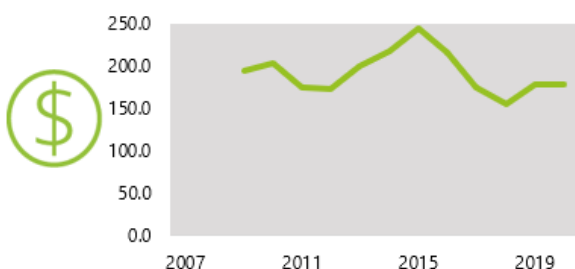


BOLIVIA

Gert-Jan Stads and Luis de los Santos

AGRICULTURAL RESEARCH SPENDING



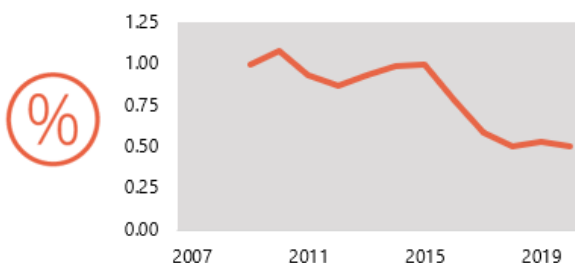
Million bolivianos (2017 constant prices)

178.9

Million PPP dollars (2017 constant prices)

65.1

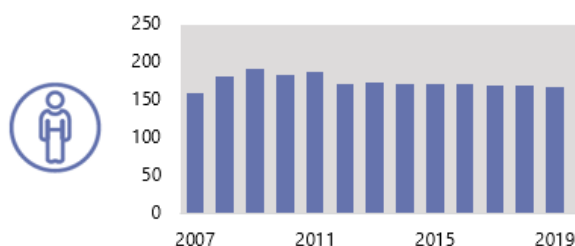
SPENDING INTENSITY



Agricultural research spending as a % of agricultural GDP

0.50%

AGRICULTURAL RESEARCHERS



Full-time equivalents

165.7

Erratic research spending

Bolivia's agricultural R&D spending is characterized by considerable year-to-year fluctuations. The costs of R&D programs, running the day-to-day operations of laboratories, and much-needed capital investments are chiefly funded by donors and development banks. Dependence on this type of funding—which by nature is volatile and ad hoc—makes the country somewhat vulnerable to funding shocks.

Underinvestment

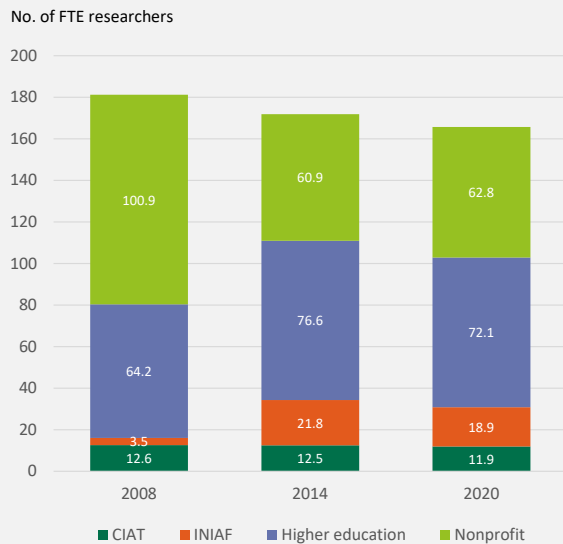
Bolivia's agricultural research spending has not kept pace with growth in agricultural output. The country's agricultural research intensity ratio—that is agricultural research spending as a percentage of agricultural GDP—halved from 1.0 to 0.5 percent during 2015–2020. Bolivia's agricultural research investment is too low to effectively address farm productivity challenges of the rural poor and threats posed by climate change.

Capacity challenges

Compared with most countries in South America, Bolivian agricultural R&D agencies employ relatively few researchers with PhD degrees. In addition, a considerable portion of the most highly qualified researchers are set to retire in the coming decade. 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.

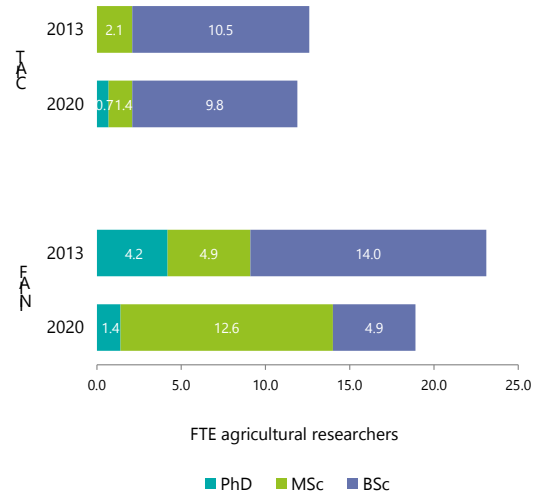
Institutional composition of Bolivia's agricultural research

Bolivia stands out from many of its Latin American counterparts in that the higher education and nonprofit sectors play an important role in the agricultural research system. The Universidad Mayor de San Simón and PROINPA are relatively big players compared to INIAF and CIAT, the two main government R&D agencies. PROINPA's involvement in agricultural R&D declined when the foundation was detached from SIBTA in 2011/12 and INIAF took over its research on the genetics of grains and tubers. This has prompted an important shift in the overall composition of Bolivian agricultural R&D system.



