1. Activity Reporting.

Activity 659-2014

Trade-off analysis between mitigation, adaptation and farmers livelihoods across cocoa and coffee systems.

Status	Complete	Milestone	1.1.1 2014
Start date	2014 Jan	End date	2014 Dec

Description: Since 2012 an increased interest across CG centers exists in assessing the trade-offs between adaptation, mitigation and livelihoods benefits. CIAT has started to assess these trade-offs in coffee systems in Central America through a vulnerability analysis project and a carbon insetting project. Furthermore is CIAT working with IITA through a BMZ grant on the same subject in coffee and cocoa growing areas in Africa. CIAT, IITA and IFPRI are also planing to comparing the approaches and methodologies of trade-off analysis.

Status: Complete. In 2014 we have advanced our knowledge on the impacts of climate change on coffee and cocoa and trade-offs in adaptation of theses systems significantly. We have published 2 papers on the impacts of climate change on coffee, one global paper (Bunn et al, 2014) and one very detailed vulnerability analysis for Central America (Baca et al, 2014), we have quantified the carbon foot prints and carbon stock to demonstrate climate friendly coffee (van Rikxhoort et al, 2014) and cocoa (Schroth et al., 2014) production. We furthermore show how coffee production intensification worldwide decreases biodiversity and carbon stocks (Jha et al., 2014).

Gender Component: The gender work will be conducted within the FP4 project under the activity that supports the NAMAs in Costa Rica.

Objectives:
1. To publish results of trade-off analysis in carbon insetting project.
2. To analyse trade-offs between mitigation, adaptation and livelihoods benefits in coffee and cocoa systems.
3. To compare and share methodologies and approaches with IITA and IFPRI.

Deliverables:

Description	Type	Year	Status	Justification
Data collected and initial trade-off analysis for coffee and cocoa systems in Africa completed.	Peer-reviewed journal articles	2014	Complete	Abstract Coffee has proven to be highly sensitive to climate change. Because coffee plantations have a lifespan of about thirty years, the likely effects of future climates are already a concern. Forward-looking research on adaptation is therefore in high demand across the entire supply chain. In this paper we seek to project current and future climate suitability for coffee production (Coffea arabica and Coffea canephora) on a global scale. We used machine learning algorithms to derive functions of climatic suitability from a database of geo-referenced production locations. Use of several parameter combinations enhances the robustness of our analysis. The resulting multi-model ensemble suggests that higher temperatures may reduce yields of C. arabica, while C. canephora could suffer from increasing variability of intra-seasonal temperatures. Climate change will reduce the global area suitable for coffee by about 50 % across emission scenarios. Impacts are highest at low latitudes and low altitudes. Impacts at higher altitudes and higher latitudes are still negative but less pronounced. The world's dominant production regions in Brazil and Vietnam may experience substantial reductions in area available for coffee. Some regions in East Africa and Asia may become more suitable, but these are partially in forested areas, which could pose a challenge to mitigation efforts.

Description	Type	Year	Status	Justification
Analysis finalized and results published	Peer-reviewed journal articles	2015	Incomplete	
Discuss results with stakeholders and include recommendations in certification schemes.	Data	2016	Incomplete	

Description	Type	Year	Status	Justification
The Mesoamerican region is considered to be one of the areas in the world most vulnerable to climate change. We developed a framework for quantifying the vulnerability of the livelihoods of coffee growers in Mesoamerica at regional and local levels and identify adaptation strategies. Following the Intergovernmental Panel on Climate Change (IPCC) concepts, vulnerability was defined as the combination of exposure, sensitivity and adaptive capacity. To quantify exposure, changes in the climatic suitability for coffee and other crops were predicted through niche modelling based on historical climate data and locations of coffee growing areas from Mexico, Guatemala, El Salvador and Nicaragua. Future climate projections were generated from 19 Global Circulation Models. Focus groups were used to identify nine indicators of sensitivity and eleven indicators of adaptive capacity, which were evaluated through semi-structured interviews with 558 coffee producers. Exposure, sensitivity and adaptive capacity were then condensed into an index of vulnerability, and adaptation strategies were identified in participatory workshops. Models predict that all target countries will experience a decrease in climatic suitability for growing Arabica coffee, with highest suitability loss for El Salvador and lowest loss for Mexico. High vulnerability resulted from loss in climatic suitability for coffee production and high sensitivity through variability of yields and out-migration of the work force. This was combined with low adaptation capacity as evidenced by poor post harvest	Peer-reviewed journal articles	2014	Complete	

Description	Type	Year	Status	Justification
infrastructure and in some cases poor access to credit and low levels of social organization. Nevertheless, the specific contributors to vulnerability varied strongly among countries, municipalities and families making general trends difficult to identify. Flexible strategies for adaption are therefore needed. Families need the support of government and institutions specialized in impacts of climate change and strengthening of farmer organizations to enable the adjustment of adaptation strategies to local needs and conditions.				

Partners:

Partners not defined

Location(s):

Countries: Ghana, Tanzania, Uganda,

Activity 745-2014

Identify CSA-practises suitable for northern Tanzania, develop application domains using crop-soil-modeling and assess and validate benefits for local agriculture through an interactive platform

Status	Complete	Milestone	1.3.2 2015 (1)
Start date	2013 Oct	End date	2015 Jan

Description: The "Climate Smart Technologies and Practices: Using Science Knowledge and Expert Feedback to Accelerate Local Adoption" project proposes to accelerate adoption of site-appropriate, climate smart agricultural practices in the Usambara Mountains in Tanzania. These practices will be selected from a scientific basis of ongoing and previous CIAT projects and a comparison of practices on climate analogue sites. Further, a feedback tool will be developed to validate this Application Domains (AD) through local agriculture experts who interacts and shares their experience regarding the selected CSA practices for their biophysical and social environment on an interactive platform.

Status: Complete. Within the project we tested a participatory prioritization of CSA packages methodology, which included local farmers, technicians from the local agricultural district office and experts from different areas of Northern Tanzanian. We further conducted the biophysical impact of climate change through integrated modeling using the Decision Support System for Agrotechnology Transfer (DSSAT) model, a climate data set of meteorological daily data for a historic period of 27 years, soil data from the Land Degradation Surveillance Framework (LDSF) as well as selected agronomic management methods from survey data of a previous CCAFS project. We developed an interactive platform for monitoring and feedback loops of participants on CSA practice implementation, and adapted an existing platform-framework for collaborative problem solving within the citizen's spatial context (Geociudadano) for the Spatial Data Infrastructure (SDI). We developed a mobile application for the monitoring of demo plot activities in ongoing CIAT led projects and we tested the use of ICT tools in the process of communicating and working with farmers and technicians in the field.

Gender Component: In the CSA prioritization workshops we identified CSA practices with farmers in groups. From the pre-selected list, farmers identified the practices that were already being used in the area, afterwards they created packages of CSA practices they would like to see demonstrated for the different agro-ecological zones. Participating farmers were divided into four groups, based on gender and agro-ecological zones of the study area.

Objectives:
1. To identify CSA-practises suitable for northern Tanzania, develop application domains using crop-soil-modeling and assess and validate benefits for local agriculture through an interactive platform

Deliverables:

Description	Type	Year	Status	Justification
The final report includes the following sections: Executive summary; Methods and Tools; Carried out activities and Achieved Results; Lessons Learned.	Research report (i.e. workshop report, consultant's report, discussion paper, project report, student thesis, etc.)	2014	Complete	
The CSA Implementer platform is a crowdsourcing tool used to collect relevant data for monitoring a project implementation in a structured way.	Platforms - Data Portals for dissemination	2014	Complete	
user-manual for CSA Implementer application	Reference material (booklets and training manuals for extension agents, etc.)	2014	Complete	

Partners:

1- Selian Agricultural Research Institute (SARI):
   George Sayula <gsayula@hotmail.com>

2- RealApps:
   Camilo Salazar <camiloess@gmail.com>

Location(s):

Benchmark Site: Usambara (Lushoto),

Regions: East Africa (EA),

Activity 642-2014

Gap analysis on 60 non-ITPGRFA crops (Global and North America focus), PGR interdepence analysis, threats to current wild relatives habitats, crop wild relatives richness analysis, genetic gap analysis

Status	On going	Milestone	1.1.1 2014
Start date	2014 Dec	End date	2014 Dec

Description: The wild relatives of crops are threatened in their habitat by land use changes and climate change. These species are considered as sources of diversity and traits useful to adapt crops to climate change through their use in breeding. International efforts in collecting plant genetic resources have been declining in recent decades and many national programs lack the capacity to collect such types of plants. The wild relatives of crops are underrepresented in ex situ collections (estimated to be 2%-18% of total holdings) and with very large gaps in species coverage (e.g. 94% of European CWR are entirely missing from ex situ collections). Agricultural research for adaptation to climate change is thus constrained by limited options in available and useful diversity for crop breeding.

Status: On going. The identification of current needs of conservation of the wild relatives of 80 crops were identified, using the gap analysis methodology at the global scale. In addition, a study focusing in the conservation needs of the wild relatives of crops in the US was finished as well. Threats analysis, plant genetic resources interdependence analysis and associated analyses were finished and we are currently in the stage of preparing manuscripts reflecting the methodologies and data that were used on each analysis, the results and discussion as thesis chapters and/or manuscripts for submissions to peer-reviewed journals.

Gender Component: Not defined

Objectives:
1. Compile a global database of crop wild relatives with georeferenced records.
2. Identify major gaps of wild species in ex situ collections.

Deliverables:

Description	Type	Year	Status	Justification
Two PhD thesis analyzing the diversity and distributions of crop wild relatives.	Book chapters	2014	On going	Last year (2014) was dedicated to refine and prepare the crop case studies (i.e. potato, sweet potato, pigeonpea) for publication in peer-reviewed journals. The analysis of the remaining chapters have been subject to revision and preparation of the corresponding manuscripts.
Data distribution tool to enable the access of ocurrence data using the Project website (www.cwrdiversity.org)	Data	2014	On going	During 2014, we had two major setbacks that did not allow us to launch the distribution tool as planned earlier: we discovered underlying deficiencies in data coming from GBIF, and the key staff in charge of the database departed. It took us a number of months to acquire updated data and a new person to manage the database that met with the technical skills required to manage the amount and type of data that we've been producing.
Database storing crop wild relatives occurrence records	Data	2014	On going	We had two major setbacks during 2014 that delayed the finalization of global database for the distributions of crop wild relatives: we detected deficiencies in the underlying data gathered from GBIF, and our data manager staff departed. It took us between 3 to 4 months to gather and curate the missing information and to find a person that met with the technical skills to manage the type and amount of data, thus affecting the completion of this deliverable.
Interactive global atlas with species distribution maps and recommendations for seed material collections	Maps (i.e. CCAFS Sites Atlas, cropland, etc.)	2014	On going	The deliverable is still ongoing, as some technical improvements are still under development, to ensure a better way of processing and displaying information.

Description	Type	Year	Status	Justification
Publications for individual and refined gap analysis for key crops (e.g. potato, sweetpotato, pigeonpea, sunflower, eggplant, tomato and lettuce)	Peer-reviewed journal articles	2014	Complete	
Increasing homogeneity in global food supplies and the implications for food security	Peer-reviewed journal articles	2014	Complete	
Policy brief based on the paper Khoury et al (2014) - PNAS, discussing the implications of the CGIAR research priorities on regards to the increasing homogeneity of global food supplies.	Policy briefs - Briefing paper	2014	Complete	

Partners:

1- Millenium Seed Bank (KEW):

Ruth Eastwood <r.eastwood@kew.org>

2- Global Crop Diversity Trust:

Jane Toll <jane.toll@croptrust.org>

3- University of Birmingham:

Nigel Maxted <nigel.maxted@dial.pipex.com>

Location(s):

Global

Activity 817-2014

Application of a protocol for quantification of smallholder agricultural GHGs and data to assess mitigation options (SAMPLES)

Status	Cancelled	Milestone	3.3.1 2014
Start date	2014 Jan	End date	2014 Dec

Description: Application of SAMPLES methods at four sites in Latin America to determine GHG balances, C footprint and global warming potential of several crop and livestock farming systems; description of potential tradeoffs between food and feed and the environment.

Status: Cancelled. The money allocated to this activity (USD 50000) was used to leverage those allocated by LAM to activity number 897-2014 which was also about GHG measurements in Latin america, with a focus on evaluating agroforestry systems using SAMPLES methodology and capacity building (USD 100000). Therefore, activities done using these resources were reported under LAM 897-2014.

Gender Component: Not defined

Objectives:
1. Determine the potential of improved crop and livestock production systems to enhance eco-efficiency of agriculture in Latin America, with emphasize on mitigation of greenhouse gas emissions at production plot and landscape scales.

Deliverables:

Description	Type	Year	Status	Justification
CIAT laboratory outfitted with gas chromatograph.	Other	2014	On going	
GHG balance and climate change mitigation potential of eco-efficient crop-livestock systems	Data	2014	On going	
Peer-reviewed manuscript for international journals	Peer-reviewed journal articles	2015	Incomplete	

Partners:

1- Centro Internacional de agricultura Tropical (CIAT):
   Aracely Castro <a.castro@cgiar.org>

2- Columbia University:

3- Ministry of Environment and National Resources (MARN):

4- Salvadoran Research Program on Development and Environment (PRISMA):

5- Nicaraguan Institute for Agricultural Technology (INTA):

6- Universidad del Cauca (UNICAUCA):

7- Corporación Colombiana de Investigación Agropecuaria (CORPOICA):

Location(s):
Countries: Colombia, El Salvador, Nicaragua,

Activity 823-2014

Evaluation (in conjunction with national grower organizations) of new materials for rice, beans, cassava and maize in Colombian sites, and analyzed using analogue concept

Status	On going	Milestone	1.1.1 2015 (1)
Start date	2013 Jan	End date	2014 Aug

Description: Genotypes of different crops are being tested in multiple locations in Colombia to measure their capacity to adapt to different environmental niches. The performance of each genotype in each tested location will be measured according to the yield obtained in each trial. At the end of these evaluations interaction between genotype and environment will be established and recommendations about which ones suites the most for each environment will be reported.

Status: On going. The genotypes were tested on different locations. In the case of cassava it was evaluated in four sites through the North Coast considering postpone harvests. The last harvest was in September of 2014.
We are doing an evaluation of 15 varieties of climbing beans in three regions to select material adapted to climate variability and diseases resistance. A total of 24 rice genotypes were evaluated during 4 seasons under direct seeding lowland conditions in three sites : Saldana, Aipe, Monteria. Yield, phenology and quality traits were registered for each sowing date.
A total of 24 rice genotypes were evaluated under upland conditions in two sites Yopal and Santa Rosa, for three sowing dates. Also Yield, phenology and quality traits were registered for each sowing date. All data is under analysis, and the results will be available at the end of the MADR project (March, 2015). Finally, for the case of maize, a phenological and yield report by 3 different sowing and 5 different sites (Córdoba, Santander, Tolima, Valle del Cauca and Quindio) seasons is available for the modelers to use as a database to perform agroclimatic forecasting, for the short and mid-term, on the maize productive regions of Colombia.

Gender Component: Not defined

Objectives:
1. To evaluate the capacity of advanced lines and varieties of different crops to adapt to different environmental conditions

Deliverables:

Description	Type	Year	Status	Justification
Reports with phenological and yield data to be included into Agtrials platform	Data	2014	Complete	
Analysis of variance of yield for climbing bean in Colombia	Research report (i.e. workshop report, consultant's report, discussion paper, project report, student thesis, etc.)	2014	Complete	

Partners:

1- Federación Nacional de Cultivadores de Cereales (FENALCE):
Carlos Molina <cmolina@fenalcecolombia.org>

2- Federación nacional de arroceros (FEDEARROZ):
Patricia Guzman <subtecnica@fedearroz.com.co>

3- Centro para la Investigacion en sistemas sostenibles de produccion agropecuaria (CIPAV):
Bernardo ospina <b.ospina@clayuca.org>

Location(s):
Countries: Colombia,

Activity 827-2014

Environmental costs & benefits of climate-smart, eco-efficient agricultural intensification pathways in sub-Saharan Africa

Status	Cancelled	Milestone	3.1.1 2014
Start date	2013 Jan	End date	2015 Dec

Description: To keep pace with population growth, food production in sub-Saharan Africa will have to increase 70 % by 2050. To meet this target, sustainable intensification pathways need to be identified, clearly laid out, promoted and adopted large-scale. Agricultural eco-efficiency focuses on increasing productivity while decreasing negative impacts on natural resources. Approaches that merit the term eco-efficient must meet the economic, social, and environmental needs of the rural poor. Eco-efficiency seeks to strive toward solutions that are competitive, profitable, sustainable, and resilient in the face of a changing climate.

Adoption of intensified production might come at an environmental cost, such as a loss of nitrogen (N) by leaching and eutrophication of natural ecosystems jeopardizing ecosystem services, or an increase in greenhouse gas (GHG) emissions, like nitrous oxide or carbon dioxide. On the other hand, adoption of eco-efficient ways of cropping could also provide benefits to the environment. It is currently unclear whether crop production can be intensified in SSA without creating some damage to the environment. Analogously, it is not clear what climate change mitigation potential lies in such crop production intensity levels that could be considered sustainable. Most likely, such production levels will be below the economic potential of the production system, and thus it unknown if sustainable production systems can meet the projected food production demands of the coming decades, and if so, whether farmers are willing to "go sustainable" if this entails a considerable loss of income. In the latter case, it may be worth looking into related costs for payments for environmental services, and whether these can be covered e.g. by Clean Development Mechanism projects under the Kyoto protocol.

Integrated soil fertility management (ISFM) has been promoted in Africa for quite some time as a viable strategy to boost agricultural productivity while at the same time increasing the efficient use of agricultural inputs. CIAT has been one of the main promoters of ISFM, and recently has broadened ISFM to fully embrace the concept of Conservation Agriculture (CA), namely the components minimum tillage and surface residue retention. The enhanced concept has been branded ISFM+. ISFM+ is seen as promising intensification pathway. It includes a step-wise adoption of agronomic management technologies that increase the agronomic efficiency and productivity of the system. Yet, despite some 15-20 years of research on ISFM, its eco-efficiency has never been fully evaluated.

To be able to quantify the impact of ISFM+ on soil health and environmental quality, there is a critical need for robust, reproducible metrics. A new area of "metrics research" is required to provide the scientific underpinning for developing integrative parameters/indicators that describe the performance of agricultural systems from field to watershed and global levels.

Assessing and quantifying eco-efficiency – including the quantification of N-losses by leaching or as

nitrous oxide – of current farmers' management practices as well as the their intensified alternative (ISFM+) by classical field trials at regional, country or sub-continental scale is not a workable option; time and costs would be exorbitant. Computer simulation modeling, once calibrated by strategically selected field trials, provides a cheaper option of assessing eco-efficiency metrics and to guide recommendations for intensified production pathways that are site/region-specific and sustainable. Combining such biophysical, mechanistic simulation tools with systematic agronomic and land health surveys at landscape level, allows for developing outscaling methods for a rapid assessment of the environmental costs and benefits of climate-smart, eco-efficient agricultural intensification pathways in sub-Saharan Africa.

This activity addresses these issues focusing on mixed crop-livestock farming systems of Eastern Africa. The objective of this study is thus to:

Inform decision makers about the environmental costs and benefits of climate-smart, eco-efficient agricultural intensification pathways in sub-Saharan Africa.

To achieve this we intend to:

1) develop metrics for eco-efficient agriculture;

2) assess the eco-efficiency of current farmers practices and ISFM+ as a potential climate smart, eco-efficient farm intensification option;

3) quantify the GHG footprint / climate change mitigation potential of these systems;

4) develop robust (empirical) outscaling methods for a large-scale assessment of eco-efficiency and climate smartness;

5) describe tradeoffs between eco-efficiency, climate change mitigation potential and food security needs of the identified climate smart, eco-efficient farm intensification pathways.

Status: Cancelled. This activity has been pursued as planned in 2014. It comprised intensive measurements of nitrogen fluxes (e.g. N2O emissions using the SAMPLES protocol) together with a range of other agronomic parameters in one of CIAT's long-term trial on Integrated Soil Fertility Management (ISFM) in Western Kenya, and the biophysical modeling of this trial using the CropSyst cropping system simulation software. We also installed chambers and measured GHGs in some selected treatments of two on-farm demonstration trials of best-bet management practices (incl. ISFM) around Babati Tanzania. Results were presented in a special session (led by CIAT) at the 20th World Congress of Soil Science in South Korea in June 2014, and have been summarized in peer-reviewed journal publication. Other activities comprised guest-editing (Sommer, Kihara, Braslow) a Special Issue of Nutrient Cycling in Agroeecosystems on "African Eco-Efficient Solutions to Food Insecurity and Climate Change", as well as a one-week training course of national scientists of Tanzania and Malawi in crop modeling (CropSyst) in Arusha in May 2014, and the launching of a "GHG Awareness Day" in Babati to which 24 regional extension workers were in invited.

