



**CoSAI**  
Commission on  
Sustainable  
Agriculture  
Intensification

# Case Study: Investment in sustainable seeds for sustainable agricultural intensification



Dalberg Asia. 2021. *Case Study: Investment in sustainable seeds for sustainable agricultural intensification*. Colombo, Sri Lanka: Commission on Sustainable Agriculture Intensification. 9p.

## Introduction

**Sustainable seed systems will be critical to support the growth in food production that is needed to feed 10 billion people by 2050 without breaking planetary boundaries.** Innovations in sustainable seeds and seed systems will be critical in developing accessible and affordable varieties of crops that have increased productivity, more resilience, better environmental outcomes, affordability and social outcomes, and nutrition outcomes. Adequate investments in these seed systems will be critical and the measurement of existing investment flows is the starting point to direct future investments effectively. This case study presents funding towards innovation in seed and sustainable seed systems within the Global South.

### Important Note on the Definition of Sustainable Seeds Systems as Used in this Case Study

- 1. The use of the word “Sustainable” in the phrase “Sustainable Seeds System” should be understood as seeds system innovations that are likely to drive sustainability as defined in this study’s framework (environmental, human, social, economic, productivity).** Through this lens, innovations in sustainable seed systems involve a set of interrelated activities that bring seeds to market that meet the following criteria: improved productivity, improved resilience, improved input efficiency, reduced environmental footprint, improved nutrition goals, and improved affordability and income for farmers.
- 2. The case study considers the entire seeds “system”, and not just the production of seeds, based on the definition from FAO: “A sustainable seed system ensures that farmers have timely access to affordable quality seeds and planting materials of the most suitable cultivars.** Stages such as the marketing of seeds, infrastructure to store and use of seeds are also considered in this analysis.

This case study accompanies the report: *Funding Agricultural Innovation for the Global South: Does it Promote Sustainable Agricultural Intensification?* The full report can be found on the CoSAI website: <https://wle.cgiar.org/cosai/innovation-investment-study>

# 1. Summary

**This study estimates that Sustainable Seeds Systems for the Global South received approximately USD 15 billion in funding cumulatively between 2010-2019** across all sources of funders. This is roughly one-third the total funding for seeds innovation in the same time period. Though the trend should get confirmed with further data, the analysis made in this study reveals a slight decline in the trend for investments in sustainable seeds innovation over the last 2-3 years for which data was available.

**Approximately 55% of this funding is concentrated in the Research & Development (R&D) and Product Development** stages of activity with **Marketing & Behaviour Change activities also receiving about 30%** of this funding. Private sector funding is concentrated in R&D and Product Development whereas Government funding is well balanced across R&D, Product Development, Marketing, Infrastructure Development. Development Funders tend to also focus on Research and Product Development.

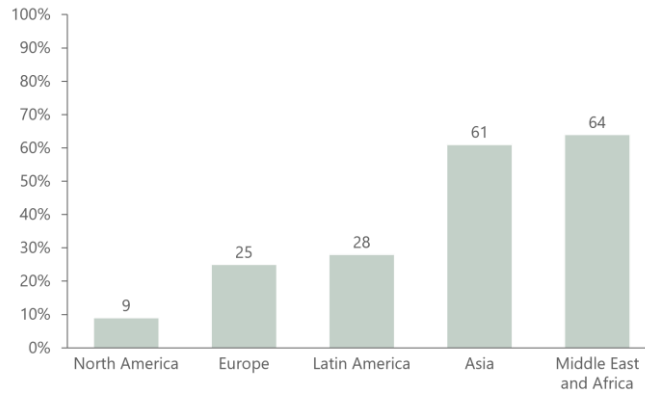
**Finally, farmer-saved seeds and community seed systems attract only miniscule funding (<USD 50 million cumulatively between 2010-2019) or less than 0.5% of total funding, and an increase in focus and funding levels for this would likely prove very helpful.**

## 2. Global Seeds System Scale & Value

**Seed systems across the world can typically be categorized into private sector led, public sector led, and farmer self-managed with overlaps between these.** There are highly scientific approaches based on formal biotechnology R&D in private sector labs and research institutions across the world. There are national and regional agriculture research systems within governments across the world with varying degrees of collaboration with the private sector and also with the development sector and organizations including CGIAR. Third there is a grassroots sector comprising of small and large Civil Society Organizations (CSOs) and local NGOs that run community seed banks and promote seed storage by farmers including open-license seed activity.

The prevalence of farm-saved seed systems versus commercial seed systems varies significantly across regions as described in Figure 1 below. Farmer saved seed constitutes over a quarter of the total in Latin America and nearly two thirds of all seed in Asia and Africa (2016 estimates).

