

PERU

Gert-Jan Stads, Sandra Perez, Jorge Sarria, and Nienke Beintema

KEY INDICATORS, 2007–2013

Total Agricultural Research Spending	2007		2009		2013
Nuevos soles (million constant 2011 prices)	105.3		143.5		126.9
PPP dollars (million constant 2011 prices)	69.3		94.4		83.4
Overall Growth		36%		-12%	
Total Number of Agricultural Researchers					
Full-time equivalents (FTEs)	288.6		298.3		339.1
Overall Growth		3%		14%	
Agricultural Research Intensity					
Spending as a share of agricultural GDP	0.43%		0.49%		0.35%
FTE researchers per 100,000 farmers	7.92		8.08		8.97

Notes: Research conducted by the private for-profit sector is excluded from this factsheet due to lack of available data. Acronyms, definitions, and an overview of agricultural R&D agencies are provided on page 4.

► Overall, agricultural R&D spending increased during 2007–2013, albeit rather erratically. Nevertheless, Peru's agricultural R&D spending is still well below the United Nations' recommended target of 1 percent of agricultural gross domestic product.

► Peru's number of agricultural researchers per capita and per farmer are among South America's lowest. Employing just 97 FTEs in 2013, INIA, the country's national agricultural research institute, is particularly small compared with its counterparts in other South American countries.

► As of 2013, just 13 percent of Peruvian agricultural researchers were qualified to the PhD level. With the exception of UNALM, most agricultural R&D agencies lack a critical mass of PhD-qualified researchers for their research to have a tangible impact.

FINANCIAL RESOURCES, 2013

Spending Allocation

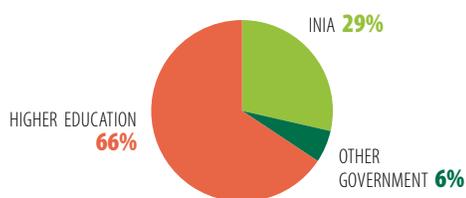
Salaries	41%
Operating and program costs	52%
Capital investments	7%

Funding Sources

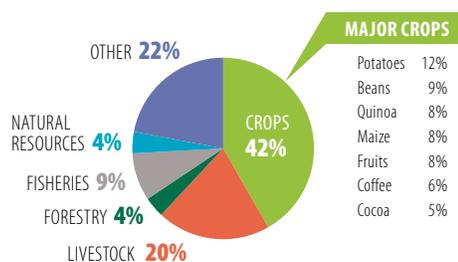
Government	83%
Donors	4%
Sales of goods and services	14%

Note: Shares are based on data for INIA only.

INSTITUTIONAL PROFILE, 2013



RESEARCH FOCUS, 2013



Notes: Major crops include those that are the focus of at least 5 percent of all crop researchers; 44 percent of total crop researchers focused on a wide variety of other crops.

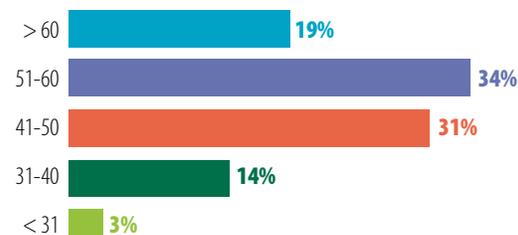
RESEARCHER PROFILE, 2013



Number by qualification (FTEs)



Share by age group (years)



