RESEARCH PROGRAM ON
Climate Change,
Agriculture and
Food Security

Theme leader 3

2013 technical report

1. Activity Reporting

Activity 479-2013 (Milestone 3.1.1 2013.)

Title: Scenarios for low emissions agriculture, including testing feasibility for emissions floors.

Status: **Partially complete.** Activities completed in 2013:a) CCAFS-IIASA Planning Meeting, Amsterdam City, 18 Feb 2013 b) Baselines set up for agricultural and land use sectors globallyc) Joint runs with the IIASA integrated assessment model MESSAGE and GLOBIOM have been set up and tested for mitigation cases under the "business as usual" scenario SSP2d) EPA(2006) mitigation options for non-CO2 emissions fully integrated in GLOBIOM

Gender component:

Deliverables:

- Planning meeting and workplan (January-February 2013)

Held in Amsterdam City, 18 Feb 2013, workplan developed.

- Scientific article and at least one international meeting presentation on 'need for agricultural mitigation – when and where' (June 2014)
- Report analyzing priorities for mitigation activities (March 2015)
- Draft tool for identifying low emissions development pathways (September 2015)
- Train national researchers in CCAFS region on use of the tool and get feedback (September-October 2015)
- Final tool ready for web-publishing (2016)
- Scientific article on analysis (2016) and at least one international meeting presentation on 'Need for agricultural mitigation'

Partners:

IIASA

Locations:

Activity 218-2013 (Milestone 3.1.1 2013.)

Title: Intermodel comparison for food-energy trade-offs. Linked to Ag-MIP project and T4 household impact modeling.

Status: **Complete.** This project is complete. PIK submitted a follow-up proposal together with ICRISAT to the Federal Ministry of the Environment (BMU) in January 2013. Results from global scenarios on changes in yields for food and bioenergy crops by 2050 under different climate scenarios were published by Muller et al. in Agricultural Economics.Global scenarios on bioenergy demand by 2050 under differentclimate stabilization targets were published by Lotze-Campen et al. in Agricultural Economics Several workshops have been held during the AgMIP global economic model inter-comparison process (see deliverables).

Gender component:

Deliverables:

- Workshop: "Global model-intercomparison on future bioenergy scenarios and trade-offs with agriculture and food production" (September 2012)

Several workshops have been held during the AgMIP globaleconomic model inter-comparison process in 2012 and 2013,partly funded by other projects:i. Mount Kenya, Kenya 16.-20.01.2012ii. Paris, France, 04.04.2012iii. Washington, DC, USA 27.-29.08.2012iv. Rome, Italy 10.-12.10.2012v. Paris, France 10.-11.01.2013vi. Dublin, Ireland 09.04.2013

- Report (to be published as a journal article): "Household modelling results on the impacts of increased bioenergy demand on food security and rural livelihoods" (together with a separately funded project by ILRI: Regional case study on increased bioenergy production and impacts on food security and rural livelihoods)

a. Report on subcontracted study by Dirk Willenbockel, IDS: "Biofuels, Land-Use Change and Food Prices: A Model-Based Scenario Analysis for Kenya and Uganda"

b. Report on household-level analysis by Mark T. van Wijk, International Livestock Research Institute (ILRI): "Household level food security impacts of increased biofuel demand"

c. Planning to submit a synthesis of both reports as a journal article.

- Presentation of project results at regional policy workshop in Nairobi

This will be postponed because Mario Herrero has left ILRI (as of 3/25/13). If a suitable date and occasion can be found, a representative of PIK will present overall results from this project.

Partners:

ILRI; PIK

Locations:

Global

Activity 221-2013 (Milestone 3.1.2 2013 (1).)

Title: Analyzing and strengthening women's innovationsfor adaptation and mitigation at CCAFS benchmark sites.

Status: **Partially complete.** This project is underway. The first activity May 2013 was a 3-day workshop to review what is being done currently by various organisations and networks in terms of promoting innovation that contributes to lowering emissions in agriculture. The workshop was held in Phnom Penh, Cambodia, from 29 April to 1 May 2013 with 25 participants from different countries and continents. The workshop participants came up with initial ideas that could be further worked out as pilots. Three of the seven initial ideas were developed into proposals for pilot projects and were supported with small funds:1. Participatory agroforestry and eco-stoves for reducing household labour, mitigating carbon emissions and improving health in Honduras2. Improving soil condition and mitigating carbon emissions through a combination of bioslurry and biochar in

Cambodia3. Enabling women's innovation capacity in social forestry through video-mediated learning in BangladeshAll three pilots will be extended for another 9–12 months so that the process can be continued and expanded further and experiences and lessons can be drawn. Lessons from these projects will feed into a framework for use by development practitioners to build recognition for women's innovations in low emissions agriculture.

Gender component:

Building on Theme 3's gender strategy, CCAFS, FAO and Prolinnova are developing a framework for use by development practitioners to build recognition for women's innovations in low emissions agriculture. The framework will be tested in action research projects in Africa, Southeast Asia, and Latin America to increase the visibility and scale of innovations that improve livelihoods and food security while reducing climate impacts.

Deliverables:

- 1 academic journal article analyzing cases and 9 small-scale pilot projects strengthening current activities and/or developing new project focus areas in:i. gender analysis and women's empowermentii. Low emission agriculture and food securityiii. innovation within the agricultural system

- A women's innovation framework to guide action research and 1 academic article analyzing the framework and its relationship to innovation systems approaches
This is a 2014 output. A draft of the journal article is complete.

- 7 short cases to be disseminated through CCAFS, WEDO, PROLINNOVA and potentially GGCA describing local women's innovations and enabling conditions
This is a 2014 output.

- Workshop on gender and agricultural innovation
Held in Phnom Penh, Cambodia, from 29 April to 1 May 2013.

- 1 academic article on the workshop as social learning
This is a 2014 output.

- 3 in-depth action research projects, building off first mini-grants for activities including: building networks within the innovation systems, establishing a learning model, initiating experimental/innovative activities that address low emission agriculture, food security and gender justice
These projects were established in July 2013. One project is in Honduras, with the Foundation for Participatory Research with Honduran Farmers. Another in Cambodia with the Cambodian Centre for Study and Development in Agriculture. A final in Bangladesh with the Department of Agricultural Extension Education of Bangladesh Agricultural University.

- At least one funding proposal
This is a 2014 output.

Partners:
UVA; PROLINNOVA
Locations:
South East Asia (SEA),Latin America (LAM)

Activity 224-2013 (Milestone 3.1.1 2013.)

Title: PAR with carbon market projects to identify institutional innovations that enable project sustainability.
Status: **Partially complete.** This research continues with two project partners: Vi Agroforestry in Kenya, and ECOTRUST in Uganda, facilitated by Ecoagriculture Partners. These two partners are implementing lessons learned in earlier phases of the project, including training manuals for community facilitators and evaluation tools to assess the effectiveness of training materials, community facilitators, and local institutions to sustain carbon and Sustainable Agricultural Land Management (SALM) projects.Research outputs in 2013 (synthesizing the learning process of the project partners) include a scientific publication, a policy brief, a presentation at The International Association for the Study of the Commons conference, and discussions with a number of national and international policy makers and donors, including IFAD, World Bank Biocarbon Fund, Mount Elgon Regional Ecosystem Conservation Programme (Uganda), and local policy makers in Kenya and Uganda.
Gender component:
Gender is integrated in this project both as a research question and as an evaluation criteria of the nonprofit partners. Vi and ECOTRUST's workplans to build local institutional capacity to sustain their projects include explicit consideration for the differing needs of male and female farmers, and measure success in terms of their ability to reach both male and female farmers. Gender as an important consideration in carbon project design has also been a topic of research outputs from this project. See:Shames S. 2013. How can small-scale farmers benefit from carbon markets? CCAFS Policy Brief No. 8. Copenhagen, Denmark: CGIAR Research Program on Climate Change, Agriculture and Food Security (CCAFS)Bernier Q, Franks P, Kristjanson P, Neufeldt H, Otzelberger A, Foster K. 2013. Addressing Gender in Climate-Smart Smallholder Agriculture. ICRAF Policy Brief 14. Nairobi, Kenya. World Agroforestry Centre (ICRAF).
Deliverables:
- Discussion paper at completion of project
2015 deliverable.

