Agricultural R&D Indicators Factsheet Update | August 2018

TANGANIA

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Background and Key Trends

- Tanzania's second Five Year Development Plan, 2016–2021, focuses on growth, transformation, and poverty reduction by promoting industry. Since the agricultural sector provides two-thirds of the country's industrial inputs, investing in agricultural R&D is fundamental to achieving these goals.
- Tanzania's agricultural productivity, however, has not grown significantly over recent decades. Any agricultural growth has been achieved through increases in inputs, such as land and labor, which is unsustainable and reaffirms the need for the application of technological innovation.
- Tanzania only invested 0.17 percent of its AgGDP in agricultural R&D in 2016, well below the 1 percent target recommended by the African Union and the United Nations. Based on an assessment of countries with similar economic conditions, a more conservative investment target of 0.37 percent of AgGDP should be attainable for Tanzania.

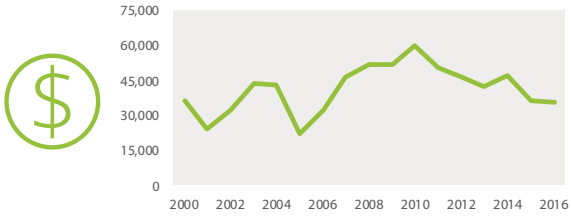
Institutional Challenges

- Spending by TARI and by TALIRI exhibited an alarmingly volatile and declining trend during 2000–2016, mainly due to declining government funding and the withdrawal of donor funding based on the prevailing political climate.
- Longterm underinvestment in the country's agricultural research system has resulted in outdated and poorly maintained infrastructure at both TARI and TALIRI. Moreover, the volatility in yearly funding levels has hindered activities at both institutes and led to unprecedented delays in the release of new technologies. With appropriate irrigation infrastructure, for example, TARI could have conducted two trials per year, significantly reducing delays.
- TARI and TALIRI have struggled to attract and retain well-qualified researchers. New recruits—even those with PhD degrees—often have inadequate experience, and, as of 2016, most senior researchers were approaching retirement age.

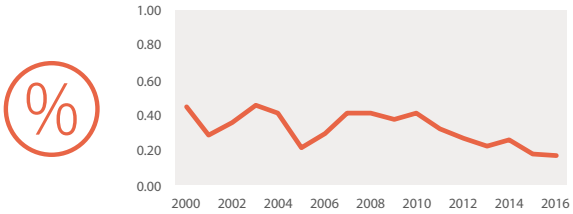
Policy Options

- The creation of TARI and TALIRI as semiautonomous bodies was an important milestone in paving the way for competitive recruitment mechanisms, efficient operating procedures, diversified funding mechanisms, and innovative partnerships with the private sector to develop and commercialize technologies. Nevertheless, sustainable government funding is needed for the institutes to maintain a foundation from which to achieve these goals.
- Both institutes require solid training and mentorship plans, supported by the government to address the human resource challenges.
- Tanzania needs to increase its investment in agricultural research and take advantage of knowledge spillovers from neighboring countries in order to accelerate agricultural productivity to reach the goals defined in its current Five-Year Development Plan.

