RESEARCH PROGRAM ON
Climate Change,
Agriculture and
Food Security

Theme leader 4.2

2013 technical report

1. Activity Reporting

Activity 217-2013 (Milestone 4.2.1 2013 (1).)

Title: Backstopping CCAFS baselines and data management strategy implementation.

Status: **Complete.** The CCAFS baseline data for the initial 3 target regions, and for 3 levels, has now been completed and all data, tools, and site reports are now publicly available on the CCAFS dataverse. In addition, the CCAFS site portfolio document V3 has been released and site atlases for all CCAFS sites in the initial 3 target regions published. A manuscript reflecting on the CCAFS baselines has been submitted to the journal "Agriculture and Food Security" in January 2014 and a CCAFS Working Paper on a cross-site analysis will be published in early 2014.Also, the household GPS coordinates in all 15 core sites were independently rechecked at the end of the year to facilitate revisits.

Gender component:
The baseline surveys collect some disaggregated gender data.

Deliverables:
- A journal article and a CCAFS report will both be prepared using the data from the baseline surveys
The journal article has been submitted in January 2014, and the Working Paper will be completed in February 2014.

Partners:
SSC-UoR; INSAH; ICRAF; Makerere University; MARIL-Ethiopia; BCAS; CEAPRED; NARO; KARI; SARI; INRAN; ISRA; Maseno University; University of Dar es Salaam

Locations:
East Africa (EA),West Africa (WA),South Asia (SAs)

Activity 504-2013 (Milestone 4.2.1 2013 (1).)

Title: Baseline synthesis completed for the initial 3 CCAFS regions.

Status: **Complete.** A CCAFS Working Paper summarizing the household baseline results across the three initial target regions is being completed, available from the CCAFS website in early 2014. In addition, a brief is being produced that provides baseline indicators across the three levels for all CCAFS sites in the three initial regions. These analyses will form the basis for comparison of the midline data against the baseline.

Gender component:

The baselines collect some gender disaggregated data.

Deliverables:

- Journal article analyzing baseline data from all 3 regions

A manuscript on "How resilient are farming households, communities, men and women to a changing climate in Africa" is being finalized in early 2014. The manuscript looks at vulnerability and resilience of smallholders at the African CCAFS sites, utilising all three levels of the CCAFS baseline.

Partners:

SSC-UoR

Locations:

East Africa (EA),West Africa (WA),South Asia (SAs)

Activity 506-2013 (Milestone 4.2.1 2013 (1).)

Title: Site atlases assembled for all CCAFS sites.

Status: **Complete.** Site atlases were compiled for all CCAFS sites in the initial three target regions. The site atlases profile geospatial indicators of climate variability, biophysical characteristics and socioeconomic variables for each site.

Gender component:

Deliverables:

- One atlas per CCAFS site in East Africa, West Africa and South Asia (15 sites total)

All available from the ccafs website

Partners:

GeoMapa GIS

Locations:

East Africa (EA),West Africa (WA),South Asia (SAs)

Activity 512-2013 (Milestone 4.2.1 2013 (1).)

Title: Designing the implementation of the M&E strategy in relation to IDOs.

Status: **Complete.** As far as Phase 1 of CCAFS is concerned, this is essentially complete.

Gender component:

Gender is part of the M&E system.

Deliverables:

- Monitoring and evaluation plan

The M&E strategy implementation is essentially complete, as for Phase 1 of CCAFS. The document uploaded is

what was presented to the ISP-3 meeting (in 2012). This activity has largely been superseded by work on the FP4 trial etc.

Partners:

Locations:

Global

Activity 252-2013 (Milestone 4.2.1 2013 (2).)

Title: MarkSim version 2 and associated tools, development and testing; and revision of MarkSim-GCM with CMIP5 data

Status: **Complete.** MarkSim-GCM is now complete and uploaded, with CMIP5 data. At the same time, a version that can be run with the DSSAT crop modelling suite is complete and documented. Progress on MarkSim version 2 has been slower than anticipated, but is proceeding.

Gender component:

Deliverables:

- MarkSim2 software

MarkSim GCM and the stand-alone version of MarkSim now with CMIP5 data are complete.

- Software manual

Under development still, with the deferred deliverable 1 above. Documentation for the new MarkSim GCM tools are under the same URL.

- Report on the software development process

Documents in the intranet under Deliverable 3.

http://intranet.ccafs.cgiar.org/CRP%207%20Management/Reviewing%20and%20Reporting/Annual%20Reporting/TL%20and%20RPL%20Technical%20Reporting/2013/THEMES/T4/Activity%20252-2013/MarkSim.doc

Partners:

Waen Associates; SSC-UoR

Locations:

Global

Activity 253-2013 (Milestone 4.2.1 2013 (2).)

Title: Regional reports evaluating different climate models for the new target regions, from the perspective of agricultural impacts modelling.

Status: **Complete.** The report has been completed for SE Asia.

Gender component:

Deliverables:

- A report for the Southeast Asia region, made available on the CCAFS website

The report is completed, and will be formatted and put on the CCAFS website in early 2014. It is on the intranet.

Partners:

University of Oxford

Locations:

Activity 254-2013 (Milestone 4.2.1 2013 (3).)

Title: Soil profile characteristics database refinement, for use in agricultural impact modeling work.

Status: **Complete.** Activity is complete, although we still need to do some comms regarding the product.

Gender component:

Deliverables:

- An updated soil profile database

Database as a flat ASCII file in DSSAT format is uploaded here.

- A secondary soil database that contains generic soil profiles

Same as deliverable 1

- Documentation that describes the analytical methods that were used

Final report in intranet

- Uncertainty analysis of soil input selection

Same as deliverable 3

Partners:

WSU

Locations:

Global

Activity 256-2013 (Milestone 4.2.1 2013 (3).)

Title: Validation of hybrid global cropland extent data layers.

Status: **Complete.** The activity is largely complete, although will continue into 2014 on expanding use of the geo-wiki game.

Gender component:

Deliverables:

- An improved calibrated cropland map using data collected from the geo-wiki game LandSpotting

The hybrid map is being updated continually, and a version can be downloaded from the website geo-wiki.org.

Partners:

IIASA

Locations:

Global

Activity 258-2013 (Milestone 4.2.1 2014 (4).)

Title: Impact model wiki population and testing (AgriMod.org).

Status: **Partially complete.** Roll-out of the website AgriMod.org has been delayed for various reasons, but it is expected to occur in the first third of 2014. Work has continued on the structure of the website, and links established with MACSUR, a large EU project, and with several other groups (AgMIP, CSIRO) who have indicated willingness to contribute to the population of the website.

Gender component:

Deliverables:

- A comprehensive website with multiple features

The AgriMod.org website is a shell at the moment, but will be rolled out within the first four months of 2014.

- Report on the process of building the website

A brief report on progress during 2013 and current status is provided in the intranet,

Partners:

James Hutton Institute

Locations:

Global

Activity 257-2013 (Milestone 4.2.1 2013 (3).)

Title: Household-level agricultural systems data collection and storage for several hundred households at key CCAFS sites for studying adaptation and mitigation strategies (includes detailed descriptions of household assets, infrastructure, crop and livestock yields, labor profiles, input use, management practices) (IMPACTLite).

Status: **Complete.** THe IMPACTLite tool to characterize livelihood activities in CCAFS sites has been completed and data collection has been carried out at all CCAFS sites. The global database has been cleaned and compiled, and is available on the CCAFS Dataverse.Contact Person is now Silvia Silvestry (s.silvestri@cgiar.org)

Gender component:

The survey instrument collects some gender disaggregated data.

Deliverables:

- An agricultural household data collection tool, in English and French, that can be run on a variety of different platforms, with appropriate documentation

The data collection tools, including the survey and training manuals are available.

- A database and meta-database of new and existing IMPACT household data available on the web

The data, metadata and a quality summary are available.

Partners:

ILRI

Locations:

Activity 260-2013 (Milestone 4.2.1 2013 (3).)

Title: Implementation of the Data Management Strategy: Data & Information Management Specialist.

Status: **Complete.** Based on the three key elements of the CCAFS data management strategy (i.e. a) establishing a process; b) facilitating the systems; and c) enabling a data culture), there has been significant progress towards the development of new integrated data and knowledge sharing strategy. In relation to the element 'establishing a process,' for instance, the open access policy recently approved by the CGIAR was adopted and an amendment to the current Program Participant Agreement (PPA) to reflect the requirements of the new policy was recommended. Addressing the element 'facilitating the systems,' we have significantly advanced on developments towards an integrated system where we will be able to identify the data produced with CCAFS funding and stream them through our current channels of disseminations. Finally, for the core of our data management strategy, we now have the tools in place to start enabling our data culture. Extensive work is planned ahead to bring awareness to our new Data Management Support Pack which will guide researchers to produce high quality, reusable data from CCAFS research activities. It consists of documents, templates and videos covering the different aspects of data management and ranging from the overarching concepts and strategies through to the day-to-day activities.

Gender component:

Deliverables:

- Data management strategy

The CCAFS Data Management Strategy document was produced and is now available in the CCAFS website. It can be found in the following link: http://ccafs.cgiar.org/publications/data-management-strategy#.UvKllfldXQM

Partners:

CGIAR Consortium Office; CIMMYT; SSC-UoR

Locations:

Global

Activity 521-2013 (Milestone 4.2.1 2013 (3).)

Title: Implementation of the Data Management Strategy: Data Technician.

Status: **Complete.** Major advancements towards having a coordinated way to further develop our platforms were achieved. New methodologies for technical development and establishment of a platform for discussions and improvements of our tools were implemented. A technical group who meets regularly to solve new technical issues and inspire new developments was formed.

Gender component:

Deliverables:

- Provide assistance to data documentation and curation

Establishment of a platform for discussions and improvements of our tools was implemented. All of CCAFS platforms were imported to either Google Code or GitHub and a development method was employed.

Partners:

CIAT

Locations:

Global

Activity 267-2013 (Milestone 4.2.1 2013 (3).)

Title: Refinement of GEOSHARE databases.

Status: **Complete.** The activity is complete for Latin America.

Gender component:

Deliverables:

- Agricultural land cover data for Latin American and Southeast Asia in 2005

The data are downloadable from the link, for Latin America.

- Both vector (administrative-level) and raster data on (1) total cropland area and (2) total pasture area

These data are available as for deliverable 1. A final report on the work is available at the URL below.

Partners:
McGill University
Locations:
Latin America (LAM),South East Asia (SEA)

Activity 524-2013 (Milestone 4.2.1 2014 (3).)

Title: Simulation of near-term climate change at target sites in West and East Africa
Status: **Complete.** This work is complete, in terms of the technical report and the data sets.
Gender component:
Deliverables:
- Technical report discussing the simulation methodology, intermediate diagnostic and experimental results and final conclusions reached during the course of the research
This is CCAFS Working Paper 58.
- An ensemble of simulation files, which may be used in conjunction with agricultural, ecosystem or other application models for the subject locations
Data files for trying out the methods.
Partners:
Columbia University
Locations:
East Africa (EA),West Africa (WA)

Activity 262-2013 (Milestone 4.2.1 2013 (5).)

Title: G-Range (global rangeland model) implementation.
Status: **Complete.** The model G-Range was completed as a first version, and extensive testing was carried out. Work will continue during 2014 on refinement and writing up.
Gender component:
Deliverables:
- A brief document describing the baseline G-Range simulation, its agreement with Century and field-based data, and changes that were made. A web site describing G-Range.
The website is set up with some description of the model and its status, at http://www.nrel.colostate.edu/projects/grange/index.php
- A document describing sensitivity analyses and presenting results.
This was completed, and is uploaded on the intranet
- A publishable manuscript synthesizing results from analyses of forecasts climate change on rangelands.
This is now a 2014 deliverable.

Partners:
CSU
Locations:
Global

Activity 270-2013 (Milestone 4.2.1 2013 (5).)