Farmer-saved seed as share of total  
%, global, 2016



Note: The estimated share of farm-saved seed here is the ratio of the estimated market value of farm-saved seed (valued at average prices by country) to the total estimated value of seed markets including farm-saved seeds.

Figure 1. Farmer-saved seed as share of total<sup>1</sup>.

While by definition, it is hard to put a value on the farmer-saved seed system, **the commercial seed industry globally is estimated to vary between USD 90-110 billion in 2020 and is growing at an annual rate of roughly 10%.**

### 3. Overview of Funding for Sustainable Seed Systems

**We estimate the total value of investments in sustainable seed systems innovation for the Global South to be around USD 1.3 – 1.7 billion per year, totalling USD 15.5 billion between 2010-2019.** This is approximately one third of the investments in seed systems innovation overall which have ranged between USD 4-5 billion annually over the last decade.

Total expenditure in sustainable seed, farmer seed and seed innovation in the Global South  
2010-2019, USD mn (Constant 2019 prices)

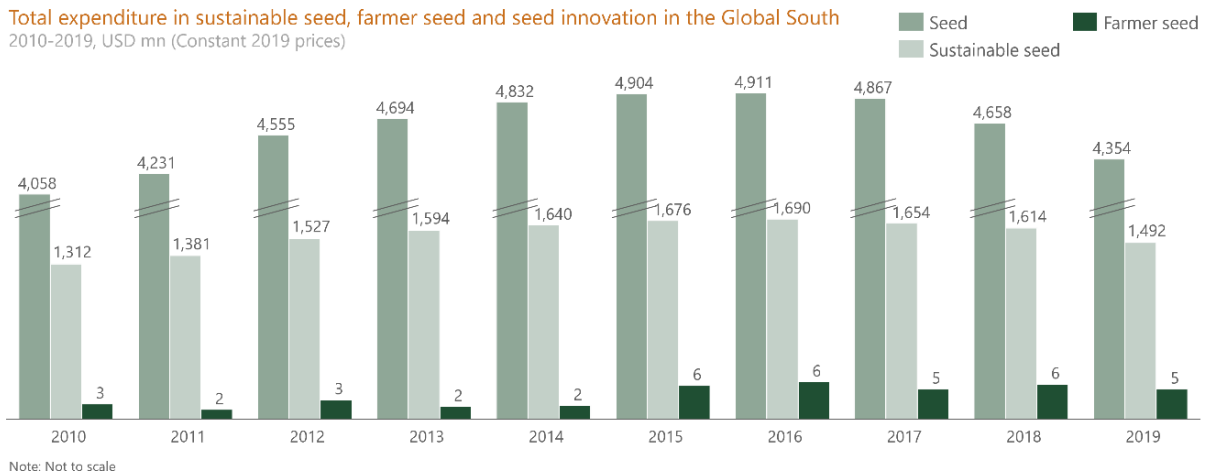
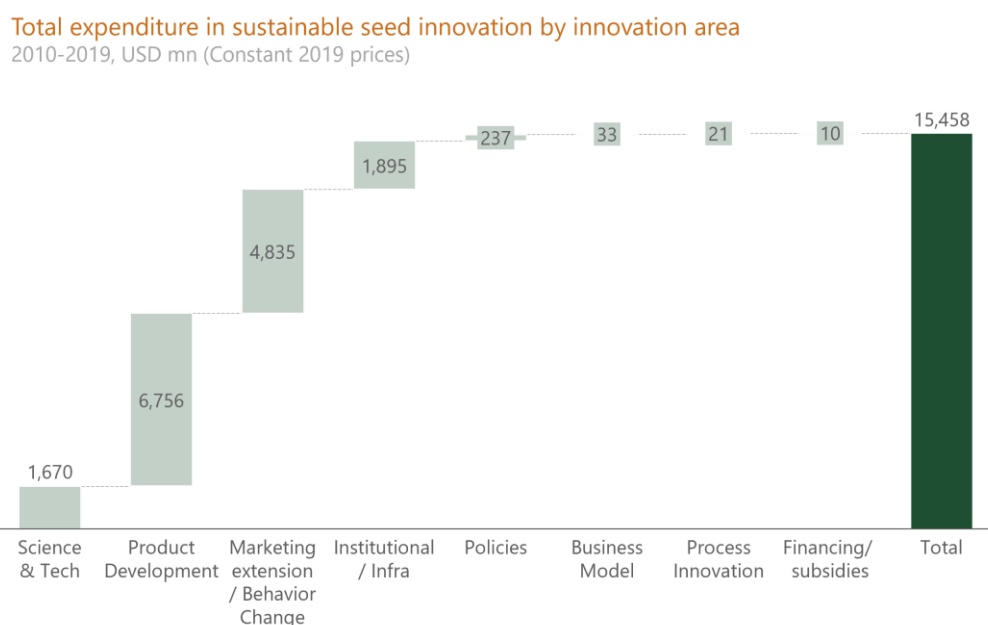


Figure 2. Total expenditure in sustainable seed and seed innovation in the Global South<sup>2</sup>.

