



YEMEN

Gert-Jan Stads, Khalil Alsharjabi, Raed Badwan, Maeen Aljarmouzi, and Michael Rahija

KEY INDICATORS, 2009–2012

Total Public Agricultural Research Spending	2009		2012
Yemeni rial (million constant 2005 prices)	1,980.7		1,435.7
PPP dollars (million constant 2005 prices)	47.6		34.5
Overall Growth		-28%	
Total Number of Public Agricultural Researchers			
Full-time equivalents (FTEs)	486.8		526.7
Overall Growth		8%	
Agricultural Research Intensity			
Spending as a share of agricultural GDP	0.61%		0.56%
FTE researchers per 100,000 farmers	22.36		23.83

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

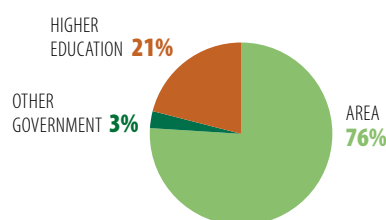
- ▶ Growing civil unrest caused agricultural R&D spending in Yemen (adjusted for inflation) to fall considerably during 2009–2012.
- ▶ Before 2005, Yemeni agricultural R&D agencies received a significant share of their funding from bilateral and multilateral donors, but widespread corruption, mismanagement of donor funds, and increased political instability have caused a withdrawal of this funding over time.
- ▶ During 2009–2012, Yemen's total number of agricultural researchers increased gradually. AREA, the country's principal agricultural R&D agency, accounted for more than three-quarters of the nation's agricultural researchers in 2012.

FINANCIAL RESOURCES, 2012

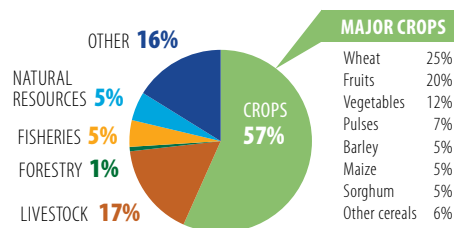
Spending Allocation	
Salaries	64%
Operating and program costs	32%
Capital investments	3%
Funding Sources	
Government	94%
Sales of goods and services	5%
Other	1%

Note: Shares are based on data for AREA only.

INSTITUTIONAL PROFILE, 2012



RESEARCH FOCUS, 2012



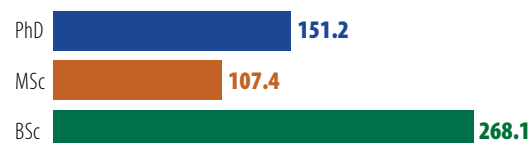
MAJOR CROPS	
Wheat	25%
Fruits	20%
Vegetables	12%
Pulses	7%
Barley	5%
Maize	5%
Sorghum	5%
Other cereals	6%

Notes: Major crops include those that are the focus of at least 5 percent of all crop researchers; 18 percent of total crop researchers focused on a wide variety of other crops.

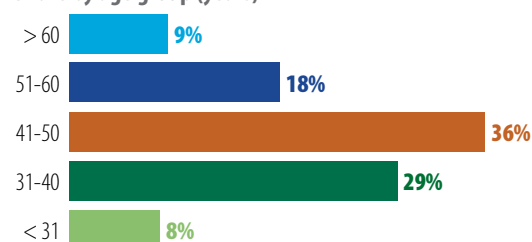
RESEARCHER PROFILE, 2012



Number by qualification (FTEs)



Share by age group (years)



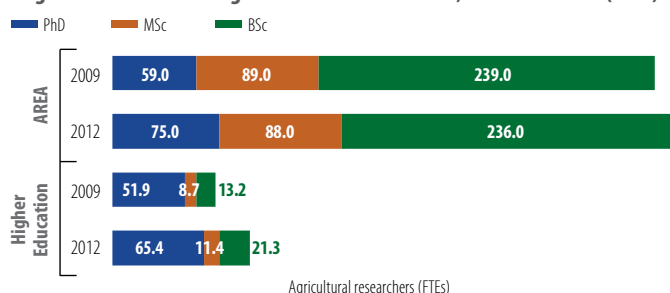
CHALLENGE

- ▶ The number of researchers with PhD degrees at AREA and the higher education agencies has steadily increased in recent years; however, more than half of these scientists will retire in the coming decade. AREA and the higher education agencies employ a large number of BSc- and MSc-qualified researchers, but in-country PhD training opportunities are limited.