Title: Household model refinement for theme-based evaluation of options for climate change studies.
Status: **Complete.** Complete for 2013, as described.
Gender component:
The household modelling is able to capture gender disaggregation in relation to resources and objectives.
Deliverables:
- A review of methods for incorporating climatic, financial and decision-making uncertainty (risk) in household models, for possible publication as a CCAFS Working Paper and/or journal article
A brief report on progress on the intranet. This activity is also linked to Theme 2 household modelling work, and ILRI-led activity in this area too.
- Improved household models including risk elements developed and implemented in at least two CCAFS sites, with appropriate documentation
In progress
Partners:
ICRISAT; IWMI; CSIRO
Locations:
Global

Activity 271-2013 (Milestone 4.2.1 2013 (5).)

Title: Implementing refined crop models in DSSAT (cassava, pigeonpea, yam).
Status: **Complete.** The work is complete. There has been good progress on cassava and yam, and the MarkSim DDSAT links are complete.
Gender component:
Deliverables:
- Cassava, pigeonpea and yam models for inclusion in DSSAT
The final report is on the intranet. It covers work on the pigeon pea model, the cassava model, assessing the potential for incorporating models for sweet potato and yam in DSSAT, and incorporation of MarkSim into DSSAT.
Partners:
UF; WSU; CIAT; University of Guelph

Locations:
Global

Activity 265-2013 (Milestone 4.2.1 2013 (5).)

Title: Quantification of regional scenarios using global integrated models.

Status: **Complete.** Quantitative scenarios have been developed for East Africa using the IMPACT and GLOBIOM models, extended to 2050 and combined with climate scenarios. For West Africa and South Asia, quantitative scenarios have been developed primarily using the GLOBIOM model since the IMPACT model team focuses first on Southeast Asia and the Andes regions - as requested by our funding partners UNEP WCMC. The orders in which regions are analysed is therefore complementary: IMPACT results analysis of West Africa and South Asia scenarios is conducted in early 2014, followed by Central America, while the GLOBIOM team will first focus on the Central American region and then quantify Southeast Asian and Andean scenarios in early 2014. However, basic model results for all regions except Central America have been generated for both models.

Gender component:
IMPACT includes indicators for women's literacy in its quantification. The scenario input assumptions for both models are based on the consideration of gender issues in the scenarios.

Deliverables:
- Draft reports containing annotated quantitative outputs in graphs and tables from GLOBIOM for East Africa, West Africa and South Asia (IIASA)

The working paper for East Africa (63) plus report drafts for West Africa and South Asia can be found on the intranet and here: http://cgspace.cgiar.org/handle/10568/34864Results summary DRAFT on WA socio-economic scenarios (used by Robert Zougmore in Presentation to ECOWAS)Results DRAFT South Asia socio-economic scenarios + climate scenarios:

- Presentations for the South Asia CCAFS scenarios quantification workshop and for the West Africa and South Asia model results feedback mini-workshops (IIASA)

Presentations can be found on the intranet. Model presentation for the SA quantification workshop in Nagarkot, Nepal (3-5 June 2013).Presentation of preliminary WA model results and scenarios activity to ECOWAS partner meeting (21 November 2013).South Asia preliminary model results review with SA participants scheduled for early 2014 because of Southeast Asia, the Andes and Central America regions planning being moved from 2014 to 2013, with workshops in late 2013. IIASA participated in the Southeast Asia and Andes regions workshops; presentation of the modelling was integrated in the main presentations. See documents for an example from Southeast Asia.

- Short report summarizing GLOBIOM team activities (IIASA)

Updated IIASA progress report on 2013 work (see URL).

Partners:
ILRI; IFPRI; IIASA; University of Kassel

Locations:
Global

Activity 273-2013 (Milestone 4.2.2 2013.)

Title: Case study in at least one CCAFS site on developing approaches to support smallholder decision making, linking with met services and household modelling.

Status: **Complete.** This multiyear activity is well under way. In 2013, close engagement with the Met Services in Tanzania have resulted in fruitful collaboration. Several training workshops were conducted with extension and NGO staff, as well as with smallholder farmers to use the approach in Tanzania, Ethiopia, Kenya, and Niger. The refined and improved approaches are being used in Tanzania to support seasonal decision making at the local level. The innovative approach has triggered a lot of donor, NGO and research interest and discussions are currently under way to roll out the approach in other countries and attract additional funding. See also the T4.2 outcome story.

Gender component:

Deliverables:

- Annual report for 2012 (Report on feedback and evaluation of training and support. Training materials and tools available web). Due by 31 March 2013

this is a technical progress report, see deliverable 4

- Annual report for 2013. (Literature review. Draft guidelines and lessons learnt on supporting extension staff and farmers in use of communication, decision making and planning approaches (available on web). Updated training materials and tools available on web.) By 31 March 2014

same as under deliverable 4 which combines 2012 and 2013 progress.

Partners:

University of Reading; TMA; SUA; ARI-Hombolo

Locations:

East Africa (EA)

Activity 266-2013 (Milestone 4.2.2 2013.)

Title: Refining and implementing CCAFS strategy on social learning and climate change decision support at the local level.

Status: **Complete.** The CCAFS strategy on social learning and decision support has been finalized. IIED, in collaboration with IDRC and IDS has also produced a review of documented social learning processes for climate change and natural resource management as described in peer-reviewed literature. Particular focus was on identifying (1) lessons and principles, (2) tools and approaches, (3) evaluation. IIED, IDRC and IDS are key partners in the Climate Change and Social Learning (CCSL) Initiative, actively contributing to the Sandbox, and producing communications outputs.

Gender component:

Deliverables:

- Producing and formatting all the current 'published' documentation from the CCSL site
relisted as new deliverable 5 below, since this is not an official publication.
- Building the glossary of terms on the CCSL wiki for use in CGIAR institutes and others outside the sytem
The CCSL glossary has been built, it continues to be a living document and will evolve over time.
- Developing opportunities for blogging
IIED has produced and contributed to blogs on the CCAFS website.
- Hosting at least one webinar on social learning
The webinar focused on the development of the CCSL framework and toolkit, an online resource the CCSL team is building to guide CGIAR and others in 1) determining whether social learning is a useful approach, 2) selecting and implementing social learning methodologies and 3) monitoring and evaluating results. The webinar took place on Dec, 3 2013 with 28 online participants. Discussions were documented on yammer.

Partners:

IDS; IIED; ILRI; IDRC

Locations:

Global

Activity 261-2013 (Milestone 4.2.1 2014 (4))

Title: Further development of methods and analysis for “seamless” climate forecasts and scenarios for 1-20 year timescales, with a focus on extreme events.

Status: **Complete.** Progress report for 2013 completed.

Gender component:

Deliverables:

Partners:

UCT

Locations:

2. Succinct summary of activities and deliverables by Output level

Output: 4.2.1

Summary:

Regional site and baseline characterisation: Baseline data collection activities at the 15 CCAFS core sites in three regions and 12 countries were completed. Objectives are to allow the construction and measurement of indicators of behavioural change in relation to climate change adaptation, mitigation and risk management that can be measured in repeat visits. The goal is to assess what kinds of changes have occurred and whether these changes are helping households adapt to, and mitigate, climate change. The baselines at household, village and organisational levels are allowing CCAFS to explore gender and other social differences in target populations. Site reports are complete, and these, the data and all training materials are available on DataVerse. Version 3 of the CCAFS site portfolio document has been released and site atlases for all CCAFS sites in the initial three target regions have been published. A paper on the baselines process has been written and submitted for publication, and a CCAFS Working Paper on a cross-site analysis will be published in early 2014. Several other papers are in various stages of development. The work has involved a wide range of national partners in the regions, as well as several CGIAR Centres (ILRI, ICRAF, IWMI and ICRISAT). As a safety precaution, the GPS coordinates in all 15 core sites were independently re-checked for accuracy at the end of the year, to facilitate revisits. The baseline protocols are undergoing limited adjustment, ready for application in the new CCAFS regions in 2014.Downscaled climate data: Several activities were undertaken in relation to downscaled climate model data for evaluating the impacts of climate change on agriculture and food systems and for assessing adaptation, mitigation and risk management options. New CMIP5 climate model data were collated from 17 climate models and four scenarios to 2100. These data were incorporated into both versions of MarkSim GCM (the stand-alone version and the Google-Earth-based version; a new and improved interface with additional capabilities was developed for the latter). MarkSim was also modified to work within in the DSSAT crop modelling suite (this work was done in conjunction with the University of Florida and Washington State University). These tools are starting to be widely used in the agricultural modelling community. A journal paper was published on the tool, which is available at ccafs-climate.org. Oxford University delivered a report on the ability of the new generation of climate models to reproduce current climate in SE Asia, the object being to establish how reliable future climate and crop growth projections might be in the region. This is a companion report to those already published for E Africa, W Africa and S Asia (available on the CCAFS website). Another similar report for the second new CCAFS region, Latin America, was commissioned under Theme 1.Databases and database tools: work here is contributing to much larger efforts by filling in key gaps that are of particular importance to climate change and food security work. Washington State University completed an activity that resulted in a public-access database of 9,000 soil profiles in DSSAT crop modelling format and extensive analysis on uncertainty ranges within soils of different types. New products were generated on cropland extent, through activities led by IIASA and new crowd-sourcing technology and gaming applications on geo-wiki.org, and a new cropland extent map for Latin America, work led by McGill University in collaboration with the GEOSHARE project. These hybrid cropland extent data sets are being used by IFPRI in their most recent global crop allocation maps, for example. For the household data collection work led by ILRI with the Impact-Lite tool, these data have undergone extensive quality control and are now publically available. These data, on about 3000 households

spread across all of the CCAFS sites, are forming a key resource for household modelling and detailed systems characterisation work. The CCAFS data management strategy (DMS) developed in 2012 underwent implementation. Significant progress was made towards an integrated system to identify key CCAFS data products and streaming them through CCAFS channels of disseminations. With partners at the University of Reading, a Data Management Support Pack was developed and disseminated, consisting of documents, templates and videos covering many different aspects of data management.Decadal / near-term climate products: another array of activities is looking at climate variability, its potential impacts on agriculture, and the ways in which farmers might appropriately manage the resulting risk. Work at IRI combined information from global climate models with weather station records at two CCAFS sites (Kaffrine, Senegal, and Machakos, Kenya) to produce future scenarios that incorporate both climatic changes and the decade-to-decade variations that may act to either enhance or mitigate the effects of those changes. Scenarios and daily weather time series were developed that quantify the uncertainty associated with changes in rainfall and temperature variability for the next few decades at these sites. This work starts to make it possible to assess the relative impacts of shifts in both means and variances in climate variables. A cross-theme initiative is addressing the science of seamless weather prediction over the near term, from 3 months to 20 years into the future, led by the University of Cape Town. Work in 2013 included a comparison of the performance of global climate models (GCM) from phases 3 and 5 of the Coupled Model Intercomparison Project (CMIP3/CMIP5) against CRU v3.20 gridded dataset for the present-day period (1961-2000). The focus of the work is to identify the value-added information that CMIP5 models have over the older CMIP3 models. At the same time, case studies were undertaken in three countries to understand more about farmers' use of climatic information. This work is forming a platform for subsequent trialling of the use of decadal-scale climate projections by farmers for planning purposes.Assessment toolkits: The G-Range global rangeland model (developed by colleagues at Colorado State University) underwent extensive evaluation and first results have been presented in various fora. A global study of climate change impacts on rangelands during the current century is underway. The University of Florida and co-workers have been improving crop simulation models for cassava and pigeon pea, using data sets from a range of co-workers. Such crops remain relatively understudied but may be highly resilient to increasing temperatures in the future. Another activity, in conjunction with AgMIP, is comparing simulation models of livestock production to understand more about the uncertainties involved in modelling livestock production. With Theme 2 and partners at ILRI and CSIRO, new developments in modelling household risk are being applied to some of the CCAFS household data sets to address multiple time periods and dynamic risk issues. Global impact modellers at IFPRI and IIASA have completed quantifying the regional scenarios developed through series of participatory workshops in E and W Africa (with theme 4.1). Several activities have been undertaken in relation to adaptation indicators for food systems, including work led by ILRI (published as CCAFS WP 51) that was subsequently built on by a small research team from CCAFS, WLE and FTA to develop a suite of indicators and tools for measuring adaptive capacity at different scales.

