2012 Technical Report per Activity

Each Program Participant must provide a small remark against each activity/deliverable to indicate the status of the activity (2-4 sentences required per activity) using the form below. Updated data from the current partners is also required.

CCAFS Center Led Activities
IITA - International Institute of Tropical Agriculture

Activity No. 141

Activity title	Develop new germplasm catalogues on existing and released cassava germplasm			
CCAFS Objective *(select from drop list)*	1.1 Adapted farming systems	**CCAFS Milestone No.** *(select from drop list / for further details go to CCAFS 2012 - 2015 LOGFRAME sheet)*	1.1.2 2013 (1)	
Activity objectives *(what the activity aims to achieve)* — **Objective 1**	This activity aims to (i) provide cassava end-users with an overview of cassava germplasm traits in terms of yields, pest and disease resistance traits, and adaptation potential to cope with environmental stresses (e.g. drought), (ii) to provide insight into the eco-physiological diversity of cassava germplasm for national (breeding) cassava programs, and (iii) to function as a parameter basis for cassava suitability modeling/mapping for current and future climates			
Activity status	Partially completed			
Insert a small remark to indicate the status of the activity. *(2-4 sentences required per activity)*	1. Agtrials global trial repository -> over 150 on-station and on-farm cassava trials uploaded. 2. Genetic Gain catalogue now has >500 varieties developed by IITA (available on cassavabase.org). 3. GxE interaction trials from 12 locations in Nigeria will be made available online through agtrials.org and cassavabase.org 4. Started a series of trials in Tanzania (Drs. Abass and Kanju) to explore if the bitterness and cyanide content of cassava is related to weather – trials installed at 5 sites from 173m to 1065m above sea level and using up to 4 varieties. Besides measurements, they also assess farmer perception. 5. Yam lines tested with particular emphasis on moisture stress screening. A germplasm catalogue is being developed and ECOCROP parameters are collected. Trial data was uploaded to Agtrials. Outlook is to include yam in DSSAT model.			

Deliverables status *(You may add any unexpected deliverable)*

Type	Description	Year	Status	Format
Data	Cassava databases uploaded to Agtrials and Catalogue started with mapping of current and future suitability of IITA-released varieties using GxE analysis and climate change predictions	2012	Partially completed	Database (*.sql, *.mdb, etc)
Model tools and software	Data is being collected for the development and calibration of a yam model in DSSAT. The work will be linked to ECOCROP and Agtrial	2014	Uncompleted	Database (*.sql, *.mdb, etc)

Current Partners

	Acronym	Name	Contact Point Full Name	Contact Point Email
CG - CGIAR Center	CIAT	International Center for Tropical Agriculture	Glenn Hyman	g.hyman@cgiar.org

Activity No. 142

Activity title	Assess risks and test strategies for adaptation to significant crop biotic threats due to climate change			
CCAFS Objective *(select from drop list)*	1.2 Breeding strategies	**CCAFS Milestone No.** *(select from drop list / for further details go to CCAFS 2012 - 2015 LOGFRAME sheet)*	1.2.1 2013 (2)	
Activity objectives *(what the activity aims to achieve)* — **Objective 1**				
Activity status	Partially completed			
Insert a small remark to indicate the status of the activity. *(2-4 sentences required per activity)*	IITA entomologists and phytopatholists are working on characterizing, understanding, and modeling major pest and disease vectors and their relationship with climate change and variability. The following pests/vectors and their natural enemies are studied: Dr. R. Hanna: Cassava mealybug, Banana aphid, Dr. D. Coyne: Root nematodes, Dr. Manu Tamo: Cowpea pod borer (Maruca Vitrata), Dr. J. Legg: whiteflies., Dr. L. Jassogne: coffee pest and diseases, Dr. P. van Asten: highland banana pests. Modeling efforts are in collaboration with CIP – workshops and meetings were organized to discuss modeling approaches and progress. Manuscripts for publication were drafted for some pest/vectors already.			

Deliverables status *(You may add any unexpected deliverable)*

Type	Description	Year	Status	Format
Reports, publications	Report on ranking of importance of biotic stresses in cassava and banana, with quantitative sensitivity analysis and priority setting for monintoring and adaptation	2013	Partially completed	Document (*.doc, *.odt, *.pdf)

