Agricultural R&D Indicators Factsheet | November 2022

ECUADOR

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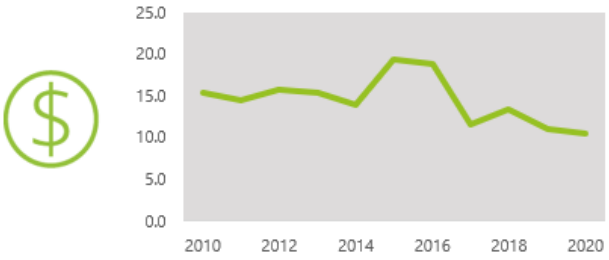
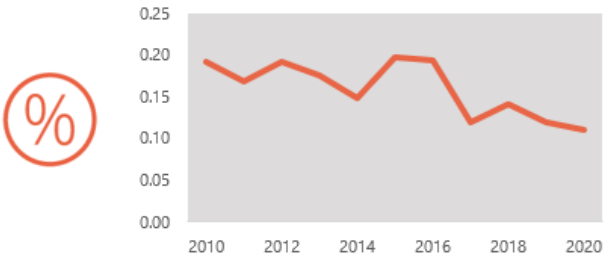
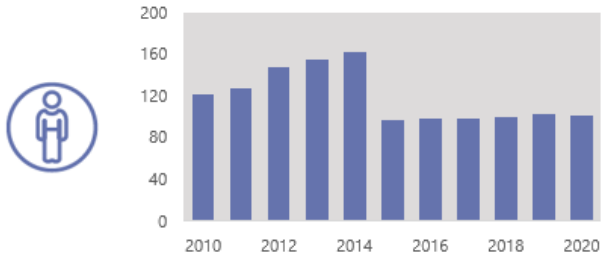
AGRICULTURAL RESEARCH SPENDING



SPENDING INTENSITY



AGRICULTURAL RESEARCHERS



	ECUADOR	PERU	BOLIVIA	COSTA RICA
Million US dollars (2017 constant prices)	10.5			
Million PPP dollars (2017 constant prices)	19.6	111.7	65.1	38.1
Agricultural research spending as a % of agricultural GDP	0.11%	0.40%	0.50%	0.87%
Full-time equivalents	101.3	349.7	165.7	237.7

Small agricultural R&D system

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. Ecuador also stands out in that a sizable portion of the time of people in official research positions is spent on nonresearch activities.

Severe underinvestment

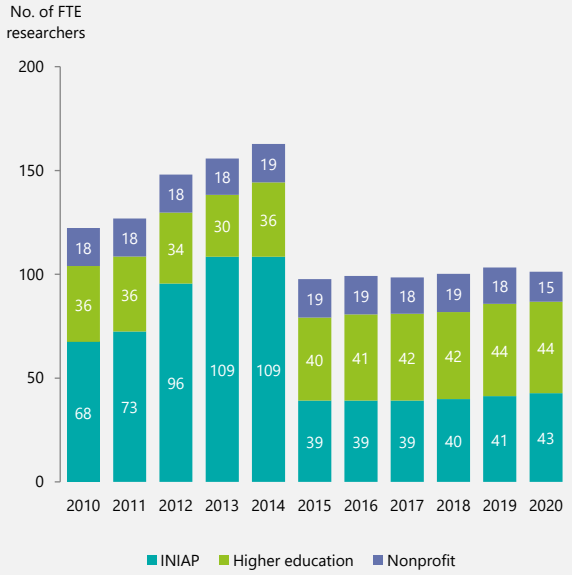
Ecuador's agricultural research expenditures nearly halved during 2015–2020 as a result of severe shock measures by the Moreno government to reduce the country's debt and public deficit. Spending just 0.11 percent of its AgGDP on agricultural R&D in 2020, Ecuador's R&D investment is far too low to effectively address the farm productivity challenges of the rural poor and the issues of soil erosion and deserti-fication posed by climate change.

Capacity challenges

Compared with most countries in South America, Ecuadorian agricultural R&D agencies employ relatively few researchers with PhD degrees. In addition, a considerable portion of the most highly qualified researchers will be retiring in the coming years. The country will need to recruit and train the next generation of agricultural researchers without delay, and provide the necessary conditions to maintain their commitment over time.

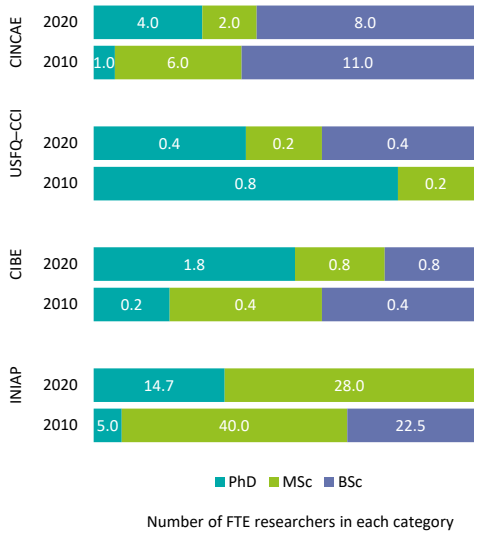
Institutional composition of Ecuador's agricultural research

Ecuador's agricultural research system is very small for a country its size. In 2015, a major job reclassification initiative by the Ministry of Labor stripped many public-sector researchers—including INIAP's—from their official *researcher* title. BSc-qualified staff were no longer considered researchers, but support staff instead. INIAP's official number of researchers dropped considerably as a result of this initiative, prompting major shifts in the researcher composition of Ecuador's agricultural research system.