- Policy brief
Shames S. 2013. How can small-scale farmers benefit from carbon markets? CCAFS Policy Brief No. 8. Copenhagen, Denmark: CGIAR Research Program on Climate Change, Agriculture and Food Security (CCAFS) http://cgspace.cgiar.org//bitstream/handle/10568/29009/CCAFS_PB8.pdf?sequence=5

- 3-4 case studies, with support to agricultural carbon project developers and managers in 4 of the projects involved to monitor, evaluate and report on institutional innovations in agricultural carbon projects
This deliverable has been deleted.

- 4-5 info briefs to communicate impacts
This deliverable has been amended to "3 policy briefs summarizing policy-relevant lessons learnt from the project, produced by EcoAgriculture, CCAFS and other partners"

- 2 Scientific papers synthesizing knowledge generated to date about institutional characteristics, challenges and innovative solutions in agricultural carbon projects to achieve both climate and rural welfare benefits
This deliverable was amended to 1 scientific publication.Shames S, Bernier Q, Masiga M. 2013. Development of a Participatory Action Research Approach for four agricultural carbon projects in East Africa. CAPRi Working Paper 113. Washington, DC: International Food Policy Research Institute (IFPRI).

Partners:
EcoAgriculture Partners
Locations:
East Africa (EA)

Activity 225-2013 (Milestone 3.1.1 2013.)

Title: Analysis of promising governance and market arrangements to halt agricultural conversion of forests in Brazil and Indonesia and indicators for monitoring.
Status: **Partially complete.** Two working papers and an article in Global Environmental Change were published from this work this year. Results will be presented at A Dialogue on Food, Fuel, Fiber and Forests in Kalimantan, Indonesia in March. This project has been extended (with no additional cost) to April 30, 2014.
Gender component:
Deliverables:
- 2-4 Country case studies
CompleteNumerous blog stories on these case studies:
http://ccafs.cgiar.org/commodity-agriculture-supply-chains-and-sustainability
http://ccafs.cgiar.org/blog/beefing-sustainable-agriculture-production-brazil
http://ccafs.cgiar.org/blog/examining-new-sustainable-beef-production-certification-brazil
http://ccafs.cgiar.org/blog/exploring-sustainable-palm-oil-production-indonesia

- Diagnostic framework
Newton P, Agarwal A, Wollenberg E. 2013. Enhancing the sustainability of commodity supply chains in tropical forest and agricultural landscapes. Global Environmental Change, 23:6: 1761–1772.

- 2 Journal articles
Published as working papers:Alves-Pinto H, Newton P, Pinto L. 2013. Certifying sustainability: opportunities and challenges for the cattle supply chain in Brazil. CCAFS Working Paper No. 57. Copenhagen, Denmark: CGIAR Research Program on Climate Change, Agriculture and Food Security (CCAFS).Newton P, Agrawal A, Wollenberg

L. 2013. Interventions for achieving sustainability in tropical forest and agricultural landscapes. CAPRi Working Paper No. 110. Washington, DC: International Food Policy Research Institute (IFPRI).

- Presentation of findings in at least one international conference
Pete Newton & Helena Alves-Pinto shared findings at COP19: http://www.landscapes.org/agenda-item/day-1-nov-16-2/technical-networking-sessions/technical-networking-sessions-slot-1/innovative-governance-commodity-agriculture-forest-landscapes-outlooks-food-fuel-forests-fiber-4f/#.UuFvb3n0ASJ

Partners:
U-M
Locations:
South East Asia (SEA)

Activity 227-2013 (Milestone 3.1.1 2013.)

Title: Development of an investment model for smallholder agriculture and mitigation.
Status: **Complete.** The Munden Project has completed work on an investment mechanism for delivering capital that supports low climate-impact agriculture to smallholder farmers in developing countries, published as a CCAFS Working Paper. This mechanism, called the Landscape Fund (previously INARI), will be tried out in a pilot phase developed under the leadership of the Center for International Forestry Research (CIFOR) and the Munden Project.
Gender component:
Deliverables:
- Report on investment mechanism
Alforte A, Matias D, Munden L, Perron J. 2013. Financing sustainable agriculture and mitigation. CCAFS Working Paper No. 52. Copenhagen, Denmark: CGIAR Research Program on Climate Change, Agriculture and Food Security (CCAFS).http://hdl.handle.net/10568/34076

- 2000-word policy brief with main messages
This deliverable was removed.

Partners:
Munden Project; CIFOR
Locations:
Global

Activity 231-2013 (Milestone 3.3.2 2013.)

Title: Analysis of issues, gaps in knowledge, and research priorities for quantifying agricultural greenhouse gases among smallholders

Status: **Complete.** This activity was completed in the form of a small issue of Environmental Research Letters: http://iopscience.iop.org/1748-9326/focus/Quantification%20of%20Greenhouse%20Gases

Gender component:

Deliverables:

- Special Issue: Papers to address critical data and analytical gaps will be explored at the workshop and published in Environmental Research Letters, a high impact open source journal
http://iopscience.iop.org/1748-9326/focus/Quantification%20of%20Greenhouse%20Gases

- A framing brief on the issues for agricultural greenhouse gas quantification
Ogle SM, Olander L, Wollenberg E, Rosenstock T, Tubiello F, Paustian K, Buendia L, Nihart A, Smith P. 2014. Reducing greenhouse gas emissions and adapting agricultural management for climate change in developing countries: providing the basis for action. Global Change Biology 20:1–6.

- A summary brief on where we are now and what the priorities are for progress on agricultural greenhouse gas quantification
This brief is currently in draft form, for publication in early 2014.

Partners:

Duke University; CSU; UNIQUE; FAO

Locations:

Global

2. Succinct summary of activities and deliverables by Output level

Output: 3.1.1

Summary:

• Completion of intermodal comparison for food-energy trade-offs and study of household food security impact of increased biofuel demand, in collaboration with ILRI and PIK. The results have been communicated at multiple AgMIP workshops over 2012 and 2013 and published in 2 journal articles and 2 reports.

• In a partnership with IIASA, regional stakeholders, and several CGIAR centers, CCAFS is generating climate mitigation scenarios consistent with the Shared Socioeconomic Pathways of the ongoing IPCC AR5 scenario process. These scenarios will be used to test to what extent mitigation by developing countries or smallholders is necessary to stay within desired climate change thresholds. In 2013, baselines were established for agricultural and land use sectors globally, and IIASA integrated 2006 EPA mitigation options for non-CO2 emissions into their GLOBIOM model and set up runs for mitigation cases under the "business as usual" scenario. This activity runs until 2015.

• 2 working papers and an article in Global Environmental Change on enhancing the sustainability of commodity supply chains in tropical forest and agricultural landscapes. Results shared at COP19.

• We are also wrapping up a long-term participatory action research project with smallholder carbon market projects in Kenya and Uganda, in collaboration with EcoAgriculture Partners. This research has generated lessons on designing such projects for sustainability and ensuring that farmers benefit, which in 2013 were published in a CCAFS policy brief, an IFPRI working paper, and an ICRAF policy brief on gender in carbon market projects.

