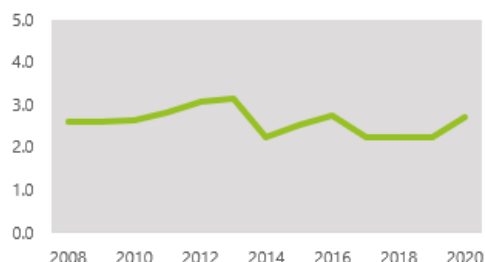


# BELIZE

Gert-Jan Stads and Luis de los Santos

## AGRICULTURAL RESEARCH SPENDING



Million Belize dollars  
(2017 constant prices)

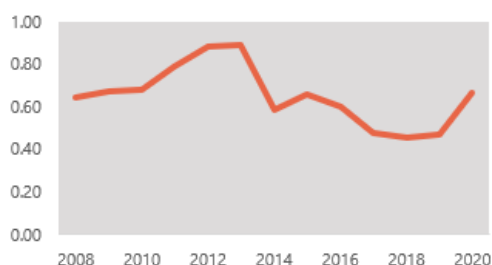
**2.0**

Million PPP dollars  
(2017 constant prices)

**1.4**

	BELIZE	GUATEMALA	HONDURAS	COSTA RICA
Million Belize dollars (2017 constant prices)	<b>2.0</b>			
Million PPP dollars (2017 constant prices)	<b>1.4</b>	14.4	9.8	38.1
Agricultural research spending as a % of agricultural GDP	<b>0.65%</b>	0.10%	0.20%	0.87%
Full-time equivalents	<b>9.5</b>	154.3	109.1	237.7

## SPENDING INTENSITY



Agricultural research spending as a % of agricultural GDP

**0.65%**

## AGRICULTURAL RESEARCHERS



Full-time equivalents

**9.5**

### Very small R&D system

Compared to most other countries in Central America, Belize's agricultural research system is very small, employing less than 10 FTE researchers in 2020. The country lacks a critical mass of highly qualified researchers needed for the conception, execution, and management of high-quality research, and for effective communication with policymakers, donors, and other stakeholders.

### Institutional fragmentation

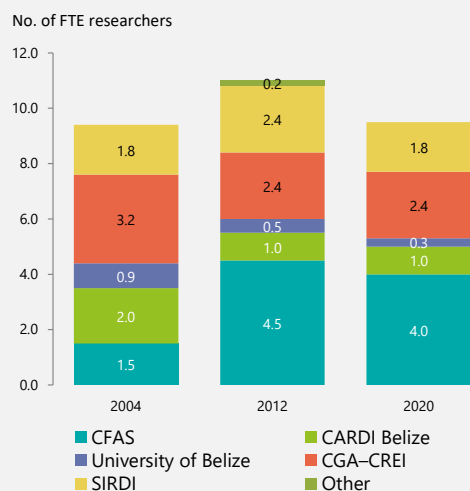
Besides being very small, Belize's agricultural research system is also fragmented. The country's very few researchers are spread over five different agencies, which hinders the effective use of the available scarce resources. More cost-effective structures that minimize duplication and promote synergy and complementarity (both within Belize and across Central America and the Caribbean) are needed to enhance the efficiency and effectiveness of agricultural R&D.

### Silver linings of Belize's NARS

Compared to many of its neighbors across Central America and the Caribbean, Belize scores relatively well on several key indicators. The country employs a relatively young pool of agricultural researchers; a higher proportion of its agricultural researchers are female; and compared to most other national agricultural research institutes in the region, the annual publication record of researchers at Belize's Central Farm is higher.

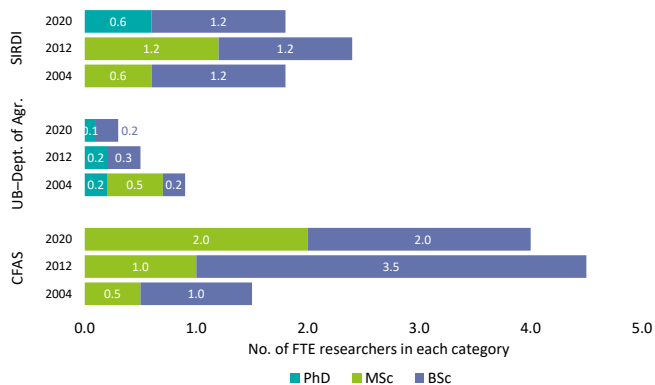
## Institutional composition of Belize's agricultural research

Belize's agricultural research system is highly fragmented. While five agencies were identified conducting agricultural R&D, collectively these five agencies employed only 9.5 FTE researchers in 2020. The Central Farm Agricultural Station (4 FTEs in 2020) is the largest of these agencies, followed by the Citrus Research and Education Institute (2.4 FTEs) and the Sugar Industry Research and Development Institute (1.8 FTEs). Compared to most countries in Latin America and the Caribbean, the higher education sector plays a negligible role in Belize's agricultural research system.