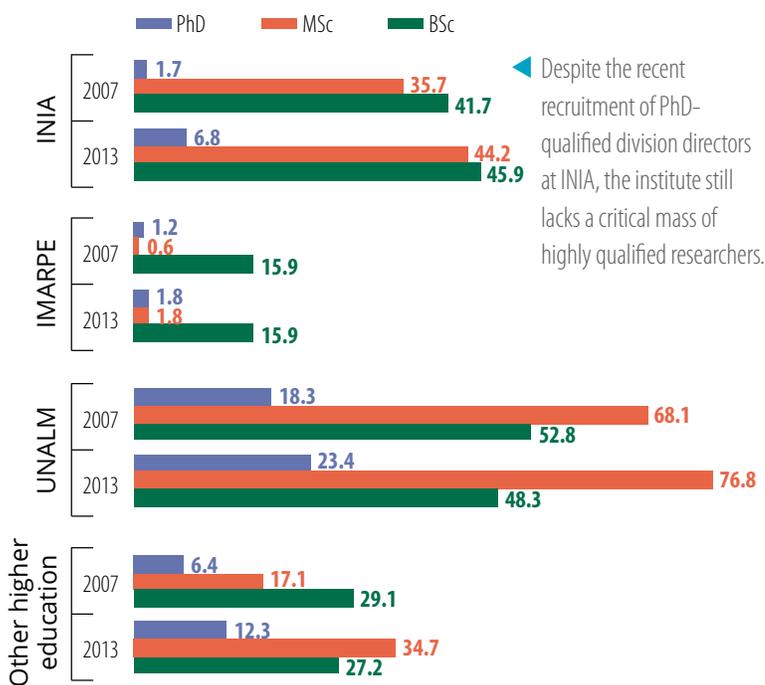
CHALLENGE

- ▶ Compared with many of its counterparts across South America, INIA is a relatively weak national agricultural research institute, primarily due to high staff turnover and numerous changes in leadership over time. This had negative impacts on the continuity of its research programs. The institute lacks the competitive salaries and benefits compared with the higher education sector, which are needed to attract, motivate, and retain well-qualified staff. In 2013, INIA employed just 8 agricultural researchers qualified to the PhD level (all of whom were in their fifties).

POLICY OPTION

- ▶ The recently launched project PNIA (discussed further on page 3) is intended to address some of INIA's immediate capacity constraints by providing the institute's researchers grants for PhD- and MSc-level training, among other initiatives designed to consolidate the national innovation agricultural system. To motivate and maintain researchers over time, salary disparities between INIA- and university-based scientists need to be addressed. In addition, the institute needs to develop a clear set of career development and performance review measures.

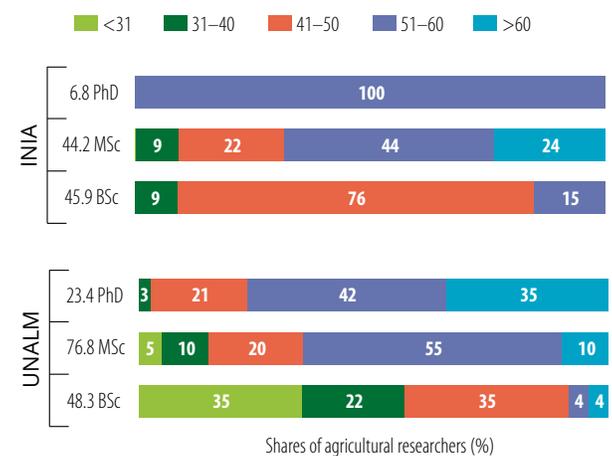
Number of agricultural researchers by degree, 2007 and 2013 (FTEs)



▶ Despite the recent recruitment of PhD-qualified division directors at INIA, the institute still lacks a critical mass of highly qualified researchers.

▶ The vast majority of Peru's agricultural researchers (especially those with PhD degrees) are employed by UNALM.

Distribution of agricultural researchers by age bracket, 2013



- ▶ The vast majority of PhD-qualified researchers in Peru are over 50 years old, posing a significant problem for the future conduct and continuity of agricultural research. A national program was established by CONCYTEC to address this challenge by attracting expatriates back to Peru. Returning researchers are offered higher salaries than those established by law and additional incentives. To date, however, the salary packages offered have not been sufficient; as of 2015 only four scientists had accepted offers to return. Nevertheless, the program is a positive step that could lead to improvements, especially if the right incentives can be provided.