Current Partners	ARI - Advanced Research Institution	**Acronym**	**Name**	
		ICIPE	African Insect Science for Food and Health	
		Contact Point Full Name	**Contact Point Email**	
		Komi Fiaboe	k.fiaboe@icipe.org	
	CG - CGIAR Center	**Acronym**	**Name**	
		CIP	Centro Internacional de la Papa	
		Contact Point Full Name	**Contact Point Email**	
		Kroschel, Jurgen	J.KROSCHEL@CGIAR.ORG	
	CRP - Challenge Research Program	**Acronym**	**Name**	
		SP-IPM	CGIAR Systemwide Program on Integrated Pest Management	
		Contact Point Full Name	**Contact Point Email**	
		Hoeschle-Zeledon, Irmgard	I.Hoeschle-Zeledon@cgiar.org	
	GO - Government office/department	**Acronym**	**Name**	
		BMZ	Bundesministerium für wirtschaftliche Zusammen-arbeit und Entwicklung	
		Contact Point Full Name	**Contact Point Email**	
		Joerg Lohmann	joerg.lohmann@giz.de	
	Donors - Donors	**Acronym**	**Name**	
			McKnight Foundation	
		Contact Point Full Name	**Contact Point Email**	
		Ibrahim Baoua, INRAN Niger		
	ARI - Advanced Research Institution	**Acronym**	**Name**	
		DGP-CRSP	Dry Grain Pulses Collaborative Research Support Program	
		Contact Point Full Name	**Contact Point Email**	
		Barry Pittendrigh		
	AI - Academic Institution	**Acronym**	**Name**	
		U-ILLINOIS	University of Illinois	
		Contact Point Full Name	**Contact Point Email**	
		Barry Pittendrigh		

2012 Technical Report per Activity

Each Program Participant must provide a small remark against each activity/deliverable to indicate the status of the activity (2-4 sentences required per activity) using the form below. Updated data from the current partners is also required.

CCAFS Center Led Activities
IITA - International Institute of Tropical Agriculture

Activity No. 143

Activity title	Develop new knowledge and tools to assess potential emission reductions from various crop systems and technology options to improve productivity and enhance food security			
CCAFS Objective *(select from drop list)*	3.1 Inform decision makers about the impacts of alternative agricultural development pathways	**CCAFS Milestone No.** *(select from drop list / for further details go to CCAFS 2012 - 2015 LOGFRAME sheet)*	3.1.1 2012	
Activity objectives *(what the activity aims to achieve)*	**Objective 1**	This activity aims to generate knowledge that people in the private and public sector can use to understand the carbon footprint of various technology/management options. This can help setup an incentive structure that may encourage behaviour that reduces the carbon footprint - the work starts with coffee and cocoa		
Activity status	Partially completed			
Insert a small remark to indicate the status of the activity. *(2-4 sentences required per activity)*	IITA has been requested by the coffee industry (united in the Sustainable Agricultural Initiative - SAI, and supported by IDH) to help develop a PCR for carbon footprinting of coffee. IITA participated in SAI meetings (Brussels 1x, Conference calls 3x) and organized a field visit for the coffee PCR leader (Brian Lindsey). Thanks to IITA input, mixed crop systems and allocation approaches (based on yield, not value) were included in the PCR. In the REALU project in Cameroon, IITA has been collaborating with ICRAF / ASB to explore high-C landuses and understand the drivers of deforestation, including exploring benefit sharing and linkages to REDD+. Progress on both activities is (partially) captured in (internal) project reports and presentations (e.g. IITA presented in GRA workshop in Accra in Nov 2012 on cocoa and CC mitigation)			

Deliverables status *(You may add any unexpected deliverable)*

Type	Description	Year	Status	Format
Reports, publications	Report on carbon footprint quantification of coffee and cocoa systems for at least 4 sites in WA and EA with recommendations on potential interventions	2012	Partially completed	Document (*.doc, *.odt, *.pdf)

Current Partners

	Acronym	Name	Contact Point Full Name	Contact Point Email
CG - CGIAR Center	CIAT	Centro Internacional de agricultura Tropical	Peter Laderach	p.laderach@cgiar.org
CG - CGIAR Center	ICRAF	World Agroforestry Centre	Fergus Sinclair	F.Sinclair@cgiar.org
Select a partner.	WUR	Wageningen Unversity and Research Centre	Jan Verhagen	jan.verhagen@wur.nl
Select a partner.	STCP	Sustainable Tree Crops Program	Jim Gockowski	j.gockowski@cgiar.org

Activity No. 144

Activity title	Assessment of cocoa and coffee based agricultural systems for carbon sequestration potential to mitigate risk of climate change and enhance food security			
CCAFS Objective *(select from drop list)*	3.3 Test and identify desirable on-farm practices and their landscape-level implications	**CCAFS Milestone No.** *(select from drop list / for further details go to CCAFS 2012 - 2015 LOGFRAME sheet)*	3.3.1 2012 (1)	
Activity objectives *(what the activity aims to achieve)*	**Objective 1**			
Activity status	Select a status			

Insert a small remark to indicate the status of the activity. *(2-4 sentences required per activity)*	Based on feedback from the theme leader, this activity has been combined with the one above. As for the deliverable (workshops) - IITA participated in the SAI platform workshop on PCR for coffee carbon footprinting. IITA organized a workshop in Uganda on climate-smart coffee with major private and public sector actors. Private sector actors interested in washed coffee for the specialty market were informed about the huge carbon footprint of wet-processed coffee. Uganda wants to promote wet processing 'big time', so we 'made noise' about the large carbon footprint cost of that choice. This was also presented at the CIALCA conference and is about to be published as an Earthscan book chapter. Further research planned on this in the IITA-CIAT BMZ proposal.

