Implementing climate-smart agriculture for enhanced food security and resilience

Progress report, 14 August 2015

CCAFS is led by the International Center for Tropical Agriculture (CIAT) in collaboration with the following research organisations

Strategic partner

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Executive Summary

This report summarises outcomes from a portfolio of CCAFS projects on climate-smart agriculture (CSA). This particular portfolio was selected for its potential of scaling up CSA, which aims for outcomes on food security, building adaptive capacity and, where appropriate, increasing carbon sequestration and reducing greenhouse gas emissions. The following set of headlines highlight the most significant research results and development outcomes achieved during August 2014 to August 2015, in collaboration with a large number of partners.

1) Supporting Policy Formulation

- Eight national policies or plans formulated on three continents (Honduras, Cambodia, Bangladesh, Tanzania, Uganda, Burkina Faso, Colombia, Ghana), through CCAFS scenarios processes, contributing to long-term food security, adaptation and mitigation.
- Kenya's Intended National Determined Contributions (INDC) includes a CSA country program guiding investments for climate resilient and low carbon agriculture. At the same time a Kenya National Appropriate Mitigation Action (NAMA) proposal for climate-smart dairy practices has been elaborated.
- India promotes climate resilience for potentially 30 million farmers and food security for 800 million people through the inclusion of climate resilience and nutritious food grains like millet and sorghum into the National Food Security Act.

2) Informing Investments in CSA:

- Investments of half a billion USD for food security under climate change informed by CCAFS via close collaboration with the International Fund for Agricultural Development - IFAD (Adaptation in Smallholder Agriculture Program - ASAP), Global Agriculture and Food Security Program - GAFSP, and Government of Nigeria (Advisory Committee on Agricultural Resilience in Nigeria - ACARN).
- CCAFS shaped investments of at least USD 16 million in climate information services in Africa and Asia providing expertise to the UN Global Framework for Climate Services and the World Bank
- Haryana (India) State government's decision to invest in Climate-Smart Villages will increase the adaptive capacity and food security of farmers in 500 villages. Similar proposals are being developed for an additional five Indian states.

3) Guiding Investments Through Decision Support

- Practical guidelines on Conservation Agriculture elaborated and referenced in Kenya's Intended Nationally Determined Contributions (INDC) for the UN Framework Convention on Climate Change (UNFCCC)
- Investigation on research and capacity needs on gender and climate change adaptation informs gender and climate change strategies and policies in Africa and Latin America. Research results were presented at the seminar on *Closing the Gender Gap in Farming under Climate Change* in Paris in March 2015, organized and hosted by CCAFS and partners.

4) Providing Climate Information Services And Agro-Advisory

- Nearly two million farming households (10 million people) have received weather forecast and advice on climate-smart agricultural technologies and practices enhancing their productivity and resilience while as the same time reducing greenhouse gas emissions.
- Millions of farmers have been reached through innovative dissemination and adaptation strategies such as community-based rural radio stations (Senegal); farmer producer associations and web-based information platforms (Colombia - through South-South collaboration with Senegal); dairy producer organizations (Kenya); distribution of information bundles through agro-dealers (Kenya); and the use of mobile phones to farmers in hard to reach villages (India).
- These ongoing efforts will reach more than four million smallholder farming households (20 million people) by the end of 2015.

5) Promoting Crop Insurance

- Improved index-based weather insurance protects one million farmers in the state of Maharashtra, India against climate risks. Through South-South exchange and a request from the Government of Nigeria, efforts are ongoing to reach 14.5 million farmers in Nigeria with similar products.

6) Scaling Through Value Chains And Private Sector Approaches

- Private sector investments in climate smart dairy practices (national and international dairy companies including Danone) as well as in drought and heat-resistant maize have been made in Kenya and Zimbabwe, while efforts are ongoing to inform private sector investments in cocoa in West Africa
- The World Business Council for Sustainable Development (WBCSD) has been advised on planning, implementing and measuring CSA thus contributing to the targets on food security, adaptation and mitigation that WBCSD will announce at the Paris COP

Lessons from CCAFS Work on the Effectiveness and Scaling of CSA

- Study on novel scaling approaches for CSA has been conducted by CCAFS. On basis of case studies, the paper analyses how value chains and the private sector, information and communication technologies, and policy engagement approaches address a range of key challenges and opportunities for scaling up and out CSA.
- Similarly CCAFS has generated evidence on the effectiveness of CSA interventions. The analysis concludes that CSA interventions can be designed to effectively deliver multiple benefits. However, serious limitation in data on cost-effectiveness have to be rectified by project proponents
- To rectify data limitations a major meta-analysis has been initiated, covering thousand peer-reviewed articles, to document the evidence on CSA three goals: productivity, adaptation and mitigation.

