



EGYPT

Gert-Jan Stads, Hoda Moussa, and Raed Badwan

KEY INDICATORS, 2009–2012

Total Public Agricultural Research Spending	2009		2012
Egyptian pounds (million constant 2005 prices)	372.9		463.0
PPP dollars (million constant 2005 prices)	379.3		471.0
Overall Growth		24%	
Total Number of Public Agricultural Researchers			
Full-time equivalents (FTEs)	6,490.3		8,419.7
Overall Growth		30%	
Agricultural Research Intensity			
Spending as a share of agricultural GDP	0.42%		0.44%
FTE researchers per 100,000 farmers	101.62		133.31

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

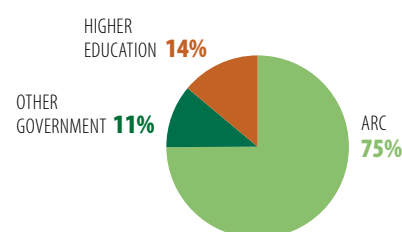
- ▶ With more than 8,400 agricultural researchers in FTEs—most qualified to the PhD degree level—Egypt’s agricultural R&D system is among the world’s largest in terms of human resource capacity; of these researchers, three-quarters are employed at the country’s principal agricultural R&D agency, ARC.
- ▶ Agricultural R&D spending grew by nearly a quarter during 2009–2012, mostly driven by higher salary-related expenses following large-scale staff recruitment by ARC.
- ▶ Egypt’s research centers are currently being consolidated under the Ministry of Scientific Research’s Supreme Council of Scientific Research Centers and Institutes, with the goal of harmonizing activities.

FINANCIAL RESOURCES, 2012

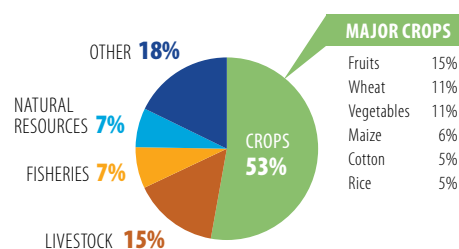
Spending Allocation	
Salaries	87%
Operating and program costs	3%
Capital investments	10%
Funding Sources	
Government	62%
Donors and development banks	4%
Sales of good/services	35%

Note: Shares are based on data for ARC agencies only.

INSTITUTIONAL PROFILE, 2012



RESEARCH FOCUS, 2012



MAJOR CROPS

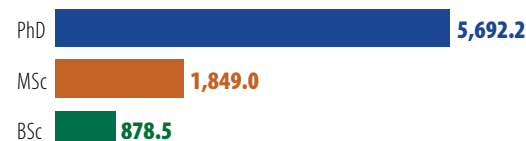
Fruits	15%
Wheat	11%
Vegetables	11%
Maize	6%
Cotton	5%
Rice	5%

Notes: Major crops include those that are the focus of at least 5 percent of all crop researchers; 47 percent of total crop researchers focused on a wide variety of other crops.

RESEARCHER PROFILE, 2012



Number by qualification (FTEs)



CHALLENGE

- ▶ Egypt employs close to close to 5,700 PhD-qualified agricultural researchers (in FTEs), but these researchers are not distributed efficiently across the country or across disciplines, are poorly remunerated, and lack sufficient funding to conduct viable research programs. Moreover, despite the influx of new recruits in the past few years, a comparatively large share of researchers is approaching retirement age.

Compared with many other large developing countries, Egypt has an extremely large pool of agricultural researchers. Egypt's number of FTE researchers per million farmers, for example, is roughly four times higher than Brazil's or Turkey's, and more than 30 times higher than India's. Although no global target has been established for this kind of ratio, Egypt's disproportionately high number of researchers raises concerns, especially based on the limited number of outputs the Egyptian system produces relative to these other countries.

	FTE agricultural researchers	FTE researchers per million population	FTE researchers per 100,000 farmers
EGYPT	8,420	104.4	133.3
TURKEY	3,009	40.7	38.5
INDIA	11,217	9.4	4.2
BRAZIL	5,376	28.6	44.1
NIGERIA	2,688	16.4	21.9

Note: Data for Egypt and Turkey are for 2012; data for Nigeria are for 2011; data for India are for 2009; and data for Brazil are for 2006. It is important to note that countries like Brazil and India, employ a large number of degree-qualified technicians, who are not included in these data because they are not officially classified as researchers.

