Photo credit: A. Nyandwi/MINAGRI Rwanda

RESEARCH PROGRAM ON
Climate Change, Agriculture and Food Security

CGIAR

CCAFS

CCAFS promotes climate-smart policies, practices, and services that enable agriculture to meet the triple goals of food security, climate change adaptation, and mitigation.

CCAFS Generates Evidence on and Supports Adoption of Climate-Smart Agricultural Policies, Practices, and Services that Alleviate Poverty, Increase Gender Equity, and Support Sustainable Landscapes.

Agriculture and climate function hand in hand. Today, 32-39% of global crop yield variability is explained by climate; this translates to annual production fluctuations of ~2 to ~22 million tonnes for major crops such as maize, rice, wheat, and soybean. At the same time, agriculture and livestock directly contribute about 11% of global greenhouse gas emissions, and agriculturally-driven land use change cause additional emissions.

By 2050, a growing global population with shifting consumption patterns will require agriculture to deliver 60% more food, yet every 1 ˚C of warming above historical levels is likely to cause a decrease of ~5% in crop productivity. Continuing uneven rural development and inattention to the resource gaps that women and youth are facing will exacerbate inequality. Such global drivers and trends present a global challenge that requires concerted action.

CCAFS proposes a climate-smart agriculture (CSA) solution that will transform and re-orient agricultural systems to support food security under the new realities of climate change. CSA entails three co-achieving pillars: 1) sustainably increasing agricultural productivity to support equitable increases in incomes, food security, and development; 2) adapting and building resilience to climate change from farm to national levels; and 3) reducing greenhouse gas emissions and sequestering carbon where possible. Embedded in CSA are efforts to close the gender gap and engage youth.

While the CSA approach is closely aligned with on-farm practices related to sustainable intensification and agro-ecological approaches, CCAFS extends CSA to landscape-level interventions (e.g. management of farm-forest boundaries), services (particularly information and finance), institutions (e.g. around market governance, incentives for adoption) and the food system (particularly consumption patterns and wider climate-informed safety nets).

Despite growing global action and investment in CSA, the science is not yet fully developed. There is limited evidence on synergies and trade-offs in productivity, resilience, and mitigation resulting from different agricultural practices, technologies, and programs and across agro-ecologies and social contexts. Science must also inform national and global climate policies that fully integrate food security concerns with the need for climate action.

Impacts by 2022

Ensuring a food-secure future in a changing climate requires engagement, from farmers' fields to global processes, forging linkages between the global change and agricultural communities, and giving equal attention to technology, institutions, power, and process. Both incremental and transformative pathways are necessary. CCAFS and partners catalyse change towards climate-smart agriculture, food systems and landscapes, thereby contributing to:

1. Reducing poverty

2. Improving food and nutrition security for health

3. Conserving natural resources and ecosystem services

With these goals in mind, CCAFS and partners are committed to globally ambitious impacts by 2022:

- 9 million people (50% women) assisted to exit poverty
- 6 million less people (50% women) that experience nutritional deficiencies
- 160 million tonnes of greenhouse gas emissions mitigated per year
- 11 million farm households adopt climate-smart agriculture
- 8 million households with improved access to capital, with increased benefits to women.

Photo credit: V. Meadu/CCAFS

7 Million Farmers in Senegal Access Climate Forecasts

Weather variability makes it difficult for farmers to know what crop varieties to plant and when to plant them, particularly when rainfall patterns are changing. Putting climate information and evidence-driven advice into the hands of farmers helps them make informed decisions on their farms.

CCAFS and partners have been working closely with farmers, the National Agency of Meteorology Senegal (ANACIM) and other partners on the ground in Senegal to make climate information accessible to over 7 million rural people.

A range of climate information is shared through regular weather reports announced on the radio and sent via SMS to farmers' cell phones. Farmers access the latest climate information, current local forecasts, description of farming conditions, warnings, and advice in common language.

"Before, I could not be sure that my peanut crop would ripen before harvest time. Much of it was guesswork or relying on my own observations. Now I get information that helps me plan," said farmer Mariama Keita from Sikilo village, Senegal. She has become an avid user of climate information.

Senegalese farmers say they now consider climate information an essential agricultural input, like seeds, fertilizers and equipment. Similar initiatives are being developed in Ghana, Lesotho, Malawi, and Tanzania.

1 Million Farmers Enroll in Crop Insurance in Maharashtra, India

Climate change increases the severity and frequency of extreme weather events, but new index insurance programs reduce the risks that farmers face, allowing them to make much-needed investments in climate-smart technology.