<sup>1</sup> OECD analysis using the Kleffmann Agriglobe database.

<sup>2</sup> Dalberg analysis.

**Investments in sustainable seed systems in the Global South are concentrated in the seed production and R&D stages; marketing is a close third.** Based on our analysis of the public and private sector seed players overall (excluding the informal sector), we can see that over USD 1.6 billion was spent in the R&D stage and USD 6.7 billion in the product development stages of the sustainable seed industry between 2010-2019. Additionally, at least USD 4.8 billion was spent in promoting the uptake of seeds by farm systems.



**Figure 3. Total expenditure in sustainable seed innovation by innovation area<sup>3</sup>.**

**Private sector investments and government investments constitute a large majority of the investment for sustainable seed systems.** As can be seen in Figure 4, private sector companies mostly fund product development and marketing whereas Global South government spending covers science & technology, product development, marketing and extension, along with infrastructure development almost equally. By contrast, Development Partners invest more in science and technology (specifically breeding).

<sup>3</sup> Dalberg analysis.

Sustainable seed innovation expenditure by ratio of innovation areas  
2010-2019, USD mn (Constant 2019 prices)

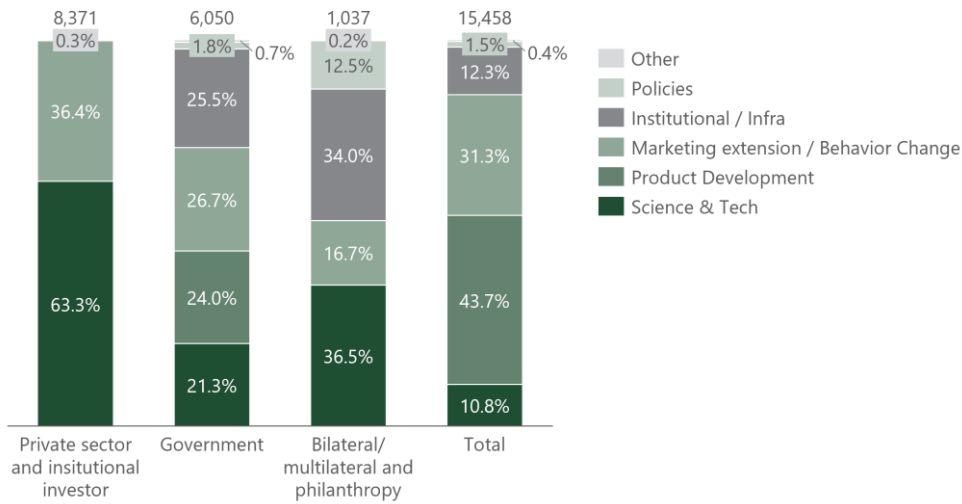


Figure 4. Total funding in sustainable seed innovation by innovation area<sup>4</sup>.

## 4. Overview of Funding by Source

Funding for sustainable seeds innovation is dominated by the private sector and governments in the Global South though there has been a dip in government investment.

Sustainable seed innovation expenditure by sources of funding  
2010-2019, USD mn (Constant 2019 prices)

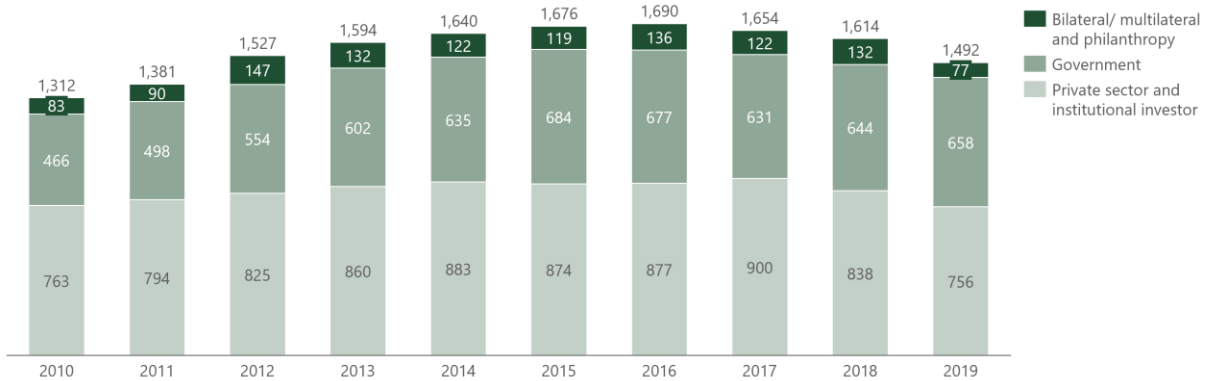


Figure 5. Sustainable seed innovation expenditure by sources of funding<sup>5</sup>.

