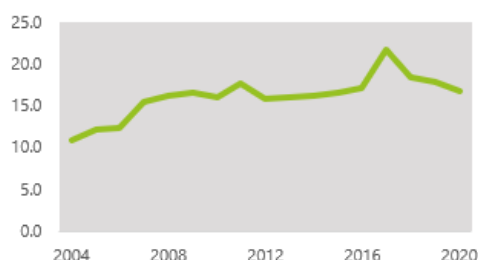


PANAMA

Gert-Jan Stads and Luis de los Santos

AGRICULTURAL RESEARCH SPENDING



Million balboa
(2017 constant prices)

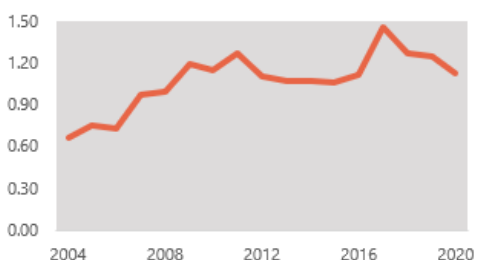
16.7

Million PPP dollars
(2017 constant prices)

33.6

	PANAMA	COSTA RICA	HONDURAS	GUATEMALA
Million balboa (2017 constant prices)	16.7			
Million PPP dollars (2017 constant prices)	33.6	38.1	9.8	14.4

SPENDING INTENSITY

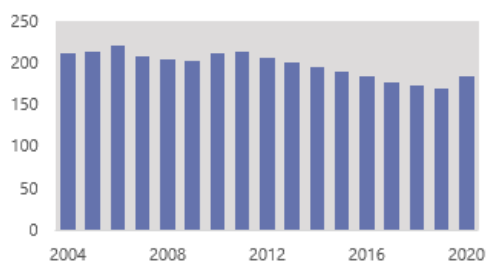


Agricultural research
spending as a % of
agricultural GDP

1.12%

	PANAMA	COSTA RICA	HONDURAS	GUATEMALA
Agricultural research spending as a % of agricultural GDP	1.12%	0.87%	0.20%	0.10%

AGRICULTURAL RESEARCHERS



Full-time equivalents

184.3

	PANAMA	COSTA RICA	HONDURAS	GUATEMALA
Full-time equivalents	184.3	237.7	109.1	154.3

Steady rise in R&D spending

Panama's agricultural research spending has gradually increased during 2004–2020, at an average rate of 2.6 percent per year. Expenditure levels peaked in 2017, but they have remained relatively high since. The 2017 peak can to a large extent be explained by the construction and equipment of IDIAP's new headquarters.

Relatively strong research system

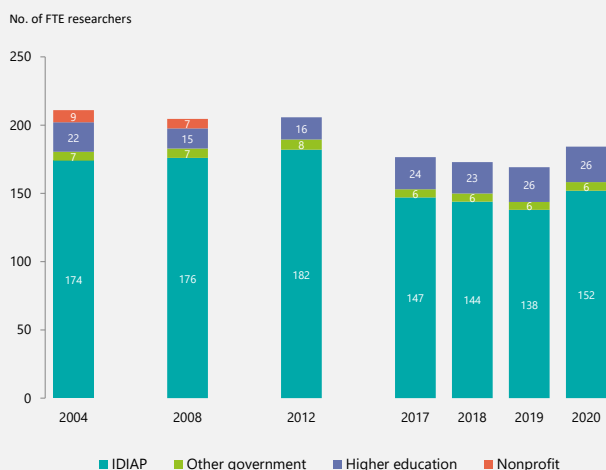
Panama outperforms many of its Central American counterparts in a number of key agricultural R&D indicators. Compared to many of its neighbors, Panama invests a considerably higher proportion of its agricultural output in agricultural research; it employs a relatively high number of scientists with PhD degrees; and it generates an above-average flow of research outputs in the form of publications, new crop varieties, and new agricultural technologies.

Capacity challenges

A very large proportion of Panama's PhD-qualified agricultural researchers is approaching retirement age, posing a significant problem for the future conduct and continuity of agricultural research. The country will need to recruit and train scientists without delay, and provide the necessary remuneration, working conditions, and incentives to maintain their commitment over time.

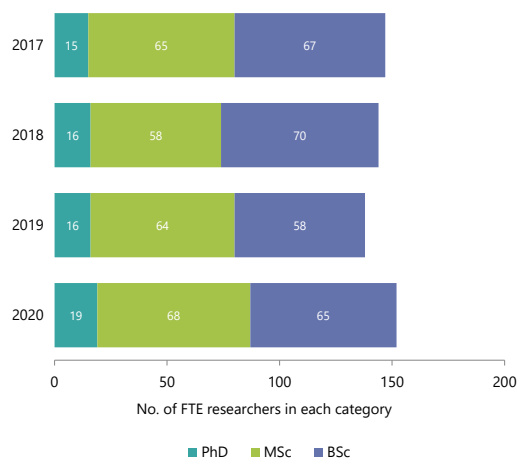
Institutional composition of Panama's agricultural research

Agricultural researcher numbers in Panama have fallen over time. In 2020, the country employed 184 FTE agricultural researchers, 82 percent of which were employed at IDIAP, the national agricultural research institute. Compared to many Latin American countries, involvement of the higher education sector in agricultural R&D is relatively limited in Panama. The Faculty of Agriculture of the University of Panama employed 104 academic staff in 2020 that collectively spend a quarter of their time on research, resulting in 26 FTE agricultural researchers.



