

# ECUADOR

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## KEY INDICATORS, 2007–2013

Total Agricultural Research Spending	2007	2010	2013
U.S. dollars (million constant 2011 prices)	na	13.1	14.4
PPP dollars (million constant 2011 prices)	na	24.9	27.3
<b>Overall Growth</b>			<b>9%</b>
Total Number of Agricultural Researchers			
Full-time equivalents (FTEs)	98.3	102.4	149.4
<b>Overall Growth</b>			<b>46%</b>
Agricultural Research Intensity			
Spending as a share of agricultural GDP	na	0.18%	0.18%
FTE researchers per 100,000 farmers	7.72	8.04	11.78

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.

▶ Agricultural R&D investments rose by 9 percent during 2010–2013. Nevertheless, Ecuador has one of the lowest R&D intensity ratios in South America, spending just 0.18 percent of its agricultural GDP on agricultural R&D.

▶ Despite the considerable size of the country's livestock, fisheries, and forestry sectors, these domains are largely overlooked by the country's R&D agencies. Crop research dominates Ecuador's agricultural research agenda, accounting for 85 percent of researchers' time.

▶ Compared with most countries in South America, Ecuadorian agricultural R&D agencies employ relatively few PhD-qualified or female researchers.

## FINANCIAL RESOURCES, 2013

### Spending Allocation

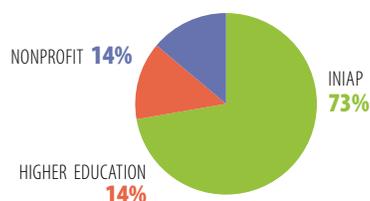
Salaries	46%
Operating and program costs	45%
Capital investments	9%

### Funding Sources

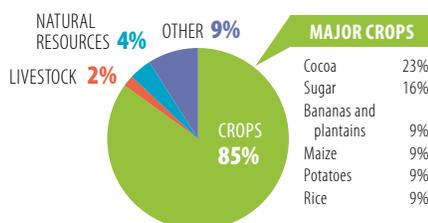
Government	77%
Sales of goods and services	23%

Note: Shares are based on data for INIAP 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; 25 percent of total crop researchers focused on a wide variety of other crops.

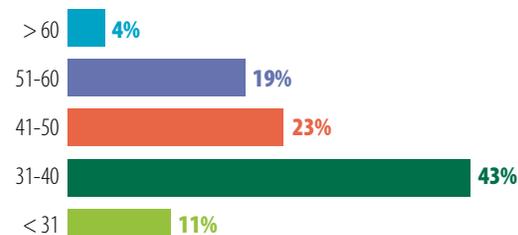
## RESEARCHER PROFILE, 2013



### Number by qualification (FTEs)



### Share by age group (years)



Note: Due to availability, age and gender data exclude the nonprofit sector.

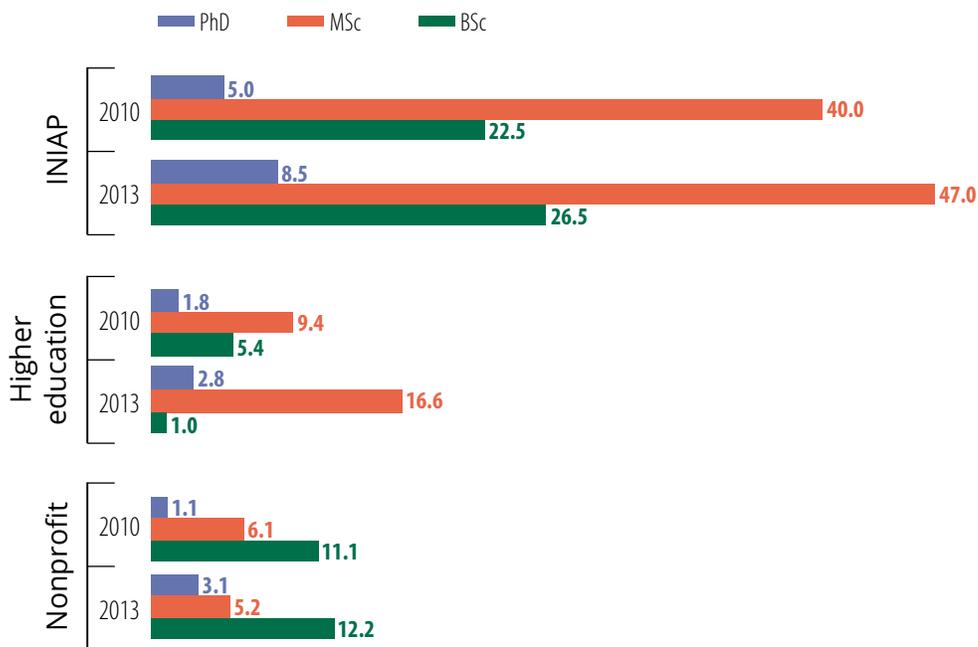
## CHALLENGE

- ▶ Despite considerable increases in the number of PhD-qualified researchers employed at INIAP in recent years, the institute is unable to offer the competitive salaries and benefits needed to attract, motivate, and maintain staff over time.