We estimate that large private sector companies spend around USD 800 million per year on innovation for seed systems in the Global South; the industry is highly concentrated and is dominated by a few global companies and is seeing greater consolidation. The private sector seed industry is dominated by large global players who are collectively spending billions of dollars on innovation in seeds. Even though these are large players, this is not a perfectly competitive market and players tend to specialize in both crops and countries that they operate in. Such spending has led

<sup>4</sup> Dalberg analysis.

<sup>5</sup> Dalberg analysis.

to advancements in genome editing, marker-assisted selection etc. However, the private sector does not focus on crops that are either self-pollinating or are small in scale<sup>6</sup> as the cost of new cultivar development is substantial and can reach USD 130 million dollars taking into account the lifecycle costs of development. Over time, investment by private sector for seed innovation has gone up by 11% in real terms from 2010 to the 2015-19 average.

**Governments across the world play a substantial role in seed systems innovation and we estimate that they spend around USD 600 million each year on innovation for seed systems in the Global South.** National agriculture research systems (NARS) play an outsized role in plant breeding and seed systems innovation in the Global South. Many countries have a network of organizations that partner both with the private sector and also with international research institutions to develop new cultivars, scale up seeds, and distribute them to the farmer. However, there are several inefficiencies in this model where new cultivars get created but don't necessarily get commercialized, thereby reducing the value that countries and communities can derive from them. The public sector funding for seed innovation has gone up from 2010 to 2019 by about 40% in real terms.

**Civil-society, public, and private philanthropic organizations play a substantial role in the global seed system, especially in the science and technical side of breeding on the one hand, and in farmer-led initiatives on the other. We estimate that they spend approximately USD 110-120 million annually on seed system innovations every year.** The global development landscape has a wide variety of institutions and programs contribute in large and small ways to progress in seeds and seed innovation.

## 5. Funding for Farmer-saved Seed Systems

**It is likely that less than 0.5% of the innovation investment in sustainable seeds is focused on farmer-saved seed systems though the lack of data granularity prevents an accurate assessment; more investment in this can drive substantial value for farmers in the Global South.** Over the last decade, based on data available, it seems that only between USD 2-6 million is spent annually on innovations for farmer-saved seed system programs.

This funding is driven largely by funders in the multilateral, bilateral, and philanthropic sectors. Multilateral and bilateral donors spend about 4% of their investment in sustainable seeds innovation on farmer-saved seeds whereas philanthropic players spend only about 1%. It is likely that there is Government spending for this theme, but the lack of data granularity makes this difficult to assess. Almost no private sector spending is focused in farmer-saved seed systems.

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<sup>6</sup> IFAD, [Lessons learned Supporting smallholder seed systems](#) (2018) - "Seed companies often focus on crops with a high SRR (seed replacement rate), such as hybrid maize or vegetables. They are less interested in self-pollinated crops for which farmers often use their own saved seeds rather than purchase seeds every season" (p. 10).



## 6. Highlights

**Investments in sustainable seed systems are dominated by private sector and public sector spending; to ensure innovations for “non-market” diversified crops, innovative financing arrangements might be needed.** Seed R&D is expensive, and the private sector tends to not focus on crops with open pollination or those that have traditional seed systems. However, innovations in the genetic materials of such crops will be essential to sustainable agriculture and hence blended finance instruments and other partnership mechanisms will be needed to ensure that innovation in these spaces gets adequate attention. The [African Orphan Crops Consortium](#) is an excellent example of such a partnership mechanism.





The Commission on Sustainable Agriculture Intensification (CoSAI) brings together 21 Commissioners to influence public and private support to innovation in order to rapidly scale up sustainable agricultural intensification (SAI) in the Global South.

For CoSAI, innovation means the development and uptake of new ways of doing things – in policy, social institutions and finance, as well as in science and technology.

Contact us: [wle-cosaisecretariat@cgiar.org](mailto:wle-cosaisecretariat@cgiar.org)

[wle.cgiar.org/cosai](http://wle.cgiar.org/cosai)

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