Output: 4.2.2

Summary:

Activities are designed to contribute towards the development and communication of decision aids for use by socially differentiated groups, as well as enabling social learning within this context. Understanding social

learning is becoming increasingly important if we wish to respond effectively to the challenges of climate change and food security and to contribute more effectively towards the achievement of development outcomes. The Climate Change and Social Learning (CCSL) Initiative which was launched in 2012 is the centre-piece of this work and is developing into an active community of practice. The CCAFS strategy on social learning and climate change decision-making is guiding the CCSL work, and it is currently being implemented through a range of partners, including IIED, ILRI, IDS, IDRC, and Euforic Services. The CCSL initiative organised, facilitated and documented the CCAFS annual science meeting in 2012, titled Achieving more impact through connecting, engaging and learning with communities and other key actors. This included the launch of the CCSL whiteboard video Transformative partnerships for a food secure world, with over three thousand hits. A CCAFS Working Paper by Harvey et al. examined social learning processes for climate change and natural resource management, focusing on different aspects including the principles of, tools and approaches to social learning, as well as evaluation and concrete examples of impacts that social learning has contributed to. The paper contributes to reflections on the role that social learning might play and the impacts it might have on supporting decision making on climate change and food security. A second working paper by Gonsalves focused on the relevance and prospects for wider uptake of social learning approaches within CGIAR. The paper provides a detailed review of the scope of social learning-related efforts undertaken within CGIAR to date and identifies a range of methods through which learning currently takes place to provide solutions to food security problems. It further explores if the new structural setup of CGIAR offers improved prospects for the inclusion of social learning approaches and identifies key conditions within the enabling environment that support social learning. These working papers are first steps towards building an evidence base of successful social learning and its value in outcome-oriented research – much of 4.2.2 work in 2014 will focus on building an evidence base, supported by documented social learning case studies across a range of organisations and contexts. In addition, University of Reading has developed an innovative approach to support smallholder decision-making and planning through the use of climate and weather information. Focusing on Tanzania, Ethiopia, Kenya and Niger in 2013, the activity includes close engagement and capacity strengthening and training of meteorological and extension services staff, as well as NGOs and smallholder farmers themselves. The activity has informed project planning of several key NGO and donor organisations – the outcomes of this activity are the focus of the Theme 4.2 2013 outcome story. The work under this output is implemented collaboratively with Theme 4.1 and ILRI, where key partners are contributing to the CCSL Initiative and to the evidence base of social learning. A working paper specifically looks at the synergies and trade-offs associated with integrating socially differentiated stakeholders into social learning processes aimed at addressing poverty and food insecurity. An extra allocation received toward the end of the year, based upon a request from the Science Officers' group, was used to hire a consultant who is in the process of creating a methodology for assessing the behavioural changes necessary for achieving outcomes in the CCAFS sites and regions. The consultant is developing a framework for understanding 1) the drivers of behavioural change within CCAFS and its partners and 2) the mechanisms through which the CCAFS programme supports positive change. A draft manual of the methodology has been submitted, and after refinement the plans are to implement it in the various sites and regions as part of the learning process for planning Phase 2 of CCAFS.

3. Publications

Publication #1

Type: Journal papers

CCAFS Themes: Theme 4.2

Citation: Challinor AJ, Stafford SM, Thornton PK. 2013. Use of agro-climate ensembles for quantifying uncertainty and informing adaptation. Agricultural and Forestry Meteorology 170, 2-7.

Publication #2

Type: Journal papers

CCAFS Themes: Theme 4.2

Citation: Fritz S, See L, You L, Justice C, Becker-Reshef I, Bydekerke L, Cumani R, Defourny P, Foley J, Gilliams S, Gong P, Hansen M, Hertel T, Herold M, Herrero M, Kayitakire F, Latham J, Leo O, McCallum I, Obersteiner M, Ramankutty N, Rocha J, Tang H, Thornton P K, Vancutsem C, van der Velde M, Wood S, Woodcock C. 2013. The need for improved maps of global cropland. Eos, Transactions of the American Geophysical Union 94 (3), 31-32.

Publication #3

Type: Other

CCAFS Themes: Theme 4.2

Citation: Sijmons K, Kiplimo J, Förch W, Thornton PK, Moussa AS, Zougmoré R. 2013. CCAFS site atlas – Yatenga / Tougou. CCAFS Site Atlas Series. Copenhagen, Denmark: The CGIAR Research Program on Climate Change, Agriculture and Food Security (CCAFS).

Publication #4

Type: Other

CCAFS Themes: Theme 4.2

Citation: Sijmons K, Kiplimo J, Förch W, Thornton PK, Bhatta G, Aggarwal PK. 2013. CCAFS site atlas – Haryana/Karnal. CCAFS Site Atlas Series. Copenhagen, Denmark: The CGIAR Research Program on Climate Change, Agriculture and Food Security (CCAFS).

Publication #5

Type: Other

CCAFS Themes: Theme 4.2

Citation: Sijmons K, Kiplimo J, Förch W, Thornton PK, Radeny M, Kinyangi J. 2013. CCAFS site atlas – Borana / Yabero. CCAFS Site Atlas Series. Copenhagen, Denmark: The CGIAR Research Program on Climate Change, Agriculture and Food Security (CCAFS).

Publication #6

Type: Other

CCAFS Themes: Theme 4.2

Citation: Sijmons K, Kiplimo J, Förch W, Thornton PK, Radeny M, Kinyangi J. 2013. CCAFS site atlas – Usambara / Lushoto. CCAFS Site Atlas Series. Copenhagen, Denmark: The CGIAR Research Program on Climate Change, Agriculture and Food Security (CCAFS).

Publication #7

Type: Other

CCAFS Themes: Theme 4.2

Citation: Sijmons K, Kiplimo J, Förch W, Thornton PK, Moussa AS, Zougmoré R. 2013. CCAFS site atlas – Kaffrine. CCAFS Site Atlas Series. Copenhagen, Denmark: The CGIAR Research Program on Climate Change, Agriculture and Food Security (CCAFS).

Publication #8

Type: Other

CCAFS Themes: Theme 4.2

Citation: Sijmons K, Kiplimo J, Förch W, Thornton PK, Radeny M, Kinyangi J. 2013. CCAFS site atlas – Kagera Basin / Rakai. CCAFS Site Atlas Series. Copenhagen, Denmark: The CGIAR Research Program on Climate Change, Agriculture and Food Security (CCAFS).

Publication #9

Type: Other

CCAFS Themes: Theme 4.2

Citation: Sijmons K, Kiplimo J, Förch W, Thornton PK, Bhatta G, Aggarwal PK. 2013. CCAFS site atlas – Khulna / Morrelganj. CCAFS Site Atlas Series. Copenhagen, Denmark: The CGIAR Research Program on Climate Change, Agriculture and Food Security (CCAFS).

Publication #10

Type: Other

CCAFS Themes: Theme 4.2

Citation: Sijmons K, Kiplimo J, Förch W, Thornton PK, Moussa AS, Zougmoré R. 2013. CCAFS site atlas – Kollo / Fakara. CCAFS Site Atlas Series. Copenhagen, Denmark: The CGIAR Research Program on Climate Change, Agriculture and Food Security (CCAFS).

Publication #11

Type: Other

CCAFS Themes: Theme 4.2

Citation: Sijmons K, Kiplimo J, Förch W, Thornton PK, Moussa AS, Zougmoré R. 2013. CCAFS site atlas – Lawra – Jirapa / Lawra. CCAFS Site Atlas Series. Copenhagen, Denmark: The CGIAR Research Program on Climate Change, Agriculture and Food Security (CCAFS).

Publication #12

Type: Other

CCAFS Themes: Theme 4.2

Citation: Sijmons K, Kiplimo J, Förch W, Thornton PK, Radeny M, Kinyangi J. 2013. CCAFS site atlas – Makueni / Wote. CCAFS Site Atlas Series. Copenhagen, Denmark: The CGIAR Research Program on Climate Change, Agriculture and Food Security (CCAFS).

Publication #13

Type: Other

CCAFS Themes: Theme 4.2

Citation: Sijmons K, Kiplimo J, Förch W, Thornton PK, Radeny M, Kinyangi J. 2013. CCAFS site atlas – Albertine Rift / Hoima. CCAFS Site Atlas Series. Copenhagen, Denmark: The CGIAR Research Program on Climate Change, Agriculture and Food Security (CCAFS).

Publication #14

Type: Other

CCAFS Themes: Theme 4.2

Citation: Sijmons K, Kiplimo J, Förch W, Thornton PK, Bhatta G, Aggarwal PK. 2013. CCAFS site atlas – Mid-Western Terrai / Rupandehi. CCAFS Site Atlas Series. Copenhagen, Denmark: The CGIAR Research Program on Climate Change, Agriculture an15d Food Security (CCAFS).

Publication #15

Type: Other

CCAFS Themes: Theme 4.2

Citation: Sijmons K, Kiplimo J, Förch W, Thornton PK, Radeny M, Kinyangi J. 2013. CCAFS site atlas – Nyando / Katuk Odeyo. CCAFS Site Atlas Series. Copenhagen, Denmark: The CGIAR Research Program on Climate Change, Agriculture and Food Security (CCAFS).

Publication #16

Type: Other

CCAFS Themes: Theme 4.2

Citation: Sijmons K, Kiplimo J, Förch W, Thornton PK, Moussa AS, Zougmoré R. 2013. CCAFS site atlas – Segou / Cinzana. CCAFS Site Atlas Series. Copenhagen, Denmark: The CGIAR Research Program on Climate Change, Agriculture and Food Security (CCAFS).

Publication #17

Type: Other

CCAFS Themes: Theme 4.2

Citation: Sijmons K, Kiplimo J, Förch W, Thornton PK, Bhatta G and Aggarwal PK. 2013. CCAFS Site Atlas – Bihar / Vaishali. CCAFS site atlas series. CGIAR Research Program on Climate Change, Agriculture and Food Security (CCAFS). Copenhagen, Denmark.

Publication #18

Type: Book chapters

CCAFS Themes: Theme 4.2

Citation: Kanamaru H, Hancock J, Bockel L, Braimoh A, Förch W, Grewer U, Hiepe C, Jonsson M, Krishnamurthy K, Marais S, Medeiros K, Matteoli F, Seeberg-Elverfeldt C, Thornton PK, Touchemoulin O and Vantwout T. 2013. Module 18: Assessment, Monitoring and Evaluation, pp 493-543 in Climate-Smart Agriculture Source Book, FAO, Rome, Italy.

Publication #19

Type: Other

CCAFS Themes: Theme 4.2

Citation: Förch W, Sijmons K, Mutie I, Kiplimo J, Cramer L, Kristjanson P, Thornton P, Radeny M, Moussa A and Bhatta G. 2013. Core Sites in the CCAFS Regions: East Africa, West Africa and South Asia, Version 3. CGIAR Research Program on Climate Change, Agriculture and Food Security (CCAFS). Copenhagen, Denmark.

Publication #20

Type: Conference proceedings

CCAFS Themes: Theme 4.2

Citation: Campbell BM, Ericksen P, Jarvis A, Thornton P K and Wollenberg E. 2013. Indicators of climate-smart agriculture: Prioritizing and assessing investments. Background paper for World Bank Montpellier meeting, June 2013.

