

# ASTI IN RETROSPECT 03

## High Shares of Senior Researchers Aged Over 50



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August 2020

This year marks the 20th anniversary of the inception of ASTI. During this time, governments, donors, and international organizations have used ASTI's evidence to guide agricultural research investment and policy decisions, to assess areas of underinvestment, to identify capacity gaps and training needs, and to demonstrate the returns to agricultural research investment. This series of notes marks this important milestone by focusing on—and updating—some of the key advancements and insights ASTI data have enabled in the past 20 years. This note focuses on the challenge in many countries, particularly in Africa south of the Sahara (SSA), of disproportionate shares of PhD-qualified researchers in their 50s and 60s.

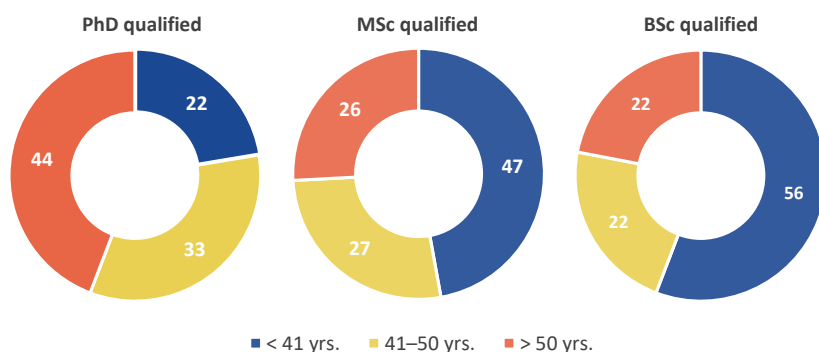
### KEY ADVANCEMENT

A minimum number of PhD-qualified scientists is generally considered fundamental to the conception, execution, and management of high-quality research; to effective communication with policymakers, donors, and other stakeholders, both locally and through regional and international forums; and for increasing an institute's chances of securing competitive funding. Although the aging of PhD-qualified agricultural researchers had been recognized as an impending challenge, especially in SSA, specific evidence of the national composition of researchers by age was lacking. For this reason, ASTI began collecting detailed information on the distribution of agricultural researchers by age cohort and qualification level.<sup>1</sup>

### RESULTING INSIGHTS

In a sample of 84 countries across four regions for which data are available, as of the mid-2010s, an average of 44 percent of agricultural researchers with PhD degrees were in their 50s and 60s (Figure 1).<sup>2</sup> Unsurprisingly, agricultural researchers without PhD degrees were considerably younger. For the same sample, 56 percent of BSc-qualified researchers and 47 percent of MSc-qualified researchers were in their 20s and 30s. Note that these average shares differ across regions and countries (see overleaf for details).

#### 1. Distribution of agricultural researchers by degree level and age cohort, mid-2010s (%)



**Note:** Data indicate average shares for 84 developing countries of the Asia-Pacific, Latin America and the Caribbean, Africa south of the Sahara, and West Asia and North Africa.

*ASTI's data on researchers by age cohort, which have been presented at a number of national forums, have highlighted the looming issue in many countries of high shares of senior, well-qualified agricultural researchers aging out of the system without appropriately trained and experienced colleagues ready to replace them. These stark realizations have prompted action toward both increased staff recruitment and the allocation of more resources for MSc and PhD training for research staff. ASTI supported the Regional Universities Forum for Capacity Building in Agriculture (RUFORUM) with relevant data to facilitate its advocacy of greater investment in postgraduate training for the next generation of African agricultural researchers.*

## CONTEXT

In many countries, government-based agricultural research institutes are highly vulnerable when it comes to their human resource capacity. To begin with, long-term civil service hiring freezes—particularly in francophone Africa—have left many institutes with aging pools of agricultural researchers, many of whom are nearing or have reached the official retirement age. Recruitment efforts in more recent years have led to an influx of junior staff in need of further training, mentoring, and supervision. Institutes therefore lack appropriately trained and experienced staff to fill roles left vacant by retiring (and departing) senior staff. At the same time, too few senior staff remain to train and mentor their newly appointed junior colleagues. This issue is even more severe at institutes with numerous disciplines and areas of research focus, or where highly specialized training and experience are needed.