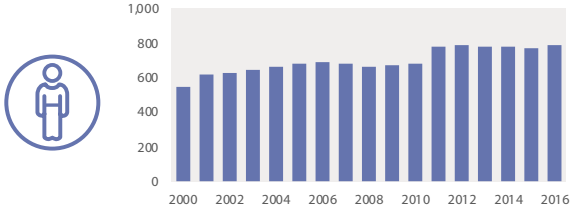
AGRICULTURAL RESEARCH SPENDING



SPENDING INTENSITY



AGRICULTURAL RESEARCHERS

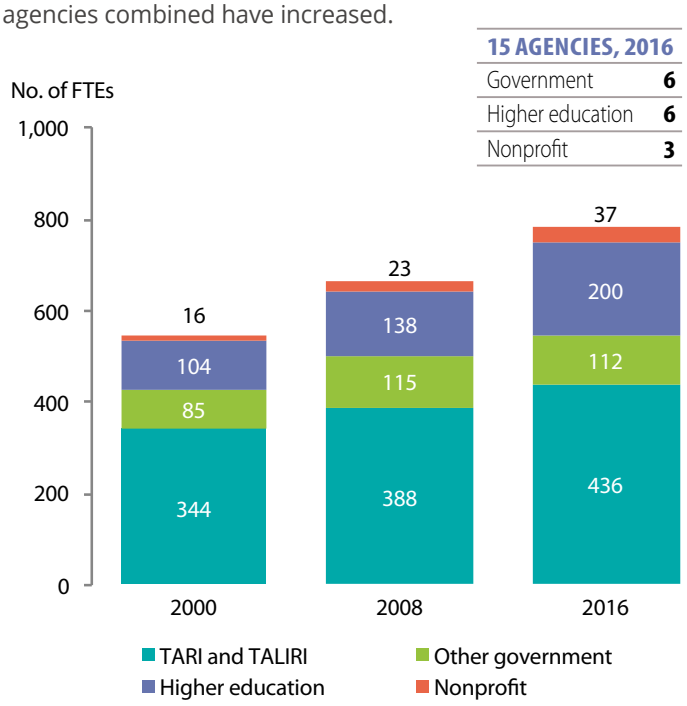


	TANZANIA	ETHIOPIA	KENYA	UGANDA
Million Tanzanian shillings (2011 constant prices)	35,814.4			
Million PPP dollars (2011 constant prices)	68.5	162.1	222.7	99.4
Agricultural research spending as a share of AgGDP	0.17%	0.29%	0.48%	0.62%
Full-time equivalents	785.0	3,024.6	1,157.6	558.7
Share of researchers with MSc and PhD degrees	77%	47%	85%	81%

Notes: Data in the table above are for 2016. 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/tanzania/directory** for an overview of Tanzania's agricultural R&D agencies.

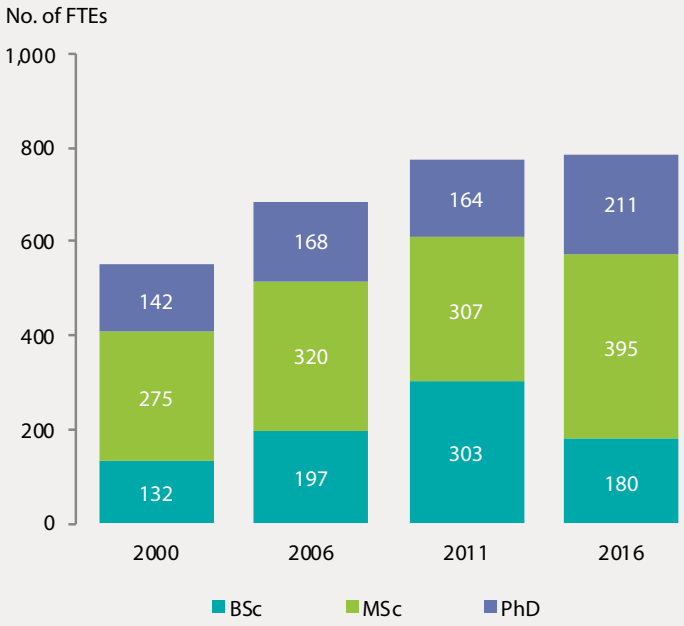
Institutional composition of agricultural research

The overall institutional composition of the country's research has changed little since 2000, but the shares by institutional category have changed somewhat. TARI and TALIRI's combined share of agricultural researchers fell from 63 to 56 percent during 2000–2016, whereas shares for SUA and the other higher education agencies combined have increased.



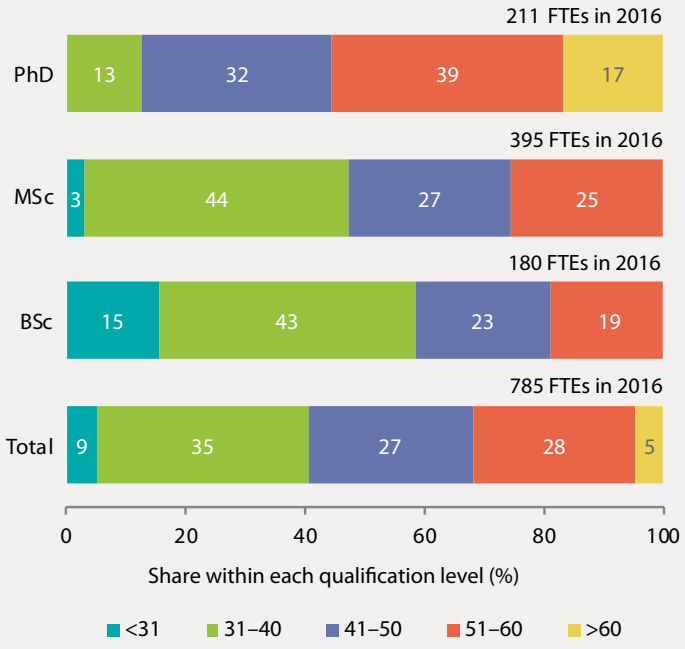
Agricultural researchers by qualification level

