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EVOLUTION OF CGIAR FUNDING

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SUMMARY

The global health crisis due to Covid-19—with its poverty and food security implications, combined with ongoing food system, climate change, and ecosystem sustainability challenges—only reinforces the need for a robust international public research system focusing on applied agricultural research. Given its half century of historically recorded achievements through a broad network of global partnerships, the CGIAR will be well positioned to address these challenges, assuming it receives the necessary levels of funding to do so. This note is intended to contribute to reflections on the CGIAR's first 50 years, which it will celebrate in 2021, while also providing a useful reference for the current “One CGIAR” governance and management transformation. The brief analysis presented herein confirms the following four CGIAR funding trends over time:

1. Despite its significant record of global research achievements and the growing need to address massive future research for development challenges, ***the CGIAR represents a very small—less than 2 percent—share of total global agricultural research.***
2. The CGIAR's major funders have not changed substantially over time, indicating a positive and much-needed trend of donor allegiance in addressing strategic medium- to long-term research needs. Nevertheless, and with the exception of the very positive entrance of the Bill & Melinda Gates Foundation as a major donor, ***the CGIAR has not attracted other significant funders***, whether as philanthropic partners or as national government partners from the global South.
3. Rather than supporting longer-term institutional research programs, ***the trend of funding relatively short-term projects (of less than three years) has become prevalent.*** This is worrying given the nature of the long-term international research outcomes and impacts the CGIAR aims, and is asked, to achieve (complemented by shorter term national research funded by developing countries).
4. ***A clear trend of increased funding for research focusing on Africa south of the Sahara*** at the expense of other regions of the global South, provides short-term benefits for the priority region but reduces the total global impacts and long-term research spillovers across the developing world.

Important strategic challenges have been created through the combined impacts of the CGIAR (a) remaining a small, but highly relevant global agricultural research system; (b) maintaining a set of key funders over time with a decentralized funding arrangement; (c) focusing on short-term projects and with a strong focus on Africa; and (d) incorporating substantial expansion of its thematic research portfolio over time. Hopefully, these challenges will be properly managed in the transition to the forthcoming, more corporate, phase of the One CGIAR.

INTRODUCTION

The primary role of international public agricultural research is undoubtedly to address key social, environmental, and economic goals at the global level. Further, there is consensus that investment must be accelerated in research-based innovations focusing on sustainable food systems. And given the relatively weak situation of many national agricultural research systems in the global South, it is imperative to reach economies of scale in investments in international initiatives. It is not yet clear, however, how much additional investment is needed or how scarce resources should be allocated across priority research-for-development challenges.

At the international level, growing consensus indicates that—in addition to increasing funding—far greater harmonization is needed in funding and executing research in order to more effectively tackle global agricultural research challenges. Growing opportunities for technology spillovers and research alliances to occur across national, regional, and international boundaries necessitates the ability to access new technological knowledge from a variety of sources. And since access to new technologies is closely related to the capacity to generate new technologies, the need to strengthen and harmonize national, regional, and global research systems becomes even more of a priority.

Although the role, contributions, and impacts of the CGIAR have been analyzed by many authors, only a few have summarized the recent evolution of its financing. This note is intended to contribute to reflections on the CGIAR's first 50 years, which it will celebrate in 2021, while also providing a useful reference for the current “One CGIAR” governance and management transformation.

GLOBAL INVESTMENT PATTERNS

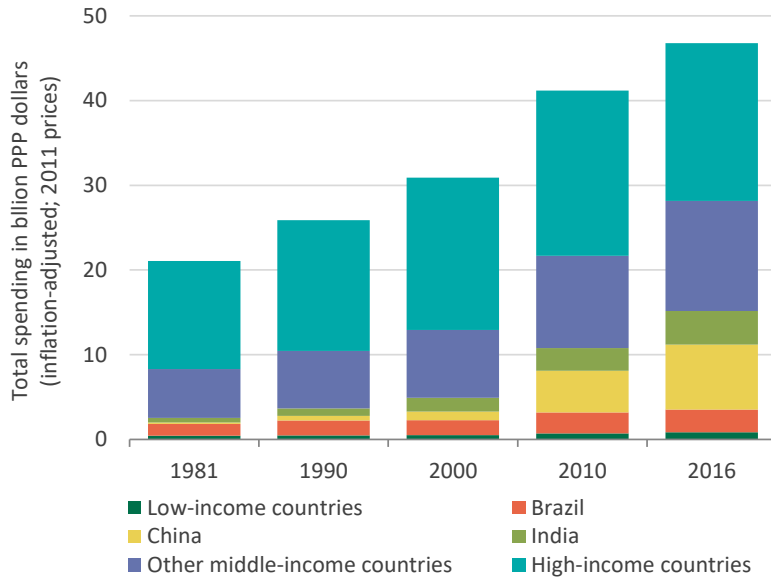
Total global agricultural research investment has grown significantly in past decades. A considerable and growing component of that investment is now funded and executed by the private sector. Middle-income countries represent a growing share of the total spending in agricultural research, and only a few of them represent the largest share of investments devoted to agricultural research.