Gender Component: Not defined

Objectives:

1. Develop metrics for eco-efficient agriculture;

2. Assess the eco-efficiency of current farmers practices and ISFM+ as a potential climate smart, eco-efficient farm intensification option;
3. Quantify the GHG footprint / climate change mitigation potential of these systems;
4. Develop robust (empirical) outscaling methods for a large-scale assessment of eco-efficiency and climate smartness;
5. Describe tradeoffs between eco-efficiency, climate change mitigation potential and food security needs of the identified climate smart, eco-efficient farm intensification pathways.

Deliverables:

Description	Type	Year	Status	Justification
Based on two season data: GHG footprint / CC mitigation potential of current and improved (ISFM) agr. practices assessed	Research report (i.e. workshop report, consultant's report, discussion paper, project report, student thesis, etc.)	2014	Complete	
Alternative eco-efficiency pathways developed	Data	2015	Incomplete	
Tradeoff analysis (cost-benefit-sustainability) started, first preliminary results ready	Data	2014	Complete	
Eco-efficiency metrics re-defined	Data	2015	Incomplete	
Report / policy brief / peer reviewed publication	Peer-reviewed journal articles	2015	Incomplete	

Partners:

1- Selian Agricultural Research Institute (SARI):

   Charles Lyamchai <lyamchai@yahoo.com>

Location(s):

Countries: Kenya, Tanzania,

Activity 828-2014

Assessment of soil and land based constraints and opportunities for best-bet adaptation strategies (crop choice, land and water management) across a range of ecologies in EA.

Status	Cancelled	Milestone	1.1.1 2014
Start date	2013 Nov	End date	2015 Dec

Description: Climate smart agriculture (CSA) in part builds on the idea that the resilience of smallholders to withstand potential negative impacts of a changing climate can be increased by improving their natural resource base.

On the one hand, this comprises better adapted crop varieties that, for instances, by establishing a deeper rooting system, can extract water from deeper soil layers and thus withstand in-season dry spells better than shallow-rooting traditional varieties. Likewise, varieties with a shorter growth cycle may as such escape late-season drought.

On the other hand, an improvement of soil physical and chemical properties and the elimination of soil erosion by appropriate measures (e.g. conservation agriculture, landscape conservation) could also add to increasing farmers' capacity to cope with or adapt to climate change. Along that line, on-farm water management, e.g. by installation of water harvesting and supplemental irrigation schemes, has also been suggested as a viable strategy to increase the adaptive capacity of smallholders.

However, the magnitude of the impact of such adaptation measures over time as well as the feasibility, in financial and biophysical terms, has not been well described. It is not clear whether adaptation options that work today will also work in the future, and to what extent current and future soil and landscape status is jeopardizing the success of CSA practices. In other words, it is questionable whether CSA practices that rely on improved varieties are sustainable, if soil and landscapes are degraded.

As a first attempt to tackle the issue, this activity will assess soil and land based constraints and opportunities for best-bet adaptation strategies across a range of ecologies in Eastern Africa.

The objective of this study is to:

Quantify the climate change adaptation potentials and limitations of CSA practices that rely on amelioration of soils.

To achieve this we intend to:

1) Assess to what extent some most prominent CC adaptation strategies are sensitive to soils and landscape conditions

2) Highlight opportunities for increasing chances of long-term success of CSA practices by sound soil and landscape management, as well as pinpoint consequences of failure to do so.

Status: Cancelled. We have submitted a paper assessing the effects of cultivation on soil health metrics, using Lushoto as a key case study.

In addition, we have completed the creation of a tool for assessing climate smart agriculture potential of a community, district, or region. The climate-smart agriculture rapid appraisal (CSA-RA) provides

an assessment of key barriers and opportunities to CSA adoption across
landscapes by collecting gender-disaggregated data, perceptions of climate variability, resource and labour allocation, as well as economic assessments at the household level. This approach combines participatory workshops, expert interviews, household/farmer interviews, and farm transect walks to gather and capture the realities and challenges facing diverse farming communities.

This manual outlines step-by-step approaches to:

I. Obtain a preliminary understanding of the farming systems, household characteristics, infrastructure, land tenure, household expenditure, asset ownership, profitability of the farming enterprises, and other important agriculture-related features.

II. Identify farmers' perceptions of weather patterns (e.g., climate variability) and its perceived impact on agricultural production.

III. Obtain a preliminary understanding of major challenges and constraints faced by farmers (i.e., climate variability, land health, specific cropping and/or livestock issues, markets, etc.).

IV. Identify existing and potential CSA practices, agronomic, and land management practices as well as assessing demonstration plots of these practices.

V. Identify opportunities for mainstreaming CSA and potential social, economic and/or institutional barriers to adoption.

VI. Identify gender dynamics related to objectives I-V.

Gender Component: The target groups include small-scale agricultural farmers, especially women and marginalized groups, national agricultural research systems, policy makers, and climate finance entities. These groups are especially targeted in order to achieve the CCAFS gender IDO: empowerment of women and marginalized groups. Benefits include enhanced food security through wide-scale adoption of locally appropriate climate-smart agricultural practices.

Objectives:

1. Assess the sensitivity of some most prominent CC adaptation strategies to soils and landscape conditions.
2. Highlight opportunities for increasing chances of long-term success of CSA practices by sound soil and landscape management, as well as pinpoint consequences of failure to do so.

Deliverables:

Description	Type	Year	Status	Justification
Reports and papers	Peer-reviewed journal articles	2014	On going	The paper is in peer-review.
This blog highlights the importance of soil data in assessing ecosystem services in diverse landscapes. Soil health is measured through indicators, such as organic carbon. This gauges inherent soil properties like texture or structure - which have an impact on what crops can grow and how well – and the impact farm management practices have on soil fertility.	Social media outputs (including web sites, blogs, wikis, linkedin group, facebook, yammer, etc.)	2014	Complete	
Farming systems that integrate crops with livestock carry much of the weight of the world's food systems. These "mixed" farming systems produce about half of the planet's food on 2.5 billion hectares. They not only account for over 90% of the world's milk supply and 80% of the meat from ruminants but also provide most of the staple crops consumed by poor people, including maize, rice, sorghum, and millet. - See more at: http://ciatblogs.cgiar.org/support/finding-the-right-mix-of-climate-smart-solutions-in-east-africa/#sthash.jQJVjWDj.dpuf	Social media outputs (including web sites, blogs, wikis, linkedin group, facebook, yammer, etc.)	2014	Complete	

Description	Type	Year	Status	Justification
As part of this CCAFS project we collected various types of data in order to better understand vulnerabilities of smallholder farmers in East Africa to climate change. We collected and integrated interdisciplinary datasets in order to assess the biophysical, agronomic, social and economic realities at the sites. The study was carried out in four CCAFS Benchmark sites in East Africa, representing various agro-ecological systems: Hoima, Uganda; Nyando, Kenya; Lushoto, Tanzania; and Borana, Ethiopia. The information is being used for researchers, policy-makers and development practitioners to better understand the vulnerabilities of smallholder farmers, both men and women, to climate change and what actions can be taken to reduce that vulnerability.	Data	2014	Complete	

Partners:

1- Selian Agricultural Research Institute (SARI):

George Sayula <g.sayula@hotmail.com>

Location(s):

Countries: Tanzania,

Benchmark Site: Usambara (Lushoto),

Activity 869-2014

Development of climate-specific agricultural management approaches for major food staples in Colombia. Includes refining, testing and validating parametric and non-parametric methods methods applicable for other regions

Status	On going	Milestone	2.3.2 2014
Start date	2014 Jan	End date	2014 Dec

Description: For the development of climate-specific management approaches, historical and new information on crop performance, which is made available by the crop sectors, is analyzed. The most appropriate analytical methods are being adapted to the commercial data available rather than the data to a particular method, as researchers have done for over a century. The results are directly being used by the different crop sectors since they are part of the project and the farmers themselves have provided the data. The information driven agriculture is informing and also expected to influencing polices of the agricultural sector over the next few years. In addition we are building a database and information platform that will deliver reports to the crop sector, extension officers and farmers. An example of the type of information generated by the analytical tools that are being used is, the scientific evidence that showed that solar radiation in the research station of Saldaña (Colombia) is the most important factor associated with rice production (see slide 15 at http://www.slideshare.net/ciatdapa/uso-degrandes-datos-big-data-en-la-agricultura-caso-de-estudio-fedearroz-en-colombia). This information allows the sector and farmers make better-informed decisions on the planting date in order to increase rice yield. As long as information on the crop performance at site level is available, together with meteorological and climate data that represents well the production site the approach can be used in any other region.

Status: On going. Analytical methods in Machine learning (Conditional Forest, random Forest and Neural Networks) were tested and validated for new regions, in maize and rice crops. Relevant factors which explained the yield variability by region were identified. Also a platform and an Android application were developed to facilitate data collection and reports. Finally two papers are being reviewed to be published by mid 2015.

Gender Component: Not defined

Objectives:
1. To Evaluate multivariate modeling techniques (parametric and non-parametric) to determine their suitability as tools for modeling the response of rice, cassava, maize and beans to variation in climate
2. To Provide the crop sectors in Colombia with scientific evidence of the effect of climate on the crops productivity

3. To identify the combination of factors that lead to high productivities

Deliverables:

Description	Type	Year	Status	Justification
Analytical tools tested for rice, avocado, plaintain, and cassava in Colombia. Scripts used to implement the analytical tools in the software R are available via r-project website.	Tools (i.e. search engines, games, etc)	2014	On going	The process on R has been finished, we are doing the last tests to let available in a website, by the moment have been shared with the partners in workshops or by emails
The platform was co designed with the partners it allows to capture details data on the crop management each user has a profile and can manage and export its own data	Platforms - Data Portals for dissemination	2014	Complete	
Android application that permitted to farmer capture soil and agronomic management information to be load in the platform.	Platforms - Data Portals for dissemination	2014	Complete	
We explore empiricals models which allowed to identify main limiting climatic factors by region	Research report (i.e. workshop report, consultant's report, discussion paper, project report, student thesis, etc.)	2014	Complete	
More than 4 nationwide tours of workshops to empower partners with analyticals tools and approach	Workshop	2014	Complete	

Description	Type	Year	Status	Justification
Two papers, one in rice and the orther in plantain, both are in review process	Research report (i.e. workshop report, consultant's report, discussion paper, project report, student thesis, etc.)	2014	On going	Both papers are being reviewed to complete the publication process

Partners:

1- Federación nacional de arroceros (FEDEARROZ):
   Patricia Guzman <subtecnica@fedearroz.com.co>

2- Ministerio de Agricultura y Desarrollo Rural (MADR):
   Nestor Hernandez <nestor.hernandez@minagricultura.gov.co>

3- Federación Nacional de Cultivadores de Cereales (FENALCE):
   Carlos Molina <cmolina@fenalcecolombia.org>

4- Coorporación CLAYUCA (CLAYUCA):
   Bernardo Ospina <ospina@clayuca.org>

Location(s):

Regions: Latin America (LAM),

Activity 639-2014

Multi-site field evaluation and system integration of Brachiaria grasses and tropical forage legumes for drought and waterlogging

Status	Complete	Milestone	1.1.1 2015 (1)
Start date	2014 Jan	End date	2014 Dec

Description: Tropical forage grasses and legumes grow over a wide range of environmental conditions. As yet, their response to climate change is not well defined. Optimization of forage systems for future use with respect to yield and nutritional quality can therefore not be performed without new experimental evidence. Seasonal drought and waterlogging are dominant features of tropical agroecosystems, and both quantity and quality of forage production can be markedly affected. Tropical grasses and legumes show considerable genotypic differences in drought resistance and forage quality. Multi-site evaluation of brachiariagrasses and legumes with participation of farmers contribute to identification of climate-adapted forage options for integration into crop-livestock systems.

Status: Complete. An interinstitutional and multidisciplinary project was completed in 2014 that contributed to development of a few hybrids of Brachiaria that combine waterlogging tolerance with high forage quality for improving meat and milk production and mitigate the impacts of climate change in the humid areas of Latin America. The results were published in a journal article (Rao et al., 2014). Researchers at the Centro Internacional de Agricultura Tropical (CIAT) have developed a high throughput screening method to evaluate waterlogging tolerance in Brachiaria. Using this method, a set of 71 most promising Brachiaria hybrids (from 5 populations of B. ruziziensis x B. brizantha x B. decumbens) were evaluated for their tolerance to waterlogging. Four hybrids were identified that were superior to the others in their tolerance to waterlogging. The superior performance of these hybrids was based on greater values of green leaf biomass proportion to total leaf biomass, green leaf biomass, green leaf area, leaf chlorophyll content and photosynthetic efficiency, and lower values of dead leaf biomass. Results on adaptive mechanisms of waterlogging tolerance were published in two journal articles (Cardoso et al., 2014a, b). The promising Brachiaria hybrids together with other previously selected hybrids and germplasm accessions were tested under field conditions for their tolerance to waterlogging with participation of National Agricultural Research Institutions and farmers of Colombia, Nicaragua and Panama and two germplasm accessions and two hybrids were identified as promising based on multilocational testing and the seed of these best-bets are being multiplied for scaling up activities in Colombia and Nicaragua. Multi-site field evaluation of forage legumes for their tolerance to drought stress are on-going in Colombia, Nicaragua and Rwanda.

Gender Component: Not defined

Objectives:

1. Waterlogging or drought tolerant Brachiaria grasses and tropical forage legumes tested for their adaptation to livestock production systems in different regions.

Deliverables:

Description	Type	Year	Status	Justification
Five Brachiaria grasses and two herbaceous legumes with greater tolerance to waterlogging and/or drought are avalaible for seed multiplication, data made available to agtrials.org	Data	2014	On going	
Progress report; 1 Journal article.	Peer-reviewed journal articles	2014	On going	
Performance of new Brachiaria grasses and tropical forage legumes at production system level quantified.	Data	2014	On going	
Best-bet Brachiaria grasses and tropical forage legumes inegrated into crop-livestock systems in different regions.	Data	2015	Incomplete	

Partners:

1- Corporación Colombiana de Investigación Agropecuaria (CORPOICA):
   Alvaro Rincon <a.rincon@corpoica.org.co>

Location(s):
Countries: Panama,

Activity 658-2014

Testing the potential of tropical forage options to mitigate climate change through reducing nitrous oxide and methane emissions and enhancing carbon sequestration.

Status	Complete	Milestone	3.3.1 2015 (1)
Start date	2014 Jan	End date	2014 Dec

Description: Livestock sector accounts for 40% of the total value of global agricultural output and provides livelihoods for nearly 1 billion people. Improved tropical forages could offer single most effective means to mitigate climate change from agriculture and change in land use, while also sustainably boosting production of milk and meat as well as crops. Livestock are estimated to be responsible for about half of agriculture's total greenhouse gas emissions. But forages, particularly brachiariagrasses can offset these emissions through diverse mitigation pathways. These include: (i) carbon sequestration in soil through their deep and abundant root systems and enhanced root turnover; and (ii) reduced emissions of nitrous oxide. Brachiariagrasses suppress nitrification in soil through release of biological nitrification inhibitors from roots and this ability is known as biological nitrification inhibition (BNI). These inhibitors have the potential to improve recovery of applied nitrogen to crops (e.g., maize) and reduce nitrous oxide emisions from agropastoral systems.

Status: Complete. Agricultural land use intensification can potentially increase carbon sequestration in the high plains of Eastern Colombia. However, greater intensification depends on economic feasibility and the practicality of land-use change, topics that have not yet been thoroughly investigated. This study used greenhouse gas and opportunity cost estimation tools to evaluate profitability of land-use changes and agricultural practices in the context of their capacity for carbon emissions or sequestration. The study combined field measurements and secondary information on carbon stocks, a 2010 land-use map and projections of future land use changes and economic surveys that calculated profitability of land-use. The results showed that several ongoing land use transitions – from native savanna to improved pastures and tree based systems – lead to carbon sequestration and are profitable for agricultural producers. Under different scenarios of future land use change, higher levels of carbon could be sequestered in the coming decade. While there may be overall increase in carbon sequestration, emissions would also rise from increasing agricultural land use intensification. Emissions in this region could potentially be reduced at a level equivalent to 5% of Colombia's overall emissions from deforestation and land-use change. More research is needed to improve estimates and better understand the economics and finance of emissions policies and programs.

In collaboration with the Humidtropics CRP, as part of an agricultural synergies project funded by NORAD, a food security scenario analysis is conducted with an existing project baseline dataset. In August 2014 a team of CIAT, Rwanda Agricultural Board (RAB) and CIMMYT scientists went on a groundtruthing trip to three different sites in Rwanda. In December, ten RAB scientists were trained in using the GHG spreadsheet model. Aim of the activity is to estimate GHG emissions of pasture

intensification scenarios in Rwanda, and relate this to food security. Food security calculations are currently included in the GHG calculator to analyze these tradeoffs. RAB is assembling data for different farming systems across the country to upscale modeling outcomes. The results are ultimately feeding into NAMA formulation for Rwanda.

Activities on greenhouse gas modeling and tradeoff analysis at farming systems level are in progress in Tanzania and Vietnam.

Gender Component: Not defined

Objectives:

1. To quantify differences among pasture systems (natural grassland, degraded pastures, improved pastures) in carbon sequestration and biological nitrification inhibition and estimate methane emissions for unit livestock product.

Deliverables:

Description	Type	Year	Status	Justification
Carbon sequestration potential of different forage based systems.	Data	2014	On going	
Biological nitrification inhibition potential of different forage based systems.	Data	2015	Incomplete	
NARS researchers in Colombia trained on GHG measurements and estimation of C sequestration.	Capacity	2015	Incomplete	

Partners:

1- Corporación Colombiana de Investigación Agropecuaria (CORPOICA):
   Alvaro rincon <a.rincon@corpoica.org.co>

Location(s):
Countries: Colombia,

Activity 872-2014

Assessing the effects of high temperature (2 C and 4 C above ambient) on soil processes and crop performance using field grown maize and soybean

Status	Complete	Milestone	1.1.3 2014 (1)
Start date	2014 Jan	End date	2014 Dec

Description: Knowledge gaps related to temperature stress effects on seed production due to increasing soil temperature will be evaluated using maize and soybean as test crops. Effect of increase in temperature 2C and 4C above ambient temperature will be evaluated on soil processes and crop growth and yield of three contrasting varieties of maize and soybean under field conditions.

Status: Complete. Three varieties of maize and three varieties of common bean were tested under ambient and 2C and 4C above ambient temperature conditions for crop growth, development and yield. Soil samples were taken and measurements are ongoing. Bean varieties were harvested and maize varieties are at physiological maturity. High temperature effects on grain development were more pronounced with maize than common bean. Improved varieties of common bean performed better at high temperature than the landrace. Results are being analyzed.

Gender Component: Not defined

Objectives:

1. To quantify the effect of increase in ambient temperature to 2C and 4 C on soil processes and crop performance of maize and soybean to provide data input to simulation modeling and scenario analysis

Deliverables:

Description	Type	Year	Status	Justification
Comprehensive analysis of the effect of high temperatures (2 and 4 C above ambient) on soil and crop traits, report, data input to climate change scenario modeling	Data	2014	On going	

Partners:

Partners not defined

Location(s):

Countries: Colombia,

Activity 873-2014

NAMA for fruit sector in for Colombia

Status	On going	Milestone	3.2.2 2014
Start date	2014 Jan	End date	2017 Dec

Description: Technical studies in collaboration with growers' organization to inform National Government and NAMA in Colombia. Studies include identifying suitable areas for the establishment of fruit-based and silvopastoral systems, determining expected productivity levels and cost-efficacy analysis to mitigate climate change across areas with different productivity potential and proximity to markets.

Status: On going. Analysis of barriers to implement two NAMAs in Colombia:
During the present reporting cycle the NAMA barriers analysis and the economic feasibility study led the ministries of Agriculture and Environment to approve a NAMA that will use the inputs of CIAT research in its development in 2016 and 2017. The NAMA is absed on the transformation of degraded pastures into another climate smart land use with mitigation potential: this has been socialized with relevant stake-holders and the primary decision-makers on the topic in the national authorities.The interest of developing a NAMA template has been manifested by the director of climate change, CIAT will work alongside with LEDS Colombia to apply the barriers analysis to inform the template.