Bolivia's agricultural researchers by qualification level

Most of Bolivia's agricultural researchers with PhD degrees are employed at the universities and PROINPA. Both INIAF and CIAT continue to lack a critical mass of PhD-qualified researchers. The 2012–2017 PISA project—funded by the World Bank, and the governments of Bolivia, Denmark, and Switzerland—offered scholarships to INIAF researchers for MSc and PhD training abroad in key areas, such as crop genetic improvement and biostatistics. Although PISA has had a very positive impact on the number of researchers with MSc degrees at INIAF, this relatively young institute continues to face severe challenge in attracting and retaining highly qualified staff.



Bolivia's agricultural researchers broken down by gender

Gender balance in agricultural research is still far from being achieved in Bolivia. As of 2020, one out of four of the country's agricultural researchers were women. This represented a substantial improvement over the 18-percent share recorded in 2013, nonetheless. Female involvement in agricultural R&D was lower at the Universidad Mayor de San Simón than at most other agricultural R&D agencies in Bolivia.

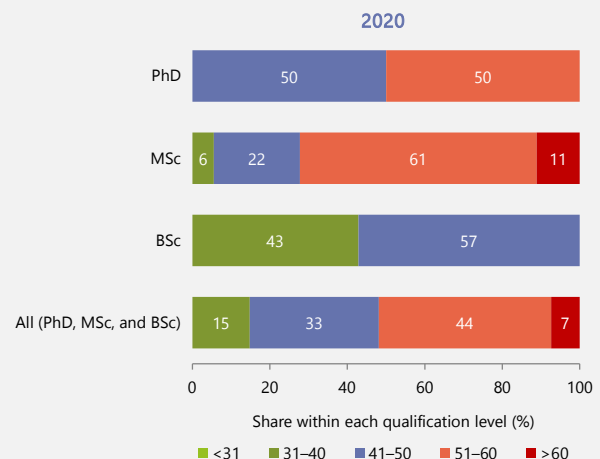


By main agricultural R&D agencies, 2020

CIAT	35%
Universidad Mayor de San Simón	17%
FDTA	31%
PROINPA	33%

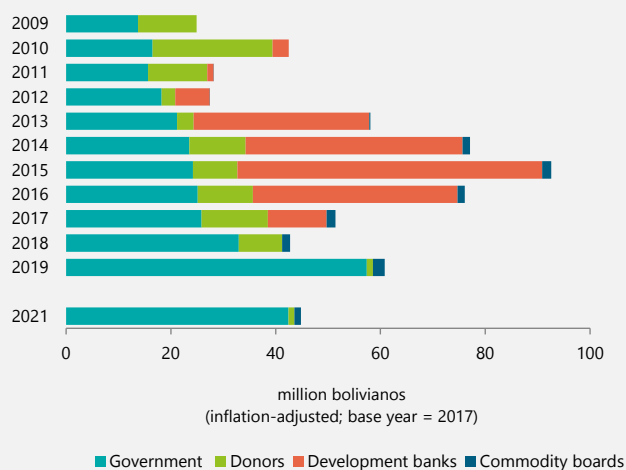
INIAF's researchers by qualification level and age bracket

In recent years, INIAF has lost a number of its most senior PhD-qualified researchers to retirement. As of 2020, 51 percent of the institute's researchers were in their 50s or 60s. Although the PISA project has boosted the overall number of MSc-qualified researchers, roughly three out of four of INIAF's researchers with MSc degrees are older than fifty. Without adequate succession strategies and training of BSc-qualified staff, significant knowledge gaps will emerge, raising concerns about the quality of INIAF's future research outputs.