## Belize's agricultural researchers by qualification level

The bulk of Belize's agricultural researchers is BSc-qualified. About one-third of agricultural researchers hold MSc degrees, while PhD-qualified researchers account for little more than 10 percent of the country's research capacity. The Central Farm Agricultural Station, the country's main agency involved in agricultural R&D, employed no researchers with PhD degrees as of 2020. Despite these serious human capacity challenges, average qualification levels of Belize's pool of agricultural scientists have gradually improved over the past two decades.

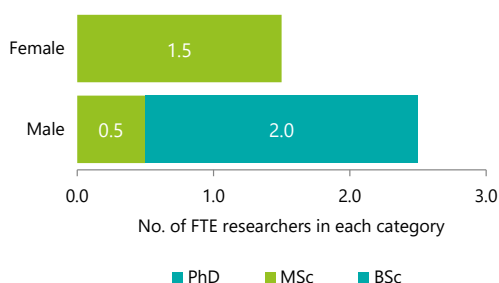


## Belize's agricultural researchers broken down by gender

In 2020, 38 percent of agricultural researchers in Belize were women, slightly lower than the 42 percent share recorded eight years earlier. Even though CFAS employs more men than women, the center's female researchers hold higher degree qualifications, on average.

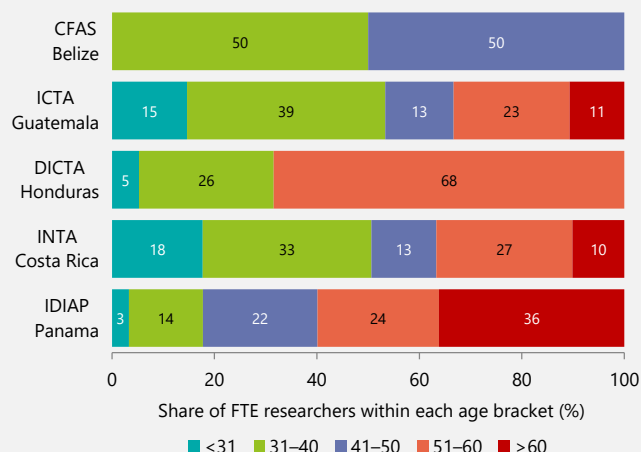


## Distribution of CFAS researchers by gender and degree, 2020



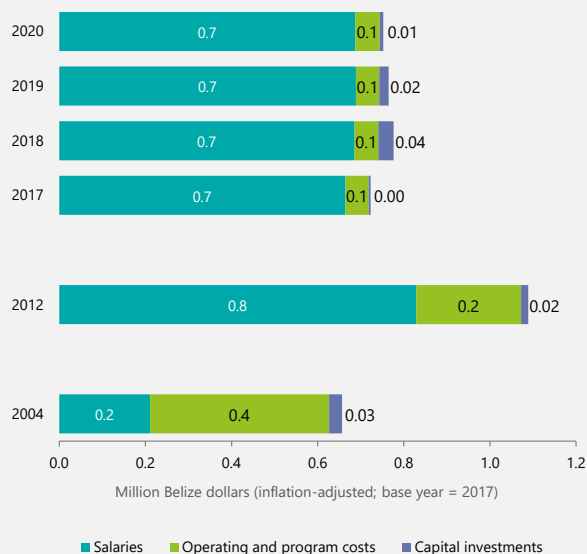
## Distribution of researchers by age bracket

Compared to the national agricultural research institutes of other Central American countries, Belize's Central Farm has a very young pool of scientists. As of 2020, all CFAS researchers were in their thirties or forties. In contrast, the national agricultural research institutes of countries like Panama and Honduras will lose many experienced and highly qualified researchers to retirement in the coming years.



