



# GHANA

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## KEY INDICATORS, 2000–2011

Total Public Agricultural Research Spending	2000	2008	2011
Cedis (million constant 2005 prices)	15.8	21.3	25.3
PPP dollars (million constant 2005 prices)	42.5	57.2	68.1
<b>Overall Growth</b>		<b>34%</b>	<b>19%</b>
Total Number of Public Agricultural Researchers			
Full-time equivalents (FTEs)	469.6	499.0	607.0
<b>Overall Growth</b>		<b>6%</b>	<b>22%</b>
Agricultural Research Intensity			
Spending as a share of agricultural GDP	0.59%	0.61%	0.69%
FTE researchers per 100,000 farmers	9.81	8.65	9.74

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

Public agricultural R&D spending continued to increase during the 2008–2011 period. Growth was strongest at Ghana’s universities, although the CSIR institutes and CRIG also reported increases in spending levels during this period.

Although government support to CSIR has remained strong, government funding only covers CSIR’s salary bill and a very small share of its day-to-day operating costs. CSIR’s institutes are almost fully dependent on donor funding for their research activities.

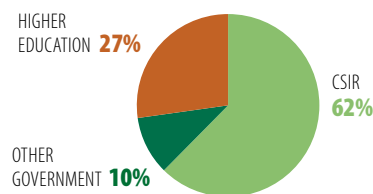
The total number of researchers increased, especially at the higher education agencies. Researchers’ qualifications also improved over time, on average. Staff aging remains an area of concern at some CSIR institutes and higher education agencies, as well as in some disciplines.

## FINANCIAL RESOURCES, 2011

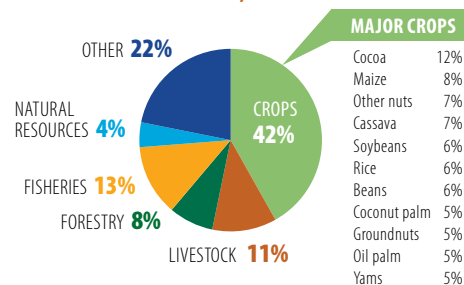
Spending Allocation	
Salaries	79%
Operating and program costs	21%
Capital investments	0.4%
Funding Sources	
Government	84%
Donors	8%
Development bank loans	1%
Sales of goods and services	5%
Other	1%

Note: Shares are based on data for CSIR only.

## INSTITUTIONAL PROFILE, 2011



## RESEARCH FOCUS, 2011



Notes: Major crops include those that are the focus of at least 5 percent of all crop researchers; 30 percent of total crop researchers focused on a wide variety of other crops.

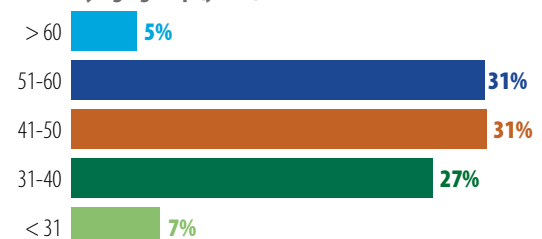
## RESEARCHER PROFILE, 2011



### Number by qualification (FTEs)



### Share by age group (years)



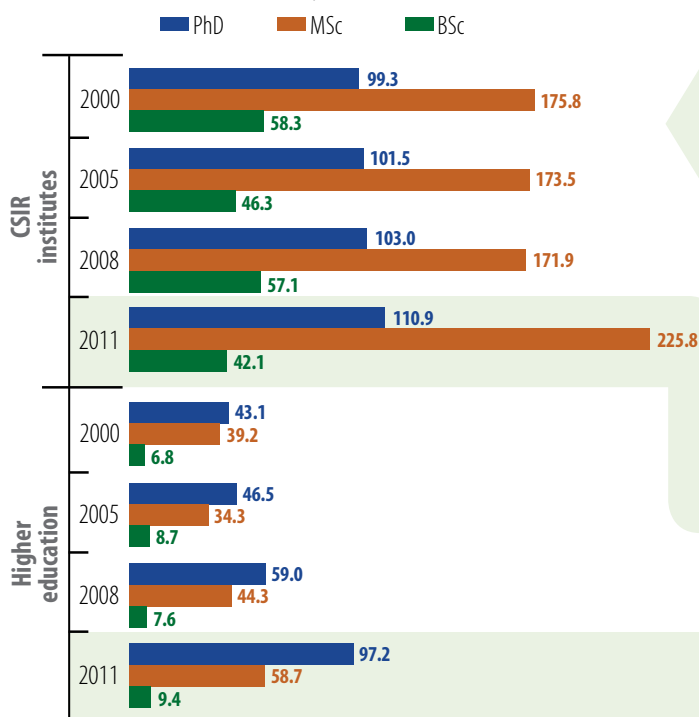
## OBSERVATIONS

- ▶ The number of PhD-qualified researchers at CSIR is comparatively low given the level of specialization required across the institutes. In efforts to curb the high turnover of researchers, in 2012 the government increased the salaries of CSIR researchers to introduce parity with university researchers. This measure has significantly improved staff morale and motivation, as well as the attrition rate.