Gender Component: Not defined

Objectives:
1. Prioritizing regions were NAMAs could be implemented
2. Gathering information about land tenure, organizational status, infraestructure and security issues for prioritized regions
3. Analyzing information about barriers to NAMA implementation
4. Identifying regional barriers to NAMAs implementation and analizing potential option to overcome them
5. Policy recommendations to overcome barriers to regional level

Deliverables:

Description	Type	Year	Status	Justification
Regional barriers analysis	Peer-reviewed journal articles	2015	Incomplete	
Policy recommendations to NAMA fruits	Peer-reviewed journal articles	2016	Incomplete	
Data about land tenure, organizational status, infraestructure and security issues by region	Data	2014	Complete	
Policy recommendations to second NAMA	Peer-reviewed journal articles	2017	Incomplete	

Partners:

1- Departamento Nacional de Planeación (DNP):
    Silvia Calderon <scalderon@dnp.gov.co>

2- Ministerio de Agricultura y Desarrollo Rural (MADR):
    Nestor Hernandez <nestor.hernandez@minagricultura.gov.co>

3- Ministerio de Ambiente y Desarrollo Sostenible:
    Olga Ospina <olospina@minambiente.gov.co>

Location(s):
Countries: Colombia,

Activity 874-2014

Carbon footprint measurement of oil palm and fruit production in Colombia

Status	Extended	Milestone	3.1.1 2014
Start date	2013 Jan	End date	2014 Jul

Description: This activity is part of an agreement with the Colombian Ministry of Agriculture who requested this study. Also, national oil palm and fruit growers organization are involved in the study since they are collaborating in information collection activities. These analyses are of high interest for national government and growers, since environmental footprint is now a topic discussed in commercial trade meetings.

Status: Extended. This activity was extended until April 2015. Nevertheless, most of carbon footprint estimations are available. Currently, these estimations and calculations are being verified and final reports are under preparation.

The main activities undertaken in 2014 were:

- In situ recognition and understanding of processes involved in the production of biodiesel

- Drawing of a map of processes following the life cycle approach. Map of processes represent the whole production chain of biodiesel, from nursering and plantation to oil refining.

- Creation of templates for data collection. These templates can be further use for future updates of the carbon footprint or for new calculations in other plantations. This include all the inputs and outputs for each specific process in the production chain of biodiesel.

- Estimation of GHG emissions of the different activities included in biodiesel production processes using collected data; Life Cycle Analysis software (i.e. Umberto); and existing literature on GHG emissions default values.

- Identification of critical points across the whole production chain of biodiesel in the emission of GHG. This information is currently being used to discuss likely strategies to reduce GHG emissions from the production of biodiesel in the study site.

- Comparison of carbon footprint estimations with previous estimations conducted in 2011 for the same plantations, and discussion of the implications of having different methodological assumptions in both studies (2011 and 2014's carbon footprint studies).

Gender Component: Not defined

Objectives:

1. To estimate carbon footprint of a ton of oil palm in two plantations in Colombia

Deliverables:

Description	Type	Year	Status	Justification
Report with the estimation of carbon footprint for representative production units of oil palm in Colombia using recognized international standards and primary and secondary information	Research report (i.e. workshop report, consultant's report, discussion paper, project report, student thesis, etc.)	2014	On going	This project had a non-cost extension until April 2015 for completing, verifying and reporting final estimations of the carbon footprint. The extension was approved by the Colombian Ministry of Agriculture due to delays in the signature of the agreement with the respective private company.

Partners:

1- Ministerio de Ambiente y Desarrollo Sostenible:
   Nelson Lozano <nelson.lozano@minagricultura.gov.co>

2- Centro de Investigación en Palma de Aceite (CENIPALMA):
   Elzbieta Bochno <<ebochno@cenipalma.org>>

Location(s):
Countries: Colombia,

Activity 875-2014

Feasibility analysis of fruit trees-based and silvopastoral systems as land use-based mitigation alternatives, in support of a NAMA in Colombia

Status	Cancelled	Milestone	3.2.1 2014 (1)
Start date	2013 Mar	End date	2014 Jul

Description: This activity is part of an agreement with the Colombian Ministry of Agriculture who requested this study. This will be based on market eligibility criteria, measured carbon stocks and GHG emissions compared to bussiness as usual land use scenarios. It is expected that this information will be an input for NAMA formulation. Results will be useful as well to understand what is the feasibility of promoting these productive alternatives via carbon markets.

Status: Cancelled. There was a confusion with this activity, this activity is part of a broader one under flagship 4 supporting NAMA development in Colombia. The activity title is ok but the delivarable is not.
The deliverable of this activity were not a commitment towards 2014. As you can be inform by the o t h e r   C C A F S   p l a t f o r m . (https://activities.ccafs.cgiar.org/ip/planning/projects/activities/activityDeliverables.do?activityID=32 , https://activities.ccafs.cgiar.org/ip/planning/projects/activities/activityDeliverables.do?activityID=31)

Gender Component: Not defined

Objectives:
1. To determine the feasibility and potential of fruit-based and silvopastoral systems to reduce GHG emissions from the agricultural sector in Colombia
2. To provide inputs to the NAMA formulation process in Colombia about feasibility of fruit-based and silvopastoral systems to mitigate GHG emissions from areas currently occupied by livestock systems

Deliverables:

Description	Type	Year	Status	Justification
Report with scope analysis about the potential of fruit trees and silvopastoral systems to participate in NAMA and possibly in carbon markets considering current applicability criteria of standards, and measured carbon stocks and GHG emissions	Peer-reviewed journal articles	2014	On going	

Partners:

1- Ministerio de Agricultura y Desarrollo Rural (MADR):

Nestor Hernandez

2- Centro para la Investigacion en sistemas sostenibles de produccion agropecuaria (CIPAV):

Julian Chara <julian@cipav.org.co>

3- Gestion Ambiental y Servicios Agropecuarios S.A. (GASA):

Nestor Riano <nestormriano@gmail.com>

Location(s):

Countries: Colombia,

Activity 649-2014

Analogue Tool - Continued development of the Climate Analogues R package and online tool

Status	On going	Milestone	1.1.1 2014
Start date	2012 Jan	End date	2014 Dec

Description: The Climate Analogues approach aims to provide tools to educate and empower people in the face of climate change. To achieve this, the Climate Analogues project has defined an approach that takes esoteric climate change predictions and transforms them into field based realities by connecting areas with similar climatic conditions that are separated spatially and/or temporally. Identification of analogue sites provided under the Climate Analogues approach may facilitate the exchange of knowledge and genetic resources between these areas, thus enhancing progressive adaptation to changing climatic conditions.

In 2014 we plan to launch an updated version of the Climate Analogue platform and continue the development of the Climate Analogues R package and online tool, including: incorporating soil data; facilitating the ability to search for temporal analogues; and facilitating improved analogue site identification by allowing the direct extraction and investigation of raw data.

Status: On going. During this year several changes were made to the Analogue Tool (http://www.ccafs-analogues.org/tool/). The first one was the new version of the library in R (Analogues 2.0), which contains changes for using more information (relevant for crops) to calculate the analogues zones, for example infrastructure, population, poverty and also some soil properties. Other important develop during this year is the launch of the desktop version to Analogues Tool (including in the new R library) this version provide the facility to run analogues directly in your computer with a user friendly interactive window and eliminate the dependence of internet connection (that is very important in some countries). Also we implemented new friendly home pages that include information related with the project like workshops, tutorials and news.
On the other hand, the statistics show a total of visits 4,732 that represent an increase of 41% respect to 2013. This reflects the user interest by the tool and the result of the different workshops (Kenya, Tanzania and Peru) and collaborative works (India and Kenya) during the year.
Also during this year it took place a new interchange between farmers in the framework of the project "Farms of the Future" in Kenya. One of the news in this time is the inclusion of socio economic information combined with the climate for identify the analogues areas to Nyando (Kenya). Finally during this year we strengthened the relation with other CCAFS regions, developing a case of study with the Program Leader in South Asia Pramod Aggarwal using climate analogues for find other areas in some Climate Smart Villages to scale different practices and technologies.

Gender Component: Not defined

Objectives:

1. Continual development of the Climate Analogues approach. E.g. in terms of improvements to the underlying statistics, R package, inclusion of the new climatic data CMIP5 (and with higher resolution), development and facilitation of search for temporal analogues, incorporation of soil data, etc.
2. Validation of Climate Analogues methodology.
3. To launch a readily accessible and user friendly online platform to apply the Climate Analogues approach with new sections.
4. Carry out training sessions
5. Development and inclusion of breeding-specific algorithms and metrics

Deliverables:

Description	Type	Year	Status	Justification
Launch of the new and improved Analogue platform including: * New climatic data CMIP5 * New Soil module developed * Option to search for temporal analogues * Improved thresholding techniques and modification of k values to improve quantification of climatic distance and objectivity in the identification of analogue sites.	Platforms - Data Portals for dissemination	2014	On going	Some developments has been satisfactorily made (in the R package), however is needed integrate new climate information (e.g. CMIP5) and the new soil module in the web tool; That's why we consider that is necessary more time in the current year to develop this application. Henceforth, this deliverable will made part of the the Project 2014-101, Activity 2014-358, Deliverable #1.
Development and inclusion of breeding-specific algorithms and metrics	Platforms - Data Portals for dissemination	2014	Complete	
Successful validation of Climate Analogues methodology which will involve assessing the efficacy of Climate Analogues in connecting areas with similar agronomic potential, with soil data included resulting in a publication.	Peer-reviewed journal articles	2014	On going	Some analyzes about the climatic validation has been made, but we need more time for explore the agronomic validation in 2015 and finish the first draft of the publication. We have a new data set for rice in Colombia that will be consider for this validation. Henceforth, this deliverable will made part of the the Project 2014-101, Activity 2014-358, Deliverable #1.
Documentation of changes in the new R library and update of the Google Code	Other	2014	Complete	
Training sessions on the use of the Climate Analogues online tool and R package provided	Workshop	2014	Complete	

Partners:

1- University of Leeds:

   Julian Ramirez <j.r.villegas@cgiar.org>

Location(s):

Global

Activity 919-2014

Development and test DSSAT based cassava model for the globe to assess yield predictions of cassava in a regional scale considering uncertainties under different scenarios of climate change

Status	On going	Milestone	4.2.1 2014 (3)
Start date	2013 Dec	End date	2014 Dec

Description: Report with the results of the cassava model evaluation using datasets from different sites in the World
Document the processes modified and the performance of the model (possible improvement in nutrients routines and photosynthesis in an hourly base)
Initial study with the incorporation of the effect of photoperiod and initial tests about the dry matter content of roots into the cassava model. Those improvements will permit to consider a wide range of conditions to grow cassava including growing cassava under areas with a photoperiod different to the tropics considering a possible increment of area suitable for this crop under climate change.

Status: On going. Due to the limited availability of physiological data of cassava outside of the equatorial regions, it is difficult to build a global model incorporating aspects as the photoperiod. However, we have been concentrating on equatorial conditions using Tony Hunt's code as a starting point, trying to incorporate some of the "lost" GUMCAS features as well as important new aspects. We now have:
• A simple air VPD algorithm that affects radiation use efficiency and transpiration; a module that restricts leaf growth and development according to both assimilate and nitrogen availability;
• A new algorithm for potential leaf size with both thermal and chronological age.
• A new algorithm for leaf appearance with thermal age.
• A new algorithm for node development based on branching levels.

Gender Component: Not defined

Objectives:
1. Evaluate the cassava model using datasets availables from different sites in the World
2. Evaluate the possible improvement in nutrients and photosynthesis routines
3. Incorporation of the effect of photoperiod (possibly necessary to stablish experiments) and initial tests about the dry matter content

Deliverables:

Description	Type	Year	Status	Justification
Report with the results of the cassava model evaluation using datasets from different sites in the World	Peer-reviewed journal articles	2014	On going	The algorithms are currently being incorporated on the code in Fortran-DSSAT. After the incorporation we will be able to do the evaluation.
Document the processes modified and the performance of the model (possible improvement in nutrients routines and photosynthesis in an hourly base)	Peer-reviewed journal articles	2015	Incomplete	
Initial study with the incorporation of the effect of photoperiod and initial tests about the dry matter content of roots into the cassava model.	Peer-reviewed journal articles	2015	Incomplete	
Initial cassava model included in DSSAT 4.6 version	Platforms - Data Portals for dissemination	2014	On going	There were not enough documentation about the processes of the CROPSIM casava model on DSSAT, then, to incorporate changes on the model was necessary to generate an initial description of the code. The algorithms to define the cohorts and their development were already developed and tested on SIMILE. They are currently being incorporated on the DSSAT code.
Document with the description of all the algorithms of CROPSIM-cassava model. It needs additional edition and more physiological explanation for the algorithms.	Research report (i.e. workshop report, consultant's report, discussion paper, project report, student thesis, etc.)	2014	On going	It needs additional edition and more physiological explanation for the algorithms.

Description	Type	Year	Status	Justification
The non-destructive method provides a means of monitoring the development of the cassava crop under a range of biophysical environments without the need to plant trials specifically for this purpose. The plots established or commercial lots can be monitored nondestructively: therefore any parcel can be monitored. The methodology collects data on the development of the cassava crop and can use this data in understanding the development of the crop, and also to generate, validate and improve the robustness of simulation models cassava. This is the first approximation of the methodology; we encourage users to voice any concerns and suggest ways of improving the non-destructive monitoring system.	Non-peer reviewed articles	2014	Complete	

Partners:

1- Washington State University (WSU):
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2- University of Guelph:
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3- Commonwealth Scientific and Industrial Research Organisation (CSIRO):
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4- The Council for Scientific and Industrial Research (CSIR):
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5- Chiang Mai University (CMU):
   ATTACHAI JINTRAWET <attachai.j@cmu.ac.th>

Location(s):
   Global

Activity 452-2014

Intellectual support in gender analysis for Theme 1 and development of guidelines for collecting data and build an evidence base regarding gender and adaptation to climate change.

Status	Complete	Milestone	1.1.2 2014 (2)
Start date	2012 Aug	End date	2014 Dec

Description: The purpose of this agreement is to establish a 3 year strategic research endeavor of University of Florida, to jointly develop and undertake with CIAT and CCAFS, a set of activities aiming to strengthen capacity in gender analysis and research at our respective institutions.

Status: Complete. 2014 was also the final year of the Univ. Florida- CIAT partnership on Intellectual support in gender analysis for Theme 1. This partnership with U. of Florida had the objectives of bridging the gap between research and the implementation of projects and strategies that effectively address gender issues, providing guidance in the implementation of the activities related to the gender strategies and their articulation with strategies and activities of other CRPs; consolidation of a Faculty research Network and research on the identification on how gender differences may influence the innovation strategies to reach intended beneficiary groups. As a result of this collaboration, the CCAFS-LAM gender survey was developed for implementation in the Cauca, Colombia CCAFS site and has also been translated into English and adapted for implementation in Nwoya, Uganda and in Tanzania. Furthermore, the collaboration resulted in several publications and student theses, as well as identifying areas of future collaborations, especially in terms of publications and student projects.

Gender Component: * Support provided in bridging the gap between research and the implementation of projects and strategies that effectively address gender issues.
 *Guidance provided in the implementation of the activities related to the gender strategies and their articulation with strategies and activities of other CRPs.
* Research on the identification on how gender differences may influence the innovation strategies to reach intended beneficiary groups.

Objectives:
1. Provide gender expertise to CIAT and CCAFS on an advisory basis and facilitate greater integration of gender research projects and proposals between CIAT and the University of Florida, focused primarily on climate change but also dealing with other areas requiring gender expertise within the context of CGIAR Research Programs.
2. Identify sex-differentiated vulnerabilities to climate change and then using that information to evaluate adaptation strategies in terms of equality and empowerment of poor women and men farmers.

Deliverables:

Description	Type	Year	Status	Justification
Provide support and guidance in the implementation of CIAT's CRP6 and CRP7 Gender Strategies related activities, their articulation with the CGIARs Gender Strategy and in general seeking to create synergies with other CRPs Gender Strategies. Support the process of strengthening evidence and knowledge to address gender/women's issues in agriculture.	Capacity	2014	Complete	
Annual report	Research report (i.e. workshop report, consultant's report, discussion paper, project report, student thesis, etc.)	2014	Complete	
Provide inputs for incorporating the gender lens in agricultural innovation, to put the needs of rural women at the center of these processes, realize their potential and address issues central to women's concerns.	Research report (i.e. workshop report, consultant's report, discussion paper, project report, student thesis, etc.)	2014	Complete	This deliverable has been replaced with publications (see added deliverables) that explore issues related to rural women and agriculture.

Description	Type	Year	Status	Justification
In collaboration with CIAT, guidelines developed for collecting data and build an evidence base regarding gender and adaptation to climate change. Case study report(s) and Recommendations to policymakers regarding NAPs.	Tools (i.e. search engines, games, etc)	2014	Complete	
Journal article regarding women landowners' participation in agricultural decision-making processes at the household level.	Peer-reviewed journal articles	2014	Complete	

Partners:

1- University of Florida (UF):

Carmen Diana Deere <deere@latam.ufl.edu>

2- Centro Internacional de agricultura Tropical (CIAT):

Jennifer Twyman <j.twyman@cgiar.org>

Location(s):

Global

Activity 925-2014

Climate smart pilots in at least two farmer sites, using seasonal climate and crop forecasts for agricultural risk management in three important crops (maize, rice and beans)

Status	On going	Milestone	2.3.1 2014
Start date	2014 Jan	End date	2014 Dec

Description: Seasonal climate and crop forecasts for agricultural risk management as a starting point to produce seasonal forecasts of crop productivity. Identifying climate variability (temperature, precipitation, etc.) of importance to farmers and its predictability along with the risks and uncertainties associated to have an "tailored agriculture" adding: local knowledge + scientific tools + appropriate policies.

Status: On going. Climate forecasts (1 to 6 months), based on Canonical Correlation Analysis (CCA) using different predictors and as predictand field with 114 meteorological stations, evaluating the degree of correlation of the predictors, helped us to design and implement agro-climatic forecasting tools, which combine seasonal climate forecasts with crop models to provide relevant and reliable information to farmers to support decisions such as: when to plant? when to harvest? which varieties to sow? when and how to implement irrigation systems?. Training tours were conducted in the different municipalities, were trained over 90 technicians (extension services), providing the expertise to analyze climate information for each their zones, to support decision making taking into account data provided by the RClimTool. Participatory workshops to share knowledge and identify adaptation strategies based on agroclimatic forecasts have been carried out in 2014, to which over 120 farmers attended and more than 160 researchers from various institutions (FENALCE, Alianzas Productivas, FEDEARROZ, MADR).

The results demonstrate that use of agro-climatic forecasts based on crop and climate models are a feasible alternative for implementing strategies for farmers in order to adapt to adverse weather conditions, and for use favorable conditions for a best crop performance. The correct use of these tools, together with the constant dialogue with farmers may become an effective mechanism to reduce uncertainty and the level of farmer's vulnerability, from different cultures and socio-economic classes, to future climatic conditions. However, we must recognize that successful implementation of this type of alternative depends on a progressive process of sensitization, learning and adaptation by farmers.

Therefore, "Tailored Agro-Climate Services and food security information for better decision making in Latin America - AGROCLIMAS" –Flagship 2, was satisfactorily approved to start operations in 2015, having gone through the evaluation stages of the 2014 CCAFS call for project proposals. The project clearly includes the needs of the Latin American agricultural sector in terms of agro-climatic information and services in the context of climate variability, and it also evidences the technical capacity to address those needs through the collaboration with strategic partners such as the International Research Institute for Climate and Society (IRI), International Potato canter (CIP),

Bioversity, among others.

Gender Component: Incorporation of local knowledge (gender roles) into the analysis of the participatory AgroClimatic Forecasts ((PACP), acronym in Spanish) through the Climate Field Schools (CFS). http://dapa.ciat.cgiar.org/que-hay-detras-de-los-servicios-de-extension/

Objectives:
1. The use of statistical structure models by CPT allows implement a methodology for climate forecasts in a fast, easy and reliable. The results of these climate predictions will be incorporated in models of rice, maize, potatoes and beans (AquaCrop and DSSAT) to identify adaptive measures.

Deliverables:

Description	Type	Year	Status	Justification
Case studies and testimonials on traditional knowledge systematized and verified, uploaded to the platform AMKN.	Video	2014	On going	Foul include these testimonies (videos and pictures) on the platform AMKN and publish the set of lessons learned from the countries involved
Workshop sharing lessons learned and uncertainties on ethno climatic information system with farming communities in countries of Colombia (CIAT), Peru-Bolivia Altiplano (CIP) and Senegal (CCAFS West Africa).	Workshop	2014	Complete	
Synergies with workshop participant's deliverable (2), meteorological services and other research institutions to enhance or strengthen local predictions to support decision making.	Social media outputs (including web sites, blogs, wikis, linkedin group, facebook, yammer, etc.)	2014	On going	On going in the Flagship 2 project: "Tailored Agro-Climate Services and food security information for better decision making in Latin America - AGROCLIMAS"

Partners:
1- Centro Internacional de la Papa (CIP):
   Roberto Quiroz <r.quiroz@cgiar.org>

2- International Research Institute for Climate and Society (IRI):

Walter E. Baethgen <baethgen@iri.columbia.edu>

3- Agence National de l'Aviation Civile et de la Météorologie (Senegal) (ANACIM):
   Ousmane Ndiaye <ondiaye70@gmail.com>

4- Federación Nacional de Cultivadores de Cereales (FENALCE):
   Carlos Molina <cmolina@fenalcecolombia.org>

5- Federación nacional de arroceros (FEDEARROZ):
   Patricia Guzman <subtecnica@fedearroz.com.co>

6- Fundación Procuenca Río Las Piedras:
   Liliana Recaman <lilianarecaman@yahoo.es>

Location(s):
Countries: Bolivia, Colombia, Peru, Senegal,
Benchmark Site: Kaffrine,

Activity 926-2014

Assess range of CSA practices, including their potential for implementation at the TZ and UG Benchmark sites and clarify their potential impacts on food production, the greenhouse gas balance and resilience of farming systems.

