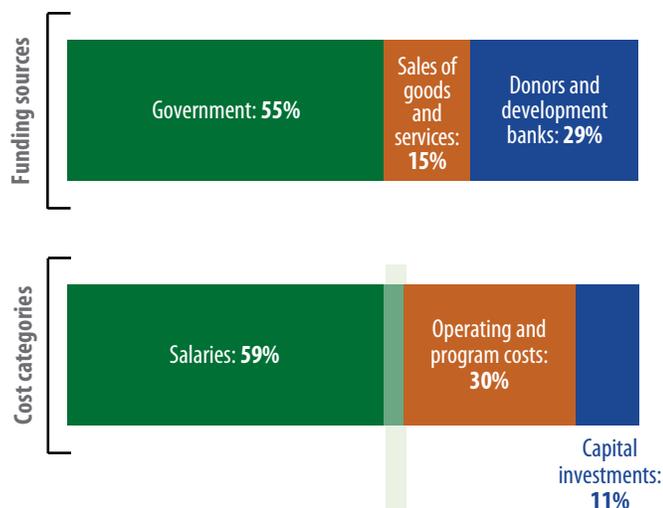
## CHALLENGE

- ▶ Since the government only funds researcher salaries, the costs of research programs and the capital investments required to develop and maintain R&D infrastructure at ISRA and ITA are largely dependent on revenues generated internally and on contributions from donors and development banks. WAAPP has funded extensive training for researchers, as well as the rehabilitation of equipment for research on millet, sorghum, and maize. R&D programs on Senegal's priority crops, rice and groundnuts, however, remain underfunded.

## POLICY OPTIONS

- ▶ The government needs to clearly identify its long-term R&D priorities and secure stable and sustainable funding for R&D programs. Donor funding also needs to be aligned with national priorities to ensure the consistency and complementarity of resulting research programs. Rehabilitation of research equipment and infrastructure is urgently needed.

ISRA's funding sources and cost categories, 2009–2011



More than half of ISRA's funding during 2009–2011 was derived from the national government, yet contributions were insufficient to cover the cost of ISRA's total salary bill. The shortfall in salaries as well as the institute's operating, program, and capital expenses are entirely financed by donors, development bank loans, and income generated internally through the sale of seeds, vaccines, and fruit plants or through research conducted on behalf of the private sector.

### ▶ WAAPP EMBRACES TECHNOLOGY TO BOOST PRODUCTIVITY OF DRYLAND CEREALS

WAAPP is a subregional program co-financed by World Bank loans, a multi-donor trust fund, and national governments for the purpose of increasing the productivity of priority crops in West Africa. The program aims to facilitate regional cooperation in generating and disseminating agricultural technology and to establish national centers of specialization to strengthen the alignment of national and regional priorities. Senegal was selected as home to the subregion's center of excellence for dryland cereals, and received a budget of CFA 7.5 billion for the 2008–2012 period. Most of this funding was allocated to short-term and degree-level training for researchers (in Ghana, Kenya, the United States, and Canada) and to the rehabilitation of laboratories and equipment for research on cereals. WAAPP also funds a competitive research scheme, FNRAA, which accepts multidisciplinary research proposals from stakeholders. Roughly 35 percent of the projects submitted by ISRA were funded during the first phase of WAAPP. UCAD had more success in securing FNRAA funding than ISRA.

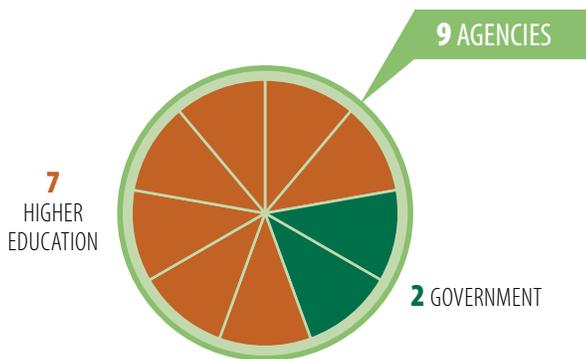
The first phase of WAAPP in Senegal is widely regarded as a success. Three new millet varieties and four new sorghum varieties were released, and around 70 new technologies were generated and successfully disseminated to farmers. Yield increases and the sheer number of farmers adopting the new varieties and technologies were much larger than anticipated at the onset of the project. In 2013, the World Bank approved a second phase of WAAPP in Senegal with a total budget of roughly CFA 30 billion for 2013–2017. The scope of this phase has been widened to also cover the livestock and horticulture sectors, and capacity strengthening will play an even more important role. Moreover, unlike in phase I, ITA will also benefit from WAAPP funding during phase II.