Paradoxically, despite the demonstrated high payoffs to investment in agricultural research, chronic underfunding threatens either the performance or the existence of many developing-country research systems. While most countries experience budget shortages in the funding needed to maintain the physical infrastructure and human resource capacity to meet traditional research needs, the agenda has expanded significantly over time to include critical challenges related to poverty, nutrition, gender, climate, and the environment.

Global patterns of agricultural research investments have changed considerably (**Figure 1**). Worldwide spending on agricultural research (excluding the private for-profit sector) totaled 47 billion dollars (in 2011 PPP prices) in 2016, the latest year for which aggregated global data are available.¹ This is more than twice the 1981 total of \$21 billion, in inflation-adjusted terms. Most of this growth occurred in middle-income countries, mainly China. As a result, the middle-income country share of the global total rose from 37 to 59 percent during 1981–2016, whereas the low-income country share remained at around 2 percent. In contrast, the high-income country share fell from 61 to 39 percent during this timeframe (Beintema, Nin Pratt, and Stads 2020).

The “research intensity”—that is, agricultural research spending as a share of agricultural gross domestic product (AgGDP)—was 0.73 percent globally during 2010–2016 (**Figure 2**). Spending averaged 0.35 percent in low-income countries; 0.25 percent in middle-income countries other than Brazil, China, and India; and 2.80 percent in high-income countries. The average intensity for developing countries as a group—and for individual developing regions—remained constant over time, indicating that growth in agricultural research spending largely followed the pattern of growth in AgGDP. In high-income countries, however, for every \$100 of AgGDP, agricultural research spending rose steadily from \$1.83 in the 1980s to \$3.45 in 2009, thereafter declining markedly to \$2.81 in 2016.

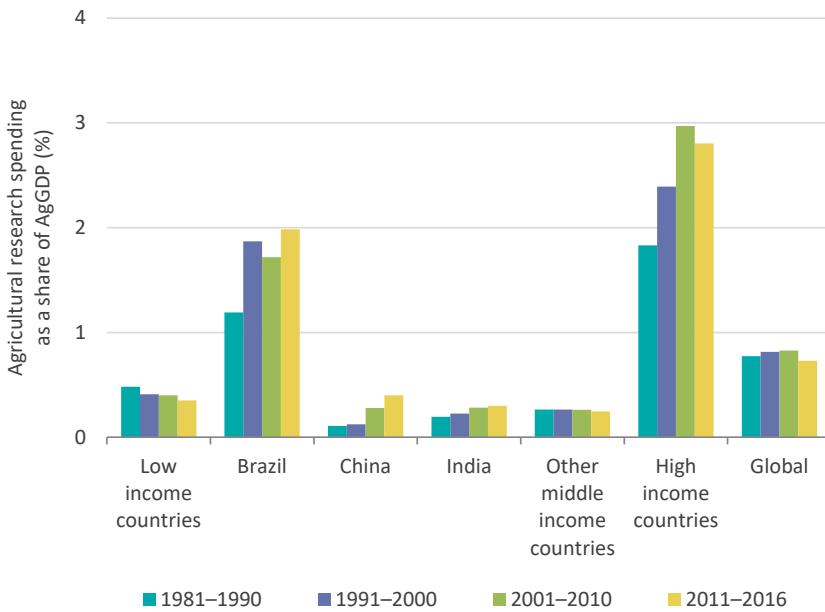
Figure 1. Agricultural research investment trends in developing countries, 1981–2016



Source: Beintema, Nin Pratt, and Stads (2020).

Note: For data coverage, estimations, and methodology see www.asti.cgiar.org/global.