## POLICY OPTIONS

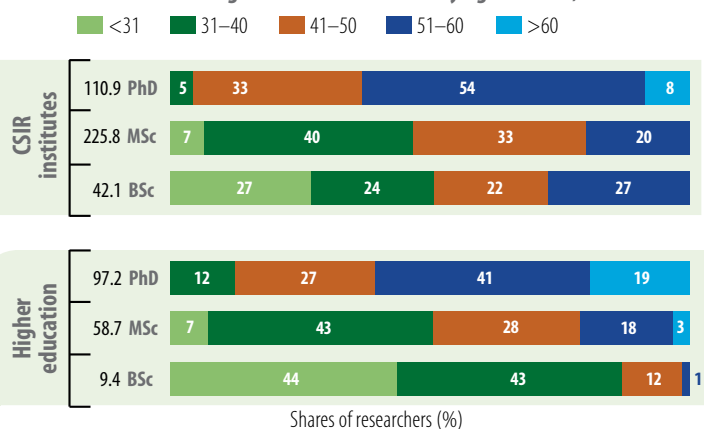
- ▶ Developing sound training and succession plans will be key to filling existing and anticipated staffing gaps at CSIR's institutes. PhD-level training and mentoring junior scientists will need to be a priority. In addition, CSIR management will need to create a more conducive work environment by developing opportunities for scientific achievement and career advancement. Raising the retirement age to 65 years would also ameliorate the impending loss of senior researchers in the short- to medium-term.

**Total number of researchers by qualification level, 2000–2011 (FTEs)**



The number of researchers at the CSIR institutes increased slightly during 2000–2011, and most of this growth occurred among researchers qualified to the MSc-degree level. The number of researchers with BSc degrees fell, whereas the number of PhD-qualified researchers increased somewhat. Although the higher education sector employs far fewer agricultural researchers (in FTEs), their numbers increased considerably over time, especially at the PhD level.

**Distribution of agricultural researchers by age bracket, 2011**



Note: In 2011, the CSIR institutes and higher education agencies employed 52.6 and 23.1 FTE technical support staff trained to the BSc level, respectively. These staff members do not have official researcher status.

In 2011, about 60 percent of PhD-qualified researchers employed at the CSIR institutes and at higher education agencies were over 50 years of age, whereas about half the researchers qualified to the MSc level were under 41 years of age.

## 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>Ghana</b>	<b>607.0</b>	<b>22%</b>	<b>38%</b>
Nigeria <sup>a</sup>	2,687.6	31%	25%
Senegal	112.2	–16%	70%
Kenya	1,150.9	13%	32%

<sup>a</sup> Share of PhD researchers applies to ARCN agencies only.

## CHALLENGE

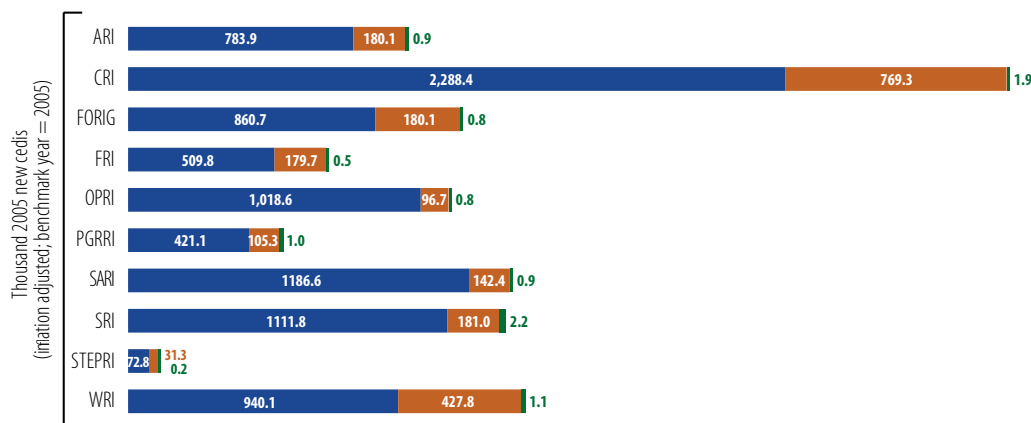
- ▶ Although government support to CSIR has remained strong, it is only sufficient to cover the cost of staff salaries, with little remaining for the operating costs or capital investments associated with conducting research. The institutes are almost fully dependent on donors to fund their research activities, and this source is both uncertain and can potentially skew the research agenda away from national priorities.

## OBSERVATION

- ▶ The government mandated that the institutes generate a significant share of their financial resources through commercial means. This may be a difficult goal based on the level of funding required, lack of capacity to generate funds internally, and challenges in securing intellectual property rights.