Output: 3.1.2

Summary:

• With Prolinnova, began work to assess the drivers and constraints to scaling up women's innovations in low emissions agriculture. Held a 3-day workshop with multiple innovation organizations to develop a framework and 3 pilot projects, which are now extended to longer-term projects. This work builds on Theme 3's gender strategy for pro-poor mitigation.

• Theme 3 and University of Aberdeen began a collaboration to develop an easy-to-use, scalable decision-support tool for spatially-linked identification of effective mitigation options for sites and regions. The tool will be completed in 2014 and tested with several national governments.Output 3.2.1 Evidence, analysis, and trials to support institutional designs, policy, and finance that will deliver benefits to poor farmers and women, and reduce GHG emissions

• With UNIQUE Forestry and Land Use, completed a feasibility study to define the design features of an agricultural NAMA in Kenya. The next phase of this work will develop NAMA arrangements for three counties in Kenya.

• Published review (with FAO) on national integrated mitigation planning in agriculture as a resource for countries considering a NAMA.

• Report that identifies and makes recommendations for a series of measures that would promote climate readiness in smallholder agricultural systems, to be published in 2014.

• Report and key statistics on the geographic distribution of climate finance, to be published in 2014.

• Completion of the design (and working paper) of a networked financing approach for sustainable agriculture and mitigation. Called The Landscape Fund, this approach will be tried out in a pilot phase developed under the leadership of the Center for International Forestry Research (CIFOR) and the Munden Project.

Output: 3.3.2

Summary:

• Publication of a special issue of Environmental Research Letters: Focus on Improving Quantification of Agricultural Greenhouse Gases, with 20 articles from leading experts.

• Draft chapters of protocol for GHG quantification at the landscape level completed, to be published in 2014.

• Full year of greenhouse gas data collection at multiple sites under the SAMPLES project. This work is being reported by CGIAR centres.

• With an additional allocation from Theme 3, the Climate Food and Farming Network (CLIFF) awarded grants to 9 students, who will work with SAMPLES researchers at CGIAR centers. Previous CLIFF students published 7 scientific papers in 2013.

• Work initiated with University of Edinburgh to adapt the Small-Holder Agriculture Monitoring and Baseline Assessment (SHAMBA) methodology to enable projects working with smallholders in sub-Saharan Africa to assess and monitor the mitigation benefits of their activities, and access mitigation finance through the sale of Plan Vivo credits, without the need to rely on technical experts or consultants. In 2013, an activity based indicator framework was developed. Rest of work to be completed in 2014.

3. Publications

Publication #1

Type: Other

CCAFS Themes: Theme 3

Citation: Shames S. 2013. How can small-scale farmers benefit from carbon markets? CCAFS Policy Brief No. 8. Copenhagen, Denmark: CGIAR Research Program on Climate Change, Agriculture and Food Security (CCAFS).

Publication #2

Type: Working papers

CCAFS Themes: Theme 3

Citation: Edmunds D, Sasser J, Wollenberg E. 2013. A gender strategy for pro-poor climate change mitigation. CCAFS Working Paper no. 36. Copenhagen, Denmark: CGIAR Research Program on Climate Change, Agriculture and Food Security (CCAFS).

Publication #3

Type: Working papers

CCAFS Themes: Theme 3

Citation: Alforte A, Matias D, Munden L, Perron J. 2013. Financing sustainable agriculture and mitigation. CCAFS Working Paper No. 52. Copenhagen, Denmark: CGIAR Research Program on Climate Change, Agriculture and Food Security (CCAFS).

Publication #4

Type: Working papers

CCAFS Themes: Theme 3

Citation: Alves-Pinto H, Newton P, Pinto L. 2013. Certifying sustainability: opportunities and challenges for the cattle supply chain in Brazil. CCAFS Working Paper No. 57. Copenhagen, Denmark: CGIAR Research Program on Climate Change, Agriculture and Food Security (CCAFS).

Publication #5

Type: Other

CCAFS Themes: Theme 3

Citation: Wilkes A, Tennigkeit T, Solymosi K. 2013. National integrated mitigation planning in agriculture: a review paper. Mitigation of Climate Change in Agriculture Series 7. Rome, Italy: Food and Agriculture Organization of the United Nations (FAO).

Publication #6

Type: Other

CCAFS Themes: Theme 3

Citation: Wilkes A, Tennigkeit T, Solymosi K. 2013. National integrated mitigation planning in agriculture: a guidance document. Mitigation of Climate Change in Agriculture Series 8. Rome, Italy: Food and Agriculture Organization of the United Nations (FAO).

Publication #7

Type: Policy briefs

CCAFS Themes: Theme 3

Citation: Foster K, Neufeldt H, Franks P, Diro R, Munden L, Anand M, Wollenberg E. 2013. Climate Finance for Agriculture and Livelihoods. ICRAF Policy Brief 15. Nairobi, Kenya. World Agroforestry Centre (ICRAF).

Publication #8

Type: Journal papers

CCAFS Themes: Theme 3

Citation: Carvalho MTM, Madari BE, Leal WGO, Costa AR, Machado PLOA, Silveira PM, Moreira JAA, Heinemann AB. 2013. Nitrogen fluxes from irrigated common‐bean as affected by mulching and mineral fertilization. Pesquisa Agropecuária Brasileira 48(5): 478-486.

Publication #9

Type: Working papers

CCAFS Themes: Theme 3

Citation: Newton P, Agrawal A, Wollenberg L. 2013. Interventions for achieving sustainability in tropical forest and agricultural landscapes. CAPRi Working Paper No. 110. Washington, DC: International Food Policy Research Institute (IFPRI).

Publication #10

Type: Journal papers

CCAFS Themes: Theme 3

Citation: Arias-Navarro C, Díaz-Pinés E, Kiese R, Rosenstock TS, Rufino MC, Sterne D, Neufeldt H, Verchot LV, Butterbach-Ball. 2013. Gas pooling: A sampling technique to overcome spatial geterogeneity of soil carbon dioxide. Soil Biology & Biochemistry 67:20-23.

Publication #11

Type: Journal papers

CCAFS Themes: Theme 3

Citation: Shi Y, We W, Meng F, Zhang Z, Zheng L, Wang D. 2013. Integrated management practices significantly affect N2O emissions and wheat–maize production at field scale in the North China Plain. Nutrient Cycle Agroecosystems 95:203–218.

Publication #12

Type: Journal papers

CCAFS Themes: Theme 3

Citation: Olander L, Wollenberg E, Tubiello F, Herold M. 2013. Advancing agricultural greenhouse gas quantification. Environmental Research Letters 8:011002.

Publication #13

Type: Journal papers

CCAFS Themes: Theme 3

Citation: Berry NJ, Ryan CM. 2013. Overcoming the risk of inaction from emissions uncertainty in smallholder agriculture. Environmental Research Letters 8:011003.

Publication #14

Type: Journal papers

CCAFS Themes: Theme 3

Citation: Keith Paustian. 2013. Bridging the data gap: engaging developing country farmers in greenhouse gas accounting. Environmental Research Letters 8:021001.

Publication #15

Type: Journal papers

CCAFS Themes: Theme 3

Citation: Rosenstock TS, Rufino MC, Butterbach-Bahl K, Wollenberg E. 2013. Toward a protocol for quantifying the greenhouse gas balance and identifying mitigation options in smallholder farming systems. Environmental Research Letters. 8:021003.