Deliverables status
(You may add any unexpected deliverable)

Type	Description	Year	Status	Format
Workshops	Workshop with coffee and cocoa stakeholders organized to evaluate mitgiation options and identify policy recommendations	2012	Partially completed	Document (*.doc, *.odt, *.pdf)

Current Partners

	Acronym	Name	Contact Point Full Name	Contact Point Email
CG - CGIAR Center	CIAT	Centro Internacional de agricultura Tropical	Peter Laderach	p.laderach@cgiar.org
CG - CGIAR Center	ICRAF	World Agroforestry Centre	Fergus Sinclair	f.sinlair@cgiar.org
AI - Academic Institution	WUR	Wageningen Unversity and Research Centre	Jan Verhagen	jan.verhagen@wur.nl
Select a partner.	MLURI			

2012 Technical Report per Activity

Each Program Participant must provide a small remark against each activity/deliverable to indicate the status of the activity (2-4 sentences required per activity) using the form below. Updated data from the current partners is also required.

CCAFS Center Led Activities
IITA - International Institute of Tropical Agriculture

Activity No. 298

Activity title	Building climate smart farming systems in Rakai (Uganda)	
CCAFS Objective *(select from drop list)*	4.1 Explore and jointly apply approaches and methods that enhance knowledge to action linkages with a wide range of partners at local, regional and global levels	**CCAFS Milestone No.** *(select from drop list / for further details go to CCAFS 2012 - 2015 LOGFRAME sheet)* — 4.1.1 2012
Activity objectives *(what the activity aims to achieve)*	**Objective 1**	To explore with farmers and extension partners, a series of constraints and options for climate change adaptation/mitigation.
Activity status	Partially completed	
Insert a small remark to indicate the status of the activity. *(2-4 sentences required per activity)*	This activity started in October 2012. We organized 20 focus group discussions with women and men seperatly. Some 60 farms were fully mapped and characterized in terms of their production system and production constraints (incl. soil analysis). These farmers were individually interviewed to capture past experiences and knowledge on the impact of climate shocks on crop production and livelihood vulnerability. Landscape maps were developed using aerial photographs. Together with ILRI, a protocol was developed (part of SAMPLES project) to quantify GHG costs of various land uses and land use changes. Individual interviews and focus group discussions revealed that changes in land use (i.e. drainage and tree planting in wetland) and land ownership (i.e. fencing off of wetlands and grazing lands that were previously 'communal' land) have greatly exposed farmers to climate variability. Their vulnerability has significantly increased. See case study section.	

Deliverables status *(You may add any unexpected deliverable)*

Type	Description	Year	Status	Format
Data	Quantification of farm and community-level resource flows, useful for determination of productivity, profitability, and carbon footprint of different production units	2012	Partially completed	Document (*.doc, *.odt, *.pdf)
Workshops	Knowledge exchange events with farmer and extension community on farming systems and their perceived resilience and vulnerability to climate change	2012	Completed	Document (*.doc, *.odt, *.pdf)
Reports, publications	Report summarizing the interim results of knowledge exchange and farm/community resource flow survey	2012	Partially completed	Document (*.doc, *.odt, *.pdf)

Current Partners

	Acronym	Name	Contact Point Full Name	Contact Point Email
CG - CGIAR Center	ILRI	International Livestock Research Institute	Mariana Rufino	m.rufino@cgiar.org
NARES - National agricultural research and extension services	NARO	National Agricultural Research Organisation	Everline Komutunga	komutungae@gmail.com
NGO_DO - Non-governmental organization/Development organization	CIDI	Community Integrated Development Initiatives	Godfrey Lubinga	cidicommunity@gmail.com
NGO_DO - Non-governmental organization/Development organization	RADFA	Rakai District Farmers Association	Kalemba Christopher	n.a. (tel +256 702518671)

2012 summary report of activities and deliverables by Output level

Each Program Participant must prepare a succinct summary of activities and deliverables, organised by Output level of the CCAFS objectives. Length is dependent on budget size so please refer to the table on the explanatory notes.