Conclusions

- CCAFS will continue to work to achieve the full potential of the ongoing processes and activities. Particular promising is the work with Climate-smart Villages, information and communication technologies, insurance and value chain approaches to CSA, and the development of guidelines and web-based decision support tools for planning and implementation of CSA.
- Another major focus area will be on providing quantitative evidence for the use and impact of CSA knowledge, services and technologies. The priority is to develop metrics for resilience and adaptation, to be prepared together with agencies such as DFID, USAID and the World Bank.

Introduction

This report summarises outcomes from a portfolio of CCAFS projects on climate-smart agriculture (CSA). This particular portfolio was selected for its potential of scaling up CSA, which aims for outcomes on food security, building adaptive capacity and, where appropriate, increasing carbon sequestration and reducing greenhouse gas emissions. The following set of headlines highlight the most significant research results and development outcomes achieved during August 2014 to August 2015, in collaboration with a large number of partners.

The outcomes are divided into six thematic areas: 1) policy formulation, 2) investments, 3) decision support tools and analysis, 4) climate information, 5) crop insurance and 6) value chain and private sector approaches. Many integrate multiple focus areas (e.g. policy formulation with investments, or climate information with value chains). References are provided to more details on the most significant outcomes.

1) Supporting Policy Formulation

CCAFS works with institutions from district to global levels integrating innovative tools and knowledge into the development of policies for climate-resilient food systems. Through policy engagement, CCAFS ensures that research informs decisions of national governments as well as donors.

Through the University of Oxford, CCAFS conducted a series of regional climate and socio-economic scenarios together with a range of stakeholders, quantifying them with IMPACT (IFPRI) and GLOBIOM (IIASA) models. Based on the challenges and opportunities presented within the different scenarios, a process for a given national plan or policy was designed. Through this work CCAFS has informed the formulation of agriculture, climate and development policies and plans in Honduras (National Strategy for Climate Change Adaptation in Agriculture), Cambodia (Climate Change Priorities Action Plan), Bangladesh (7th 5 year plan), Tanzania (New Environmental Policy), Uganda (Agricultural Sector Plan), Burkina Faso (National Plan for the Rural Sector), Colombia (Action Plan for the National Agricultural Adaptation Strategy) and Ghana (National Climate Change Policy). Policy makers tested their plans against diverse socio-economic and climate scenarios. Plans in Cambodia, Honduras are finalized; Bangladesh to be finalized in Sept 2015; other countries in late 2015 and early 2016.[1]

Read more: National climate, agriculture and socio-economic development policies and plans formulated with the use of scenarios across six global regions

[1] A large number of stakeholders are involved in the scenarios work including: The Cambodia Ministry of Agriculture, Forestry and Fisheries; Cambodia Ministry of Commerce; Cambodia Ministry of Environment; Honduras Secretariat for Agriculture and Livestock; Bangladesh Global Economics Division, Planning Commission; International Centre for Climate Change and Development; UNDP Bangladesh; Vice President's Office, Tanzania; Uganda Ministry of Agriculture, Animal Industry and Fisheries; UNEP WCMC (World Conservation Monitoring Centre); FAO; IIASA (International Institute for Applied Systems Analysis); IFPRI (International Food Policy Research Institute); WRI (World Resources Institute); University of Kassel; Burkina Faso Permanent Secretariat for the Coordination of Agricultural Sector Policies; Colombia Ministry of Agriculture and Rural Development; Ghana Ministry of Environment, Science, Technology and Innovation; University of International Cooperation, Costa Rica; Oxfam GB

CCAFS-ICRAF conducted a meta-analysis of various climate-smart dairy practices, industry know-how, as well as the latest Nationally Appropriate Mitigation Actions (NAMAs), to establish a repertoire of best practices and inform a Kenyan national proposal for mitigation action on climate-smart dairy practices. The NAMA proposal has been elaborated and will be submitted in 2016 to the NAMA Facility or to the Green Climate Fund. Through dairy farm producer organizations and businesses approximately 600,000 farm households, 25% of which are headed by women, have been informed about climate-smart feed production and feeding practices.[2]