Status	Cancelled	Milestone	1.1.1 2014
Start date	2014 Jan	End date	2016 Dec

Description: Considering the rapid pace of climate change and the threat of its impact on global food security, adaptation and mitigation measures must be put into place with an urgency to match. The "Increasing food security and farming system resilience in East Africa through wide-scale adoption of climate-smart agricultural practices" project proposes to generate a scientific basis for strategic targeting of locally appropriate CSA practices, with an emphasis on system-based technologies for improved land and livestock management and overall increased food security. We aim to facilitate the adoption of CSA practices that enable farmers both adapt to and mitigate the effects of climate change while improving food security. In particular, we aim to identify practices that maximize adaptive capacity, mitigate climate change and increase food security in smallholder agricultural systems, analyze the environmental benefits of these practices using real-time land and soil health survey data and improved crop/climate modeling, discern the social, political, economic and environmental barriers to adoption in East Africa, and implement locally appropriate CSA practices at project sites.

Status: Cancelled. Participatory workshop to prioritize Climate Smart Agriculture practices in Lushoto, Tanzania
were conducted in the CCAFS Climate Smart Village of Lushoto, Tanzania in the West Usambara Mountains in June 2014. Two separate stakeholder workshops were conducted, one with farmers and the other with national and local experts.
The overall objectives were to gather information on the barriers and constraints for climate smart agricultural practices in Lushoto from various stakeholders and select practices for the demonstration plots. Specific objectives of both workshops were: 1) To identify the different agro-ecological zones around Lushoto CCAFS Villages and describe their characteristics; 2) To assimilate information, opinions, and/or concerns regarding CSA practices from farmers and experts; 3) To develop a prioritised list of CSA practices and/or packages for each agro-ecological zone; and 4) To identify current and past demonstration plots of different sustainable land management (SLM), CSA, or other agricultural practices in the region.
Land Health Surveys were also conducted in Lushoto identifying soil organic carbon as a key constraint. Data showed that roughly 50% of the carbon in the soil has been lost due to unsustainable farming systems.
Socio-ecological landscape scale analysis were conducted using including the CCAFS Baseline Household and Village Surveys, IMPACTLite Surveys, Land and Soil Health Biophysical Surveys, as

well as previous initiatives to identify current CSA practices in order to develop locally appropriate CSA practices in Lushoto.

Similar workshops and data analysis were conducted in the Rakai CCAFS Benchmark site.

Gender Component: The target groups include small-scale agricultural farmers, especially women and marginalized groups, national agricultural research systems, policy makers, and climate finance entities. These groups are especially targeted in order to achieve the CCAFS gender IDO: empowerment of women and marginalized groups. Benefits include enhanced food security through wide-scale adoption of locally appropriate climate-smart agricultural practices.

Objectives:

1. Assess range of CSA practices and clarify their potential impacts on food production, the greenhouse gas balance and resilience of farming systems;
2. Conduct spatially explicit monitoring and modeling of land health and agronomic suitability as well multi-dimensional trade-off analysis to identify locally appropriate CSA practices;
3. Implement and appraise the most promising CSA practices at the local level to identify perceived benefits and barriers to adoption;

Deliverables:

Description	Type	Year	Status	Justification
Crop suitability maps using improved climate predictions and crop models for different IPCC scenarios (AR5).	Peer-reviewed journal articles	2014	On going	The manuscript is undergoing peer review. However the research results are being presented at scientific conferences.
Summary of barriers and constraints to CSA adoption from the farmer's perspective, utilizing both quantitative (questionnaire survey) and qualitative (workshops, testimonials) evidence.	Articles for media or news (radio, TV, newspapers, newsletters,etc.)	2015	Incomplete	
Implementation of selected CSA practices at benchmark sites	Other	2016	Incomplete	
Comprehensive assessment of land and soil health, including identification of major constraints to productivity, at project sites	Data	2015	Incomplete	
CIAT led a Rapid Rural Appraisal (RRA), an integrative approach to data collection, in Northern Uganda to guide further research in a bid to improve food security and climate change resilience of small holder farmers; part of a new IFAD funded project*.	Social media outputs (including web sites, blogs, wikis, linkedin group, facebook, yammer, etc.)	2014	Complete	

Description	Type	Year	Status	Justification
The overall project goal is to improve food security and farming system resilience of smallholder mixed crop-livestock farmers in East Africa while mitigating climate change through wide-scale adoption of climate-smart agriculture (CSA). The project integrates interdisciplinary approaches, including participatory research, integrating a meta-analysis of CSA practices, real-time land and soil health assessments, crop suitability modelling, socio-economic appraisals and multi-dimensional trade-off analyses, as well as on-farm participatory evaluations of CSA to identify, test, implement, and outscale locally appropriate CSA practices.	Data	2014	Complete	
The CSA-RA provides an assessment of key barriers and opportunities to CSA adoption across landscapes by collecting gender-disaggregated data, perceptions of climate variability, resource and labour allocation, as well as economic assessments at the household level. This approach combines participatory workshops, expert interviews, household/farmer interviews, and farm transect walks to gather and capture the realities and challenges facing diverse farming communities	Information outputs	2014	Complete	

Partners:

1- Selian Agricultural Research Institute (SARI):

   Charles Lyamchai <• comprehensive assessment of land and soil health, including identification of major constraints to productivity, at project sites>

2- National Agricultural Research Organization (NARO):

3- Ministry of Agriculture, Food and Cooperatives:
   Eliezer Moses <moseseliezer2011@gmail.com>

Location(s):
Benchmark Site: Albertine Rift (Hoima), Usambara (Lushoto),

Regions: East Africa (EA),

Activity 927-2014

Conduct climate change vulnerability analysis and set up CSA R4D engagement platform to inform NAMA and NAP in Uganda and Tanzania and to guide IFAD national investment programs.

Status	On going	Milestone	1.1.1 2014
Start date	2014 Dec	End date	2016 Dec

Description: • Regional and National Learning Platforms already established and coordinated by CCAFS, involving key national policy-makers, NGOs and the research community, will be the medium for the project to respond to and inform current policy priorities and processes in the countries and at regional level, and to connect with the large-scale programs that are out-scaling CSA practices.
• CSA AR4D pathway that directly links the project with the IFAD Country Program Management Teams and their government partners that will implement the forthcoming IFAD loans and ASAP grants in the two countries. Via this collaboration, the project will produce demand-driven knowledge products of direct relevance to the implementation of, and continuous learning within, the IFAD programs at national and regional level.

Status: On going. Through an IFAD grant is CIAT in collaboration with IITA and ICRAF and also aligned to the FP4 EA project and other ongoing CSA work in EA developing tools and approaches to prioritize and evaluate CSA practices. In 2014 we specifically developed and tested a CSA Rapid Appraisal (CSA-RA) tool, the results of the appraisals are informing two large IFAD investment loans, in Uganda the ASAP PRELINOR project and in Tanzania the SAGCOT corridor investments.

Gender Component: The developed CSA-RA is a tool that specifically looks at CSA practices with a gender lens. The CSA-RA delivers insight on access to resources, division of labor and decisions making within the families and specifically among men and women.

Objectives:

1. To upscale and out-scale CSA activities in East Africa through participation in National Learning Platforms and a CSA AR4D pathway, involving strategic policy and development partnerships.

Deliverables:

Description	Type	Year	Status	Justification
Impact pathways for CSA practices, taking into account perceived barriers and incentives for actors along this pathway;	Platforms - Data Portals for dissemination	2015	Incomplete	
Better informed policy and program decisions by government, NGOs and national research communities via the National and Regional Learning Platforms	Capacity	2016	Incomplete	
Demand-driven knowledge products for IFAD programs, particularly their ASAP-financed components	Articles for media or news (radio, TV, newspapers, newsletters ,etc.)	2016	Incomplete	
The CSA-RA provides an assessment of key barriers and opportunities to climate-smart agriculture (CSA) adoption across landscapes by collecting gender-disaggregated data, perceptions of climate variability, resource and labour allocation, as well as economic assessments at the household level. This approach combines participatory workshops, expert interviews, household/farmer interviews, and farm transect walks to gather and capture the realities and challenges facing diverse farming communities.	Research report (i.e. workshop report, consultant's report, discussion paper, project report, student thesis, etc.)	2014	Complete	

Partners:

1- Ministry of Agriculture, Food and Cooperatives:

   Elizabeth Msoka <msokae@yahoo.com>

2- International Fund for Agricultural Development (IFAD):
Stephen Twonmlow <s.twomlow@ifad.org>

Location(s):

Benchmark Site: Nyando (Katuk Odeyo), Albertine Rift (Hoima), Usambara (Lushoto),

Regions: East Africa (EA),

Activity 930-2014

Vulnerability assessment and abiotic constraint identification of 28 globally important crops to provide additional information of traits required to help adapting crops to climate change.

Status	Complete	Milestone	1.1.1 2015 (2)
Start date	2013 Sep	End date	2014 Dec

Description: This work will use the EcoCrop model which will be calibrate both expert knowledge and literature revision. It will use the evaluation of a possible 4 degrees up temperature and its effects in the climate suitability for the different crops.

Status: Complete. The activity was developed in a joint effort with the University of Leeds (Activity number 942-2014). The parameters were defined with the help of experts for each crop. Some crops were evaluated on a regional basis and were defined different parameters according to the varieties for each zone. It would permit to have suitability analysis considering both Global and Regional cultivars. At the end, the parameters for 31 crops were identified as well as 40 set of parameter including regional varieties for some crops.

Gender Component: Not defined

Objectives:
1. To evaluate the abiotic constraints related with the effect of a condition with four degrees up temperature in 28 important crops
2. To conduct an initial vulnerability assessment for those 28 crops

Deliverables:

Description	Type	Year	Status	Justification
One publication in peer reviewed journal summarizing main results.	Peer-reviewed journal articles	2015	Incomplete	
Maps and reports per crop made available in AMKN.	Data	2015	Incomplete	
Reports to inform Millenium Seed Bank, Kew and Global Crop Diversity Trust.	Research report (i.e. workshop report, consultant's report, discussion paper, project report, student thesis, etc.)	2014	Complete	
Spreadsheet with the parameters for the crops evaluated in the study. It also includes the version of the model and the experts that contribute on the definition of those parameters.	Data	2014	Complete	
Tutorial with the steps to run EcoCrop v1.1 using R. It is based on a workshop in Mozambique with the IIAM.	Workshop	2014	Complete	

Partners:

1- Millenium Seed Bank (KEW):

   Ruth Eastwood <r.eastwood@kew.org>

2- Global Crop Diversity Trust:

   Jane Toll <jane.toll@croptrust.org>

Location(s):

 Global

Activity 660-2014

Detailed quality assessment of different AR5 GCMs and RCMs for CCAFS regions, including AMIP5 runs (atmospheric-only runs). Initial pilot study of bias correction for one region (probably South Asia) using a perfect-sibling framework

Status	On going	Milestone	4.2.1 2014 (2)
Start date	2013 Jan	End date	2014 Dec

Description: Future climate projections are critical for projection-based frameworks whereby impact (e.g. Crop, hydrology) models are used to predict future conditions of cropping or livestock systems, or catchments. Such impacts research relies on high resolution climate data to develop such projections. CIAT has long ago recognised the need for spatially downscaled future climate information, and so to date CIAT has provided downscaled climate data of the whole IPCC Fourth Assessment report Global Climate Models. This activity thus consists in the download, processing, downscaling and final online publishing of all AR5 projections. These will include the four RCPs, and as many climate models as possible, for the climate fields of interest (e.g. Precipitation, mean temperature, maximum temperaure, minimum temperature).

Status: On going. A complete set of delta method downscaled IPCC AR5 GCM data for 4 RCP (RCP2.6, 4.5, 6.5 and 8.5), 106 GCM (about 25 models per RCP), 4 future periods, 5 climatological variables and 4 resolutions (the highest at 1 Km2). Documentation about comparison and evaluation of several bias correction/dowscaling methodologies are being carried out and we seeks to have them ready in 2015.

This activity is closely linked with the activity "CCAFS-climate portal" (650-2014).

Gender Component: Not defined

Objectives:
1. Download AR5 data from the Earth System Grid.
2. Process (i.e. Convert and re-grid) the data.
3. Downscale data using delta method.
4. Publish data in the CCAFS-climate data portal (http://www.ccafs-climate.org).
5. Develop analyses of uncertainty in downscaling methods.
6. Quality assessment of different AR5 GCMs and RCMs for CCAFS regions, including AMIP5 runs (atmospheric-only runs(
7. Initial pilot study of bias correction for one region (probably South Asia) using a perfect-sibling framework

Deliverables:

Description	Type	Year	Status	Justification
Downscaled AR5 data fully available in the CCAFS portal.	Data	2014	Complete	
Draft paper on uncertainty in downscaling.	Peer-reviewed journal articles	2014	On going	Some analyzes has been made but there more work in this is needed in 2015 to finish the first draft of the publication. Henceforth, this deliverable will made part of the the Project 2014-101, Activity 2014-358, Deliverable #2.
Draft paper on quality assessment of different AR5 GCMs and RCMs for CCAFS regions	Peer-reviewed journal articles	2015	Incomplete	
Report with the results of pilot study of bias correction for one region (probably South Asia) using a perfect-sibling framework	Peer-reviewed journal articles	2015	Incomplete	

Partners:

1- International Livestock Research Institute (ILRI):
  Jawoo Koo <j.koo@cgiar.org>

2- Centro Internacional de la Papa (CIP):
  Roberto Quiroz <r.quiroz@cgiar.org>

3- Waen Associates:
  Peter Jones <p.jones@cgiar.org>

4- University of Leeds:
  Andy Challinor <a.j.challinor@leeds.ac.uk>

5- International Livestock Research Institute (ILRI):
  Philip Thornton <p.thornton@cgiar.org>

Location(s):
  Global

Activity 932-2014

Detailed study of skill and uncertainty in crop-climate predictions (using AR5 GCMs and including methods for bias-correction/downscaling) and impact assessment on at least 5 crops (maize, soybean and possibly rice, cassava, beans)

Status	On going	Milestone	4.3.3 2014
Start date	2013 Sep	End date	2015 Sep

Description: In addition to maize and soybean, three additional crops will be selected on the basis of their regional importance. These crops may include (but are not restricted to) rice, potato, common bean, wheat, coffee, cassava, and bananas. Regionally minor crops may warrant being included given their importance for local food security. For these crops, one or more crop models (either empirical, process-based, or both) will be used to simulate present-day and future (2030, 2050) mean yields and yield variability.

Crop models will be calibrated using relevant site-specific or regional-scale observations from CIAT DAPA's modeling partners (e.g. EMBRAPA, INTA, INIA Uruguay, CIP, among others) and CIAT's programs trial databases. Among the models to be used, there are those related within the Decision Support System for Agrotechnology Transfer (DSSAT), the Agricultural Production Systems Simulator (APSIM), the General Large Area Model (GLAM) for annual crops, EcoCrop, various niche modeling techniques, among others. Current and future climate simulations will be used to quantify the likely impacts under climate change scenarios.

Status: On going. According to the relevance in LAC, other crops like rice, soybean and potato were selected in addition to maize and dry bean. The 2030s short-term period was considered, which is a very important time scale for decision-making in agriculture. A 4.5 RCP scenario was used.

We first downscaled the raw GCM model output to a 0.5° resolution using nearest neighbor resampling in order to match the spatial resolution of the historical baseline from the WATCH dataset. We then run a calibration approach to correct daily climate model output, in accordance with the observations, for both the present and future periods.

In the next 2 months, the entire process of simulating the impact of climate change on crops will be developed, and the potential impacts analyzed, generally, for the region and its crops. Later, advantage will be taken of various spaces in other CIAT–CCAFS projects and activities to socialize the results on biophysical impacts.

Gender Component: Not defined

Objectives:

1. To collect relevant site-specific or regional-scale observations from CIAT DAPA's modeling partners (e.g. EMBRAPA, INTA, INIA Uruguay, CIP, among others) and CIAT's programs trial

databases.
2. To evaluate skill and uncertainty in crop-climate predictions (using AR5 GCMs and including methods for bias-correction/downscaling) for 5 regionally important crops

Deliverables:

Description	Type	Year	Status	Justification
Report with the results skill and uncertainty in crop-climate predictions f for 5 regionally important crops under future climate scenarios using a variety of crop models.	Research report (i.e. workshop report, consultant's report, discussion paper, project report, student thesis, etc.)	2014	Complete	

Partners:

1- Empresa Brasileira de Pesquisa Agropecuária (EMBRAPA):
Alexandre Heinemann <alexandre.heinemann@embrapa.br>

Location(s):

Regions: Latin America (LAM),

Activity 939-2014

Using present day and future projected agricultural yields and the IMPACT model to predict future market changes for the selected crops. In colaboration with IFPRI.

Status	On going	Milestone	4.3.2 2014
Start date	2010 Jan	End date	2015 Dec

Description: Utilizing biophysical crop modeling (DSSAT) and an economic model that projects the future production, consumption, and trade of key agricultural commodities, the project will assess the effects of climate change, water availability and other major trends, and will make it possible to more effectively evaluate potential research expenditures and their impact on the world's most important crops, forests, and livestock.

Status: On going. The project is divided into three crops, rice, common bean, and cassava. Status will be reported by crop.

Rice: A survey of rice research priorities was conducted for Latin America. We conducted a multi-criteria exercise with members of FLAR. The report of this effort is nearly complete and currently under revision. This work will be presented at the upcoming rice conference in Brazil. We have also begun the process of evaluating what varieties can be used as model inputs. Once this is determined, we will work the crop modeling team to facilitate estimates of production then run the IMPACT model to examine LAC impact of changes in rice technology given climate change.

Beans: A survey of bean research priorities was conducted for LAC and Africa. Report is complete, there will be a published article associated with this effort. Current activities are focused on the process of evaluating what varieties can be used as model inputs. Once this is determined, we will work the crop modeling team to facilitate estimates of production then run the IMPACT model to examine LAC and Africa impact of changes in bean technology given climate change.

Cassava: A survey was implemented to evaluate technologies in cassava, but the results are not suitable for problems currently at hand. We are contributing to the implementation and improvement of the cassava model in DSSAT and then will use this model to investigate the impact of different value chains in systems in Asia, Africa and LAC using IMPACT. Some prior work was published for a side-effort that bridged CCAFS and RTB: http://www.rtb.cgiar.org/category/resources/working-papers/

Gender Component: Research priority setting exercises include questions both regarding the gender of the participant and the potential effects of decision-making regarding potential technologies on gender. For example, in the case of cassava, one possibility is a variety that makes mechanized peeling possible. This has a positive economic impact (enabling greater throughput of product), but a negative gender impact as job of peeling is typically a source of employment for women.

Objectives:

1. To assess plausible future scenarios in agricultural production
2. To propose effective policies and strategic investments based on exante evaluation models

Deliverables:

Description	Type	Year	Status	Justification
Assesment of plausible future scenarios, that include climate change effects, and proposed technologies for adaptation, for Cassava and Beans,	Working Paper	2014	On going	Project was not completed under previous years funding.
Exante economic modeling of the chosen plausible escenarios and impact assessment of the proposed technologies.	Peer-reviewed journal articles	2014	On going	The work was not completed during the previous year of funding.

Partners:

1- International Food Policy Research Institute (IFPRI):
   Sherman Robinson <s.robinson@cgiar.org>

2- Centro Internacional de la Papa (CIP):
   Ulrich Kleinwechter <u.kleinwechter@cgiar.org>

3- International Crops Research Institute for the Semi-Arid Tropics (ICRISAT):
   Swamikannu Nedumaran <s.nedumaran@cgiar.org>

4- International Maize and Wheat Improvement Center (CIMMYT):
   Gbegbelegbe SikA <g.sika@cgiar.org>

5- International Livestock Research Institute (ILRI):
   Dolapo Enahoro <d.enahoro@cgiar.org>

Location(s):
   Global

Activity 647-2014

Develop guidelines for collecting data and build an evidence base regarding gender and adaptation to climate change. This will involve first identifying sex-differentiated vulnerabilities to climate change and then using that information to evaluate adaptation strategies in terms of equality and empowerment of poor women and men farmers.

Status	On going	Milestone	1.1.1 2014
Start date	2013 Jan	End date	2015 Dec

Description: Given the key role women play in agriculture in many places around the globe, it is essential that we include activities that are related to gender and specifically to women. By developing guidelines to collect this type of data in a systematic way we will begin to build an evidence base that we will enable us to identify, develop, and implement technologies (and/or practices) that are gender and socially-responsive. It will also help ensure that we are implementing such practices in a way that is empowering (or at the very least 'does no harm') to women.