IDIAP's agricultural researchers by qualification level

Average degree levels of IDIAP's researchers have gradually improved over time. In 2020, 13 percent of the institute's researchers held PhD degrees; 45 percent held MSc degrees; and the remainder was BSc-qualified. Employing 19 researchers with PhD degrees in 2020, the absolute number of PhD-qualified researchers at IDIAP is considerably higher than at the national agricultural research institutes in certain Latin American countries with a greater population than Panama, including INTA (Costa Rica, 10 FTEs), INIA (Peru, 8 FTEs), ICTA (Guatemala, 0 FTEs), and DICTA (Honduras, 1 FTE).



Panama's agricultural researchers broken down by gender

Compared to most countries in Latin America, very few women are involved in agricultural R&D in Panama. In 2020, just 13 percent of the country's agricultural researchers were female, representing a substantial drop over the 18-percent share recorded in 2012. The University of Panama's Faculty of Agriculture employs relatively more female scientists than IDIAP.



By main agricultural R&D agencies, 2020

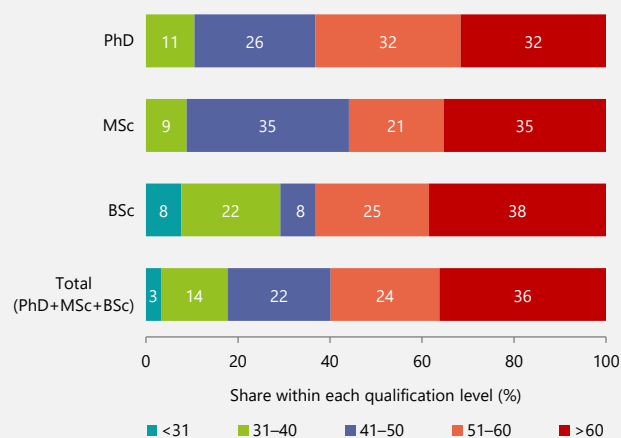
IDIAP	11%
Universidad de Panamá	29%

By qualification level, IDIAP, 2020

BSc 8% MSc 13% PhD 11%

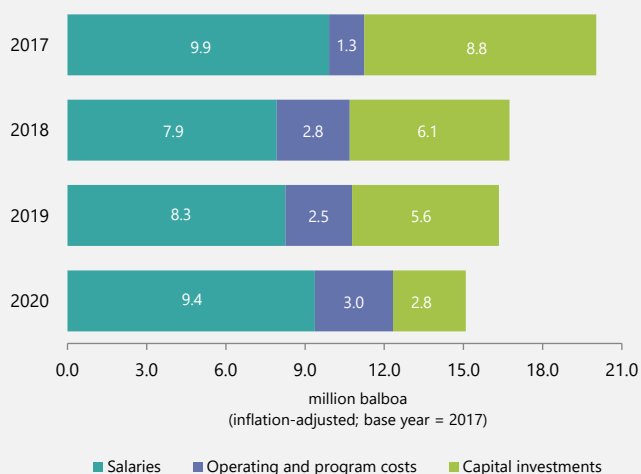
IDIAP's researchers by qualification level and age bracket

Public-sector recruitment restrictions have skewed the average age of IDIAP researchers to the higher end of the spectrum over time, such that many are approaching retirement age. Overall, as of 2020, 36 percent the institute's researchers were in their 60s and approaching retirement. Without adequate succession strategies and training, significant knowledge gaps will emerge, raising concerns about the quality of the institute's future research outputs.



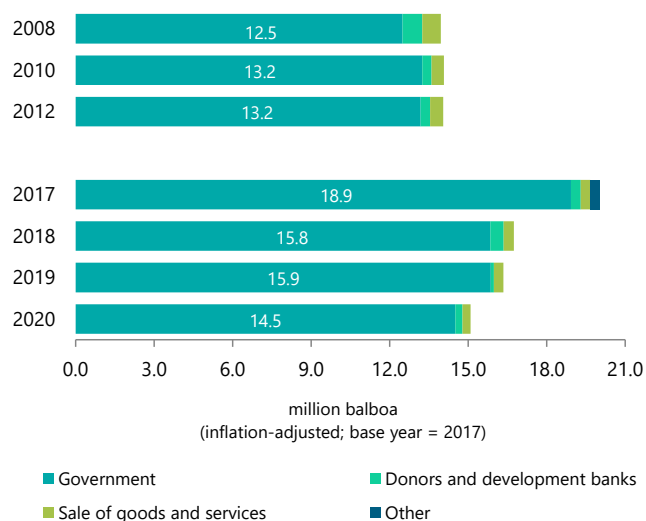
IDIAP's spending broken down by cost category

IDIAP's spending levels decreased during 2017–2020. This is mainly the result of very high one-off capital investments associated with the construction and furnishings of the institute's new headquarters in the Ciudad del Saber just outside Panama City during 2017–2019. In 2020, salary costs represented 62 percent of IDIAP's total expenditures; operating and program costs 20 percent; and capital investments 18 percent.