CCAFS Center Led Activities

IITA - International Institute of Tropical Agriculture

Theme 1. Adaptation to Progressive Climate Change	
Objective 1.1 Analyze and design processes to support adaptation of farming systems in the face of future uncertainties of climate in space and time	
Outcome 1.1: Agricultural and food security strategies that are adapted towards predicted conditions of climate change promoted and communicated by the key development and funding agencies (national and international), civil society organizations and private sector in at least 20 countries	
Output 1.1.2 Building of regional and national capacities to produce and communicate socially inclusive adaptation and mitigation strategies for progressive climate change at the national level (e.g. through NAPAs)	
Prepare a succinct summary of activities and deliverables, organised by Output level of the CCAFS objectives	IITA has uploaded over 150 cassava trials into Agtrials and has setup a cassava catalogue (in partnership with other research bodies - see cassavabase.org). In addition to this work, IITA has initiated research to explore the impact of climate parameters (and variability) on the bitterness (and cyanide content) of cassava varities. This also includes an analysis of farmer perceptions. Besides the work on cassava, IITA has initiated work on yams; i.e. another IITA mandate crop. A catalogue was started and parameters have been captured in trials to develop ECOCROP and develop/calibrate a yam model to be build into DSSAT. On the issue of plant health x climate change, IITA has engaged with CIP in partners in developing models that can be adapted and calibrated for various pests/vectors. Using field survey data and controlled lab experiments, excellent insights have been created with some major pests in Africa (a.o. nematodes, whitefly, coffee pests/diseases, banana weevil) and some of this work will soon appear in journal publications. Exciting work in progress.
Objective 1.2 Develop breeding strategies for addressing abiotic and biotic stresses induced by future climatic conditions, variability and extremes, including novel climates	
Outcome 1.2: Strategies for addressing abiotic and biotic stresses induced by future climate change, variability and extremes, including novel climates mainstreamed among the majority of the international research agencies who engage with CCAFS, and by national agencies in at least 12 countries	
Output 1.2.1 Understanding and evaluating the response of different varieties/crops to climate change in time and space, and generating comprehensive strategies for crop improvement through a combination of modeling, expert consultation and stakeholder dialogue	
Prepare a succinct summary of activities and deliverables, organised by Output level of the CCAFS objectives	
Theme 3. Pro-Poor Climate Change Mitigation	
Objective 3.1 Inform decision makers about the impacts of alternative agricultural development pathways	
Outcome 3.1: Enhanced knowledge and tools about agricultural development pathways that lead to better decisions for climate mitigation, poverty alleviation, food security and environmental health, used by national agencies in at least 20 countries	
Output 3.1.1 Analysis of agricultural development pathways and trade-offs	
Prepare a succinct summary of activities and deliverables, organised by Output level of the CCAFS objectives	Whereas IITA consolodated the work on cocoa systems in the REALU project (with ICRAF-ASB) in Cameroon, a large number of new activities were initiated on mitigation-adaptation synergies and trade-offs, often in collaboration with CIAT. The most significant project developed (i.e. current status 'informally approved') was the BMZ-funded project on Trade-offs and synergies for climate change adaptation/mitigation in coffee/cocoa systems. The work on climate-smart perennial systems (i.e. particularly banana-intercropping) got very high media exposure, particularly on coffee in East Africa. Due to this exposure, the private sector platform (SAI) developing a PCR on carbon footrpinting for coffee invited IITA to join the group working on the development of the norms. We have also had the opportunity to expose the work on climate change adaptation-mitigation in a large number of workshops at the regional level. The suitability change maps (CIAT-IITA) developed for coffee x climate change have alerted the private sector and coffee authorities that climate change is a very serious problem and that smart shade systems are needed to adapt and mitigate. Time series analysis reveals that increments in temperature and rainfall during the dry season have a strong negative impact on coffee yields. An analysis of the institutional organisation of the coffee sector in Uganda (and the region) reveals that climate-smart shade systems have not received sufficient attention in the past, due to the recommendation from the respective public authorities to promote coffee monocropping. However, due to the research initiated by CCAFS the demand for climate-smart shade systems that contribute to CC adaptation and mitigation are full on the agenda. We have been invited by the coffee authorites and the private sector (e.g. 4C) to assit them in the quest for improved coffee shade systems.
Objective 3.3 Test and identify desirable on-farm practices and their landscape-level implications	
Outcome 3.3: Key agencies dealing with climate mitigation in at least 10 countries promoting technically and economically feasible agricultural mitigation practices that have co-benefits for resource-poor farmers, particularly vulnerable groups and women	
Output 3.3.1 Analysis of mitigation biophysical and socioeconomic feasibility for different agricultural practices and regions, and impacts on emissions, livelihoods and food security	
Prepare a succinct summary of activities and deliverables, organised by Output level of the CCAFS objectives	
Theme 4. Integration for Decision Making	
Objective 4.1 Explore and jointly apply approaches and methods that enhance knowledge to action linkages with a wide range of partners at local, regional and global levels	
Outcome 4.1: Appropriate adaptation and mitigation strategies mainstreamed into national policies in at least 20 countries, in the development plans of at least five economic areas (e.g. ECOWAS, EAC, South Asia) covering each of the target regions, and in the key global processes related to food security and climate change	
Output 4.1.1 Future economic development scenarios taking climate change into account, and vulnerability maps and analyses incorporating a changing climate and food security issues shared with decision-makers at national, regional and global levels and informing regional economic development and national food security plans and policies	
Prepare a succinct summary of activities and deliverables, organised by Output level of the CCAFS objectives	

List of publications that acknowledge CCAFS support

(a) Each Program Participant must list all publications that acknowledge CCAFS support. Only include publications that came out in final version in the calendar year. Please do not include journal papers under review (submitted etc) or out in electronic format ahead of print, except of course for electronic-only journals.
(b) Please try to format references in the Harvard style. A clear guide can be found here: http://libweb.anglia.ac.uk/referencing/harvard.htm

(c) For journal articles, please indicate all of the references that are "green open access" with a single asterisk and those that are "gold open access" with a double asterisk. This is now a requirement from CGIAR donors. Green open access means that the authors have made a free copy available on a website. Gold open access means that the journal allows free download (either as standard practice or because the authors paid for it).
(d) For all publications that are up online, please provide a web link if possible. This will help us to advertise your work more widely.