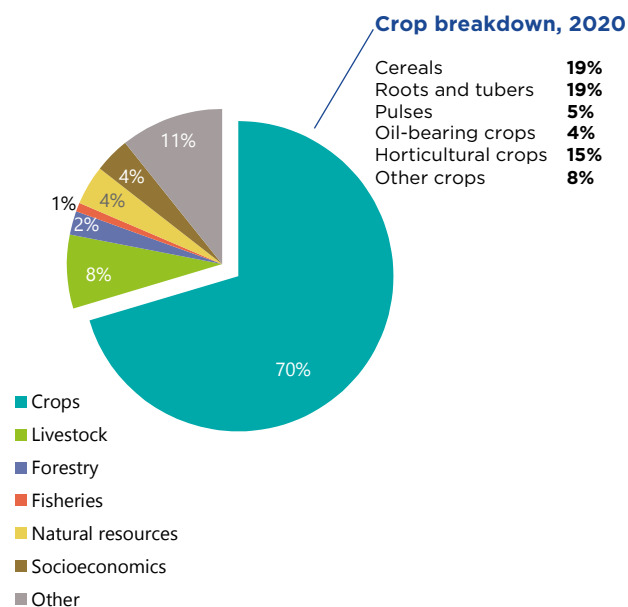
INIAF's funding broken down by source

INIAF's total funding levels have shown an erratic pattern over time. The composition of this funding shows important year-to-year fluctuations as well. In the early years after its 2008 creation, INIAF was heavily dependent on donor and development bank funding. The PISA project provided an important financial injection during 2012–2017, strengthening INIAF's institutional development and capacity to undertake research, technical assistance, and certified seed distribution. Since the completion of PISA, INIAF has been heavily reliant on government funding, which is primarily used to foot the institute's salary bill.



Commodity focus of Bolivia's agricultural researchers

Crop researchers represent 70 percent of Bolivia's agricultural researchers, while livestock researchers account for 8 percent. The remaining researchers are focused on natural resources, socioeconomics, forestry, and fisheries. The country's most researched crops include potato, wheat, maize, quinoa, and banana.



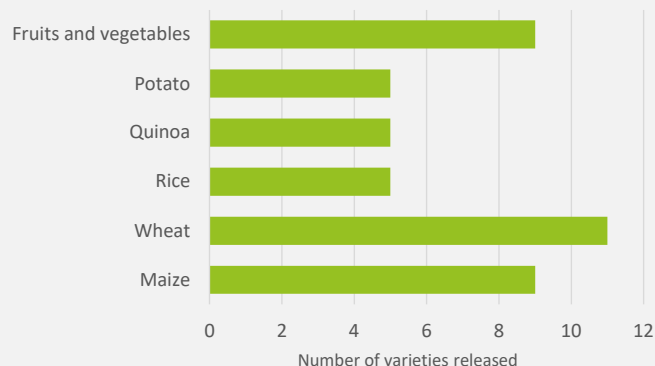
Thematic focus areas of INIAF researchers, 2020

Crop genetic improvement	28%
Crop pest and disease control	5%
Agronomy	35%
Other crop research	1%
Animal genetic improvement	3%
Animal pest and disease control	2%
Pastures and forages	5%
Other livestock research	1%
Soil	4%
Water	4%
Other natural resources	2%
On-farm postharvest	5%
Off-farm postharvest	2%
Agricultural engineering	2%
Other	1%

Total 100%

Crop varieties released by INIAF (2011–2020)

INIAF is Bolivia's principal agency involved in crop breeding. During 2011–2020, the institute released 44 new crop varieties, seven of which have been registered and protected. The bulk of these new crop varieties are wheat, maize, and horticultural varieties, but INIAF has also released a steady flow of potato, quinoa, and rice varieties. Most of the country's new varieties are generated through alliances, either with international agricultural research centers, such as CIMMYT for maize and wheat, or with international cooperation initiatives such as South Korea's KOPIA and KolFACI.



ASTI RESOURCES FOR BOLIVIA

This factsheet presents recent data on the agricultural research system of Bolivia, 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 Bolivia 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 Bolivia and many other countries.
- ASTI's **agency directory** provides an overview of agencies involved in agricultural research in Bolivia, 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
CIAT	Centre for Tropical Agricultural Research
CIMMYT	International Maize and Wheat Improvement Center
FDTA	Foundation for Agricultural Technology Development of Los Valles
FTEs	full-time equivalent(s)
GDP	gross domestic product
IDB	Inter-American Development Bank
IFPRI	International Food Policy Research Institute

INIAF	National Institute for Agriculture and Forestry Innovation
KoIFACI	Korea–Latin America Food and Agriculture Cooperation Initiative
KOPIA	Korea Program for International Cooperation in Agricultural Technology
PISA	Agricultural Innovation and Services Project
PPP	purchasing power parity (exchange rates)
PROINPA	Foundation for Promotion and Research of Andean Products
R&D	research and development
SIBTA	Bolivian Agricultural Technology System

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The Inter-American Development Bank would like to acknowledge the **International Food Policy Research Institute (IFPRI)**.

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). INIAF 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.

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