Publication #16

Type: Journal papers

CCAFS Themes: Theme 3

Citation: Tubiello FN, Salvatore M, Rossi S, Ferrara A, Fitton N, Smith P. 2013. The FAOSTAT database of greenhouse gas emissions from agriculture. Environmental Research Letters 8:015009

Publication #17

Type: Journal papers

CCAFS Themes: Theme 3

Citation: Ogle SM, Buendia L, Butterbach-Bahl K, Breidt FJ, Hartman M, Yagi K, Nayamuth R, Spencer S, Wirth T, Smith P. 2013. Advancing national greenhouse gas inventories for agriculture in developing countries: improving activity data, emission factors and software technology. Environmental Research Letters 8:015030.

Publication #18

Type: Journal papers

CCAFS Themes: Theme 3

Citation: Lloyd CR, Rebelo LM, Finlayson CM. 2013. Providing low-budget estimations of carbon sequestration and greenhouse gas emissions in agricultural wetlands. Environmental Research Letters 8:015010.

Publication #19

Type: Journal papers

CCAFS Themes: Theme 3

Citation: Vågen TG, Winowiecki LA. 2013. Mapping of soil organic carbon stocks for spatially explicit assessments of climate change mitigation potential. Environmental Research Letters 8:015011.

Publication #20

Type: Journal papers

CCAFS Themes: Theme 3

Citation: Milne E, Neufeldt H, Rosenstock T, Smalligan M, Cerri CE, Malin D, Easter M, Bernoux M, Ogle S, Casarim F, Pearson T, Bird DN, Steglish E, Ostwald M, Denef K, Paustian K. 2013. Methods for the quantification of GHG emissions at the landscape level for developing countries in smallholder contexts. Environmental Research Letters 8:015019.

Publication #21

Type: Journal papers

CCAFS Themes: Theme 3

Citation: Columb V, Touchemoulin O, Bockel L, Chotte JL, Martin S, Tinlot M, Bernoux M. 2013. Selection of appropriate calculators for landscape-scale greenhouse gas assessment for agriculture and forestry. Environmental Research Letters 8:015029.

Publication #22

Type: Journal papers

CCAFS Themes: Theme 3

Citation: Reisinger A, Ledgard S. 2013. Impact of greenhouse gas metrics on the quantification of agricultural emissions and farm-scale mitigation strategies: a New Zealand case study. Environmental Research Letters 8:025019.

Publication #23

Type: Journal papers

CCAFS Themes: Theme 3

Citation: Modernel P, Astigarraga L, Picasso V. 2013. Global versus local environmental impacts of grazing and confined beef production systems. Environmental Research Letters 8:035052.

Publication #24

Type: Journal papers

CCAFS Themes: Theme 3

Citation: Lobell DB, Baldos ULC, Hertel TW. 2013. Climate adaptation as mitigation: the case of agricultural investments. Environmental Research Letters 8:015012.

Publication #25

Type: Journal papers

CCAFS Themes: Theme 3

Citation: Hussein Z, Hertel T, Golub A. 2013. Climate change mitigation policies and poverty in developing countries. Environmental Research Letters 8:035009.

Publication #26

Type: Journal papers

CCAFS Themes: Theme 3

Citation: Valin H, Havlik P, Mosnier A, Herrero M, Schmid E, Obersteiner M. 2013. Agricultural productivity and greenhouse gas emissions: trade-offs or synergies between mitigation and food security? Environmental Research Letters 8:035019.

Publication #27

Type: Journal papers

CCAFS Themes: Theme 3

Citation: Signor D, Cerri CEP, Conant R. 2013. N2O emissions due to nitrogen fertilizer applications in two regions of sugarcane cultivation in Brazil. Environmental Research Letters 8:015013.

Publication #28

Type: Journal papers

CCAFS Themes: Theme 3

Citation: Silva-Olaya AM, Cerri CEP, La Scala Jr N, Dias CTS, Cerri CC. 2013. Carbon dioxide emissions under different soil tillage systems in mechanically harvested sugarcane. Environmental Research Letters 8:015014.

Publication #29

Type: Journal papers

CCAFS Themes: Theme 3

Citation: Hensen A, Skibe U, Famulari D. 2013. Low cost and state of the art methods to measure nitrous oxide emissions. Environmental Research Letters 8:025022.

Publication #30

Type: Journal papers

CCAFS Themes: Theme 3

Citation: VanderZaag AC, MacDonald JD, Evans L, Vergé XPC, Desjardins RL. 2013. Towards an inventory of methane emissions from manure management that is responsive to changes on Canadian farms. Environmental Research Letters 8:035008.

Publication #31

Type: Journal papers

CCAFS Themes: Theme 3

Citation: Burzaco JP, Smith DR, Vyn TJ. 2013. Nitrous oxide emissions in Midwest US maize production vary widely with band-injected N fertilizer rates, timing and nitrapyrin presence. Environmental Research Letters 8:035031.

Publication #32

Type: Working papers

CCAFS Themes: Theme 3

Citation: Shames S, Bernier Q, Masiga M. 2013. Development of a participatory action research approach for four agricultural carbon projects in East Africa. CAPRi Working Paper No. 113. Washington D.C.: International Food Policy Research Institute (IFPRI).

Publication #33

Type: Journal papers

CCAFS Themes: Theme 3

Citation: Newton P, Agarwal A, Wollenberg E. 2013. Enhancing the sustainability of commodity supply chains in tropical forest and agricultural landscapes. Global Environmental Change, 23:6: 1761–1772.

Publication #34

Type: Working papers

CCAFS Themes: Theme 3

Citation: Kissinger G, Patterson C, Neufeldt H. 2013. Payments for ecosystem services schemes: project---level insights on benefits for ecosystems and the rural poor. ICRAF Working Paper No 172. Nairobi: World Agroforestry Centre

Publication #35

Type: Journal papers

CCAFS Themes: Theme 3

Citation: Harvey CA, Chacón M, Donatti CI, Garen E, Hannah L, Andrade A,Bede L, Brown D, Calle A, Chará J, Clement C, Gray E, Hoang MH, Minang P, Rodríguez AM, Seeberg-Elverfeldt C, Semroc B, Shames S, Smukler S, Somarriba E, Torquebiau E, van Etten J, Wollenberg E,. 2013. Climate-smart landscapes: opportunities and challenges for integrating adaptation and mitigation in tropical agriculture. Conservation Letters 00:1–14.

Publication #36

Type: Journal papers

CCAFS Themes: Theme 1, Theme 2, Theme 3

Citation: Neufeldt H, Jahn M, Campbell C, Beddington JR, DeClerck F, De Pinto A, Hellin J, Herrero M, Jarvis A, LeZaks D, Holger M, Rosenstock T, Scholes M, Scholes R, Vermeulen S, Wollenberg E, Zougmoré R. 2013. Beyond climate-smart agriculture – toward safe operating spaces for global food systems. Agriculture and Food Security 2(12).

Publication #37

Type: Journal papers

CCAFS Themes: Theme 3

Citation: Newton P, Agrawal A, Wollenberg E. 2013. Enhancing the sustainability of commodity supply chains in tropical forest and agricultural landscapes. Global Environmental Change 23: 1761-1772.