CCAFS Center Led Activities
IITA - International Institute of Tropical Agriculture

Publication 1	**Type**: Journal papers	**Citation identifier**: DOI 10.1007/s11027-011-9325-7
	Citation: Tambo, J.A., Abdoulaye, T., 2012. Climate change and agricultural technology adoption: the case of drought tolerant maize in rural Nigeria. Mitigation and Adaptation Strategies for Global Change 17(3): 277-292	
Publication 2	**Type**: Journal papers	**Citation identifier**: DOI 10.1007/s10113012-0351-0
	Citation: Tambo, J.A., Abdoulaye, T., 2012. Smallholder farmers' perceptions of and adaptations to climate change in the Nigerian savanna. Regional Environmental Change, in press (already online)	
Publication 3	**Type**: Book chapters	**Citation identifier**: http://www.springer.com/economics/environ
	Citation: Labintan, A. C., Mignouna, D. B. and Ituma, C.C, 2012. The contributions of climate change mitigating policies to poverty reduction in the Sahel region. Climate Change and Disaster Risk Management, pages 217-235, chapter 14	

Publication 4	**Type** Journal papers	**Citation identifier** http://r4dreview.org/2013/01/climate-smart-
	Citation Jassogne, L., van Asten, P., Laderach, P., Craparo, S., Wanyama, I., Nibasumba, A., Bielders, C., 2012. Climate-smart perennial systems. R4D Review 9: 12-16.	
Publication 5	**Type** Journal papers	**Citation identifier** http://r4dreview.org/2013/01/cocoa-and-
	Citation Gockowski, J., Robiglio, V., Muilerman, S., Agyeman, N.F. ,Asare, R., 2012. Cocoa and REDD. R4D Review 9: 44-48	
Publication 6	**Type** Journal papers	**Citation identifier** DOI 10.1080/14735903.2012.714576
	Citation Jassogne, L., Van Asten, P., Wanyama, I., Baret, P. 2012. Perceptions and outlook on intercropping coffee with banana as an opportunity for smallholder coffee farmers in Uganda. International Journal of Agricultural Sustainability. 1-15	
Publication 7	**Type** Journal papers	**Citation identifier** http://dx.doi.org/10.1017/S1479262112000214
	Citation Fatokun, C.A., O. Boukar and S. Muranaka. 2012. Evaluation of cowpea (Vigna unguiculata (L.) Walp.) germplasm lines for tolerance to drought. Plant Genetic Resources 10: 171-176	
Publication 8	**Type** Conference proceedings	**Citation identifier** http://asic2012costarica.org/download/PROGR
	Citation Craparo, A., van Asten, P., Läderach, P., Jassogne, L., Grab, S. 2012. Coffee and climate change in East Africa. Poster presentation at the 24th International Conference on Coffee Science (ASIC), 11-16 November, San José, Costa Rica.	
Publication 9	**Type** Other	**Citation identifier** http://www.slideshare.net/cgiarclimate/b1-
	Citation Van Asten, P., Laderach, P. and Gockowski, J., 2012. Agricultural intensification for climate change adaptation and mitigation: synergies and tradeoffs. Presentation at the third annual Climate Change, Agriculture and Food Security (CCAFS) science workshop,	

Publication 10

Type	Citation identifier
Other	http://biblio.iita.org/index.php?page=publicati

Citation

Tamo, M., Beed, F., Goergen, G., Hanna, R., Coyne, D., Van Asten, P. and Legg, J., 2012. Risk assessment and modelling: IITA. Abstract, p. 33 in Program Book of Abstracts, Scientific Review and Planning Workshop: "Modelling climate impacts on pests and diseases", 10-14 December 2012 Lima, Peru, 2012.

Publication 11

Type	Citation identifier
Other	http://biblio.iita.org/index.php?page=publicati

Citation

Jassogne, L., Laderach, P., Van Asten, P. and Van Rikxoort, H., 2012. Quantification of greenhouse gas emissions in agriculture standards and data quality context of coffee and East Africa: a report presented at the green coffee PCR project technical working group meeting,

Publication 12

Type	Citation identifier
Other	http://biblio.iita.org/index.php?page=publicati

Citation

Jassogne, L., van Asten, P., Laderach, P., 2012. Impact of climate change on coffee in Uganda lessons from a case study on Arabica coffee in the Rwenzori Mountains. Oxfam report - to be released.

2012 Case studies

Number of case studies to be submitted is dependent on budget size so please refer to the table on the explanatory notes. Each case study should be about half a page, and Program Participants are expected to build a portfolio of case studies over the years that demonstrate all different types.