Publication #21

Type: Conference proceedings

CCAFS Themes: Theme 4.2

Citation: Thornton P K, Lipper L (2013). How does climate change alter agricultural strategies to support food security? Background paper for the conference "Food Security Futures: Research Priorities for the 21st Century", 11-12 April 2013, Dublin

Publication #22

Type: Working papers

CCAFS Themes: Theme 4.2

Citation: Greene AM, Khomyakov I. 2013. Simulation of near-term climate change at target sites in West and East Africa. CCAFS Working Paper No. 58. CGIAR Research Program on Climate Change, Agriculture and Food Security (CCAFS). Copenhagen, Denmark

Publication #23

Type: Working papers

CCAFS Themes: Theme 4.2

Citation: Chesterman S, Ericksen P. 2013. Monitoring adaptation to enhance food security: a survey of approaches and best practice. CCAFS Working Paper No. 51. Copenhagen, Denmark: CGIAR Research Program on Climate Change, Agriculture and Food Security (CCAFS).

Publication #24

Type: Other

CCAFS Themes: Theme 4.2

Citation: Pramova E, Hills T, Ericksen P, Neufeldt H, Kobb D, Thornton PK. 2013. Indicators for Resilience and Adaptive Capacity.

Publication #25

Type: Other

CCAFS Themes: Theme 4.2

Citation: Onyango L, Mango J, Loo L, Odiwuor H, Mwangangi M, Mutua E, Mutuo T. 2013. Village Baseline Study: Site Analysis Report for Makueni – Wote, Kenya (KE0202). Copenhagen, Denmark: CGIAR Research Program on Climate Change, Agriculture and Food Security (CCAFS).

Publication #26

Type: Working papers

CCAFS Themes: Theme 4.2

Citation: Dumollard G, Havlík P, Herrero M. 2013. Climate change, agriculture and food security: a comparative review of global modelling approaches. CCAFS Working Paper No. 34. Copenhagen, Denmark: CGIAR Research Program on Climate Change, Agriculture and Food Security (CCAFS).

Publication #27

Type: Working papers

CCAFS Themes: Theme 4.2

Citation: Ng'ang'a SK, Diarra L, Notenbaert A, Herrero M. 2013. Coping strategies and vulnerability to climate change of households in Mali. CCAFS Working Paper No. 35. Copenhagen, Denmark: CGIAR Research Program on Climate Change, Agriculture and Food Security (CCAFS).

Publication #28

Type: Other

CCAFS Themes: Theme 4.2

Citation: Bangladesh Centre for Advances Studies. 2013. Summary of Baseline Household Survey Results: Bagerhat, Bangladesh. CGIAR Research Program on Climate Change, Agriculture and Food Security (CCAFS).

Publication #29

Type: Other

CCAFS Themes: Theme 4.2

Citation: Bhatta GD, Singh RKP, Kristjanson P. 2013. Summary of Baseline Household Survey Results: Vaishali Site, Bihar State (Northeast India). Copenhagen, Denmark: The CGIAR Research Program on Climate Change, Agriculture and Food Security (CCAFS)

Publication #30

Type: Working papers

CCAFS Themes: Theme 4.2

Citation: Harvey B, Ensor J, Garside B, Woodend J, Naess LO, Carlile L. 2013. Social learning in practice: A review of lessons, impacts and tools for climate change. CCAFS Working Paper No. 38. Copenhagen, Denmark: CGIAR Research Program on Climate Change, Agriculture and Food Security (CCAFS).

Publication #31

Type: Working papers

CCAFS Themes: Theme 4.1, Theme 4.2

Citation: Shaw A, Kristjanson P. 2013. Catalysing learning for development and climate change: an exploration of social learning and social differentiation in CGIAR. CCAFS Working Paper No. 43. Copenhagen, Denmark: CGIAR Research Program on Climate Change, Agriculture and Food Security (CCAFS).

Publication #32

Type: Working papers

CCAFS Themes: Theme 4.1, Theme 4.2

Citation: Gonsalves J. 2013. A new relevance and better prospects for wider uptake of social learning within CGIAR. CCAFS Working Paper No. 37. Copenhagen, Denmark: CGIAR Research Program on Climate Change, Agriculture and Food Security (CCAFS).

Publication #33

Type: Other

CCAFS Themes: Theme 4.1, Theme 4.2

Citation: CCSL Initiative. 2013. CCAFS climate change and social learning strategy. CCSL Learning Brief No. 2. Copenhagen, Denmark: CGIAR Research Program on Climate Change, Agriculture and Food Security (CCAFS).

Publication #34

Type: Other

CCAFS Themes: Theme 4.1, Theme 4.2

Citation: Carlile L, Ballantyne P, Ensor J, Foerch W, Garside B, Harvey B, Patterson Z, Thornton P, Woodend J. 2013. Climate change and social learning (CCSL): supporting local decision making for climate change, agriculture and food security. CCSL Learning Brief No. 1. Copenhagen, Denmark: CGIAR Research Program on Climate Change, Agriculture and Food Security (CCAFS).

Publication #35

Type: Other

CCAFS Themes: Theme 4.2

Citation: Thornton P, Van de Steeg J, Notenbaert A, Herrero M. 2013. Climate change: do we know how it will affect smallholder livestock farmers? The Futures of Agriculture Brief No. 43. Rome: Global Forum on Agricultural Research (GFAR).

Publication #36

Type: Other

CCAFS Themes: Theme 4.1, Theme 4.2

Citation: CCAFS. 2013. Unlocking the potential of social learning for climate change and food security: Wicked problems and non-traditional solutions. Copenhagen, Denmark: CGIAR Research Program on Climate Change, Agriculture and Food Security (CCAFS).

Publication #37

Type: Other

CCAFS Themes: Theme 4.1, Theme 4.2

Citation: Carlile L. 2013. 5 key institutional change areas for adopting a social learning methodology with CCAFS and the CGIAR system: a synthesis paper. Synthesis of ideas from the CCAFS-ILRI Workshop on Communications and Social Learning in Climate Change, held 8-10 May 2012. Copenhagen, Denmark: CGIAR Research Program on Climate Change, Agriculture and Food Security (CCAFS).

Publication #38

Type: Other

CCAFS Themes: Theme 4.1, Theme 4.2

Citation: CCAFS. 2013. Social learning and climate change. Copenhagen, Denmark: CGIAR Research Program on Climate Change, Agriculture and Food Security (CCAFS).

Publication #39

Type: Other

CCAFS Themes: Theme 4.1, Theme 4.2

Citation: Vervoort J. 2013. Shared action on food and environments in East Africa. CGIAR Research Program on Climate Change, Agriculture and Food Security (CCAFS), and Environmental Change Institute, Oxford University Centre for the Environment.

Publication #40

Type: Other

CCAFS Themes: Theme 4.2

Citation: Robertson AW, Bell M, Cousin R, Curtis A, Li S. 2013. Online tools for assessing the climatology and predictability of rainfall and temperature in the Indo-Gangetic plains based on observed datasets and seasonal forecast models. Copenhagen, Denmark: CGIAR Research Program on Climate Change, Agriculture and Food Security (CCAFS).

Publication #41

Type: Other

CCAFS Themes: Theme 4.2

Citation: Herrero M, Jones PG, Karanja S, Mutie I, Rufino, MC, Thornton PK. 2013. Potential Impact of Climate Change on Resilience and Livelihoods in Mixed Crop-Livestock Systems in East Africa. Washington D.C. World Bank Study

Publication #42

Type: Journal papers

CCAFS Themes: Theme 4.2

Citation: Herrero M, Thornton PK. 2013. Livestock and global change: emerging issues for sustainable food systems. PNAS 110 (52), 20878-20881.

Publication #43

Type: Journal papers

CCAFS Themes: Theme 4.2

Citation: Herrero M, Havlík P, Valin H, Notenbaert AM, Rufino M, Thornton PK, Blummel M, Weiss F, Obersteiner M. 2013. Global livestock systems: biomass use, production, feed efficiencies and greenhouse gas emissions. PNAS 110 (52), 20888-20893.

Publication #44

Type: Journal papers

CCAFS Themes: Theme 4.2

Citation: Jones PG, Thornton PK. 2013. Generating downscaled weather data from a suite of climate models for agricultural modelling applications. Agricultural Systems 114, 1-5.

Publication #45

Type: Journal papers

CCAFS Themes: Theme 1, Theme 4.2

Citation: Ramirez-Villegas J, Challinor AC, Thornton PK, Jarvis A. 2013. Implications of regional improvement in global climate models for agricultural impacts research. Environmental Research Letters 8, 024018

Publication #46

Type: Journal papers

CCAFS Themes: Theme 4.2

Citation: Rufino MC, Thornton PK, Ng'ang'a SK, Mutie I, Jones PG, van Wijk MT, Herrero M. 2013. Transitions in agro-pastoralist systems of East Africa: impacts on food security and poverty. Agriculture, Ecosystems and Environment 179, 215-230.

Publication #47

Type: Journal papers

CCAFS Themes: Theme 1, Theme 4.2

Citation: Vermeulen SJ, Challinor AJ, Thornton PK, Campbell BM, Eriyagama N, Vervoort JM, Kinyangi J, Jarvis A, Läderach P, Ramirez-Villegas J, Nicklin KJ, Hawkins E, Smith DR. 2013. Addressing uncertainty in adaptation planning for agriculture. PNAS 110 (21), 8357–8362.

Publication #48

Type: Other

CCAFS Themes: Theme 4.2

Citation: CEAPRED. 2013. Summary of baseline household survey results: Rupandehi, Nepal. Copenhagen, Denmark: CGIAR Research Program on Climate Change, Agriculture and Food Security (CCAFS).

Publication #49

Type: Other

CCAFS Themes: Theme 4.2

Citation: Chaves B, Hoogenboom G, Thornton PK. 2013. Variability in maize yield due to differences in soil texture and the effect of water and nitrogen. ASA, CSSA & SSSA International Annual Meetings, 3-6 November, Tampa, Florida.

Publication #50

Type: Journal papers

CCAFS Themes: Theme 4.2

Citation: Garnett T, Appleby MC, Balmford A, Bateman IJ, Benton TG, Bloomer P, Burlingame B, Dawkins M, Dolan L, Fraser D, Herrero M, Smith P, Thornton PK, Toulmin C, Vermeulen SJ, Godfray HCJ. 2013. Sustainable Intensification in agriculture; navigating a course through competing priorities. Science 341, 33-34.

Publication #51

Type: Journal papers

CCAFS Themes: Theme 4.1, Theme 4.2

Citation: Chaudhury, M., J. Vervoort, P. Kristjanson, P. Ericksen, and A. Ainslie. 2013. Participatory scenarios as a tool to link science and policy on food security under climate change in East Africa. Regional Environmental Change 13:389-398.

Publication #52

Type: Other

CCAFS Themes: Theme 4.1, Theme 4.2

Citation: CCAFS. 2013. CCAFS regional scenarios for food security, environments and livelihoods in South Asia Workshop 2: providing inputs into quantification process, revising scenarios. Workshop held in Kathmandu, Nepal, 3-5 June 2013. Copenhagen, Denmark: CGIAR Research Program on Climate Change, Agriculture and Food Security (CCAFS).

Publication #53

Type: Working papers

CCAFS Themes: Theme 4.1, Theme 4.2

Citation: Vervoort JM, Palazzo A, Mason-D'Croz D, Ericksen PJ, Thornton PK, Kristjanson P, Förch W, Herrero M, Havlik P, Jost C, Rowlands H. 2013. The future of food security, environments and livelihoods in Eastern Africa: four socio-economic scenarios. CCAFS Working Paper No. 63. Copenhagen, Denmark: CGIAR Research Program on Climate Change, Agriculture and Food Security (CCAFS).

Publication #54

Type: Other

CCAFS Themes: Theme 4.2

Citation: Mohd Noor M. 2013. Assessing complex interactions between human and agro-ecosystem using Satellite Information. A Case Study in Katuk Odeyo, Western Kenya. CCAFS Technical Report. CGIAR Research Program on Climate Change, Agriculture and Food Security (CCAFS). Copenhagen, Denmark.