Figure 2. Agricultural research investment intensity, 1981–2016



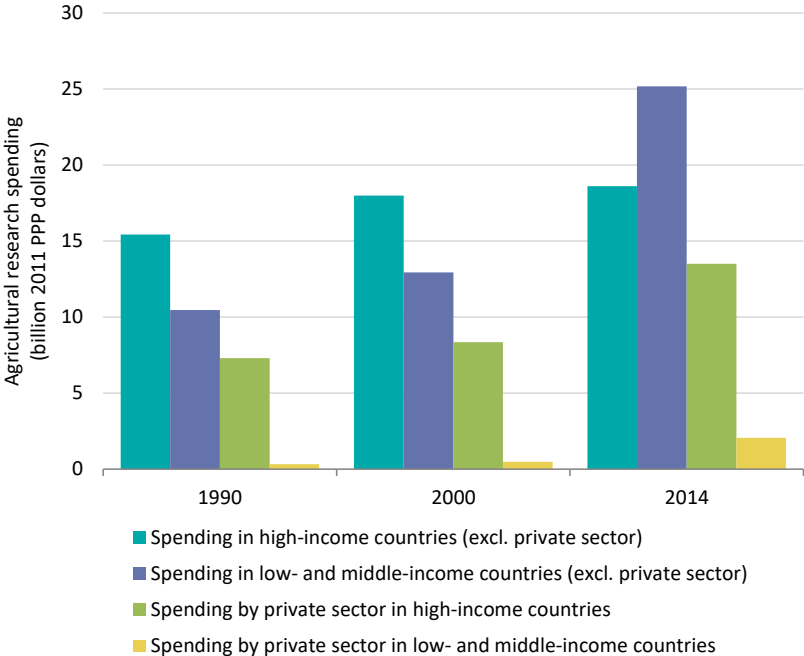
Source: Beintema, Nin Pratt, and Stads (2020).

Note: For data coverage, estimations, and methodology see www.asti.cgiar.org/global.

Although research intensity ratios provide useful insights into relative investment levels over time and across countries and regions, they do not take into account the policy and institutional environment within which agricultural research occurs, the broader size and structure of a country’s agricultural sector and economy, or qualitative differences in research performance across countries; hence, they should be interpreted with care.

Between 1990 and 2014, global agricultural research investment by the private for-profit sector doubled from \$8 to 16 billion in 2011 PPP prices (Figure 3). Overall, the private-sector share of global agricultural research increased from 23 to 27 percent during this timeframe, indicating that global growth in private agricultural research investment was somewhat faster than investment in agricultural research by the government and higher education sectors.²

Figure 3. Private and nonprivate agricultural research spending by income group, 1990, 2000, and 2014



Sources: Fuglie (2016) and Beintema, Nin Pratt, and Stads (2020).

After several decades of strong support, international funding for agriculture and for agricultural research began to decline around the mid-1980s. For example, the amount of funding that the United States Agency for International Development directed toward agricultural research conducted by national agencies in less-industrialized countries declined by 75 percent, in inflation-adjusted terms, from the mid-1980s to 2004. World Bank lending to the rural sector was erratic, but also showed a downward trend during this period as well (Pardey et al. 2006). But since then, donors have shown renewed interest in the importance of agriculture and agricultural research and knowledge (a) for achieving economic development, poverty reduction, and food security; (b) for adapting to and mitigating climate change; and (c) for improving health and nutrition.

Time will tell whether this renewed donor interest will translate into increased contributions for agricultural research in the future—not only on the part of donors, but also on the part of national governments. These increases will be crucial in light of the current Covid-19 health crisis and its potential to instigate a food security crisis. Clearly, more international research is needed related to strengthening the links among agriculture, nutrition, and health; improving food safety; and continuing to invest in the transformation of food systems under climate change.