CCAFS Center Led Activities
IITA - International Institute of Tropical Agriculture

CASE STUDY 1

Title
Trade-off analysis of climate change adaptation and mitigation in perennial-based

Author
P. van Asten, P. Laderach, J. Gockwoski, L. Jassogne

Type
Inter-center collaboration

Date (DD/MM/YYYY)
12/31/2012

Countries
East Africa (coffee), West Africa (cocoa)

Keywords
Adaptation, Mitigation, Coffee, Cocoa, Smallholder, Trade-offs

Photo URL

Introduction/Objectives (400 characters)

Cocoa and coffee are the primary sources of income of millions of African smallholder farmers and key foreign revenue generators. Coffee and cocoa are highly sensitive to progressive climate change. Aware of the risks, the private and public sector are currently trying to encourage producers to adapt to climate change. Little research is conducted on technology efficiencies and trade-offs across scale from a productivity, livelihood, and environmental perspective. CIAT and IITA initiated collaboration on this topic thanks to CCAFS.

Description of the project,procedures etc. (1100 characters)

This case study is the collection of collaborative projects between IITA and CIAT – the list below is not comprehensive, but summarizes 1.5yrs of collaboration initiated by CCAFS:
1. CIALCA conference -> joint keynote presentation and paper on Climate-smart coffee systems for the EA Highlands.
2. EAFCA coffee science meeting -> Coffee suitability maps for EA presented in Feb 2012 in Ethiopia, using the Maxent (CIAT) and regional production data assembled by IITA.
3. Oxfam study -> Impact of climate change on coffee in Uganda. A 16k USD Oxfam-funded project where IITA led the field survey work and CIAT provided suitability mapping input.
4. ASIC conference -> Impact of climate change on coffee in East Africa. A joint PhD student collected long term yield x weather response data in TZ .
5. GMCR study -> Understanding the vulnerability of the livelihoods of coffee farmers in East Africa. A 30k USD project building on CIAT work on coffee livelihoods in LA.
6. CCAFS Rakai site study -> participatory development of climate change adaptation scenarios in the CCAFS site of Rakai (Uganda). The 133k USD is supported by CIAT suitability modeling.
7. BMZ project -> Trade-offs and synergies in climate change adaptation and mitigation in coffee and cocoa systems. This project proposal (1.2 M Euro for 3 years) was developed using a 30k USD CCAFS grant.

Project results (be concrete as possible), innovate findings, novel outcomes and short discussion on the implication of these results (1100 characters)

The collaboration has led to results at research, output, and outcome level:
1. IITA-CIAT shared the results on coffee and climate change (i.e. mapping + field evidence) with the East African coffee science community through conference and workshop presentations. This has put climate change much higher on the coffee community agenda (e.g. upcoming coffee 4C-AFCA workshop strongly having climate change clearly on the agenda http://www.sustainableafricancoffee.org/p/3-rd-african-coffee-sustainability.html).
2. We discovered that relative small changes in minimum temperature and rainfall in the dry season, can have huge impact on coffee yield. (ASIC poster presentation by Craparo et al.)
3. Through our collaborative work, we've been invited by the industry (SAI platform) to help develop carbon footprint norms for coffee http://www.saiplatform.org/activities/alias/climate-change/coffee-pcr-project.
4. Coffee x banana intercropping as climate-smart practice is now being actively promoted in Uganda through our interaction with the agricultural (coffee) authorities (e.g. http://edepot.wur.nl/210075) by request from the coffee sector to present climate findings at their strategic events (e.g. annual coffee stakeholder meeting). In East Rwanda, the practice is now being validated by the Rwandan agricultural research institute, whereas it was forbidden in the past.
5. Donors increasingly recognize the strength of the collaboration and have awarded several projects (see above).

Partners involved and their role (250 characters)

IITA leads biophysical and socio-economic/political characterization -> farming systems approach.
CIAT leads the climate change modeling and geo-spatial modeling approach and brings system experience from LA.
NARS are involved in field work and capacity building.
Universities (in EU and Africa) provide backstopping for post-graduate research
Private sector link with farmers and through professional platforms (e.g. SAI platform on carbon footprinting)

Links/Sources for further information

http://www.cgiar.org/consortium-news/coffee-bananas-a-climate-smart-combination/
http://ccafs.cgiar.org/node/1616
http://r4dreview.org/2013/01/climate-smart-perennial-systems/
http://r4dreview.org/wp-content/uploads/2013/01/figure-2-suitability-maps-for-arabica-coffee-developed-with-ciat.jpg
http://www.slideshare.net/cgiarclimate/b1-synergies-andtradeoffsinccadaptationandmitigationpeterladerach
http://poorfarmer.blogspot.com/2012/12/study-banana-can-protect-coffee-from.html
http://climate-l.iisd.org/news/cgiar-highlights-climate-benefits-of-coffee-banana-intercropping/

Title
Participatory development of climate change adaptation scenarios in Rakai (CCAFS

Author
L. Jassogne, E. Ampaire, I. Wanyama, R. Nansamba, P. van Asten

Type
Innovative non-research partnershi

Date (DD/MM/YYYY)
12/31/2012

Countries
Uganda

Keywords
Adaptation, Farming system, Livelihood, Vulnerability, Gender, Policy

Photo URL

Introduction/Objectives (400 characters)

Rakai (Uganda) is the only CCAFS site with perennial-based farming systems. These systems are dominant in South Uganda, East DR Congo, Rwanda, Burundi, NW Tanzania, and in the humid high altitude areas of Kenya and Tanzania. Despite their importance, CCAFS has dominantly selected cereal-legume based sites. In this case study, we would like to understand adaptation-mitigation options by combining quantitative data with participatory analysis of constraints, risks, and opportunities to deal with climate change.

