ASTI Led by IFPRI

TANZANIA

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KEY INDICATORS, 2000–2011

Total Public Agricultural Research Spending	2000		2008		2011
Tanzanian shillings (million constant 2005 prices)	16,064.3		30,825.4		32,192.4
PPP dollars (million constant 2005 prices)	40.6		77.9		81.4
Overall Growth		**92%**		**5%**	
Total Number of Public Agricultural Researchers					
Full-time equivalents (FTEs)	552.6		689.5		814.8
Overall Growth		**25%**		**18%**	
Agricultural Research Intensity					
Spending as a share of agricultural GDP	0.45%		0.58%		0.54%
FTE researchers per 100,000 farmers*	4.08		4.30		4.70

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

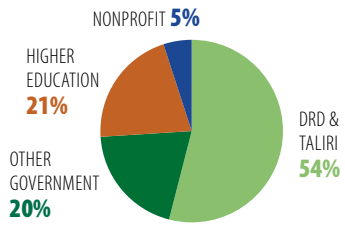
- National agricultural R&D spending increased by 5 percent during 2008–2011, primarily due to increased government support; nonetheless, spending as a share of agricultural GDP remained fairly constant.
- Although the national number of BSc-qualified researchers increased by 20 percent during 2008–2011, substantially increasing Tanzania's total number of researchers, the number of researchers with PhD qualifications declined by 20 FTEs during this timeframe.
- In 2010 steps were taken to transform DRD and DRTE from government divisions to semiautonomous bodies in order to provide greater flexibility in recruitment, funding, and operating procedures. DRTE became TALIRI in 2012 and DRD is expected to become the Tanzania Agricultural Research Institute by the end of 2013.

FINANCIAL RESOURCES, 2011

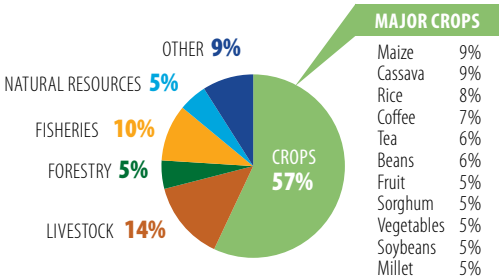
Spending Allocation	
Salaries	45%
Operating and program costs	50%
Capital investments	5%
Funding Sources	
Government, core	53%
Government, other	2%
Donors	17%
Development bank loans	13%
Commodity levies/producer organizations	8%
Sales of goods/services	5%
Other	2%

Note: Due to lack of availability, financial data exclude the higher education sector and two of the nonprofit agencies.

INSTITUTIONAL PROFILE, 2011



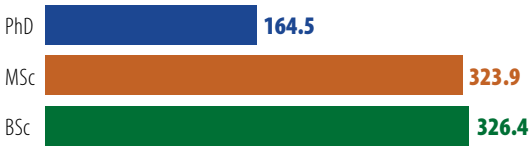
RESEARCH FOCUS, 2011



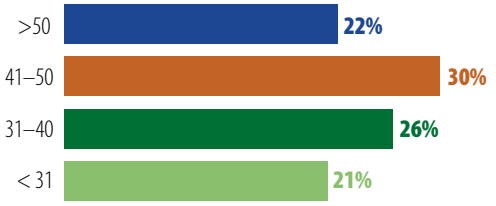
Notes: Major crops include those that are the focus of at least 5 percent of all crop researchers; 30 percent of total crop researchers focused on a wide variety of other crops.

RESEARCHER PROFILE, 2011

Number by qualification (FTEs)



Share by age group (years)



Note: Due to lack of availability, data by age bracket exclude the higher education sector and two of the nonprofit agencies.

