Agricultural R&D Indicators Factsheet | September 2014

JORDAN

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KEY INDICATORS, 2000–2012

Total Public Agricultural Research Spending	2000		2009		2012
Jordanian dinars (million constant 2005 prices)	4.6		6.8		6.4
PPP dollars (million constant 2005 prices)	23.2	▲	34.0	▼	32.3
Overall Growth		**46%**		**–5%**	
Total Number of Public Agricultural Researchers					
Full-time equivalents (FTEs)	174.8	▲	268.7	▲	272.3
Overall Growth		**54%**		**1%**	
Agricultural Research Intensity					
Spending as a share of agricultural GDP	3.50%		2.11%		1.84%
FTE researchers per 100,000 farmers	149.4		227.7		228.8

Notes: Acronyms, definitions, and an overview of agricultural R&D agencies are available on page 4. All indicators on this page exclude agricultural R&D performed by the private sector.

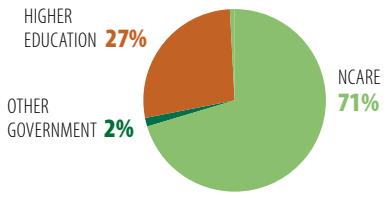
- Despite the fact that Jordan's agricultural R&D spending increased by nearly 40 percent during 2000–2012, spending has not kept pace with rapid growth in agricultural GDP. As a result, the country's agricultural research intensity ratio nearly halved during this period.
- In 2007, Jordan's main agricultural research agency at that time (NCARTT) was merged with the country's agricultural extension department to form NCARE. The new center's expanded mandate put a considerable strain on its scarce resources, including vehicles and equipment.
- Notwithstanding a considerable increase in the national number of agricultural researchers during 2000–2009, a widespread public-sector recruitment ban has caused researcher numbers at NCARE to decline in recent years.

FINANCIAL RESOURCES, 2012

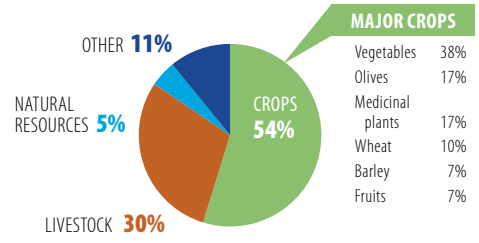
Spending Allocation	
Salaries	61%
Operating and program costs	16%
Capital investments	23%
Funding Sources	
Government	93%
Donors	6%
Sales of goods and services	2%

Note: Shares are based on data for NCARE only.

INSTITUTIONAL PROFILE, 2012



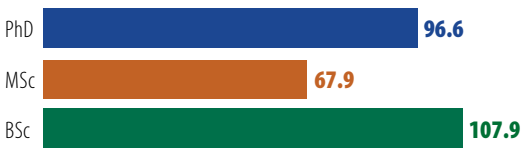
RESEARCH FOCUS, 2012



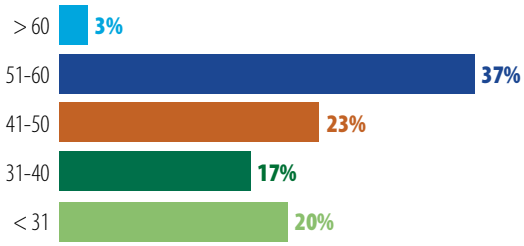
Notes: Major crops include those that are the focus of at least 5 percent of all crop researchers; 3 percent of total crop researchers focused on other crops.

RESEARCHER PROFILE, 2012

Number by qualification (FTEs)



Share by age group (years)



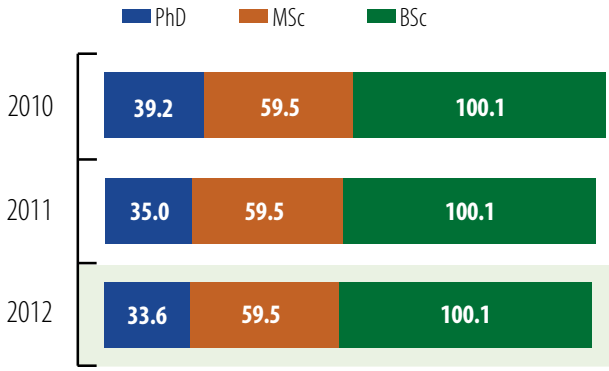
CHALLENGE

- The combination of a recruitment ban, instituted in 2009 by the Jordanian government, and uncompetitive salaries compared with the higher education sector resulted in a contraction in the number of PhD- and MSc-qualified researchers at NCARE. Exacerbating this situation, as of 2012 close to two-thirds of NCARE's PhD-qualified researchers were over 50 years old and hence approaching the official retirement age of 55 years for women and 60 years for men.