POLICY OPTIONS

- ▶ In order to secure a critical mass of agricultural scientists, the government will not only need to provide postgraduate training opportunities for young researchers, but also ensure that the necessary conditions are in place to retain and motivate them over time. The widely advocated, but thus far unapproved, increase in the official retirement age from 60 to 65 years would ease the imminent loss of senior scientists and allow them five more years to train and mentor their younger colleagues.

Degree distribution of agricultural research staff, 2009 and 2012 (FTEs)



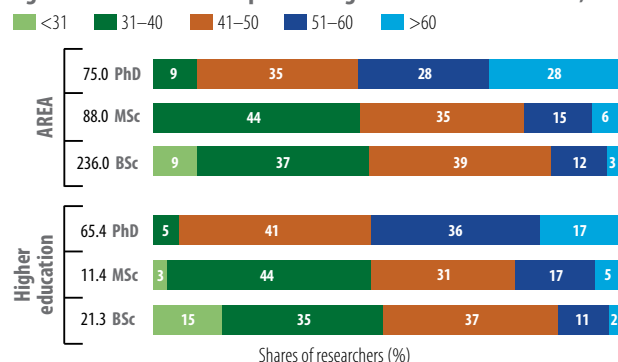
The number of PhD-qualified researchers at AREA and the higher education agencies increased steadily during 2009–2012, a trend that began in the early 1990s. In 2012, two-thirds of all university-based agricultural researchers held PhD degrees, compared with just 19 percent of researchers employed at AREA.

▶ LIMITED POSTGRADUATE TRAINING OPPORTUNITIES FOR RESEARCHERS

Most agricultural scientists in Yemen have received BSc level training within the country. The older generation of researchers has typically obtained postgraduate degrees from universities in other Arab nations or former Eastern bloc countries, but over time, an increasing number of Yemeni faculties have begun to offer MSc training in a variety of agriculture and livestock-related areas. In 2004, the Nasser Faculty of Agricultural Sciences at Aden University was the first agricultural faculty to launch a PhD program in agronomy and plant protection. It was joined in 2013 by Sana'a University's Faculty of Agriculture, which launched a PhD program in horticulture.

Despite the increased number of postgraduate programs in agricultural sciences offered by Yemeni universities, access to formal training by agricultural scientists is limited by funding constraints. Nonetheless, over the past decade, the Yemeni government has sponsored a few fellowships for AREA's researchers at foreign universities, and other AREA researchers secured grants to pursue PhD training in the Czech Republic, Egypt, India, Russia, the United Kingdom, the United States, and Sudan. Organizations like AC-SAD, AOAD, FAO, IAEA, and ICARDA have also funded short-term training for AREA's researchers, most of which took place outside Yemen.

Age distribution of PhD-qualified agricultural research staff, 2012



More than half of the PhD-qualified agricultural researchers at AREA and the higher education agencies are over 50 years old, and a sizable share are over 60 years old. The average age of BSc- and MSc-qualified researchers is considerably lower. It is important that these younger researchers are given opportunities to upgrade their qualifications in the medium term to counteract the impending large-scale loss of senior researchers to retirement.

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)
Yemen	526.7	8%	29%
Oman	243.6	26%	26%
Jordan	272.3	1%	35%
Lebanon	209.2	61%	45%

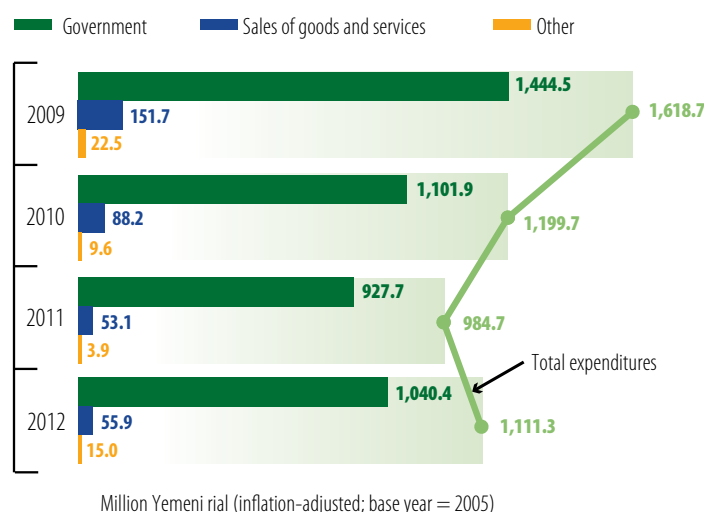
CHALLENGE

- Persistent political instability, coupled with widespread corruption and mismanagement of funds, has caused donor and development bank funding for agricultural R&D to disappear over time. Government contributions to AREA have also fallen in recent years, putting the long-term continuity and effectiveness of research programs at significant risk.