Publication #55

Type: Other

CCAFS Themes: Theme 4.2

Citation: Klapwijk CJ. 2013. Workshop report: Analysis of trade-offs in agricultural systems. CGIAR Research Program on Climate Change, Agriculture and Food Security (CCAFS)

Publication #56

Type: Other

CCAFS Themes: Theme 4.1, Theme 4.2

Citation: Carey C. 2014. The CCAFS Regional Scenarios Programme: External evaluation report on progress towards programme outcomes. CGIAR Research Program on Climate Change, Agriculture and Food Security (CCAFS). Copenhagen, Denmark.

Publication #57

Type: Other

CCAFS Themes: Theme 4.2

Citation: Garnett T and Godfray C (2012). Sustainable intensification in agriculture. Navigating a coursethrough competing food system priorities, Food Climate Research Network and the Oxford MartinProgramme on the Future of Food, University of Oxford, UK

Publication #58

Type: Other

CCAFS Themes: Theme 4.2

Citation: Sood R, 2013. An interface for running crop models over gridded land surfaces. CCAFS Technical Report. CGIAR Research Program on Climate Change, Agriculture and Food Security (CCAFS). Copenhagen, Denmark.

Publication #59

Type: Other

CCAFS Themes: Theme 4.2

Citation: Van den Ende, P, Dorward, P, Muchedzi, K (2013) Mainstreaming Climate Change Adaptation in Zimbabwe's Agricultural Extension System, Final Project Report. University of Reading and Practical Action

4. Communications

Media campaigns:

Media activities around PNAS Special Issue via ILRI

Blogs:

Kiplimo J, Sijmons K, and Cramer L. 2013. Maps illustrating climate variability in various regions now available. http://ccafs.cgiar.org/blog/maps-illustrating-climate-variability-various-regions-now-available

Ericksen P and Chesterman S. 2013. New paper outlines best practices for monitoring climate adaptation projects. http://ccafs.cgiar.org/blog/new-paper-outlines-best-practices-monitoring-climate-adaptation-projects

Cramer L. 2013. Adapting on the ground: Are farmers' needs being met? http://ccafs.cgiar.org/blog/Adapting-ground-farmers-needs-met#.UvxhOfZRF9c

Thornton P. 2013. Tool for generating weather data updated. http://ccafs.cgiar.org/blog/tool-generating-weather-data-updated#.UvxhX_ZRF9c

Van Asten P. 2013. Shining a light on trade-offs in agricultural systems. http://ccafs.cgiar.org/blog/Shining-light-trade-offs-agricultural-systems

Dumollard G. 2013. New Working Paper helps to map the world of economic models. http://ccafs.cgiar.org/blog/new-ccafs-working-paper-helps-map-world-economic-models

MacMillan S. 2013. Little known about climate impacts on livestock - research priorities outlined. http://ccafs.cgiar.org/blog/climate-impacts-livestock-research-outlined#.Uvxh9vZRF9c

Fritz S and See L. 2013. Play the new geo-wiki game: Cropland capture. http://ccafs.cgiar.org/blog/play-new-geo-wiki-game-cropland-capture#.Uvxi7_ZRF9c

Schubert C. 2013. How much greenhouse gases do cattle emit? New study provides answers. http://ccafs.cgiar.org/blog/how-much-greenhouse-gas-do-cattle-emit-new-study-provides-answers

Fadda C. 2013. Assessing climate change vulnerability and its effects on food security: Testing new tools in Tanzania. http://ccafs.cgiar.org/blog/assessing-climate-change-vulnerability-and-its-effects-food-security-testing-new-tools-tanzania#.UvxjhfZRF9c

Beltrán M. 2013. Farmers map strategies to adapt to climate change in Colombia. http://ccafs.cgiar.org/blog/farmers-map-strategies-adapt-climate-change-colombia

Carlile L. 2013. Making it real: Social learning in practice. http://ccafs.cgiar.org/research-highlight/making-it-real-social-learning-practice

Meadu V. 2013. Transformative partnerships for a food-secure world. http://ccafs.cgiar.org/blog/transformative-partnerships-food-secure-world

CCAFS Climate Change and Social Learning Champions. 2013. Farmers and scientists: better together in the fight against climate change. http://ccafs.cgiar.org/blog/farmers-and-scientists-better-together-fight-against-climate-change

Gopikrishna-Warrier S. 2013. Adding quantity and direction to scenarios in South Asia. http://ccafs.cgiar.org/blog/adding-quantity-and-direction-scenarios-south-asia

Gopikrishna-Warrier S. 2013. Staying one step ahead of South Asia's climate challenge. http://ccafs.cgiar.org/blog/Staying-step-ahead-South-Asia-climate-challenge

Smith G. 2013. Decision makers debate climate threats for Southeast Asia. http://ccafs.cgiar.org/es/blog/decision-makers-debate-climate-threats-southeast-asia

Smith G. 2013. Thinking outside the box on climate change. CIAT blog http://www.ciatnews.cgiar.org/2013/11/07/thinking-out-of-the-climate-box/

Smith G. 2013. Framing the bigger picture: climate change in SE Asia. http://www.ciatnews.cgiar.org/2013/11/06/framing-the-bigger-picture-climate-change-in-se-asia/

Smith G. 2013. The world in 2050: on the front line. CIAT blog. http://www.ciatnews.cgiar.org/2013/11/12/the-world-in-2050-on-the-front-line/

Koningstein M. 2013. Hananta Yuyaspa - a new day and start - for the Andean countries http://ccafs.cgiar.org/blog/hananta-yuyaspa-new-sunlight-scenarios-workshop-andean-countries#.UrHMnP2fGCo ; Spanish: http://ccafs.cgiar.org/es/blog/'hananta-yuyaspa'-un-nuevo-amanecer-para-los-pa%C3%ADses-andinos#.UqDUwMTimGs

Marin O. 2013. Escenarios futuros para la seguridad alimentaria en Centroamérica. http://ccafs.cgiar.org/es/blog/escenarios-futuros-para-la-seguridad-alimentaria-en-centroam%C3%A9rica

Le Borgne, E. 2013 Climate change communication and social learning for smarter agricultural research. http://infoilri.wordpress.com/2013/12/24/cccsl-smart/

Langford K. 2013. Could scenario-building be the tool that links food security science with policy-making? http://ccafs.cgiar.org/es/blog/could-scenario-building-be-tool-links-food-security-science-policy-making#.UwXUv15sh9c

Websites:

CCSL Wikispace being kept updated: http://ccsl.wikispaces.com/

Social media campaigns:

None

Newsletters:

None

Events:

CCAFS Science Meeting in Bodega Bay, March 18-19, 2013: http://ccafs.cgiar.org/events/18/mar/2013/ccafs-science-meeting-2013-rethinking-science-learning-and-partnerships-meet

Food Security Futures Conference Dublin. Co-facilitated and submitted paper: http://ccafs.cgiar.org/events/11/apr/2013/food-security-futures-conference

CSIRO-CCAFS joint Workshop on Transformational Adaptation, planned event with planned report and journal article

AISA Prolinnova Workshop Nairobi, Kenya 2013. Farmers innovation fair: http://ccafs.cgiar.org/events/28/may/2013/eastern-african-farmer-innovation-fair co-facilitated as part of the Week on Agricultural Innovation in Africa (WAIA) http://aisa2013.wikispaces.com/home

London Flagship 4 Meeting organised and facilitated to select regional projects under the Flagship 4 results-based management trial

IDS Workshop 5-6 March: http://www.w3.org/2014/03/lgd/ and http://ccsl.wikispaces.com/201303_IDSclimateLearning CCSL co-organised and facilitated the event.

CCSL IIED Webinar in Dec 2013 hosted with 28 partipants, focused on guidelines, contextual challenges, criteria for successful projects for social learning https://www.yammer.com/ccsl/#/Threads/show?threadId=344491472 and https://www.yammer.com/ccsl/#/Threads/show?threadId=350473479

IITA-CCAFS systems tools workshop in Wageningen in February 2013; the workshop that brought together 30 scientists from all over the world, including representatives from 10 CGIAR centres and 8 CRPs. The main objective was to share experiences and lessons on available methods and tools to identify and analyse trade-offs in agricultural systems at different scales

CCSL Donor Meeting: March 2013 in London: "Supporting local decision making for climate change, agriculture and food security. A meeting for CCAFS donors, partners and interested individuals' http://ccsl.wikispaces.com/201303_IIED_DonorMeeting

Videos and other multimedia:

Video: Transformative partnerships for a food-secure world: http://www.youtube.com/watch?v=5pKaoD5sGjw&list=PLmATng7lKk6XLk_5gQGmLhkjq6MnhL4zW

East Africa scenarios: http://www.youtube.com/watch?v=6zDTLfYKcf4;
South Asia scenarios: http://www.youtube.com/watch?v=zkCJ-RGWFGU;
Southeast Asia scenarios with UNEP WCMC and FAO: http://www.youtube.com/watch?v=9oKMhBs0meY

Maasai Voices on Climate Change (and other changes, too) https://vimeo.com/73980798

Photos: South Asia workshop 2 http://www.flickr.com/photos/cgiarclimate/sets/72157634438122943/
Photos: Southeast Asia workshop 1 http://www.flickr.com/photos/cgiarclimate/sets/72157637540876486/
Photos: Central America workshop 1 http://www.flickr.com/photos/cgiarclimate/sets/72157638546156883/
Photos: Andean region workshop 1 http://www.flickr.com/photos/cgiarclimate/sets/72157638333013656/
Photos: Science Meeting 2013, Bodega Bay (USA) http://www.flickr.com/photos/cgiarclimate/

Other communications and outreach:

NPR: I'm Not Just Gaming, Ma! I'm Helping The World's Farmers. (Linked to Cropland Capture Game): http://www.npr.org/blogs/thesalt/2013/11/25/247210031/i-m-not-just-gaming-ma-i-m-helping-the-world-s-farmers

http://www.theguardian.com/technology/2014/jan/25/online-gamers-solving-sciences-biggest-problems

Engaging in CCSL Yammer group and wikispaces

Sonja Vermeulen and Andy Challinor. 2013. How farmers can adapt to a warming world. Al Jazeera, 6 June 2013. http://www.aljazeera.com/indepth/opinion/2013/06/20136585711493753.html (Scenarios)

S. Gopikrishna Warrier. 2013. How predictable can you get? The Hindu Business Line, 1 July 2013. http://www.thehindubusinessline.com/opinion/how-predictable-can-you-get/article4932150.ece. (Scenarios)

Georgina Smith (CIAT). 2013. Looking for clues to navigate climate uncertainty. REUTERS Trustnet, 31 Oct 2013. http://www.trust.org/item/20131031114340-4a2gc

FAO, 1 Nov 2013. UN Website: http://www.un.org.vn/en/fao-agencypresscenter1-96/2877-fao,-ccafs-and-unep-support-the-government-of-vietnam-in-developing-regional-socio-economic-scenarios-for-climate-smart-agriculture.html

Georgina Smith (CIAT). 2013. Looking at 2050 to create better policy today. REUTERS Trustnet, 18 November http://www.trust.org/item/20131118114746-tkjes

Georgina Smith (CIAT). 2013. Looking at 2050 to create better policy today. REUTERS Trustnet, 18 November http://www.trust.org/item/20131118114746-tkjes

Editors, 2013. Revista Mercados & Tendencias (on-line and in print, regional private sector-oriented magazine). http://revistamyt.com/2013/12/en-que-debe-trabajar-la-centroamerica-hacia-2050/

LeBorgne E. 2013. Climate change communication and social learning for smarter agricultural research http://infoilri.wordpress.com/2013/12/24/cccsl-smart/

Participatory Actions with Farmers http://www.reading.ac.uk/ssc/resources/participatory-activities-with-farmers/story.html

Langford K. 2013. Could scenario-building be the tool that links food security science with policy-making? http://ccafs.cgiar.org/blog/could-scenario-building-be-tool-links-food-security-science-policy-making#.UwTIUV5sh9c

5. Case studies

Case Study #1

Title:

Implementing CCAFS Data Management Strategy and the Support Pack

Author: Theme 4.2

Type: Inter-center collaboration,Innovative non-research partnerships

Project description:

Theme 4.2 partnered with the consortium office and the statistical service centre from the University of Reading to design a comprehensive data management strategy for CCAFS. CCAFS aims at providing a "one-stop shop" for data generated by its research activities and expects to attract data contributions from scientists working in related areas even if not directly managed or funded by CCAFS.In this strategy we use the term "Data+" to indicate the actual data generated by the research process once it has been cleaned and is considered of good quality, as well as the documentation that will enable the use of these datasets in the future. This includes but is not restricted to documents about the methodology for data collection/generation, computer programs used for data manipulation and data processing, data quality assessment, and any metadata that helps in building a description of the context in which the data has originated.