## CROSS-COUNTRY COMPARISONS OF KEY INDICATORS *continued*

	Total spending, 2011 (million 2005 PPP dollars)	Overall spending growth, 2008–2011	Spending as a share of AgGDP, 2011
<b>Senegal</b>	<b>24.8</b>	<b>4%</b>	<b>0.83%</b>
Mali	33.6	33%	0.61%
Burkina Faso	25.4	29%	0.42%
Mauritania	8.9	22%	0.80%

## OVERVIEW OF SENEGAL'S AGRICULTURAL RESEARCH AGENCIES

Nine public agencies conduct agricultural R&D in Senegal. ISRA (employing 76 FTE researchers in 2011) is by far the largest of these, accounting for two-thirds of Senegal's agricultural researchers in 2011 (in FTEs). The institute holds a broad mandate covering crops, livestock, forestry, fisheries, and socioeconomic research. ITA (employing 9 FTEs in 2011) conducts research on the storage, conservation, and processing of agricultural products and is the only other government agency involved in agricultural R&D in Senegal. An estimated 27 FTEs conducted agricultural research in the higher education sector in 2011, most of which were employed at UCAD and UGB. Compared with many other African countries, the private sector plays a relatively important role in agricultural R&D in Senegal. While the government sector dominates agricultural R&D in the area of food crops, companies like SENCHIM, Suneor, SODEFITEX, and SPIA are major innovators in the production (and processing) of groundnuts and cotton, Senegal's principal export crops.



 For a complete list of the agencies included in ASTI's dataset for Senegal, visit [www.asti.cgiar.org/senegal](http://www.asti.cgiar.org/senegal).

## 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.
- ▶ **Public agricultural research** includes research conducted by government agencies, higher education agencies, and nonprofit institutions.
- ▶ 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 2005 local currencies and **2005 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, due to **decimal rounding**, the percentages presented can sum to more than 100.

 For more information on ASTI's data procedures and methodology, visit [www.asti.cgiar.org/methodology](http://www.asti.cgiar.org/methodology); for more information on agricultural R&D in Senegal, visit [www.asti.cgiar.org/senegal](http://www.asti.cgiar.org/senegal).

## ACRONYMS USED IN THIS FACTSHEET

<b>CAMES</b>	African and Malagasy Council for Higher Education
<b>FNRAA</b>	National Agricultural and Food Research Fund
<b>FTE(s)</b>	Full-time equivalent (researchers)
<b>GDP</b>	Gross domestic product
<b>ISRA</b>	Senegalese Agricultural Research Institute
<b>ITA</b>	Food Technology Institute
<b>PPP(s)</b>	Purchasing power parity (exchange rates)
<b>R&amp;D</b>	Research and development
<b>SENCHEM</b>	Chemical Commercialization Company
<b>SODEFITEX</b>	Textile Fiber Development Company
<b>SPIA</b>	Industrial and Agricultural Products Company
<b>UCAD</b>	Cheikh Anta Diop University
<b>UGB</b>	Gaston Berger University
<b>WAAPP</b>	West Africa Agricultural Productivity Program

## ABOUT ASTI, IFPRI, AND ISRA

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 **Senegalese Agricultural Research Institute (ISRA)** is Senegal's principal agricultural research agency. It falls under the Ministry of Agriculture and Rural Infrastructure and focuses on crop, livestock, forestry, fisheries, and socioeconomic research.

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