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Outdated infrastructure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 under equipped, 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.

ARCN's ongoing reform process

Although ARCN 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 ARCN along the lines of India's ICAR and Brazil's Embrapa. This is an important step in overcoming the financial and human resource constraints ARCN 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 ARCN’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.

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.

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.

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

ARCN and other government agricultural researchers by qualification level
Although the absolute number of PhD-qualified researchers employed at ARCN’s institutes increased during 2000–2014, ARCN’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 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 ARCN 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.
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.

<table>
<thead>
<tr>
<th>Year</th>
<th>Male</th>
<th>Female</th>
</tr>
</thead>
<tbody>
<tr>
<td>2008</td>
<td>75%</td>
<td>25%</td>
</tr>
<tr>
<td>2014</td>
<td>71%</td>
<td>29%</td>
</tr>
</tbody>
</table>

By qualification level, 2014

<table>
<thead>
<tr>
<th>Level</th>
<th>Percentage</th>
</tr>
</thead>
<tbody>
<tr>
<td>BSc</td>
<td>35%</td>
</tr>
<tr>
<td>MSc</td>
<td>30%</td>
</tr>
<tr>
<td>PhD</td>
<td>20%</td>
</tr>
</tbody>
</table>

By age bracket, 2014

<table>
<thead>
<tr>
<th>Bracket</th>
<th>Percentage</th>
</tr>
</thead>
<tbody>
<tr>
<td>&lt; 41</td>
<td>40%</td>
</tr>
<tr>
<td>41–50</td>
<td>23%</td>
</tr>
<tr>
<td>&gt; 50</td>
<td>17%</td>
</tr>
</tbody>
</table>

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.

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.

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.

<table>
<thead>
<tr>
<th>Type</th>
<th>Number of publications, 2012–2014 annual average</th>
<th>Per FTE researcher</th>
</tr>
</thead>
<tbody>
<tr>
<td>Journal articles</td>
<td></td>
<td></td>
</tr>
<tr>
<td>International</td>
<td>282.0</td>
<td>0.216</td>
</tr>
<tr>
<td>Regional</td>
<td>82.0</td>
<td>0.063</td>
</tr>
<tr>
<td>National</td>
<td>258.3</td>
<td>0.198</td>
</tr>
<tr>
<td>Books</td>
<td>9.0</td>
<td>0.007</td>
</tr>
<tr>
<td>Book chapters</td>
<td>112.0</td>
<td>0.086</td>
</tr>
<tr>
<td>Total</td>
<td>743.3</td>
<td>0.569</td>
</tr>
</tbody>
</table>
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 ARCN

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 (ARCN) 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 ARCN 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 ARCN.

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