## OVERVIEW OF TRENDS

**High shares of senior researchers nearing retirement.** Many low- and middle-income countries have made considerable progress in building their agricultural research capacity. For example, in the early 1960s, SSA employed about 2,000 researchers in the agricultural sciences, measured in full-time equivalents (FTEs). This number had grown to about 16,000 FTEs in 2016 (excluding the private for-profit sector). The qualifications of African agricultural researchers improved steadily in the decades leading to 2000, mostly due to substantial donor support for training, which ceased in the 1990s. In general, agricultural researchers with PhD degrees were comparatively younger in the Asia–Pacific than in the other regions (Figure 2), but these averages hide substantial differences across countries. In 38 of the 84 sample countries, at least half of all

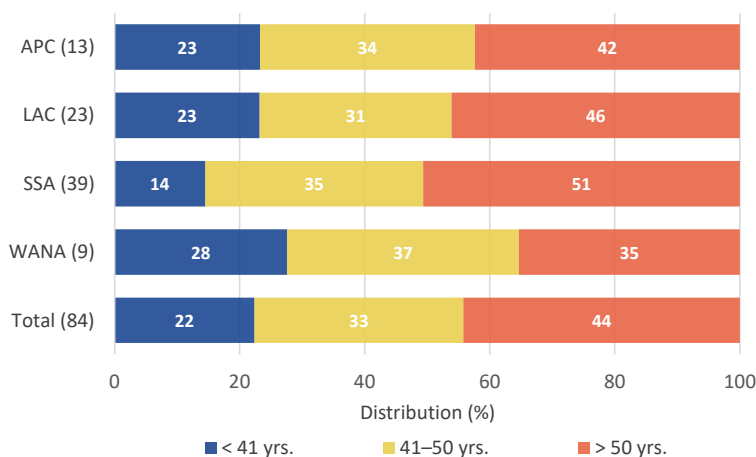
researchers with PhD degrees were over 50 years old as of the mid-2010s (Figure 3), while in 12 of these countries, more than 70 percent of the PhD-qualified researchers were over 50 years old. In fact, many of the research institutes, especially in smaller countries, lack the critical mass of senior researchers needed to lead research programs, and mentor and train junior staff.

The situation is particularly severe in West Africa, Madagascar, Peru, and a few other African and Central American countries. For example, as of 2016, more than 90 percent of all agricultural researchers in Guinea were over 50 years old. And although the official retirement age was raised from 60 to 65 years, the Guinean Agricultural Research Institute is expected to need to replace 90 percent of its PhD-qualified researchers by 2023 due to staff retirement. Filling these positions internally will not be possible because the Institute’s pool of researchers is small (as a result of past recruitment freezes) and includes relatively few researchers with PhD degrees. Various other institutes in SSA and Central America whose overall agricultural research capacities are small are facing similar situations.

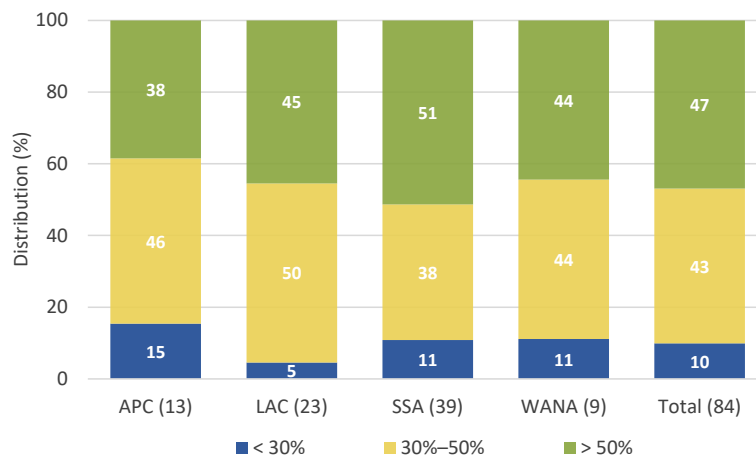
Numerous medium-sized countries are also experiencing this challenge. For example, as of 2013, 77 percent of Peru’s PhD-qualified researchers were over 50 years old. A number of countries have increased their official retirement age to 65 and even 70 years, but without large-scale recruitment this will only provide a temporary solution.