## POLICY OPTION

- ▶ In 2015, the government launched a new salary scale for all researchers based on their scientific output. Nevertheless, salaries continue to differ between INIAP and university researchers, posing a challenge for INIAP to successfully attract and retain well-qualified staff. Sufficient financial resources need to be made available to facilitate further training for young BSc- and MSc-qualified recruits, and to provide the necessary conditions to motivate them and secure their commitment over time.

### Number of researchers by qualification level, 2010 and 2013 (FTEs)



- ▲ Ecuador lacks a critical mass of PhD-qualified agricultural researchers. In 2013, the country employed just 14.4 FTE agricultural researchers with PhD degrees. Nevertheless, the number of PhDs increased during 2010–2013, not only at INIAP but also at the country's higher education and nonprofit agencies involved in agricultural R&D.

### ▶ SCIENTISTS SPEND LIMITED TIME ON ACTUAL RESEARCH

Despite the fact that agriculture plays a key role in the country's economy and employment, Ecuador's agricultural research system is very small compared with other countries its size. The country's number of agricultural researchers per capita and per farmer are among South America's lowest. During the period studied, INIAP researchers spent around 50 percent of their time on research activities. Their remaining time was spent on technology validation, capacity-building, extension, and project-related administrative tasks. In 2015, SENESCYT required INIAP researchers to spend their time exclusively on the generation of knowledge and technologies. Seed production and technology transfer have since been implemented by dedicated staff specifically contracted for that purpose.

## 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
<b>Ecuador</b>	<b>149.4</b>	<b>46%</b>	<b>10%</b>	<b>27.3</b>	<b>9%<sup>a</sup></b>	<b>0.18%</b>
Peru	339.1	14%	13%	83.4	-12%	0.35%
Paraguay	209.5	36%	5%	26.8	32%	0.26%
Bolivia	190.3	-1%	11%	58.9	3%	0.93%

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

## CHALLENGE

- ▶ In 2013, Ecuador invested just 0.18 percent of its agricultural GDP in agricultural R&D, which is considerably less than other South American countries and the internationally recommended minimum target of 1 percent. This very low research intensity ratio is a clear sign that agricultural R&D investments are too low to effectively address the farm productivity challenges of the rural poor and the issues of soil erosion and desertification posed by climate change.

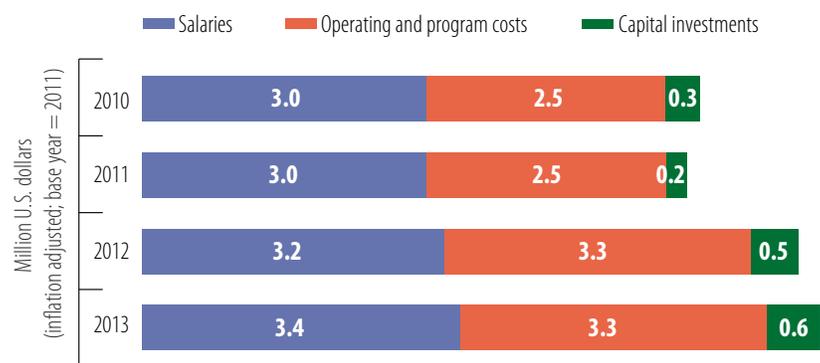
## POLICY OPTION

- ▶ To generate high-quality, effective outputs, Ecuador needs to increase its funding for agricultural R&D. The government must clearly define its long-term R&D priorities and secure sustained funding to cover the day-to-day costs of operating R&D programs as well as much-needed upgrades of R&D infrastructure. Integral to this process is the need to simplify bureaucratic procedures associated with the disbursement of donor and competitive funding to R&D agencies and to cultivate a more enabling policy environment for private investment in R&D.

INIAP's spending on agricultural R&D—that is, excluding costs associated with the institute's agricultural production and extension activities—increased by 9 percent during 2010–2013. Growth continued in subsequent years, but a rapid fall in global oil prices forced the government to cut INIAP funding in 2016.