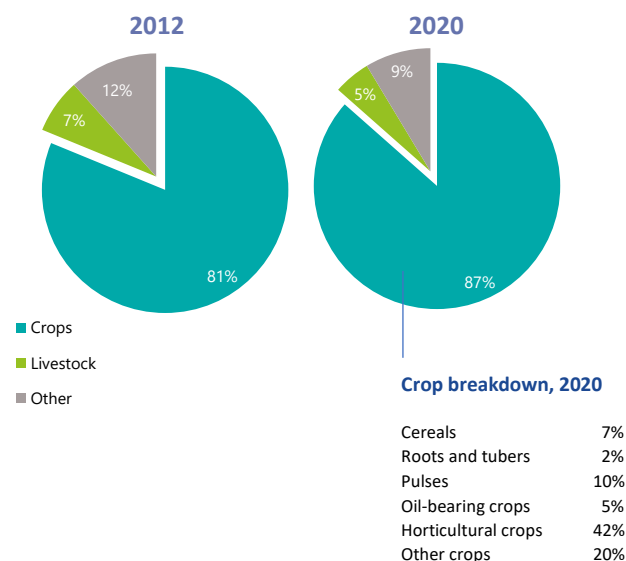
## CFAS's spending broken down by cost category

During 2017–2020, salary costs accounted for 90 percent of CFAS's expenditures, leaving very few resources to cover the costs of research programs and much-needed investments in the construction and maintenance of research infrastructure and equipment. CFAS's budget is entirely funded by the Belize government.



## Commodity focus of Belize's agricultural researchers

Over time, crop research has taken an increasingly prominent position in Belize's agricultural research system at the expense of other noncrop agricultural research areas. In 2020, 87 percent of Belize's agricultural researchers focused their research on crops, just 5 percent on livestock, and the remainder on other areas. The country's most researched crops include fruits, sugarcane, beans, vegetables, maize, and coconut.



## Thematic focus areas of Belize's agricultural research

The breakdown of agricultural researchers by thematic area of focus clearly demonstrates the lack of a critical mass of researchers in a number of key domains. Very few scientists are involved in crop breeding or soil research. Agronomy and crop pest and disease control are the main focus areas.

Thematic research area	Number of researchers (FTEs)	Share of total FTE researchers (%)
Crop genetic improvement	0.4	4.6
Agronomy	3.3	34.9
Crop pest and disease control	1.7	17.7
Other crop areas	0.1	0.9
Animal genetic improvement	0.6	6.3
Animal management	0.1	0.6
Soil	0.3	2.7
Water	0.1	0.9
On-farm postharvest	0.1	1.1
Off-farm postharvest	0.8	8.4
Agricultural engineering	0.3	2.9
Farm systems	0.1	0.9
Socioeconomics	0.1	0.9
Capacity strengthening	1.6	16.8
<b>Total</b>	<b>9.5</b>	<b>100.0</b>

## Outputs of CFAS's researchers

Given the small size of CFAS compared to counterpart institutes across Latin America and the Caribbean, the center's research outputs are understandably a lot lower. During 2010–2020, CFAS's scientists released one improved maize variety. Their research is published in local journals.

### New crops varieties released, 2010–2020

Variety name	Crop type	Year of release	Protection mechanism
YC001	Maize	2010	None

### Number of peer-reviewed publications, 2017–2020

	2017	2018	2019	2020
Journal articles				
International	-	-	-	-
National	6	6	2	4
Books	-	-	-	-
Book chapters	-	-	-	-
<b>Total</b>	<b>6</b>	<b>6</b>	<b>2</b>	<b>4</b>
<b>Peer-reviewed publications per FTE researcher per year</b>	<b>2.0</b>	<b>2.0</b>	<b>0.6</b>	<b>1.0</b>

## ASTI RESOURCES FOR BELIZE

This factsheet presents recent data on the agricultural research system of Belize, 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](http://www.asti.cgiar.org) and include:

- ASTI's **interactive country page** for Belize 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 Belize and many other countries.
- ASTI's **agency directory** provides an overview of agencies involved in agricultural research in Belize, 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](http://www.asti.cgiar.org/methodology).

## ACRONYMS USED IN THIS FACTSHEET

ASTI	Agricultural Science and Technology Indicators	IDIAP	Agricultural Innovation Institute of Panama
CARDI	Caribbean Agricultural Research and Development Institute	IFPRI	International Food Policy Research Institute
CFAS	Central Farm Agricultural Station	INTA	National Institute of Agricultural Innovation and Technology Transfer (Costa Rica)
CGA	Citrus Growers Association		
CREI	Citrus Research and Education Institute	NARS	national agricultural research system
DICTA	Agricultural Science and Technology Directorate (Honduras)	PPP	purchasing power parity (exchange rate)
FTEs	full-time equivalent(s)	R&D	research and development
GDP	gross domestic product	SIRDI	Sugar Industry Research and Development Institute
ICTA	Agricultural Science and Technology Institute (Guatemala)		
IDB	Inter-American Development Bank		

## 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). CFAS coordinated in-country data collection. For more information on ASTI, please visit [www.asti.cgiar.org/about](http://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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