Read more: Scaling up climate-smart dairy practices in Kenya through Nationally Appropriate Mitigation Actions

Kenya has also developed a Climate-Smart Agriculture Framework Program (CSA-FP) with inputs from CCAFS-ICRAF scientists and national partners aimed at guiding investments into agricultural practices that are climate resilient and low on greenhouse gas (GHG) emissions. As of July 2015, the CSA-FP was integrated into Kenya's Intended Nationally Determined Contribution (INDC) submitted to the UNFCCC. The INDC seeks to abate 30% of Kenya's' GHG emissions by 2030 relative to a business as usual scenario of 132 Mt CO_2 eq. The framework programme is one of the seven listed focus mitigation initiatives that will benefit from an estimated 40 billion USD of mitigation finance to be mobilized by 2030.[3]

Read more: Kenya integrates Climate-Smart Agriculture into its Intended Nationally Determined Contribution

In India, CCAFS scientists and partners have informed the formulation and implementation of a major national policy conducive to food security and climate change adaptation. In 2014, India began the implementation of the National Food Security Act, which for the first time embraces climate-resilient and nutritious food grains like millet and sorghum. The inclusion of these broad varieties of grains within the law came as a result of research and policy engagement efforts by Bioversity International and its partners, particularly the M.S. Swaminathan Research Foundation. The new law aims to provide subsidized food for more than 800 million people in the country while at the same time promoting climate resilience for potentially 30 million farmers who grow these crops.

Read more: India promotes climate resilience through its food security bill

2) Informing Investment In CSA

[2] Project partners include; World Bank, International Livestock Research Institute (ILRI); Dairy Research Institute; the State Department of Livestock at the Ministry of Agriculture, Livestock and Fisheries; Brookside Dairy, New Kenya Cooperative Creameries; IFAD; Kenya National Farmers' Federation; Kenya Livestock Breeders Organization; Kenya Dairy Producers Association; Kenya National Milk Producers Organization; Association of Kenyan Feed Manufacturers; and Dairy Traders Association

[3] Key partners include: , International Livestock Research Institute (ILRI); Center for International Forestry Research (CIFOR); International Center for Tropical Agriculture (CIAT); Ministry of Environment, Water and Natural Resources; Ministry of Agriculture, Livestock and Fisheries; The Common Market for Eastern and Southern Africa (COMESA); East African Community (EAC);

CCAFS has helped shape climate-smart investments in agriculture and food security through research and through CCAFS scientist expert input.

On a global level and drawing on multiple research outputs, CCAFS participated in processes that informed the allocation of over half a billion USD of international public finance (grants and loans) to food security under climate change, via close collaboration with the agencies responsible for targeting and disbursement of funds, including: IFAD for the Adaptation in Smallholder Agriculture Program[4] (ASAP), the Global Agriculture and Food Security Program (GAFSP), and Government of Nigeria for the Advisory Committee on Agricultural Resilience in Nigeria[5] (ACARN). For example, in Nigeria this led to the formulation of the first National Agricultural Resilience Framework where CCAFS contributed as member of the advisory committee and as coordinating lead author for chapter five.[6]

At the same time CCAFS shaped roughly USD 16 million of investment in climate services in Africa and Asia including a USD 10 million investment by the Norwegian Agency for Development Cooperation (NORAD) in the first multi-sector national implementation project under the UN Global Framework for Climate Services (GFCS) in Tanzania and Malawi; the World Bank's investment in agrometeorological services as part of its work to strengthen hydro-meteorological services in Myanmar, and a USAID investment in climate services through a CCAFS-designed small grants initiative.[7]

Read more: CCAFS Science Strengthens Investments in Climate Services for Agriculture

The concept of Climate-Smart Villages has been elaborated and demonstrated at sites in India in collaboration with the International Maize and Wheat Improvement Center (CIMMYT). On the basis of evidence provided by the pilot projects the Haryana State Government has decided to invest in scaling up the approach to 500 villages, which will increase the adaptive capacity and food security of thousands of farmers.[8] Through ongoing engagement, other Indian states including Bihar, Chhattisgarh, Madhya Pradesh, Maharashtra and Uttar Pradesh are considering similar approaches, which can potentially develop clusters of climate-smart villages on 237,000 ha of land. Pilot schemes worth USD 140 million have been developed and submitted by CCAFS-IFPRI to these five states for their processing, implementing and further triggering investment for climate-smart agriculture.[9]
Read more: Scaling-up Climate-Smart Villages in India