Ecuador's agricultural researchers by qualification level

Despite considerable increases in the number of PhD-qualified researchers employed at INIAP, CINCAE, and some of the higher education agencies in recent years, the country continues to lack a critical mass of agricultural researchers with PhD degrees. Uncompetitive salary levels and benefits compared to universities pose a challenge for INIAP to successfully attract, motivate, and retain well-qualified staff over time.



Ecuador's agricultural researchers broken down by gender

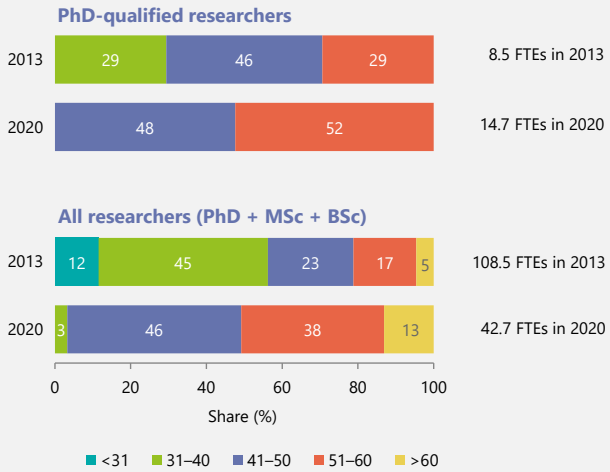
Gender balance in agricultural research is still far from being achieved in Ecuador. In 2020, 25 percent of the country's agricultural researchers were women, a fraction lower than the 26-percent share recorded in 2013. On average, Ecuador's higher education agencies employ a higher proportion of female agricultural researchers than INIAP and CINCAE.

By main agricultural R&D agencies, 2020

INIAP	**20%**
Universidad Central de Ecuador	**34%**
Universidad Técnica de Manabí	**24%**
Universidad San Francisco de Quito	**20%**
CIBE	**38%**
CINCAE	**21%**

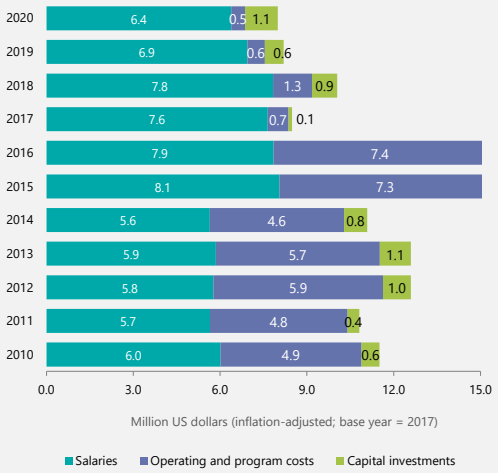
INIAP's researchers by qualification level and age bracket

Public-sector recruitment restrictions have skewed the average age of INIAP researchers to the higher end of the spectrum over time, such that many are approaching retirement age. Overall, as of 2020, more than half the institute's researchers were in their 50s or 60s. Without adequate succession strategies and training, significant knowledge gaps will emerge, raising concerns about the quality of the institute's future research outputs.



INIAP's spending broken down by cost category

In recent years, salary costs represented about 80 percent of INIAP's total expenditures. Operating and program costs still represented a sizeable share of the institute's expenditures during 2010–2016, but the 2017 fall of the Correo government and the ensuing financial crisis prompted sharp cuts in government funding. The salary cuts for Ecuador's civil servants that took effect in 2020 reduced INIAP's overall expenditures even further. An important share of government contributions is allocated to research agencies through competitive funding schemes, such as those from SENESCYT and SENPLADES. Donor funding is managed centrally by the government as well, and subsequently disbursed to R&D agencies.

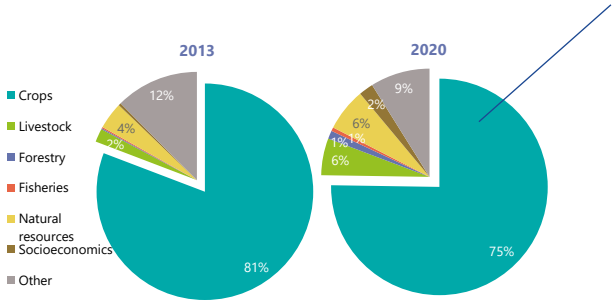


Commodity focus of Ecuador's agricultural researchers

Despite the considerable size of Ecuador's livestock, fisheries, and forestry sectors, these domains are largely overlooked by the country's R&D agencies. Crop researchers represent three quarters of Ecuador's agricultural researchers, while livestock and natural resources account for 6 percent each. The country's most researched crops include sugarcane, potato, cocoa, fruits, and maize.