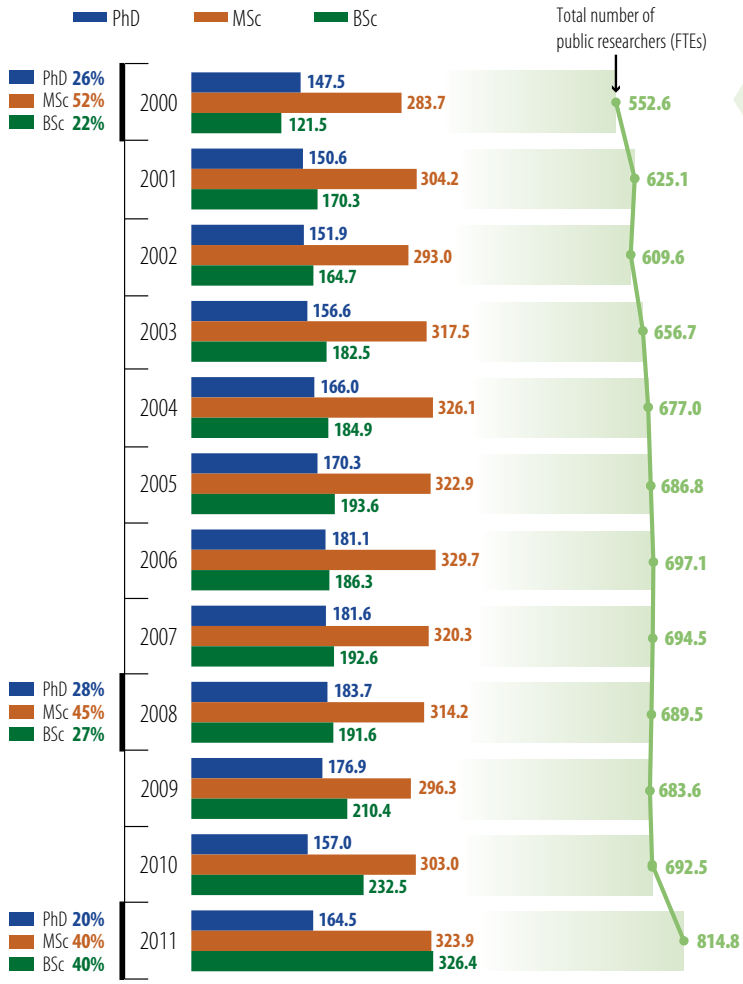
CHALLENGE

The growing numbers of junior (BSc-qualified) researchers combined with declining numbers of senior (mainly PhD-qualified) researchers at DRD and TALIRI are distorting the distribution of researchers by age and qualification, leaving too few senior researchers to train and mentor growing numbers of younger colleagues. DRD and TALRI's decision to hire retired researchers on short-term contracts is only a temporary solution.

SOLUTION

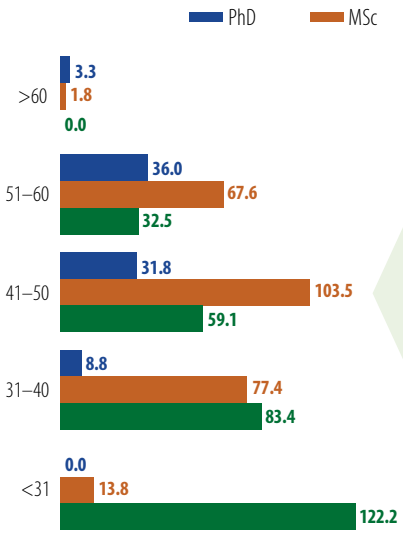
By transforming DRD and TALIRI into semiautonomous bodies (see Page 1), Tanzania is already taking the necessary steps to solve these agencies' underlying structural problem of being unable to compete with other agencies for well-qualified researchers. In the meantime, solid training and mentorship strategies are needed.

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



During 2008–2011, the total number of BSc-qualified researchers increased by two-thirds, whereas the number of PhD-qualified researchers fell by 17 percent (in FTEs). This is mostly the result of DRD's and TALIRI's strategy of hiring junior scientists because they cannot compete with the salaries and conditions offered by other agencies to attract senior scientists, especially those with PhD degrees (see Box on Page 3 ▶).

Total number of researchers (FTEs) by age group (years) , 2011



Fifty percent of PhD-qualified researchers are over 50 years of age, whereas about 40 percent of those qualified to the BSc level are 30 years old or younger.