**High shares of junior researchers needing training.** Agricultural research systems in such countries as Belize, Cameroon, Ethiopia, Laos, Mauritania, and Namibia lack a critical mass of highly qualified and experienced researchers. These systems are primarily staffed by

### 2. Distribution of PhD-qualified agricultural researchers by region and age cohort, mid-2010s (%)

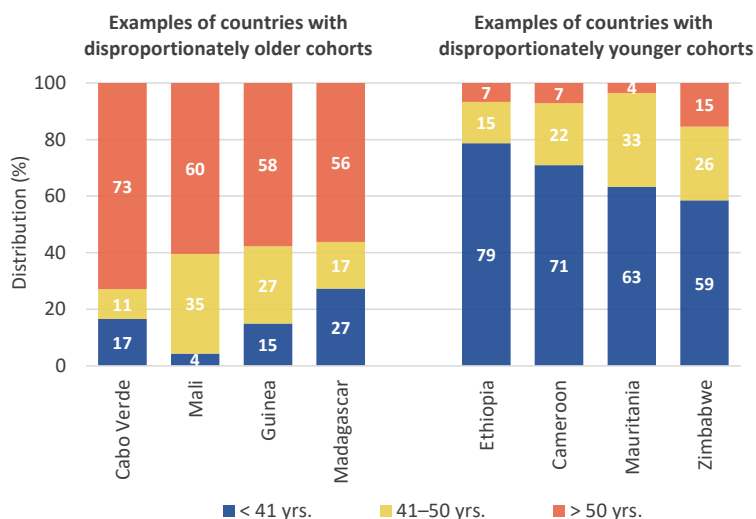


### 3. Distribution of the share of PhD-qualified agricultural researchers over 50 years old by region and country, mid-2010s (%)



**Notes:** Data represent average total shares for the countries included in each regional category. Figures in parentheses indicate the number of countries in each category. APC = Asia–Pacific, LAC = Latin America and the Caribbean, SSA = Africa south of the Sahara, and WANA = West Asia and North Africa.