POLICY OPTIONS

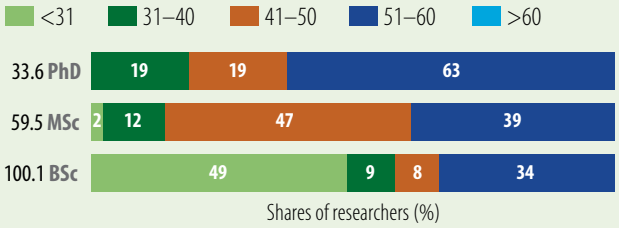
- In order to secure a critical mass of highly qualified agricultural researchers in the future, the government needs not only to invest in the training of young researchers without further delay, but also to ensure that sufficient financial resources are available to retain them over time and provide the necessary conditions to motivate them. Closing the existing salary and retirement age gaps between government and university appointments is a necessary first step.

Total number of NCARE researchers by qualification level, 2010–2012 (FTEs)



Between 2010 and 2012, NCARE lost 8 PhD-qualified scientists (5.6 FTEs, taking into account the time these scientists spent on research as opposed to nonresearch activities). This negative trend is expected to continue as long as recruitment restrictions remain in place.

Distribution of NCARE researchers by age bracket, 2012



NCARE FACES STIFF COMPETITION FROM UNIVERSITIES IN ATTRACTING HIGHLY QUALIFIED SCIENTISTS

NCARE is at a distinct disadvantage to the higher education sector when it comes to recruiting, retaining, and motivating highly qualified scientists. Salaries offered to professional university staff are two to three times higher than for equivalent positions at NCARE; agricultural scientists widely regard university-based positions as more prestigious; Jordan's universities offer promotional opportunities based on merit rather than seniority; and the universities allow fully remunerated sabbaticals, whereas NCARE salaries are cut by 25 to 50 percent when researchers take a sabbatical. Finally, faculty staff at universities can work until they are 70 years old. All these factors make it very difficult for NCARE to attract and retain highly qualified scientists.

In 2012, close to two-thirds of NCARE's researchers with PhD degrees were over 50 years old. With an official retirement age of 55 years for women and 60 years for men, urgent recruitment and training efforts are needed to prevent the center from losing a further 21 PhD-qualified FTE researchers by 2022. Of NCARE's 100 BSc-qualified researchers, 49 are still in their twenties, so measures are needed to provide these researchers with the opportunity to upgrade their qualifications to the MSc and PhD level in the coming years.

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

Note: Indicators in this table exclude agricultural R&D performed by the private sector.

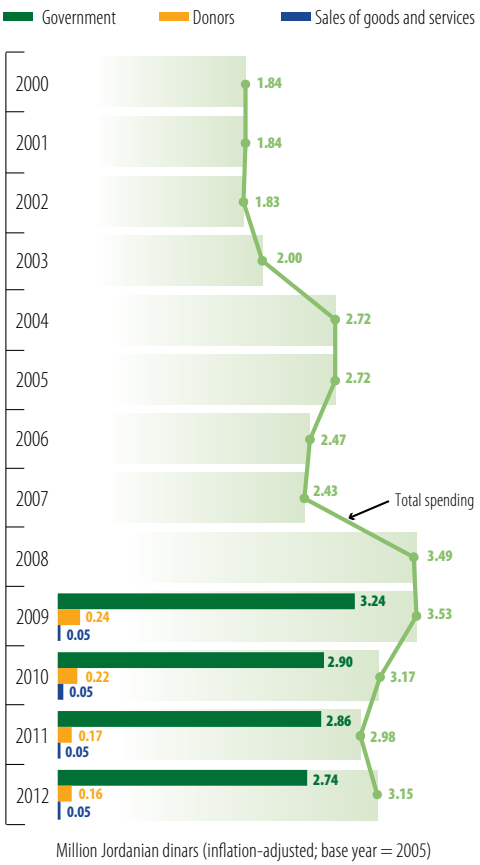
CHALLENGE

- Since the 2007 merger of NCARTT with the former agricultural extension department, NCARE's funding has not increased in proportion to its expanded mandate. The center's research programs are predominantly funded by donors, and any funds NCARE raises internally through the sale of products and services are channeled back to the Treasury, creating a disincentive for the center to pursue this revenue stream.