Introduction / objectives:

CCAFS is mandated to producing international public goods and has developed a Data Management Strategy (DMS) to guide the creation of an enabling environment where scientists and partners are able to produce and share high quality data outputs throughout CCAFS, while at the same time supporting a variety of data management procedures and practices at project level.

Project results:

The implementation of the data management strategy was based on its three key elements:i) establishing a process; ii) facilitating the systems; and iii) enabling a data culture. Under the element 'establishing a process,' for instance, the open access policy recently approved by CGIAR was adopted and the Program Participant Agreement (PPA) was amended to reflect the requirements from the new policy.CCAFS now counts with an integrated system where the data produced are streamed to our current channels of dissemination. This addresses the second key element of the Data Management Strategy named 'facilitating the systems.' Finally, the third key element 'enabling a data culture,' is on the way. Extensive work is planned to create awareness of of the products and to build capacity within the research community. The Data Management Support Pack will guide researchers to produce high quality, reusable data from CCAFS research activities. It consists of documents, templates and videos covering the different aspects of data management and ranging from the overarching concepts and strategies through to the day-to-day activities.The implementation of the Data Management Strategy provided the opportunity for CCAFS to position itself as a leader in data management across CGIAR, and interact closely with the Consortium Office efforts on data.

Partners:

CGIAR Consortium Office, France Michael Marus - m.marus@cgiar.orgCIMMYT – International Maze and Wheat Improvement Center, Mexico Medha Devare - m.devare@cgiar.orgSSC-UoR Statistical Service Centre, University of Reading, United Kingdom Carlos Ba

Links/sources for further information:

Data Management Strategy (CCAFS Website - http://ccafs.cgiar.org/publications/data-management-strategy#.UvoUXvldXeI)

Data Management Support Pack (CCAFS Website - http://ccafs.cgiar.org/data-management-support-pack)

Case Study #2

Title:

Utilising CMIP5 climate model data in the MarkSim daily weather generator tool

Author: Theme 4.2

Type: Breakthrough science

Project description:

MarkSim is a third-order markov rainfall generator, first released in 2002, that is able to simulate the observed variance of rainfall in both tropical and temperate regions. It works from a large set of parameters based on a calibration dataset of many thousands of stations worldwide that have in most cases more than 15 years of daily historical rainfall data. Climates are clustered into some 700 types, and some of the parameters of the MarkSim model calculated by regression from the cluster most representative of the climate point to be simulated. Since its release, the tool has been widely used in the agricultural modelling community. The tool is now being used to empirically downscale the outputs from climate models to produce daily weather data that are characteristic of future climatologies that can then be fed to agricultural models to evaluate possible impacts in the future. Data from the CMIP5 climate models have now been added to the tool.

Introduction / objectives:

Daily weather data are needed for many purposes in the agricultural modelling community, and impact studies routinely make use of different methods to generate these for future scenarios of climate. This work has involved using the outputs from the newest generation of global climate models and modifying the MarkSim tool, so that users can use up-to-date climate model output.

Project results:

Two versions of MarkSim GCM exist: one that can be used interactively using an interface with Google Earth, and another that can be run using scripts. These new versions of MarkSim GCM include data from seventeen individual climate models that were part of the IPCC's Fifth Assessment Report (CMIP5). A new feature is that the user can select any combination of these 17 models (just one, all 17, or any combination in between). The user can also chose which greenhouse-gas emissions pathway to use; in CMIP5, these are called "Representative Concentration Pathways, and contain a range of low, moderate and high emissions pathways. The highest, RCP8.5, leads to global temperature increases of nearly 5 °C by the year 2100. Data are output in a simple ASCII format, which can be used directly in the DSSAT crop modelling suite or in any other modelling application that requires daily weather information, after formatting appropriately. During 2013, it was accessed or downloaded more than 3050 times.

Partners:

Waen Associates, Dolgellau, UKILRICIAT

Links/sources for further information:

http://ccafs-climate.org

http://gisweb.ciat.cgiar.org/MarkSimGCM/

Case Study #3

Title:

Harnessing the Power of Volunteers, the Internet and Google Earth to Collect and Validate Global Spatial Information using Geo-Wiki

Author: Theme 4.2

Type: Successful communications,Innovative non-research partnerships,Breakthrough science

Project description:

To address this issue of land cover uncertainty, a tool called Geo-Wiki was developed, which integrates online and mobile applications, high resolution satellite imagery and data collection through crowdsourcing as a mechanism for validating and improving globally relevant spatial information on land cover and land use. Through its growing network of volunteers and a number of successful data collection campaigns, data on land cover and land use have been collected at more than 500 000 locations on the Earth.

Introduction / objectives:

Information about land cover and land use is needed for a wide range of applications such as environmental protection and biodiversity, forest and water management, monitoring of agricultural policies and economic land use modelling as well as applications in the field of food security. Different remotely-sensed global land cover products are available, but they all have some problems.

Project results:

The basic Geo-wiki is continuing to grow and to branch out into new data areas. Some recent developments are geo-wiki for the classroom, a mobile App called geo-wiki pictures, a new branch called livestock.geo-wiki.org and a "game with a purpose" called cropland capture (http://www.geo-wiki.org/games/croplandcapture/). The crowdsourced data are then combined with other data sources and maps. Some recent products include a new cropland map for Ethiopia and a new global hybrid cropland map used by the GEOGLAM initiative (http://www.geoglam-crop-monitor.org/node/118) as an important input dataset. Currently, Geo-wiki has 4244 registered users, and Cropland Capture is played by 2647 players. There are 1300 uploaded geo-wiki pictures of which a large number contain in-situ land cover information from pictures.geo-wiki.org. The site and game are attracting a lot of media coverage – recent examples include a piece on National Public Radio in the US and in the UK's Guardian newspaper (links below).

Partners:

International Institute for Applied Systems Analysis (IIASA), AustriaILRI, NairobiGEOGLAM and several other European initiatives

Links/sources for further information:

http://www.geo-wiki.org

http://www.geo-wiki.org/games/croplandcapture/

http://www.geo-wiki.org/branches/livestock/

http://www.theguardian.com/technology/2014/jan/25/online-gamers-solving-sciences-biggest-problems

http://www.npr.org/blogs/thesalt/2013/11/25/247210031/i-m-not-just-gaming-ma-i-m-helping-the-world-s-farmers

6. Outcomes

Outcomes #1

Title:

Developing approaches to support smallholder decision-making and planning through the use of climate and weather information

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

The research conducted by University of Reading and partners on Developing approaches to support smallholder decision-making and planning through the use of climate and weather information has resulted in changes in the policies and activities of national and international organisations that support the development of smallholder agriculture, particularly those who focus on the provision of climate and weather information. These organizations include the national meteorological or agri-meteorological services of Tanzania, Ethiopia, Malawi, Lesotho and others, and the international organizations include the International Fund for Agricultural Development (IFAD), and the World Meteorological Organization (WMO). The research has resulted in improved understanding of farmers' perceptions and information needs together with the design and implementation of methods for providing climate information services that better reflect smallholders' requirements. The research has to date had impact on the policies and activities of organisations responsible for design and delivery of climate information and services in at least 10 countries in Africa and South Asia and benefited thousands of farmers. The Met services of the countries adopting the new approaches are now providing more useful information to farmers in formats that are more responsive to farmers' needs. Specific activities have been set up to monitor the impact of using these approaches on farmers' livelihoods and these will be evaluated in 2014.

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

University of Reading research activities have addressed important research and development needs through: 1) improving understanding of what informs farmers' current perceptions of climate and weather and how this influences their planning, decision-making and information requirements; 2) developing the use of analysed historical weather data with farmers which provides baseline information for them on climate - how it is changing and simple probabilities of rainfall characteristics for future years; and 3) developing an approach, together with participatory tools, for service providers, such as government advisory services and NGOs, to provide information to large numbers of farmers and support them to interpret and use the information in their farm planning. The approach consists of several stages. First, analysed historical climate information from local meteorological stations is provided to farmers in the form of clear graphs. The graphs are used to establish with farmers the basic characteristics of the local climate, whether they are changing, and then, together with information on local crop requirements and livelihoods, what crops, crop management and livelihoods are best suited for different strategies. Next, the Seasonal Climate Forecast (produced regionally in Africa and then interpreted by each country) is introduced and explained to farmers. Following this, farmers are trained in the use of participatory planning methods that enable them to take into account the weather, climate and crop information received. Farmers, supported by extension staff, use these to explore weather scenarios and

determine the combinations of livelihood activities, individual enterprises and how they can be managed, to best suit their individual farms and circumstances. At the start of the rainy season, and at 5-10 day intervals during it, short-term weather forecasts (together with the updated seasonal forecast) are communicated directly to farmers by the meteorological service through mobile phones, thereby supporting farmers in their short-term planning and in making adjustments to plans developed earlier. This overall approach can be implemented with large numbers of farmers using existing extension and meteorological staff. Following success early in the project in Zimbabwe, CCAFS funded further research by the team on the approach in Tanzania (2012 -2013).Dissemination of the research findings and the approach have largely been achieved through publication of a training manual and field guide (Muchedzi, et al 2012), invited talks, personal contacts and invited presentations at international conferences including: international workshop in Senegal in December 2012 (Scaling Up Climate Services for Farmers in Africa and South Asia) organised and funded by WMO, CCAFS and USAID; international meeting of national meteorological staff across Africa (Nairobi, April 2013) funded by WMO; international workshop organised by CCAFS on provision of climate information to farmers through intermediaries (Nairobi, June 2013); Third International Conference on Climate Services (Montego Bay, Jamaica, December 2013). These, together with the current international focus on seeking ways to support smallholder farmers to deal with climate variability and change, led to requests for training and support and for further information, which in turn have influenced policies and practices of organisations.

What partners helped in producing the outcome?

This outcome has been produced under the lead of Peter Dorward at University of Reading, with CCAFS support. Roger Stern, University of Reading, has led the engagement and capacity strengthening component with national meteorological services in the target countries. Primary focus of implementation in 2013 was Tanzania, where the Tanzania Meteorological Authority, Sokoine University of Agriculture and the Hombolo Agricultural Research Institute have been the key partners. In light of a current focus on opportunities to enhance the provision of climate information services to support farmer decision-making, the presentation and dissemination of the approach and research findings at key international conferences, invited presentations and personal talks has resulted in requests for training, support and further information of key international and national organisations; in turn influencing their decision-making process, policies and practice. Examples of requests include those from IFAD who are developing major national agricultural programmes in several countries, Malawi (National Director of Meteorological services), Tanzania (National Director of Agri Met Services) and Ethiopia (National Director of Agric. Met. services) who requested support with developing information services using the Reading approach, and international NGOs such as CARE and Oxfam. USAID funded Reading to develop a proposal (that has subsequently been approved) to plan scaling up provision of climate information services to smallholders in six countries in East and West Africa.

Who used the output?