Status: On going. Guidelines have been developed in the form of a questionnaire (and manual for its implementation) and are currently being piloted. The idea is to continue working with this questionnaire so that it can be adapted and implemented in various CCAFS sites to better understand important gender relations that impact women's empowerment and adoption by men and women of various adaptation (or CSA) practices. In 2015 we will create databases from at least two sites and begin analysis (in collaboration with other CCAFS activities); in this way we are building an evidence base and will be able to formalize the guidelines in the form of a brief, learning note, or CCAFS working paper.

Gender Component: This project is a gender-specific activity that seeks to develop guidelines for sex-disaggregated data collection related to gender, agriculture, and climate change. Furthermore, we are starting to build the evidence base related to these topics. We expect that such data will inform decision-making and planning processes related to climate change adaptation and mitigation strategies.

Objectives:
1. Assess the gender differentiated impact of new technologies/practices recommended for adaptation to climate change (in case study sites).
2. Identify gender differentiated vulnerabilities to climate change (in the case study sites).
3. Provide gender-sensitive input into the design of adaptation options and strategies.
4. Conduct case studies in at least three sites.
5. Develop guidelines for collecting and analyzing gender data on climate vulnerability and adaptation strategies.

Deliverables:

Description	Type	Year	Status	Justification
Reports and papers focusing on gender differences in vulnerabilities and adaptation to climate change.	Working Paper	2014	Complete	
Case study reports and student theses.	Research report (i.e. workshop report, consultant's report, discussion paper, project report, student thesis, etc.)	2014	Complete	
Collect and analyze quantitative and qualitative data.	Information outputs	2014	Complete	
Invited lecture seminar describing CCAFS work on gender, agriculture and climate change as part of the University of Galway Master's program on Climate Change, Agriculture, and Food Security.	Presentations	2014	Complete	
Develop (i.e. adapt and translate from Spanish) survey questionnaire and collect quantitative data regarding gender, agriculture and climate change.	Tools (i.e. search engines, games, etc)	2014	Complete	
Presentation of women's roles in rice production in Peru. This presentation is the result of collecting sex-disaggregated data about agricultural production and perceptions of climate change. The lessons learned from this experience have been incorporated into the questionnaire design and sampling procedures of other surveys.	Presentations	2014	Complete	

Description	Type	Year	Status	Justification
Two field reports and one manual for collecting qualitative data are included here. These reports were conducted under the IFAD-funded project in East Africa and the gender content was a collaboration between that project and this activity.	Research report (i.e. workshop report, consultant's report, discussion paper, project report, student thesis, etc.)	2014	Complete	

Partners:

1- University of Florida (UF):
   Carmen Diana Deeere <deere@ufl.edu>

2- World Agroforestry Centre (ICRAF):
   Patti Kristjanson <p.kristjanson@cgiar.org>

3- International Food Policy Research Institute (IFPRI):
   Quinn Bernier <q.bernier@cgiar.org>

Location(s):
Countries: Tanzania, Uganda, Ghana, Senegal, Bangladesh, Colombia, Mexico, Nicaragua,
Benchmark Site: Kagera Basin (Rakai), Usambara (Lushoto),

Activity 648-2014

AgTrials- The Global Agricultural Trial database of agricultural technologies

Status	On going	Milestone	1.1.3 2015 (2)
Start date	2012 Jan	End date	2015 Dec

Description: The CCAFS multi-site agricultural trial initiative, started in 2010, builds on the wealth of technology evaluations available for modeling climate change adaptation by standardizing and consolidating data that will be used by the scientific community to build adaptation road maps.The effort has now completed initial development of databases, file repositories, web interfaces, communication protocols and processes for further development of a powerful information resource for the agricultural research community. Project partnerships have been developed to motivate the growth and development of the information resource. Significant advances made with GCP, the Tropical Legumes project, UC-Riverside, Monsanto, AgMips and the CGIAR centers. Efforts at fund raising have been mixed, with good leveraging of co-finance (GCP, Tropical Legumes, etc), but lacking a major grant for future sustainability. Efforts in the next phase of the trials project should focus on technical and process improvements, securing project sustainability, improving partnerships and increasing the number of trials held in the database. In the coming years the Agtrials project should become consolidated and mature leaving a system that is fully ready to be utilized by the international crop improvement community.

Status: On going. The information resource and application has now been transferred to cloud computing technology. A new interfaces been developed by CIMMYT, but it is not yet online. A new project was leveraged from AgTrials, funded by USAID with the objective of building interoperability between the information resource and AGMIP (global climate change modeling initiative). We have some expectations to be able to acquire funds from the CGIAR open access initiative.

Gender Component: Not defined

Objectives:
1. Scale up the AgTrials platform to include tens of thousands of evaluation trials.
2. Create a major transformation of the site with greater usability
3. Continue to strengthen relationships with other partners and other bioinformatics initiatives and systems
   focusing on motivating their further involvement
4. To support the integration of the evaluation data and climate related information resulting from the centers-led CRP7 related activities relevant to Agtrials
5. New analysis, results and publication of studies using data from AgTrials

6. To raise funds for further development

Deliverables:

Description	Type	Year	Status	Justification
Re-configured website (project with CIMMYT)	Platforms - Data Portals for dissemination	2014	On going	This deliverable is largely dependent on the work of CIMMYT. It was not an activity that was fully funded by CCAFS. CCAFS funding only went to CIAT support for this initiative. Therefore we are dependent on the time frame of CIMMYT.
A doubling of the number of agricultural trials in the database, incorporating adding value tools such as the climate analogue, the AMKN platform and the CCAFS data product portal.	Data	2014	On going	This deliverable largely depends on the willingness of our partners to share data within the system. We had expected that CIMMYT was going to make a major push to include data. But for one reason or another that was delayed. But we expect this doubling in 2015.
PhD thesis on climate change and beans: Comprehensive analysis of the international bean trials and their implications for climate change adaptation	Peer-reviewed journal articles	2014	On going	Jagath Shanthalal had an illness in his family and he had to put his thesis work on hold. But it is going forward and is expected to be finished in 2015.
AgTrials overview article in agricultural journal (technical note or something similar)	Peer-reviewed journal articles	2014	On going	We simply overestimated our capacity to put this together this year. We would like to move this deliverable to 2015.
Report on yield gaps of roots tubers and bananas (RTB)	Peer-reviewed journal articles	2014	On going	Parts of the report have been finished but we are still waiting for other parts. Cassava, sweet potato and potato has been completed. We are still waiting on bananas and yam.
Full integration between information systems of AgTrials and AgMIP	Platforms - Data Portals for dissemination	2014	On going	This is something that just needs to go online.

Partners:

1- Agricultural Model Intercomparison and Improvement Project (AgMIP):

Cheryl Porter <cporter@ufl.edu>

2- International Maize and Wheat Improvement Center (CIMMYT):
   Devare, Medha <m.devare@cgiar.org>

3- CRP 3.4 Roots, Tubers, and Bananas:
   Graham Thiele <g.thiele@cgiar.org>

4- Bioversity International (BI):
   Elizabeth Arnaud <e.arnaud@cgiar.org>

5- International Maize and Wheat Improvement Center (CIMMYT):
   Darrell Sison <d.sison@cgiar.org>

Location(s):
  Global

Activity 949-2014

Climate change mitigation potentials of traditional vs. improved agroforestry & silvopastoral smallholder production systems in El Salvador and Nicaragua, and (potentially) in Colombia.

Status	Cancelled	Milestone	1.1.1 2014
Start date	2014 Jan	End date	2014 Dec

Description: The activity will include three related studies, two to be executed in Salvador and Nicaragua and one in Colombia. The objective of these studies is to determine the potential of improved crop and livestock production systems to enhance eco-efficiency of agriculture in Latin America, with emphasize on mitigation of greenhouse gas emissions at production plot and landscape scales. Research will be carried out in two countries of Central America, Nicaragua (Somotillo and San Dionisio) and El Salvador (Chalatenango); and in Colombia (Orinoquia region).

Status: Cancelled. This activity was a 100% bilateral but it was not carried out after all.

Gender Component: Not defined

Objectives:
1. 1. Develop and evaluate improved crop and livestock systems.
2. 2. AssessGHG emissions; determine GHG balances, C footprint and global warming potential of the crop and livestock systems in evaluation; and describe potential tradeoffs between food and feed and the environment.

3. 3. Support (though training) capacity building on methods for GHG emissions monitoring.
4. 4. Develop methods to scale environmentally friendly crop and livestock production systems.

Deliverables:

Description	Type	Year	Status	Justification
GHG footprint and climate change mitigation potential of eco-efficient crop-livestock systems.	Data	2016	Incomplete	
Reports on uptake of eco-efficient production technologies.	Peer-reviewed journal articles	2016	Incomplete	
Peer-reviewed manuscripts for international journals.	Peer-reviewed journal articles	2015	Incomplete	
Presentations at international conferences.	Other	2014	On going	
Policy briefs.	Articles for media or news (radio, TV, newspapers, newsletters ,etc.)	2016	Incomplete	

Partners:

1- Corporación Colombiana de Investigación Agropecuaria (CORPOICA):
   Jose Euripides Baquero <jbaquero@corpoica.org.co>

2- Universidad del Valle (UNIVALLE):

3- Universidad del Cauca (UNICAUCA):

4- Mancomunidad La Montañona:

5- National Agrarian University (UNA):

Location(s):
Countries: Colombia, El Salvador, Nicaragua,

Activity 650-2014

CCAFS-climate portal

Status	On going	Milestone	1.2.1 2015 (1)
Start date	2012 Jan	End date	2014 Dec

Description: The CCAFS-climate portal is timely delivering downscaled climate change datasets to scientists all over the world. Around 1TB data is being downloaded per month. Given the need of updating the portal to make it more user-friendly, and the need of incorporating new climate change data, particularly with the upcoming IPCC 5AR and its related model ensemble (CMIP5), the portal will undergo a massive update in terms of data, and querying capabilities.

Status: On going. Given the importance of the portal for supporting impact and adaptation analyses, various changes have been implemented during the course of 2014 including the implementation of a new friendly search engine, the incorporation of CMIP5 downscaled GCM data and new RCM datasets i.e. data from the Eta model for South America. An improved interface allowing display and query of daily CMIP5 data (mainly oriented to crop modelers) and documentation about comparison and evaluation of several bias correction/dowscaling methodologies are being carried out and we seeks to have them ready in 2015.

Gender Component: Not defined

Objectives:
1. Upgrade the portal to make the data-download more user friendly (inclusion of new search engine, integration with Climate Wizard…)
2. Perform analyses of bias-correction/downscaling, and sensitivities of crop models to these issue.

   .

3. Downscaling of CMIP5 data for all RCPs and the addition of these pathways to the datasets currently provided on the website and provide the results of regional downscaling experiments (i.e. CORDEX), for several regions (including South America, Central America, Africa and others of CCAFS interest).

4. Make the GCMs CMIP5 daily data available in original resolution to extract time series for all RCPs.

Deliverables:

Description	Type	Year	Status	Justification
Improved interface allowing extraction of daily CMIP5 data (in original resolution) and new friendly search engine online	Platforms - Data Portals for disseminati on	2014	Partially complete	An improved user interface that enhances the functionality and visual appeal of the portal was developed. The changes include a friendly new search engine for the easy location of datasets and the option of downloading files by geographic tile rather than the entire globe. It was not possible to develop the interface allowing extraction of daily CMIP5 data in 2014. This part will made in 2015 for the Project 2014-101, Activity 2014-358, Deliverable #3. For more info see the "CCAFS Climate Final Report (2014)" attached.
Data from regional experiments available online for at least two experiemental runs (South America, Central America, Africa or another CCAFS region).	Data	2014	Partially complete	A new dataset from the Eta RCM model for South America was published in the website. The dataset is available for 4 GCM, 2 scenarios (baseline, SRES-A1B), and 4 future periods. Moreover, we got all CORDEX output data for South America, Africa, South Asia, East Asia and others. These were stored in the CIAT-DAPA storage Cluster system, but it was not possible its post-processing and make available in the platform in 2014. It will made in 2015 as part of for the Project 2014-101, Activity 2014-358, Deliverable #3. For more info see the "Data Strategy 2015" documentation attached.
Downscaled CMIP5 data available for all RCPs.	Data	2014	Complete	

Description	Type	Year	Status	Justification
Peer-reviewed article or a short communication describing the database (new downscaled CMIP5 data released)	Peer-reviewed journal articles	2014	On going	Some analyzes has been made but more work in this is needed in 2015 to finish the first draft. Henceforth, this deliverable will made part of the the Project 2014-101, Activity 2014-358, Deliverable #2.
Climate data for crop modelers available for download	Data	2014	On going	This will made part in 2015 of Project 2014-101, Activity 2014-358, Deliverables #2 and #3. See more information in the "CCAFS Climate Final Report (2014)" and the "CCAFS-Climate dataset map" attached.

Partners:

1- International Livestock Research Institute (ILRI):
   Jawoo Koo <j.koo@cgiar.org>

2- Centro Internacional de la Papa (CIP):
   Roberto Quiroz <r.quiroz@cgiar.org>

3- Waen Associates:
   Peter Jones <p.jones@cgiar.org>

4- University of Leeds:
   Andy Challinor <a.j.challinor@leeds.ac.uk>

5- International Livestock Research Institute (ILRI):
   Philip Thornton <p.thornton@cgiar.org>

Location(s):
   Global

2. Succinct summary of activities and deliverables by Output level.

Output: 1.1.1

Summary: The identification of current needs of conservation of the wild relatives of 80 crops was finalized using the gap analysis methodology at the global scale.

Changes made to the Analogue Tool include: New version of the library in R, launch of the desktop version of Analogues Tool and implementation of a user-friendly homepage. The statistics show a total of 4,732 visits that represent an increase of 41% compared to 2013.

In 2014 we have advanced our knowledge on the impacts of climate change on coffee and cocoa and trade-offs in adaptation of theses systems significantly. We have published 5 papers on the subject.

Through an IFAD grant is CIAT in collaboration with IITA and ICRAF and also aligned to the FP4 EA project and other ongoing CSA work in EA developing tools and approaches to prioritize and evaluate CSA practices. In 2014 we specifically developed and tested a CSA Rapid Appraisal (CSA-RA) tool, the results of the appraisals are informing two large IFAD investment loans, in Uganda the ASAP PRELINOR project and in Tanzania the SAGCOT corridor investments. Participatory workshop to prioritize Climate Smart Agriculture practices in Lushoto, Tanzania were conducted in the CCAFS Climate Smart Village.

An inter-institutional and multidisciplinary project was completed in 2014 that contributed to development of a few hybrids of Brachiaria that combine water logging tolerance with high forage quality for improving meat and milk production and mitigate the impacts of climate change in the humid areas of Latin America.

Five varieties of climbing beans in three regions to select material adapted to climate variability and diseases resistance were evaluated. A total of 24 rice genotypes were evaluated during 4 seasons For maize, a phenological and yield report of 3 different sowing seasons and different sites is available for the modelers to use as a database to perform agro climatic forecasting.

Vulnerability assessment and abiotic constraint identification of 31 globally important crops were conducted to provide additional information of traits required to help adapting crops to climate change.

Gender Summary
We developed gender-specific guidelines for sex-disaggregated data collection related to gender, agriculture, and climate change.
In the East African work the target groups include small-scale agricultural farmers, especially women and marginalized groups, national agricultural research systems, policy makers, and climate finance entities. These groups are especially targeted in order to achieve the CCAFS gender IDO:

empowerment of women and marginalized groups. Benefits include enhanced food security through wide-scale adoption of locally appropriate climate-smart agricultural practices

The developed CSA-RA is a tool that specifically looks at CSA practices with a gender lens. The CSA-RA delivers insight on access to resources, division of labor and decisions making within the families and specifically among men and women.

Output: 1.1.2

Summary: This year was the final year of the Univ. Florida- CIAT partnership on Intellectual support in gender analysis for Theme 1. As a result of this collaboration, the CCAFS-LAM gender survey was developed for implementation in the Cauca, Colombia CCAFS site and has also been translated into English and adapted for implementation in Nwoya, Uganda and in Tanzania. Support was provided in bridging the gap between research and the implementation of projects and strategies that effectively address gender issues. Guidance was provided in the implementation of the activities related to the gender strategies and their articulation with strategies and activities of other CRPs. Research was conducted on the identification on how gender differences may influence the innovation strategies to reach intended beneficiary groups. Furthermore, the collaboration resulted in several publications and student theses, as well as identifying areas of future collaborations, especially in terms of publications and student projects.

Output: 1.1.3

Summary: Three varieties of maize and three varieties of common bean were tested under ambient and 2C and 4C above ambient temperature conditions for crop growth, development and yield. The Global Agricultural Trial (AgTrials) database of agricultural technologies information resource and application has now been transferred to cloud computing technology. A new interfaces been developed by CIMMYT, but it is not yet online.

Output: 1.2.1

Summary: Given the importance of the CCAFS-climate portal for supporting impact and adaptation analyses, various changes have been implemented during the course of 2014 including the implementation of a new friendly search engine, the incorporation of CMIP5 downscaled GCM data and new RCM datasets i.e. data from the Eta model for South America. An improved interface allowing display and query of daily CMIP5 data (mainly oriented to crop modelers) and documentation about comparison and evaluation of several bias correction/downscaling methodologies are being carried out and we seeks to have them ready in 2015.

Output: 1.3.2

Summary: In collaboration with IFAD we developed a CSA Rapid Appraisal methodology, we assessed the biophysical impact of climate change through an integrated modeling approach using DSSAT, a climate data set of meteorological daily data, soil data from the Land Degradation Surveillance Framework (LDSF) as well as selected agronomic management methods from survey data of a previous CCAFS project. We developed an interactive platform for monitoring and feedback

loops of participants on CSA practice implementation. We developed a mobile application for the monitoring of demo plot activities in ongoing CIAT led projects and we tested the use of ICT tools in the process of communicating and working with farmers and technicians in the field.

Gender

In the CSA prioritization workshops participating farmers were divided into four groups, based on gender and agro-ecological zones of the study area. The above-mentioned activities are implemented taking into consideration gender dimensions.

Output: 2.3.1

Summary: Climate forecasts (1 to 6 months), based on Canonical Correlation Analysis (CCA) using different predictors and as predictand field with 114 meteorological stations, evaluating the degree of correlation of the predictors, helped us to design and implement agro-climatic forecasting tools, which combine seasonal climate forecasts with crop models, in a Colombian rice, bean and maize growing regions. These tools helped 170 rice producers on 1800 hectares of cultivated area in Montería avoided large economic losses which would had resulted from the intense period of drought in May and the experimental trials were established on June 20, 2014 in Espinal and the results showed that the best variety at field scale was Fedearroz 733 with 6860 kg/ha, higher than Fedearroz 60 which obtained 4600 kg/ha.

Output: 2.3.2

Summary: Analytical methods in Machine learning (Conditional Forest, random Forest and Neural Networks) were tested and validated for maize and rice in order to identify the relevant factors, which explained the yield variability by region. Also a platform and an Android application were developed to ease the data capture and reports.

Output: 3.1.1

Summary: We measured nitrogen fluxes (e.g. N2O emissions using the SAMPLES protocol) together with a range of other agronomic parameters in one of CIAT's long-term trial on Integrated Soil Fertility Management (ISFM) in Western Kenya, and the biophysical modeling of this trial using the CropSyst cropping system simulation software. We also installed chambers and measured GHGs in some selected treatments of two on-farm demonstration trials of best-bet management practices (incl. ISFM) around Babati Tanzania. Results were presented in a special session (led by CIAT) at the 20th World Congress of Soil Science in South Korea in June 2014, and have been summarized in peer-reviewed journal publication. Other activities comprised guest-editing (Sommer, Kihara, Braslow) a Special Issue of Nutrient Cycling in Agroecosystems on "African Eco-Efficient Solutions to Food Insecurity and Climate Change", as well as a one-week training course of national scientists of Tanzania and Malawi in crop modeling (CropSyst) in Arusha in May 2014, and the launching of a "GHG Awareness Day" in Babati to which 24 regional extension workers were in invited.

The carbon foot print measurements of oil palm in Colombia are available and are being verified and final reports prepared. Tasks conducted included: Understanding process of production of biodiesel, data gathering templates developed, estimation of GHG emission, identification of critical points

across the whole production, comparison of carbon footprint estimations with previous estimations conducted in 2011.

Output: 3.2.1

Summary: During the present reporting cycle the NAMA was made visible with the Ministry of Agriculture and the Ministry of Environment, the general barriers analysis and the economic feasibility led the ministries to approve the develop of a NAMA that will use the inputs of this project in his development in 2016 and 2017. A NAMA to transform degraded pastures into other climate smart land uses with mitigation potential have been made shared with relevant stake-holders and the primary decision-makers in the in the national authorities.The interest of developing a NAMA template have been manifest by the director of climate change, we will work alongside with LEDS Colombia in order to use the barriers analysis to inform the template.