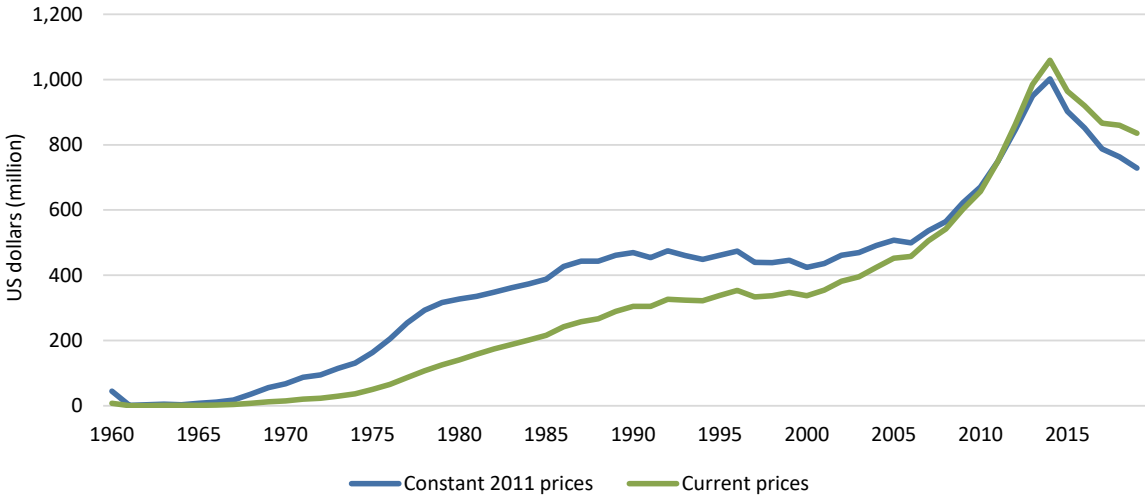
INVESTING IN THE CGIAR: A CHANGING LANDSCAPE

In addition to delivering substantial research outcomes as important international public goods for developing countries and as inputs into private-sector innovations, the CGIAR has had a significant role of building research capacities and linking advanced academic research organizations with development-oriented agencies to achieve social, economic, and environmental impacts at scale. However, investments in international agricultural research through the CGIAR have seen many changes over time. The CGIAR budget, in inflation-adjusted terms, remained fairly flat during 1980–2000 despite its mandate being expanded to cover a broad array of research themes. This represents a big challenge for low-income countries, impeded from investing relatively small amounts of funding in agricultural research. As a result, the continuous search for sustained financing of global and national public agricultural research remains one of the major challenges ahead.

Funding of CGIAR research has shifted dramatically from being historically center-based, long-term, and institutionally directed, to being program-based, short- to medium-term, and project-oriented. The mode of funding has shifted significantly from unrestricted institutional allocations toward concrete time-bound projects.

After more than a decade of slow growth, spending by the CGIAR increased substantially during 2006–2014 (Figure 4). In 2014, total spending exceeded US\$1 billion, more than twice the 2006 total, in inflation-adjusted terms. But after 2014, total spending declined about a quarter to less than US\$0.8 billion in 2018—close to the 2011 level.

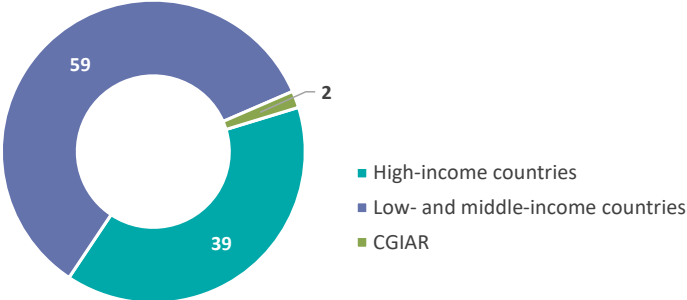
Figure 4. CGIAR spending trends, 1960–2019



Sources: CGIAR (various years), CGIAR (2018–2019), and related underlying datasets.

Although the CGIAR plays an important role in agricultural research in developing countries, it accounts for only a small share of global agricultural research spending. In 2016, CGIAR spending accounted for less than 2 percent of total global agricultural research spending, 2 percent excluding the private for-profit sector, and 3 percent if high-income countries are excluded (Figure 5).

Figure 5. CGIAR share of global agricultural research spending, 2016



2016 total = \$47 billion

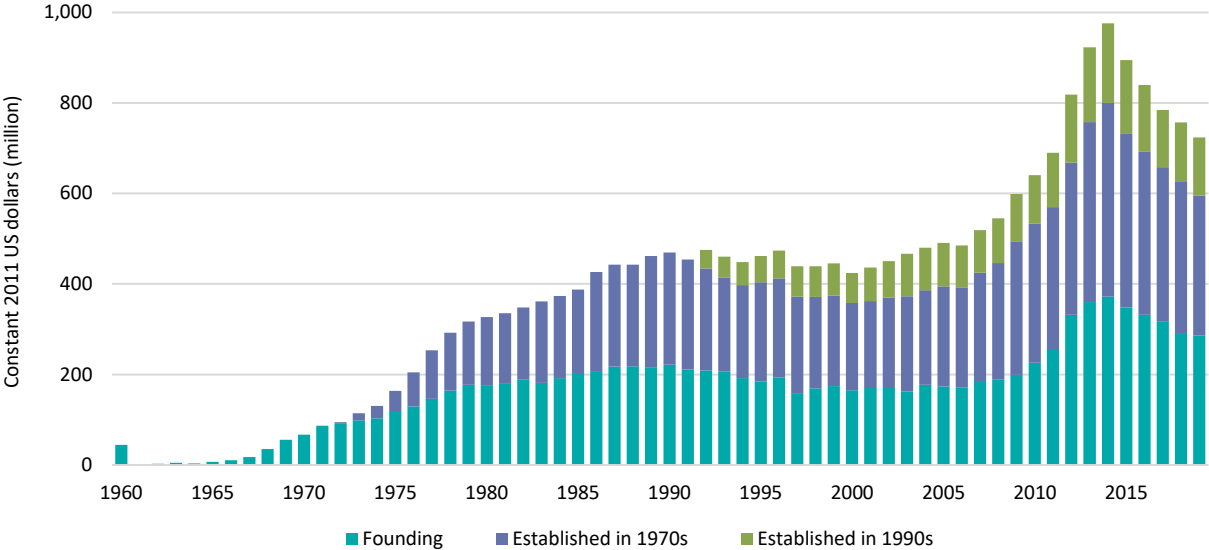
Sources: Figures 1 and 4.

