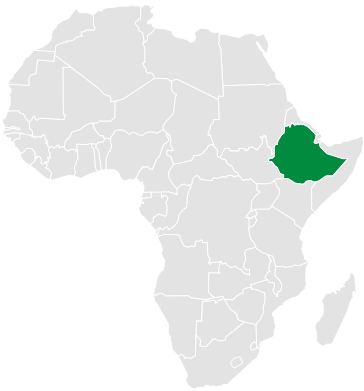
CIAT 50
1967-2017

CIAT in Ethiopia: Science for Impact

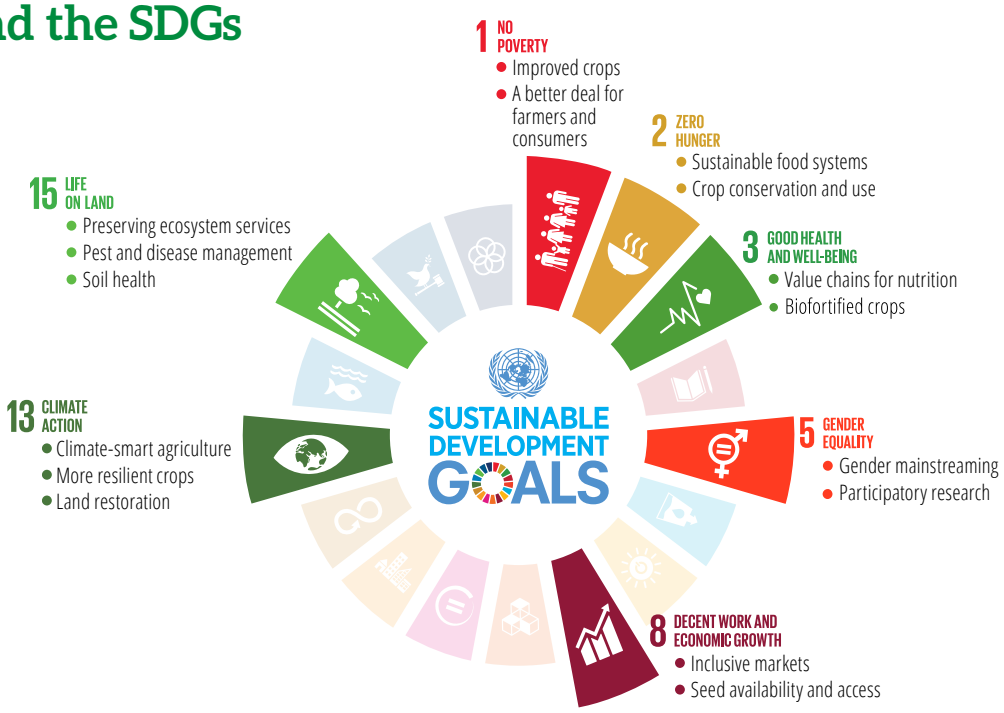


CIAT has worked in Ethiopia for 30 years, in collaboration with the Ethiopian Institute of Agricultural Research (EIAR) and regional agricultural research centers. Initially focused on bean variety development – getting improved, better beans to communities, improving their nutrition and incomes – our work has broadened to include soil fertility management, sustainable land management, climate change and climate information services.

Ethiopia has one of the most diverse agro-ecological zones in Africa, with an ambitious restoration plan and climate-resilient, green economy strategy. Together with national research institutions, farmer organizations, and the private sector, our approach has focused on mainstreaming research into the country's development and research priorities, contributing to major Ethiopian development agendas such as the Growth and Transformation Plan (GTP2), Sustainable Land Management Program (SLMP2), and Climate-Resilient Green Economy (CRGE).

Aligning with the government's Sustainable Land Management initiative, we support climate-resilient landscapes in partnership with local communities. Our cutting-edge science helps policymakers, the private sector, scientists, civil society, and farmers respond to the pressing challenges of our time. Drawing on international expertise and the world's largest collections of beans and livestock forages, we tackle poverty, food insecurity, malnutrition, climate change, and environmental degradation. We support and complement government efforts to create 'climate resilient landscapes,' developing and piloting frameworks, tools, options and evidence generation of restoration efforts across the country. We contribute to the agricultural transformation agenda of the country through improving agronomic and management practices, contributing to fertilizer recommendation efforts and leading the effort to build "digital agriculture" through Big Data analytics.