CROSS-COUNTRY COMPARISONS OF KEY INDICATORS

	Total number of researchers, 2013 (FTEs)	Growth in number of researchers, 2009-2013	Share of PhD researchers, 2013 (FTEs)	Total spending, 2013 (million 2011 PPP dollars)	Overall spending growth, 2009-2013	Spending as a share of AgGDP, 2013
Peru	339.1	14%	13%	83.4	-12%	0.35%
Ecuador	149.9	46%	10%	27.3	9% ^a	0.18%
Bolivia	190.3	-1%	11%	58.9	3%	0.93%
Paraguay	209.5	36%	5%	26.8	32%	0.26%

^a For Ecuador, this overall spending growth is based on data for the 2010-2013 period. Note: Please visit www.asti.cgiar.org/benchmarking/lac to benchmark Peru with other countries in Latin America and the Caribbean or compare the country's key indicators with regional averages.

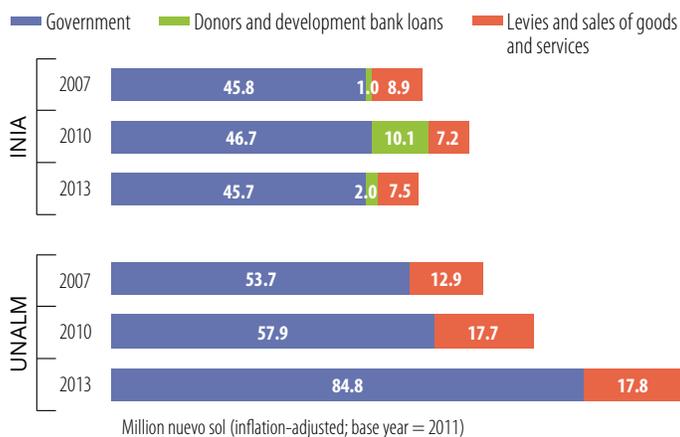
CHALLENGE

- ▶ Despite the progress made by various initiatives to strengthen the national agricultural research system, underinvestment and shifting institutional policies following frequent leadership changes at INIA remain serious constraints. Regardless of the Peruvian economy's rapid growth in recent years, the country's agricultural research capacity remains limited, and its infrastructure and facilities are inadequate. Well-targeted investment and long-term government commitment are crucial.

POLICY OPTION

- ▶ To generate high-quality and effective research outputs, Peru requires higher levels of funding for agricultural R&D. The implementation of PNIA should allow the government to prioritize research activities and to promote coordination across research agencies. Success will require sustainable funding and the establishment of a variety of financial, human resource, and institutional incentives to develop a solid and effective national agricultural innovation system.

Funding sources for INIA and UNALM (2007, 2010, 2013)



- ▶ The majority of INIA's budget was funded by the government during 2007–2013. Project-related loans, such as through PNIA, have increased INIA's funding since. In addition to government funding, UNALM and public universities have received revenues from the mining canon levy since 2004, but funds cannot be allocated to staff salaries so have primarily been allocated to infrastructure and equipment.

▶ STRENGTHENING AGRICULTURAL RESEARCH

The Peruvian agricultural research system is critically understaffed and underfunded. Outdated research facilities and equipment often impede the conduct of productive research and compromise the number and quality of research outputs. Many graduate programs are deficient and fail to meet international training standards. Moreover, scientific production is very fragmented and insufficient to meet the needs of the country's agricultural sector, creating a high dependency on research conducted abroad.

Research coordination and collaboration between Peru's agricultural research agencies has traditionally been very weak. Each agency determines its own research agenda regardless of how areas of focus relate to national agricultural priorities. In order to maximize the use of very limited resources, a more integrated approach to agricultural R&D is needed. To generate high-quality, effective outputs, the Peruvian government needs to clearly define its long-term R&D priorities, establish political and institutional mechanisms to enhance research collaboration among research actors, and earmark sustained funding for a national agricultural research agenda targeting issues of common interest and benefit.

PNIA is intended to tackle some of these issues. The project—which constitutes the third phase of a larger initiative, INCAGRO—was launched in March 2015 with funding from the national government (US\$100 million for five years) and loans from IDB and the World Bank of US\$40 million each. While the first loan targets the consolidation of INIA, the second will focus on developing the national agricultural innovation system. Significant efforts will be made (1) to enhance scientific collaboration between INIA and the higher education sector using competitive funding mechanisms for both basic and applied research projects in pre-defined areas of priority; (2) to renovate INIA's research infrastructure and equipment; and (3) to provide grants for local and international degree-level training. It is expected that by 2017 the number of technologies transferred to farmers will have tripled, and INIA will have the capacity needed to address the country's agricultural research needs within the framework of a solid national agricultural research system.