4. Communications

Media campaigns:

Media campaign around the release of the special issue of Environmental Research Letters: Focus on Improving Quantification of Agricultural Greenhouse Gases.Development of infographics with the key messages from the special issuePress releaseBlog

Blogs:

22-Jan-13: Ever wondered how REDD+ can work, or if it can work?
28-Jan-13: The promse and pitfalls of agricultural carbon projects
15-Feb-13: Step-by-step, strategies for low-emission cultivation are being explored
28-Feb-13: Carbon and communities: innovative approaches to agriculture and forest management in Indonesia
5-Apr-13: New paper outlines gender strategy for pro-poor mitigation research
14-Apr-13: From field to landscape: Tackling mitigation and livelihoods with help from farmers
20-May-13: Countries reach for food security while reducing agriculture's climate costs
24-Jun-13: Vietnam's fields to get 'climate proofed' with new investment focus
22-Jul-13: Reducing agriculture emissions while maintaining yields, can it be done?
22-Jul-13: Commodity agriculture: supply chains and sustainability
31-Jul-13: Tropical Peat Swamp Forests: how land use change effects methane and carbon emissions
15-Aug-13: Exploring sustainable palm oil production in Indonesia
22-Aug-13: Are there synergies between climate change adaptation and mitigation in coffee production?
13-Sep-13: Gas pooling: the best way to measure soil emissions more efficiently?
1-Oct-13: Getting the process started: developing national mitigation plans for agriculture
8-Oct-13: Examining the new sustainable beef production certification in Brazil
22-Oct-13: Lower emissions in Latin American agriculture: can we reach that goal?
31-Oct-13: New guidelines address agricultural emissions in peatlands and mangroves
13-Nov-13: Rolling up our sleeves: agriculture, landscapes and greenhouse gas emissions
23-Dev-13: Investing in the next generation of climate and agriculture scientists

Websites:

New CLIFF webpage: http://ccafs.cgiar.org/climate-food-and-farming-network
SAMPLES website: www.worldagroforestry.org/samples

Social media campaigns:

Facebook messaging by Julianna White to publicize Todd Rosenstock's Dec. 4 live-stream presentation on SAMPLES.

Newsletters:

4 newsletters to mitigation scientists within the CGIAR:May 17, June 14, Sept. 10 and Nov. 15

Events:

1. Side event at SBSTA 2013: http://ccafs.cgiar.org/blog/low-emissions-development-agriculture-new-tools
2. Global Landscapes Forum in Warsaw at COP 19- Technical and Networking Session with Pete Newton: http://www.landscapes.org/agenda-item/day-1-nov-16-2/technical-networking-sessions/technical-networking-sessions-slot-1/innovative-governance-commodity-agriculture-forest-landscapes-outlooks-food-fuel-forests-fiber-4f
3. CLIFF kick-off workshop at Aarhus University Foulum (Denmark): http://ccafs.cgiar.org/blog/investing-next-generation-climate-and-agriculture-scientists
4. Workshop on innovation and gender in low-emission agriculture, 29 April to 1 May 2013 in Phnom Penh, Cambodia
5. IIASA planning meetingAny meetings in Indonesia?

Videos and other multimedia:

CCAFS Live-Streamed Science Seminar: http://ccafs.cgiar.org/events/live-stream-improving-quantification

2 webinars co-organized with Latin American regional program and the UNEP Latin American Community of Practice on Mitigation in Agriculture

1. "Herramientas y esquemas aplicados en la región para el sector agropecuario" http://finanzascarbono.org/comunidad/pg/webinars/group/group:168604/view/357553/herramientas-y-esquemas-aplicados-en-la-region-para-el-sector-agropecuario
2. "Sinergias entre Adaptación y Mitigación en la agricultura" http://finanzascarbono.org/comunidad/pg/webinars/group/group:168604/view/341211/sinergias-entre-adaptacion-y-mitigacion-en-la-agricultura

Other communications and outreach:

None

5. Case studies

Case Study #1

Title:
Climate, Food and Farming Network
Author: Meryl Richards
Type: Inter-center collaboration,Capacity enhancement

Project description:

The Climate, Food and Farming Network began in 2011 as a join initiative of CCAFS, Copenhagen University, and Aarhus University, with overall goal to build capacity among young scientists for research on climate change, agriculture, and food security. In late 2011, CCAFS awarded grants of $3,000 to 8 Ph.D students conducting work on climate change and agriculture in developing countries, and organized a learning and networking workshop for the students. The same model was followed in 2012, though grants were increased to $5,000. In 2013, CLIFF awarded grants of $10,000 to 9 students. These students will use their grants for 3-4 month research stays with CCAFS scientists at CGIAR centers, contributing to research under the SAMPLES project (worldagroforestry.org/samples) and learning methods that they can then apply in their own research. Word about the program is spreading, and there were over 140 applicants in 2013, allowing us to choose a strong pool of grant recipients, all of whom are from developing countries and have research interests relevant to CCAFS priorities.

Introduction / objectives:

The network has two objectives: (1) to build the capacity of young scientists, working in developing countries, to help farmers adapt to and mitigate climate change and (2) to generate novel research on climate change in smallholder systems.

Project results:

Over a period of 3 years the CLIFF network has supported a total of 27 students from multiple countries to work on a diverse range of topics related to climate change and agriculture. The supported students have so far managed to publish or submit for publication at least 7 publications in scientific peer-reviewed journals and conference proceedings (see publications list below). Several manuscripts are still being developed. The scientific contacts gained by the students have also been valuable; for example, Cristina Arias-Navarro and Elizabeth Adobi Okwuosa, who first met at a CLIFF workshop, shared information and contacts which enabled Elizabeth to obtain further funding for her PhD research.In a survey of the 8 grant recipients from 2011, conducted in early 2013, all 8 students reported that the grant had allowed them to conduct field work that they would not have otherwise been able to conduct. Half of the students had already shared their research results with stakeholders, such as farmers in Indonesia, project managers at Oxfam and Heifer, and local governments in China.

Partners:

University of CopenhagenAarhus UniversityMultiple CG centers: ICRAF, ILRI, CIFOR, CIAT, IRRIGrant recipients come from numerous universities; see CLIFF network webpage for complete list: ccafs.cgiar.org/climate-food-and-farming-network

Links/sources for further information:

CLIFF webpage: http://ccafs.cgiar.org/climate-food-and-farming-network

Blogs:http://ccafs.cgiar.org/blog/investing-next-generation-climate-and-agriculture-scientists

http://ccafs.cgiar.org/blog/reducing-agriculture-emissions-while-maintaining-yields-can-it-be-done

http://ccafs.cgiar.org/blog/gas-pooling-best-way-measure-soil-emissions-more-efficiently

News item from Aarhus University:

http://dca.au.dk/en/current-news/news/show/artikel/translate-to-english-unge-forskere-fra-ulande-laerte-om-muligheder-for-at-mildne-klimaforandringe/

List of publications by CLIFF students:

Arias-Navarro C, Díaz-Pinés E, Kieseb R, Rosenstock TS, Rufino MC, Stern D, Neufeldt H, Verchot LV, Butterbach-Bahl K. 2013. Gas pooling: a sampling technique to overcome spatial heterogeneity of soil carbon dioxide and nitrous oxide fluxes. Soil Biology and Biochemistry 67: 20–23.

Carvalho MTM, Madari BE, Leal WGO, Costa AR, Machado PLOA, Silveira PM, Moreira JAA, Heinemann AB. 2013. Nitrogen fluxes from irrigated common‐bean as affected by mulching and mineral fertilization. Pesquisa Agropecuária Brasileira 48(5): 478-486.

Ding L, Wang C, Lu Q, Yan Z, Shi Z. 2013. Effects of Configuration and Head Space Wind Profile on the Performances of Flux Chambers in Gas Emission Measurement: A Laboratory Study. American Society of Agricultural and Biological Engineers. Paper Number 131619989. Kansas City, Missouri, USA.

Guarnacci, U. 2012 Governance for sustainable reconstruction after disasters: Lessons from Nias, Indonesia. Environmental Development 2:73-85.