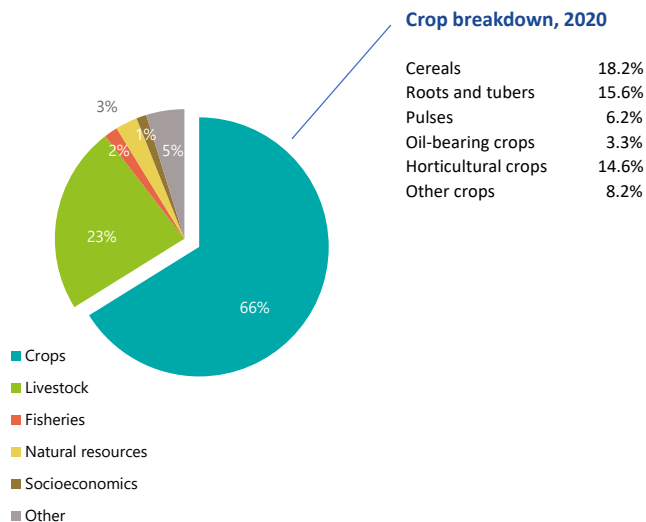
IDIAP's funding broken down by source

The Panamanian government accounts for 95 percent of IDIAP's funding. In addition to allocating core funding to cover the institute's salary and operating costs, the government channels additional funding for research activities through SENACYT on a competitive basis. IDIAP generates very little funding internally through the sale of goods and services. The principal donors to IDIAP include FONTAGRO and IDB.



Commodity focus of Panama's agricultural researchers

Two-thirds of Panamanian agricultural research is focused on crops, 23 percent on livestock, and the remainder on natural resources, fisheries, socioeconomics, and other areas. This focus has shifted very little over time. The country's most researched crops include rice, maize, beans, coffee, bananas, and potato.



New crop varieties released by IDIAP, 2017–2020

During 2017–2020, IDIAP released 28 improved crop varieties, mostly rice, cassava, maize, and cocoa varieties. Most of these new varieties offer higher yield and/or improved resistance to pests. Only four new rice varieties were registered and protected.

Variety name	Crop type	Year of release	Protection mechanism
IDIAP FL 72-17	Rice	2017	Plant breeder's rights
IDIAP-FL-069-18	Rice	2018	Plant breeder's rights
IDIAP-FL-148-18	Rice	2018	Plant breeder's rights
IDIAP Panamæ-19	Rice	2019	Plant breeder's rights
IDIAP Negro-19	Rice	2019	—
IDIAP Jaguar-19	Rice	2019	—
IDIAP Colorao-19	Rice	2019	—
IDIAP Camaleón-19	Rice	2019	—
IDIAP Uvito-19	Rice	2019	—
IDIAP-ProA-04	Maize	2018	—
IDIAP-MQ-18	Maize	2019	—
IDIAP-MV-1816	Maize	2019	—
IDIAP Roja -17	Potato	2017	—
IDIAP-P-09-11	Bean	2018	—
IDIAP-P-13-38	Bean	2018	—
IDIAP BMR 929-17	Sorghum	2017	—
IDIAP BMR 943-17	Sorghum	2017	—
IDIAP-Candejas-17	Soy	2017	—
IDIAP-Santana-17	Saril (medicinal plant)	2017	—
IDIAP Y 523-17	Cassava	2017	—
IDIAP Y 1450-17	Cassava	2017	—
IDIAP Y 1505-17	Cassava	2017	—
Brasileña	Cassava	2017	—
IDIAP C 03-17	Sweet potato	2017	—
IDIAP C 90-17	Sweet potato	2017	—
IDIAP Blanco	Cocoa	2018	—
IDIAP Morado	Cocoa	2018	—
IDIAP Mulato	Cocoa	2018	—

ASTI RESOURCES FOR PANAMA

This factsheet presents recent data on the agricultural research system of Panama, 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 Panama 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 Panama and many other countries.
- ASTI's **agency directory** provides an overview of agencies involved in agricultural research in Panama, 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	INIA	National Agricultural Research Institute (Peru)
DICTA	Agricultural Science and Technology Directorate (Honduras)	INTA	National Institute of Agricultural Innovation and Technology Transfer (Costa Rica)
FONTAGRO	Regional Fund for Agricultural Technology		
FTEs	full-time equivalent(s)	R&D	research and development
GDP	gross domestic product	PPP	purchasing power parity (exchange rate)
ICTA	Agricultural Science and Technology Institute (Guatemala)	SENACYT	National Science, Technology, and Innovation Secretariat
IDB	Inter-American Development Bank		
IDIAP	Agricultural Innovation Institute of Panama		
IFPRI	International Food Policy Research Institute		

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). IDIAP 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.

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