New varieties released by INIA, 2007–2013

COMMODITY	NUMBER OF VARIETIES
Maize	11
Potatoes	11
Beans	8
Wheat	6
Rice	3
Oats	3
Quinoa	3
Barley	1
Carrots	1
Cotton	1
Cowpeas	1
Garlic	1
Sweet potatoes	1
Triticale	1

- ▶ INIA, Peru's main agricultural research agency involved in crop breeding, released 52 new varieties and numerous other technologies during 2007–2013. INIA collaborated with the country's universities, institutes, and private companies involved in agricultural R&D to generate new cultivars of major crops, including potatoes, rice, maize, and quinoa, along with native Andean crops. Peru imports the majority of its new varieties of vegetables.

Knowledge transfer activities by INIA, 2013

ACTIVITY/OUTPUT/PARTICIPATION	NUMBER OF EVENTS/OUTPUTS/PARTICIPANTS
Field days organized	519
Training events conducted	668
Brochures published	29
People trained	30,983

OVERVIEW OF PERU'S AGRICULTURAL RESEARCH AGENCIES

Eight agencies conduct agricultural R&D in Peru. The main government agency, INIA (97 FTEs in 2013), operates the La Molina experiment center at its headquarters in Lima, and 13 agricultural stations located across the country's agroecological zones. INIA has 15 national programs for agricultural innovation in five areas: crops, livestock, forestry, biotechnology, and genetic resources. Peru's other government agency, IMARPE (20 FTEs in 2013) focuses on fisheries research. Six higher education agencies conduct agricultural research in Peru. The National Agricultural University La Molina (employing 149 FTE researchers in 2013) is by far the largest, accounting for close to 44 percent of the country's agricultural researchers (in FTEs); it offers 12 undergraduate programs, 27 MSc programs, and 7 PhD programs, focusing on agronomic engineering, genetic resources, crops, natural resource management, and socioeconomics. Five additional higher education agencies conduct agricultural R&D in Peru: the Institute of Research of the Faculty of Veterinary Medicine at the National University of San Marcos (33 FTEs); the Faculty of Agricultural Science at the Alas Peruanas University (21 FTEs); the Department of Agroforestry Engineering within the Faculty of Environmental Science of the Scientific University of the South (8 FTEs); the Department of Agricultural and Food and Environmental Engineering at the National University José Faustino Sánchez Carrión (7 FTEs), and the Faculty of Veterinary Medicine of the University Cayetano Heredia (5 FTEs). No private for-profit agencies conducting agricultural R&D were identified.



Note: Excludes private for-profit agencies.

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

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, 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 Peru, visit www.asti.cgiar.org/peru.

ACRONYMS USED IN THIS FACTSHEET

AgGDP	Agricultural gross domestic product
CONCYTEC	National Council for Science, Technology, and Technological Innovation
FTE(s)	Full-time equivalent (researchers)
IDB	Inter-American Development Bank
INCAGRO	Peru Agricultural Research and Extension Program
IMARPE	Peruvian Marine Research Institute
INIA	National Agricultural Innovation Institute
PNIA	National Agricultural Innovation Program
PPP(s)	Purchasing power parity (exchange rates)
R&D	Research and development
UNALM	National Agricultural University La Molina

ABOUT ASTI, IFPRI, AND INIA

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 Agricultural Innovation Institute (INIA)** is Peru's principal governmental agricultural research agency; the institute falls under the Ministry of Agriculture and Irrigation and focuses on crop, livestock, and natural resources research.

ASTI/IFPRI and INIA gratefully acknowledge participating agricultural R&D agencies for their contributions to the data collection and preparation of this country factsheet. ASTI also thanks the Inter-American Development Bank for its generous support of ASTI's work in South America and Mexico. 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 INIA.