Kansiime MK, Wambugu SK, Shisanya CA. 2013. Perceived and actual rainfall trends and variability in Eastern Uganda: implications for community preparedness and response. Journal of Natural Sciences Research 3(8).

Nyamadzawo G, Wuta M, Chirinda N, Smith JL. 2013. An estimation of greenhouse gas emissions from seasonal wetland (dambo) rice in Chiota smallholder farming area of Zimbabwe. Atmospheric Climate Sciences. 3:13-20.

Nyamazawo G, Wuta M, Nyamangara J, Nyamugafata P, Chirinda N. 2013. Optimizing dambo (vlei) cultivation for climate change adaptation and sustainable crop production in the smallholder farming areas of Zimbabwe.

(accepted)

Yusuf H. 2013. Managing semi-arid rangelands for carbon storage: Grazing and wood encroachment effects on soil carbon and nitrogen. (submitted)

Case Study #2

Title:
Scaling up local innovation in low-emission agriculture
Author: Meryl Richards
Type: Social differentiation and gender,Innovative non-research partnerships,Participatory action research

Project description:
In 2013, CCAFS Theme 3 published a gender strategy for pro-poor climate change mitigation, with the purpose of "assuring that mitigation efforts meet the goals of poverty alleviation and food security, and do so in ways that benefit poor women materially, personally and socially." This strategy is now being put into action in collaboration with Prolinnova and researchers at the University of Virginia.The project began with a workshop with 25 participants, to review what is currently being done by to promote innovation that contributes to lowering emissions in agriculture whilst promoting gender justice. The discussion from the workshop informed a framework for women's innovation in low emission agriculture as well as three action research pilot projects in Honduras, Cambodia, and Bangladesh. These pilots are now being developed into larger-scale activities, linking farmer-led groups with regional institutions and others within the innovation system, with a research component focused on the enabling factors for scaling up local innovations that benefit women and men.

Introduction / objectives:
1. Stimulate women's innovation in low emission agriculture, an aspect that has been given little attention in agricultural development and climate change mitigation interventions.
2. Generates experience and lessons on how women can be supported to innovate in ways that lead to improved food security, more equitable gender relations and reduce emissions.

Project results:
The three action research projects supported groups of women and men in experimentation with low emissions innovations: locally designed agroforestry plots and eco-stoves in Honduras, bioslurry and biochar for soil conditioning in Cambodia, and participatory video learning on vermicomposting and soil carbon storage in Bangladesh. The local NGOs that are supporting these projects are linking the farmers with local government and agricultural extension actors, to expand the technologies to new areas. However, all the partners have agreed that it is the process of experimentation and adaptation of a new technology that is critical, and this is where the project's biggest impact will be. For example, agricultural university partners in Bangladesh are working with extension agents to encourage local experimentation, which will impact 10s of thousands of farmers. Prolinnova's network of NGO partners will leverage the lessons learned from these in-depth projects to enable the spreading of farmer innovations to larger scales.

Partners:
ProlinnovaU. VirginiaFundación para la Investigación Participativa con Agricultores de Honduras (FIPAH), Cambodian Centre for Study and Development in Ag. (CEDAC), Dept. of Ag. Extension Education (DAEE) of

Bangladesh Agricultural U. (BAU)

Links/sources for further information:

http://ccafs.cgiar.org/new-paper-outlines-gender-strategy-pro-poor-mitigation-research

http://www.prolinnova.net/gender

6. Outcomes

Outcomes #1

Title:

Carbon project partners use institutional innovation lessons in project design and development

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

In 2010, CCAFS began a participatory research process with six agricultural carbon projects in sub-Saharan Africa to assess the institutional arrangements of these projects through case studies, generating lessons for other agricultural mitigation projects. The lessons generated from the first phase of this project included:(1) Prioritize the non-carbon project benefits of improved agricultural productivity and community strengthening(2) Cultivate strong relationships between the carbon managers and community groups(3) Empower local actors to manage projects, and(4) Develop partnerships for scaling up.These results were shared with the carbon project partners in a workshop in 2011 and published in Shames et al. 2012. As a result of the participatory research process, the NGO partners (project managers and field staff) identified #3 and #4 as the areas needing most improving in their projects. In particular, they sought to build the capacity of community facilitators and government extensionists to sustainably manage the carbon projects so that climate smart practices would continue after the NGOs left.Following this workshop, two NGO partners (ECOTRUST Uganda and Vi Agroforestry) engaged in a participatory learning process with Ecoagriculture partners and CCAFS to identify specific weaknesses in their current capacity building efforts and develop action plans for improving them. In the case of Vi Agroforestry, the research indicated that farmers lacked faith in the technical capacity of the project's community facilitators, which prevented them from adopting agroforestry practices. There was also a need for better training of project facilitators on how to monitor carbon benefits, and more extension to farmers on how to produce tree seeds and seedlings so that trees could be replanted. Vi has now established demonstration plots to build farmer confidence in agroforestry practices, and developed a training manual for community facilitators to address the knowledge gaps that were identified in the research. The manual will be used across their projects, which reach over 40,000 farmers in Kenya.ECOTRUST, meanwhile, had no training materials, which meant that only paid ECOTRUST project staff could provide extension information to farmers. Using recommendations from the research, they developed a comprehensive manual for training local project promoters. The manual was piloted at their core Mbale project site (93 farmers), where they are working with local government to implement a sustainable financing mechanism that will last beyond the current UNDP-funded project. This will allow the organization to scale up at other sites in Uganda by working with more farmers groups and community-based organizations as a "trainer of trainers."Vi and ECOTRUST will assess the effectiveness of these changes in 2015 using an evaluation tool co-developed with researchers.The lessons learned from these case studies have also informed carbon project funders and developers of certification standards. The Climate, Community and Biodiversity Alliance (which develops standards for projects that deliver joint benefits for climate change mitigation, biodiversity, and community livelihoods) drew from this research in developing a new edition of their standards that can be used with smallholder projects.

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

Shames S, Wollenberg E, Buck LE, Kristjanson P, Masiga M and Biryahwaho B. 2012. Institutional innovations in African smallholder carbon projects. CCAFS Report 8. Copenhagen: CGIAR Research Program on Climate Change, Agriculture and Food Security (CCAFS). Shames S. 2013. How can small-scale farmers benefit from carbon markets? CCAFS Policy Brief No. 8. Copenhagen, Denmark: CGIAR Research Program on Climate Change, Agriculture and Food Security (CCAFS)Shames S, Bernier Q, Masiga M. 2013. Development of a Participatory Action Research Approach for four agricultural carbon projects in East Africa. CAPRi Working Paper 113. Washington, DC: International Food Policy Research Institute (IFPRI).Wollenberg E, Higman S, Seeberg-Elverfeldt C, Neely C, Tapio-Bistrom M.-L, Neufeldt H. 2012. Helping smallholder farmers mitigate climate change. CCAFS Policy Brief 5. Copenhagen, Denmark: CGIAR Research Program on Climate Change, Agriculture and Food Security (CCAFS).Havemann T, Muccione V. 2011. Mechanisms for agricultural climate change mitigation incentives for smallholders. CCAFS Report 6. Copenhagen, Denmark: CGIAR Research Program on Climate Change, Agriculture and Food Security (CCAFS).Workshops: Workshop on Institutional Analysis and Capacity Building of Agricultural Carbon Projects in AfricaCo-convened by EcoAgriculture Partners and CCAFSNovember 3-5, 2010, Jacaranda Hotel, Nairobi, KenyaWorkshop on lessons from Phase 1 of project: Institutional assessmentCo-convened by EcoAgriculture Partners and CCAFSSeptember 22–23, Kisumu, Kenya(This is when the findings published in Shames et al. 2012 were shared with NGO partners)

What partners helped in producing the outcome?