POLICY OPTIONS

- If agricultural R&D is to address Jordan's most pressing challenges, including water scarcity and loss of agricultural land, the government will need to clearly identify its long-term agricultural R&D priorities, secure higher levels of funding for R&D programs, and enhance donor interest in funding agricultural R&D. Incentives should be put in place for NCARE to generate its own funding, and mechanisms to stimulate private-sector R&D funding should also be explored.

NCARE's total expenditures and funding sources, 2000–2012



Million Jordanian dinars (inflation-adjusted; base year = 2005)

NCARE's total spending grew by more than 70 percent during 2000–2012. It was highest during 2008–2009 due to the establishment of regional research centers in Mafraq and Tafieleh and the purchase of capital goods at the time of its creation in 2007. NCARE derives the bulk of its funding from the national government; nevertheless, almost all of this funding is allocated to salary-related expenses and day-to-day operations, rather than costs associated with conducting research. Donors are the principal funding source for NCARE's research programs, but overall funding levels are extremely low.

Note: Financial data have been adjusted to account for the proportion of time NCARE researchers spent on research-related activities, as opposed to extension or other activities. 2000–2007 data are for NCARTT because they predate its merger with the agricultural extension department.

NCARE'S R&D PROGRAMS REMAIN HIGHLY DEPENDENT ON (DECLINING) DONOR FUNDING

Public agricultural R&D in Jordan is funded through a variety of sources, including the national government, a competitive grant scheme administered by HCST, and a variety of donors. Each year NCARE undergoes a lengthy, bureaucratic budget approval process that acts as a disincentive to requests for increased funding. National government funding generally covers the costs of administration and overhead, plus about 20 percent of the center's research activities. Consequently, most of the funding for research is derived from bilateral donors, including the governments of Denmark, Italy, Japan, and the United States, as well as multilateral donors and international organizations, including the Arab Centre for the Study of Arid Zones and Dry Lands, the Arab Organization for Agricultural Development, the European Union, the Food and Agriculture Organization of the United Nations, the International Center for Agricultural Research in the Dry Areas, the International Fund for Agricultural Development, the Montreal Fund, and the United Nations Development Programme. Due to the global financial crisis, funding from many donors has declined in recent years: donor funding in 2012 was about one-third lower than 2009 levels.

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

Note: Indicators in this table exclude agricultural R&D performed by the private sector.

OVERVIEW OF JORDAN'S AGRICULTURAL RESEARCH AGENCIES

Thirteen agencies perform agricultural R&D in Jordan. NCARE (employing 193 FTE researchers in 2012) is the largest of the country's agricultural R&D agencies, accounting for close to 70 percent of all agricultural researchers in 2012 (in FTEs). NCARE is headquartered in Baqa' (25 km north of Amman), and operates 8 regional centers and 13 research stations focusing on the country's various agroecological zones. NCARE's researchers focus on crops (mainly wheat, barley, chickpeas, fruit, vegetables, and olives), livestock, socioeconomics, and natural resources. Seven higher education agencies are actively engaged in agricultural R&D, the largest of which are the University of Jordan's Faculty of Agriculture (36 FTEs in 2012), and JUST's Faculty of Agriculture (16 FTEs) and Faculty of Veterinary Medicine (10 FTEs). Four private agencies conduct agricultural R&D in Jordan; together they employed 8.8 FTE agricultural researchers in 2012 focusing on issues relating to vegetables, fruits, medicinal plants, pastures and forages, and agricultural engineering.

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

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 Jordan, visit* **www.asti.cgiar.org/jordan.**

ACRONYMS USED IN THIS FACTSHEET

FTE(s)	Full-time equivalent (researchers)
GDP	Gross domestic product
HCST	Higher Council for Science and Technology
JUST	Jordan University of Science and Technology
NCARE	National Center for Agricultural Research and Extension
NCARTT	National Center for Agricultural Research and Technology Transfer
PPP(s)	Purchasing power parity (exchange rates)
R&D	Research and development

ABOUT ASTI, IFPRI, AND NCARE

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 **National Center for Agricultural Research and Extension (NCARE)** is Jordan's principal agricultural R&D agency. It falls under the Ministry of Agriculture and carries out research on crops, livestock, socioeconomics, and natural resources.

ASTI/IFPRI and NCARE 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 NCARE.