POLICY RESPONSE





- ▶ The Ministry of Agriculture's Sustainable Agricultural Development Strategy towards 2030 emphasizes human resource development in agricultural R&D and extension. ARC is currently in the process of establishing a systematic training program for all staff. In addition, the government recently approved salary increases and performance bonuses for both ARC and university-based scientists, which will have a positive impact on staff motivation.

▶ STEPS TO REDRESS QUESTIONS ABOUT THE QUALITY OF LOCAL AGRICULTURAL PHD QUALIFICATIONS

Egypt's agricultural research system has an extremely large pool of PhD-qualified researchers; in fact, Egypt employs more PhD-qualified agricultural researchers than does the rest of Africa combined. A PhD qualification is the basis of promotional opportunities within the country's civil service system, but many question the quality of local PhD training compared with international standards, citing that Egyptian PhDs are too easily awarded.

It is encouraging that the Egyptian government has recognized these issues and taken steps to improve the situation. The US\$50 million World Bank-funded Higher Education Enhancement Project (2000–2017) is currently being implemented. The project is intended to lay the foundation for a new education system through legislative reform, institutional restructuring, and the establishment of independent quality-assurance mechanisms and monitoring systems. Key objectives include deepening the country's agricultural science capacity and modifying the current system of promotions from one based on seniority to one based on merit. Still, it will remain challenging to attract and maintain a qualified pool of agricultural researchers without competitive remuneration. Egypt's most talented professors and researchers are working in the Gulf States, Europe, and North America; those who have remained in Egypt are compelled to seek additional sources of income in order to make ends meet. For example, many university-based professors no longer prioritize research, but instead devote their free time to teaching at private universities or undertaking higher paying consultancies.

CROSS-COUNTRY COMPARISONS OF KEY INDICATORS

	Total number of researchers, 2012 (FTEs)	Growth in number of researchers, 2009–2012	Share of PhD researchers, 2012 (FTEs)
Egypt	8,419.7	30% 	68%
Algeria	593.4	16% 	23%
Jordan	272.3	1% 	35%
Turkey	3,009.4	17% 	42%

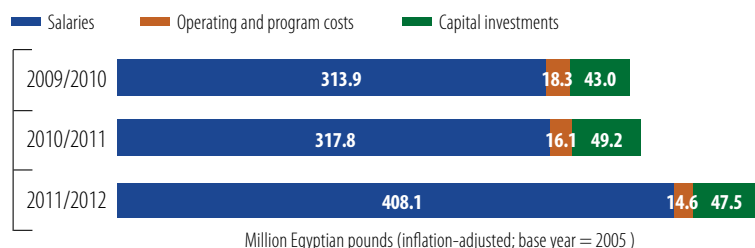
CHALLENGE

- Close to 90 percent of ARC's total spending is allocated to salary-related expenses, leaving relatively limited resources to fund the day-to-day costs of conducting research and maintaining and upgrading R&D infrastructure and equipment. In the past, donors played a considerable role in funding these types of expenditures, but the 2011 revolution led to a substantial decline in donor contributions.

POLICY OPTION

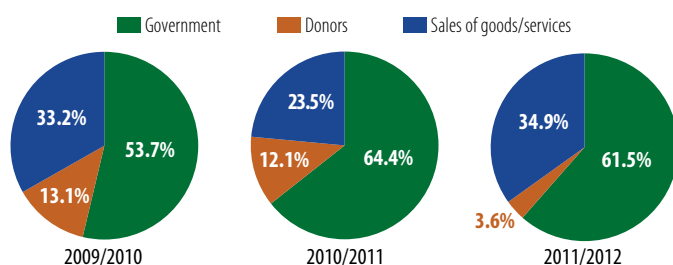
- Higher levels of sustainable government funding are needed, not just for salaries, but also for operating and capital expenditures. The government must also provide a more enabling policy environment to stimulate private-sector funding through tax incentives and regulatory reforms. Finally, ARC needs to enhance awareness among its staff of the funding opportunities available through international agencies and to provide researchers training in the development and presentation of project proposals.

ARC's expenditures by cost category, 2009/10–2011/12



ARC's total spending increased by 25 percent during 2009–2012, but this growth was entirely driven by higher salary-related expenses following a sharp rise in the number of researchers employed. ARC's research programs are severely underfunded: operating and program costs accounted for a very small (and declining) share of the center's total expenditures during 2009–2012.