Note: Data exclude the private for-profit sector.

CGIAR SPENDING TRENDS

Spending by the four founding centers of the CGIAR (the International Center for Tropical Agriculture, International Maize and Wheat Improvement Center, International Institute of Tropical Agriculture, and International Rice Research Institute) has remained stable over time, representing close to 40 percent of total spending by CGIAR centers in 2019. As new centers became part of the group over time, total spending increased, and the thematic focus of research expanded significantly, with far more emphasis on policy, the environment, and biodiversity conservation.

Figure 6. CGIAR spending by all centers by establishment group, 1960–2019



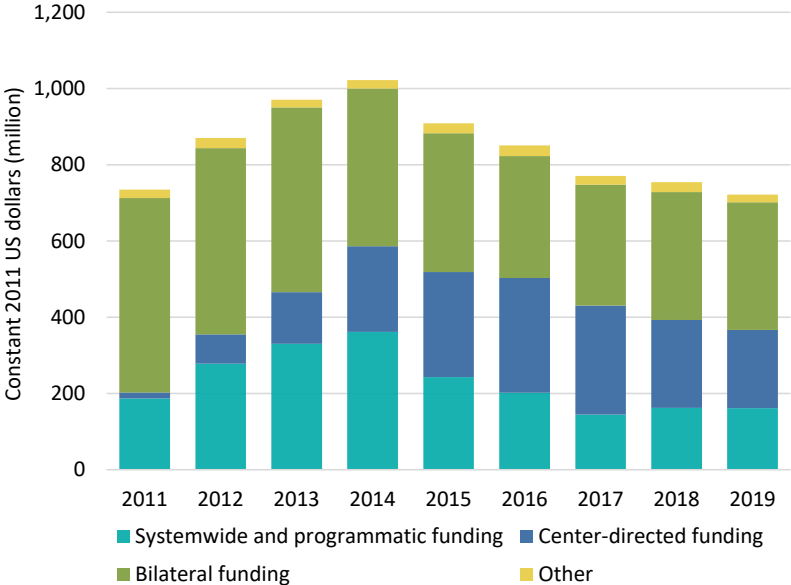
Sources: CGIAR (various years), CGIAR (2018–2019), and related underlying datasets.

Note: Data exclude expenditures at the CGIAR System level.

During 2011–2019, on average, 27 percent of CGIAR funding was channeled to systemwide and programmatic initiatives (Windows 1 and 2) and 23 percent was channeled to the centers (Window 3). Bilateral funding accounted for an average of 47 percent during this timeframe.

The type of funding has also changed overtime (Figure 7). The decline in systemwide and programmatic funding (CGIAR Windows 1 and 2), was the most pronounced: as of 2019, total funding through Windows 1 and 2 had fallen to less than half the 2014 level, in inflation-adjusted terms. This is a serious cause for concern considering that—as a global research system aiming to generate long-term impacts—systemwide and medium-term allocations are clearly the most important type of funding. Funding directed to the centers (Windows 3) increased substantially between 2014 and 2017 but has contracted since then.³ Bilateral funding declined by 19 percent during 2014–2019.

Figure 7. Total CGIAR funding by type, 2011–2019



Sources: CGIAR (various years), CGIAR (2018–2019), and related underlying datasets.

Notes: “Type” indicates systemwide funding (Window 1), programmatic funding (Window 2), and center-based funding (Window 3). Data exclude other income generated by the centers.