Ecoagriculture PartnersEnvironmental Conservation Trust Of Uganda (ECOTRUST)*Vi Agroforestry*Nature Harness InitiativeCARE Cocoa Carbon InitiativeICRAFHumbo Assisted Natural Regeneration Project (Ethiopia)Climate, Community and Biodiversity Alliance (CCBA)*As this was a participatory action research process, Vi and ECOTRUST can be considered partners in the research. However, research is not the primary goal of these organizations.

Who used the output?

Environmental Conservation Trust Of Uganda (ECOTRUST)Vi AgroforestryClimate, Community and Biodiversity Alliance

How was the output used?

1. Vi Agroforestry and ECOTRUST Uganda changed the structure of their projects to improve institutional sustainability using recommendations from CCAFS research (see above). 2. CCBA incorporated findings from CCAFS case studies in their standards for smallholder carbon projects..

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.

2013 CAPRi working paper documents the entire PAR process:Shames S, Bernier Q, Masiga M. 2013. Development of a Participatory Action Research Approach for four agricultural carbon projects in East Africa. CAPRi Working Paper 113. Washington, DC: International Food Policy Research Institute (IFPRI).ECOTRUST Uganda's 2013 report describes the gaps the research found in their capacity building program and the actions

that they are taking to address these gaps. The report has not been formally published:Masiga, M, Kalunda PN, Kiguli, L, Katusiime C. 2013. Gap analysis for ECOTRUST capacity building activities with project partners and CBOs in Uganda. Kampala, Uganda: Environmental Conservation Trust of Uganda (ECOTRUST).CCBA used text from Shames et al. 2012 in their 2013 revised standards, and acknowledge input from CCAFS in the standards (https://s3.amazonaws.com/CCBA/Third_Edition/Rules_for_the_Use_of_the_CCB_Standards_December_2013.pdf).Priti Narasimhan an Advisor to the CCB Standards at Conservation International, described the use of CCAFS outputs in an email:"The Third Edition of the CCB Standards was recently launched last month after a year-long transparent and participatory process. One of the main objectives of the revision was to support and increase access to finance for smallholder-led projects. The primary way in which this objective has been met is by providing an opportunity for projects where smallholders and community members implement activities on land they own or manage, to showcase their multiple benefit and risk management quality through the Exceptional benefits Community Gold Level. The indicators for this Gold level were developed based on extensive research, production of case studies and workshops. The indicators in this section relate to equitable benefit sharing both with the smallholders and also among them by ensuring that benefits flow to women and other marginalized and vulnerable groups including building capacity for active involvement of smallholders in decision making, implementation and eventually in management of the project and institutional arrangements that facilitate active management. Apart from inputs from Seth Shames and Lini Wollenberg, some of the CCAFS publications that we used for development of the smallholder module are:CCAFS Report no 8: Institutional innovations in African smallholder carbon projectsCCAFS Policy brief 5: Helping smallholder farmers mitigate climate changeCCAFS: Mechanisms for agricultural climate change mitigation incentives for smallholders"

Outcomes #2

Title:

East African Dairy Development program adopts Climate Smart Agriculture

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

The East African Dairy Development program of Heifer International began in 2008 with the goal of improving profits for dairy producers in Kenya, Tanzania, and Uganda. The World Agroforestry Center (ICRAF) has been a partner in this program during the first five years, helping Heifer reach 179,000 farming families and increasing their earnings by a collective $131 million (http://www.heifer.org/join-the-conversation/blog/2014/January/heifer-launches-eadd-ii.html). ICRAF supports EADD in the animal feed and fodder components of the program. In the first phase of EADD (2008-2013), Heifer focused on improving milk production and quality, production efficiency, and access to markets through the formation of Dairy Farmer Business Associations—hubs through which farmers can market their products and access services such as finance and technical support. Climate change was not an explicit consideration in this phase of the program. By increasing productivity per animal and decreasing milk loss in the production chain, EADD Phase I may have decreased greenhouse gas emissions per unit product, but this impact was not quantified.Due to the involvement of CCAFS Theme 3 and ICRAF, in particular EADD's partnership with the Standard Assessment of Mitigation Potential and Livelihoods in Smallholder Systes (SAMPLES) project led by Todd Rosenstock, EADD has

developed strategies for addressing climate change in Phase II of the program, which has now been funded for the next four years. The proposal for Phase II lists “Adopt climate smart agricultural techniques to reduce negative impacts of livestock-produced methane on the environment” as an objective, to be achieved by integrating sustainable land management practices into the feeding systems component of the program.

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

Ongoing input by ICRAF and SAMPLES researchers into EADD programThornton PK, Herrero M. 2010. Potential for reduced methane and carbon dioxide emissions from livestock and pasture management in the tropics. Proceedings of the National Academy of Sciences of the United States of America, 107(46), 19667–72. doi:10.1073/pnas.0912890107

What partners helped in producing the outcome?

CCAFSHeifer InternationalFAO-MICCA (FAO-MICCA funds SAMPLES field sites at the EADD project site in Kaptumo, Kenya)ICRAFGates Foundation (funding Phase II of EADD)

Who used the output?

Heifer International East African Dairy Development program

How was the output used?

Heifer International used evidence from CCAFS research to select climate smart agriculture interventions for Phase II of the East African Dairy Development program. Specifically, EADD adopted reduction of GHG emission as a program objective based on evidence that better feeding and manure management can contribute both to GHG reduction and improved income for farmers..

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.

Onesmo N.E Shuma, Deputy Regional Director the East Africa Dairy Development (EADD) Project, wrote:"I am writing in connection with our ongoing work with ICRAF, and more specifically, on the component of ‘climate smart agriculture’, which ICRAF is well placed to bring on board to address environmental related issues, as part of our wider efforts to ensure sustainability of our interventions under EADD project. In this regard, we are pleased to have worked with ICRAF and the Mitigation of Climate Change in Agriculture (MICCA) project, promoting climate smart agriculture for EADD dairy farmers in Kaptumo Dairy Farmers Business Association, Kenya. The integration of climate smart agriculture into phase II has partly been the effect of MICCA and ICRAF efforts."

7. Outcome indicators

Outcome indicator #1

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:

* Decision-makers in Colombia commissioned CIAT to identify suitable practices and areas for implementing agroforestry and silvopastoral systems as a mitigation option. This work will be complete in 2014, and is feeding directly into a NAMA proposal.* CSA taken up by Heifer East African Dairy Development program in East Africa (see outcome report)• IFPRI completed model-driven analyses of LED pathways (using IMPACT and land use modeling) for Vietnam and Bangladesh. Modeling process underway in Zambia and Colombia.* IFPRI has influenced planning for mitigation and adaptation in Burkina Faso

Evidence:

Colombia: final report not yet availableEast Africa Dairy Development: see outcome reportIFPRI: no study on this indicator has been conducted

Outcome indicator #2

Outcome indicator:

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

Achievements:

* Work by CIAT and IITA on trade-offs in coffee systems in Nicaragua (LAM) is contributing to Sustainable Agriculture Initiative product category rules (PCR) for quantifying the carbon footprint of coffee production.* Carbon market projects in East Africa using institutional innovations from CCAFS research (see outcome story)* NAMA MRV design in Kenya

Evidence:

SAI platform PCR: http://www.saiplatform.org/activities/alias/climate-change/coffee-pcr-projectEast Africa carbon markets: see outcome storyNAMA MRV design: UNIQUE Project Report: Testing climate benefit and perfor-mance monitoring systems for an agricultural NAMA in Kenya