[4] Key partners were the Agricultural Economics Division (ESA) of FAO, and the University of Oxford and Wageningen University.
[5] Main partners include: the Ministry of Agriculture of the Government of Nigeria; World Bank; International Fund for Agricultural Development (IFAD)
[6] For a comprehensive list of lead authors and their affiliation please see http://www.fmard.gov.ng/images/uploads/other_media/narf-2014le.pdf
[7] Besides the organizations mentioned the main partners are the International Research Institute for Climate and Society (IRI); the World the International Rice Research Institute (IRRI); Metrological Organization (WMO); World Food Program (WFP); Tanzania Meteorological Agency; World Vision-Tanzania; Regional Integrated Multi-Hazard Early Warning System (RIMES)
[8] Key partners include the Department of Agriculture; Government of Haryana; the International Food Policy Research Institute (IFPRI); the International Water Management Institute (IMWI); Indian Council of Agricultural Research (ICAR); State Agriculture Universities; IFFCO Kisan Sanchar Limited (IKSL); Kisan Sanchar; Agriculture Insurance Company of India
[9] Other partners include: Chhattisgarh State Planning Commission; the Environmental Planning and Coordination Organisation (EPCO) Madhya Pradesh; Agricultural Economics Research Association (AERA); National Council for Climate Change and Public Leadership, Gujarat; Centre for Agriculture and Rural Development, New Delhi; DNS Regional Institute of Cooperative Management, Patna, Bihar; Centre for Good Governance, Hyderabad, Telengana;

Also in India, CCAFS research on the effectiveness of solar pumps and ways to improve existing subsidy policies shaped the Indian Government's decision to increase the allocation for promotion of solar pumps. A credit subsidy scheme to install 10,000 solar pumps in two years (by 2016) across India was launched to benefit more than 50,000 farmers with affordable and assured irrigation.[10] In this, and in many of the proposed investments mentioned above, CCAFS will continue as a partner, including monitoring the CSA triple objectives, and the effectiveness of the various investments.

3) Guiding Investment through Decision Support

The successful efforts to inform and influence policy and funding opportunities, are to a large extent based on CCAFS work with partners at all levels to develop and apply the best and most promising methods, decision support tools and approaches to promote and scale up integrated portfolios of CSA technologies and practices, that meet the needs of farmers – including women.

In Africa, CCAFS—including scientists from the World Agroforestry Centre (ICRAF), CIMMYT, and the International Livestock Research Institute (ILRI)—is co-creating two CSA 'Practical Guides' with partners from NEPAD, FAO, COMESA, African Universities, Government Ministries, and Civil Society Organisations The first guideline on Conservation Agriculture is referenced in the Kenyan CSA Country Program. The second guideline is the cornerstone product that will guide implementation in the NEPAD-led African CSA Alliance. Though this is still under development, in the near future, it stands to influence at least five national governments, three regional economic communities, and the five participating international Nongovernmental Organisations that are part of the Africa CSA Alliance. With the rapidly developing CSA funding landscape in Africa the two guidelines have potential to influence millions of dollars of investments.[11]

Read more: Informing CSA implementation at national, regional, and continental scales

In terms of gender, CCAFS-IFPRI's work on identifying research and capacity needs on gender and climate change adaptation with 10 national and regional organizations are being used (i) to inform the European Centre for Development Policy Management's gender strategy in sub-Saharan Africa; (ii) to promote gender integration into the Inter-American Institute for Cooperation on Agriculture's climate change policies in Latin America; and (3) to shape dialogue on gender and resilience among a network of NGOs, donors and researchers (including World Vision, Lutheran World Relief, Catholic Relief Services, and USAID). CCAFS research on gender and climate change was presented at the gender, agriculture and climate seminar in Paris in March 2015 ("Closing the gender gap in farming under climate change: New knowledge for

[10] Partners include: the International Water Management Institute (IWMI); Claro Energy; SunEdison; Rotomag Motors and Control Pvt. Ltd.; Gautam Vivek; World Energy Council – Indian Secretariat