Output: 3.2.2

Summary: We have identified suitable areas for the establishment of fruit-based and silvo-pastoral systems, determining expected productivity levels and cost-efficacy analysis to mitigate climate change across areas with different productivity potential and proximity to markets. Infrastructural, organizational, land tenure and social variables were collected to identify barrier for implementing the NAMA.

Output: 3.3.1

Summary: Agricultural land use intensification can potentially increase carbon sequestration in the high plains of Eastern Colombia. We used greenhouse gas and opportunity cost estimation tools to evaluate profitability of land-use changes and agricultural practices in the context of their capacity for carbon emissions or sequestration. Emissions in this region could potentially be reduced at a level equivalent to 5% of Colombia's overall emissions from deforestation and land-use change. Rwanda Agricultural Board (RAB) scientists were trained in using the GHG spreadsheet model to estimate GHG emissions of pasture intensification scenarios in Rwanda, and relate this to food security; the results are ultimately feeding into NAMA formulation for Rwanda. Activities on greenhouse gas modeling and tradeoff analysis at farming systems level are in progress in Tanzania and Vietnam.

Output: 4.2.1

Summary: A complete set of delta method downscaled IPCC AR5 GCM data for 4 RCP, 106 GCM, 4 future periods, 5 climatological variables and 4 resolutions is ready; documentation is still being finalized. Due to the limited availability of physiological data of cassava outside of the equatorial regions, it is difficult to build a global model; therefore we have been concentrating on equatorial conditions.

Output: 4.3.2

Summary: The project is divided into three crops, rice, common bean, and cassava. Rice research priorities for LAM and beans for LAM and Africa were identified and will be presented at crop conference. Current activities are focusing on the process of evaluating what varieties can be used as

model inputs. Once this is determined, we will work with the crop modeling team to facilitate estimates of production and then run the IMPACT model to examine LAM and Africa impact of changes in bean technology given climate change. For cassava we are contributing to the implementation and improvement of the cassava model in DSSAT and will then use this model to quantify the impact of climate change on different value chains in systems in Asia, Africa and LAC using IMPACT.

Output: 4.3.3

Summary: The most important LAM staple crops were selected (rice, soybean, potato maize and dry bean) and 4.5 RCP GCMs and the 2030 time horizon are being used in combination with DSSAT and APSIM to quantify the impact of climate change on these crops. The current predictions have been finalized and the future ones are in process. The results will be shared across LAM through ongoing CCAFS and CIAT projects and published in peer-reviewed publications.

3. Communications.

Media Campaigns:

A story about the UN Big Data Climate Challenge won by CIAT scientists for work on rice in Colombia was promoted by the CGIAR Consortium and CIAT in relation to the CGIAR Development Dialogues event, held alongside the UN Climate Summit in New York City. This resulted in more than 50 hits in print and electronic media, including pieces by Agence France Presse (AFP), The Guardian (UK), and El Espectador (Colombia).

• http://www.efe.com/efe/noticias/english/technology/honors-ciat-project-that-saved-rice-crops-colombia/4/1061/2407261
• http://www.theguardian.com/global-development/2014/sep/30/colombia-rice-growers-climate-change
• http://www.elespectador.com/noticias/economia/cultivos-de-arroz-colombia-prueba-del-cambio-climatico-articulo-519132

PNAS Khoury et al 2014 Received media coverage by: National Geographic Guardian BBC Time Magazine NBC NPR LA Times Reuters Scientific American (over 320 total articles published worldwide)

Blogs:

Communications support for the IDB event on CSA also included this blog post published originally on the IDB partnerships-for-development blog:
http://www.ciatnews.cgiar.org/2014/06/25/a-fight-to-the-finish-against-climate-change/

Communications support for a successful event at World Bank headquarters to launch a set of nine CSA profiles included this blog post:
http://www.ciatnews.cgiar.org/2014/10/30/country-profiles-on-climate-smart-agriculture-well-received-at-the-world-bank/

Series of blog posts by CIAT's Georgina Smith for CCAFS:
http://ccafs.cgiar.org/blog/women-front-line-battling-climate-change
http://ccafs.cgiar.org/blog/photo-story-ground-breaking-women (photo story)
http://ccafs.cgiar.org/blog/down-earth-data
http://ccafs.cgiar.org/blog/elite-rice-combat-flooding-vietnam%E2%80%99s-mekong-delta
http://ccafs.cgiar.org/blog/getting-climate-smart-talk-top-agenda
http://ccafs.cgiar.org/blog/new-study-shreds-light-climate-concerns-mekong-delta
http://ccafs.cgiar.org/blog/tracing-vietnam%E2%80%99s-climate-scars

1. http://blog.agtrials.org/?p=704 AgTrials at GODAN workshop in Wageningen, Netherlands

2. http://blog.agtrials.org/?p=699   Interoperabilidad de datos de ensayos agronómicos entre las plataformas Agtrials y Ag-MIP

3. http://blog.agtrials.org/?p=675 Continued collaboration between AgTrials, CropOntology, AgMIP, CSISA and others

4.Khoury CK (2014) How many crops feed the world? PlantVillage, 9 May 2014. Available online at: https://medium.com/p/b0250e87e0ce

5.Khoury C (2014) Will the pursuit of food security weaken the resilience of global food systems? Agriculture and Ecosystems invited blog for Building Resilience for Food and Nutrition Security IFPRI 2020 Conference, 16 May 2014. Available online at: http://wle.cgiar.org/blogs/2014/05/16/will-pursuit-food-security-weaken-resilience-global-food-systems/

6.http://ccafs.cgiar.org/blog/students-will-become-teachers#.VOXh8fmG--M

7http://dapa.ciat.cgiar.org/farmer-urges-range-of-measures-to-aid-women-battling-climate-change/

Websites:
Crop Wild relatives: http://www.cwrdiversity.org/

Gender:
1. http://ciat.cgiar.org/gender-equity
2. http://ccafs.cgiar.org/blogs/gender-and-equity

Social Media Campaigns:
A story about the UN Big Data Climate Challenge won by CIAT scientists for work on rice in Colombia was promoted by the CGIAR Consortium and CIAT in relation to the CGIAR Development Dialogues event, held alongside the UN Climate Summit in New York City. This resulted in more than 50 hits in print and electronic media, including pieces by Agence France Presse (AFP), The Guardian (UK), and El Espectador (Colombia).

• http://www.efe.com/efe/noticias/english/technology/honors-ciat-project-that-saved-rice-crops-colombia/4/1061/2407261
• http://www.theguardian.com/global-development/2014/sep/30/colombia-rice-growers-climate-change
• http://www.elespectador.com/noticias/economia/cultivos-de-arroz-colombia-prueba-del-cambio-climatico-articulo-519132

PNAS Khoury et al 2014 Received media coverage by: National Geographic Guardian BBC Time Magazine NBC NPR LA Times Reuters Scientific American (over 320 total articles published

worldwide)

Newsletters:

Policy briefs:

Climate-Smart Agriculture Country profiles for LAC

English: https://cgspace.cgiar.org/handle/10568/52993

Spanish: https://cgspace.cgiar.org/handle/10568/52994

Related materials in French prepared for a meeting in Port Au Prince:

• Note d'information

• Messages pour les preneurs de décisions

• Messages pour les bailleurs de fonds

• Messages pour les médias

Mesoamerican coffee: Startegy development for climate change
https://cgspace.cgiar.org/handle/10568/52307

Climate change adaptation in the Andes: what do we not know yet? Identifying and prioritizing knowledge gaps
https://cgspace.cgiar.org/handle/10568/51755

http://ciat.cgiar.org/wp-content/uploads/2014/04/policy_brief16_haiti_coffee_mango_production.pdf

http://ciat.cgiar.org/wp-content/uploads/2014/07/politicas_sintesis15_evaluacion_vulnerabilidad_cambio_climatico_ecuador.pdf

http://ciat.cgiar.org/wp-content/uploads/2014/03/politicas_sintensis14_evaluacion_vulnerabilidad_cambio_climatico_peru.pdf

http://ciat.cgiar.org/wp-content/uploads/2014/03/politicas_sintesis13_evaluacion_vulnerabilidad_region_andina_colombia.pdf

http://ciat.cgiar.org/wp-content/uploads/2014/03/politicas_sintesis13_evaluacion_vulnerabilidad_region_andina_colombia.pdf

Coffee:

• http://ciat.cgiar.org/wp-content/uploads/2014/04/policy_brief16_haiti_coffee_mango_production.pdf

Climate Change vulnerability:

Vulnerabilidad al cambio climático:

- http://ciat.cgiar.org/wp-content/uploads/2014/07/politicas_sintesis15_evaluacion_vulnerabilidad_cambio_climatico_ecuador.pdf
- http://ciat.cgiar.org/wp-content/uploads/2014/03/politicas_sintensis14_evaluacion_vulnerabilidad_cambio_climatico_peru.pdf
- http://ciat.cgiar.org/wp-content/uploads/2014/03/politicas_sintesis13_evaluacion_vulnerabilidad_region_andina_colombia.pdf
http://ciat.cgiar.org/wp-content/uploads/2014/03/politicas_sintesis13_evaluacion_vulnerabilidad_region_andina_colombia.pdf

Events:

Crop Will relatives: https://docs.google.com/document/d/1cXX-GIbS-SgsSx4XBKNvMtzdj1-fI1SsT5pLe5KeV9k/pub

Workshop: Water and Carbon footprint in the Colombian Agriculture. April 29-30,2015. Bogota, Colombia: http://www.aclimatecolombia.org/expertos-en-huella-hidrica-y-huella-de-carbono-se-dan-cita-en-bogota/

Gender:
1. Event on Gender in Climate Change Policy making, 28th of November, Lima, Peru
2.Workshop on the Gender Toolbox, November, Matagalpa, Nicaragua

Videos and other Multimedia:
Videos:
Participatory video: Climate change in Nicaragua
https://cgspace.cgiar.org/handle/10568/56814

Climate-proofing rice farming in Vietnam
https://www.youtube.com/watch?v=okW0tDZlmFM&list=PLydVmaJIkSF53k5PkheLyJRHZIxj8CxvE

Crop Wild relatives: https://www.youtube.com/watch?v=XGUYd1A2wMI

Gender:
1. https://www.youtube.com/watch?v=7v6yiITDr54
2.https://www.youtube.com/watch?v=qHC_1HXIqT0
3.https://www.youtube.com/watch?v=2gKs_q22bHU

Other Communications and Outreach:
http://www.aclimatecolombia.org/download/notasprensa/NotaVanguardiaLiberal160214.pdf

http://www.ciatnews.cgiar.org/wp-content/uploads/2014/02/tierras_ganados_el_tiempo_10_enero.pdf

http://www.elpais.com.co/elpais/valle/noticias/ciat-presentara-ante-bid-estrategia-frente-cambio-climatico

http://www.eluniversal.com.co/economica/colombia-la-vanguardia-mundial-contra-el-cambio-climatico-151088

Crop Wild relatives: Khoury CK, Dempewolf H, and Castañeda Álvarez NP (2014) Wild Relatives. The Scientist. June 2014. Available online at: http://www.the-scientist.com/?articles.view/articleNo/40026/title/Wild-Relatives/

4. Case studies.

Case Study #1
Title: Participatory Agro-Climatic Forecast (PACP)
Author: Diana Carolina Giraldo Mendez
Type: Successful communications; Capacity enhancement; Participatory action research ;

Project Description:

The project "Climate and the Colombian agricultural sector, adaptation for productive sustainability", an agreement between the Ministry of Agriculture and Rural Development (MADR) of Colombia and CIAT, promotes the use of climate forecasts as an alternative for the Colombian agricultural sector to adapt to climatic variability. The methodology applied integrates climate forecasts (six months) with crop models to estimate the potential effects of climate on maize, rice and beans and then defines management and adaptation measures which can enhance productivity in pilot sites.

Crop simulation models are tools to support decision making in agriculture based on mathematical operations that simulate biophysical processes between plants, climate, soil and management. These models allow, for example, to evaluate the response of crops to climate variability and change, define best planting date in each agricultural season, more favorable seeds, and amount of irrigation and fertilizer desirable according to climate conditions. In 2014, trials were established in different parts of the country in associations with actors such as the National Rice Federation (FEDEARROZ) and the National Federation of Cereal and Legumes Growers (FENALCE) who provide necessary information

to fit agricultural simulation models such as as AquaCrop-FAO, and DSSAT system.

For instance, one of the tools developed in the project, RClimTool, is designed to facilitate the statistical analysis of quality control, missing data, homogeneity analysis and calculation of indicators for daily weather series of temperature (max-min) and precipitation. In 2014 the CIAT RClimTool-Fedearroz tour began, with the main objective to provide intensive training in the use and management of RClimTool for the analysis of climatological series. Over 90 technicians of Fedearroz were trained in a two day workshop.

Introduction / objectives:

The main objective of climate predictions and crop models is the provision of useful information to farmers to select best adaptation measures or appropriate management of their crops according to climate scenarios. The joint use of climate forecasts and crop models is a valuable strategy to support the adoption of better agricultural practices, allowing farmers to access information of improved certainty about possible variations in local climate and know how they may affect their crops.

The RClimTool training aimed at providing necessary skills to analyze climate information and support decision making taking into account data provided by the tool.

Project Results:

In Colombia CIAT is developing and implementing these innovative approaches and tools with national stakeholders innovative approaches and tools based on local and scientific information for improving climate risk management in order to strengthen and promote the elaboration of policies and support decision-making in agriculture.

Since 2013 CIAT has been elaborating climate forecasts (1 to 6 months), based on Canonical Correlation Analysis (CCA) using different predictors. This has helped to design and implement seasonal forecasts pilots and consistent adaptive actions involving climate and crop models, providing farmers reliable information through extension services.

Together with local extension services, a newsletter on agro-climatic news considering weather and crop information was developed for three areas.

The free tool RClimTool is one of the tools developed in the project. RClimTool tool has been downloaded 125 times since its launch in March 2014 and has 150 users from all around the world. A survey with training participants shows increased statistical knowledge and skills in handling the tool, with very high evaluation of the training by participants.

Partners:

CCAFS, FEDEARROZ, FENALCE, IDEAM

Links / sources for further information:

www.aclimatecolombia.org

https://www.flickr.com/photos/aclimatecolombia/sets/

http://dapa.ciat.cgiar.org/que-hay-detras-de-los-servicios-de-extension/

http://dapa.ciat.cgiar.org/capacitando-a-los-tecnicos-de-fedearroz-en-rclimtool/

http://www.elnuevodia.com.co/nuevodia/ciudadania/contacto-agropecuario/239972-adaptacion-para-

la-sostenibilidad-productiva-llega-al-tolima

http://dapa.ciat.cgiar.org/cultivando-favorablemente-en-tiempos-de-incertidumbre-climatica-con-apoyo-de-modelos-agroclimaticos/

http://www.fenalce.org/nueva/pg.php?pa=98&d=Pron%F3stico%20Clima

Case Study #2

Title: Workshops to strengthen the negotiation capacity of the UNFCCC COP 20's presidency and Peruvian negotiation team

Author: Augusto Castro

Type: Capacity enhancement; Policy engagement;

Project Description:

The workshop 'In search of consensus: Understanding the underlying factors explaining countries' positions in global climate negotiations related to Reduction of Emissions from Deforestation and Forest Degradation (REDD +); Land Use, Land Use Change and Forestry (LULUCF), and Agriculture, Forestry and Other Land Use (AFOLU)' was held in Lima, Peru, on October 6, 2014. It was developed within the collaboration alliance between the Ministry of Environment of Peru (MINAM) and ONF INTERNATIONAL (ONFI). This alliance aimed to assist the Peruvian Negotiations team during its Presidency of the COP 20, including the Tenth Meeting of the Parties to the Kyoto Protocol - CMP10, held in Lima, December, 2014. This workshop is part of the CCAFS RBM Trial LAM.

Ten participants attended, including officials and representatives of MINAM/ Presidency COP 20, MINAM/ GIZ, MINAM/ National Forest Program for Climate Change Mitigation (PNCB), Conservation International (CI)/ Presidency of COP 20, ONFI and ONF Andina (ONFI branch for the Andean Region, Central America and the Caribbean). Experts from ONFI and ONF Andina were in charge of facilitation and thematic presentations. Inputs to facilitate dialogue between parties and the methodology used to elaborate the document 'In search of consensus: Understanding the underlying factors explaining countries' positions in global climate negotiations' were presented and results discussed. The document presents countries' positions about REDD +, LULUCF and AFOLU and analyzes them in relation to variables that could explain these positions, following Geist and Lambin (2002). Additional discussions related to: the Durban Platform for Enhanced Action (ADP); challenges

and key issues to reach agreements in Lima; progress in the definition of requirements for Intended National Determined Contributions (INDC) and in the process to evaluate them; and the need for a methodology to assess ambition and equity in INDC according to the principle of 'Common but Differentiated Responsibilities' (CBDR&RC).

Introduction / objectives:

The objective of the workshop was to provide negotiators with in-depth knowledge of the different positions of key countries involved in the climate and forests negotiations (i.e. REDD+ , LULUCF, AFOLU). The underlying assumption was that knowing factors explaining positions and how close or how far these positions are would assist Peruvian negotiators in facilitating dialogue between parties. Presentations included: evolution of international climate negotiations; methodology used to analyze the factors that explain positions in climate negotiations; LULUCF - Land Use, Land Use Change and Forestry in negotiations; and the role of the AFOLU sector in the future agreement.

Project Results:

ONF committed to:

(1) scientifically validate results presented during the workshop;

(2) propose a methodology to assess equity and ambition on climate change intended contributions in the contexts of CBDR&RC: examples from the land sector.

Partners:

ONF International, CIAT

Links / sources for further information:

http://onfandina.com/files/BCC_16_ES.pdf

http://www.onfandina.com/noticias/151-la-participacion-de-onf-international-y-onf-andina-en-la-cop20-lima

Case Study #3

Title: Gender Integration Activities for FP4 and at COP
Author: Jennifer Twyman and Tatiana Gumucio
Type: Social differentiation and gender; Policy engagement;

Project Description:

Latin America is at a critical point in time where many governments and well-organized sectors are developing their mitigation and adaptation strategies. The project supports policymakers to assure that gender is being considered in NAMA/NAP and that negotiators are well prepared to represent their countries in the COP. This project has an important opportunity to share and exchange knowledge and learning across LAM as it works in several countries on similar topics, whereas most of the stakeholders usually only interact within their own country. The project aims to influence policy makers to take gender equity concerns explicitly into account when formulating policies and plans. Engaging policy-makers actively in this aspect is an explicit goal of the project.

Introduction / objectives:

The expected outcome from this project is that policymakers and major regional actors involved in agriculture or rural development have increased awareness of the importance of gender to climate change policies and demonstrate willingness to make efforts to incorporate gender into policy

Project Results:

12 representatives of the Ministries of Agriculture and of regional organizations involved in agriculture or rural development in Peru, Colombia, Nicaragua, El Salvador, Guatemala, and Costa Rica expressed interest in incorporating gender in national and local level climate change related policies

through their participation in a 1 day workshop on gender and climate change policy in the context of COP20. This was facilitated through CCAFS LAM. During the workshop, participants received information on gender in the UNFCCC, engaged in exercises to evaluate and improve gender integration in their institution's programs and policies, and exchanged experiences in gender integration. The workshop identified the following next steps: that CCAFS-CIAT Gender support participants with information on useful tools and methods for gender integration and the development of case studies and best practices; that CCAFS-CIAT Gender facilitate additional capacity-building opportunities on gender integration; and that participants constitute a network of information and exchange on gender integration in policy. As a result, we have developed a monthly bulletin for participants on helpful concepts, tools, and methods for gender integration in public policies and programs related to climate change. The bulletin furthermore presents the experiences of 2 countries/past participants, per month, in gender integration; in this way, it aims to collect and share best practices in gender integration in climate change related policies to decision-makers in Latin America.