CIAT and the SDGs



Theme 1

Leveraging markets through improved productivity and competitiveness

The challenge:

To run successful and profitable agricultural businesses, smallholder farmers need improved crop varieties, good-quality and affordable seed, organized channels to sell their produce, access to market information, and options for value addition among many other things. Yet, too often, they find themselves trapped in a vicious circle: small dispersed volumes of produce that are not attractive in competitive markets.

CIAT, through the Pan Africa Bean Research Alliance (PABRA), in collaboration with EIAR and other partners, has spearheaded a market-led approach linking producers to high-value and structured markets, supporting the inclusion of white pea beans on the Ethiopian Commodity Exchange (ECX). This has seen the volumes and prices of beans triple in the last decade and a half. Beans are now a major export earner for the country.

Together with partners, our commodity corridor approach aims to intensify the production, distribution, marketing, and consumption of nutritious agricultural commodities. Currently, two bean corridors – one for white and one for red bean types – are established in Ethiopia to consolidate benefits for producers and consumers, and drive investment in productivity to boost yields and improve bean productivity and incomes nationally and regionally. Connecting buyers with producers; producers with improved varieties, we have a formula for success. We can do the same with other crops – like livestock forages. For livestock keepers across Ethiopia, a key constraint is lack of quality feed - especially during the dry season. Through integrating improved forages in the mixed crop-livestock systems, farmers can become reliable suppliers of livestock products and engage in commercialization.

What we can do together:

- We can work with you to develop innovative business models linking smallholder farmers to markets through engagement with the private sector, farmers' organizations, civil society, government and other key value chain actors.
- We can support scaling up of commodity corridors to enhance the scale and competitiveness of the bean value chain.
- Our approaches and lessons can be used in other commodity value chains – for example, that of improved forage grasses, which CIAT also focuses on.
- We can help add value addition for efficient markets and improved, nutritious diets.
- We combine genetic improvement of beans and tropical forages with research on agronomy, soils and ecosystems for increased productivity.
- Our researchers help farmers gain access to improved seeds, working with the private sector to provide research advice about best bean varieties for specific agro-ecological conditions, with nutritional value and traits preferred in the market by consumers.

White Gold Revolution

In his hands, Abdul Kadir holds up a milky white bean. Ten years ago, he says, it was a rare thing here. But today, this bean is what helps him buy cattle, send his children to school, and build a house. This variety can bring in three times more income, says Kadir, one of 2.5 million smallholder farmers who rely on white pea beans for an income, also multiplying bean seeds for other farmers to buy. This bean is well suited to local soils and agro-ecological conditions as well as stringent export market requirements. Together, PABRA and partners including EIAR made high-quality varieties available to farmers like Kadir – and connected farmers with private companies. Today, the value of Ethiopia's white pea bean production has risen from USD 20 million in 2006 to more than USD 120 million today.