Funding sources of ARC's nonsalary expenditures, 2009/10–2011/12



ARC's salary bill is entirely funded by the Egyptian government, as is roughly 60 percent of all other expenses. ARC generates a relatively large share of funding internally through the sale of seeds and vaccinations, and services such as laboratory tests and technical assistance. Traditionally, donors like the European Union, Italy, France, Japan, the United States, the World Bank, and FAO have played an important role in funding ARC's research, but these sources of funding contracted substantially in 2011.

SEVERE UNDERINVESTMENT IN AGRICULTURAL R&D

In 2012, Egypt invested just 0.44 percent of its AgGDP in agricultural R&D, which is well below the 1-percent minimum target recommended by the United Nations and NEPAD. Salary-related expenses for the enormous pool of scientists and support staff weighs heavily on the country's agricultural R&D budget, leaving an extremely small share to cover costs associated with running research programs and developing and rehabilitating agricultural R&D infrastructure and equipment.

Recent initiatives, including the 2007 creation of HCST and of STDF—a competitive research fund that issues roughly 200 million Egyptian pounds per year to agricultural and nonagricultural research programs—are signs of increased government commitment to science and technology. Yet, significantly more funding is needed to address the challenges facing Egypt's agricultural sector. Overturning three decades of neglect will require time and commitment, as well as substantial change in cultural and political attitudes, in the operation of universities and research centers, within the education system more broadly, and within the private sector.

CROSS-COUNTRY COMPARISONS OF KEY INDICATORS *continued*

	Total spending, 2012 (million 2005 PPP dollars)	Overall spending growth, 2009–2012	Spending as a share of AgGDP, 2012
Egypt	471.0	24%	0.44
Algeria	81.7	19%	0.21
Jordan	32.3	–5%	1.84
Turkey	406.3	0%	0.51

OVERVIEW OF EGYPT'S AGRICULTURAL R&D AGENCIES

Fifty agencies conduct agricultural R&D in Egypt. ARC—a semiautonomous center headquartered in Cairo and administered by the Ministry of Agriculture—is the largest by far. ARC's structure is complex and includes 16 research institutes, 8 central laboratories, 56 research stations (including 10 regional research stations), and 23 research administrations located across the country. In 2012, these units employed a total of 6,308 FTE researchers focusing on a variety of areas, including crops, livestock, fisheries, and natural resources. ARC is also involved in the provision of agricultural extension services. Other large government centers conducting agricultural research include NRC (363 FTEs in 2012), which plays an important role in crop, veterinary, and food and nutrition research (in addition to conducting considerable nonagricultural research); NWRC (207 FTEs), which focuses on research related to water; and DRC (369 FTEs), which focuses on water resources, soil management, plant production, and animal husbandry in the Sinai and Sahara deserts. The higher education sector accounts for roughly one-fifth of Egypt's total agricultural R&D capacity (in FTEs), and the principal universities involved are Alexandria University (191 FTEs), Cairo University (108 FTEs), Menofia University (99 FTEs), and Suez Canal University (95 FTEs). The private sector plays a limited role in conducting agricultural R&D, although Pioneer is an important player in maize and sunflower breeding.

50 AGENCIES



Government

29



Higher education

21



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

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 Egypt, visit www.asti.cgiar.org/egypt.

ACRONYMS USED IN THIS FACTSHEET

AgGDP	Agricultural gross domestic product
ARC	Agricultural Research Center
DRC	Desert Research Center
FAO	Food and Agricultural Organization of the United Nations
FTE(s)	Full-time equivalent (researchers)
HCST	Higher Council for Science and Technology
NEPAD	New Partnership for Africa's Development
NRC	National Research Center
NWRC	National Water Research Center
R&D	Research and development
STDF	Science and Technological Development Fund

ABOUT ASTI, IFPRI, AND ARC

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 Center (ARC)** is a semiautonomous agricultural research and extension institution under the Ministry of Agriculture. Its research focuses on issues related to crops, livestock, fisheries, and natural resources.

ASTI/IFPRI and ARC gratefully acknowledge participating agricultural R&D agencies for their contributions to the data collection and preparation of this country factsheet. ASTI also thanks the Economic Research Service of the United States Department of Agriculture for its generous support of ASTI's work in West Asia and North Africa and the Association of Agricultural Research Institutions in the Near East and North Africa for facilitating the survey implementation. 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 ARC.