Note: Due to lack of availability, data by age bracket exclude the higher education sector and two of the nonprofit agencies.

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)
Tanzania	**814.8**	**18%**	**20%**
Kenya	1,150.9	13%	32%
Uganda	353.9	13%	31%
Ethiopia	1,876.6	33%	9%

TREND

- Agricultural R&D spending at DRD and TALIRI continued to rise during 2008-2011, largely as a result of increased operating and program-related expenses, and capital investments. Nevertheless, salary levels and operating and capital budgets remained low. Low allocations to research programs, for example, left some researchers with insufficient project activities. At the same time, staff housing at remote research stations was insufficient to accommodate all the new recruits.

OBSERVATION

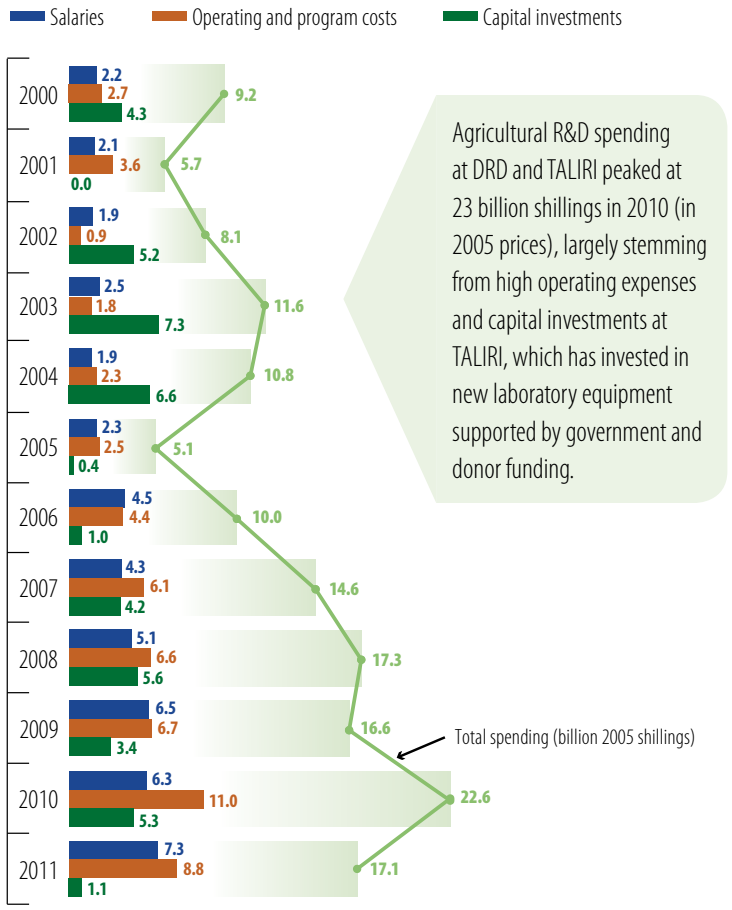
- The transformation of DRD and TALIRI into semi-autonomous government bodies will provide these agencies with the necessary flexibility to diversify and increase their funding sources so that, in addition to increasing researcher salary levels (see Page 2), they will be able function more competitively across the board.

AN INNOVATIVE, BUT TEMPORARY, "FIX" TO A CRITICAL PERSONNEL CHALLENGE

As the two largest government agencies conducting agricultural R&D in Tanzania, DRD and TALIRI struggle to attract and retain well-qualified researchers due to fierce competition from the higher education sector and international institutes, which offer better salaries and benefits, more attractive research programs and working conditions, and appropriate incentive schemes and promotional opportunities. This factor, combined with the effects of a decade-long recruitment freeze during 1992–2002 has led to high researcher attrition rates (DRD lost 50 scientists between 2003 and 2009).