CASE STUDY 2

Description of the project, procedures etc. (1100 characters)

IITA and partners are currently jointly organizing the CCAFS farming systems survey in Rakai where coffee/banana systems are dominant. This project will use participatory approaches with farmers, local extension and governance actors, and NGOs to discuss the constraints and opportunities of the coffee/banana system. The focus will be on climate change and adaptation and mitigation strategies that improve farmers' livelihoods and increase system resilience. Different qualitative approaches will be used to organize knowledge exchange between research and farmer communities and support services. A strongly quantitative approach will be linked to this work to map plot, household, and community level resource flows. This will be used to analyse trade-offs at farm and community / landscape level. Taking into consideration farmers' preferences and resource limitations, a series of promising scenarios will be developed and discussed.

Project results (be concrete as possible), innovate findings, novel outcomes and short discussion on the implication of these results (1100 characters)

Focus groups revealed that not the common production constraints, but particularly policy constraints at local level exacerbated farmer vulnerability. In the past, farmers had access to communal grazing lands and wetlands, which were utilized during periods of fodder scarcity and crop production failures. Recently, communal grazing lands and wetlands were leased out to a few well-off farmers, who fenced them off to keep poor villagers out. Commercial eucalyptus woodlots in the wetlands have lowered the water table and dried up wells, requiring women and children to walk up to four km to fetch water during the dry season. The most vulnerable farmers have cut down their trees to sell the wood/charcoal, exposing them even further to climatic variability. Hence, the most vulnerable group now seems to be least capable of adopting 'climate-smart' practices. Laws in place are not properly defined and enforced to constrain degradation and 'grabbing' of communal resources. There is need to engage policy and decision-makers to address issues of natural resource access and sustainable management. Technical efforts will become more profitable if there is political will to jointly address constraints, particularly to support equitable access to natural resources.

Partners involved and their role (250 characters)

CIAT: suitability change mapping
IFPRI: gender x climate change
NARO: local contextual knowledge + partner in field work
CIDI: Local NGO - link with farmers and public authorities
RADFA: Rakai District Farmers Associoation – local knowledge

Links/Sources for further information

ILRI -> SAMPLES project and IMPACT-Lite survey. CIAT -> DAPA team work on crop suitability mapping, CIDI: http://www.ugandangodirectory.org/index.php?option=com_mtree&task=viewlink&link_id=86, CCAFS work in Rakai available on ccafs.cgiar.org

2012 Outcome report

Frequency of reporting outcomes is dependent on budget size so please refer to the table on the explanatory notes. (max 1 page)

CCAFS Center Led Activities
IITA - International Institute of Tropical Agriculture

OUTCOME 1

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

IITA research on 'climate-smart' banana-coffee intercrop systems have been widely exposed in the East African region. The coffee authorities in these countries have abandoned their past policies and recommendations that coffee should not be intercropped with banana, despite the two crops (coffee and banana) playing a crucial role for food security and revenue at the farmer and national level.

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

The outputs were improved technologies for farmers on how to best intercrop banana and coffee to increase revenue >50%, to reduce climate shocks on coffee, and to reduce household vulnerability. Farmers in the past were recommended/imposed (in Burundi, Rwanda, Uganda) to monocrop both crops. Research on this work was published in international publications on: (1) agronomic benefit of coffee-banana intercropping, (2) perception analysis on the benefits of this technology, including an analysis of institutional/policy constraints and opportunities for intercropping, (3) quantitative and qualitative analysis of impact of climate change on (Arabica) coffee.

What partners helped in producing the outcome?

NARS partners in Uganda, Rwanda, Burundi (and the EA region), CIAT (particularly for suitability mapping), Coffee auhorities in Uganda, Rwanda, Burundi, Private sector partners, Media

Who used the output?

NARS and NGOs (supported by donors) are currently recommending banana-coffee intercropping where this did not happen before. The endusers are the smallholder coffee producers.

How was the output used?

The output was used to promote the practice by the extension officers and by the national researchers in the respective target countries. Farmers then adopted this practice in their fields. The DG of ISAR (now RAB) and the head of Coffee Research in Uganda have publically (in the major local newspapers) supported and recommended this practice. The local media (radio, newspaper) and international media (Reuters, AFP, BBC, etc) picked up the outputs and provided global exposure

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? Please provide a reference or source.