Partners:
CATIE, IUCN, Equidad de Género (Mexico)

Links / sources for further information:
http://dapa.ciat.cgiar.org/genero-y-cambio-climatico/
http://ccafs.cgiar.org/blog/how-create-climate-change-policies-gender-focus#.VMI5OUeG9vk
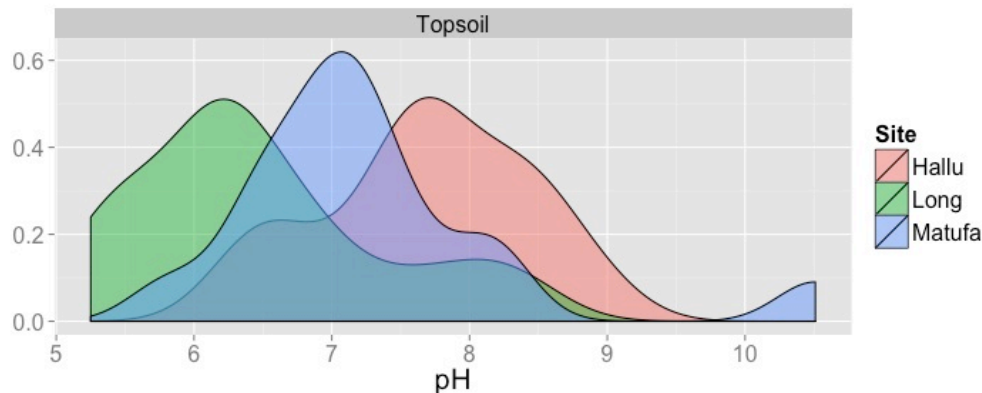https://www.youtube.com/watch?v=2gKs_q22bHU

Case Study #4

Title: Measuring Greenhouse Gases to Assess Eco-efficiency of Farming Systems in Babati, Tanzania
Author: Leigh Winowiecki and Rolf Sommer
Type: Capacity enhancement;

Project Description:

In collaboration with the USAID Africa Rising initiative, CIAT conducted land and soil health assessments across the Babati region, in the rift valley of northern Tanzania in 2014. Biophysical field surveys were conducted using the Land Degradation Surveillance Framework (LDSF). These data were used to identify key soil constraints to agricultural production. Additionally, GHG emissions were measured in selected treatments of on-farm maize-pigeon pea trials in two villages (Seloto and Hallu). Therefore also an automatic weather station was installed in one of these trials. GHG measurements started in January 2014. SARI scientist, George Sayula, was trained in gas sampling based on the standardized (SAMPLES) method developed by CCAFS. Nitrous oxide (N2O), carbon dioxide and methane fluxes were measured eight times during the season.

This project aimed to strengthen the capacity and awareness of agricultural extension workers on the mechanisms and/or practices that can mitigate or adapt to climate change. Therefore opportunities were created to train agriculture extension workers on the measurements of greenhouse gas emission in the ongoing field trials. A training on climate change and agriculture was conducted in Babati district for the Agricultural Extension Workers, initiated by CIAT CCAFS scientists in collaboration with the Africa RISING team. The training was held in Babati 4/4/2014, and was attended by 24 agriculture extension workers and the district agriculture officer of the ministry of agriculture in Babati District.

Introduction / objectives:
The objectives of the project were:
1) Identify soil constraints to farming system.
2) Identify current farming practices and cropping systems in the region.
3) Assess GHG emissions under different cropping systems in Babati district of Tanzania.
4) Enhance the capacity of the extension personnel in Babati district in creating awareness of the effect of climate change to local farmers, indlucing highlighting the relevant information on climate change, including its causes and impacts;

5) Understand the perspectives of extension workers on the use of inorganic and organic fertilizers and their effect on soil health and GHG emissions.

Project Results:

Three LDSF sites were sampled across the region (Hallu, Long, Matufa). Across the three sites, average topsoil OC was 16 g kg-1 and average subsoil OC was 12 g kg-1 (see Figure below). These SOC values indicate that management practices that increase SOC would be beneficial. Though average pH was 7.1 (figure below, the distribution of pH values varied greatly between sites. In fact, soil constraints include areas with high pH in Hallu and clusters in Matufa which also have high salinity, which limits crop production. Cation exchange capacity is an important soil parameter, average cation exchange capacity was 26.7 cmolc kg-1.

Spatial heterogeneity of observed N2O emissions was high and as such significant different differences between treatments or sites could not be observed. As expected, N2O fluxes were highest early in the season, due to start-up application of organic or inorganic sources of N-fertilizer and higher soil moisture content. A second peak of N2O fluxes was observed after top-dressing of urea mid-February. The team is currently looking into funding opportunities for continuing measurements and intensifying sampling intervals.

The GHG Awareness Day was well received by the extension workers and officers. SARI indicated the need to repeat such events and involve further districts in Tanzania, as the Tanzanian government is emphasizing the need for building national capacity on GHG emissions and climate change in general.

Partners:

SARI, CCAFS

Case Study #5

Title: Innovations in knowledge management in agricultural research for development
Author: Knowledge Management Team
Type: Innovative non-research partnerships; Capacity enhancement; Participatory action research ;

Project Description:

Support services for agriculture face major challenges to increase the coverage and efficient response to the needs of farmers. FENALCE (National Federation of Grains and Legumes Producers) and the Knowledge Management (KM) group of CIAT, supported by the Ministry of Agriculture and Rural Development of Colombia (MADR) within the agreement 'Climate and the Colombian agricultural sector: Adaptation for productive sustainability' (Convenio) are conducting participatory research to generate an innovative methodology of exchange between scientists, technicians and farmers and improve climate variability adaptation in agriculture. CIAT has developed a knowledge management methodology (KM) for its programs and projects to design management plans according to their impact pathways. Concepts of Theory of Change (ToC) were applied to identify, design and implement appropriate KM interventions and derive lessons.

In the Convenio, the first to bring together 9 national partners including research centers, associations and NGOs involved in the production of maize, beans, rice, potatoes, fruit and oil palm, the KM component integrates them to generate dissemination, involvement and social construction. It applies participatory planning actions to develop a Theory of Change, its monitoring and evaluation, corporate communication, documentation, and facilitation of capacity building activities. Participatory workshops to share knowledge and identify adaptation strategies based on agroclimatic forecasts have been

carried out in 2014, to which over 120 farmers attended from the municipalities of Cereté, Buga and Espinal, important for the production of maize. A series of exercises was carried out to measure the level of knowledge of participants related to the concepts of forecasts and adaptation measures; to share results in the form of graphs built with the producers to increase ownership; to identify in a participatory way the most appropriate adaptation measures; and at the end of the day, an agroclimatic newsletter which summarized the information discussed during the event was shared.

Introduction / objectives:

While applying ToC to CIAT projects, the KM group ToC for agricultural research for development emerged: desired impacts mainly concern how project implementers interact among them and with next users of innovation systems. The objective of the KM exercise is to involve next users in the research process so that they are more inclined to adopt, adapt, appropriate and promote research results. It also aims to increase the ability to influence policies that favor the adoption of recommendations and research practices. The workshops aim, beyond a simple socialization, to generate knowledge from the discussion between technicians, CIAT researchers and farmers.

Project Results:

To the extent that projects identify their impact pathways using methodologies such as ToC, this generates a reflection that allows to highlight specific contributions of knowledge management, which are adapted to efficiently accompany the process of achieving results and innovation. The community of practice created with this project, which also involves communications specialists from partner organizations, is strengthening the institutional capacity in KM and improves the flow of internal and external knowledge. Partners improve their ability to work with different institutions and strengthen their research capacity. CIAT researchers improve their ability to work between different research groups and do research under an approach oriented to user-needs. Stakeholder groups related to climate change in the country and other interest groups have access to information on activities, lessons learned and results of the project. The transfer of research results to technicians and farmers through participatory workshops facilitates the identification of adaptation measures applicable to the context of each participant, while training facilitates the understanding and adoption of information from agroclimatic forecasts by farmers.

Currently interviews with producers are being conducted in three sites identified by Fenalce (Tolima, Santander and Córdoba) for maize and beans, with 15 producers per area. The surveys explore sources of technical information, reliability of these sources, frequency of access to information, format and means to access it. After completing the process of data collection with producers, the analysis of information will begin in order to deliver to Fenalce a diagnostic study on its current system and to suggest areas and methods to improve it, with specific recommendations on how to integrate results of the MADR-CIAT Agreement within a new extension system.

Partners:

FENALCE, MADR, CCAFS

Links / sources for further information:

http://journal.km4dev.org/index.php/km4dj/article/viewFile/180/273

http://www.aclimatecolombia.org/tras-una-nueva-estrategia-de-asistencia-para-el-agro-colombiano/

http://www.aclimatecolombia.org/agricultores-identifican-medidas-de-adaptacion-partir-de-pronosticos-agroclimaticos/

http://www.aclimatecolombia.org/gira-fedearroz-intercambio-saberes/

http://www.aclimatecolombia.org/diseno-de-intervenciones-de-gestion-de-conocimiento-en-la-investigacion-agricola-para-el-desarrollo/

Case Study #6

Title: Climate-Smart Agriculture Country Profiles for Latin America and the Caribbean

Author: Andrea Nowak, Caitlin Corner-Dolloff

Type: Policy engagement; Food security;

Project Description:

The climate-smart agriculture (CSA) concept reflects an ambition to improve the integration of agriculture development and climate responsiveness. It aims to achieve food security and broader development goals under a changing climate and increasing food demand. CSA country profiles are answer to the need of research that documents where countries are in terms of CSA (more precisely of this integrated approach to sustainable agricultural growth) and what are those enablers that help them move forward into integrating CSA in their policies and actions in the field. Climate experts at CIAT and the Tropical Agricultural Research and Higher Education Center (CATIE) have in fact embarked on the initiative, with support from the World Bank, to develop CSA country profile "knowledge baselines" that assess the current CSA environment in the region. The joint effort responds to a daunting triple challenge: bolstering food security through sustainable increases in

production, while also enhancing agriculture's resilience in the face of climate change and mitigating future impacts through reductions in greenhouse gas emissions. The profiles are meant for decision-makers new to the CSA concept, to those who already invest in CSA and want to see new windows of opportunity and partnerships; and government and donor organizations interested in investing in CSA. The priorities of different countries and stakeholders are reflected to achieve more efficient, effective, and equitable food systems that address challenges in environmental, social, and economic dimensions across productive landscapes.

The product of this partnership consists of seven country profiles and two sub-national ones, prepared with the active participation of government ministries and agencies as well as representatives of the private sector and civil society from Argentina, Colombia, Costa Rica, El Salvador, Grenada, Mexico, and Peru.

Introduction / objectives:

The CSA Country Profiles provide snapshots of a baseline to initiate discussion, both within countries and globally, about entry points for investing in CSA at scale. They help mainstream CSA by raising awareness of its importance among governments and financing institutions, and by identifying specific entry points for action and investment.

The profiles specifically establish a national baseline for CSA, identify ongoing CSA activities (practices, policies, finance) and promising opportunities for scaling out CSA practices, policies, and finance; identify existing barriers and incentives to mainstreaming CSA; and initiate discussion, within countries and globally, about entry points for investing in CSA.

Project Results:

Several points about climate change adaptation and mitigation can be derived from the profiles:

• The threat is large, not uniform, and affects each country differently.

• For this reason and because each country shows particular strengths and weaknesses, CSA offers no one-size-fits-all solutions.

• Examples of effective adaptation and mitigation provide a foundation for building more comprehensive national strategies.

• To capitalize on individual advantages, every country must do more to strengthen its planning and capacity for confronting climate change.

• Countries have much to learn from one another – with respect to specific technologies and financial mechanisms among other areas

The complete set of profiles was presented last October at World Bank headquarters in Washington, D.C. Each profile describes the overall context of agriculture and climate change, surveys climate-smart technologies and practices that have already been adopted, explains the institutions and policies in place to advance these options, assesses opportunities for financing them, and presents case studies on especially promising initiatives. After the presentation, Juergen Voegele, World Bank's senior director for agriculture global practice, stressed the Bank's commitment to climate-smart programs: "You cannot have an agricultural development strategy that ignores climate change." Other participants responded positively to the country profiles as well, emphasizing their value for starting

conversations based on a snapshot of the current situation and for identifying entry points to change with a range of actors, including those who are not agricultural specialists. With exactly this in mind, the World Bank has expressed interest to continue cooperation with CIAT for the preparation of further such studies for other countries in Africa and Asia. Center scientists also aim to incorporate CSA planning into broader discussions centered on landscape and value-chain approaches, using other CSA decision-support tools now being developed.

Partners:
CCAFS, World Bank, CATIE

Links / sources for further information:
http://dapa.ciat.cgiar.org/csa-profiles/
http://ccafs.cgiar.org/research-highlight/new-latin-america-country-profiles-open-pathways-reaching-climate-smart#.VOdaofmG9LE
http://ciatblogs.cgiar.org/support/world-bank-smart-investments-in-triple-win-agriculture/
http://climate-l.iisd.org/news/ciat-catie-produce-lac-climate-smart-agriculture-profiles/

5. Outcomes.

Outcome #1:

Using CIAT science, Colombian government prioritizes NAMA for reconverting pastures into fruit crops (Joint CIAT/FP4LAM)

What is the outcome of the research (i.e. use of research results by non-research partners)?

In 2011/2012 CIAT researchers identified Colombian regions with highest potential for silvo-pastoral systems and improved pastures, and contributed to a WB study on reduction of carbon emissions in Colombia, on which the Colombian LEDS draws largely. The Colombian government used these studies to prioritize one NAMA to reconvert pastures into fruit crops. An outcome validation study also identified potential practice changes as producer associations will measure greenhouse gas emissions, carbon footprints and will recommend changes in cattle production.

What outputs produced in the three preceding years resulted in this outcome?

CIAT-UNDP study shows among other things that the rehabilitation of degraded pastures on 4.4 million ha would reduce 1.4 million tons of CO_2-eq emissions per year while increasing yields. Mitigation measures analysed include silvopastoral and agroforestry systems; use of biofertilizers (symbiotic and asymbiotic nitrogen-fixing bacteria); use of grasses with ability to inhibit nitrification (BNI); and use of chemicals to reduce losses of nitrogen in the soil:

CIAT, & PNUD. (2011). Evaluación de flujos de inversión y financiamiento para acciones de mitigación y adaptación en el Sector Agropecuario

http://dataccafs.ciat.cgiar.org/2014/CIAT/CIAT%20PNUD%202011%20Informe%20Final%20Sept%209%9%20AJUSTADO%20V2.docx

http://www.undpcc.org/docs/Investment%20and%20Financial%20flows/Results%20flyers/Colombia/Colombia_Summary_sp.pdf

WB study with CIAT research on which LEDS is based. CIAT research shows benefits of planting avocado and mango trees in livestock areas. The document also uses CIAT information on costs in the eastern llanos generated under the CIAT-MADR agreement:

World Bank. (2014). Low Carbon Development for Colombia. The World Bank and DNP.

http://intranet.ccafs.cgiar.org/Institutional%20Contact%20Points%20Library/Reviewing%20and%20Reporting/Center%20Technical%20Reports/2014/CIAT/Outcome%20Stories%20Anexes/World%20Bank%202014%20LowCarbonDevelopmentForColombia-04.pdf

Presentations closing event CIAT-MADR convenio:

http://es.slideshare.net/ciatdapa/clima-y-sector-agropecuario-en-colombia-evento-cierre-2014

What partners helped in producing the outcome?

 Universidad Nacional

CIPAV (Foundation for Research on Sustainable Agricultural Production Systems)

Who used the output?

LEDS Colombia, MADR and MADS adopted results of CIAT research to prioritize one NAMA. The World Bank and DNP used CIAT research for the study on impacts of climate change in Colombia, which was adopted by Universidad de Los Andes with MADS and Inter-American Development Bank in the Colombian LEDS.

How was the output used?

Research outputs were used in the Colombian LEDS; in the World Bank study; and by LEDS, MADS and MADR to prioritize the NAMA on reconversion of pastures into fruit.

What is the evidence for this outcome? Specifically, what kind of study was conducted to show the connection between the research and the outcome? Who conducted it?

Colombian LEDS - recommends improved pastures, silvo-pastoral systems and fruit plantations as measures with highest mitigation potential:

UniAndes. (2013). Estrategia colombiana de desarrollo bajo en carbono.

http://dataccafs.ciat.cgiar.org/2014/CIAT/ECDBC%20UANDES.pdf

https://www.minambiente.gov.co/index.php/component/content/article?id=469:plantilla-cambio-climatico-25#documentos

Validation study:

Wilson-Grau, R. 2015. Validation Report – Outcome Stories for CIAT-CCAFS Projects in Colombia during 2014.

http://intranet.ccafs.cgiar.org/Institutional%20Contact%20Points%20Library/Reviewing%20and%20Reporting/Center%20Technical%20Reports/2014/CIAT/Outcome%20Stories%20Anexes/Validation%20Report%20CIAT%20Outcome%20Stories%20A4%20format.pdf

Outcome #2:

Colombian adaptation to CC strategy and National Development Plan 2015-2019 use CIAT/CCAFS science (Joint CIAT/FP4LAM/FP1)

What is the outcome of the research (i.e. use of research results by non-research partners)?

In 2014, CIAT/Theme1 - informed results for a DNP study were used: by MADR and DNP to draft an investment proposal on adaptation and mitigation of climate change for the agricultural sector; by DNP in a strategy for climate-smart agriculture in the National Development Plan 2014-2018; and by DNP along with MADS, IDEAM, and UNGRD - who are the coordinators of the National Adaptation Plan to Climate Change – in the diagnosis and proposals for adaptation in the 2015-2025 strategy.

What outputs produced in the three preceding years resulted in this outcome?

DNP-BID study including CC components (CIAT research results on livestock, water and biodiversity sector) into national economic scenarios that drive policy decisions:

DNP-BID (2014). Impactos Económicos del Cambio Climático en Colombia. Bogotá, Colombia.
https://colaboracion.dnp.gov.co/CDT/Prensa/Impactos%20Econ%C3%B3micos%20del%20Cambio%20Climatico_Sintesis_Resumen%20Ejecutivo.pdf

CIAT modelling for the General Equilibrium Model contributing to DNP study since 2011:
http://dapa.ciat.cgiar.org/dnp-y-ciat/

Methods used in the DNP study:

Ramírez, J. Jarvis, A. (2010). Downscaling Global Circulation Model Outputs: The Delta Method. Decision and Policy Analysis Working Paper No. 1, Decision and Policy Analysis Working Papers, International Center for Tropical Agriculture, CIAT, Colombia. Cali
http://www.ccafs-climate.org/downloads/docs/Downscaling-WP-01.pdf

Ramírez-Villegas, J., Salazar, M., Jarvis, A., Navarro-Racines, C.E. (2012).A way forward on adaptation to climate change in Colombian agriculture: Perspectives towards 2050, Climatic Change 1–18.
http://link.springer.com/article/10.1007%2Fs10584-012-0500-y

Lau, C.; Jarvis, A.; Ramírez, J. 2010. Colombian agriculture: Adapting to climate change. CIAT Policy Brief no. 1. Centro Internacional de Agricultura Tropical (CIAT), Cali, Colombia. 4 p.
http://dapa.ciat.cgiar.org/wp-content/uploads/2014/08/policy_brief1_colombia_climate_change.pdf

What partners helped in producing the outcome?

Universidad Nacional

Who used the output?

National Planning Department (DNP)
Inter-American Development Bank (BID)
Economic Committee for Latin America and the Caribbean (CEPAL)

Ministry of Environment and Sustainable Development (MADS)

Institute of Hydrology, Meteorology, and Environmental Studies of Colombia (IDEAM)

National Disaster Risk Management Unit (UNGRD)

How was the output used?

DNP, BID and CEPAL used research outputs in the Economic Impacts of Climate Change study; DNP and MADR drafted a proposal to invest on adaptation and mitigation and to include a strategy for CSA in the National Development Plan; DNP, IDEAM and UNGRD used them in the national adaptation strategy.

What is the evidence for this outcome? Specifically, what kind of study was conducted to show the connection between the research and the outcome? Who conducted it?

Study on Economic Impacts of Climate Change by DNP:

DNP-BID (2014). Impactos Económicos del Cambio Climático en Colombia. Bogotá, Colombia. http://dataccafs.ciat.cgiar.org/2014/CIAT/DNP_Impactos_economicos_Cambio_climatico.pdf https://colaboracion.dnp.gov.co/CDT/Prensa/Impactos%20Econ%C3%B3micos%20del%20Cambio%20Climatico_Sintesis_Resumen%20Ejecutivo.pdf

Wilson-Grau, R. 2015. Validation Report – Outcome Stories for CIAT-CCAFS Projects in Colombia during 2014.

http://intranet.ccafs.cgiar.org/Institutional%20Contact%20Points%20Library/Reviewing%20and%20Reporting/Center%20Technical%20Reports/2014/CIAT/Outcome%20Stories%20Anexes/Validation%20Report%20CIAT%20Outcome%20Stories%20A4%20format.pdf

Outcome #3:

Colombian rice farmers use CCAFS informed big data analyses and reduce climate related production losses

What is the outcome of the research (i.e. use of research results by non-research partners)?

This is a joint CIAT Theme 1 Outcome, reported under Theme 1

What outputs produced in the three preceding years resulted in this outcome?

This is a joint CIAT Theme 1 Outcome, reported under Theme 1

What partners helped in producing the outcome?

 This is a joint CIAT Theme 1 Outcome, reported under Theme 1

Who used the output?

This is a joint CIAT Theme 1 Outcome, reported under Theme 1

How was the output used?

This is a joint CIAT Theme 1 Outcome, reported under Theme 1

What is the evidence for this outcome? Specifically, what kind of study was conducted to show the connection between the research and the outcome? Who conducted it?

This is a joint CIAT Theme 1 Outcome, reported under Theme 1

Outcome #4:

Theme 1 lead author in IPCC 5th Assessment Report (AR5), and CCAFS research featured prominently.

What is the outcome of the research (i.e. use of research results by non-research partners)?

CCAFS researcher Andy Challinor was the lead author of chapter 7 "Food production and food security" in the IPCC's AR5. The chapter drew heavily from CCAFS research and key figures are included not only in the full length IPCC report but also in the "Summary for Policy Makers," designed explicitly to be available for use by decision makers and non-research stakeholders. The report has far reaching influence on policy makers globally, providing the evidence base for informed decision making.