[11] The complete list of partners include: Common Market for Eastern and Southern Africa (COMESA); National Ministries of Environment and Agriculture; FAO; New Partnership for Africa's Development (NEPAD); African CSA Alliance (ACSAA); World Agroforestry Centre (ICRAF); International Maize and Wheat Improvement Center (CIMMYT); International Crop Research Institute for the Semi-Arid Tropics (ICRISAT); International Livestock Research Institute (ILRI), Total LandCare; Department of Agricultural Research Services Malawi

renewed action"). The conference was organized and hosted by CCAFS together with Future Earth, the International Social Science Council and the CGIAR Consortium Office.[12]

4) Providing Climate Information Services and Agro-Advisory

Precise and timely information on the climate, combined with agro-advisory reduces uncertainty and improves farmer's decision making. For example, climate information on the total rainfall, the onset and end of the rainy season, or daily and weekly forecast across the rainy season, together with advice tailored to meet local needs, allows farmers to adjust farm management practices or purchase index-based insurance to protect assets.

In Senegal CCAFS scientists worked with the National Meteorological Agency and 82 rural radio stations, to develop and disseminate downscaled climate information services (CIS), and to raise capacity of partners to do longer-term analysis and convey more actionable information for farmers. An estimated 740,000 rural households now have access to climate information services in Senegal.[13] In Ghana, ICRAF-CCAFS jointly with other partners capacitated the meteorological agency in historical analysis of station data, which provided, likewise through rural radios, place-based forecasts to farmers in northern Ghana. The estimated reach is approximately 34,000 smallholder farmers.[14]

Based on the experience in Senegal and fostered by South-South cooperation, the government of Colombia and six major national growers associations in Colombia are incorporating climate and site-specific information into their strategies, planning and advisory systems. Thanks to this, approximately 160,000 farmers have received agro-climatic advisories and 6,000 adopted climate-smart options. In the mid-term the effort is expected to reach about 1,600,000 farmers. Based on this success, further South-South exchange is planned in 2015, now between Colombia and Kenya, with Colombian officials, farmers and CCAFS researchers discussing with Kenyan counterparts as to whether the scheme can be introduced in Kenya.[15]

Read more: Scaling up climate advisories in Senegal and Colombia

Finally in India, agro-advisories were disseminated to farmers in over 60 villages of Bihar, Haryana and Punjab through voice messages on mobile phones with inputs taken from metrological departments,

[12] Partners include: University of Missouri, American University,World Agroforestry Centre (ICRAF), European Centre for Development Policy Management; Inter-American Institute for Cooperation on Agriculture; World Vision; Lutheran World Relief; Catholic Relief Services; and USAID
[13] Partners include: the National Meteorological Service in Senegal (ANACIM); URAC (Union des Radios Associatives et Communautaires du Sénégal, FONGS); The National GTP (multidisciplinary working group) ; The local GTPs (multidisciplinary working groups); The Ministry of Agriculture; The Senegalese Institute for Agricultural Research (ISRA)
[14] Key partners include: Adventist Development and Relief Agency (ADRA); OXFAM; Mali Meteo; Ghana Meteorological Agency; Savana Agricultural Research Institute (SARI) of Ghana; African Institute for Mathematical Sciences (AIMS); radio stations in Ghana and Mali radios (Zaa FM, Radio Opper Nest, Radio Von, and Radio Freed); Columbia University; University of Reading; Washington State University; World Agroforestry Centre (ICRAF) and the Internationa Crop Research Institute for the Semi-Arid Tropics (ICRISAT)
[15] Other partners include: Ministry of Agriculture in Colombia and Senegal; national federations of cereal, rice, livestock, banana, fruit and coffee growers (FENALCE, FEDEARROZ, FEDEGAN, AUGURA, ASOHOLFRUCOL, Federación Nacional de Cafeteros); NARS (CORPOICA and ICA from Colombia, and ISRA from Senegal); Cenicana; Resguardo Indígena Puracé; JAC; Acuaducto de Popayan; OAGRP; Universities (UNICAUCA and UNICORDOBA), ASOCAMPO; Municipal Technical Assistance Units; CORPOMOJANA; Fundacion Riopiefras, Ecohabitats and IDEAM

scientists, input dealers and farmers. Much of this work focusses on women's groups, to empower women to participate in farming decision-making.[16]

[16] The two major partners involved in getting this outcome were. IFFCO Kisan Sanchar limited (IKSL) and Kisan Sanchar (KS)

5) Promoting Crop Insurance

Millions of small-scale farmers in low-income countries are trapped in poverty because they are unable to take the risks associated with investments in improved agricultural technologies and practise; a tendency exacerbated by climate change and increased variability. Establishing well-designed insurance schemes not only enhances resilience when climatic shocks occur, the presence of a safety net can help farmers overcome the risk of investing in climate-smart technologies