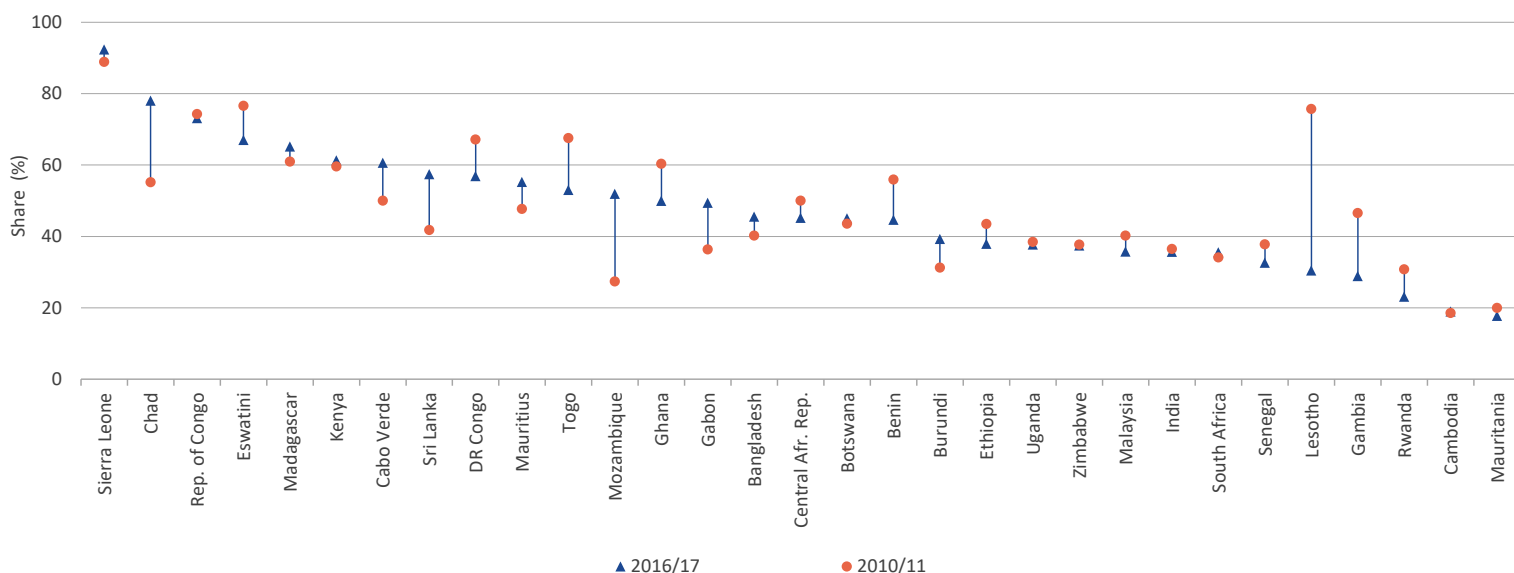
#### 4. Older and younger cohorts of agricultural researchers in selected countries of Africa south of the Sahara, mid-2010s (%)



junior researchers with limited experience. Universities in some of these countries only employ a handful of young professors in agricultural sciences, which further restricts the scope and quality of their higher agricultural education programs.

**Positive and negative changes over time.** Data over multiple years were available for 32 SSA and South Asian countries, which allowed changes over a five- to six-year period to be assessed. Overall, the share of PhD-qualified researchers over 50 years old fell from 53 to 49 percent between 2010/11 and 2016/17 (Figure 4). Focusing on individual countries, significant improvement occurred in Chad, Mozambique, and Sri Lanka. In contrast, the situation worsened in Benin, Democratic Republic of Congo, Gambia, Lesotho, and Togo.

#### 5. Change in the national share of PhD-qualified agricultural researchers aged over 50 years for selected countries of Africa south of the Sahara and South Asia, 2010/11 and 2016/17 (%)



**Note:** Data are for each country's main government agricultural research department(s) or institute(s). Data for India are for 2014 and 2018.

**Prevalence of knowledge gaps.** The retirement and departure of numerous senior, well-qualified researchers from agricultural research institutes has created significant knowledge gaps and concerns about the quality of research outputs. And, as already stated, it left many institutes without the critical mass of experienced, PhD-qualified researchers needed to lead research programs and mentor and train junior staff.

**Inability to compete for well-qualified staff.** In addition, many government-based agricultural research institutes are challenged by an inability to compete with universities, the private sector, and other organizations for well-qualified staff based on low salary levels, poor service conditions, limited career prospects, and inadequate facilities and equipment. Attracting and retaining staff is an even more serious problem in countries with small research capacities. This lack of sufficient well-qualified researchers in small countries also highlights the ongoing need for regional collaboration targeting the specific needs and vulnerabilities of small countries.

**The need for greater strategic planning.** Increased strategic planning and coordination in human resource management could make a significant difference. Yet institutes are limited in the options they have available to address the challenges they face in maintaining and developing their human resource capacity. Financial constraints are ultimately at the core of all of these issues (see Note 04 in this series on *Underinvestment in Agricultural Research*). Such constraints affect an institute's ability to offer competitive salaries and conditions; to provide training and career opportunities; and to create the necessary incentives to attract, retain, and motivate staff over the long term.