Tanzania's total number of researchers rose by more than 40 percent during 2000–2016. Growth was initially stronger among BSc-qualified researchers than among those with MSc and PhD degrees, but this trend reversed during 2012–2016. While the total number of researchers changed little in recent years, average degree levels have improved markedly.



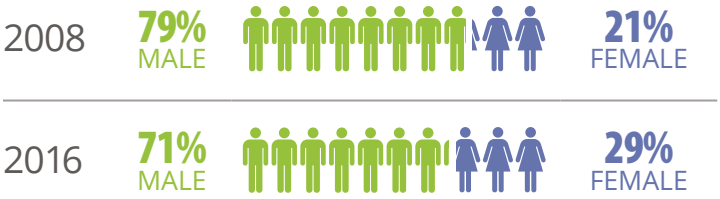
Agricultural researchers by age bracket

As of 2016, more than half the country's PhD-qualified researchers were in their 50s or 60s. Overall, researchers at the other government agencies were significantly younger than those at the government institutes TARI and TALIRI or in the higher education sector.



Agricultural researchers by gender

Overall, the share of female researchers rose from 21 percent in 2008 to 29 percent in 2016. In general, female researchers were comparatively younger and less well-qualified than their male colleagues.



Share of women within each qualification level, 2016

BSc **31%**	MSc **33%**	PhD **22%**

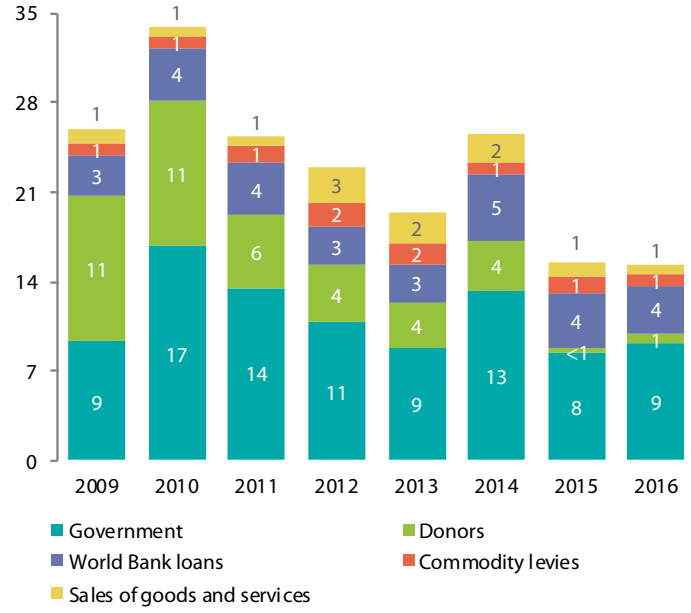
Share of women by age bracket, 2016

< 41 **35%**	41–50 **24%**	> 50 **27%**

Sources of TARI and TALIRI's funding

During 2009–2016, government support for TARI and TALIRI fluctuated, in inflation adjusted terms, and donor contributions fell. The vast majority of government funding is allocated to staff salaries and basic operational costs. The costs associated with research programs are primarily funded through donor contributions, from sales of goods and services, or through commodity taxes.