Crop breakdown, 2020

Cereals	12%
Roots and tubers	9%
Pulses	2%
Oil-bearing crops	6%
Horticultural crops	20%
Other crops	25%



Crop varieties released by INIAP (2017–2020) and CINCAE (2007–2020)

During 2017–2020, INIAP released 8 new crop varieties, three of which were rice varieties. All these new varieties are in the process of being registered and protected. CINCAE has released a steady flow of new sugarcane varieties over the past decade, all of which have been registered and protected.

Variety name	Crop type	Year of release	Protection mechanism
INIAP			
INIAP-Arenillas	Rice	2017	Reg. in process
INIAP-Toquecita	Sweet potato	2019	Reg. in process
INIAP 543-QPM	Maize	2019	Reg. in process
INIAP-Fátima	Potato	2019	Reg. in process
INIAP-Impacto	Rice	2020	Reg. in process
INIAP-FL-elite	Rice	2020	Reg. in process
INIAP Fortaleza	Oats	2020	Reg. in process
INIAP-La Rendidora	Yucca	2020	Reg. in process
CINCAE			
ECU-01	Sugarcane	2007	Registered
EC-02	Sugarcane	2009	Registered
EC-03	Sugarcane	2011	Registered
EC-04	Sugarcane	2011	Registered
EC-05	Sugarcane	2013	Registered
EC-06	Sugarcane	2013	Registered
EC-07	Sugarcane	2016	Registered
EC-08	Sugarcane	2016	Registered
EC-09	Sugarcane	2020	Registered

Publication record of INIAP's researchers

During 2017–2020, INIAP researchers published around 60 peer-reviewed publications per year, mostly in international journals. This brings the institute's average number of peer-reviewed publications to 1.45 per FTE researcher per year. The scientific output of researchers at INIAP has been relatively high in recent years compared to many other national agricultural research institutes across Latin America. Researchers at INIA (Peru) or INTA (Costa Rica), for example, produce significantly fewer peer-reviewed publications on an annual basis. Comparable average 2017–2020 ratios for these two institutes were just 0.41 and 0.22, respectively.

Number of peer-reviewed publications, 2017–2020

	2017	2018	2019	2020
Journal articles				
International	51	34	51	51
National	15	5	9	8
Books	1	0	0	1
Book chapters	1	0	2	8
Total	**68**	**39**	**62**	**68**

ASTI RESOURCES FOR ECUADOR

This factsheet presents recent data on the agricultural research system of Ecuador, primarily focusing on key financial, human resource, institutional, and output indicators, while also highlighting relevant trends, challenges, and institutional changes. Additional resources are available at **www.asti.cgiar.org** and include:

- ASTI's **interactive country page** for Ecuador features national agricultural research investment and capacity data, a data exploration and download tool, as well as access to a variety of country publications.
- ASTI's **benchmarking tool** allows key agricultural research indicators to be ranked and compared across Latin American countries.
- ASTI's **data download tool** provides access to more in-depth ASTI datasets and graphs for Ecuador and many other countries.
- ASTI's **agency directory** provides an overview of agencies involved in agricultural research in Ecuador, along with their location and key agency-level indicators.

ASTI DATA PROCEDURES AND METHODOLOGY

The data underlying this factsheet were derived through detailed primary surveys from the country's principal agricultural R&D agencies. Data from smaller R&D agencies 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 incomplete data coverage.

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 (non-research) activities.

ASTI presents its financial data in 2017 local currencies and 2017 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 decimal rounding can cause totals to be one point higher or lower than the sum of their parts.

For more information on ASTI's data procedures and methodology, visit www.asti.cgiar.org/methodology.

ACRONYMS USED IN THIS FACTSHEET

ASTI	Agricultural Science and Technology Indicators
CIBE	Biotechnology Research Center of Ecuador
CINCAE	Sugarcane Research Center of Ecuador
FTEs	full-time equivalent(s)
GDP	gross domestic product
IDB	Inter-American Development Bank
IFPRI	International Food Policy Research Institute
INIA	National Agricultural Innovation Institute (Peru)
INIAP	National Agricultural Research Institute (Ecuador)
INTA	National Institute of Agricultural Innovation and Technology Transfer (Costa Rica)
PPP	purchasing power parity (exchange rate)
R&D	research and development
SENESCYT	National Secretary of Higher Education, Science, Technology, and Innovation
SENPLADES	National Secretary of Planning and Development

ABOUT ASTI

Working through collaborative alliances with numerous national and regional R&D agencies and international institutions, ASTI is a comprehensive and trusted source of information on agricultural R&D systems across the developing world. ASTI is facilitated by the International Food Policy Research Institute (IFPRI). INIAP coordinated in-country data collection. For more information on ASTI, please visit www.asti.cgiar.org/about.

ASTI gratefully acknowledges participating agricultural R&D agencies for their contributions to the data collection and preparation of this country factsheet. They also thank the Inter-American Development Bank (IDB) for its generous support of ASTI's work in Latin America.

This country brief 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 IDB.