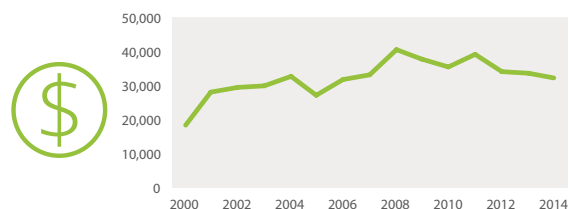


NIGERIA

Nienke Beintema, Abdullahi Mohammed Nasir, and Lang Gao

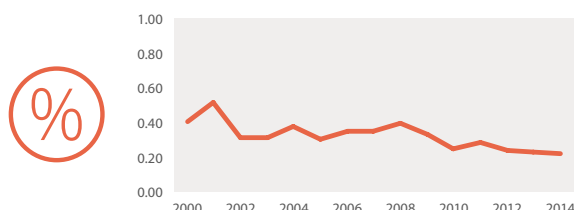
AGRICULTURAL RESEARCH SPENDING



Million naira
(2011 constant prices) **32,245.8**

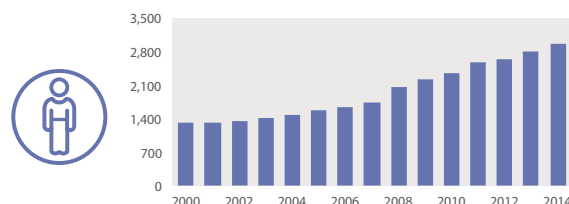
Million PPP dollars
(2011 constant prices) **433.5**

SPENDING INTENSITY



Agricultural research
spending as a share
of AgGDP **0.22%**

AGRICULTURAL RESEARCHERS



Full-time
equivalents **2,975.5**

Share of researchers with
MSc and PhD degrees **33%**

Notes: Data above are for 2014. The 2009–2014 values include estimates for the higher education sector based on 2008 data. 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/Nigeria/directory for an overview of Nigeria's agricultural R&D agencies.



Lack of funding diversity

By virtue of size, Nigeria continues to lead Africa south of the Sahara in terms of agricultural research capacity and investment; nevertheless, spending levels declined in recent years (in inflation-adjusted terms). The country's investment in agricultural research as a share of AgGDP fell from an already low 0.39 percent in 2008 to 0.22 percent in 2014. The country's agricultural research funding is mainly provided by the government, with donors and other sources constituting a very small share of the total amount (only 1.2 percent per year on average during 2009–2014).



Human capacity constraints

After a period of steady growth, agricultural researcher numbers in the government sector stagnated during 2011–2014. As of 2014, close to two-thirds of the sector's senior researchers were approaching retirement age, making recruitment and training of young scientists to the PhD level an urgent priority. The first phase of WAAPP (2012–2016) funded PhD- and MSc-level training for 14 and 17 scientists, respectively. Nonetheless, much more training and recruitment is needed to tackle the imminent agricultural research capacity losses that Nigeria's government sector is facing.



Outdated infrastructure

With low levels of capital investment, Nigeria's agricultural research infrastructure remains underequipped, understandably having negative impacts on the quality and quantity of research outputs. Investment in the rehabilitation of research centers—other than those being rehabilitated under WAAPP—is crucial to the performance of effective research, to retaining and motivating researchers, and to the development of high-quality outputs. Therefore, funding for investments in research infrastructure and equipment needs to be sought urgently from the government and other sources.

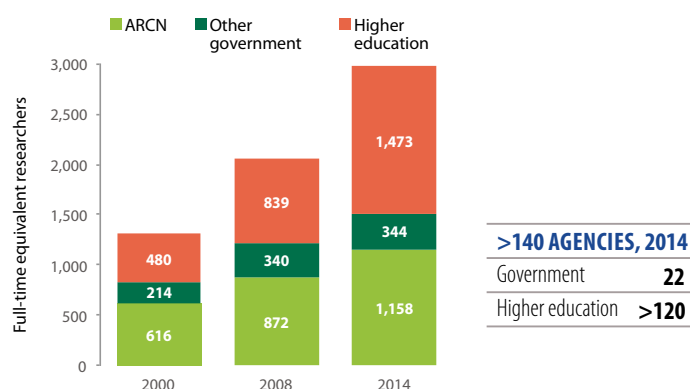


ARC N's ongoing reform process

Although ARC N is formally mandated to coordinate agricultural research in Nigeria, it does not have the power to allocate financial resources to institutes under its umbrella. To address this, the government is in the process of reforming ARC N along the lines of India's ICAR and Brazil's Embrapa. This is an important step in overcoming the financial and human resource constraints ARC N currently faces. It is intended that the legislation creating the new entity will encompass improved governance structures, more effective budgeting processes, and a broader funding base.