What outputs produced in the three preceding years resulted in this outcome?

CCAFS publications from 2009-2013 factored prominently into the development of the chapter and were cited a total of 52 times in:

* Schroth et al. (2009)
* Jarvis et al. (2012)
* Ramirez-Villegas et al. (2012)
* Glenn et al. (2013)
* Ramirez-Villegas et al. (2013)
* Vermeulen et al. (2013)

The selection of CCAFS researcher Andy Challinor is a result of his widely recognized expertise and several key high level publications he authored in the past three years including:

* Iizumi et al (2013)
* Asseng et al. (2013)
* Hawkins et al. (2013)
* Vermeulen et al. (2012)
* Ramirez-Villegas & Challinor (2012)
* Thornton et al. (2011)

Challinor et al's article published in Nature in 2014 contains a number of the figures that were used in the production of the AR5 chapter and is in essence a synthesis of the scientific findings of the report.

What partners helped in producing the outcome?

 Chapter co-authors: CSIRO (Mark Howden); Stanford University (David Lobell); INTA (Maria Isabel Travaso); University of Leeds (Andy Challinor and Jim Watson); ILRI (Phillip Thornton); University of Copenhagen (John R. Porter)

Who used the output?

Associated Chambers of Commerce and Industry of India (ASSOCHAM) president and YES BANK

CEO
BioVision
Department For International Development (DFID)
European Union (EU)
Global Climate Adaptation Partnership (GCAP)
Oxfam
SEKEM
United Nations Framework Convention on Climate Change (UNFCCC)
United Nations head
US Senate Budget Committee chairwoman
World Bank vice-president

How was the output used?
Output users, such as EU, Oxfam, IFAD, representatives from the UN, WB, DFID and US Senate Budget Committee, used the chapter to call for increased international cooperation. The Summary for Policymakers was used by others, such as the UNFCCC, to influence adaptation frameworks and toolkits focussing on iterative risk management.

What is the evidence for this outcome? Specifically, what kind of study was conducted to show the connection between the research and the outcome? Who conducted it?
SEE ANNEX: http://dataccafs.ciat.cgiar.org/2014/TL1/Theme_1_2014_Outcome_3_Annexes.docx

7. Outcome indicators.

Outcome Indicator:

One to five flagship technical and/or institutional approaches identified and developed with farmers, key development and funding agencies (national and international), civil society organizations and private sector in three regions, which would directly enhance the adaptive capacity of the farming systems to the climate change conditions

Achievements:

1. CIAT contributed to the development of a new partnership between CCAFS and the AU-NEPAD in support of the NEPAD Vision 25x25 (25 million African farming families practicing CSA by 2025)—the partnership document is yet to be signed, but has high-level support from both NEPAD and CCAFS. Under the umbrella of the NEPAD Vision 25x25, CIAT (along with ICRAF) is representing CCAFS on the steering committee of the NEPAD-iNGO African CSA Alliance to support the scaling of climate-smart agriculture (CSA) to reach 6 million African farming families by 2021. A Climate-Smart Agriculture Prioritization Framework (CSA-PF) that facilitates the identification of Climate-smart agriculture (CSA) investment portfolios, is one of the approaches that CIAT is developing for the Alliance. Furthermore, CIAT is significantly supporting the COMESA-CCAFS led workshops with national level decision-makers to develop CSA country programs in Botswana, Kenya, Namibia, Tanzania, and Uganda.

2. A new project on mainstreaming CSA practices in mixed tree/food crop systems among poor smallholder farmers in West Africa & Latin America focuses on certified supply chains and impact investing by partnering with two major private sector stakeholders: Root Capital and Rainforest Alliance, who leveraged 3.3m USD in matching funds. The project aims to reach 48,426 farmers and 41 farmer associations by 2016 and at least 300,000 farmers and 59 farmer associations by 2018 through training or impact investment vehicles.

3. Taking into account CIAT research results, IFAD Invested about USD 22 Million to strengthen the cocoa and coffee value chains to address the country's vulnerability to climate change in Nicaragua. This resulted in the NICADAPAT project

Evidence:

http://dapa.ciat.cgiar.org/making-smart-decisions-for-a-food-secure-future

http://www.ifad.org/climate/asap/stories/nicaragua.htm

Outcome Indicator:

Breeding strategies of regional and national crop breeding institutions in three target regions are coordinated, informed by CCAFS-led crop modeling approaches that are developed and evaluated for biotic and abiotic constraints for the period 2020 to 2050

Achievements:

An analysis of varieties of climbing beans from the AgTrials database suggests the potential for these

varieties to be more broadly disseminated in sub-Saharan Africa. The analysis looked at the performance of climbing bean varieties at sites in Rwanda and Uganda and then estimated their suitability in other parts of Africa. This result suggests some potential modifications in the crop improvement program in order to realize the potential of these varieties.

Steve Beebe's +3ºC adapted beans. Modelling analyses indicated that the potential impact of heat-tolerant beans would be substantial. CIAT's breeding strategy hence strengthened the focus on heat tolerance. Field trials conducted in Armero (a very warm location where mesoamerican bean cultivation is not possible) revealed encouraging results, with some lines maintaining yields at high temperatures. Greenhouse experiments at CIAT's HQ showed that current genetic variability can protect the bean crop against expected temperature increases up to the year 2080, and possibly permit even broader expansion of bean production areas where production has not been possible in the past...

Evidence:

http://www.ciatnews.cgiar.org/?s=Rambo+root

http://www.ciatnews.cgiar.org/2012/07/03/ciat-rambo-root-cassava-research-featured-in-south-african-press/

Outcome Indicator:

Integrated adaptation strategies for agricultural and food systems inserted into policy and institutional frameworks at regional, national or sub--national level in 2 target regions. Policy makers and key stakeholders use CCAFS research outputs - guidelines, tools and methods-- to support the development of NAPAS, sector specific adaptation plans, or germplasm benefit sharing policies.

Achievements:

CIAT research was adopted by the Colombian government to draft an investment proposal on adaptation and mitigation of climate change for the agricultural sector; in a strategy for climate-smart agriculture in the National Development Plan 2014-2018; and in the diagnosis and proposals for adaptation in the 2015-2025 strategy.

Evidence:

http://intranet.ccafs.cgiar.org/Institutional%20Contact%20Points%20Library/Reviewing%20and%20Reporting/Center%20Technical%20Reports/2014/CIAT/Outcome%20Stories%20Anexes/Validation%20Report%20CIAT%20Outcome%20Stories%20A4%20format.pdf

http://ciat.cgiar.org/dapa-2/logros-y-retos-de-la-agricultura-colombiana-frente-al-cambio-climatico-4

Outcome Indicator:

One to five flagship risk management interventions evaluated and demonstrated by farmers and agencies at benchmark locations in three regions

Achievements:

Participatory workshops to share knowledge and identify adaptation strategies based on agroclimatic

forecasts have been carried out in 2014, to which over 120 farmers attended from the municipalities of Cereté, Buga, Villanueva, Popayan, Villavicencio and Espinal. Dissemination of information for farmers through of newsletter to the maize farmers of 3 zones, a newsletter agro-climatic considering climate and crop information; historical, monitoring the present and giving information relevant to the future with data collected from each zone, about 100000 farmers will be reached by 2023 through the scale out of the approach.

Evidence:

http://www.aclimatecolombia.org/agricultores-identifican-medidas-de-adaptacion-partir-de-pronosticos-agroclimaticos/

http://www.fenalce.org/nueva/pg.php?pa=98&d=Pron%F3stico%20Clima

http://dapa.ciat.cgiar.org/que-hace-el-campesino-ante-eventos-climaticos-resistir-y-mantenerse-en-la-zona/

Outcome Indicator:

National meteorological services and regional climate centers trained and equipped to produce downscaled seasonal forecast products for rural communities in two countries in each of three regions

Achievements:

CIAT researchers developed the free RClimTool. In 2014 the CIAT RClimTool-Fedearroz tour began, with the main objective to provide intensive training in the use and management of RClimTool for the analysis of climatological series. Over 90 technicians of the Colombian National Federeation of Rice Producers (Fedearroz) were trained in a two day workshop.

Evidence:

http://dapa.ciat.cgiar.org/capacitando-a-los-tecnicos-de-fedearroz-en-rclimtool/

Outcome Indicator:

Findings and evaluation tools on mitigation and livelihoods benefits of alternative agricultural development pathways used by global agencies and decision-makers in two countries in each of the three regions

Achievements:

1. The government of Colombia adopted scientific results from CIAT research to draft a NAMA on reconverting pastures to fruit crops. CIAT's suggested intervention area is 395,000 ha until the year 2040 with an estimated potential of net carbon sequestration of 1,900 tons of CO_2-eq per year.

2. CIAT contributed to two NAMA facility submission processes for a Livestock NAMA and a Coffee NAMA. The coffee proposal has been approved and its implementation will start in 2015 (http://www.nama-facility.org/projects/costa-rica.html) the Livestock NAMA has not been approved.

Evidence:

1 .
http://intranet.ccafs.cgiar.org/Institutional%20Contact%20Points%20Library/Reviewing%20and%20Reporting/Center%20Technical%20Reports/2014/CIAT/Outcome%20Stories%20Anexes/Validation%20

Report%20CIAT%20Outcome%20Stories%20A4%20format.pdf

http://ciat.cgiar.org/dapa-2/logros-y-retos-de-la-agricultura-colombiana-frente-al-cambio-climatico-4

2. http://www.nama-facility.org/projects/costa-rica.html

Outcome Indicator:

Decision-makers in three regions better informed re options and policy choices for incentivizing and rewarding smallholders for GHG emission reductions

Achievements:

1. A Capacity building workshop in Central America to pro-poor climate change mitigation: Smallholders trained oncommon understanding of GHG measiremtns and the SAMPLES mesuarement protocol was shared and explained. Measurements will be done by 2015.

2. The government of Colombia adopted scientific results from CIAT research to draft a NAMA on reconverting pastures to fruit crops. CIAT's suggested intervention area is 395,000 ha until the year 2040 with an estimated potential of net carbon sequestration of 1,900 tons of CO_2-eq per year.

Evidence:

1. http://ciatblogs.cgiar.org/suelos/2014/12/22/aprendiendo-sobre-cambio-climatico-y-sistemas-agrosilvopastoriles-en-centroamerica/

2.http://intranet.ccafs.cgiar.org/Institutional%20Contact%20Points%20Library/Reviewing%20and%20Reporting/Center%20Technical%20Reports/2014/CIAT/Outcome%20Stories%20Anexes/Validation%20Report%20CIAT%20Outcome%20Stories%20A4%20format.pdf

http://ciat.cgiar.org/dapa-2/logros-y-retos-de-la-agricultura-colombiana-frente-al-cambio-climatico-4

Outcome Indicator:

Project design and monitoring guidelines for smallholder agriculture in developing countries produced and contributing to global standards

Achievements:

CIAT research was adopted by the Colombian government to draft an investment proposal on adaptation and mitigation of climate change for the agricultural sector; in a strategy for climate-smart agriculture in the National Development Plan 2014-2018; and in the diagnosis and proposals for adaptation in the 2015-2025 strategy.

Evidence:

https://colaboracion.dnp.gov.co/CDT/Prensa/Impactos%20Econ%C3%B3micos%20del%20Cambio%20Climatico_Sintesis_Resumen%20Ejecutivo.pdf

http://intranet.ccafs.cgiar.org/Institutional%20Contact%20Points%20Library/Reviewing%20and%20Reporting/Center%20Technical%20Reports/2014/CIAT/Outcome%20Stories%20Anexes/Validation%20Report%20CIAT%20Outcome%20Stories%20A4%20format.pdf

http://ciat.cgiar.org/dapa-2/logros-y-retos-de-la-agricultura-colombiana-frente-al-cambio-climatico-4

Outcome Indicator:

Agriculture mainstreamed into the global climate change policies, and major international food security initiatives fully incorporate climate change concerns

Achievements:

1. Taking into account CIAT research results, IFAD Invested about USD 22 Million to strengthen the cocoa and coffee value chains to address the country's vulnerability to climate change in Nicaragua. This resulted in the NICADAPAT project.

2. CIAT contributed to the formalization of a new partnership between CCAFS and the AU-NEPAD, AU-NEPAD iNGO African CSA Alliance (ACSAA) to support the scaling of climate-smart agriculture (CSA) to reach 10 MIO farmers by 2020. A Climate-Smart Agriculture Prioritization Framework (CSA-PF) that facilitates the identification of Climate-smart agriculture (CSA) investment portfolios, is one of the approaches that CIAT is developing for the Alliance.

Evidence:

1. http://www.ifad.org/climate/asap/stories/nicaragua.htm
2. http://dapa.ciat.cgiar.org/making-smart-decisions-for-a-food-secure-future/

Outcome Indicator:

Global database and set of tools for climate-smart agriculture established and used by key international and regional agencies

Achievements:

1. CIAT continued the development and strengthening of databases and tools for climate-smart-agriculture, namely, CCAFS-Climate and AgTrials. This included improvements on the capacity to store data, validation and documentation of methodologies as well as technical improvements on the web technologies and hence on the usability of the portals.

CCAFS-Climate: The portal is timely in delivering downscaled climate change datasets to users, both scientists and non-scientists, all over the world. In particular, CCAFS-Climate is having significant impact by putting high resolution climate change information into the hands of non-climate scientists and next users which represent up to 19% of all CCAFS-Climate users (NGOs, non-research international/national organizations, donors and governmental institutions). The portal has successfully moved beyond its immediate sphere of influence and now has a broad, multidisciplinary and global user base that employs the data to support impact and adaptation analyses.

2. Climate experts at CIAT and the Tropical Agricultural Research and Higher Education Center (CATIE), with support from the World Bank, developed CSA profiles for countries of the Latin American region (Argentina Colombia Costa Rica México (+ 2 subnational Profiles for Sinaloa and Chiapas) El Salvador Granada Perú). At the end of 2014, the World Bank has asked CIAT to prepare more country profiles with selected countries of sub-Saharan Africa and Asia.

3. CIAT and CCAFS have created a Climate-Smart Agriculture Prioritization Framework (CSA-PF) that facilitates the identification of Climate-smart agriculture (CSA) investment portfolios. The framework is currently being used by national government actors in Guatemala and by a national stakeholder platform in Mali. Five pilots are planned for 2015 in Africa and Asia, in collaboration with the Africa CSA Alliance, USAID, and various country partners, and with a community-level organization in Colombia.

Evidence:

1. List of papers citing CCAFS-Climate: https://scholar.google.com.co/scholar?hl=en&as_sdt=2005&cites=826545555842834771,9170887996669754539,3983360470989514394&scipsc=&q=&scisbd=1

For metrics on the use of portal by non-research partners contact Carlos Navarro (c.e.navarro@cgiar.org) as these can only be accessed through a CIAT internal database.

2. http://www.ciatnews.cgiar.org/2014/10/30/country-profiles-on-climate-smart-agriculture-well-received-at-the-world-bank/

http://climate-l.iisd.org/news/ciat-catie-produce-lac-climate-smart-agriculture-profiles/

3. http://dapa.ciat.cgiar.org/making-smart-decisions-for-a-food-secure-future/

Outcome Indicator:

New knowledge on how alternative policy and program options impact agriculture and food security under climate change incorporated into strategy development by at least 3 national agencies, and 3 key international and regional agencies

Achievements:

1. CIAT research was adopted by the Colombian government to draft an investment proposal on adaptation and mitigation of climate change for the agricultural sector; in a strategy for climate-smart agriculture in the National Development Plan 2014-2018; and in the diagnosis and proposals for adaptation in the 2015-2025 strategy.

2. The government of Colombia adopted scientific results from CIAT research to draft a NAMA on reconverting pastures to fruit crops. CIAT's suggested intervention area is 395,000 ha until the year 2040 with an estimated potential of net carbon sequestration of 1,900 tons of CO_2-eq per year.

3. 2. CIAT contributed to two NAMA facility submission processes for a Livestock NAMA and a Coffee NAMA. The coffee proposal has been approved and its implementation will start in 2015 (http://www.nama-facility.org/projects/costa-rica.html) the Livestock NAMA has not been approved.

Evidence:

1. https://colaboracion.dnp.gov.co/CDT/Prensa/Impactos%20Econ%C3%B3micos%20del%20Cambio%

20Climatico_Sintesis_Resumen%20Ejecutivo.pdf

http://intranet.ccafs.cgiar.org/Institutional%20Contact%20Points%20Library/Reviewing%20and%20Reporting/Center%20Technical%20Reports/2014/CIAT/Outcome%20Stories%20Anexes/Validation%20Report%20CIAT%20Outcome%20Stories%20A4%20format.pdf

http://ciat.cgiar.org/dapa-2/logros-y-retos-de-la-agricultura-colombiana-frente-al-cambio-climatico-4

2. UniAndes. (2013). Estrategia colombiana de desarrollo bajo en carbono.

http://dataccafs.ciat.cgiar.org/2014/CIAT/ECDBC%20UANDES.pdf

http://intranet.ccafs.cgiar.org/Institutional%20Contact%20Points%20Library/Reviewing%20and%20Reporting/Center%20Technical%20Reports/2014/CIAT/Outcome%20Stories%20Anexes/Validation%20Report%20CIAT%20Outcome%20Stories%20A4%20format.pdf

3. http://www.nama-facility.org/projects/costa-rica.html

8. Leveraged funds.

Leveraged funds #1

Title:

Adapting to Changing Markets and the Effects of Climate Change Project (NICADAPTA)

http://www.ifad.org/climate/asap/stories/nicaragua.htm

Partner Name: Government of Nicaragua

Budget: $22,000,000.00

Theme :1

Leveraged funds #2

Title:

Costa Rica Low Carbon Coffee NAMA

http://www.nama-facility.org/projects/costa-rica.html

Partner Name: Ministerio de Agricultura (MAG) Costa Rica

Budget: $7,000,000.00

Theme :3

9. Publications.

Publication #1:
Patrimonial Violence: A study of women's property rights in Ecuador

Citation:

Deere, Carmen Diana, Jacqueline Contreras, and Jennifer Twyman. 2014. "Patrimonial Violence: A Study of Women's Property Rights in Ecuador." Latin American Perspectives, 41: 143 – 165.

Identifier	CCAFS Themes	Type	Access
10.1177/0094582X13492133	Not defined	Non-peer reviewed articles	Limited

Publication #2:
Genero, estado civil y la acumulacion de activos en Ecuador: una mirada a la violencia patrimonial

Citation:

Deere, Carmen Diana and Jennifer Twyman. 2014. "Quien toma las decisions agricolas? Mujeres propietarias en el Ecuador. Who makes agricultural decisions? Women Landowners in Ecuador." Agricultura, Sociedad y Desarrollo, 11(3): 425-440.

Identifier	CCAFS Themes	Type	Access
1390-5708	Not defined	Peer-reviewed journal articles	Green

Publication #3:
Climate friendliness of cocoa agroforests is compatible with productivity increase

Citation:

The citation is not defined yet.

Identifier	CCAFS Themes	Type	Access
DOI 10.1007/s11027-014-9570-7	Theme 4.1,	Peer-reviewed journal articles	Gold

Publication #4:

Carbon footprints and carbon stocks reveal climate-friendly coffee production

Citation:

The citation is not defined yet.

Identifier	CCAFS Themes	Type	Access
10.1007/s13593-014-0223-8	Theme 4.2,	Peer-reviewed journal articles	Limited

Publication #5:

Winner or loser of climate change? A modeling study of current and future climatic suitability of Arabica coffee in Indonesia

Citation:

The citation is not defined yet.

Identifier	CCAFS Themes	Type	Access
10.1007/s10113-014-0713-x	Not defined	Peer-reviewed journal articles	Gold

Publication #6:

Historical climate trends, deforestation, and maize and bean yields in Nicaragua

Citation:

The citation is not defined yet.

Identifier	CCAFS Themes	Type	Access
doi:10.1016/j.agrformet.2014.10.002	Not defined	Peer-reviewed journal articles	Gold

Publication #7:

Recommendations for the Regionalizing of Coffee Cultivation in Colombia: A Methodological Proposal Based on Agro-Climatic Indices

Citation:

The citation is not defined yet.

Identifier	CCAFS Themes	Type	Access
DOI: 10.1371/journal.pone.0113510	Not defined	Peer-reviewed journal articles	Limited

Publication #8:

Using species distributions models for designing conservation strategies of Tropical Andean biodiversity under climate change

Citation:

The citation is not defined yet.

Identifier	CCAFS Themes	Type	Access
doi:10.1016/j.jnc.2014.03.007	Not defined	Peer-reviewed journal articles	Limited

Publication #9:

Climate adaptation imperatives: Cuntapped global maize yield opportunities

Citation:

The citation is not defined yet.

Identifier	CCAFS Themes	Type	Access
DOI:10.1080/14735903.2013.867694	Not defined	Peer-reviewed journal articles	Gold