The Government of India expressed a commitment to make crop insurance more accessible to farmers, and index insurance provided the means. Using several scientific techniques such as crop and statistical models to examine crop–weather relationships, CIMMYT scientists developed new region- and crop-specific rainfall triggers for key crops (rice, pearl millet, soyabean, and cotton) in Maharashtra state. Triggers are the thresholds beyond which crop growth begins to suffer, and when payoffs to affected farmers can be determined.

The Maharashtra state government adopted the new approach to protect several thousand farmers from the vagaries of the weather for key crops.

Then several insurance companies, notably the Agriculture Insurance Company of India, applied the region- and crop-specific triggers to provide rainfall risk coverage to the crops of almost 1 million resource-poor farmers.

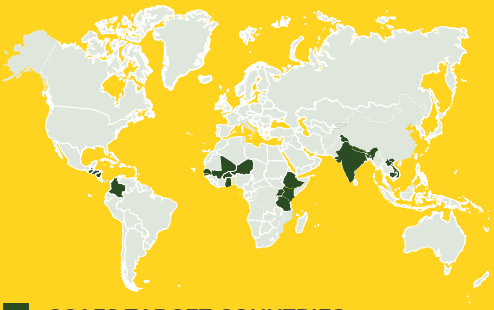
Photo credit: Neil Palmer/CIAT/CCAFS

If there is a deficiency in crop yield we will get cover as per index of loss" said Horil Singh, participating farmer.

"The final product attempts to provide a win–win situation for all: farmers, the insurance industry as well as the government," said Pramod Aggarwal, Program Leader, CCAFS South Asia.

By 2016, 11 million farmers had signed up for weather-based crop insurance in India.

Where We Work



CCAFS TARGET COUNTRIES

Latin America: Colombia, El Salvador, Guatemala, Nicaragua, Honduras.
West Africa: Burkina Faso, Ghana, Mali, Niger, Senegal.
East Africa: Ethiopia, Kenya, Rwanda, Tanzania, Uganda.
South Asia: Bangladesh, India, Nepal.
South East Asia: Cambodia, Laos, Vietnam.

CCAFS Focuses on Four Research Areas:

- **Priorities and Policies for CSA**
- **Climate-Smart Technologies and Practices**
- **Low Emissions Development**
- **Climate Services and Safety Nets**

Flagship Project 1: Priorities and Policies for Climate-Smart Agriculture (CSA) improves evidence and tools on enabling policy environments and priority-setting for targeted investment to support the scaling of CSA technologies to ultimately contribute to food and nutritional security under climate change.

Home of Learning Platform 1: ex-ante evaluation and decision support for climate-smart options.

Flagship Project 2: Climate-Smart Technologies and Practices provides evidence on the synergies and trade-offs among technologies and practices, towards the achievement of the distinct pillars of CSA across a range of agro-ecologies and social contexts and carries out research on innovative scaling mechanisms.

Home of Learning Platform 2: participatory evaluation of CSA technologies and practices in climate-smart villages.

Flagship Project 3: Low Emissions Development tests the feasibility of reducing agricultural GHG emissions intensities at large scales while ensuring rural food and nutrition security in low-income and middle-income countries.

Home of Learning Platform 3: Identifying priorities and options for low-emissions development