In sum, as total funding to the CGIAR declined (by 29 percent) from its historical peak of more than US\$1 billion in 2014, funding directed to the centers increased, and systemwide and programmatic funding decreased (Table 1).

Table 1. CGIAR center spending levels before, at, and after peak 2014 funding

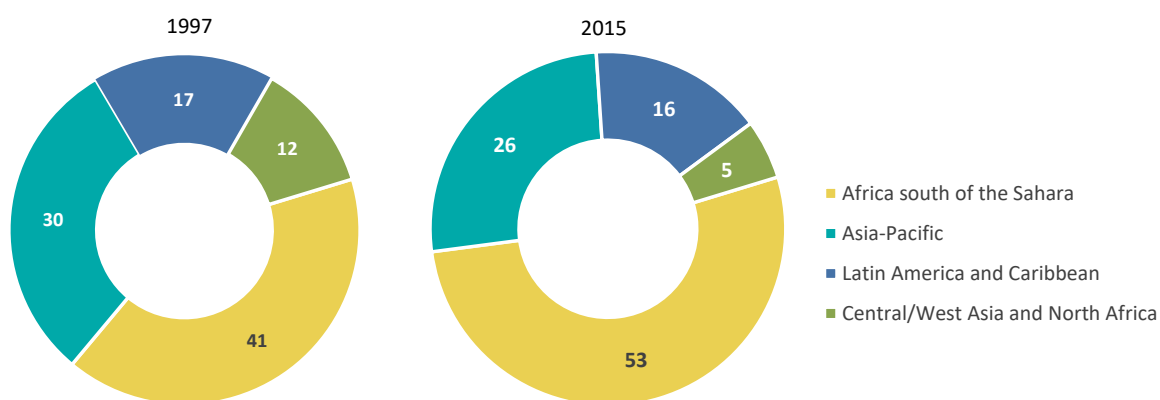
| Center | Million 2011 US dollars | | | Share of total (%) | | |
|--|-------------------------|--------------|--------------|--------------------|------------|------------|
| | 2008 | 2014 | 2019 | 2008 | 2014 | 2019 |
| AfricaRice | 11.3 | 27.4 | 14.7 | 2 | 3 | 2 |
| Bioversity | 39.4 | 39.9 | 25.1 | 7 | 4 | 3 |
| Center for International Forestry Research | 21.4 | 46.7 | 30.0 | 4 | 5 | 4 |
| International Center for Agricultural Research in the Dry Areas | 33.3 | 58.2 | 25.1 | 6 | 6 | 3 |
| International Center for Tropical Agriculture | 49.2 | 80.2 | 62.9 | 9 | 8 | 9 |
| International Crops Research Institute for the Semi-Arid Tropics | 49.8 | 66.0 | 52.8 | 9 | 7 | 7 |
| International Food Policy Research Institute | 50.3 | 112.7 | 96.9 | 9 | 12 | 13 |
| International Institute of Tropical Agriculture | 53.1 | 91.4 | 82.7 | 10 | 9 | 11 |
| International Livestock Research Institute | 44.3 | 74.8 | 51.4 | 8 | 8 | 7 |
| International Maize and Wheat Improvement Center | 43.4 | 123.2 | 86.8 | 8 | 13 | 12 |
| International Potato Center | 28.7 | 49.1 | 43.9 | 5 | 5 | 6 |
| International Rice Research Institute | 43.1 | 77.3 | 53.2 | 8 | 8 | 7 |
| International Water Management Institute | 26.2 | 33.2 | 18.3 | 5 | 3 | 3 |
| World Agroforestry Centre | 29.5 | 58.7 | 51.0 | 5 | 6 | 7 |
| WorldFish | 21.6 | 37.1 | 28.9 | 4 | 4 | 4 |
| Total | 544.8 | 975.9 | 723.8 | 100 | 100 | 100 |

Sources: CGIAR (various years), CGIAR (2018–2019), and related underlying datasets.

Note: Data exclude expenditures at the CGIAR System level.

CGIAR expenditures by region reveal some interesting shifts overtime (**Figure 8**). In 2015, more than half of CGIAR spending was allocated to Africa south of the Sahara (SSA), up from 41 percent in 1997. This increase came at the cost of relative investments in the Asia-Pacific (APC) and Central/West Asia and North African (CWANA) regions.