Theme 2

Agriculture for improved nutrition

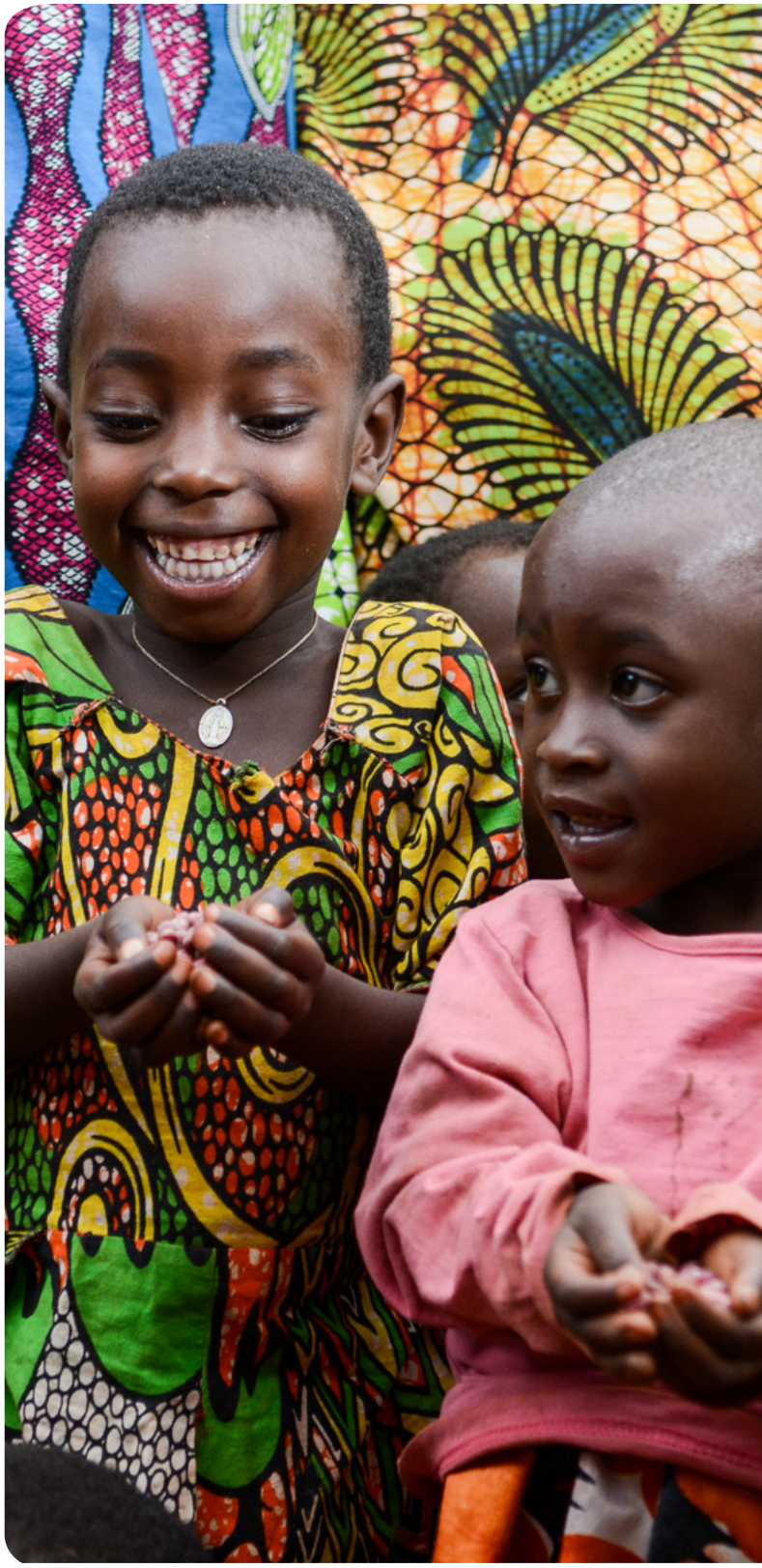
The challenge:

Ethiopia has made great progress in reducing hunger and undernutrition alongside impressive economic growth. However, food security and nutrition remain key challenges. According to the country's Cost of Hunger in Africa (COHA) report, more than two out of every five children in Ethiopia are stunted, 44% of health costs associated with undernutrition occur before a child is one year old, and 28% of all child mortality in Ethiopia is associated with undernutrition. Eliminating poor nutrition in Ethiopia is a necessary step for inclusive and sustained development in the country.

What we can do together:

From a recent review of progress in nutrition in Ethiopia, we find six critical gaps that offer key opportunities for collaborative action to further accelerate gains in nutrition:

- Mainstream nutrition into all relevant sectors: CIAT has experience in developing and mainstreaming food and nutrition policy, supporting multi-sectoral action plans.
- We advocate linking agriculture to nutrition and can co-create explicit nutrition targets with national partners to guide program design and investment impact.
- Our experience in scaling up successful community-based nutrition programs in Malawi and Madagascar can help mainstream these approaches with multi-level partners.
- Our experiences in Burundi, Tanzania, and Zimbabwe show that we can generate demand for nutrient-dense foods at the community level, making agricultural technologies and incentives available for farmers.
- We can support the development of nutrition-sensitive value chains and engage local food processors to produce age-appropriate and diverse nutrient-dense products.
- We can develop targeted messaging and culinary demonstrations for adolescent girls, set up nutrition gardens for nutrient-dense foods, and introduce biofortified beans.
- We can support Nutrition Early Warning Systems in the country through integrated data analysis and scenarios using artificial intelligence and big data approaches.



Theme 3

Transforming farms and landscapes for sustainability

The challenge:

Ecosystem services encompass multiple benefits that people receive from landscapes − from nutritious food and clean water to outdoor recreation. Agriculture provides numerous ecosystem services central to food production while mitigating the impacts of climate change, outlined in Sustainable Development Goals 2, 3, and 13. At the same time, agriculture can lead to a greater negative impact on these services than any other land use through, for example, nutrient runoff, erosion, and deforestation.