Billion Tanzanian shillings (inflation-adjusted; base year = 2011)

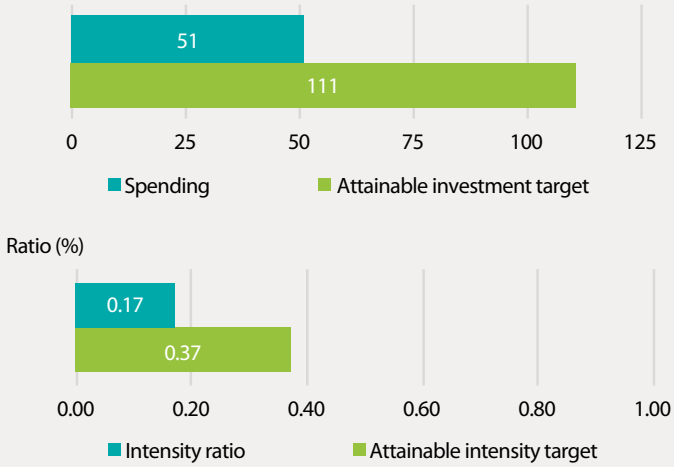


Investment needed to close the intensity gap

Analyses show that no country with economic conditions similar to Tanzania has reached the 1 percent agricultural research investment target set by the United Nations and African Union, but that a significantly lower target of 0.37 percent would be attainable. In order to have met this lower target in 2016, Tanzania would need to have invested 111 billion, or an additional 60 billion (both in current prices).

Actual and attainable spending, 2016

Billion Tanzanian shillings (current prices)

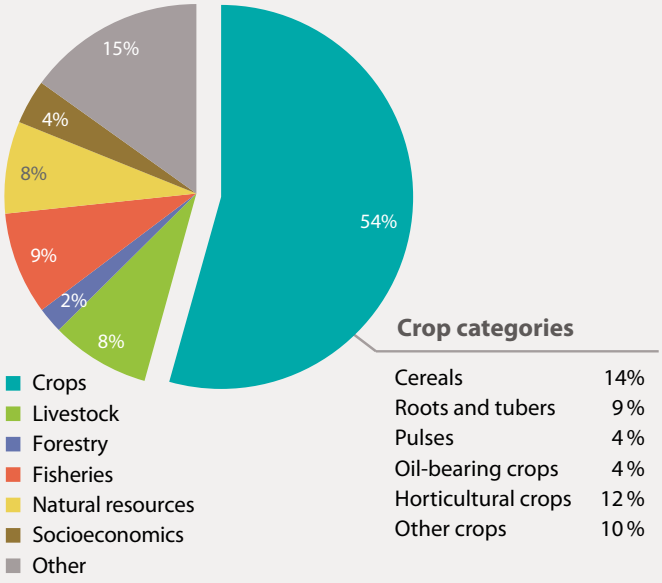


Notes: Traditionally, agricultural research intensity ratios compare investment and AgGDP levels to determine whether countries may be underinvesting. ASTI's Intensity Index incorporates additional factors that account for the size and nature of a nation's economy; hence, facilitating more accurate cross-country comparisons. For more information, see https://astinews.ifpri.info/2017/07/01/a-new-look-at-research-investment-goals-for-ssa/.

Agricultural researchers by area of focus

In 2016, 54 percent of the country's FTE researchers conducted crop research, whereas only 8 percent undertook livestock research. Major crops under investigation were fruit, maize, vegetables, cassava, sweet potatoes, coffee, sorghum, and beans.

Share of researchers, 2016



Crop categories

Cereals	14%
Roots and tubers	9%
Pulses	4%
Oil-bearing crops	4%
Horticultural crops	12%
Other crops	10%

TARI's recently released crop varieties

Tanzania's main agricultural research agency involved in crop breeding, TARI, released 6 new varieties of maize and 29 new varieties of other crops during 2012–2016.

Crop	Number of varieties, 2012–2016
Maize	6
Groundnuts	3
Sugar	3
Sweet potatoes	3
Vegetables	3
Beans	2
Cassava	2
Rice	2
Wheat	2
Cotton	1
Potatoes	1
Soybeans	1
Other	6
Total	**35**

Resources for Tanzania

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

ASTI's **agency directory** provides a view of agencies that conduct agricultural research in Tanzania, 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
FTE(s)	full-time equivalent(s)
NARIs	national agricultural research institute(s)
PPP(s)	purchasing power parity (exchange rates)
R&D	research and experimental development
SUA	Sokoine University of Agriculture
TALIRI	Tanzania Livestock Research Institute
TARI	Tanzania Agricultural Research Institute

About ASTI, IFPRI, and TARI

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 facilitated 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 **Tanzania Agricultural Research Institute (TARI)** is Tanzania's principal agricultural research agency; the institute falls under the Ministry of Agriculture, Livestock and Fisheries and focuses on crop and natural resource research.

ASTI/IFPRI and TARI 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 TARI.