Figure 8. Regional shares of total CGIAR spending, 1997 and 2015



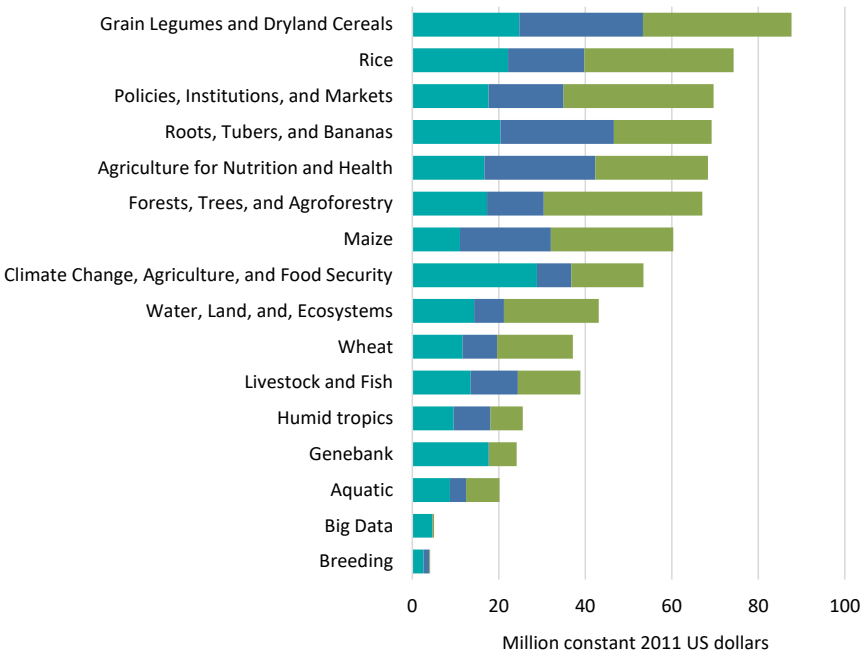
Sources: CGIAR (various years), CGIAR (2018–2019), and related underlying datasets.

Note: Regional shares could not be presented beyond 2015 because some centers reported data based on the location of the research performer rather than the location of those benefiting from the research.

PROGRAMMATIC FUNDING

Most CGIAR research is organized and funded under global programs and platforms (Figure 9). During 2012–2019, on average, 32 percent of their combined funding to was channeled to systemwide and programmatic initiatives (Windows 1 and 2) and 26 percent was channeled to the centers (Window 3). Bilateral funding accounted for an average of 41 percent during this timeframe. Funding for programs and platforms shifted over time as total CGIAR funding decreased. The Big Data and Breeding platforms started after 2012, and the Humid tropics and Aquatic programs ended after 2012. The majority of funding for global programs was either center-directed (Window 3) or derived from bilateral donors (with the exception of the Genebank, Breeding, and Big Data platforms).

Figure 9. Funding by program and funding source, 2012–2019 totals



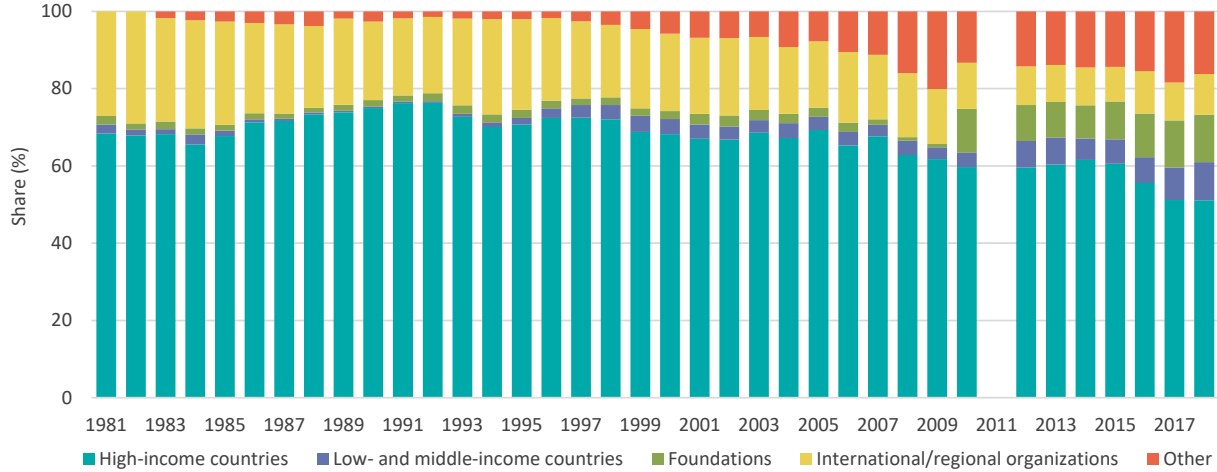
Sources: CGIAR (various years), CGIAR (2018–2019), and related underlying datasets.