Institutional composition of national agricultural research

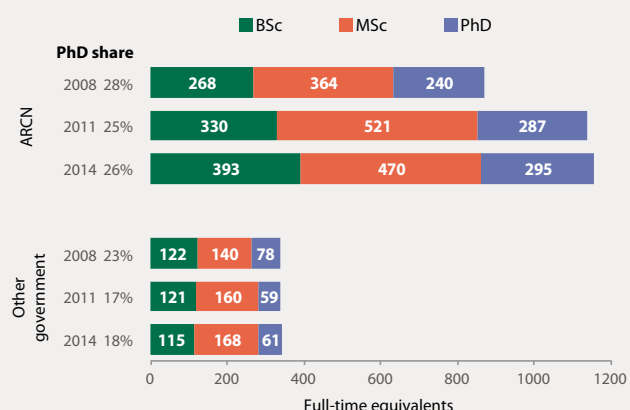
Agricultural researcher numbers rose steadily during 2009–2014 (in FTEs), not only among ARC's institutes, but also in the higher education sector given growth in the number and size of public and private universities. As of 2014, it is estimated that more than 100 higher education agencies employed about half the country's agricultural researchers.



Note: Data for the higher education sector in 2014 were estimated based on data for 2008.

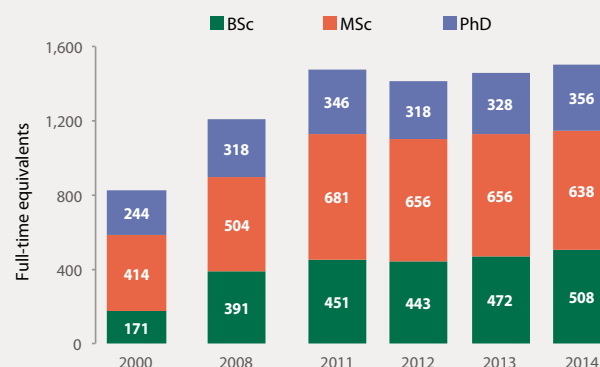
ARC and other government agricultural researchers by qualification level

Although the absolute number of PhD-qualified researchers employed at ARC's institutes increased during 2000–2014, ARC's overall share fell slightly due to stronger growth among BSc- and MSc-qualified researchers. The absolute number of researchers with PhD degrees employed at the other government agencies declined somewhat over this timeframe.



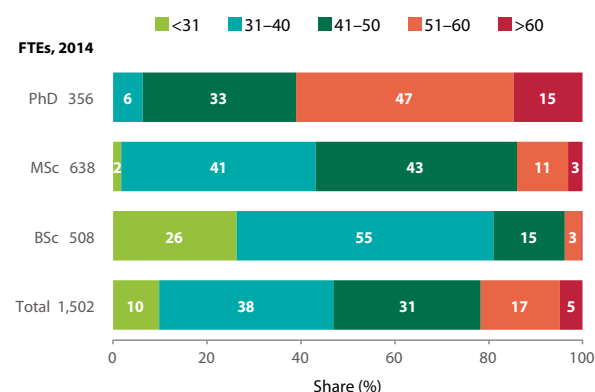
Government sector's agricultural researchers by qualification level

Following a period of strong growth during 2000–2011, the total number of researchers employed by the government sector stagnated during 2011–2014. This stagnation occurred across all three qualifications levels but varied substantially by individual agency.



Government sector's agricultural researchers by age bracket

As of 2014, more than 60 percent of the PhD-qualified researchers employed by the government sector were in their 50s or 60s, hence approaching retirement. Fourteen young ARC researchers were undertaking or had completed PhD training at Nigerian universities as part of WAAPP. Much more PhD training is needed, however, to maintain long-term capacity at the levels required.