Outcome indicator #3

Outcome indicator:

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

Achievements:

* IRRI contributed to a CDM methodology for methane emission reduction by adjusted water management practice in rice cultivation* IRRI facilitated and submitted a CDM methodology for preventing straw burning to UNFCCC* IRRI/SAMPLES has strong linkages with the Global Research Alliance paddy rice group, and 5 countries within this group of the GRA are harmonizing GHG measurement protocols with IRRI* CCAFS T3 and collaborators at EcoAgriculture Partners had substantial input into new CCBA standards for smallholders (see Outcome story)* CIFOR research contributed substantially to wetlands supplement to IPCC guidelines, which is now a part of mandatory country reporting to the UNFCCC* Draft chapters of SAMPLES protocol completed

Evidence:

Rice water management CDM: http://ccafs.cgiar.org/publications/alternate-wetting-and-drying-philippine-rice-production-feasibility-study-cleanKick-off of IRRI's measurement harmonization project: http://irri-news.blogspot.com/2013/01/philippines-irri-holds-workshops-on.htmlIPCC wetlands supplement: http://www.ipcc-nggip.iges.or.jp/home/docs/wetlands/Wetlands_Supplement_precopyedit.pdf

8. Leveraged funds

Leveraged fund

Title:

University of Michigan leverage an additional $21,777 from private donors for work on institutions for avoided deforestation in Indonesia and Brazil.

Partner name: University of Michigan

Budget: $21777

Theme: T3

9. Theme Leader Summary by outputs

Output: 3.1.1

Summary:

CIAT identified best bets for reducing agricultural emissions in Colombia and restoring degraded lands in LAM while reducing emissions. GHG measurements are underway in multiple silvopastoral and fruit tree prototype systems. CIAT has also assessed the economic viability of these options for implementation in Colombia as part of a NAMA. In sub-Saharan Africa, CIAT developed a set of preliminary metrics to assess climate change resilience and adaptation needs of eco-efficient agriculture.

CIAT and IITA published a paper on trade-off analysis between mitigation, adaptation and farmers livelihoods in coffee systems in Nicaragua. Results are contributing to product category rules (PCR) for quantifying the carbon footprint of coffee production. This work will continue on coffee in EA and cocoa in WA under a grant from GIZ. IITA also examined cocoa as a driver for deforestation in DR Congo, with the support of T3. The key findings showed that deforestation is still largely driven by population movements and expansion, with staple food crops being most important

ICRAF completed a study on policy options towards comprehensive approach to reducing emissions from the effective and efficient fertilizer use in China, with several publications and a workshop for ag technicians, as well as a workshop and scoping study for an analysis of mechanisms to support adoption of low-carbon agricultural options in East Asia

IFPRI completed model-driven analyses of LED pathways (using IMPACT and land use modeling) for Vietnam and Bangladesh. Modeling process underway in Zambia and Colombia.

Output: 3.1.2

Summary:

No center reported on 3.1.2 in 2013.

Output: 3.2.1

Summary:

CIMMYT completed an ssessment of economic and GHG benefits of switching to zero-tillage in wheat/rice systems in IGP, and of using laser land leveling in IGP rice systems

ICRAF assessed the feasibility of bioenergy provision by the agroforestry sector in East Africa, including case studies and a publication on project costs and governance of biocarbon projects, with several NGO collaborators. ICRAF's headquarters became certified carbon neutral this year.

IFPRI completed data collection on comparative economic viability of biochar adoption in Vietnam, Kenya, and Ghana.

ILRI made progress on an ongoing synthesis on carbon sequestration and incentives for mitigation in rangelands. Further work on this topic will completed as part of SAMPLES in 2014.

Output: 3.3.1

Summary:

Data collection and synthesis on greenhouse gas reductions and socioeconomic feasibility of agricultural mitigation practices continued under the Standard Assessment of Mitigation Potential and Livelihoods in Smallholder Systems (SAMPLES) program. Four joint publications from ICRAF, ILRI, and CIFOR in East Africa on methods for GHG quantification, as well as GHG flux and soil carbon measurements from tea, livestock, and cereal systems in Kenya and Tanzania at over 100 sites. IRRI continued field experiments and model development to improve mechanistic understanding of mitigation effects in rice-based systems in terms of element cycles and ecosystem functions. IRRI also tested MRV guidelines and developed protocols to ease MRV requirements for emissions reductions in rice systems and conducted interviews and extension activities to identify strategies to strengthen female engagement into mitigation projects in rice-based production systems. ILRI completed data collection from 249 dairy farming households in Kenya on the potential for reduction of emissions intensity by increasing milk yields. Publications to follow. CIFOR began modeling and measurement of CO2 emissions from peat in oil palm systems of Indonesia. Work on methods for GHG assessment in peat soils was published as a supplement to the 2006 IPCC guidelines (IPCC wetlands supplement). CIMMYT completed multi-year field trials (Mexico, India) on conservation agriculture, a database on GHG emissions for various CA-based management practices, and a meta-analysis of conservation agriculture, showing substantial benefit to soil quality but limited benefits to climate change mitigation. CIMMYT also examined optimum nutrient use efficiency practices for cereal systems in India and Mexico. 2 years of data have been completed, but these trials are ongoing. Multiple publications from CIMMYT's conservation agriculture and nutrient use efficiency work.

CIAT synthesized of results on potential of forage options to mitigate climate change (C sequestration

CIMMYT used the Cool Farm Tool to assess carbon footprint of maize in sub-Saharan Africa using their SIMLESA dataset, and calculated optimum N fertilization rates for yields and GHG emissions.

ICRAF has substantial work underway in E Africa to analyze the potential for smallholder communities to provide sufficient biomass for efficient pyrolysis liquid fuel production and assess biochar potential for C sequestration and improved management practices. A pyrolysis kiln to generate heat and liquid energy and biochar has been piloted in W. Kenya. Wood energy surveys have been completed and a report published.

CIAT and IITA launched a major project to assess cocoa and coffee based agricultural systems for carbon sequestration potential to mitigate risk of climate change and enhance food security. Funded by GIZ.

IRRI completed a CDM methodology for reduced burning of rice straw as a mitigation practice.

CIFOR collected data from 4 states on India on carbon stocks and land quality improvement from farmer assisted regeneration trials in the Indo-Gangetic Plains. One manuscript has been submitted.

Output: 3.3.2

Summary:

Under the SAMPLES program, ICRAF, ILRI, CIFOR have draft chapters for a protocol of GHG quantification methods. These three centers plus IRRI and CIMMYT are testing the methods. CIAT jointed the SAMPLES program in 2013 and will begin testing methods in 2014. ICRAF has also developed algorithms for remote sensing above-ground biomass and carbon and a framework for quantifying error propagation and cost-error trade-offs in soil carbon stock measurements. Substantial capacity building for GHG quantification (for students and NARS researchers) is embedded in SAMPLES. A training was conducted in June 2013 and conversations with extension agencies initiated. Currently four PhD students and six Masters students from four different Kenya and two European universities have been trained in the GHG emissions measurement process, and nine more will undertake training this year as part of the Climate Food and Farming Network. The capacity building has included training of technicians from NARES, further imbedding the capacity to government technicians and institutions. This capacity generated by the activity has been spread through the initial steps and establishment of a regional GHG emissions working group to showcase the methodologies, results and learning of the initial work to the wider regional community. This has included contributions to the Kenya National Roundtable as well as ground level contributions through the establishment of demonstration plots within the CCAFS regional benchmark sites.