Notes: Some of CGIAR Research Programs were closed or merged during 2012–2019. Data exclude other income generated by the centers.

CGIAR FUNDERS

The major source of CGIAR funding—high-income countries and international agencies—have not changed substantially over time (Figure 10). That is a positive trend showing donor allegiance and consistent support, which is much needed for strategic medium to long-term research needs. Nevertheless, with the exception of the very positive entrance of the Bill & Melinda Gates Foundation as a major donor a decade ago, the CGIAR has not been able to attract other significant philanthropic funding partners. Moreover, national governments of low- and middle-income countries are providing more funding than they had prior to 2010, but as yet they have not been able to make substantive contributions.

Figure 10. Total CGIAR funding by donor groups, 1981–2018



Sources: CGIAR (various years), CGIAR (2018–2019), and related underlying datasets.

Note: 2012–2018 data were estimated using center-directed (Window 3) and bilateral funding by donor, combined with estimates of national contributions to the CGIAR Fund based on their shares of systemwide and programmatic funding (Windows 1 and 2).

As total funding by high-income countries and international organizations increased over time, a significant shift occurred: with the entrance of the Gates Foundation, support from key funders—such as the World Bank, Canada, and Japan—declined (Table 2).

Table 2. Major donors, 1981–2018

| Donor | Share (%) | | | |
|---------------------------------|-----------|-------|-------|-------|
| | 1980s | 1990s | 2000s | 2010s |
| Australia | 2 | 2 | 2 | 5 |
| Canada | 6 | 5 | 6 | 1 |
| European Commission | 4 | 5 | 7 | 3 |
| Germany | 5 | 6 | 3 | 3 |
| Japan | 7 | 11 | 4 | 1 |
| Netherlands | 2 | 4 | 4 | 5 |
| Switzerland | 4 | 6 | 4 | 3 |
| United Kingdom | 4 | 4 | 8 | 8 |
| United States | 26 | 15 | 13 | 17 |
| Bill & Melinda Gates Foundation | 0 | 0 | 1 | 10 |
| World Bank | 12 | 13 | 11 | 5 |

Sources: CGIAR (various years), CGIAR (2018–2019), and related underlying datasets.

Note: Data include donors that contributed at least 5 percent of the total funding for at least one decade.

CONCLUSION

The positive record of CGIAR achievements, combined with the lack of a major global alternative provider of similar research for development outcomes, is cause for optimism about future of CGIAR's funding. In addition, the continuing need to strengthen food systems, combined with the ongoing reform of CGIAR governance and management, may create new incentives to address the apparent major gap in current system funding.

The following funding trends are indicated:

1. The CGIAR remains at less than 2 percent of total agricultural research funding, a very small share based on its significant record of global research outcomes and impacts.
2. Funders of the CGIAR have not changed substantially over time, which is a positive trend showing that strategic medium- to long-term research needs consistent support. Nevertheless, with the exception of the Bill & Melinda Gates Foundation, the CGIAR has not been able to attract other significant funding partners.
3. Short-term project funding is prevalent as opposed to longer-term system funding.
4. Funding for Africa south of the Sahara has increased at the expense of other developing regions of the world.

Important strategic challenges have been created through the combined impacts of the CGIAR (a) remaining a small, but highly relevant global agricultural research system; (b) maintaining a set of key funders over time with a decentralized funding arrangement; (c) focusing on short-term projects and with a strong focus on Africa; and (d) incorporating substantial expansion of its thematic research portfolio over time. It is important that these challenges be properly managed in the transition to the forthcoming, more corporate, phase of the One CGIAR.

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ENDNOTES

1. Note that all dollar values in the global investment trends section are based on 2011 PPP exchange rates, which reflect the purchasing power of currencies more effectively than do standard exchange rates because they compare the prices of a broader range of local, as opposed to internationally traded, goods and services. ASTI collects all its financial time-series data in local currency units and then converts these to constant prices using official World Bank GDP deflators. Currently, ASTI expresses its financial data in 2011 prices.
2. It is important to note, however, that research spending on food processing is excluded from these data because research undertaken by food companies is heavily oriented toward improving manufacturing processes and developing new products. As such, it tends to have limited relevance for production agriculture. Input manufacturers (that is, seed, chemical, pharmaceutical, and machinery companies), which invest in research to improve the quality of farm inputs, are more relevant for agriculture.
3. For further definitions of Windows 1, 2, and 3 and of bilateral funding sources, see the CGIAR Financial Reports.

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