MSc- and PhD-qualified agricultural researchers in the government sector by discipline

Among PhD-qualified researchers employed by the government sector, veterinary medicine, fisheries/aquatic resources, socioeconomics, and extension/education constitute the largest disciplines, each accounting for 10 percent or more of all government-sector researchers qualified to the PhD level as of 2014. The discipline mix among MSc-qualified researchers was more diverse.

Agricultural researchers, 2014	FTEs		Share (%)	
	MSc	PhD	MSc	PhD
Plant breeding/genetics (incl. biotechnology)	42	28	7	8
Plant pathology	26	29	4	8
Plant physiology	40	23	6	6
Botany	10	3	2	1
Seed science and technology	7	4	1	1
Other crop sciences	15	21	2	6
Animal breeding/genetics	13	5	2	1
Animal husbandry	—	1	—	0.4
Animal nutrition	11	28	2	8
Dairy science	3	—	1	—
Poultry	3	2	1	1
Veterinary medicine	99	29	15	8
Zoology/entomology	43	30	7	8
Other animal and livestock	4	3	1	1

Agricultural researchers, 2014	FTEs		Share (%)	
	MSc	PhD	MSc	PhD
Forestry and agroforestry	3	2	0.5	0.4
Fisheries and aquatic resources	84	29	13	8
Soil sciences	42	34	7	9
Natural resources management	13	1	2	0.4
Water and irrigation management	9	3	1	1
Ecology	3	5	1	2
Biodiversity conservation	2	—	0.3	—
Food sciences and nutrition	31	11	5	3
Socioeconomics (incl. agricultural economics)	73	32	11	9
Extension and education	62	33	10	9
Other sciences	—	—	—	—
Total	638	356	100	100

Note: Data are estimates based on an agency sample representing 74 percent of the total number of FTE researchers employed in the government sector.

Share of agricultural female researchers in the government sector

The share of female agricultural researchers in the government sector rose from 25 percent in 2008 to 29 percent in 2014. As of 2014, female researchers were comparatively younger and less well-qualified than their male colleagues.



By qualification level, 2014

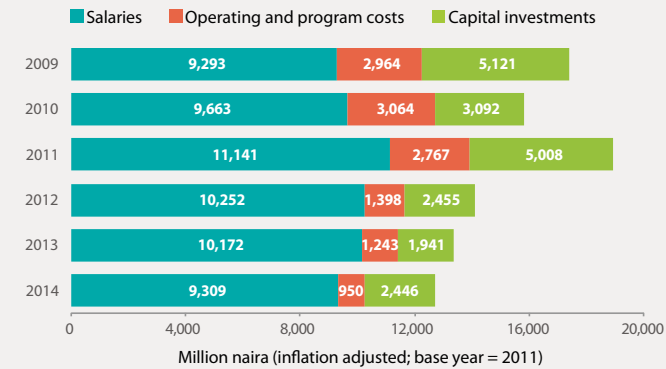
BSc	35%	MSc	30%	PhD	20%
-----	-----	-----	-----	-----	-----

By age bracket, 2014

< 41	40%	41–50	23%	> 50	17%
------	-----	-------	-----	------	-----

ARCN's spending by cost category

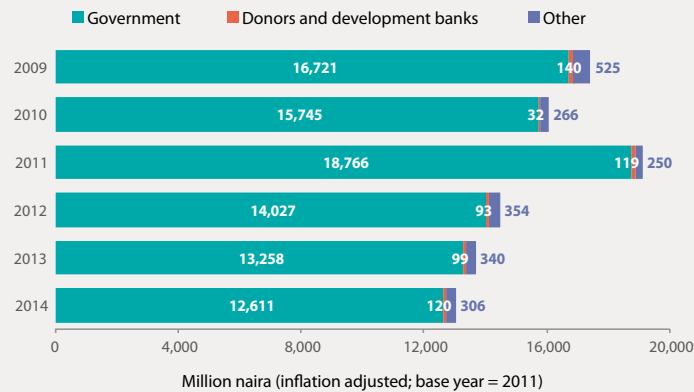
Salaries accounted for about two-thirds of spending by ARCN's institutes during 2009–2014. Nonsalary-related spending by the council's institutes—that is, operating and program costs and capital investments—declined during this period despite investments in infrastructure associated with WAAPP.



Note: Data are based on 15 institutes under the ARCN umbrella.