In India, CCAFS has developed new region- and crop-specific rainfall triggers which improve existing weather based index insurances schemes because it makes pay-out more accurate and timely. The state government of Maharashtra, with a large population of resource-poor rain-fed farmers, has adopted these new products and several insurance companies, notably the Agricultural Insurance Company of India, have applied them in 2015 to provide rainfall risk cover to crops of almost one million farmers.[17]

In Nigeria, the Federal Ministry of Agriculture and Rural Development (FMARD) is also keen on providing insurance to 14.5 million of its smallholder farmers. Through South-South exchange CCAFS facilitated an analysis and interchange of information and experiences with weather-based index insurance in India and elsewhere. A whitepaper and a workshop on designing and implementing index insurance in Nigeria was delivered; and a related panel event held in London (January 2015); with a follow-up workshop in Zurich (May 2015). Results so far include a concept note for piloting weather and area-yield index insurance for maize and rice (to be bundled with appropriate seed from the International Institute for Tropical Agriculture (IITA) and AfricaRice, and using insurance expertise from SwissRe, GIZ and CIMMYT) as well as the preparation of a 4-year roadmap for achieving the goal of nationwide farmer coverage, and a brief for the incoming Minister.[18]

Read more: Scaling up and Improving Insurance Schemes for Farmers in India and Nigeria

6) Scaling Up Through Value Chains and Private Sector Approaches

CCAFS is increasingly using value chains and the private sector to promote and scale up climate-smart decisions and practices. Considering climate change impacts throughout the value chain helps companies to identify risk and opportunities for implementing CSA, at the same time as research is disseminated through well-stabilised networks and partners with common objectives.

In Kenya CCAFS-CIMMYT is targeting 3 million farmers with climate-smart agriculture information through private sector input suppliers (at least 370,000 farmers reached by July 2015). Through a network of small-

[17] All partner include: Agricultural Insurance Company of India; Department of Agriculture, Government of Maharashtra; Kolli N Rao; IRICS/Aon Benfield

[18] Partners include: International Maize and Wheat Improvement Center (CIMMYT); Nigerian (NAIC) and Indian (AIC) Agricultural Insurance Corporations; Swiss Reinsurance Company Ltd. (SwissRe); German Development Corporation (GIZ); Nigerian Meteorological Agency (NIMET); Nigerian Agricultural Insurance Corporation (NAIC); Pula Advisors (a consultancy company)

scale, entrepreneurial agro-dealers, climate-smart practices are being disseminated directly to farmers. Key practices include increasing efficiency of fertilisers use, and improved post-harvest storage. With a total of 1,500 agrodealers, 3 million farmers will be reached by the end of September 2015.[19]

Work on the use of CCAFS climate science and site-specific CSA practices in the Rainforest Alliance voluntary certification scheme and in impact investment approaches implemented by Root Capital began in 2015. The project leverages existing smallholder value chain interventions to translate climate science into actionable strategies for farmers and supporting actors, including agricultural businesses, voluntary certification schemes, and investors, across a number of geographies using smallholder coffee and cocoa systems in Africa and Latin America as model cases. Initial outcomes include a clear demand from private sector partners for improved information on climate change and cocoa in Ghana expressed by the widespread use of exposure maps at the recent global World Cocoa Foundation partnership meeting. The long-term objective is the adoption of recommended CSA practices by 15% of global cocoa producers and 7% of global coffee producers, as well as the provision of USD 350 million of tailored financial products to producer organizations, traders, exporters, and other key value chain actors by 2019.[20]

Read more: Mobilizing private sector partners for climate action in the cocoa value chain

In Zimbabwe CIMMYT-CCAFS research prepares maize breeding programs for future climates through the use of climate projections for maize-producing areas in sub-Saharan Africa. Research highlighted the increasing prevalence of heat stress and identified hotspots of vulnerability in Southern Africa. It also included phenotyping and crop modelling of commercially available varieties and new drought-tolerant varieties developed under the Drought Tolerant Maize for Africa (DTMA) project under expected future climates highlighting the susceptibility of these varieties and potential yield gains that could be made through adapting the existing breeding pipeline to address the potential effects of future climates. The outputs influenced the agenda of public (Crop Breeding Institute) and private (Progene, AgriSeeds, SeedCo, Pannar) maize breeding programs in Zimbabwe, to ensure new varieties being developed will be tolerant to both heat and drought.[21]

Read more: CIMMYT-CCAFS research prepares maize breeding programs for future climates

The Kenyan dairy activities mentioned previously as part of NAMA development also have a major private sector connection, through the global food company Danone. Success in this work will be ensuring that farmers are closely linked to the market.