### INIAP's spending by cost category, 2010–2013



INIAP's capital investments represented an annual average of 6 percent of total spending from 2010 to 2013. More investment in infrastructure and equipment is needed to address the institute's challenges.

### ▶ FUNDING SOURCES OF AGRICULTURAL R&D

- The national government is the principal source of agricultural R&D funding in Ecuador. The government funds all staff-related expenditures, as well as the cost of day-to-day operations.
- In addition to core funding, a large share of government contributions are allocated to research agencies through competitive funding schemes, such as SENESCYT and SENPLADES, to which INIAP and other R&D agencies submit research proposals. Bureaucratic approval procedures and constantly changing requirements, however, are major disincentives for researchers to apply for this type of funding.
- INIAP generates considerable amounts of funding through the sale of goods and services. Funds generated by the sale of seeds and specialized services are reinvested into INIAP's budget.
- Donors play a relatively minor role in financing agricultural R&D in Ecuador. All donor funds are managed centrally by the government, and long and complex procedures often delay the disbursement of these funds to R&D agencies. This situation is said to act as a disincentive for donors to fund Ecuadorian agricultural R&D.

### New varieties released by INIAP, 2007–2013

COMMODITY	NUMBER OF VARIETIES
Beans	9
Maize	5
Potatoes	5
Cocoa	4
Fruit	4
Rice	3
Wheat	3
Amaranth	2
Soybeans	2
Groundnuts	1

- ◀ INIAP, Ecuador's main agricultural research agency involved in crop breeding, released 38 new crop varieties and 198 other technologies during 2007–2013.

### Knowledge transfer activities by INIAP, 2013

ACTIVITY/OUTPUT/PARTICIPATION	NUMBER OF EVENTS/OUTPUTS/PARTICIPANTS
Field days organized	124
Training events conducted	19
Brochures published	4
People trained	26,145
Researchers involved	37

## OVERVIEW OF ECUADOR'S AGRICULTURAL RESEARCH AGENCIES

Nine agencies perform agricultural R&D in Ecuador. INIAP (employing 108.5 FTE researchers in 2013) is the largest of these, accounting for 73 percent of the country's agricultural researchers (in FTEs). In addition to central offices in Quito and Guayaquil, INIAP operates seven field stations, one research center, and 5 experimental farms. Most of INIAP's research focuses on crops, especially bananas, cocoa, potatoes, and rice. The six higher education agencies involved in agricultural R&D account for 14 percent of Ecuador's agricultural researchers (in FTEs). The largest include the Catholic University of Santiago de Guayaquil (employing 8.6 FTEs in 2013) and the Faculty of Agriculture of the University of the Americas (employing 6.4 FTEs). The remaining universities each employed 2 FTEs or fewer. Compared with many other countries in South America, the private nonprofit sector plays an important role in Ecuadorian agricultural R&D. CINCAE (20 FTEs) and ANCUPA (0.5 FTEs) are the country's main sugarcane and oil palm R&D agencies, respectively, deriving their funding entirely from producers. The private-for-profit sector also plays an important role in Ecuador, with a large number of multinational companies involved in banana and fruit research. Data on the country's private for-profit sector were not available and are therefore not included in this factsheet.



Note: Excludes private for-profit agencies.

 For a complete list of the agencies included in ASTI's dataset for Ecuador, visit [www.asti.cgiar.org/ecuador](http://www.asti.cgiar.org/ecuador).

## 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](http://www.asti.cgiar.org/methodology); for more information on agricultural R&D in Ecuador, visit [www.asti.cgiar.org/ecuador](http://www.asti.cgiar.org/ecuador).

## ACRONYMS USED IN THIS FACTSHEET

<b>AgGDP</b>	Agricultural gross domestic product
<b>ANCUPA</b>	National Association of Oil Palm Growers
<b>CINCAE</b>	Sugarcane Research Center
<b>FTE(s)</b>	Full-time equivalent (researchers)
<b>INIAP</b>	National Institute for Agricultural Research
<b>PPP(s)</b>	Purchasing power parity (exchange rates)
<b>R&amp;D</b>	Research and development
<b>SENESCYT</b>	National Secretary of Higher Education, Science, Technology and Innovation
<b>SENPLADES</b>	National Secretary of National Planning and Development

## ABOUT ASTI, IFPRI, AND INIAP

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 Institute for Agricultural Research (INIAP)** is Ecuador's principal agricultural research agency; the institute falls under the Ministry of Agriculture, Livestock, Aquaculture and Fisheries and focuses on crop and natural resources research.

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