Direct training in the approach has been provided across multiple sub-Saharan African countries. In Zimbabwe, 224 extension staff were intensively trained in the initial phase, followed by a further 1,023 staff [1]. The Rockefeller Foundation funded training by University of Reading of 24 key staff from NGOs and meteorological services from Kenya, Tanzania and Ethiopia [2]. Seven National Farmer Organisations (FOs) from Niger, Mali, Burkina Faso and Senegal received training from University of Reading in December 2012 (funded by the

McKnight Foundation and CCAFS) [3]. These FOs represent tens of thousands of farmers in their countries. The World Meteorological Organisation has also endorsed the approach and is promoting scaling up of training across Africa through funding the development and delivery of a new e-learning course by University of Reading (currently being taken up by over 200 participants from 5 countries in Africa).In Zimbabwe during 2012-13, the national agricultural advisory service (Agritex) reported that 6,168 farmers had benefited from the approach [1]. A sample of 58 farmers gave a mean score of 4.6 for usefulness of the approach (using scale of 1-5 with 1=no use, 5=extremely useful) and the end of project final report documents farmers changing to practices that better suit local climate and weather as a direct result of using the approach, including farmers demanding and obtaining seeds of particular varieties for their location and adopting conservation agriculture practices (Van den Ende, et al 2013).The developed approach allows partners working with communities, namely government advisory services such as extension services and NGOs, to provide climate and weather information to large numbers of farmers and to support them in interpreting and using the information in planning their livelihood activities. These key partners are being trained in the interpretation of historical climate data, as well as seasonal weather forecasts, and in communicating with farmers about this information and providing additional technical information on livelihood practices and cropping. Key partners work closely with farmers to interpret the diverse information available and facilitate local decision-making and planning livelihood strategies ahead of time. A key component of this approach is the analysis of historical climatic data. The use of historical climatic data, particularly the daily data, is a very sensitive topic for many national met services. Met service engagement takes time but is critical in order to strengthen national capacities to manage, analyse and disseminate historical climate data and information. The novel approach of the Reading team is to engage met services in the provision of climate information to farmers from the onset, to empower national met service staff to undertake data analyses themselves and to communicate analyses that are relevant and useful to farmers. This is changing the information provided by the National Met Services, which previously was based almost totally on the seasonal forecast. The main shift has been towards requesting national met services that they supply products, and not their data. For example, in 2013, the team facilitated a workshop with the Tanzania Met Authority, which analysed historical climate information for eight met stations (i.e. one from each region in the country). This is the first time this has been done successfully. Engagement processes are successfully on-going in other countries including Kenya, Ghana, Burkina Faso, Niger, Lesotho and Malawi.

How was the output used?

Climate and weather information provided through the approach developed by Reading research has changed the activities of and approaches used by major international, government and non-government organisations working to improve agriculture and reduce poverty in Sub-Saharan Africa and South Asia and helped thousands of smallholders to improve their decisions and livelihoods.The dissemination and training have directly resulted in a number of NGOs and national organisations adopting the approach to provide more useful climate and weather data to smallholder farmers. These include Oxfam, Farm Africa, Practical Action and World Vision who have incorporated the approach into their training materials and work.For example, Farm Africa reported that farmers who had been involved in Kenya “by the end of the training were more knowledgeable and could relate the rainfall patterns to their environment and also make informed decisions especially on choice of crop varieties, when to plant and how to conserve water through the type of farming/land preparation methods they use” [4] and Practical Action that “both farmers and extension staff [in Zimbabwe] have recognised the positive

impact of the project in assisting them to choose coping and adaptation strategies which enhance crop production and livelihood security" [7]. The research has had impact on NGOs policies and foci across countries they work in. For example, Practical Action reports that "the success of the above approach and project, along with other Practical Action interventions has influenced Practical Action in making the collation and dissemination of weather and climate information a key component of our work in promoting climate resilient agriculture" [7].IFAD, a Specialized United Nations Agency present in more than 90 countries, commissioned Dorward, Clarkson and Stern to conduct assessments and prepare plans to "outscale the approaches developed in Zimbabwe throughout its emerging programme in the region" which includes Uganda, Kenya, Malawi, Lesotho, Tanzania, Madagascar [6].

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 evidence for this outcome comes from various sources, including correspondence with officials in the national met services of the target countries and other participating stakeholders. Journal articles, the training manual and workshop reports are also available.1. Correspondence from Head of Crops Branch, Department of Agricultural, Technical and Extension Services (AGRITEX), Department of Agriculture, Mechanisation and Irrigation Development, Zimbabwe.2. Report on fSIAC Statistics in Agricultural Climatology Face–to–Face Workshop, 8th to 16th April 2013, Adama, Ethiopia, Offered by Walker Institute, University of Reading, under the project Supporting the Rockefeller Foundation Climate Change Units in East and Central Africa: Phase II.3. Report on Training workshop on climatic risk analysis, December 10-15, 2012, Niamey, Niger, offered by University of Reading, funded by the McKnight Foundation and CCAFS.4. Correspondence from Maendeleo Agricultural Enterprise Fund (MAEF) Coordinator, Farm Africa, Kenya Country Office.5. Correspondence from Climate Change, Agriculture and Food Security CGIAR, CCAFS Climate Services Champion, Scientist, CCAFS.6. Correspondence from Climate and Environmental Specialist, Regional Office for East and Southern Africa (ESA), International Fund for Agricultural Development IFAD.7. Correspondence from Programme Coordinator, Practical Action Programme Support Unit, Practical Action.Osbahr, H, Dorward, P, Stern, R and Cooper, S. (2011) Supporting agricultural innovation in Uganda to climate risk: linking climate change and variability with farmer perceptions. Experimental Agriculture, 47,293-316 (doi: 10.1017/S0014479710000785)Dorward, P, Stern, R. (2012) Developing approaches to support smallholder decision making and planning through the use of: historical climate information; forecasts; and participatory planning methods. Synopsis presented at workshop on Scaling Up Climate Services for Farmers in Africa and South Asia December 10-12, 2012, Saly, Senegal, CGIAR Research Program on Climate Change, Agriculture and Food Security (CCAFS)Muchedzi, H, Van den Ende, P, Dorward, P, Stern, R, Marovanidze, K, Nhongonhema, R, Mupuro, J, Unganai, L (2012) Mainstreaming climate change adaptation in agricultural extension: A training manual on use of climate information, and vulnerability and capacity assessment, for agricultural extension staff in Zimbabwe. University of Reading, Practical Action, AgritexVan den Ende, P, Dorward, P, Muchedzi, K (2013) Mainstreaming Climate Change Adaptation in Zimbabwe's Agricultural Extension System, Final Project Report. University of Reading and Practical Action

7. Outcome indicators

Outcome indicator #1

Outcome indicator:

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

Achievements:

Databases:

• CCAFS-Climate was viewed by over 2,000 unique visitors in 30,000 visits from more than 160 countries in 2013. Some 135,000 files were downloaded. All in all, there were about 7,000 users of CCAFS databases (including CCAFS-Climate, AgTrials, and Dataverse) in 2013. International and regional agencies that downloaded climate data and/or produced publications that made use of the data include FAO, GIZ, CDC, CIRAD, JRC, World Bank, the Asian Development Bank, WWF, SADC, ASARECA, and CORAF. The data from CCAFS-Climate were used in 52 refereed publications during 2013. With Theme 1,

• Cropland extent data has been crowd-sourced by 4,244 registered users, and the "Cropland Capture" game is played by nearly 2,700 players. The data has been used by IIASA and in the latest version of the SPAM cropland allocation model.

• In 2013 there were nearly 1,900 downloads of material from Dataverse on the CCAFS baselines, and nearly 1,200 unique visitors. International agencies that downloaded material include GIZ, World Bank, and International Relief for Development.

• CT Atlas designated the official database for the data storage, retrieval, and visualisation needs of the CTI-CFF (Coral Triangle Initiative for Coral Reefs, Fisheries and Food Security), an inter-governmental agreement between the six Coral Triangle countries (Worldfish and partners).

• New data on greenhouse gas emissions from livestock and livestock systems contributed to the IPCC's Fifth Assessment and to a PNAS Special Issue and are being taken up by the IPCC (ILRI, IIASA).CCAFS regional scenarios (with Theme 4.1):

• Co-development has been supported by FAO ESA EPIC in SE Asia, and by UNEP WCMC, Oxfam Great Britain, and the "Healthy Futures" FP7 program.

• New institutional arrangements resulting from scenario champions' work have occurred in E Africa (East Africa Farmers Federation, EAFF), in W Africa (Economic Community Of West African States, ECOWAS) and in Central America (Comisión Centroamericana de Ambiente y Desarrollo, CCAD).Tools (with Theme 1, Theme 4.3):

• CIAT together with Theme 4 has developed and maintained the CCAFS-climate portal, which now has more than 5,000 users, 5% of whom are governmental organisations. CIAT has also co-funded and supported the development of the Analogues tool under the leadership of Theme 1, and through commissioned activities contributed to the development and release of the Agtrials database, which is being contributed to by AgMIP

and MACSUR as well as other CGIAR Centres such as CIMMYT.

• CIAT has led the development of cost-benefit prioritisation tools for CSA, which have been tested in Colombia and are currently being piloted in four additional countries. This work is in partnership with the World Bank and other members of the CSA Alliance.

• IFPRI's IMPACT model has been redesigned and improved to meet the demands of model users and collaborators. The new version is being used widely in other CGIAR Centres and by the OECD Agriculture and Fisheries Division for analyses of climate change and agriculture.

• The participatory tool to support smallholder planning and decision making via the use of climate and weather information (Reading University) has been trialled in Zimbabwe and Tanzania, and is being taken up by several organisations.

• The MarkSim daily weather generator for current and future climates was downloaded some 3060 times during 2013, and is being used quite widely for research and training.

• The new DSSAT Cassava model is already in use by CIAT, CSIRO and several organisations in SE Asia.

Evidence:

http://www.ccafs-climate.org/ (and Google Analytics)

http://www.agtrials.org/

http://ctatlas.reefbase.org/

http://thedata.harvard.edu/dvn/dv/

CCAFS baseline (and analytics)

http://geo-wiki.org

Carey, C (2014). The CCAFS regional scenarios programme: external evaluation report on progress towards programme outcomes. CCAFS internal report. http://www.reading.ac.uk/ssc/resources/participatory-activities-with-farmers/story.html

http://dssat.net

8. Leveraged funds

Leveraged fund #1

Title:

Household risk modelling. CSIRO, in return for 0.5 FTE support from T4.2 for a post-doc, are contributing 2.5 FTE on this work, much of which will concentrate on T2, T3 and T4 activities n Asia and W and E Africa

Partner name: CSIRO

Budget: $300000

Theme: T4

Leveraged fund #2

Title:

CO-LEVERAGED WITH T4.1 - FAO ESA EPIC program - funding for the organization of CCAFS regional scenarios development in Southeast Asia and scenarios development for Zambia and Malawi (using CCAFS method but handled by CCAFS consultant to avoid time spent

Partner name: FAO ESA EPIC

Budget: $210000

Theme: T4

Leveraged fund #3

Title:

Other scenarios work co-leveraged with Theme 4.1. See under:UNEP WCMCOxfam Great BritainHealthy Futures EC-funded program

Partner name: UNEP WCMC, Oxfam Great Britain, Healthy Futures EC-funded program

Budget: $380000

Theme: T4

Leveraged fund #4

Title:

USAID have confirmed funding (from March) of Scaling up climate services for farmers in Africa (across several collaborating partners)

Partner name: University of Reading, Dorward

Budget: $150000

Theme: T4

Leveraged fund #5

Title:

The potential of novel climate services for smallholder farmers in Lesotho. International Fund for Agricultural Development (IFAD) (2013)

Partner name: University of Reading, Dorward and Stern

Budget: $26700

Theme: T4

Leveraged fund #6

Title:

Work with National Met Services: funds from WMO to train staff from Met Offices in Africa on the analysis of weather records.

Partner name: University of Reading, Stern

Budget: $58000

Theme: T4

Leveraged fund #7

Title:

Funds for the management of climatic data from UK Met Office to support the development of CLIMSOFT

Partner name: University of Reading, Stern

Budget: $20000

Theme: T4

Leveraged fund #8

Title:

not yet signed: Support for CRP 1.1. to develop a set of resources to help researchers in NARES in the design of research activities and the analysis of the data resulting from those activities.