As a creative solution, the two institutes began hiring BSc-qualified researchers and engaging retired senior researchers on short-term contracts to mentor the new recruits. As a result, during 2009–2011 the two agencies' aggregated shares of PhD- and MSc-qualified researchers decreased from 18 to 14 percent and 50 to 38 percent, respectively, while their combined share of BSc-qualified researchers increased from 31 to 47 percent. During this time, 17 retired researchers returned under contract, but this temporary "fix" has been limited by ongoing financial constraints, the willingness of retired researchers to return, and other problems. Five of the new recruits had already moved on to university or other appointments by 2011.

Spending by cost category for DRD and TALIRI, 2000–2011 (billion 2005 shillings)



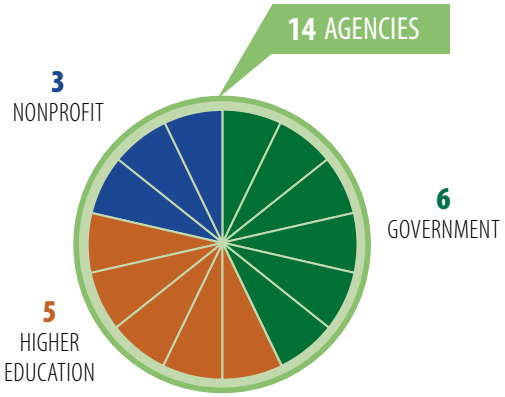
Agricultural R&D spending at DRD and TALIRI peaked at 23 billion shillings in 2010 (in 2005 prices), largely stemming from high operating expenses and capital investments at TALIRI, which has invested in new laboratory equipment supported by government and donor funding.

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
Tanzania	**81.4**	**5%**	**0.54%**
Kenya	188.1	11%	1.22%
Uganda	106.8	15%	1.22%
Ethiopia	69.6	8%	0.19%

OVERVIEW OF TANZANIA'S AGRICULTURAL RESEARCH AGENCIES

Fourteen agencies conduct agricultural R&D in Tanzania, the largest of them being DRD (368 FTE researchers in 2011), TALIRI (72 FTEs in 2011), and SUA (152 FTEs in 2011). DRD has a network of 16 agricultural research centers that operate in seven agroecological zones and focus on locally relevant adaptive research. In 2006, livestock research was transferred from DRD to form DRTE under the Ministry of Livestock and Water Development, which now is the Ministry of Livestock and Fisheries Development. In 2012, DRTE became TALIRI. This development, combined with a considerable increase in faculty staff at SUA, led to a significant reduction in DRD's FTE researchers, from 62 percent of the national total in 2001, to 45 percent in 2011. SUA is the country's leading university for agricultural education and research. The number of FTE researchers has grown at both SUA and UDSM (21 FTEs in 2011) causing a similar increase in the higher education sector's share of national agricultural R&D capacity. Three nonprofit agencies in Tanzania also conduct research (on coffee, tea, and tobacco, respectively); in 2011 these agencies employed a combined total of 37 FTEs. Research conducted by the private-for-profit sector remains small and is, therefore, excluded from ASTI's data synthesis.



For a complete list of the agencies included in ASTI's dataset for Tanzania, visit **www.asti.cgiar.org/tanzania**.

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**; *for more information on agricultural R&D in Tanzania, visit* **www.asti.cgiar.org/tanzania**.

ACRONYMS USED IN THIS FACTSHEET

AgGDP	Agricultural gross domestic product
DRD	Department of Research and Development
DRTE	Division of Research, Training and Extension
FTE(s)	Full-time equivalent (researchers)
PPP(s)	Purchasing power parity (exchange rates)
R&D	Research and development
SUA	Sokoine University of Agriculture
TALIRI	Tanzanian Livestock Research Institute
UDSM	University of Dar es Salaam

ABOUT ASTI, IFPRI, AND DRD

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 **Department of Research and Development (DRD)** is Tanzania's principal agricultural research agency; the Department falls under the Ministry of Agriculture, Food Security, and Cooperatives and focuses on crops and natural resources research.

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* This December 2013 version reports FTE researchers per 100,000 farmers, which is an adjustment from the November 2013 version (which reported per thousand farmers).