Sources of ARCN's funding

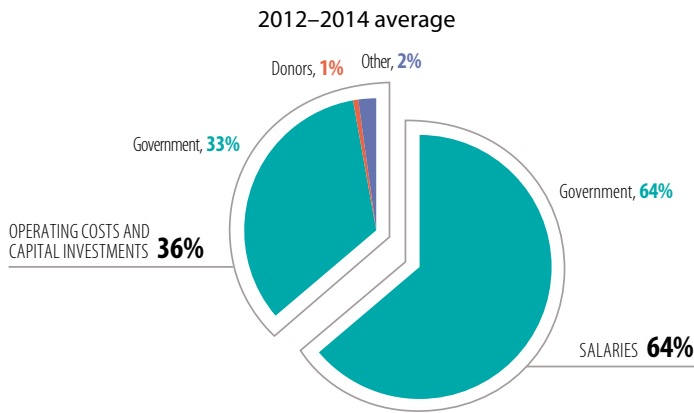
ARCN's institutes are almost fully funded by the Nigerian government, although a small share was derived through the World Bank–funded WAAPP. Nevertheless the council's institutes still lack research-related infrastructure, facilities, and equipment.



Note: Data are based on 15 institutes under the ARCN umbrella.

ARCN's spending and funding compared

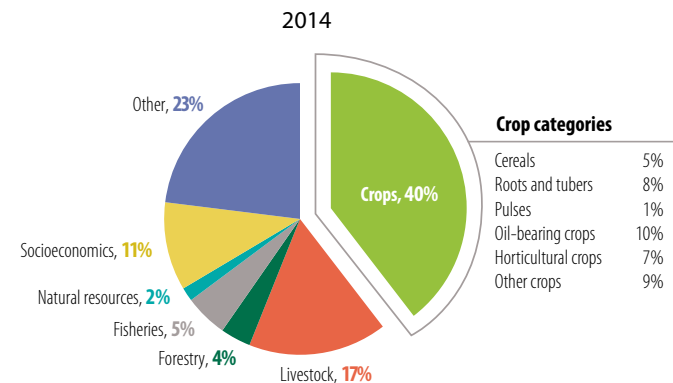
Government support to ARCN's institutes encompasses all major spending categories (salaries and related expenses, operating and program costs, and capital investments). Other sources of funding—such as through donors, the sale of goods and services, or commodity levies—is negligible and in 2009–2014 averaged only 3 percent.



Note: Data are based on 15 institutes under the ARCN umbrella.

Agricultural researchers in the government sector by area of focus

In 2014, 40 percent of the government sector's FTE researchers conducted crop research. Noticeably, 23 percent of the researchers undertook research in other areas, such as on-farm harvesting and agricultural engineering. Major crops investigated were soybeans, vegetables, fruit, and cocoa.



Recent peer-reviewed publications by government-sector researchers

During 2012–2014, agricultural researchers employed in the government sector published a large number of journal articles, books, and book chapters. At 0.6, the average number of peer-reviewed publications per researcher per year is comparatively high.

Type	Number of publications, 2012–2014 annual average	Per FTE researcher
Journal articles		
International	282.0	0.216
Regional	82.0	0.063
National	258.3	0.198
Books	9.0	0.007
Book chapters	112.0	0.086
Total	743.3	0.569

Note: Due to lack of availability, data exclude two of ARCN's institutes: the Institute of Agricultural Research and the National Root Crops Research Institute.

Resources for Nigeria

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



ASTI's **agency directory** provides a view of agencies that conduct agricultural research in Nigeria, 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
ARCN	Agricultural Research Council of Nigeria
Embrapa	Brazilian Agricultural Research Corporation
FTE(s)	full-time equivalent(s)
ICAR	Indian Council of Agricultural Research
NARS	national agricultural research system
PPP(s)	purchasing power parity (exchange rates)
R&D	research and development
WAAPP	West Africa Agricultural Productivity Program

ABOUT ASTI, IFPRI, AND ARCEN

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 Council of Nigeria (ARCEN)** is a parastatal under the Federal Ministry of Agricultural and Rural Development. The council is responsible for the guidance and coordination of agricultural research activities in Nigeria.

ASTI/IFPRI and ARCEN 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 ARCEN.

Copyright © 2017 International Food Policy Research Institute and Agricultural Research Council of Nigeria. Sections of this document may be reproduced without the express permission of, but with acknowledgment to, IFPRI and ARCEN. For permission to republish, contact ifpri-copyright@cgiar.org.