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## KEY MARKERS OF ASTI'S EVOLUTION

- ✓ ASTI was established as a CGIAR public good in early 2001, led by IFPRI and the former International Service for International Agricultural Research.
- ✓ In those earlier years, ASTI undertook the somewhat daunting task of developing key indicators and statistical methods in alignment with international standards; initiating data-collection activities on an ad hoc, project-driven basis; and forging fledgling relationships with potential national partners. And with the creation of its website, ASTI became one of the CGIAR's first sources of open-access data.
- ✓ With consistent funding from the Bill & Melinda Gates Foundation and numerous other supporters, ASTI matured to become a more holistic program, focusing not only on data collection, but also on building its partners' capacity, expanding its analysis and outreach activities, developing a suite of innovative online data tools, and contributing to influential global and regional initiatives and reports.
- ✓ Supplementary funding facilitated the expansion of geographic coverage, the initiation of more in-depth studies, and greater focus on increasing the capacity of ASTI's extensive network of national partners.

## AUTHOR'S REFLECTIONS ON 20 YEARS

Twenty years ago—with email still relatively rare and Internet access very limited in developing countries—the only way to get information was to send (and resend) letters, faxes, and telexes, and to visit (and revisit) research institutes in person. Then came the fastidious work of manually entering the data into computer files. Thankfully, much has changed. Greater Internet access paved the way for ASTI to make its data freely available online, becoming one of the CGIAR's first open-access data sources. Technological advancements not only allowed collecting, processing, and sharing data to be done effectively, but also facilitated the development of creative solutions for accessing, presenting, and analyzing data. Fruitful partnerships became possible across national, regional, and international boundaries. Importantly, sustainable funding from the Bill & Melinda Gates Foundation and numerous other donors facilitated the expansion and capacity building of ASTI's network, collaboration with partners to undertake more in-depth analyses of the data's implications, and greater outreach to disseminate the resulting findings.

## RELEVANT RESOURCES

- ASTI. 2019. ASTI database. International Food Policy Research Institute, Washington, DC.
- Beintema, N., and H. Elliott. 2016. "Ensuring Human Resource Capacity to Secure Agricultural Transformation." Chapter 8 in *Agricultural Research in Africa: Investing in Future Harvests*, J. Lynam, N. Beintema, J. Roseboom, and O. Badiane, ed. Washington, DC: International Food Policy Research Institute.
- Beintema, N., and G. Stads. 2014. *Taking Stock of National Agricultural R&D Capacity in Africa South of the Sahara*. ASTI Synthesis Report. Washington, DC: International Food Policy Research Institute.
- Beintema, N., and G. Stads. 2017. *A Comprehensive Overview of Investments and Human Resource Capacity in African Agricultural Research*. ASTI Synthesis Report. Washington, DC: International Food Policy Research Institute.
- Osiru, M., P. Nampala, and A. Ekwamu. 2016. "African Faculties of Agriculture within An Expanding University Sector." Chapter 9 in *Agricultural Research in Africa: Investing in Future Harvests*, J. Lynam, N. Beintema, J. Roseboom, and O. Badiane, ed. Washington, DC: International Food Policy Research Institute.

## NOTES ON DATA

1. The underlying data presented in this note can be downloaded, by country and available year, via the [Data Tool at ASTI's website](#).
2. ASTI calculates its human resource data in full-time equivalents or FTEs. This method considers the proportion of time researchers spend on research compared with other nonresearch activities. University employees, for example, spend the bulk of their time on teaching, administration, and student supervision rather than on research. As a result, four faculty members estimated to spend 25 percent of their time on research would individually represent 0.25 FTEs and collectively be counted as 1.0 FTE.

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**Nienke Beintema** is the former head of ASTI. This series of notes has been prepared as an ASTI output and has not been peer reviewed; any opinions are those of the author and do not necessarily reflect the policies or opinions of IFPRI. The author acknowledges the Bill & Melinda Gates Foundation and the CGIAR Research Program on Policies, Institutions, and Markets for their generous support of ASTI and, in particular, this series of notes. She also thanks Mary Jane Banks who provided excellent editorial and graphic design support in the preparation of this series.

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