Partner name: University of Reading, Barahona

Budget: $115000

Theme: T4

9. Theme Leader Summary by outputs

Output: 4.2.1

Summary:

Regional site and baseline characterisation: Baseline data collection activities at the 15 CCAFS core sites in three regions and 12 countries were completed. The goal is to assess what kinds of changes have occurred and whether these changes are helping households adapt to, and mitigate, climate change. The baselines at household, village and organisational levels are allowing CCAFS to explore gender and other social differences in target populations. Site reports are complete and all materials are available on DataVerse. Version 3 of the CCAFS site portfolio document has been released and site atlases for all CCAFS sites in the initial three target regions have been published. A paper on the baselines process has been written and submitted for publication, and a CCAFS Working Paper on a cross-site analysis will be published in early 2014. Several other papers are in various stages of development. The work has involved a wide range of national partners in the regions, as well as several CGIAR Centres (ILRI, ICRAF, IWMI and ICRISAT). As a safety precaution, the GPS coordinates in all 15 core sites were independently re-checked for accuracy at the end of the year, to facilitate revisits. The baseline protocols are undergoing limited adjustment, ready for application in the new CCAFS regions in 2014. Work was done in implementing the M&E strategy in relation to the CGIAR IDOs, and this is being built on as CCAFS moves towards Phase 2. Some initial survey work was carried out on users of tools and databases supported by theme 4.2, and this will be expanded upon and written up in 2014.

Downscaled climate data: CIAT worked on new CMIP5 downscaled data, and these are now fully available on the website for 4 RCPs, 4 future periods, 105 Global Climate Models (about 25 GCM by scenario) and 5 climatological variables (see http://www.ccafs-climate.org/data). At the same time, some of the CMIP5 climate model data were incorporated into both versions of MarkSim GCM (the stand-alone version and the Google-Earth-based version; a new and improved interface with additional capabilities was developed for the latter). MarkSim was also modified to work within the DSSAT crop modelling suite (this work was done in conjunction with ILRI and the University of Florida and Washington State University). CIP worked with UCSB to address questions regarding the South American Monsoon System (SAMS), and results have been documented and published. The Statistical Physics Downscaling Model (SPDSM) was tested in the high Andes, and the high-resolution downscaling may be an improvement over conventional statistical techniques. CIP has also developed and tested a methodology based on scaling laws and (joint) multifractal theory to address spatial variability in crop modelling yield simulations. CIAT, University of Oxford and INPE, in different studies (the last commissioned jointly with Theme 1), evaluated the ability of the CMIP5 climate models to reproduce current climate in different regions, particularly SE Asia and Latin America. Results generally indicate only marginal improvements compared with CMIP3 model output.

Databases and database tools: theme-led activity is contributing to much larger efforts by filling in key gaps that are of particular importance to climate change and food security work, including soils information, agricultural systems, and cropland extent throughout the global tropics (Washington State University, IIASA, McGill

University, FAO, ILRI, ICRAF). Several activities have been collecting household data from CCAFS and other sites that can be used for modelling and characterisation purposes (ILRI, ICRAF, ICRISAT), including the Impact-Lite datasets for about 3000 households in West Africa, East Africa and South Asia. ICRAF collected and made available soil carbon data for five sentinel sites in Western Kenya, as well as setting up a dendrochronology laboratory for evaluating changes in climate. A protocol for measuring carbon and a web-based soil carbon calculator have been developed, and country profiles assembled that describe institutional and governance conditions that can support fair and efficient national planning (ICRAF). IRRI has assembled technical coefficient databases for assessing technological and socio-economic viability of adaptation and mitigation projects in rice-based production systems. Databases for a province in central Vietnam concerning yields and GHG fluxes are providing a 'road map' for desirable development of rice production technologies in the region. WorldFish hosts and maintains several databases such as Reefbase, Coral Triangle Atlas and AAS-Base, which are being used in different ways to monitor and evaluate food security issues in Asia and the Pacific region. The CCAFS data management strategy (DMS) developed in 2012 is now being implemented. With partners at the University of Reading, a Data Management Support Pack was developed and disseminated. Also with partners at Reading, work has been on-going with National Meteorological Services in several countries in Africa (Tanzania, Ghana, Kenya, Burkina Faso, Lesotho). This interaction is leading to the provision of tailored weather data products that make use of national data climatic data, as well as analyses of climatic data for at least some of the CCAFS sites (most of this will be forthcoming during 2014).

Decadal / near-term climate products: another array of activities is looking at climate variability, its potential impacts on agriculture, and the ways in which farmers might appropriately manage the resulting risk. To date, this work is being done at IRI and the University of Cape Town. The purpose of these activities is to make it possible to assess the relative impacts of shifts in both means and variances in climate variables, and the relative impacts these may have on agriculture and food security.

Assessment toolkits: The G-Range global rangeland model (developed by colleagues at Colorado State University) underwent extensive evaluation and first results have been presented in various fora. A global study of climate change impacts on rangelands during the current century is underway. The University of Florida and co-workers have been improving crop simulation models for cassava (with CIAT) and pigeon pea, using data sets from a range of co-workers. Such crops remain relatively understudied but may be highly resilient to increasing temperatures in the future.

Work has been done in validating, comparing and improving other crop simulation models, particularly rice (IRRI), beans (CIAT), and maize and wheat (CIMMYT). These crop modelling tools are being used to assess possible futures of tropical agriculture at different scales, including integrated bioeconomic modelling at fine spatial resolution to provide insights into the impact of climate change at the local level and to identify regions that are highly vulnerable to climate change and to evaluate adaptation options. In this regard, CIMMYT has set up databases that link maize and wheat yield trial data with soil and climate information in a network of research stations in Eastern and Southern Africa. Another activity, in conjunction with AgMIP, is comparing simulation models of livestock production to understand more about the uncertainties involved in modelling livestock production. With Theme 2 and partners at ILRI, Bioversity, ICRAF, ICRISAT, CIFOR, CIAT, CIMMYT, IFPRI

and CSIRO, new developments in modelling household risk are being applied to some of the CCAFS household data sets to address multiple time periods and dynamic risk issues. Global impact modellers at IFPRI and IIASA have completed quantifying the regional scenarios developed through a series of participatory workshops in E and W Africa (with Theme 4.1). IFPRI has recently quantified the CCAFS regional socioeconomic scenarios to 2050 for East Africa. IFPRI and IIASA will complete work on quantifying the regional scenarios in South Asia, SE Asia (in collaboration with FAO) and Latin America in 2014. The Tradeoff Analysis model for Multi-Dimensional impact assessment (TOA-MD) has been adapted as an integrated assessment framework for regional analysis of climate change and adaptation impacts. The methodology is now well established and several regional integrated assessments are ongoing in West Africa, East Africa and South Asia, with input from ICRISAT. These assessment toolkits are making use of the ILRI-led Impact-Lite household data (see above) where possible. ILRI assembled a framework for identifying vulnerability due to disease risk in livestock systems, and this is being used to identify disease "hotspots" to help prioritise interventions. In East Africa, several decision support tools were trialled for evaluating impacts of risk management interventions on rural livelihood resilience in Ethiopia, Kenya, Tanzania and Uganda, in activities led by ICRISAT, ILRI, Maseno University and East Africa Farmers Federation (EAFF). The tools have included APSIM, the Climate Predictive Tool (CPT) and FEWSNET Agro-Climatology Toolkit Forecast Interpretation Tool (FACT-FIT), along with the trialling of near real-time rainfall intensity observation. This work is contributes to other efforts to test seasonal forecasting tools that have potential for wide-scale use in the region. In South Asia, the regional CCAFS team and IWMI have developed the CSAP (Climate Smart Agriculture Prioritisation) toolkit. This dynamic-stochastic-spatial model is being used to analyse “safe spaces” of food production, emissions and income under climate change. It is being applied in a case study in Bihar state, India, and is providing information for planners on future trade-offs between different objectives under uncertainty. Also in South Asia, a crop modelling interface was completed and tested, which allows users to run crop models in both the DSSAT and INFOCROP suites over large spatial areas. Several activities have been undertaken in relation to adaptation indicators for food systems, including work led by ILRI (published as CCAFS WP 51) that was subsequently built on by a small research team from CCAFS, WLE and FTA to develop a suite of indicators and tools for measuring adaptive capacity at different scales.

Output: 4.2.2

Summary:

Activities are designed to contribute towards the development and communication of decision aids for use by socially differentiated groups, as well as enabling social learning within this context. Bioversity has completed studies in Tanzania and Colombia that helped to generate a local participatory vulnerability assessment methodology that explicitly takes into account gender and social differentiation in different livelihoods. The new manual, together with the experience developed in 2013, will serve as the basis for systematic implementation of this approach in order to guide community adaptation planning. Understanding social learning is becoming increasingly important if we wish to respond effectively to the challenges of climate change and food security and to contribute more effectively towards the achievement of development outcomes. CCAFS WA in collaboration with IUCN has explored how individual outcomes contribute to broader system-wide changes, focusing on behavioural change, while training researchers and national partners in the use of participatory M&E tools.

The Climate Change and Social Learning (CCSL) Initiative which was launched in 2012 is the centre-piece of this work and is developing into an active community of practice. ILRI is a key partner in the facilitation of the CCSL Initiative and has ensured that the CCSL Sandbox has been growing and become very visible. The CCAFS strategy on social learning and climate change decision-making is guiding the CCSL work, and it is currently being implemented through a range of partners, including IIED, ILRI, IDS, IDRC, and Euforic Services. The CCSL Initiative with ILRI organised, facilitated and documented the CCAFS annual science meeting in 2012, titled Achieving more impact through connecting, engaging and learning with communities and other key actors. This included the launch of the CCSL whiteboard video Transformative partnerships for a food secure world, with over three thousand hits.

CCAFS Working Paper by Harvey et al. examined social learning processes for climate change and natural resource management, focusing on different aspects including the principles of, tools and approaches to social learning, as well as evaluation and concrete examples of impacts that social learning has contributed to. The paper contributes to reflections on the role that social learning might play and the impacts it might have on supporting decision making on climate change and food security. A second working paper by Gonsalves focused on the relevance and prospects for wider uptake of social learning approaches within CGIAR. The paper provides a detailed review of the scope of social learning-related efforts undertaken within CGIAR to date and identifies a range of methods through which learning currently takes place to provide solutions to food security problems. It further explores if the new structural setup of CGIAR offers improved prospects for the inclusion of social learning approaches and identifies key conditions within the enabling environment that support social learning. These working papers are first steps towards building an evidence base of successful social learning and its value in outcome-oriented research – much of 4.2.2 work in 2014 will focus on building an evidence base, supported by documented social learning case studies across a range of organisations and contexts.

In addition, University of Reading has developed an innovative approach to support smallholder decision-making and planning through the use of climate and weather information. Focusing on Tanzania, Ethiopia, Kenya and Niger in 2013, the activity includes close engagement and capacity strengthening and training of meteorological and extension services staff, as well as NGOs and smallholder farmers themselves. The activity has informed project planning of several key NGO and donor organisations – the outcomes of this activity are the focus of the Theme 4.2 2013 outcome story.

The work under this output is implemented collaboratively with Theme 4.1 and ILRI, where key partners are contributing to the CCSL Initiative and to the evidence base of social learning. A working paper specifically looks at the synergies and trade-offs associated with integrating socially differentiated stakeholders into social learning processes aimed at addressing poverty and food insecurity.

An extra allocation received toward the end of the year, based upon a request from the Science Officers' group, was used to hire a consultant who is in the process of creating a methodology for assessing the behavioural changes necessary for achieving outcomes in the CCAFS sites and regions. The consultant is developing a framework for understanding 1) the drivers of behavioural change within CCAFS and its partners and 2) the mechanisms through which the CCAFS programme supports positive change. A draft manual of the methodology has been submitted, and after refinement the plans are to implement it in the various sites and regions as part of the learning process for planning Phase 2 of CCAFS.