[19] Key partners include: Ministy of Agriculture (MoA); Kenya Agricultural and Livestock Research Organisation (KALRO); SOFDI Kenya (an NGO); the COMESA supported Programme PAFID; the International Maize and Wheat Improvement Center (CIMMYT -SIMLESA and other projects), and the International Center for Tropical Agriculture (CIAT)

[20] A full list of partners include: International Institute of Tropical Agriculture (IITA) Ghana; Rainforest Alliance Ghana; Global Climate Change Team; Root Capital; Sustainable Food Lab and the International Center for Tropical Agriculture (CIAT)

[21] A complete list of partners include: Crop Breeding Institute (Zimbabwe),, MAIZE CRP and IITA breeders; Ministry of Agriculture (Zimbabwe), Seed Companies (Progene, AgriSeeds, SeedCo and Pannar)

CCAFS has also partnered with the global private sector during 2015. For example, working with the World Business Council for Sustainable Development (WBCSD), CCAFS has provided advice on planning, implementing and measuring CSA, and provided real examples through a field visit to climate-smart villages in South Asia, thus contributing to the targets on food security, adaptation and mitigation that WBCSD will announce at the upcoming UN Climate Change conference in Paris (COP21).

Lessons from CCAFS Work on the Effectiveness and Scaling of CSA

CCAFS, through 11 case studies, has explored novel scaling approaches for CSA. The case studies revolve around value chains and the private sector, information and communication technologies and policy engagement. The analysis offers insights into scaling approaches, the main challenges and opportunities for scaling CSA practices and technologies. The paper concludes that multi-stakeholder platforms and policy making networks are key to effective upscaling, especially if paired with capacity enhancement, learning and innovative approaches to support decision-making of farmers (either directly or indirectly). Projects that aim to intervene upstream at higher leverage points can be highly efficient and offer cost-effective dissemination strategies that reach across scales and include new and more diverse partnerships and alliances. However, these novel approaches still face challenges of promoting uptake and adaptation, because of the highly context specific nature of solutions; thus, there is still a requirement for a certain level of local engagement, while continuously paying attention to farmer's needs and contexts. For CGIAR, this often means having excellent local partners.

Similarly CCAFS has generated evidence on the effectiveness of CSA interventions. The evidence concludes that CSA interventions can be designed to deliver multiple benefits effectively, including those related to productivity, resilience, mitigation, as well as other co-benefits like job creation, infrastructural development, addressing gender inequalities, and addressing nutritional needs. There are gaps relating to data availability and quality, which limits further analysis. There is a strong need to fill these gaps by conducting rigorous cost-benefit analysis of interventions, as well as applying suitable metrics and tools to quantify the benefits of CSA. To rectify data limitations a major meta-analysis has been initiated, covering thousand peer-reviewed articles, to document the evidence on CSA three goals: productivity, adaptation and mitigation.

Read more: Dinesh D, Frid-Nielsen S, Norman J, Mutamba M, Loboguerrero Rodriguez AM, Campbell BM. Is Climate-Smart Agriculture effective? A review of selected cases. CCAFS Working Paper no. 129.

Conclusions

CCAFS will continue to work to achieve the full potential of the ongoing processes and activities. Particularly promising is the work in Climate-Smart Villages, information and communication technologies, insurance and value chain approaches to CSA, and the development of guidelines and web-based decision support tools for planning and implementation of CSA. The latter include a Compendium of CSA Practices, a Methodology for Developing Country Profiles, a CSA Prioritization Framework, a CSA Tool Comparison

Methodology, and a Climate-Smart Decision Platform that introduces and guides users through the process of understanding, developing and implementing CSA proposals and projects.

Another major focus area will be on providing quantitative evidence for the use and impact of CSA knowledge, services and technologies. This has to include the development of metrics and approaches to track outcomes. CCAFS is now well advanced in developing a GHG accounting tool for targeting practices and for tracking mitigation outcomes, through work with the University of Aberdeen. The priority then is the metrics for resilience and adaptation, to be prepared together with agencies such as DFID, USAID and the World Bank.