### Spending levels of CSIR institutes by cost category, 2011

■ Salaries ■ Operating and program costs ■ Capital investments

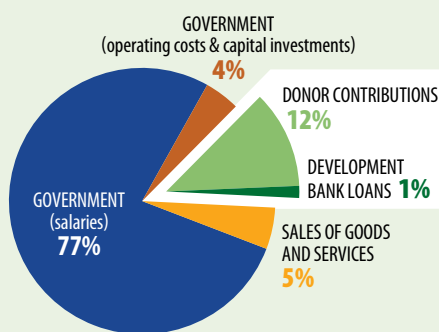


CRI accounted for about 25 percent of CSIR's agricultural research spending in 2011. STEPRI accounted for the smallest share of spending, reflecting its broad science policy mandate including non-agricultural issues. The remaining eight institutes reported spending levels in the range of 0.8 and 1.3 million constant 2005 cedis.

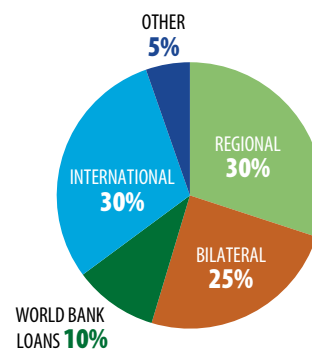
### ▶ DONOR FUNDING TO CSIR'S RESEARCH PROGRAMS

During 2009–2012, the majority of research funding from donors was derived from regional agencies, international organizations, and bilateral donors—predominantly the European Union and CGIAR centers. World Bank—loan funding, mostly through WAAPP, accounted for 10 percent of the total donor funding during this timeframe. Specific CSIR institutes—in particular, CRI, FORIG, FRI, and SARI—received significant donor funding for their research activities. WAAPP has become an important donor for CRI, SARI, and SRI.

### Allocation of CSIR institutes' funding sources, 2009–2012 average



### Donor funding allocation by category, 2009–2012 average

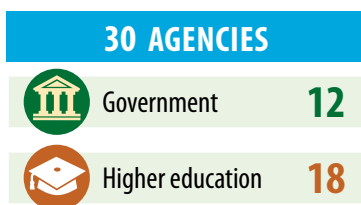


## CROSS-COUNTRY COMPARISONS OF KEY INDICATORS *continued*

	Total spending, 2011 (million 2005 PPP dollars)	Overall spending growth, 2008–2011	Spending as a share of AgGDP, 2011
Ghana	68.1	19%	0.69%
Nigeria	393.9	-2%	0.33%
Senegal	24.8	4%	0.83%
Kenya	188.1	11%	1.21%

## OVERVIEW OF GHANA'S AGRICULTURAL RESEARCH AGENCIES

Thirty public agencies conduct agricultural R&D in Ghana. The main government research organization, CSIR, encompasses 13 research institutes, 10 of which conduct agricultural research (employing a combined total of 379 FTE researchers in 2011). CSIR operates largely autonomously under the Ministry of Environment, Science, Technology, and Innovation and collectively accounts for more than 60 percent of the country's agricultural researchers (in FTEs). CSIR institutes conduct agricultural research on crops, livestock, forestry, Savannah agricultural crops, soil, water, food, oil palm, plant genetic resources, and science and technology policy. The other government institutes involved in agricultural research are CRIG (51 FTEs), which conducts research on tree crops (cocoa, coffee, kola, and cashews), and the Marine Fisheries Research Division (12 FTEs), which focuses on marine fisheries. Eighteen higher education agencies—comprising faculties, departments, and institutes—conduct agricultural R&D. The most significant are the University of Ghana (66 FTEs), Kwame Nkrumah University of Science and Technology (41 FTEs), University of Cape Coast (27 FTEs), and University for Development Studies (28 FTEs). Nonprofit and for profit private companies, although engaged in some collaboration with the government and higher education agencies, have minimal involvement in agricultural R&D.



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

## 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 Ghana, visit [www.asti.cgiar.org/ghana](http://www.asti.cgiar.org/ghana).

## ACRONYMS USED IN THIS FACTSHEET

<b>CRI</b>	Crop Research Institute
<b>CRIG</b>	Cocoa Research Institute of Ghana
<b>CSIR</b>	Council for Scientific and Industrial Research
<b>FORIG</b>	Forestry Research Institute of Ghana
<b>FRI</b>	Food Research Institute
<b>FTE(s)</b>	Full-time equivalent (researchers)
<b>OPRI</b>	Oil Palm Research Institute
<b>PGRRI</b>	Plant Genetic Resources Research Institute
<b>PPP(s)</b>	Purchasing power parity (exchange rate)
<b>R&amp;D</b>	Research and development
<b>STEPRI</b>	Science and Technology Policy Research Institute
<b>SARI</b>	Savanna Agricultural Research Institute
<b>SRI</b>	Soil Research Institute
<b>WAAPP</b>	West Africa Agricultural Productivity Program

## ABOUT ASTI, IFPRI, AND STEPRI

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 **Science and Technology Policy Research Institute (STEPRI)** is one of the 13 research agencies under the Council for Scientific and Industrial Research (CSIR). The institute provides research support for the formulation of policies to promote innovation and create the enabling conditions for the effective use of S&T for socioeconomic development.

ASTI/IFPRI and STEPRI gratefully acknowledge participating agricultural R&D agencies for their contributions to the data collection and preparation of this country factsheet. ASTI also thanks the Bill and Melinda Gates Foundation for its 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 STEPRI.