POLICY OPTIONS

- If agricultural R&D in Yemen is to generate higher quality outputs and become more effective, higher levels of funding need to be secured. The government needs to clearly define its long-term R&D priorities and allocate sustained funding, not only for staff salaries, but also to support the costs associated with conducting research. In addition, more creative mechanisms to stimulate private funding for agricultural R&D need to be explored.

AREA's funding sources, 2009–2012







AREA receives the vast majority of its funding from the Yemeni government (more than 90 percent during 2009–2012). In the 1980s and 1990s, AREA received roughly 20 percent of its total budget from donors and development banks. Growing political instability in the country has prompted many donors to withdraw their support over time.

► POLITICAL INSTABILITY PROMPTS DECLINING AGRICULTURAL R&D FUNDING

Yemen's recent history has been marked by civil conflict and political instability, which have had devastating consequences for the country's agricultural R&D agencies. AREA was the target of repeated vandalism, looting, and destruction during the political turmoil. In May 2011, its research station in Elkod was destroyed, and it has yet to be rebuilt. Stations in Taiz and Alhudaidah Provinces were attacked, and laboratory equipment at the Food Research and Post-Technology Center in Aden and the Livestock Improvement Research Center in Lahj Province was stolen.

The country's political instability—in addition to widespread corruption and bad management—have discouraged donors from investing in agricultural R&D in Yemen. The Netherlands withdrew its large-scale support to AREA in 2001, and in 2002 the World Bank–funded Farming Community Development Project, which included a substantial R&D component, was discontinued. IFAD withdrew its agricultural and rural development projects in Rayma Province, Almahra Province, and most recently (2011) in Dhamar Province. All onfarm and adaptive trials in these provinces have come to a complete halt, and the Yemeni government has been unable to provide funding for their continuation. Many other donors have discontinued projects in Yemen in recent years, which has understandably had a tremendously negative impact on day-to-day operations. AREA's coverage of research themes, commodities, and disciplines has narrowed considerably, and investments in human resource development and infrastructure have also contracted. The uncertain and volatile inflow of donor funding to AREA has prompted the agency to generate funding through alternative sources, including the sale of goods and services.

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
Yemen	34.5	–28% 	0.56
Oman	97.0	19% 	6.51
Jordan	32.3	–5% 	1.84
Lebanon	34.1	57% 	0.95

OVERVIEW OF YEMEN'S AGRICULTURAL RESEARCH AGENCIES

Seven public agencies perform agricultural R&D in Yemen. AREA (employing 399 FTE researchers in 2012) accounted for about three-quarters of Yemen's agricultural researchers that year (in FTEs). AREA is headquartered in Tamar City and consists of eight research stations and six national centers located across the country's agroecological zones. AREA's scientists conduct research related to crops, livestock, pastures and forages, socioeconomics, postharvest technologies, and natural resources. The only other government agency engaged in agricultural R&D in Yemen is GAFWRS (15 FTEs in 2012), which focuses its research activities on fisheries. Five higher education agencies are engaged in agricultural R&D in Yemen, the largest of which are the Faculty at Agriculture of Sana'a University (41 FTEs), and the Nasser Faculty of Agricultural Sciences at Aden University (21 FTEs). Agricultural research activities at Yemen's other universities are small-scale and largely ad hoc due to a lack of dedicated funding for research. Agricultural R&D conducted by the private for-profit sector in Yemen is negligible.

7 AGENCIES



Government

2



Higher education

5



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

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 Yemen, visit www.asti.cgiar.org/yemen.

ACRONYMS USED IN THIS FACTSHEET

ACSAD	Arab Center for the Study of Arid Zones and Dry Lands
AOAD	Arab Organization for Agricultural Development
AREA	Agricultural Research and Extension Authority
FAO	Food and Agriculture Organization of the United Nations
FTE(s)	Full-time equivalent (researchers)
GAFWRS	General Authority of Fishery Wealth Research and Sealife
GDP	Gross domestic product
IAEA	International Atomic Energy Agency
ICARDA	International Center for Agricultural Research in the Dry Areas
IFAD	International Fund for Agricultural Development
PPP(s)	Purchasing power parity (exchange rates)
R&D	Research and development

ABOUT ASTI, IFPRI, AND AREA

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 and Extension Authority (AREA)** is Yemen's principal agricultural R&D agency. It falls under the Ministry of Agriculture and Irrigation and carries out research related to crops, livestock, pastures and forages, socioeconomics, postharvest technologies, and natural resources.

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