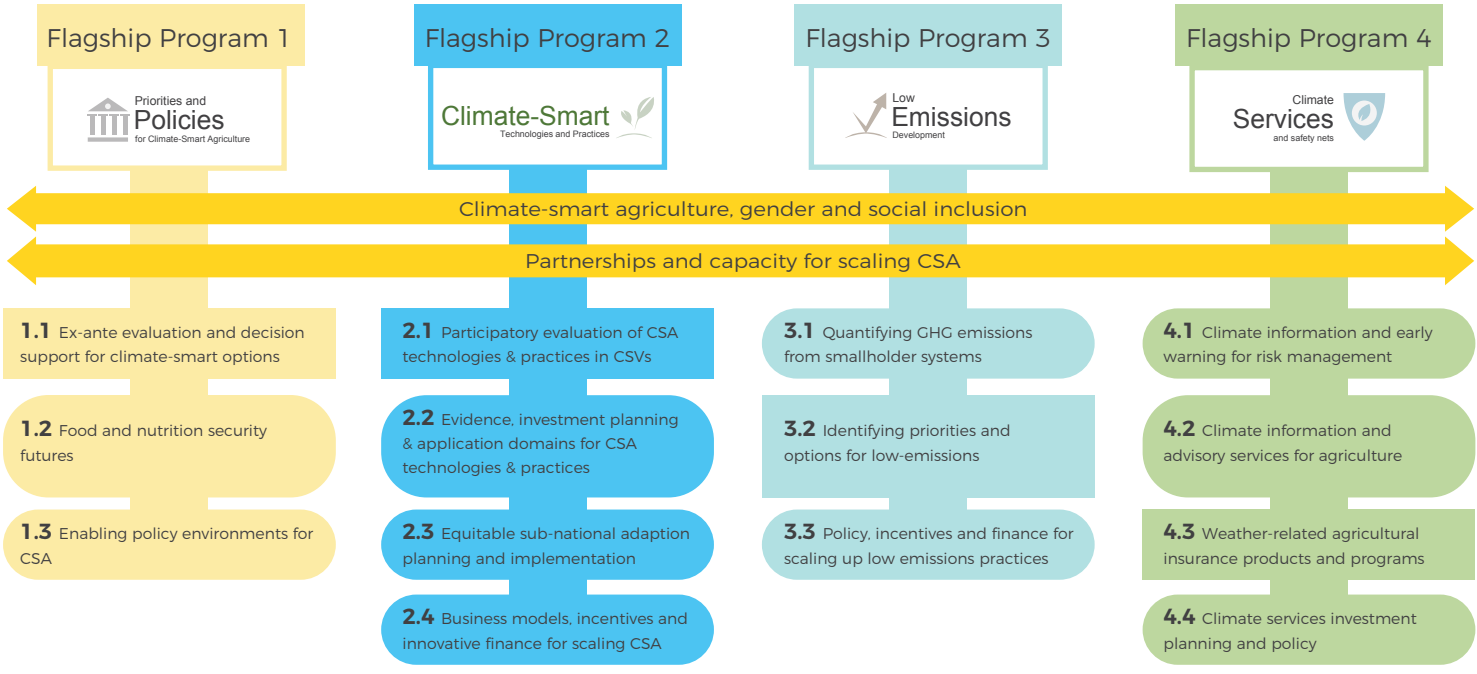
Flagship Project 4: Climate Services and Safety Nets addresses critical gaps in knowledge, methodology, evidence, and capacity needed to effectively implement a set of scalable interventions that use climate-related information tomanage climate-related risk.

Home of Learning Platform 4: Weather-related agricultural insurance products and programs.

Learning Platform 5 on CSA, gender and social inclusion undertakes research to inform, catalyse and target CSA solutions to women and other vulnerable groups, increase the control of disadvantaged groups over productive assets and resources, and increase their participation in climate-relevant decision-making.

Learning Platform 6 on partnerships and capacity for scaling CSA positions CGIAR as the leading global research organization for developing country food systems and climate change by managing partnerships and capacity development at global, regional and national levels to deliver impact from research.

CCAFS' role as a CGIAR Research Program that integrates across Center specialties strongly enhances both research and impact: An integrated climate Research Program allows CGIAR to speak with one voice on climate change and play a major role in national to global processes and implementation of climate-smart agriculture. CCAFS takes its mandate from the CGIAR vision: "a world free of poverty, hunger and environmental degradation".



Global Partners for Impact

CCAFS works with several hundred partners at sub-national, national, regional, and global levels. CCAFS partners include leading research organizations; inter-governmental development and policy organizations; non-governmental development organizations; and the private sector.

CCAFS has built a comprehensive and relevant range of strategic partnerships for key functions, including research, capacity building, knowledge management, action on practices, policy and institutional change, and management and governance. Our 41 strategic partners include all 15 CGIAR Centers, 13 non-CGIAR research partners, and 14 development partners.

15 CGIAR Research Centers

CIAT · Bioversity International · IFPRI · CIP · IITA · IWMI · ICARDA · ILRI · World Agroforestry Centre · CIFOR · CIMMYT · WorldFish · IRRI · ICRISAT · AfricaRice

13 Non-CGIAR Reaserch Partners

CATIE · futureearth · eci · IRI · NUI Galway · CSIRO · Wageningen UR · cirad · The University of Vermont · Utrecht University · University of Leeds

7 Intergovernmental Development & Policy Partners

CTA · FAO · IFAD · NEPAD · IICA · World Bank Group · SEARCA

6 Non-governmental Development Partners

care · World Vision · IIRR · wisat · giz · PAFO

Private Sector Partners

wbcsd

Working to Achieve the Global Goals

CCAFS will deliver on the following SDGs: 1, 2, 5, 12, 14, and 15, but its primary focus will be goal 13, climate action.

CCAFS actions will deliver on a number of SDG golas

- Enable adaption to deal with long-term change and extreme events.
- Improve human and institutional capacity on climate change mitigation, adaption, early warning.
- Embed climate change in national policies and planning.
- Secure effective financing.

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www.cgiar.org/funders

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