The positive benefits of banana intercropping in coffee for climate change adaptation has been reported by very many media sources over the past 2 years (Reuters, AFP, Fresh Fruit portal, Monitor News Uganda, New Times, Rwanda, the East African newspaper, etc. Extension programs involved in coffee (e.g. LEAD-USAID partners - http://pdf.usaid.gov/pdf_docs/PDACN582.pdf) picked up the story and started recommending banana-coffee intercropping to farmers. In Rwanda, the research organisation started its own coffee x banana intercrop trials;, similarly in Burundi, such trials were initiated. The DG of Rwanda's research body confirmed in the media that she supported the practice (The coffee research and climate change teams of ISABU (Burundi) both visited IITA-Uganda to learn more about it. We organized presentations in the countries with the key partners, including private sector stakeholders. A policy brief was written together with NARO and WUR (http://edepot.wur.nl/210075). The media reports are easy to find, but some recent examples are http://www.freshfruitportal.com/2013/01/10/banana-trees-hold-potential-for-better-coffee-production/, http://www.cgiar.org/consortium-news/coffee-bananas-a-climate-smart-combination/, http://www.africasciencenews.org/en/index.php?option=com_content&view=article&id=708:study-says-banana-protects-coffee-climate-change-effects&catid=49:food&Itemid=113. In Rwanda and Uganda, the practice of intercropping bananas in coffee was forbidden, but is now increasingly tolerated by the local authorities. We are currently making an effort to have the practice being recommended to farmers, whereas it was forbidden a few years ago.

Gender and Social Differentiation related activities summary report - 2012

CRPs that have presented their Gender Strategy to the Consortium in 2012 should show progress in 2013 in relation to implementing the Strategy. Therefore it is expected from Program Participants that findings of gender and social differentiation activities and their significance to be referred in this summary report. It is essential to relate progress towards outcomes to the baseline gender-differentiated conditions being used to measure change. This report should also refer specifically to what is being learnt about gender and how this knowledge is being used to inform research priority-setting and approach. If none or few of your activities integrate gender please explain why it is not relevant to your research portfolio.

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A case study of cocoa intensification and the Cocobod High Tech programme in the Western Region of Ghana was conducted by IITA to better understand the potential of the intensified perennial tree production systems as a potential tool for addressing rural poverty and climate change mitigation. The analysis was based on the work of a multidisciplinary research team and on farm level data generated over the last 10 years, combined survey data, remote sensing analysis and qualitative research with attention to gender differences.

The growth of Ghana's cocoa sector over the last century has been based on a migratory model whereby the centre of gravity of cocoa farming moved from the east to the west of the country. It thereby effectively was responsible for the bulk of the deforestation of the Ghanaian Upper Guinean Rainforest – with the exception of areas of protected forest. Remote sensing revealed important encroachment into forest reserves over the last ten years, though also caused by illegal logging. The quantitative analysis of survey data showed how this system can only sustainably continue to produce at the current output levels when an intensification approach is adopted; however, findings suggest an under-allocation of household capital resources to fertilizers and additional applications that would generate greater net profits for the farmer. For several reasons, other inputs like pesticides and improved planting materials are also underutilized. Looking at the determinants of agricultural output the household head's educational attainment was important, but with regard to gender, only the age of the household head, not the sex, turned out to be a significant variable. It also became clear that producers with smaller land holdings were more likely to adopt the intensified system than were larger producers who opted for an extensive technology system and showed significantly lower yield. These findings suggest that climate change mitigation packages for agricultural intensification will find wider acceptance among land-constrained producers, especially if credit constraints are not binding; however, the greatest impact on deforestation is most likely to occur from interventions targeting the extensive land use practices of the largest farmers. On the other hand, agricultural intensification appears to be a good fit when poverty reduction is the principal objective –as is the case for the government of Ghana.

The historical migratory model is no longer an option as available lands, both literally and practically under the customary land tenure arrangements, have no longer been available since the end of the last century. The anthropological investigation and survey data showed manifest differences in land tenure arrangements between 'citizen' and migrant (cocoa) farmers, though migrants with official land titles are now often more secure of their ownership than 'citizens' still under customary arrangements. At any rate, cocoa as a crop creates a great deal of security as the act of being allowed to plant cocoa seen as receiving a renewable land use right for about 40 years. An added realization was that slowly real estate markets are coming into existence. This shows an important link with changing inheritance arrangements, especially among the matrilineal 'citizen' populations of Western Ghana. A change from a matrilineal to an officially matrilineal system is significantly impacting the structure of farming. Land that historically remained intact over the generations is now inherited equally by all the biological children – daughters and sons. The resulting rapid fragmentation limits the options of the farming enterprise and reinforces the emerging land markets and other phenomena like emergency sales, the use of land as collateral and other new financial arrangements. Certainly there will be winners and losers, and efficient farmer will be buying out the less-efficient. These effects are not expected to impact men, women and youth equally. These emerging patterns need to be understood in more detail, but what begins to emerge is a pathway out of poverty based on the increased usage of fertilizer, increases in farm size, security of ownership, the adoption of hybrid cocoa varieties and increases in the farmers' stock of knowledge. To what extent men, women and youth will have equal opportunity in this scenario needs to be the object of further research.