Yet, the immediate economic benefits of protecting ecosystems are not always obvious enough to provide incentives for change. Strategies are needed to increase agricultural production without putting more pressure on soils, land, water, biodiversity, and farmers' livelihoods – especially the livelihoods of women.

Our research links the enormous impact that landscape restoration can have on the productivity of the whole farm by looking at the bigger picture. We work with farmers, the private sector, and development partners in Ethiopia to protect landscapes, advising which interventions are the most environmentally effective or financially viable.

We also seek partnerships to develop business models for sustainable farm and landscape solutions for smallholder farmers, and analyze landscapes to identify land degradation hotspots for targeted interventions. This information can guide decision-makers and investment portfolios. Currently, CIAT leads the landscape restoration elements of the Africa RISING project, and co-leads the restoring degraded landscapes (RDL) component of the CGIAR Research Program on Water, Land, and Ecosystems (WLE), implemented in Ethiopia.

What we can do together:

- We can guide the decision-making process on sustainable land management options by measuring the effectiveness of different interventions − such as terracing and grass strips, water harvesting, etc.
- Using crop suitability modeling, we can examine the factors driving land-use change.
- Using hydrological models, we assess development scenarios, optimize land and water management, and advise farmers on how they can avoid potentially harmful scenarios.
- We can work with you to develop land degradation risk assessments and restoration options.
- Together, we can map hotspot areas of soil organic carbon sequestration potential and target specific management practices to sequester the most carbon.
- We can help develop site-specific fertilizer recommendations through assessing historical and spatially distributed crop response to fertilizer application in the country.
- We can work with you to build capacity in creating databases and agronomic data mining using Big Data approaches.
- Together, we can build capacity of early career scientists for long-term sustainability.

Greening Ethiopia's steep hills

In the steep fields of Ethiopia's highlands, rain falls on the parched land and takes it all downhill, carrying some of the most productive soil with it. Farmers lose around 130 tons of soil per hectare per year – and they're not only losing the soil, but all the benefits that go with healthy soil – such as moisture that provide communities with water during times of drought.

In the Gdoberet-Adisghe Counties, Ethiopia, a collaborative effort between communities and researchers is restoring landscapes. Under the Africa Research in Sustainable Intensification for the Next Generation (Africa RISING) project, CIAT, ILRI and the local community began working together to build check-dams and percolation ponds to collect water, and terraces integrated with appropriate multipurpose forage trees. Based on capacity development through trainings and exchange visits, the community has planted cover crops on degraded areas and is implementing controlled grazing to improve water capture and slow down soil loss.

In addition to capacity building, CIAT and its partners generate evidence to assess impact of interventions and guide successful implementation at larger scale.

Theme 4

Investment planning for resilient agriculture

The challenge:

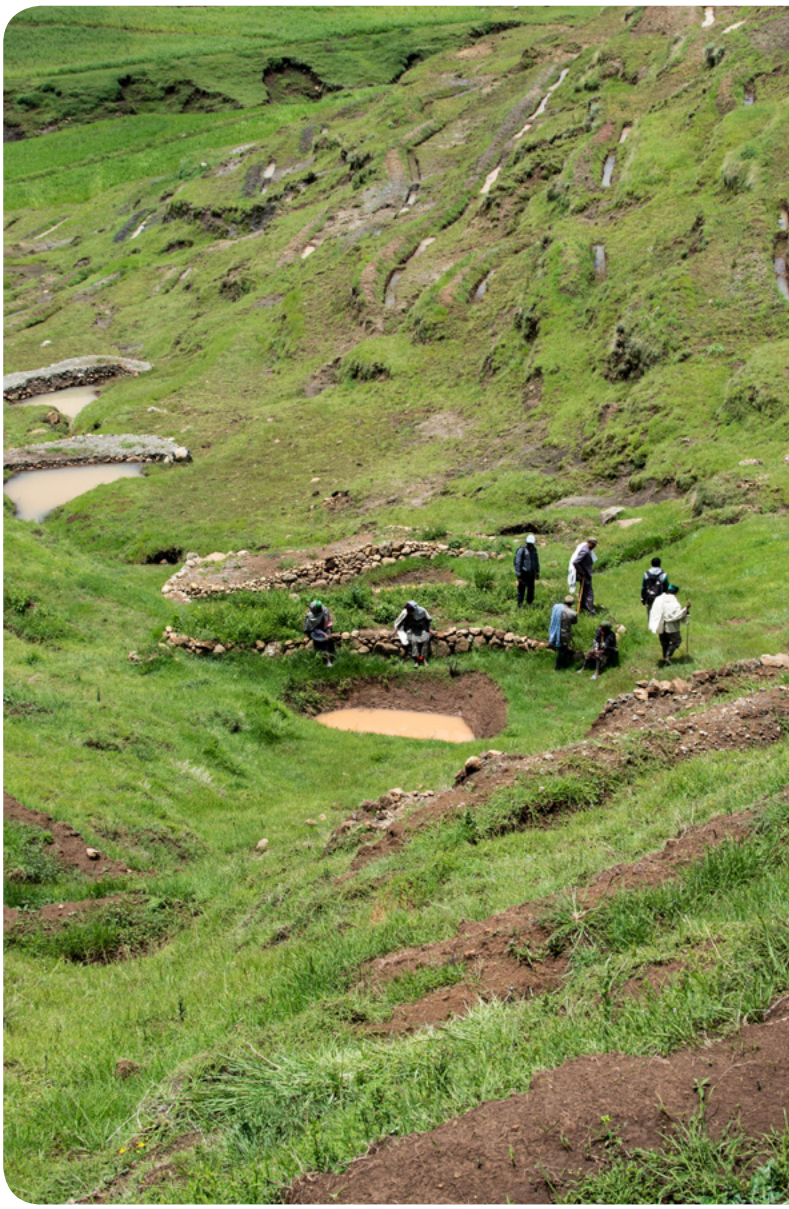
Climate change and variability put crop productivity at risk, and make pest and disease outbreaks more likely to increase. Small-scale farmers in Africa are particularly vulnerable. The African Union, World Bank, and many institutions globally – as well as a growing number of private companies – have recognized the need to address climate change in their agricultural investments. Climate-smart agriculture (CSA) can help reduce the risk to agriculture and livelihoods, but there is a need to better integrate it into policies, programs, and projects.

Working with the Climate Resilient Green Economy Unit of the Ministry of Agriculture and Natural Resources, the Sustainable Land Management Program, and the Agricultural Transformation Agency, CIAT is developing CSA country profiles and a framework for prioritizing climate-smart agricultural interventions within Ethiopia's flagship agricultural development programs.

Using a holistic, landscape approach to build resilient, climate-smart landscapes, we are also introducing smart interventions that sequester carbon and enhance the pool of soil organic carbon to improve soil health. Our work in Ethiopia is identifying the types and locations of interventions that can maximize carbon sequestration. In addition, improved livestock forage varieties developed by CIAT can improve resilience of livestock to climate shocks, and help reduce greenhouse gas emissions. Stress tolerant beans are also high in iron, and can provide both climate resilience and nutrition benefits.

What we can do together:

- We can support countries in designing programs to access climate financing, such as from the Green Climate Fund. We can support partners to share robust evidence of the risks associated with climate change, and opportunities for Climate-Smart Agriculture, to guide investment and policy decisions.
- This includes quantifying the trade-offs among CSA options, scenario analysis, and economic analyses to show value for money in investing in CSA. We consult with a wide range of partners to provide Climate-Smart Agriculture profiles that provide a snapshot of climate challenges and solutions in specific areas.
- With limited investment, CSA profiles outline where investment can be channeled for the best economic and environmental returns, taking community priorities into account.
- We can work with partners to provide farmers with climate-smart services and information, enabling them to make better use of the resources available to them.
- With national policymakers and implementers, we develop evidence of risk, return, and societal benefits to motivate investment aligned with national priorities.
- With private sector partners, we can design inclusive and climate-smart value chains.
- Create awareness about options to build soil organic carbon in agricultural landscapes toward national targets and engage in dialogue with multi-sector stakeholders to increase awareness of the potential of restoration initiatives.
- Enhance capacities of national partners to monitor and verify soil carbon stocks in land restoration and management projects throughout the tropics towards national targets.



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In Ethiopia, CIAT collaborates with the Ministry of Agriculture, Ministry of Forest and Environment, Ethiopian Institute of Agricultural Research, Mekelle University, Addis Ababa University, ILRI, Bioversity, IWMI, CIFOR, IITA, ICRISAT, CIMMYT, ICRAF, Climate-Resilient Green Economy, and GIZ.

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